



Transportation Safety

REGIONAL EXISTING CONDITIONS

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Executive Summary

Between 2009 and 2020, there were almost 37,000 fatal collisions in the Southern California Association of Governments (SCAG) region, killing more than 17,300 people, and seriously injuring more than 66,000. During this same period, statewide, approximately 40,000 people died in collisions and more than 150,000 people were seriously injured. Transportation safety remains a significant challenge for both the region and the state.

Though people have traveled less during the COVID-19 pandemic, collisions have still occurred, particularly with reduced congestion and the opportunity to travel at higher speeds. The National Highway Transportation Safety Administration's (NHTSA) recent report noted that the rate of traffic fatalities was up by about 18 percent, while traffic volumes were down by nearly 17 percent.¹ In California, University of California Berkeley's SafeTREC identified similar circumstances, with rates of fatal and serious injury collisions increasing by nearly 15 percent. Preliminary data from the National Safety Council (NSC) showed a 24 percent increase over a year in the traffic fatality rate, which is the sharpest spike the NSC has measured since 1924.² Experts attribute the increases to surging speeds on less congested roads, altered economic activity levels, adjusted law enforcement practices, road design, and pandemic policies. NHTSA has also reported that drivers engaged in riskier behaviors in the first half of 2020, with large numbers of collision victims testing positive for drugs and alcohol and fewer of them wearing seat belts than in the past.³ We anticipate that as our region emerges from the pandemic, rates may continue to rise, particularly if people shift away from using public transit or shared vehicles.



The challenges confronting the region and the state are significant and that is why coordination is critical. The State of California, SCAG, and local governments are committed to ensuring transportation safety for all people in our region. Each year metropolitan planning organizations such as SCAG work with the state to develop statewide and regional safety targets to comply with federal requirements. More specifically, we work together to assess fatalities and serious injuries on all public roads and set annual targets for the following performance measures:

- Number of Fatalities;
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT);
- Number of Serious Injuries;
- Rate of Serious Injuries per 100 million VMT; and
- Number of Non-motorized Fatalities and Non-motorized Serious Injuries.

We depend on data to help us make better transportation decisions that result in fewer fatalities and serious injuries. We want to find solutions to make the region safer for everyone. To do this, we require perspective on our existing conditions. Specifically, what is happening? Where is it happening? When is it happening? Who is it happening to? And why is it happening?

This report has two purposes. The first is to provide some answers to these questions by reviewing our region's most recent roadway collision data, patterns, and trends. The second purpose is to serve as a reference when considering future planned improvements and actions.



Introduction

Southern California is home to roughly 19 million people, about half the entire state's population and nearly 13 million licensed drivers. Even in the COVID-19 pandemic, we are relying on our cars, buses, rail lines, bicycles, wheels, and feet to get around. And we are getting around a lot: in a typical year, we travel more than 440 million miles every day. That is equivalent to 17,911 trips around the world every day. The thing is, we are not going around the world. In a typical year, we are going to work, the grocery store, to visit our grandma, and to our child's soccer game.

With all that traveling, it is not surprising that mistakes are made. At the wrong moment, we might take a quick glance at a text message, rush to make it through a traffic signal, or forgo the intersection to cross midblock. The consequences of these mistakes can last a lifetime.

On average, 1,450 people are killed, 5,500 are seriously injured, and 124,000 are injured in traffic collisions each year in Southern California. The region experienced a period of annual declines in traffic-related fatalities and serious injuries until 2012 when they began to steadily rise to their previous peaks around 2016. These numbers represent children, parents, spouses, relatives, and friends. These are people who were going about their typical day. Collisions are happening in every community in our region, from El Centro in Imperial County to Malibu in Los Angeles County. They are happening to people who drive, and disproportionately to people who walk and bike. Low income and communities of color are also negatively impacted; a significant portion of SCAG's High Injury Network, about 66 percent, exists in Disadvantaged Communities.

The region remains on track to experience population and economic growth and there will likely be corresponding increases in demand for existing roadways, resulting in increasing traffic density and making safety more critical than ever for the diverse population who use our network on a daily basis.

Recognizing the transportation safety challenges confronting the region, in 2021, SCAG adopted a resolution affirming its regional leadership role and commitment to advancing transportation safety, and adopting a Regional Safety Policy that:

- Endorses Toward Zero Deaths (TZD) as part of a comprehensive effort to strive to achieve zero transportation-related fatalities and serious injuries in the SCAG region by 2050, if not sooner;
- Motivates data driven approaches, including High Injury Networks and safety modeling, to inform safety policy and planning and the strategic use of available funds and resources;
- Promotes equity in regional safety policies and plans by considering and analyzing impacts on Disadvantaged Communities, Communities of Concern, and Environmental Justice Areas, and protecting vulnerable roadway users, such as pedestrians and bicyclists, older adults and youth;
- Engages regional stakeholders in transportation safety policy and plan development, implementation, and evaluation, with the goal of achieving alignment with TZD; and
- Provides leadership at the state and regional levels to promote safety, including supporting work on statewide efforts (e.g., Strategic Highway Safety Plan (SHSP)) and legislation that furthers TZD.

SCAG, along with the State of California and local governments, is committed to ensuring transportation safety for all people in our region. We want to work together to find solutions to make the region safer for everyone. To do this, we need to regularly analyze our existing conditions. Specifically, what is happening?

Where is it happening? When is it happening? Who is it happening to? And why is it happening?

This report has two purposes. The first is to provide some answers to these questions by reviewing our region's most recent roadway collision data, patterns, and trends. The second purpose is to serve as a reference when considering future planned improvements and actions.

Overview

MANY LOCAL JURISDICTIONS ARE ALREADY HARD AT WORK ON IMPROVING SAFETY. WHY DOES SCAG SET ANNUAL REGIONAL SAFETY TARGETS?

Communities everywhere are working to develop safer transportation systems. Our combined efforts can be better supported and coordinated by establishing common goals and targets at the state and regional level.

Transportation funding legislation was approved in 2012 (Moving Ahead for Progress in the 21st Century Act or MAP-21) and 2015 (Fixing America's Surface Transportation Act or the FAST Act) that called for establishing performance measures and standards. The Federal Highway Administration (FHWA) requires State Departments of Transportation (DOTs) to work with metropolitan planning organizations (MPOs) to assess fatalities and serious injuries on all public roads and to set annual targets for the following performance measures:

- Number of Fatalities;
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT);
- Number of Serious Injuries;
- Rate of Serious Injuries per 100 million VMT; and
- Number of Non-motorized Fatalities and Non-motorized Serious Injuries.

Targets are set based on five-year rolling averages. A five-year rolling average is the average of five individual, consecutive annual points of data for each proposed performance measure. Using a multiyear average approach provides a better understanding of the overall fatality and serious injury data over time. For instance, if a particularly high or low number of fatalities and/or serious injuries occur in one year, a return to a level consistent with the average in the previous year may occur.

State DOTs and MPOs are expected to use the information and data generated as a result of the safety target-related analysis to help make better transportation planning and funding decisions that result in fewer transportation fatalities and serious injuries.

WHEN DO WE SET OUR REGIONAL SAFETY TARGETS?

The California Department of Transportation (Caltrans) is required to establish statewide safety targets on an annual basis, beginning in August 2021 for calendar year 2022 targets. SCAG is required to establish targets for the same five safety performance measures up to 180 days after Caltrans establishes targets (i.e., February each year). SCAG has the option to agree to support Caltrans' targets, establish numerical targets specific to our region, or use a combination of both.

Calendar year 2021 was the fourth year for which safety targets were established pursuant to the requirements under MAP-21. In the prior three years of target setting, SCAG supported the statewide targets and adopted SCAG-specific targets based on Caltrans' target setting methodology. In 2021, SCAG adopted region-specific targets based on Caltrans' prior target setting methodology that was supportive of achieving Toward Zero Deaths. SCAG is now working towards achieving annual reductions of 3.5 percent in fatalities and serious injuries until 2050 (roughly aligning with the horizon year of Connect SoCal, 2045), at which time the region is anticipated to experience zero traffic-

related fatalities. For past and current safety targets, please refer to [Table 1](#). Because targets are updated annually, SCAG will have the opportunity to revisit and update its targets each calendar year. SCAG must provide regular updates on its progress towards achieving these targets, including within Connect SoCal and the Federal Transportation Improvement Program.

HOW DO WE KNOW IF WE ARE MAKING PROGRESS?

FHWA considers whether Caltrans has met or made significant progress toward meeting its safety targets when at least four of the five targets are met or the outcome for the performance measure is better than the baseline performance the year prior to the target year. The “met or made significant progress” determination only applies to state DOT targets, not MPOs. In April 2020, FHWA notified Caltrans that California had not met or made significant progress towards its 2018 safety targets. In response to this determination, California was required to obligate HSIP (Highway Safety Improvement) funds in the amount apportioned for the prior year only for HSIP projects (Caltrans was already doing this). Caltrans was also required to submit an HSIP Implementation Plan to FHWA by October 1, 2020. The purpose of the HSIP Implementation Plan was to identify tangible actions for the California to take in Federal Fiscal Year 2021 to make progress toward achieving the targets. SCAG anticipates that because California did not meet its targets, greater coordination between Caltrans and MPO safety activities will likely have to occur going forward.

The “met or made significant progress” determination only applies to State DOT targets, not MPOs, as part of oversight of the planning process, FHWA reviews how MPOs such as SCAG are addressing their targets or assisting the state in addressing its targets during Transportation Management Area (TMA) Certification Reviews, when FHWA reviews the Transportation Improvement Programs (TIPs) and State Transportation Improvement Programs (STIPs). FHWA also reviews how MPO targets are achieved during the Federal Planning

Finding associated with the approval of the STIP.

WHAT HAPPENS IF WE DO NOT MEET OUR TARGETS?

As described above, when California does not meet its targets, a State Implementation Plan must be developed to meet its targets, and whatever flexibility there is in using HSIP is gone.

ISN'T CALIFORNIA ALREADY WORKING ON SAFETY?

California has its own Strategic Highway Safety Plan (SHSP), which started development in 2006 and was updated in 2020.⁴ As a statewide, coordinated safety plan, it provides a comprehensive framework for reducing fatalities and serious injuries experienced by motorists, pedestrians, and bicyclists on all public roads. California aims to have a safe transportation system for all users. Similar to SCAG, California’s overarching goal is Toward Zero Deaths. The state is currently hard at work on implementing this plan. The current SHSP Implementation Plan includes a number of recommendations from the Zero Traffic Fatalities Task Force, which was convened in 2019 and focused on identifying changes in speed setting methodologies and other steps to reduce traffic injuries and fatalities.⁵ SCAG is currently leading SHSP Implementation Plan action items that are advancing the Task Force recommendations- developing statewide guidance on a definition of and methodology for High Injury Networks.

In addition to these statewide efforts, a number of jurisdictions in California and across the world are implementing strategies known as Vision Zero, Toward Zero Deaths, or Safe System approaches aiming to achieve transportation systems with no fatalities or serious injuries. These approaches are based on the understanding that even one traffic-related fatality is unacceptable. In the United States, the Toward Zero Deaths National Strategy was launched in 2014, adopting the zero-focused imperative along with a strong commitment to a

Table 1: Regional Targets

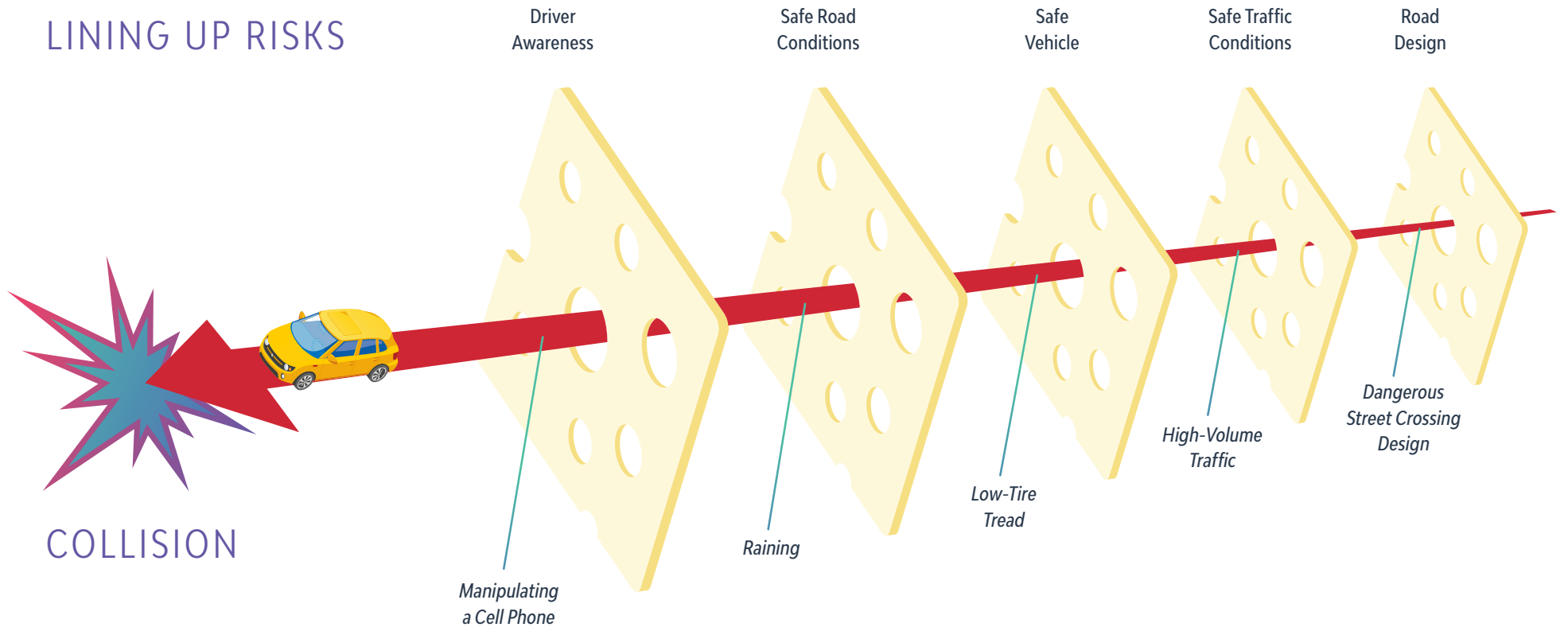
MEASURE	SCAG TARGETS	CALTRANS TARGETS	SCAG TARGETS	CALTRANS TARGETS	SCAG TARGETS	CALTRANS TARGETS	SCAG TARGETS	CALTRANS TARGETS
	2018		2019		2020		2021	
Number of Fatalities	1,601.00	3,590.80	1,467.00	3,445.40	1,607.00	3,518.00	1,608.90	3,624.80
Rate of Fatalities per 100M VMT	0.97	1.03	0.89	0.995	0.96	1.02	1.31	1.04
Number of Serious Injuries	5,752.00	12,823.40	5,552.00	12,688.10	5,735.61	13,740.40	6,490.10	15,419.40
Rate of Serious Injuries per 100M VMT	3.50	3.83	3.37	3.66	3.42	3.99	5.30	4.42
Total Number of Non-motorized	2,068.20	4,271.10	2,133.00	3,949.80	1,915.98	4,147.40	2,162.59	4,340.80

safety culture. The principles underpinning the approach include:

1. People make mistakes which can lead to crashes; however, no one should die or be seriously injured on the road as a result of these mistakes;
2. The human body has a limited physical ability to tolerate crash forces;
3. Road safety is a shared responsibility amongst everyone, including those that design, build, operate and use the road system; and
4. All parts of the road system must be strengthened in combination to multiply the protective effects and if one part fails, the others will still protect people.

At the center of the system is people – people that are fragile and will at times make mistakes that can lead to collisions. With that understanding, the road system needs to put layers of protection in the form of safe roads, vehicles, speeds, and people (safe road users) around the fallible and vulnerable human in order to prevent fatalities and serious injuries. Collisions occur due to a number of variables including human error, poor urban design, weather conditions, vehicle safety and more, and **Figure 1** illustrates how all of these factors working together can cause a collision to occur.

Figure 1: Swiss Cheese Model of Crash Causation



Sources: Adapted from Seppa (2013) and Reason (2000).

Helpful Definitions, Acronyms, and Data

WHAT IS VMT AND WHY IS IT IMPORTANT?

VMT stands for Vehicle Miles Traveled. Per VMT is used to describe collision rates per vehicle miles traveled. This helps us measure the safety per distance traveled.

WHAT IS A SERIOUS INJURY VERSUS A NON-SERIOUS INJURY?

Serious injuries are non-fatal and result in one or more of the following:

- 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;
- Suspected skull, chest, or abdominal injury other than bruises or minor lacerations;
- Significant burns (second and third degree burns over 10 percent or more of the body);
- Unconsciousness when taken from the crash scene; and/or
- Paralysis.

Note: The definition of serious injuries was changed to include suspected serious injuries and was implemented in mid-2017. At the statewide level, the first full year of suspected serious injuries resulted in an increase of 21 percent from the last full year using the former definition.

Non-serious injuries are also non-fatal or serious, but more common. They may include visible injuries and/or a complaint of pain.

WHAT IS NON-MOTORIZED TRANSPORTATION?

Non-motorized transportation is a term for active transportation or human powered transportation and includes walking and bicycling, and variants such as skates, skateboards, and wheelchairs.

WHY ARE WE REFERRING TO CRASHES OR COLLISIONS AND NOT ACCIDENTS?

Fatal and non-fatal collisions are not all simply “accidents” – that is, unavoidable tragedies. People driving, walking, and bicycling will make mistakes on the road. We recognize that most crashes have identifiable causes and we can work together to implement programs and improvements to ensure that future similar mistakes do not result in death.

WHERE IS THE DATA COMING FROM?

Collision data for this report was generated from the California Statewide Integrated Traffic Report System (SWITRS). Because SWITRS combines records from all state and local police departments, data varies due to differences in reporting methods. It is important to note that the number of collisions reported to SWITRS is likely an underestimate of the actual number of collisions that take place because some parties do not report minor collisions to law enforcement, particularly collisions not resulting in injury or property damage. In addition, because reports are written at the time of the collision, the severity of injuries and even fatalities may be different from reality as injuries may worsen with time, and eventually turn to fatalities. Although under-reporting and omissions of near-misses are limitations, analyzing the collision data allows us to look for trends both spatially and in behaviors or design factors that cause collisions in our region. It is important to note that the most recent year of complete data is from 2018. The 2019 and 2020 data we are sharing are provisional. Throughout the report we have relied on 2019 as our baseline year, though we include

2020 to provide a preliminary analysis of trends. VMT data was generated from the 2018 Highway Performance Monitoring System (HPMS), a national level highway information system that includes data on the extent, condition, performance, use, and operating characteristics of the nation’s highways. The HPMS contains administrative and extent of system information on all public roads, while information on other characteristics is represented in HPMS as a mix of universe and sample data for arterial and collector functional systems. Limited information on travel and paved miles is included in summary form for the lowest functional systems. Additional data on mode split was taken from the 2015-2019 American Community Survey.

Endnotes

- 1 National Cooperative Highway Research Project 17-67, “Identification of Factors Contributing to the Decline of Fatalities in the United States”
- 2 <https://www.nsc.org/newsroom/motor-vehicle-deaths-2020-estimated-to-be-highest>
- 3 <https://www.bloomberg.com/news/articles/2021-04-09/the-right-way-to-rethink-cities-for-post-covid-work>
- 4 <http://www.dot.ca.gov/trafficops/shsp/>
- 5 <https://calsta.ca.gov/subject-areas/enforcement-and-safety/zero-traffic-fatalities>



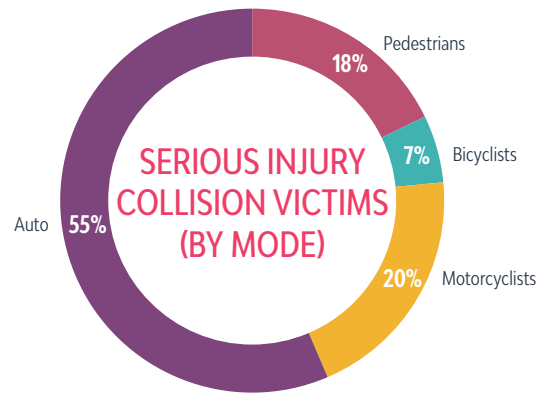
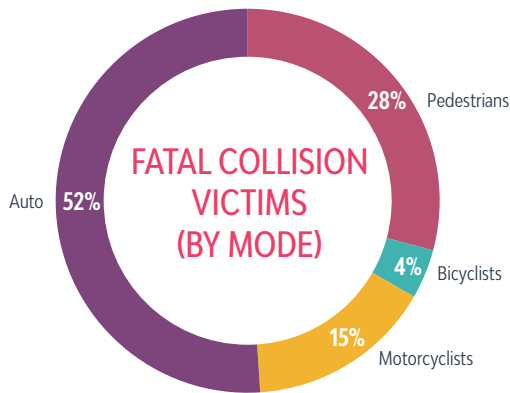
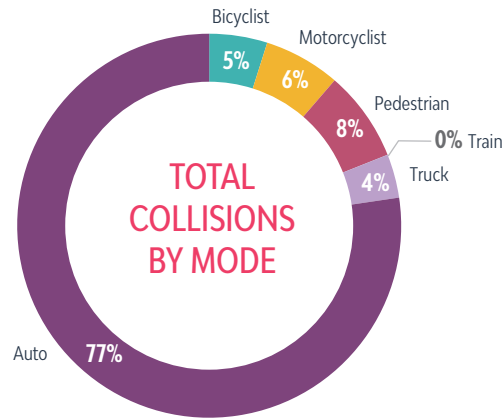
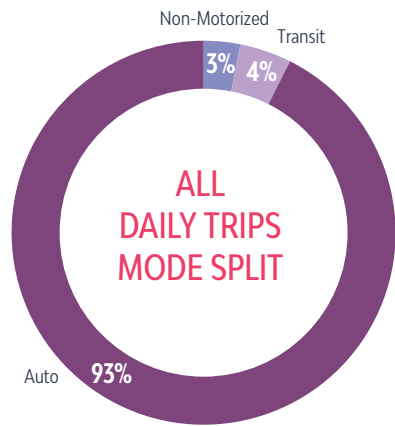


Regional Existing
Conditions

SCAG Region BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





Regional Existing Conditions

WHAT ARE THE OVERALL TRENDS?

On average, 1,450 die in traffic collisions, 5,500 people are seriously injured, and 124,000 people sustain injuries every year in the SCAG region. In reviewing the past decade's worth of data, the total number of fatal victims began to rise in 2012 until they peaked in 2016 at approximately 1,700. Since 2016, the number of fatal victims gradually declined as reflected in [Figure 1](#). In contrast, over the course of the past decade, the number of serious injury victims has continued to increase at an average growth rate of 3 percent per year ([Figure 2](#)). There has been a similar trend in the number of visible injury victims in the same time period as reflected in [Figure 3](#). Since 2009, 1 percent of collisions have ended with fatalities, 4 percent with serious injuries, and 95 percent with visible injuries.

[Maps 1](#) and [2](#) reflect where the concentrations of fatal and serious injury collisions occurred in the region in 2019 (our most recent year of finalized data). Both maps indicate that these types of collisions are generally concentrated in areas of high population.

From 2009 to 2020, about 67 percent of those killed were in vehicles or on motorcycles, while the other 32 percent of fatal victims were walking or biking. Of the roughly 1,450 fatal collisions that occurred each year, about 472 were active transportation collisions. The numbers of active transportation fatal victims have increased over this same time period.

[Figure 4](#) reflects the number of pedestrians killed and serious injured from 2009 to 2020. It is important to note is that the number of pedestrians killed and seriously injured were consistent with the overall trends for fatal and serious injury victims. The number of pedestrians killed increased slightly, while the number of pedestrians who sustained serious injuries has been steadily climbing since 2009, at an average growth rate of 3 percent per year. Over the course of the past decade, pedestrians and bicyclists constituted approximately 32 percent of all fatal victims, disproportionate to their mode share of just under 3 percent of the daily trips. [Map 3](#) highlights all of the pedestrian-involved collisions that resulted in a fatality or serious injury that occurred in the region in 2019.

[Figure 5](#) reflects the number of bicyclists killed and seriously injured from 2009 to 2020. While bicyclist fatal victims have been steadily rising from 2009 to 2019, over the same time period, bicyclist serious injury victims have generally slightly decreased. [Map 4](#) highlights all the bicyclist-involved collisions that resulted in a fatality or serious injury that occurred in the region in 2019.

Although much understanding can be gained by analyzing the numbers of fatalities and serious injuries from various modes, it is important to consider how external factors may influence the numbers. For example, during the COVID-19 pandemic, vehicle miles traveled (VMT) decreased due at least in part to city, county, and state stay-at-home orders, resulting in reduced exposure to the potential for collisions.

Across all modes, the number of fatal and serious injury victims per 1,000 people

provide a measurement of overall safety in roadways across the region. While population steadily increased in the region, it was incremental: from 2010 to 2020, it increased less than 1 percent per year. When considering the number of fatal victims per 1,000 people, trends were similar to their non-normalized counterparts. Fatal victims per 1,000 people peaked in 2016 before the number of fatal victims began to slowly decline. Over the same time period, the total number of serious injury victims per 1,000 people steadily increased across the region. As highlighted in **Figure 6**, both fatal and serious injury victims per 1,000 people follow similar trends as their non-normalized trends, suggesting that population had little impact on the trends behind the number of fatal and serious injury victims.

Since 2009, there was no consistent trend in the vehicle miles traveled (VMT) in California. While prior research demonstrated that decreases in VMT were correlated with decreases in the number of fatal collisions, more recent research released during the COVID-19 pandemic found that decreases in VMT from various stay-at-home orders has been associated with increases in collisions in certain jurisdictions, including single vehicle fatal crash rates of fatal collisions.¹

Figure 7 demonstrates how trends for the number of fatal and serious injury victims normalized by VMT across the region were consistent with non-normalized and population-normalized numbers. For fatal victims, there was a peak in 2016 before starting to decrease, while the number of serious injury victims increased over the same time period.

VMT per capita reached a peak in 2010 and 2011 before decreasing and subsequently returning to previous levels in 2016. There may be a variety of reasons that lead to shifts or changes in any of the indicators (i.e., fatalities, serious injuries, VMT, or population) not restricted to and including transportation technology changes, changing demographics, saturated highways, and/or preferences for living in more compact neighborhoods that reduce the need for driving. However, measuring VMT remains critical for both

SCAG's sustainability goals, and in increasing transportation safety, as collisions with vehicles result in more fatal and serious injury victims than collisions involving other modes.

WHERE ARE COLLISIONS OCCURRING?

The California Department of Transportation (Caltrans) adjusts definitions of urban and rural areas from the U.S. Census to create distinct identifications of rural and urban areas. Per the Caltrans definition, parts of the region differ on whether they are part of an urban or rural area, with urbanized areas defined as 50,000 or more people, urban clusters 2,500 to 50,000 people, and rural areas defined by any populations below 2,500 people. In 2019, the vast majority of fatal and serious injury collisions in the region occurred in urbanized areas and urban clusters: 73 percent of all fatal collisions (including pedestrian-, bicyclist-, and motorcyclist-involved) and 75 percent of all serious injury collisions. **Maps 1-4** display collisions (by mode) that resulted in a fatality or serious injury, highlighting their concentrations in the region, the majority of which are in urbanized areas.

Southern California's highway, arterial, and collector system includes around 21,000 centerline miles and 36,000 centerline miles of local roads.^{2,3,4} The region is home to approximately 5,000 bikeway miles, including around 850 miles of Class I bikeways (bicycle paths), almost 3,000 miles of Class II bikeways (a striped lane for one-way bicycle travel), approximately 1,200 miles of Class III bikeways (signs or pavement markings, but no separation), and almost 20 miles of Class IV bikeways (separated cycle tracks), with over 9,000 additional bikeway miles currently being planned.⁵

In 2019, most fatal collisions across all modes occurred on local roads (65 percent) compared with fatal collisions on arterials (15 percent) and highways (20 percent). While local roads are typically low-speed streets with low traffic volumes in residential areas, they also include similar streets in commercial and

industrial areas. Local roads also generally account for the largest percentage of all roadways in terms of mileage, and vehicles traveling on these roads have more opportunities to interact with oncoming traffic, cross-traffic, and vulnerable road users like pedestrians and bicyclists. All these factors may explain why so many collisions occur on these types of roadways.

Notably, when broken down by pedestrian-involved and bicyclist-involved fatal collisions, 73 percent of pedestrian-involved fatal collisions occurred on local roads (compared to 13 and 14 percent on arterials and highways, respectively), and 77 percent of bicyclist-involved fatal collisions occurred on local roads (compared to 15 percent and 8 percent on arterials and highways).

To provide greater detail on where fatalities and serious injuries are occurring, SCAG created a regional High Injury Network (HIN). The HIN identifies roadways throughout the region where high concentrations of collisions are occurring. A StoryMap on the [SCAG website](#) details the regional HIN. At the point in time when the network was created, 66 percent of all fatalities and serious collisions were occurring on 2 percent of the network.

WHEN ARE COLLISIONS OCCURRING?

Collisions can vary by time of day based on a variety of factors. For example, the volume of cars increases around rush hour, and visibility can decrease in the evening, thus make collisions more likely to occur. As an example, [Figure 8](#) illustrates how total fatal collisions were typically at their highest at the tail end of rush hour after 6:00pm, and at their lowest after the morning rush hour, from 9:00 – 11:59am..

Similarly, pedestrian- and bicyclist-involved collisions peaked in the later afternoon and early evening. When broken down by fatalities and serious injuries, [Figures 9 and 10](#) highlight that pedestrians were killed and sustained serious injuries more in the later afternoon and evening, while more bicyclists

were killed and seriously injured in the earlier afternoon (3:00 – 5:59pm). The heightened number of pedestrian-involved fatal collisions that occurred in the later evening after 9:00pm, was not unique to the year 2019, but instead likely attributed to limited visibility. [Figure 11](#) illustrates that this trend has slowly increased since 2009, by over 80 percent from 2009 to 2020, following national trends.⁶

Fatal and serious injury collisions tend to increase over the course of the week ([Figure 12](#)). Differences in the traffic patterns that pedestrians and bicyclists may face on the road by day of week may lead to some of the differences between the number of fatal and serious injury collisions between them. While there was not a consistent trend for pedestrian-involved fatal collisions, pedestrian-involved serious injury collisions clearly increased over the course of the week and declined over the weekend ([Figure 13](#)). Bicyclist-involved fatal collisions were highest at the beginning and end of the work week, while bicyclist-involved serious injury collisions were highest during the work week ([Figure 14](#)).

When examining the trends by time of year, the number of fatal collisions were higher at the end of the year, perhaps due to reduced daylight hours and reduced visibility. Fatal collisions peaked in November, while the number of fatal collisions was lowest in February ([Figure 15](#)). [Figures 16 and 17](#) show that the number of pedestrian-involved fatal collisions were highest in November and lowest in May, while bicyclist-involved fatal collisions were highest in December and lowest in August.

WHO IS BEING HURT?

Mode

Over the course of the past decade, pedestrians and bicyclists constituted approximately 32 percent of all fatal victims, disproportionate to their mode

share of just under 3 percent of the daily trips. Since 2009, motorcyclists have accounted for 15 percent of all fatal victims. Motorcyclist fatalities peaked in 2016, at nearly 300 fatalities (compared a low of 167 in 2010) and have begun to slowly decline once again. Meanwhile, the number of motorcyclists sustaining serious injuries has continued to increase, from roughly 800 in 2009, to a peak of nearly 1,500 motorcyclist serious injury victims in 2018. The number of total collisions involving trains remained low at approximately 24 collisions per year, and the number of collisions involving trucks was approximately 3,000 per year.

Demographics

In 2019, significantly more men than women were killed or sustained seriously injuries in traffic-related collisions across the region. Compared to women, nearly three times as many men were killed and almost twice as many men sustained seriously injuries. In total, 1,160 men were killed in fatal collisions compared to 417 women, and eight people with no gender stated. Similarly, about 4,850 men sustained serious injuries compared to about 2,150 women in 2019.

As observed in [Figure 18](#), when stratified by age group, the largest number of fatal victims were those ages 25-34, constituting 21 percent of all fatal victims in the region, a consistent pattern across genders. Similarly, those ages 25-34 sustained more serious injuries than any other age group, constituting 25 percent of all serious injury victims ([Figure 19](#)).

Men in this age range were overrepresented in the proportion of fatalities. While the proportion of men between the ages of 25-34 represent about 8 percent of the regional population, they constituted about 17 percent of all fatal victims and 18 percent of all serious injury victims. Women in this age range did not experience fatalities or sustain serious injuries at a disproportionate rate—they constituted approximately 5 percent of all fatal victims and 4 percent of serious injury victims, while representing 7 percent of the regional population.

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), additional patterns emerge. Drivers were the largest number of fatal victims (763 fatal victims), followed by pedestrians (501), passengers (234), bicyclists (76), and other (11). Nearly five times as many drivers who were killed during a collision were male (623 fatal victims) than female (136 fatal victims) as illustrated in [Figures 20](#) and [21](#). Of all men killed in traffic collisions in 2019, 54 percent of the men were drivers, followed by 31 percent who were pedestrians. Of the women killed in traffic collisions, 35 percent were pedestrians, 33 percent were drivers, and 31 percent of all female fatal victims were passengers.

Overall, male drivers constituted 39 percent of all fatal victims across gender, age, and victim status. Dissecting these factors further, male drivers between the ages of 25-34 experienced the highest number of fatalities (182 fatal victims) in 2019, followed by the next highest group - male drivers between the ages of 18-24 (112 fatal victims).

Understanding the ways in which individuals of different races/ethnicities are impacted by collisions is challenging due to limitations of data collection. Collision data, which is most frequently derived from SWITRS, may obscure the true statistics on who experiences fatalities and serious injuries because race/ethnicity is recorded by the officer at the scene and they may not be able to distinguish a party's race/ethnicity. In addition, they are only able to record one response. This is particularly important to note in the context of the regional High Injury Network, the majority of which (66 percent) is located in Disadvantaged Communities as defined by SB 535.⁷

Across the region, Black, white, and Other (i.e., American Indian, Alaska Native, Native Hawaiian, Pacific Islander, some other race alone, and two or more races) racialized individuals were overrepresented as fatal and serious injury victims compared to their proportion of the region's population ([Figure 22](#)). Most notably, Black individuals constitute 10 percent of fatal and serious injury

victims, but only represent about 6 percent of the region’s population, while Other racialized individuals constitute nearly 5 percent of total fatalities and more than 5 percent of serious injuries while representing only 3 percent of the region’s population. White individuals constituted 37 percent of all fatalities and 36 percent of serious injuries, while representing only 31 percent of the region’s population. These discrepancies in the number of fatal and serious injury victims could be due to a variety of factors, including historical discrimination in housing that has placed people of color in more high-risk areas for collisions, as described above.

Furthermore, in the SCAG region, many residents who live in high-risk areas for pedestrian-involved and bicyclist-involved collisions are disproportionately people of color. **Figure 23** reflects that a large percentage of Hispanic/Latinx residents live in high-risk areas for pedestrian-involved (60 percent) or bicyclist-involved (62 percent) collisions compared to white residents - only 10 percent and 11 percent of white residents live in similar high-risk areas for pedestrian-involved and bicyclist-involved collisions respectively.⁸

Maps 5 and **6** highlight the concentration of fatal and serious injury collisions that occurred in Communities of Concern in 2019 across the region in 2019.⁹

WHY ARE COLLISIONS OCCURRING?

Across the region, about 20 percent of collisions are a result of unsafe speed. This is important to note as the survivability in a collision decreases significantly with increases in speed. For example, a car hitting a pedestrian at 50 miles per hour gives a pedestrian only a 25 percent chance of surviving if struck, while the same car going at 25 miles per hour would give the pedestrian a 90 percent chance of surviving if struck (**Figure 24**).

Maps 7-10 reflect the top three contributing factors for all fatal and serious injury collisions, and pedestrian- and bicyclist-involved fatal and serious

collisions in 2019.

The top three contributing factors for all fatal collisions across the region were Pedestrian Violations (24 percent), Unsafe Speed (20 percent), and Driving or Bicycling Under the Influence of Alcohol or Drugs (18 percent). For serious injury collisions, the top three contributing factors were Unsafe Speed (32 percent), Driving or Bicycling Under the Influence of Alcohol or Drugs (20 percent), and Improper Turning (18 percent).

It is important to note that there may be additional secondary factors at play in traffic collisions, such as distracted driving, which can include the use of cellphones while driving. In 2017, AB 1785 went into effect, restricting anyone operating a motor vehicle from holding a handheld wireless phone or electronic device (cellphone). It is not yet understood what the impacts of this law may have had on traffic-related collisions. With AB 47, a bill adding greater enforcement to driving while talking (Distracted Driving), set to become law on July 1, 2021, time will tell whether there will be a difference in the number of collisions.

Marijuana has been legal for recreational use since 2016 due to Proposition 64, and there have been many questions on its impacts as a potential factor leading to collisions, particularly when it comes to the overlap between drivers between the ages of 18-24 (one of the age ranges with the highest proportion of fatalities, as mentioned above). While some systematic literature reviews and research have been conducted, there remains much that is unknown and needs to be evaluated.

Figure 1: SCAG Region
Total Number of Fatal Victims (2009 - 2020)

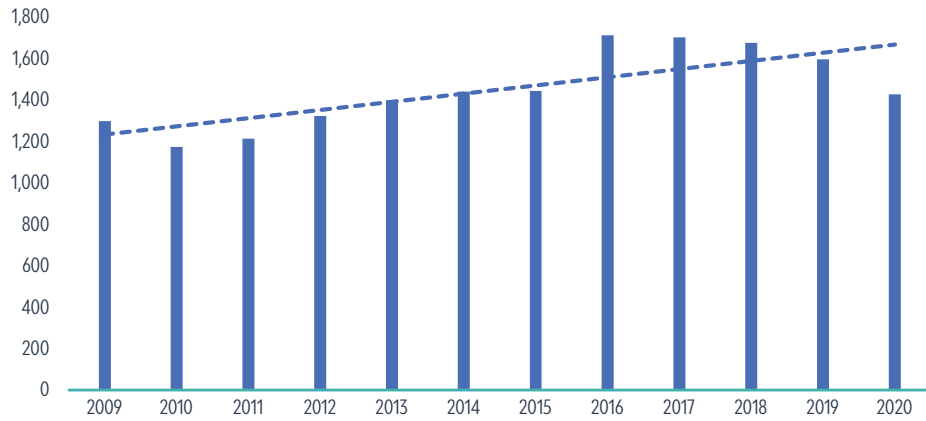


Figure 3: SCAG Region
Total Number of Non-Visible Injury Victims (2009 - 2020)

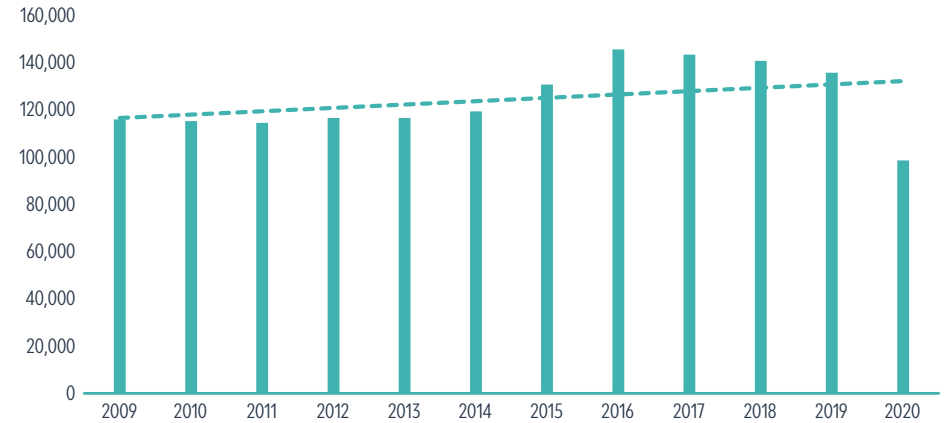


Figure 2: SCAG Region
Total Number of Serious Injury Victims (2009 - 2020)

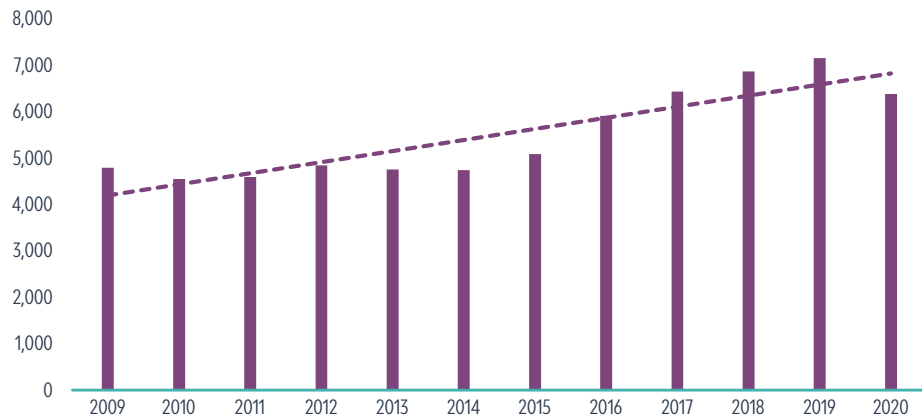


Figure 4: SCAG Region
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

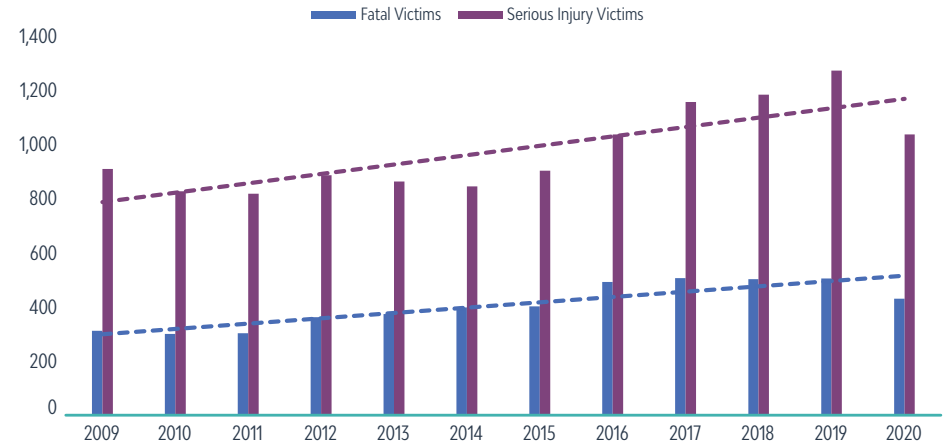


Figure 5: SCAG Region
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)



Figure 7: SCAG Region
Total Fatal and Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

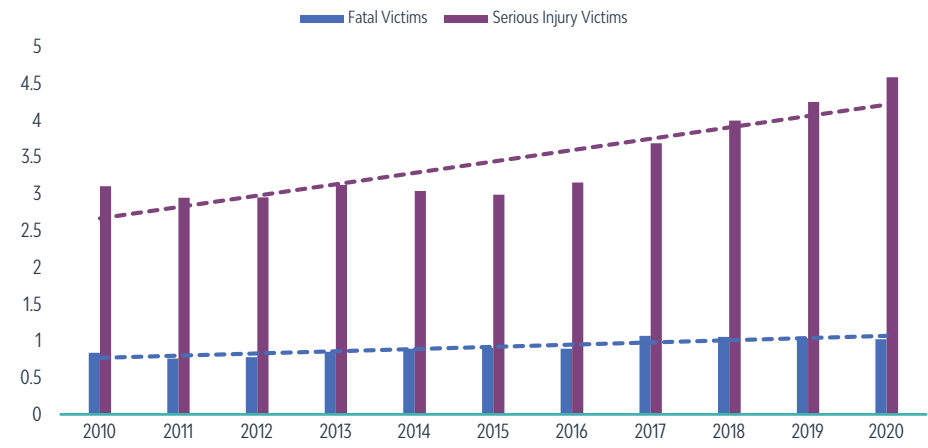


Figure 6: SCAG Region
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

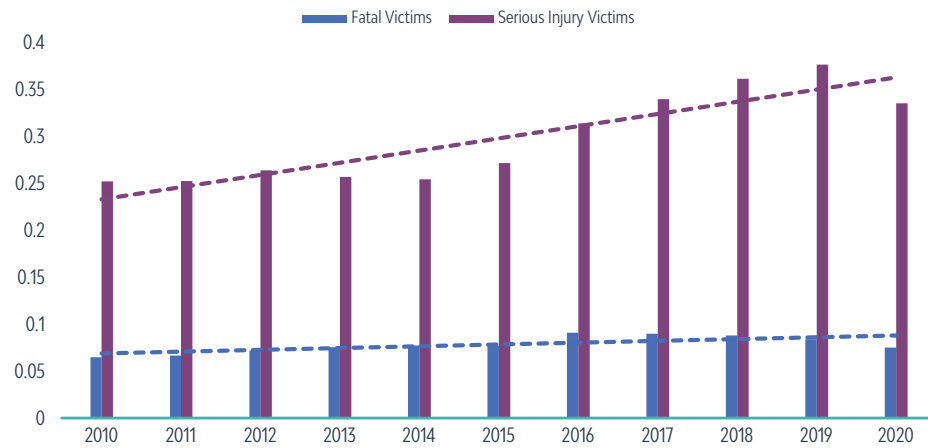


Figure 8: SCAG Region
Fatal Collisions by Time of Day (2019)

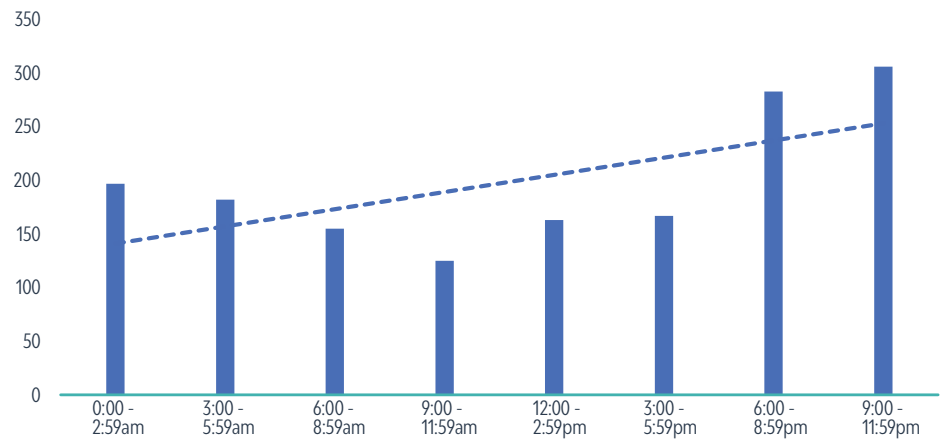


Figure 9: SCAG Region
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

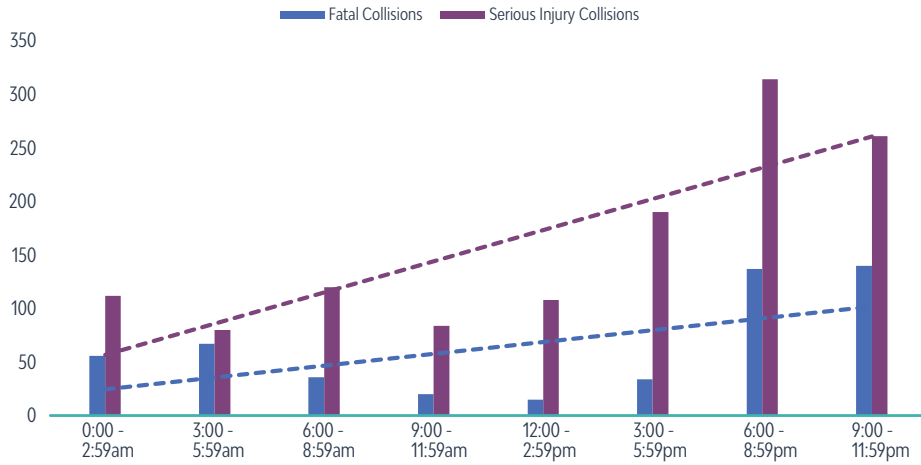


Figure 10: SCAG Region
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

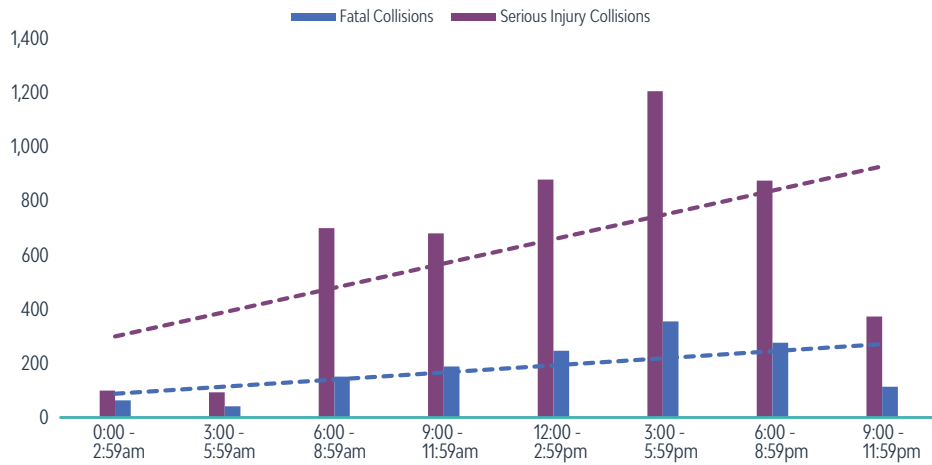


Figure 11: SCAG Region
Pedestrian-Involved Fatal Collisions between 9:00 - 11:59pm (2009 - 2020)

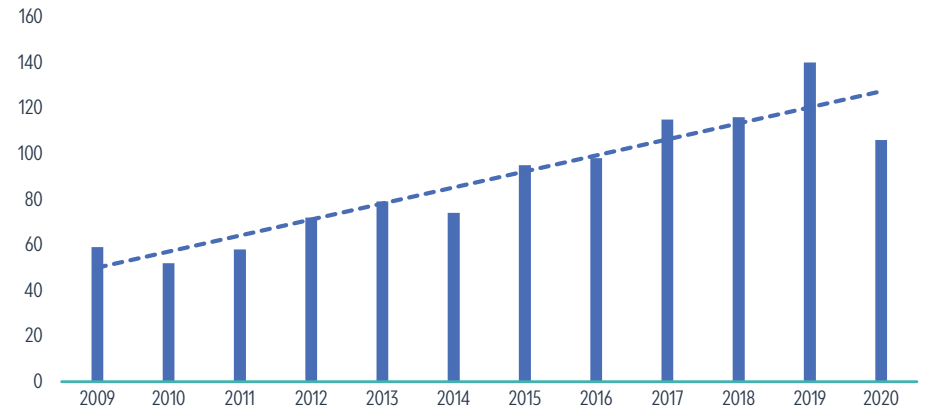


Figure 12: SCAG Region
Fatal and Serious Injury Collisions by Day of Week (2019)

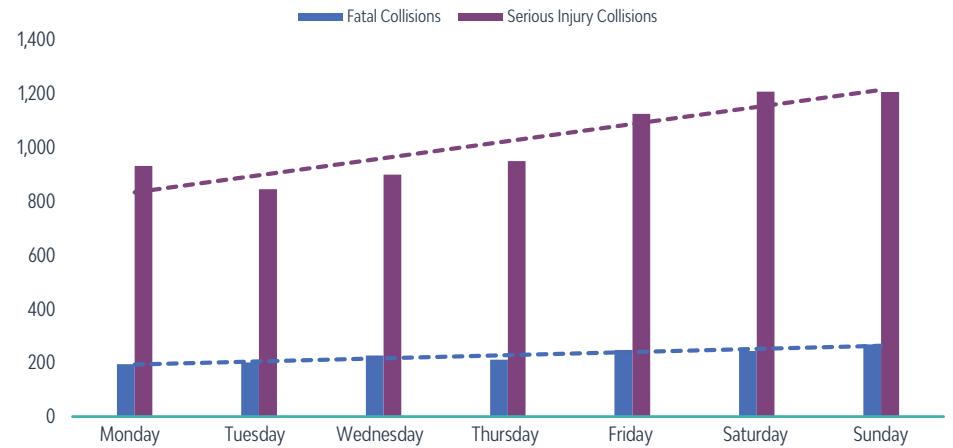


Figure 13: SCAG Region
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

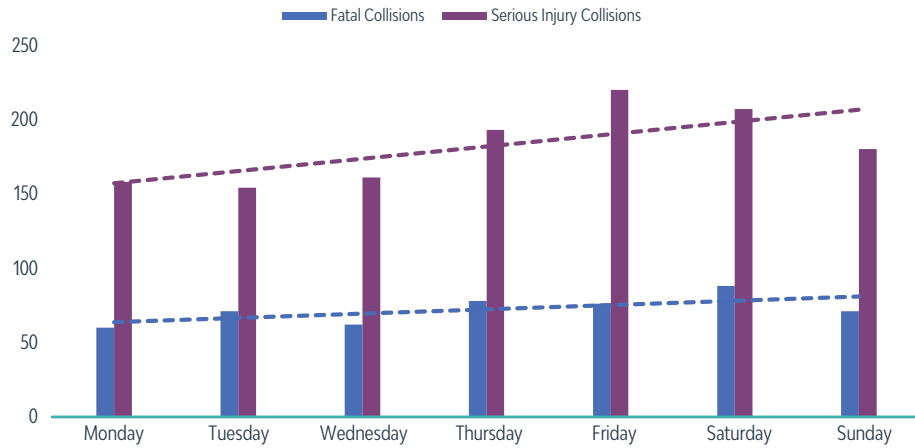


Figure 15: SCAG Region
Fatal and Serious Injury Collisions by Month (2019)

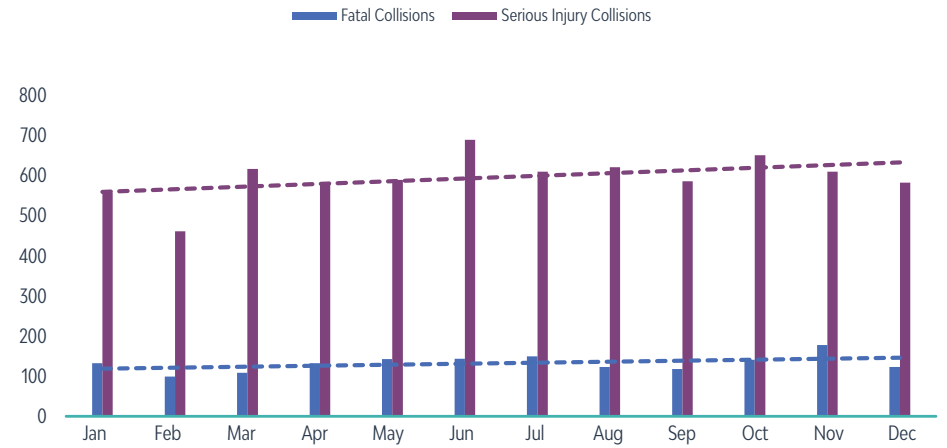


Figure 14: SCAG Region
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

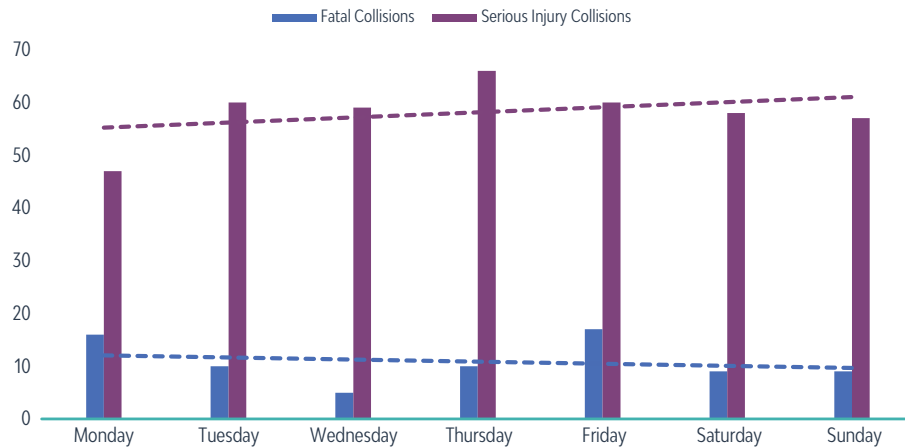


Figure 16: SCAG Region
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

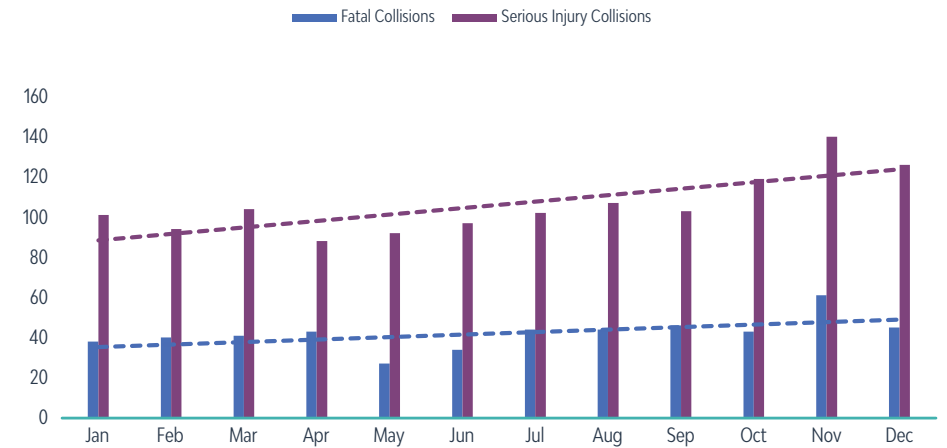


Figure 17: SCAG Region
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

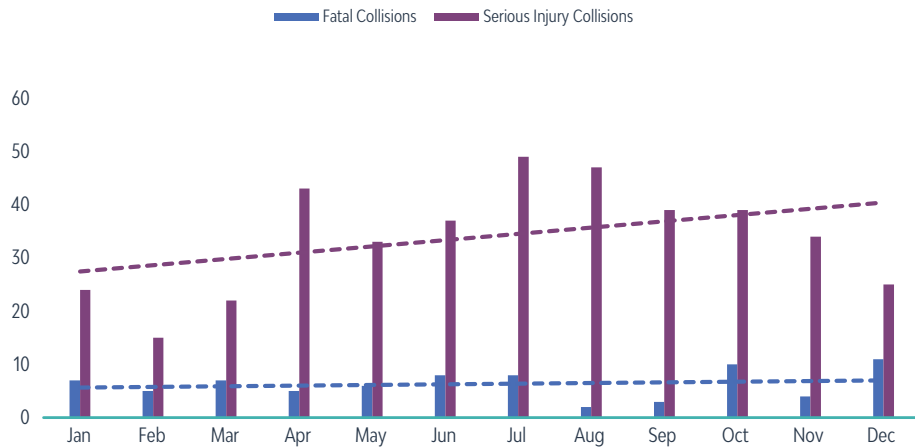


Figure 18: SCAG Region
Fatal Victims by Age and Gender (2019)

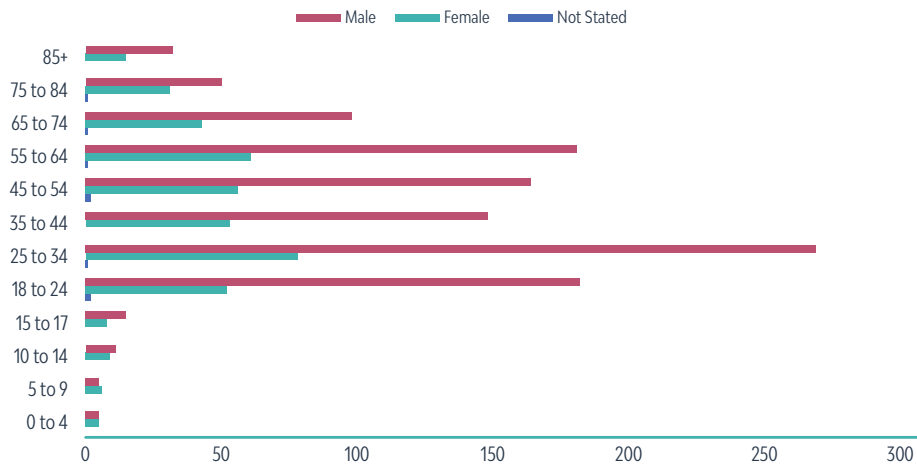


Figure 19: SCAG Region
Serious Injury Victims by Age and Gender (2019)

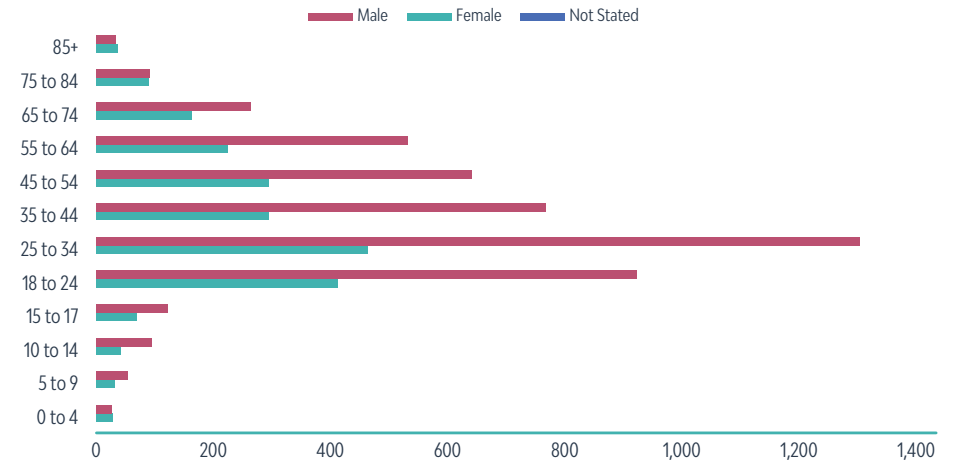


Figure 20: SCAG Region
Female Fatal Victims by Age and Involvement in Collision (2019)

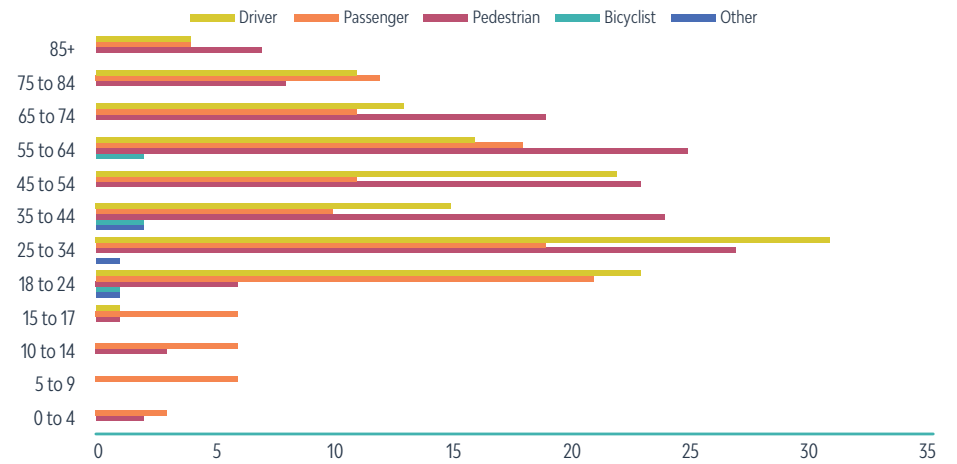


Figure 21: SCAG Region
Male Fatal Victims by Age and Involvement in Collision (2019)

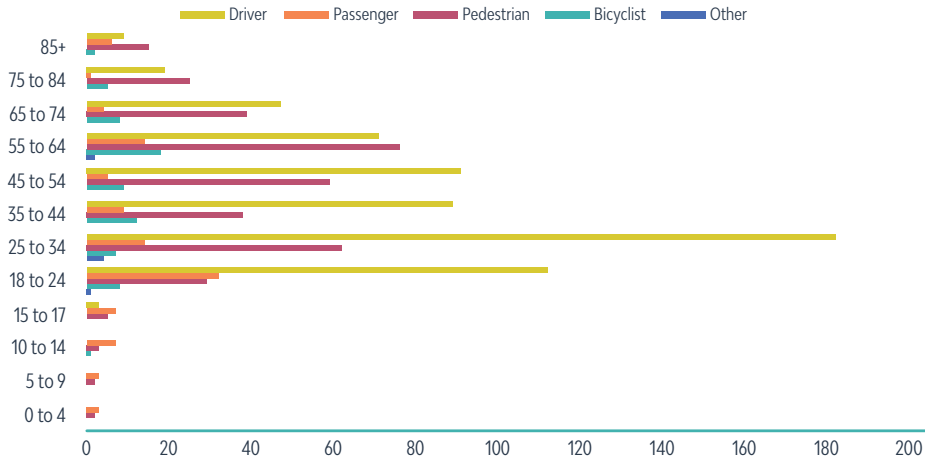


Figure 22: SCAG Region
Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)

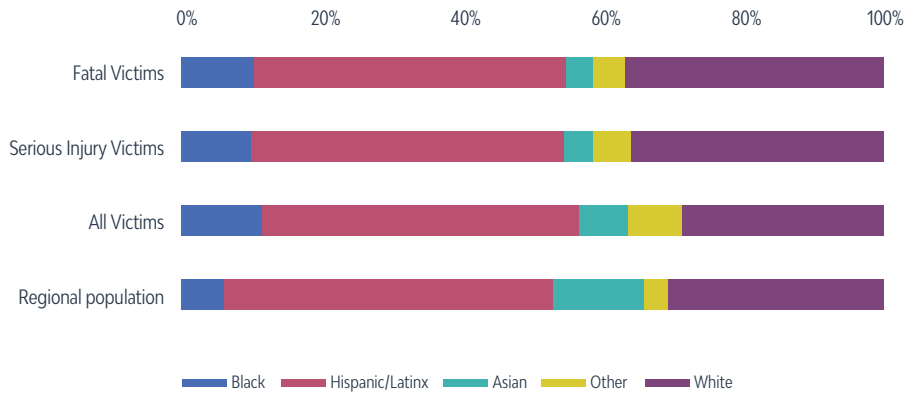


Figure 23: SCAG Region
Population Breakdown of Region and High Concentrated Area of Pedestrian- and Bicycle-Involved Collisions

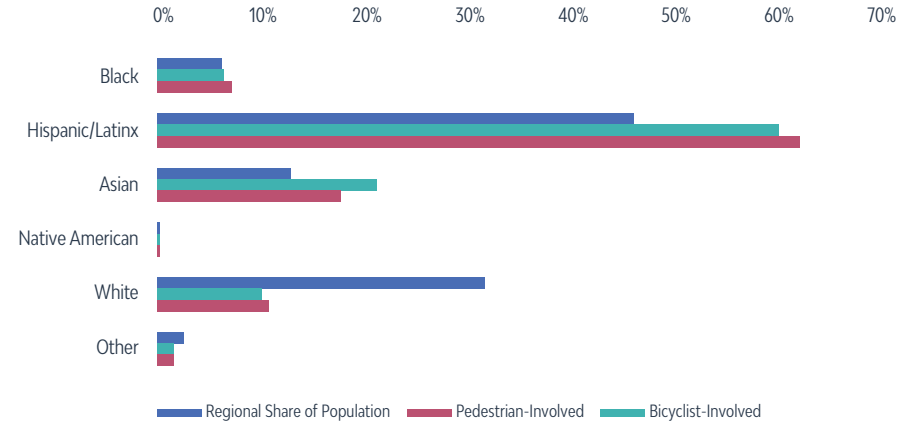
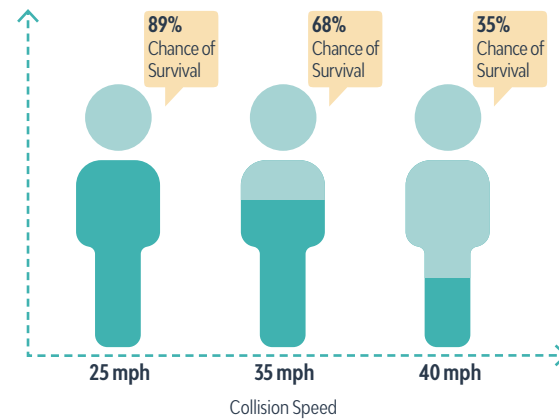
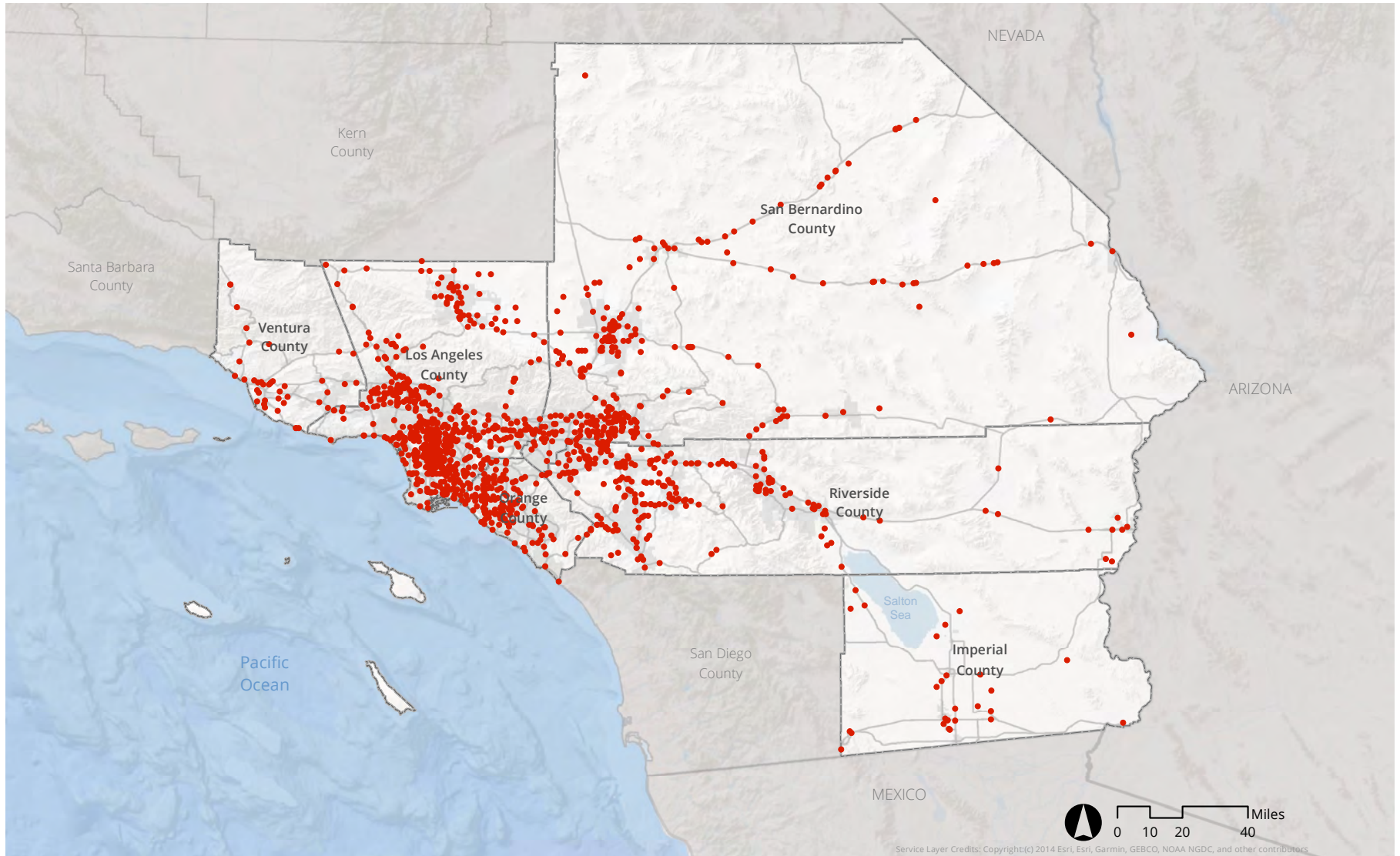


Figure 24:
Relationship Between Vehicle Speed, Collisions, and Fatalities



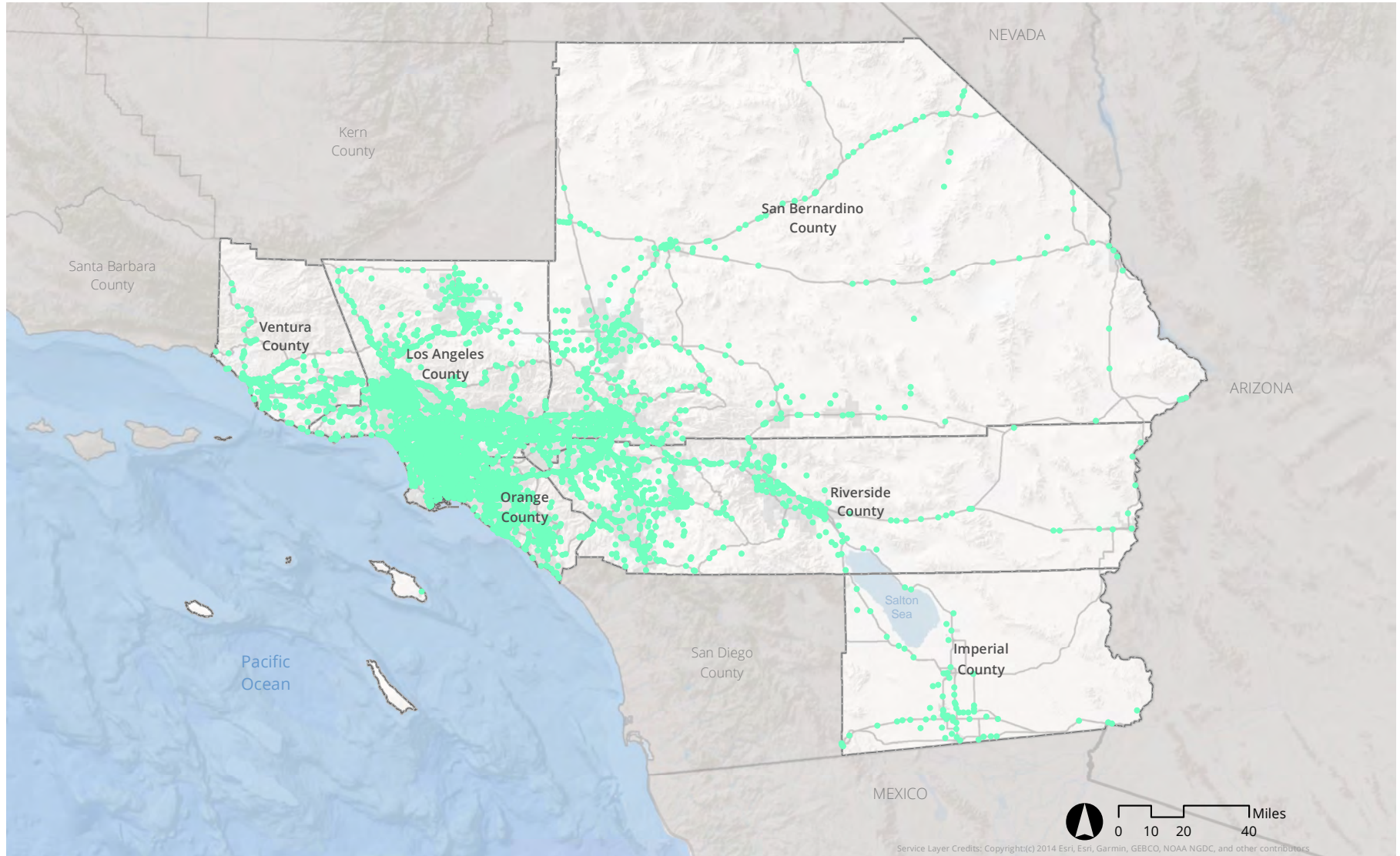
Map 1: SCAG Region, 2019 Fatal Collisions



-  County Boundaries
-  SCAG Region 2019 Fatal Collisions
-  City Boundaries
-  Freeway

Source: SCAG, SWITRS, TIMS

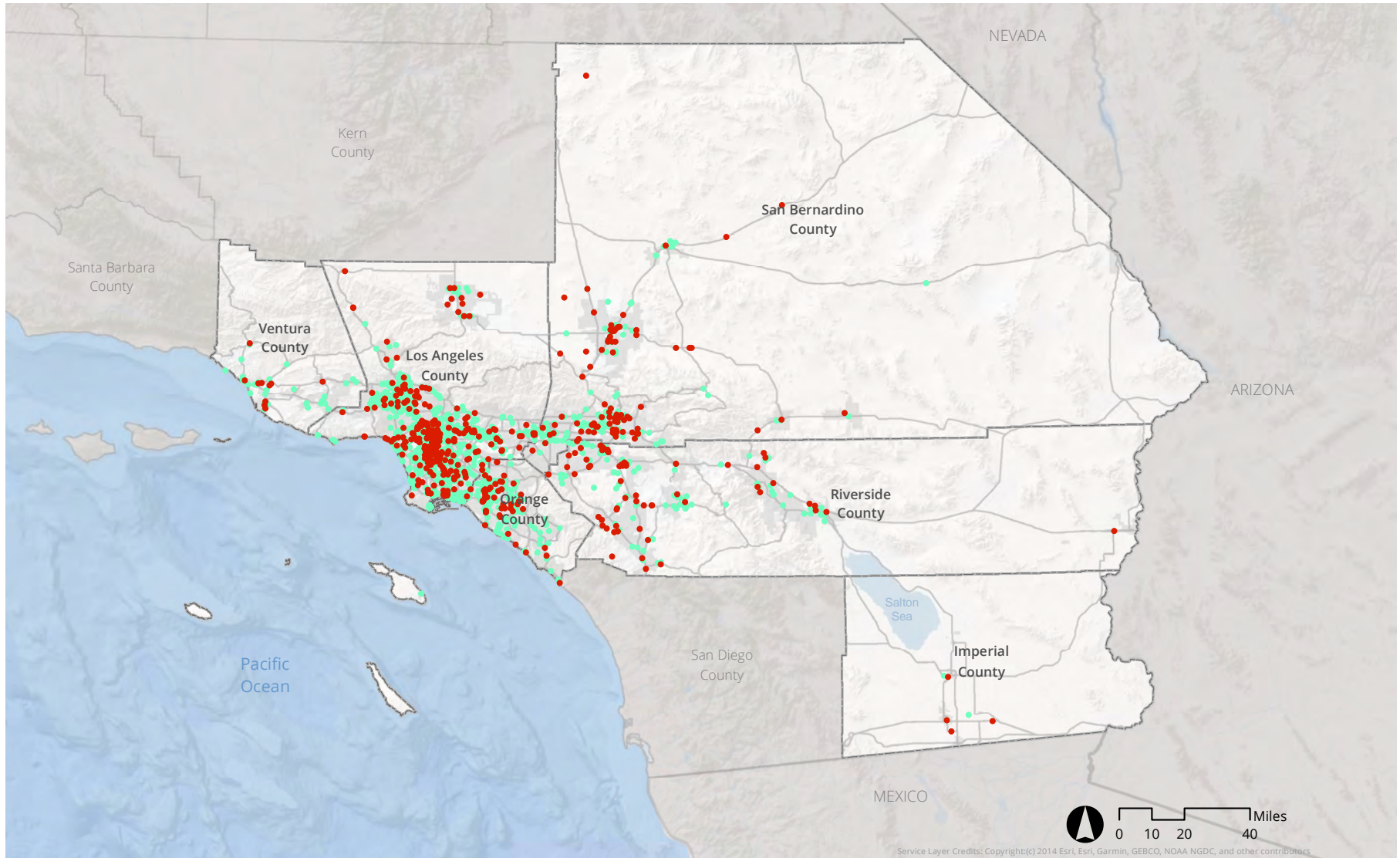
Map 2: SCAG Region, 2019 Serious Injury Collisions



- County Boundaries
- City Boundaries
- Freeway
- SCAG Region 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

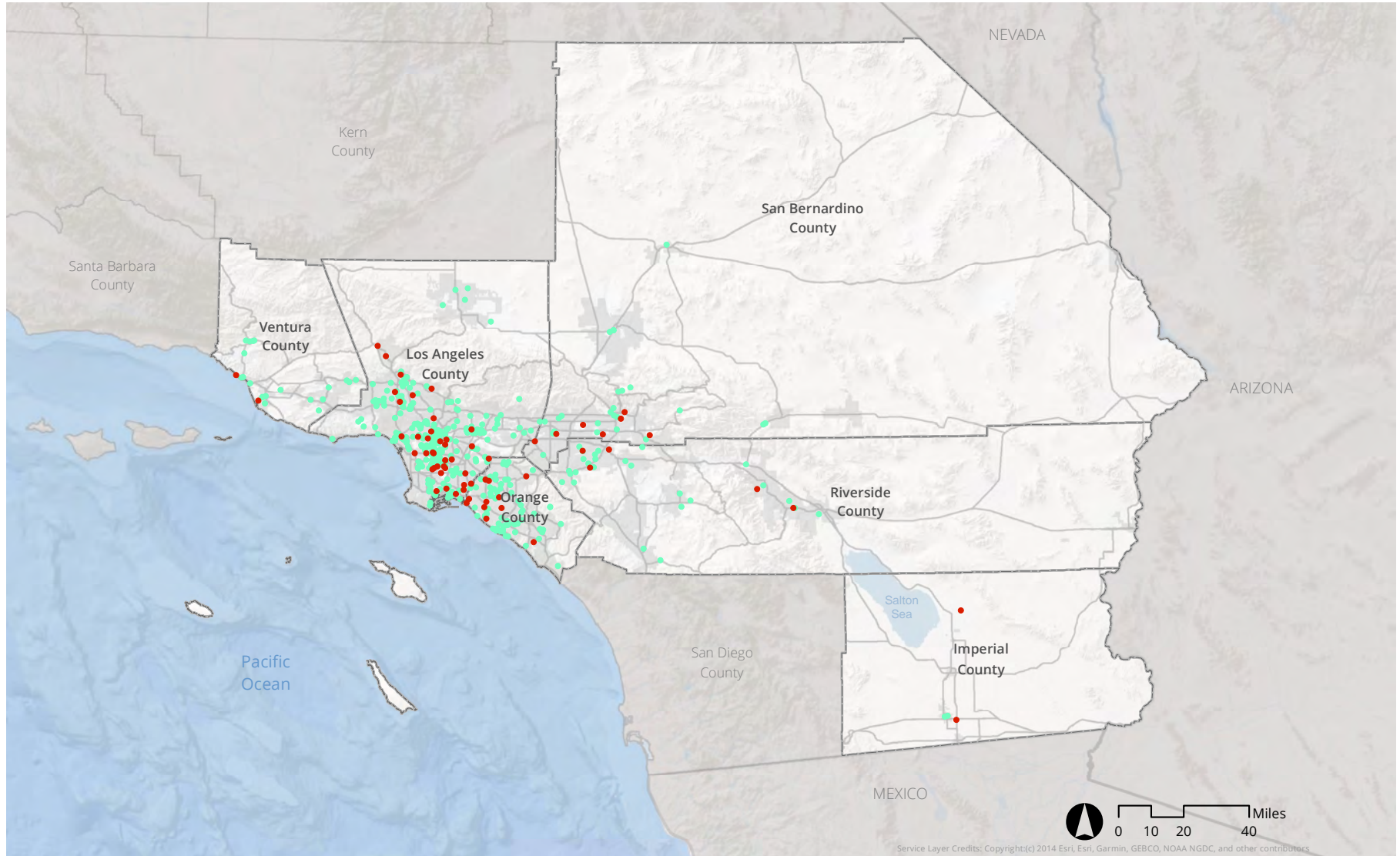
Map 3: SCAG Region, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions



-  County Boundaries
-  SCAG Region 2019 Pedestrian-Involved Fatal Collisions
-  SCAG Region 2019 Pedestrian-Involved Serious Injury Collisions
-  City Boundaries
-  Freeway

Source: SCAG, SWITRS, TIMS

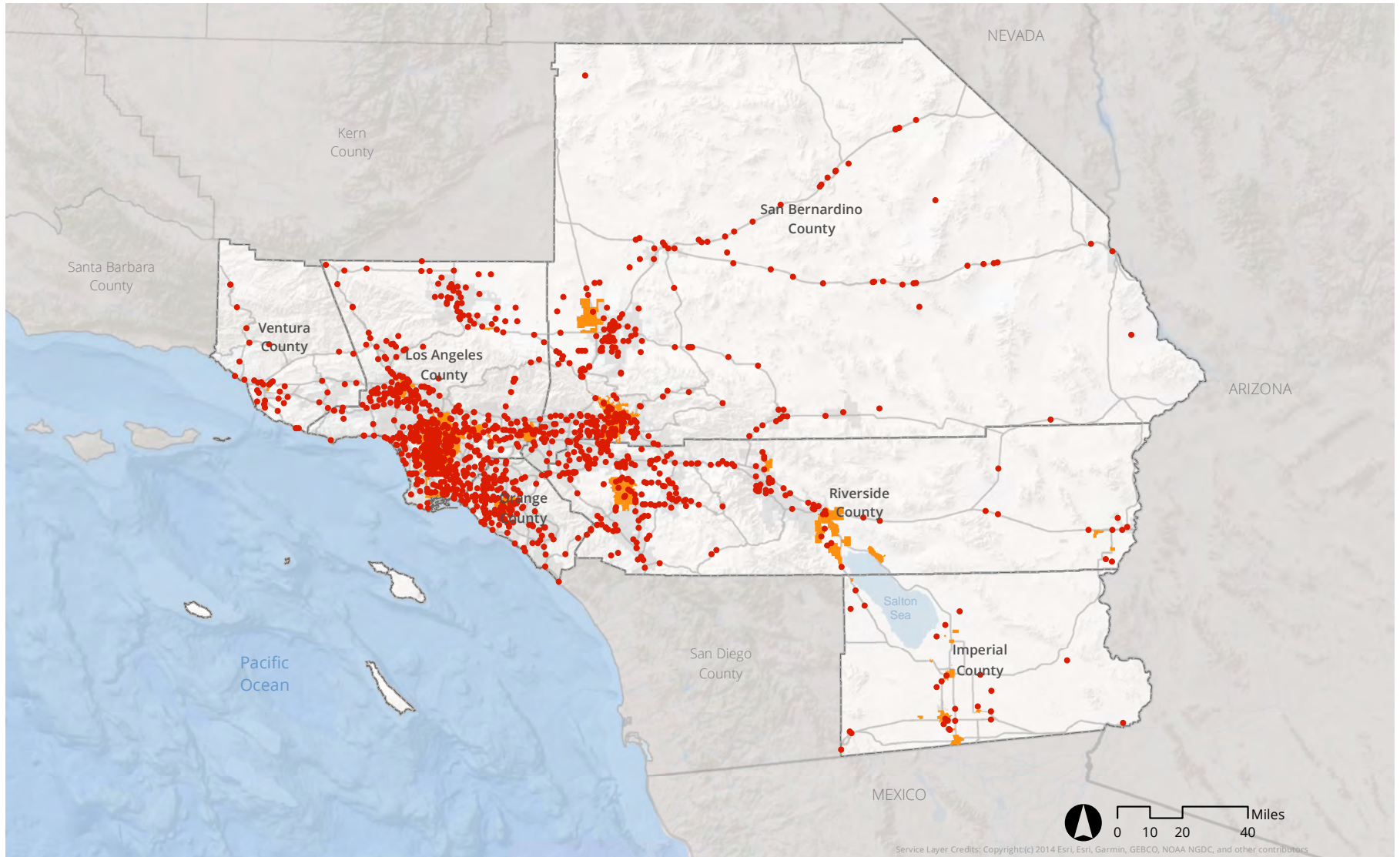
Map 4: SCAG Region, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions



- County Boundaries
- City Boundaries
- Freeway
- SCAG Region 2019 Bicyclist-Involved Fatal Collisions
- SCAG Region 2019 Bicyclist-Involved Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

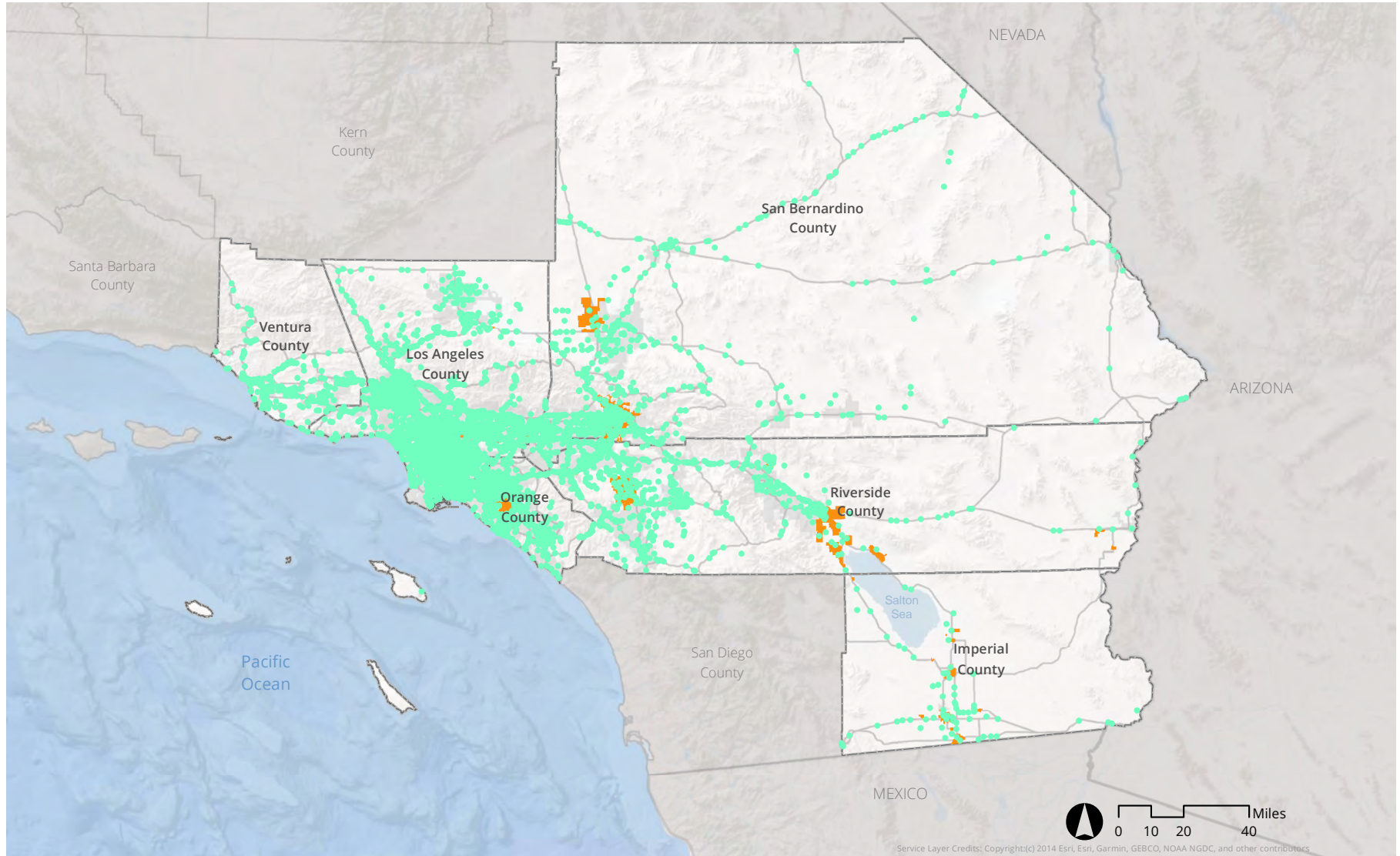
Map 5: SCAG Region, 2019 Fatal Collisions in Communities of Concern



- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- SCAG Region 2019 Fatal Collisions

Source: SCAG, SWITRS, TIMS

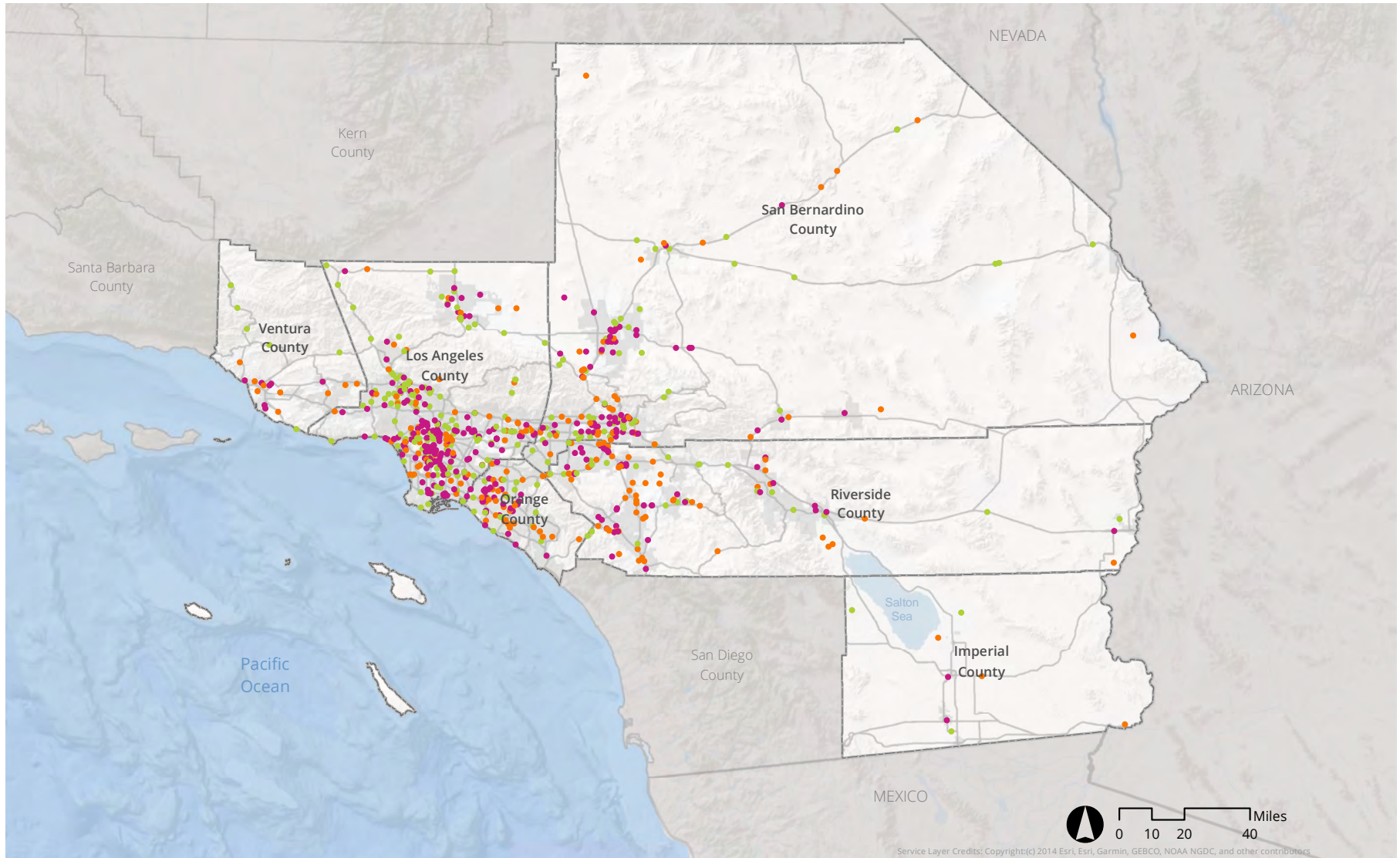
Map 6: SCAG Region, 2019 Serious Injury Collisions in Communities of Concern



- County Boundaries
- Communities of Concern
- City Boundaries
- SCAG Region 2019 Serious Injury Collisions
- Freeway

Source: SCAG, SWITRS, TIMS

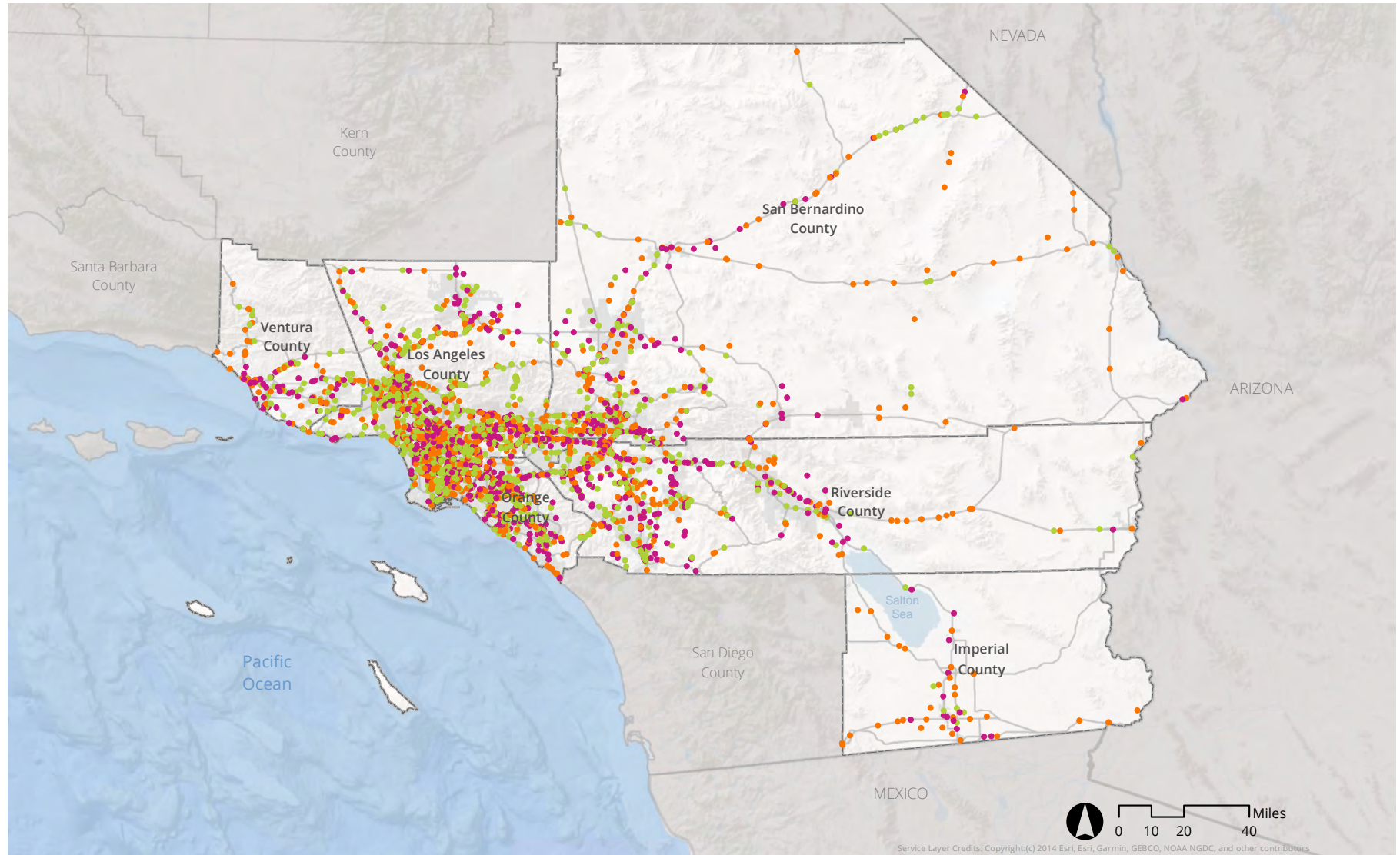
Map 7: SCAG Region, 2019 Primary Collision Factors of Fatal Collisions



- County Boundaries
- City Boundaries
- Freeway
- Pedestrian Violation
- Unsafe Speed
- Driving or Bicycling Under the Influence of Alcohol or Drug

Source: SCAG, SWITRS, TIMS

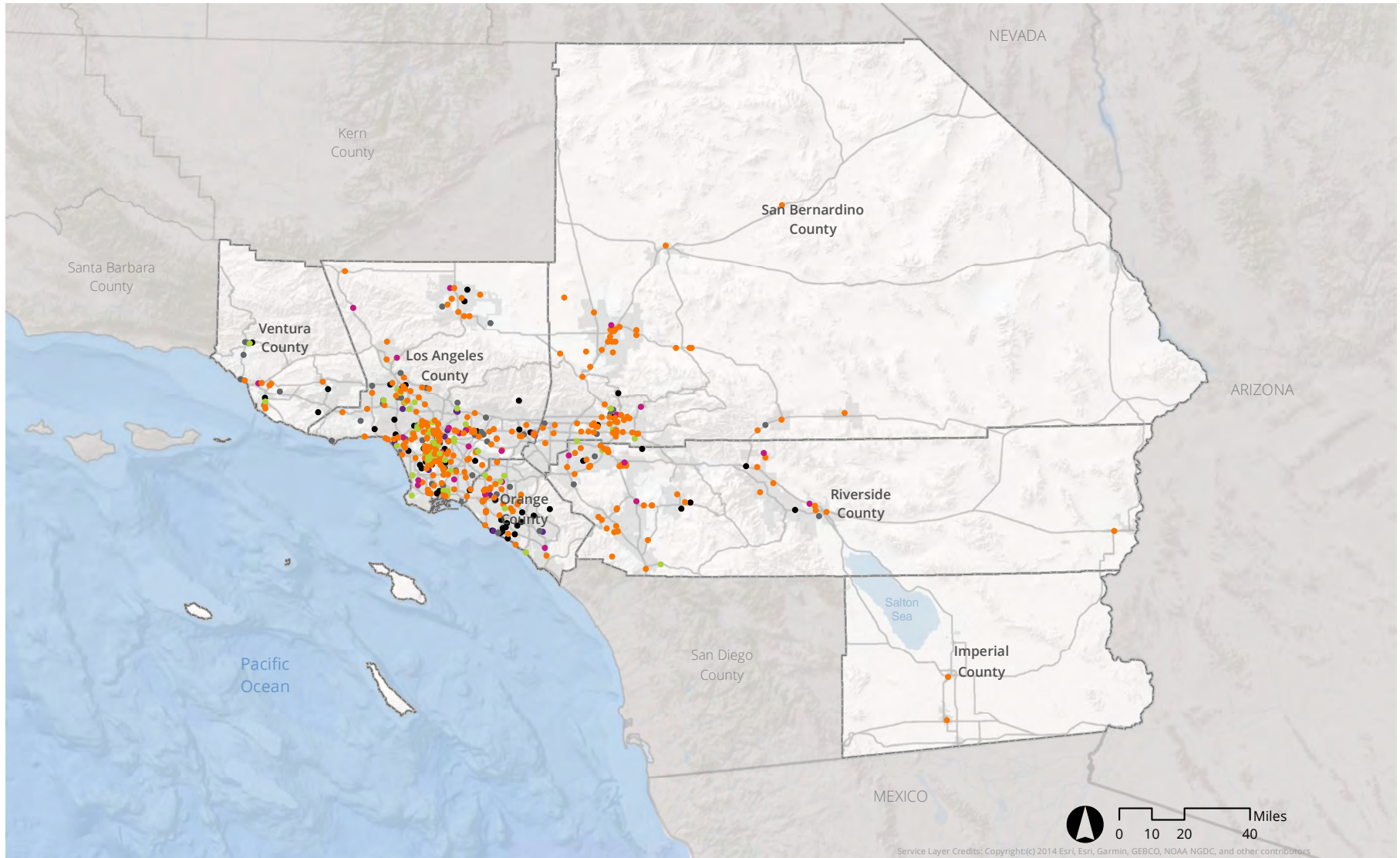
Map 8: SCAG Region, 2019 Primary Collision Factors of Serious Injury Collisions



- County Boundaries
- City Boundaries
- Freeway
- Driving or Bicycling Under the Influence of Alcohol or Drug
- Unsafe Speed
- Improper Turning

Source: SCAG, SWITRS, TIMS

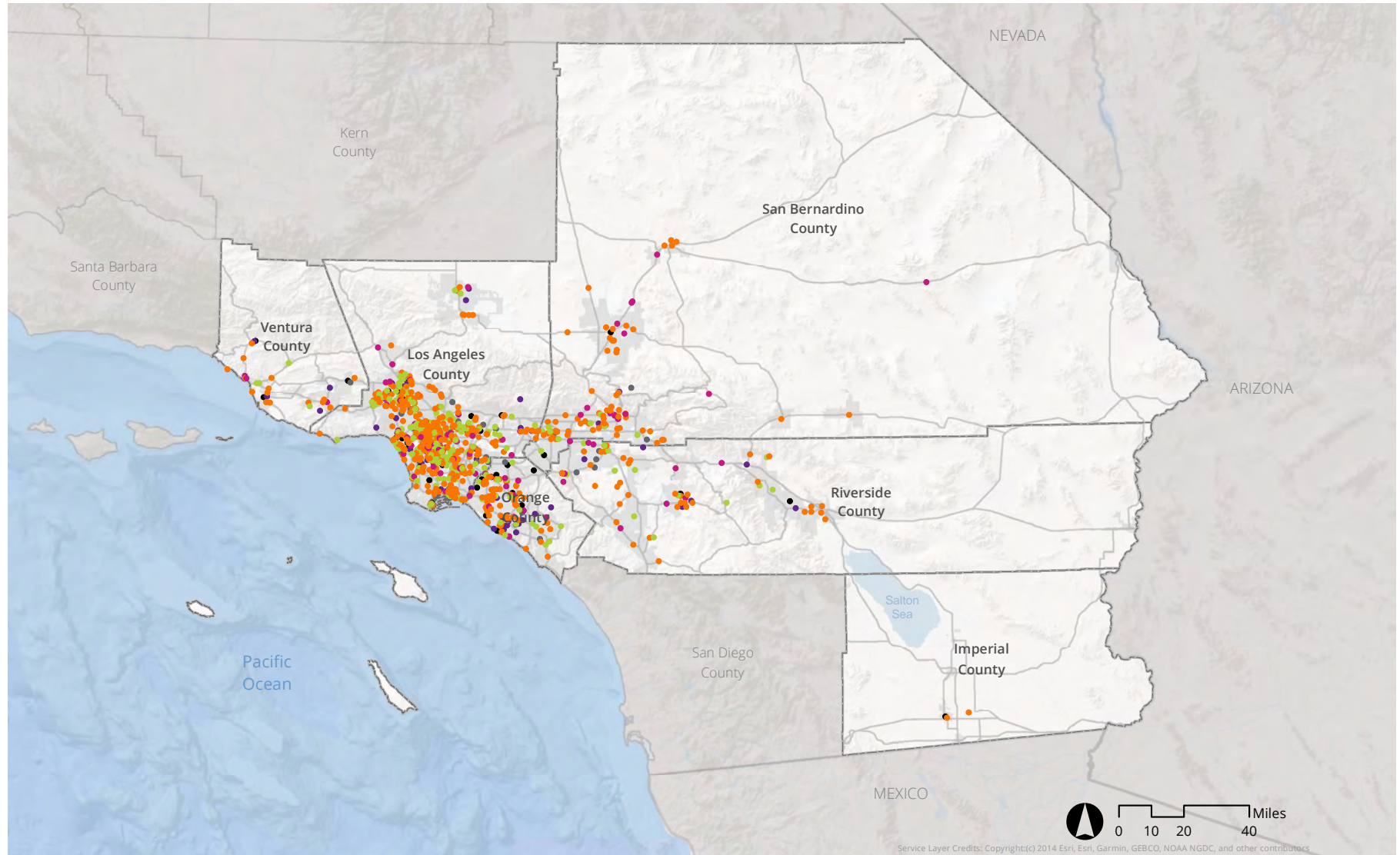
Map 9: SCAG Region, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions



- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Fatal Collisions: Unknown | Primary Collision Factors of Bicyclist-Involved Fatal Collisions: Driving or Bicycling Under the Influence of Alcohol or Drug |
| City Boundaries | Pedestrian Right of Way | Unsafe Speed |
| Freeway | Pedestrian Violation | Improper Speed |

Source: SCAG, SWITRS, TIMS

Map 10: SCAG Region, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



- | | | |
|-------------------|--|--|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions: Unsafe Speed | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions: Automobile Right of Way |
| City Boundaries | Pedestrian Right of Way | Traffic Signals and Signs |
| Freeway | Pedestrian Violation | |

Source: SCAG, SWITRS, TIMS

Endnotes

- 1 Doucette, M., et al. (2021). "Initial Impact of COVID-19's stay-at-home order on motor vehicle traffic and crash patterns in Connecticut: an interrupted time series analysis." *Injury Prevention* 27(1): 3-9. <https://injuryprevention.bmj.com/content/27/1/3>
 - 2 Interstates are the highest classification of roadways with typical posted speeds of 55 to 75 mph.
 - 3 Arterials are freeways, multilane highways and other roadways that supplement the Interstate system with typical posted speeds of 50 to 70 mph. See the Federal Highway Administration Road Function Classifications for more details.
 - 4 Collectors are major and minor roads that connect local roads and streets with arterials with typical speeds between 35 and 55 mph. See the Federal Highway Administration Road Function Classifications for more details.
 - 5 SCAG. (2020). "Active Transportation Technical Report." Southern California Association of Governments.
 - 6 Retting, Richard. (2019). "Pedestrian Traffic Fatalities by State: 2018 Preliminary Data." Governors Highway Safety Association. https://www.ghsa.org/sites/default/files/2019-02/FINAL_Pedestrians19.pdf
 - 7 Disadvantaged Communities are census tracts that have been identified by the California Environmental Protection Agency based on the requirements set forth in SB 535, which seek to identify disproportionately burdened by and vulnerable to multiple sources of pollution.
 - 8 SCAG. (2021). "Racial Equity: Baseline Conditions Report." Southern California Association of Governments.
 - 9 Communities of Concern are census tracts that both in the upper third of households in poverty and percentage of people of color in the SCAG region.
-

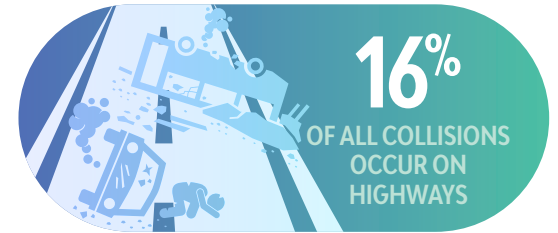
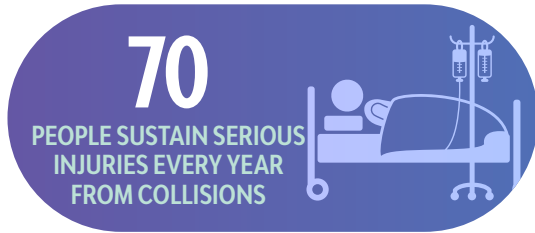




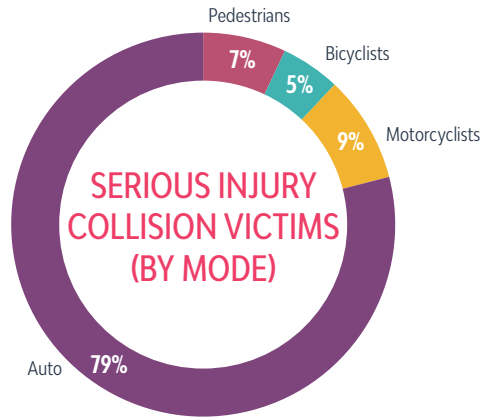
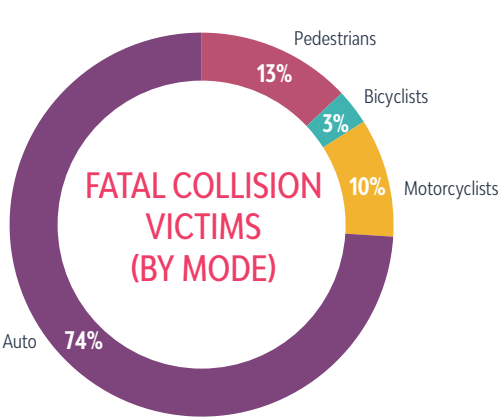
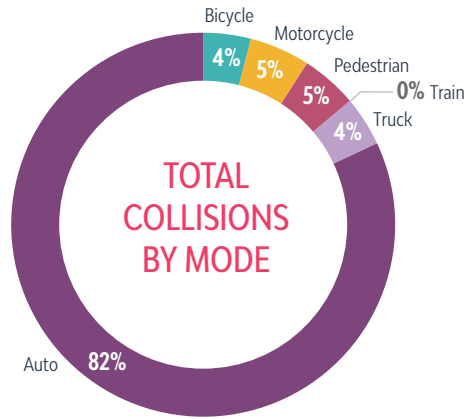
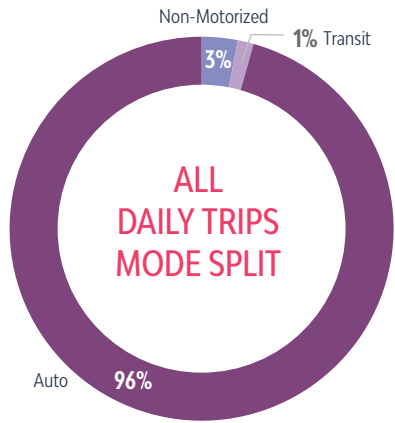
REGIONAL EXISTING CONDITIONS

Imperial County

Imperial County BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





REGIONAL EXISTING CONDITIONS

Imperial County

Imperial County is located in the southeast corner of California and borders the counties of Riverside (north), San Diego (west), and Yuma, Arizona (east). To its south lies Mexico. With 4,176 square miles of land, it is slightly larger than Los Angeles County (4,057), but has a much smaller population, about 182,000 residents. Residents of Imperial County drive roughly 12,000 miles each year on average, more than any other county in the SCAG region. This may be due to the area's low density of land uses and options for alternative forms of transportation (e.g., light rail).

WHAT ARE THE OVERALL TRENDS?

On average 30 people die in traffic collisions, 70 people are seriously injured, and 700 people are injured each year in Imperial County. Over the past decade, Imperial County slowly stabilized the total number of fatal victims, from a low in 2011 (13) to its highest in 2014 (46), as observed in [Figure 1](#). In contrast, the number of serious injury victims began to increase over the past decade until they peaked in 2019 at 127, before declining to 91 in 2020, although this decline may be attributed to the COVID-19 pandemic ([Figure 2](#)). [Maps 1](#) and [2](#) reflect the locations of all collisions resulting in fatalities or serious injuries in Imperial County in 2019.

From 2009 to 2020, about 84 percent of those killed were in vehicles or on motorcycles while the other 16 percent were walking or biking. Of the roughly 31 fatal collisions that occurred each year, about five were active transportation collisions. The numbers of active transportation fatal victims have remained fairly constant over this same time period.

[Figure 3](#) reflects the total number of pedestrian fatal and serious injury victims from 2009 to 2020. The number of pedestrian fatal victims peaked in 2017 at eight fatalities, from a low in 2011 of one fatality. Pedestrian serious injury victims do not display a clear trend over the years, but have remained relatively steady except for three peaks. [Map 3](#) highlights all of the pedestrian-involved collisions resulting in a fatality or serious injury that occurred in Imperial County in 2019.

[Figure 4](#) reflects bicyclist fatal and serious injury victims between 2009 to 2020. Bicyclist fatal victims fluctuated between zero to two fatalities per year since 2009, and overall, bicyclist fatal victims demonstrated no clear trend. Bicyclist serious injury victims similarly fluctuated between zero to six per year, and again displayed no clear trend. [Map 4](#) highlights all of the bicyclist-involved collisions resulting in a fatality or serious injury that occurred in Imperial County in 2019.

Figure 5 shows the historical rates of fatal and serious injury victims per 1,000 people over the last decade from 2010 to 2020. Both the rates of fatal and serious injury victims followed relatively similar trends as shown in **Figures 1** and **2**, despite normalizing by population, indicating that population change did not impact these numbers. Similarly, normalizing by vehicle miles traveled (VMT) reveals similar trends to non-normalized numbers for the number of fatal and serious injury victims (**Figures 6** and **7**).

However, when VMT per capita is considered, trends remained relatively consistent, before sharply increasing in 2015. Considering VMT generally increased from 2010 to a peak of nearly 8 million daily VMT in 2017, these differences in the VMT per capita suggest that changes in the population have made a difference to the amount of VMT generated. However, there may be a variety of reasons that lead to shifts or changes in any of the indicators (i.e., fatalities, serious injuries, VMT, or population) not restricted to and including transportation technology changes, changing demographics, saturated highways, and/or preferences for living in more compact neighborhoods that reduce the need for driving. Overall, VMT averaged about 12,900 VMT per capita.

WHERE ARE COLLISIONS OCCURRING?

In Imperial County, the majority of fatalities and serious injuries occurred in rural areas. About 73 percent of all fatal collisions and 75 percent of serious injury collisions occurred in rural areas. However, there were zero pedestrian fatal collisions in rural areas – 67 percent of pedestrian fatal collisions occurred in urbanized areas and 33 percent occurred in urban clusters. All bicyclist fatal collisions occurred in rural areas in 2019. In total, 62 percent of the county population lives in urbanized areas, 20 percent in urban clusters, and 17 percent lives in rural areas in Imperial County. **Maps 1-4** display the total fatal and serious injury collisions (by mode), highlighting their concentrations in the rural areas.

Imperial County includes a roadway network consisting of 94 highway centerline miles, 497 arterial centerline miles, 1,039 collector centerline miles, and 2,339 local road centerline miles. Local roads account for nearly 59 percent of all roadways in terms of mileage within Imperial County. Imperial County is also home to 1.3 miles of Class I bikeways, more than 13 miles of Class II bikeways, and nearly 78 miles of Class III bikeways.

In 2019, more than half of fatal collisions across all modes occurred on local roads, while about 19 percent occurred on arterials, and 29 percent on highways. Forty-four percent of serious injury collisions occurred on local roads, while 37 percent occurred on arterials, and 19 percent on highways.

In the same year, one of three bicyclist-involved and pedestrian-involved fatal collisions occurred on local streets. Two pedestrian-involved fatal collisions occurred on arterials, and two bicyclist-involved fatal collisions occurred on highways. One of three bicyclist-involved serious injury collisions occurred on local roads (with two on local arterials), and three of five bicyclist-involved serious injuries occurred on local roads (with two on highways).

WHEN ARE COLLISIONS OCCURRING?

In Imperial County, across all modes, more people were killed and seriously injured from traffic collisions in the afternoon and evening, with nearly 70 percent of all fatal collisions occurring after 12:00pm in 2019 (**Figure 8**). The largest number of fatal collisions (six) occurred in the early afternoon from 12:00 – 2:59pm and again in the later evening from 6:00 – 8:59pm. As illustrated in **Figure 9**, serious injury collisions peaked during the evening from 6:00 – 8:59pm (28 serious injury collisions).

When examining trends by time of day for pedestrian- and bicyclist-involved collisions, the small dataset of pedestrian and bicyclist fatalities in 2019 limits the ability to detect distinct trends. **Figure 10** clearly illustrates the limitations

of this data, highlighting the greatest number of pedestrian fatal collisions for any given time period was one fatal collision. Bicyclist fatal collisions expressed a similar pattern in 2019 as highlighted in [Figure 11](#), peaking at one bicyclist fatal collision for any given time period.

By day of week, fatal collisions across all modes were highest at the beginning of the week (Monday) and sharply declined over the course of the week ([Figure 12](#)). Serious injury collisions peaked near the end of the week, and were highest on Friday and Sunday. The greatest number of fatal collisions occurred on Tuesdays in 2019 (eight fatal collisions). As highlighted by [Figures 13](#) and [14](#), there was no distinctive pattern for pedestrian and bicyclist fatal collisions by time of day due to the small dataset. The greatest number of pedestrian fatal and serious injury collisions occurred towards the end of the work week from Thursday – Saturday. Similarly, there were few bicyclist fatal and serious injury collisions in 2019.

When examining the trends by time of year, there were again few distinct trends due to the small dataset of fatal and serious injury collisions. Fatal collisions across all modes peaked in January at six fatal collisions, ([Figure 15](#)). [Figure 16](#) displays the fatal and serious injury collision trends for pedestrians by month: all pedestrian fatal collisions occurred during the winter months in 2019, perhaps due to reduced daylight hours. There was no distinctive pattern for bicyclist fatal collisions over the year as illustrated in [Figure 17](#).

WHO IS BEING HURT?

In Imperial County, out of all the fatal collision victims from 2009 to 2020, pedestrians and bicyclists accounted for about 16 percent of all fatal collision victims, disproportionately higher than the 3 percent of daily trips that were made via walking or biking.

A similar number of men and women were killed or sustained serious injuries in a collision in 2019. Men experienced marginally more fatalities (17) and 346

men were seriously injured. This is compared to 15 female fatal victims and 335 women sustaining serious injuries in 2019. These trends differ from regional or national trends where a higher number of fatalities and serious injuries occur in men.

As observed in [Figure 18](#), when stratified by age group, the largest number of fatalities occurred in those aged 25-34 as compared to other age groups, in total representing 25 percent of all fatal victims in Imperial County in 2019. For elderly individuals, fatalities occurred more often in females than males. On the other hand, fatalities occurred more frequently in younger males than females. Similarly, those ages 25-34 sustained more serious injuries than any other age group – 81 males, 70 females, and two no gender stated - constituting 15 percent of all serious injury victims ([Figure 19](#)).

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), additional patterns emerge. Drivers experienced the largest number of fatalities (17), followed by passengers (seven), and pedestrians and bicyclists tied at three fatalities each. Significantly more drivers killed in collisions were male (12) than female (seven) as illustrated in [Figure 20](#). Interestingly, there were no male passengers killed in 2019, although there were seven female passenger fatalities. Of all men killed in traffic collisions in 2019, 71 percent were male drivers (12). Dissecting these factors further, male drivers between the ages of 35-44 experienced the highest number of fatalities (five) in 2019. Of the women killed in traffic collisions, the same number of women died as the driver or as passenger (seven fatalities each), with just one woman killed as a pedestrian in 2019.

When broken down by race, it is evident that some people of color were disproportionately represented in fatal and serious injury victims ([Figure 21](#)). Hispanic/Latinx individuals represent the largest proportion of the County's population at 85 percent. Interestingly, although they constitute the largest proportion of all victims (74 percent), fatalities (63 percent), and serious injury

victims (55 percent), these are significantly less than their expected proportions. On the other hand, white individuals were significantly overrepresented in both fatal and serious injury victims, as they represent about 11 percent of the County's population, but constitute nearly 37 percent of all fatal victims and 34 percent of serious injury victims. Asian, Black, and Other racialized individuals did not experience any known fatalities in 2019, but were overrepresented in the number of serious injury victims. Asian individuals represent just over 1 percent of the County's population, but almost 4 percent of serious injury victims. Black individuals represent about 2 percent of the population, but constitute 5 percent of serious injury victims, and "Other" individuals constitute nearly 3 percent of serious injury victims, while representing less than 2 percent of the County's population.

Maps 5 and 6 highlight the concentration of fatal and serious injury collisions that have occurred in Communities of Concern in 2019.

WHY ARE COLLISIONS OCCURRING?

Maps 7-10 reflect the top three contributing factors for all fatal and serious collisions, and pedestrian- and bicyclist-involved fatal and serious collisions in 2019. The top three contributing factors for fatal collisions across Imperial County were Improper Turning (42 percent), followed by Automobile Right of Way and Unsafe Speed, and Wrong Side of Road, which tied for second (12.5 percent each respectively). For collisions resulting in serious injuries, the top three contributing factors were similar: Improper Turning (39 percent), Automobile Right of Way (23 percent) and Driving or Bicycling Under the Influence of Alcohol or Drugs (17 percent).

For pedestrian-involved fatal collisions, the top two contributing factors were Pedestrian Violations (67 percent) and Unsafe Speed (34 percent). Pedestrian Violations were the most significant contributor to pedestrian fatalities across all counties in 2019. For bicyclist-involved fatal collisions, Improper Turning and

Unsafe Speed were the top two contributing factors (50 percent each). Note, the dataset was small for both pedestrian- and bicyclist-involved fatal collisions three and two fatal collisions, respectively.

Figure 1: Imperial County
Total Number of Fatal Victims (2009 - 2020)



Figure 2: Imperial County
Total Number of Serious Injury Victims (2009 - 2020)

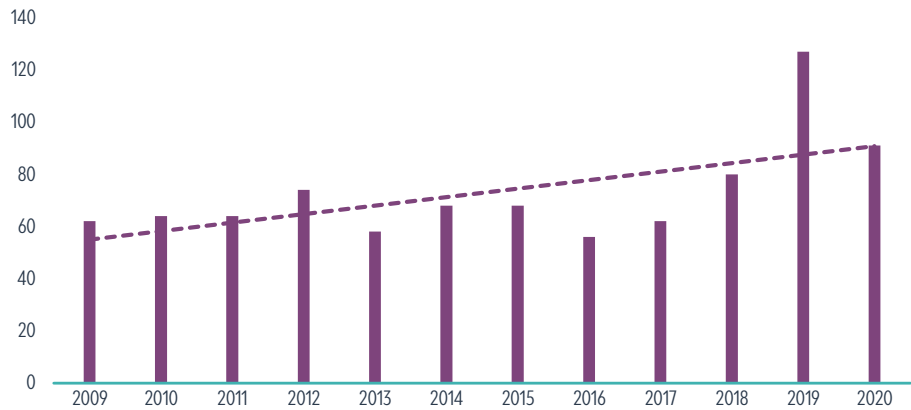


Figure 3: Imperial County
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

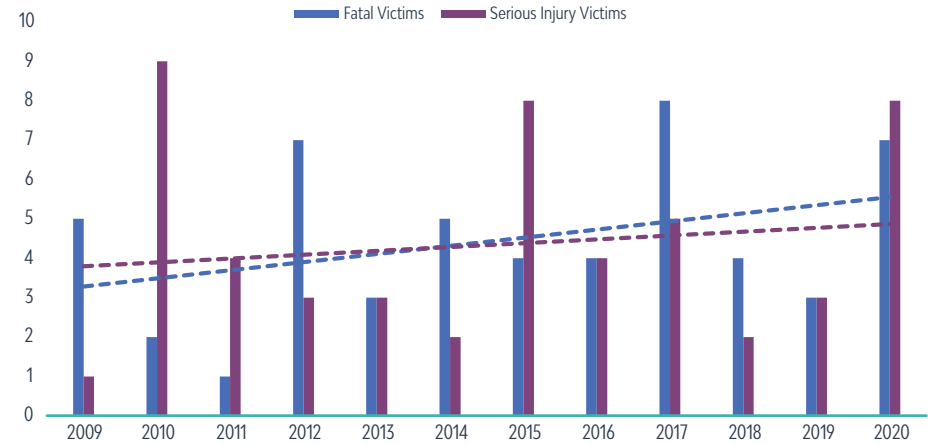


Figure 4: Imperial County
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)

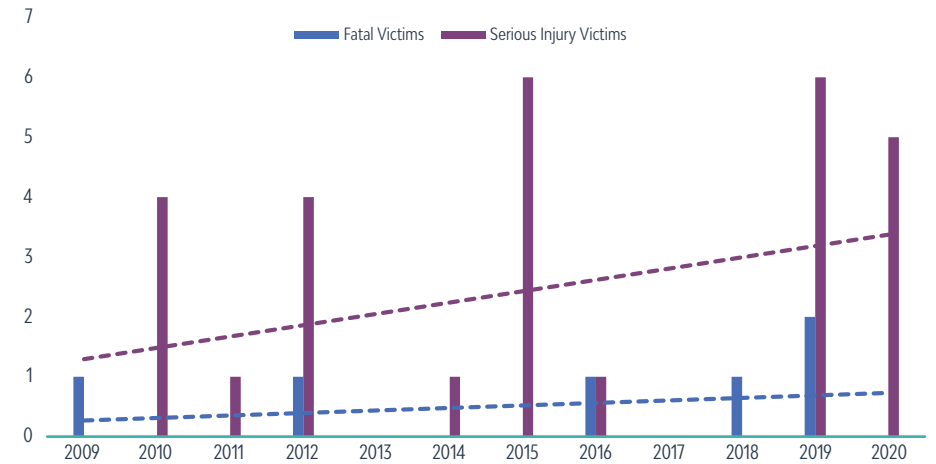


Figure 5: Imperial County
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

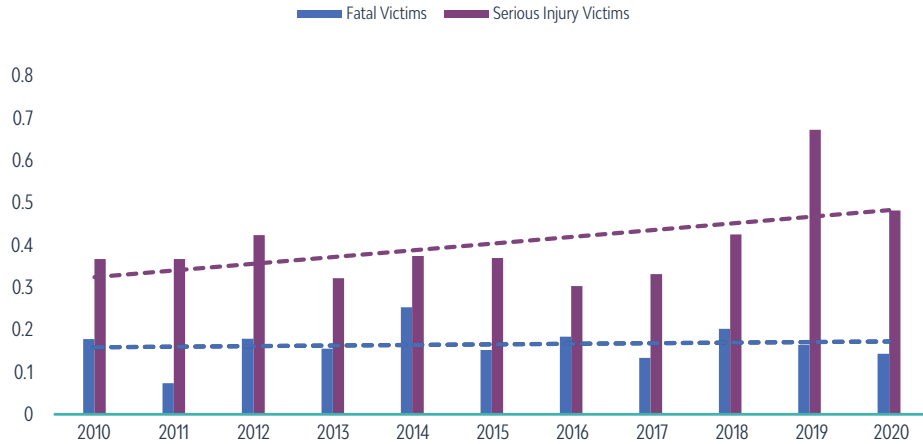


Figure 6: Imperial County
Total Fatal Victims, Normalized by 100M VMT (2009 - 2019)

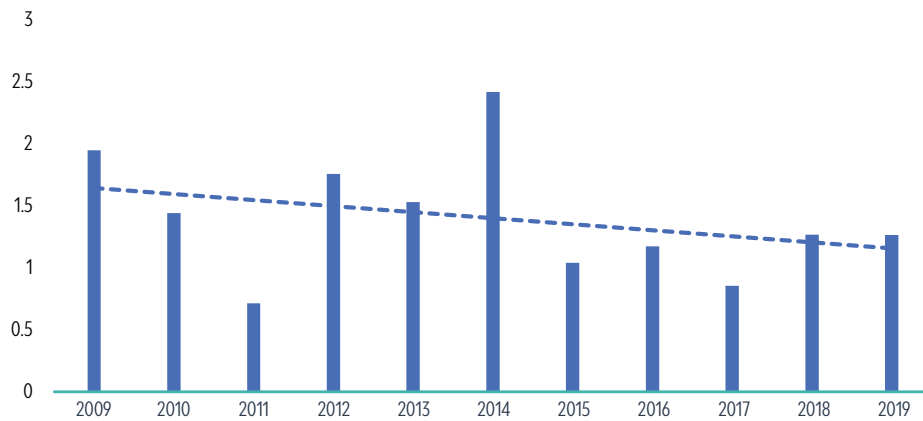


Figure 7: Imperial County
Total Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

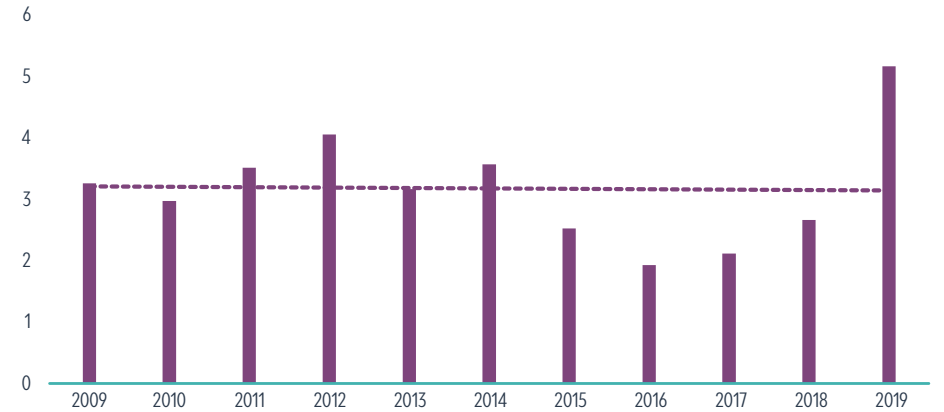


Figure 8: Imperial County
Fatal Collisions by Time of Day (2019)

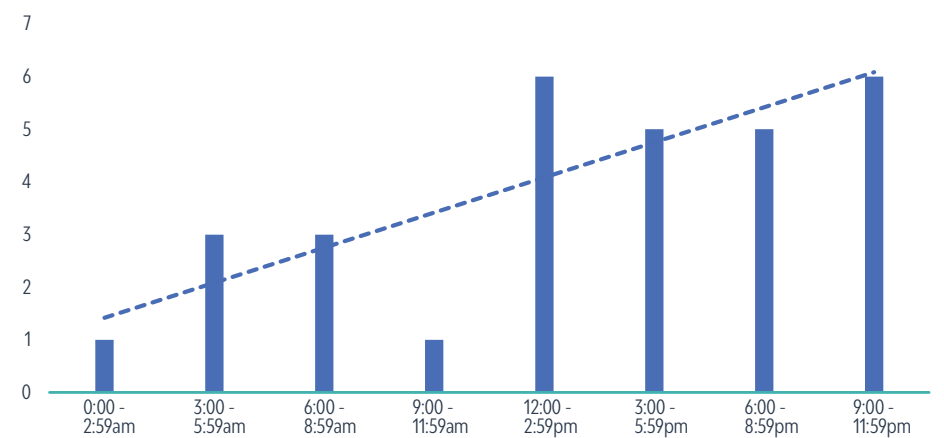


Figure 9: Imperial County
Serious Injury Collisions by Time of Day (2019)

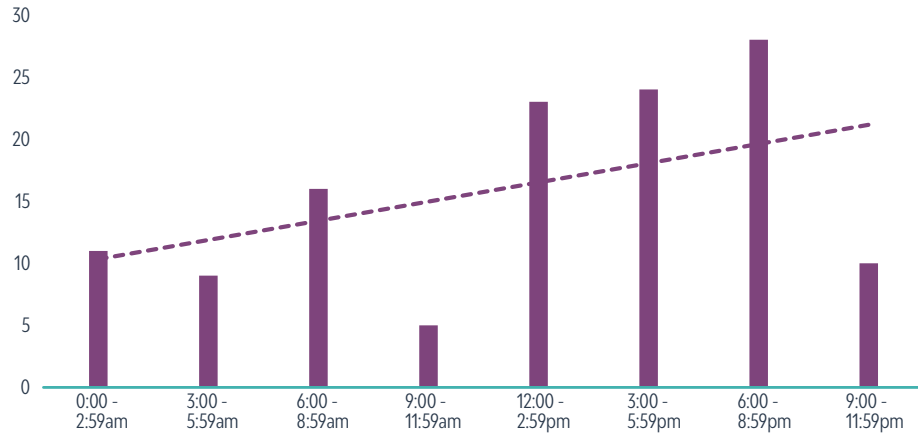


Figure 10: Imperial County
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

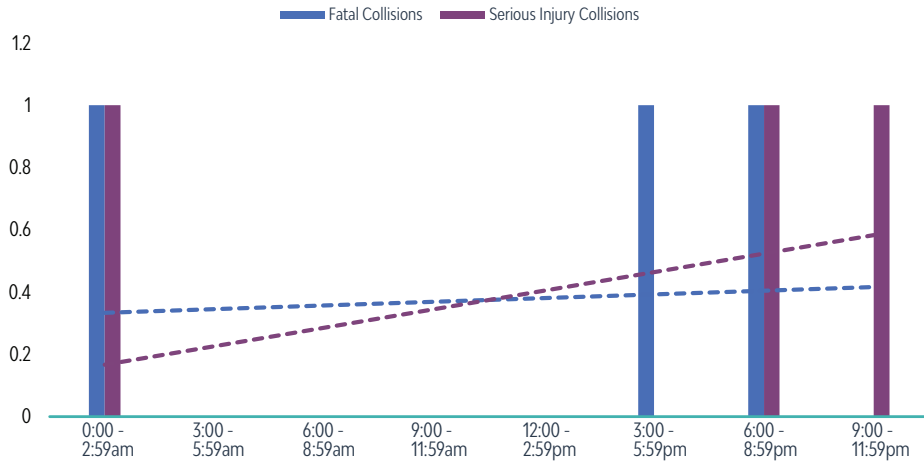


Figure 11: Imperial County
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

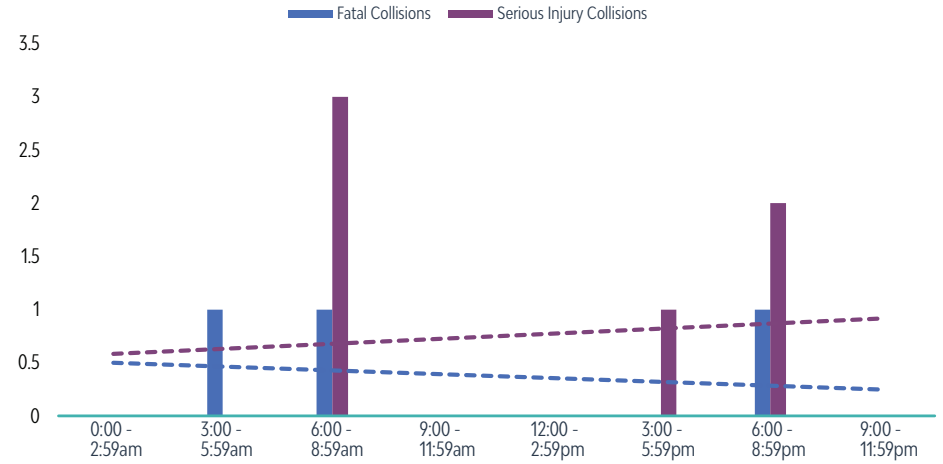


Figure 12: Imperial County
Fatal and Serious Injury Collisions by Day of Week (2019)

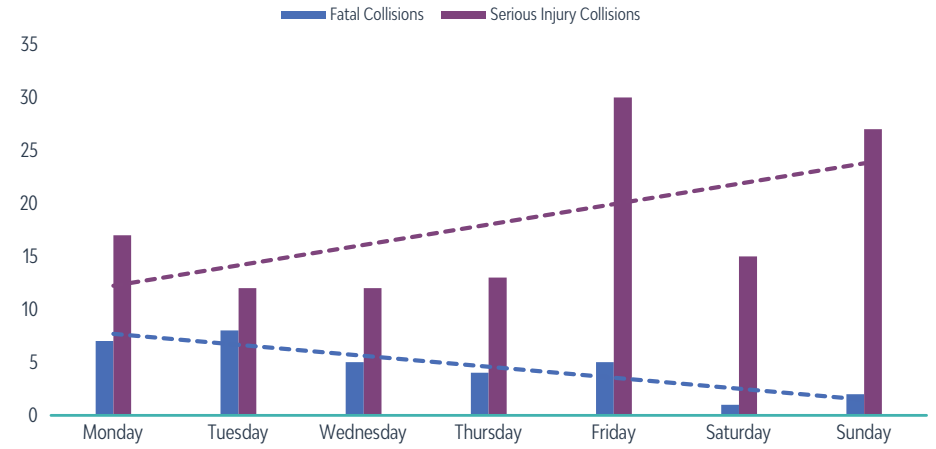


Figure 13: Imperial County
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

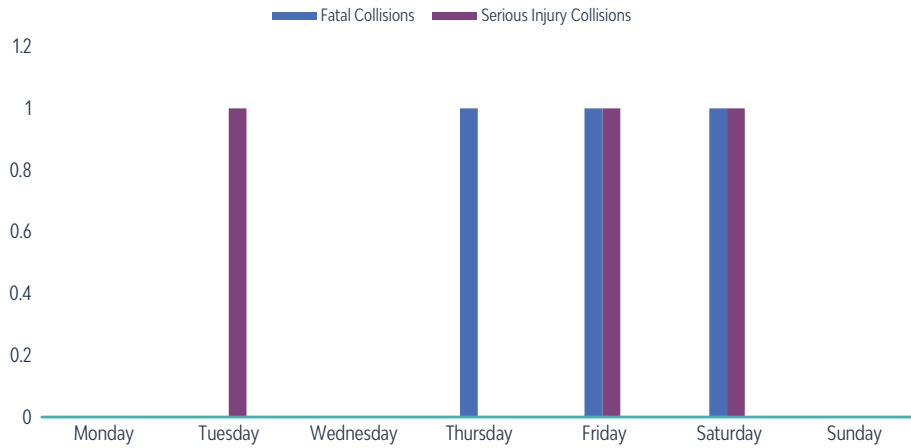


Figure 15: Imperial County
Fatal and Serious Injury Collisions by Month (2019)

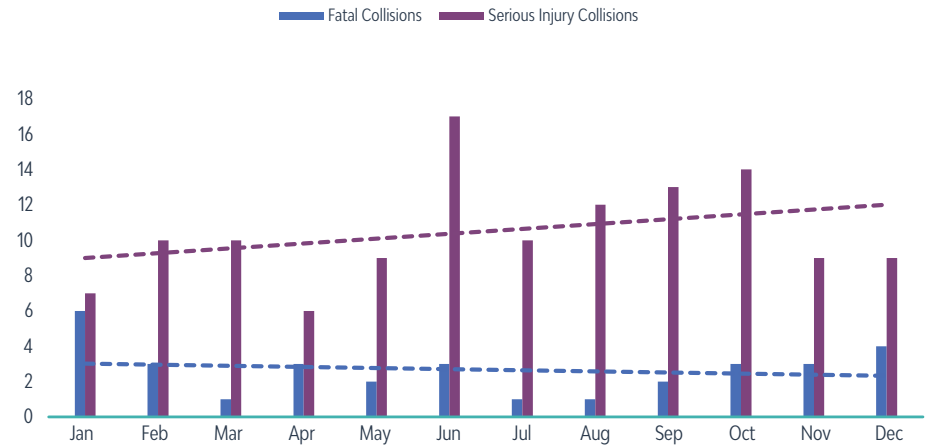


Figure 14: Imperial County
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

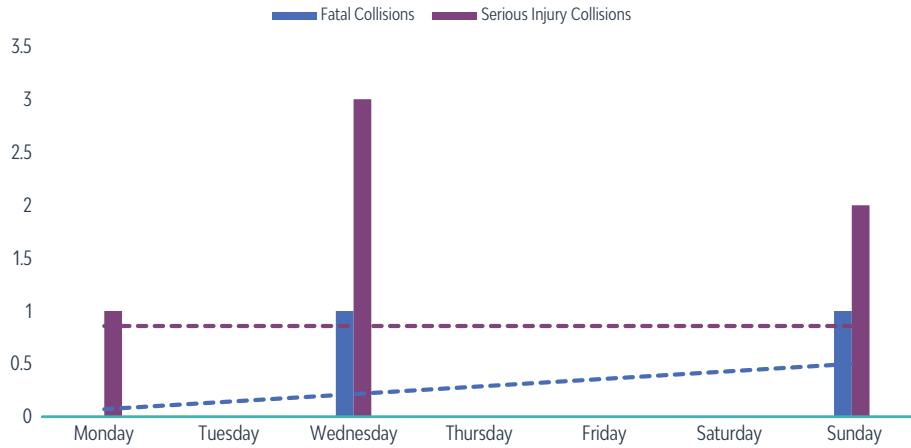


Figure 16: Imperial County
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

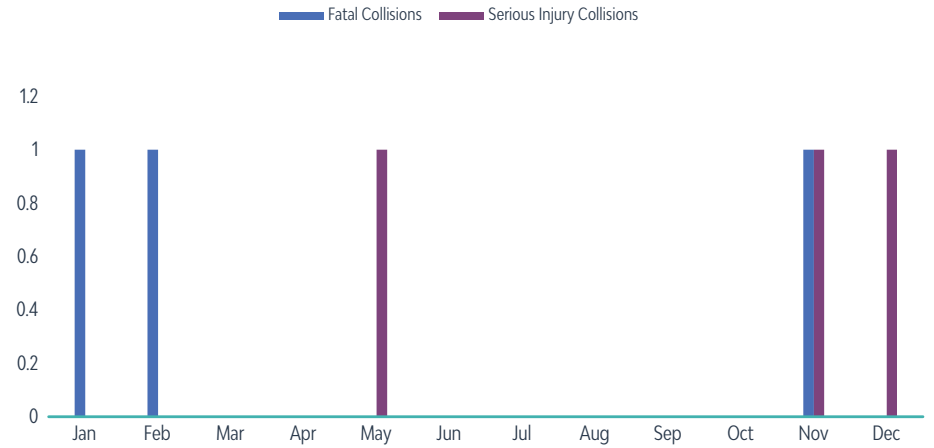


Figure 17: Imperial County
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

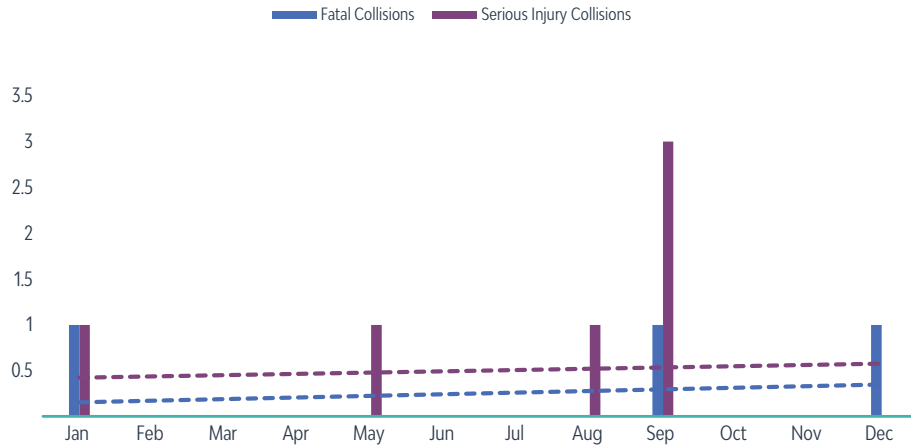


Figure 19: Imperial County
Serious Injury Victims by Age and Gender (2019)

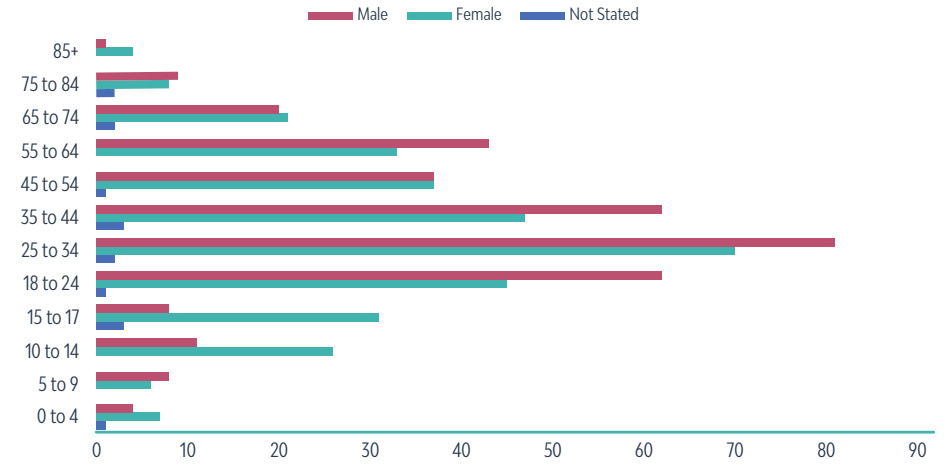


Figure 18: Imperial County
Fatal Victims by Age and Gender (2019)

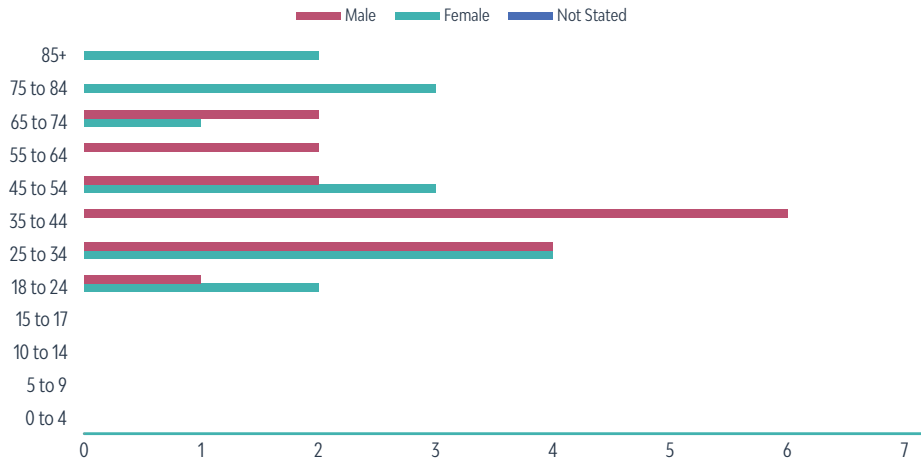


Figure 20: Imperial County
Fatal Victims by Involvement in Collision by Gender (2019)

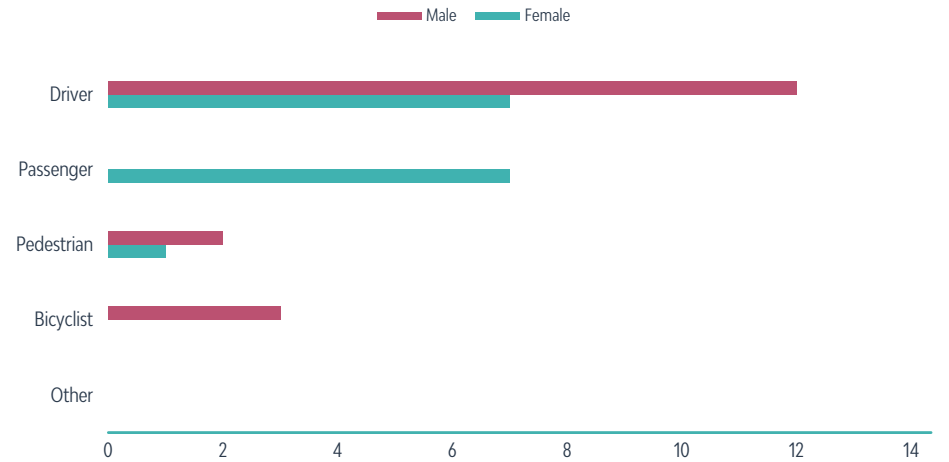
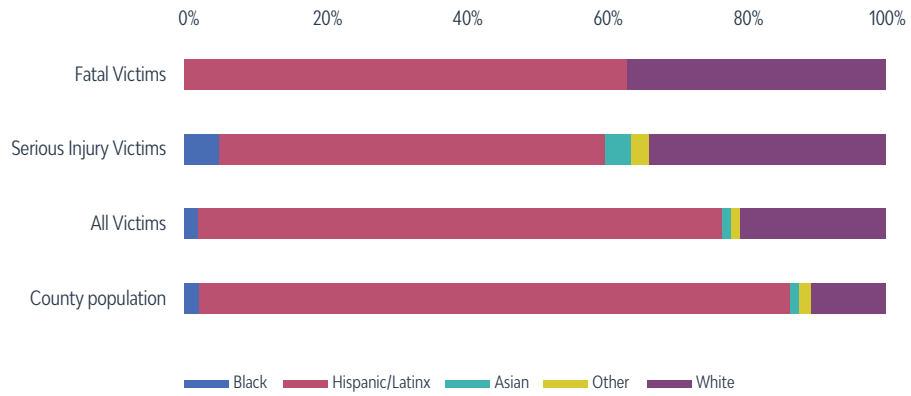
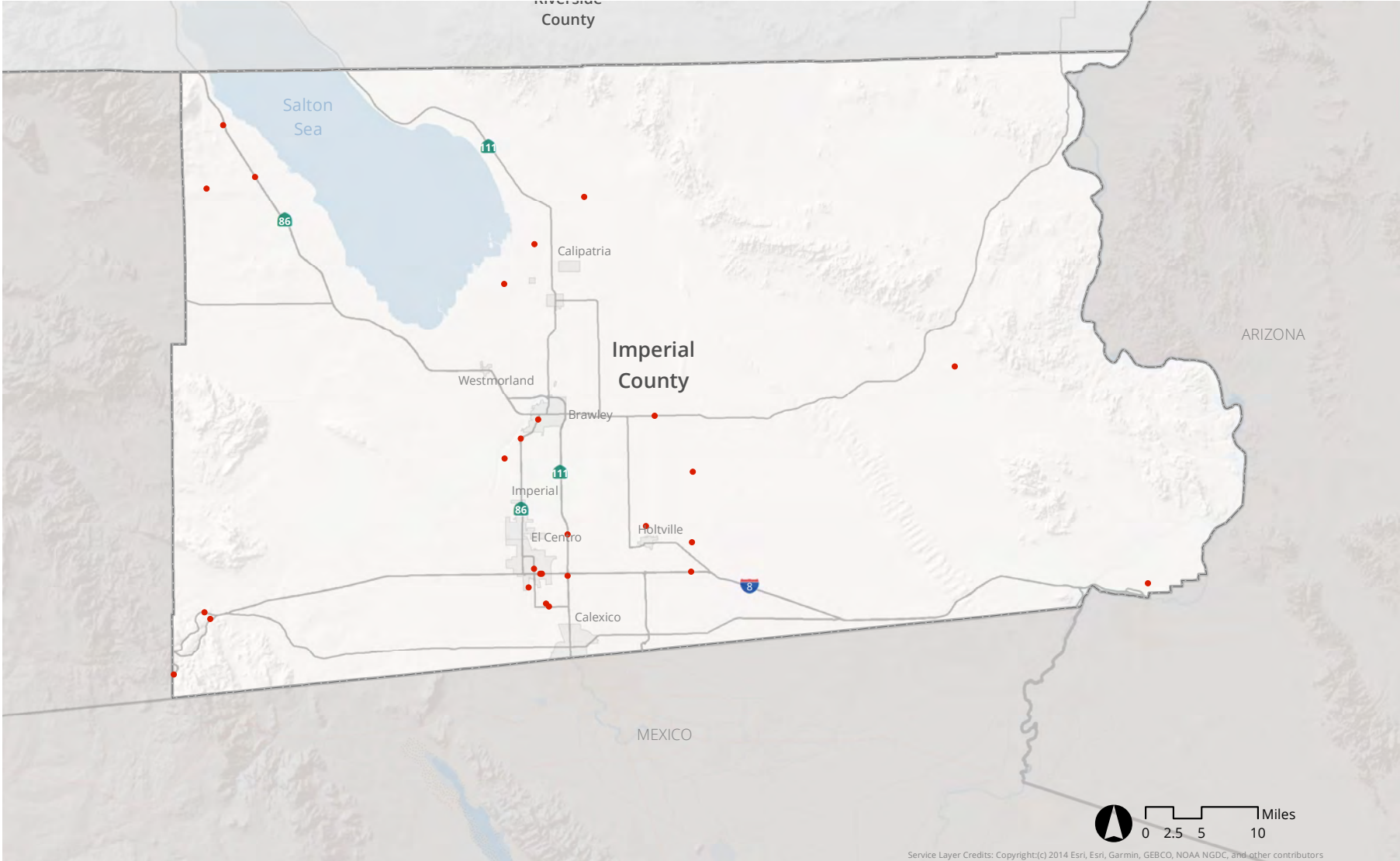


Figure 21: Imperial County
 Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)



Map 1: Imperial County, 2019 Fatal Collisions

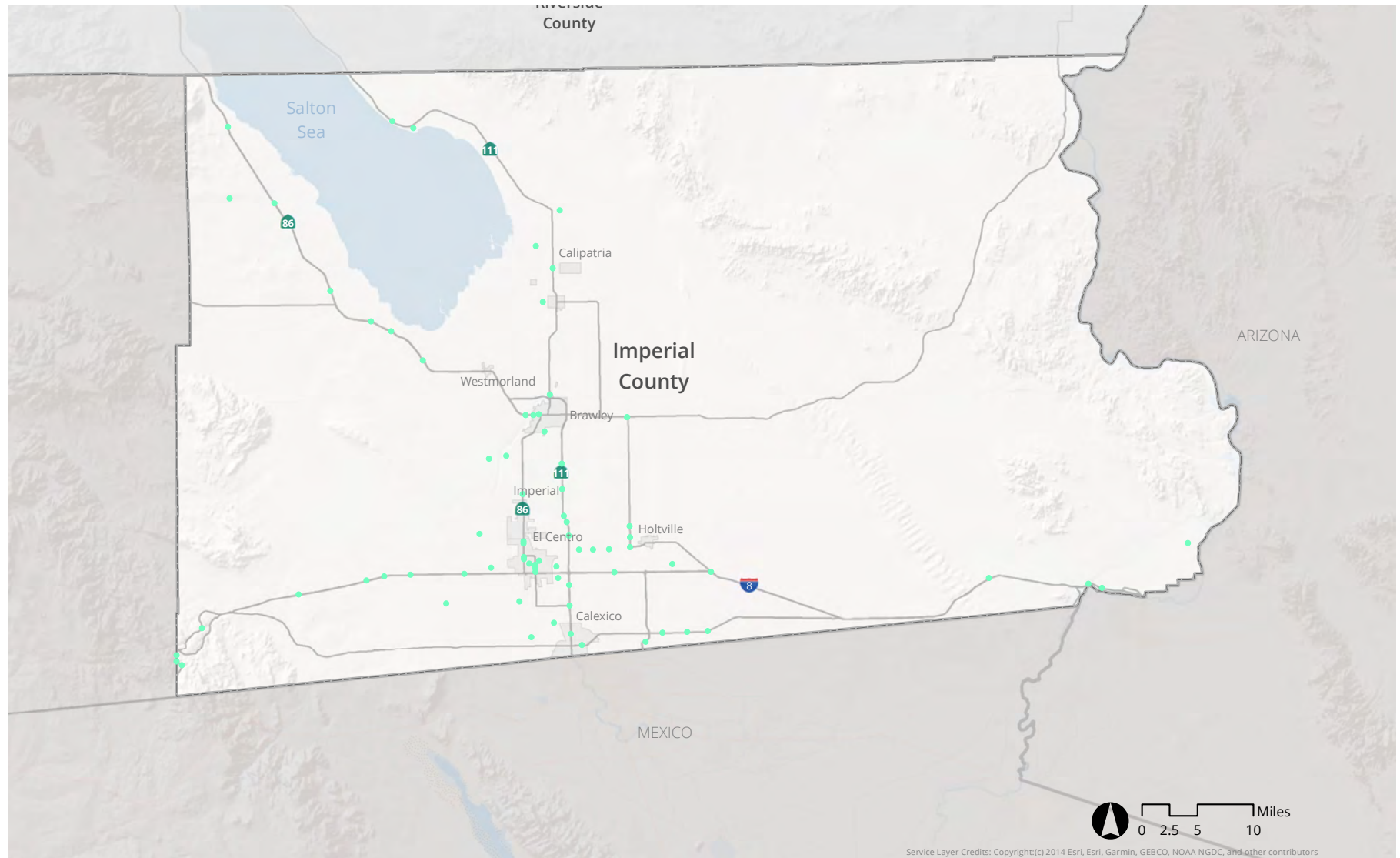


- County Boundaries
- City Boundaries
- Freeway
- Imperial County 2019 Fatal Collisions

Source: SCAG, SWITRS, TIMS



Map 2: Imperial County, 2019 Serious Injury Collisions



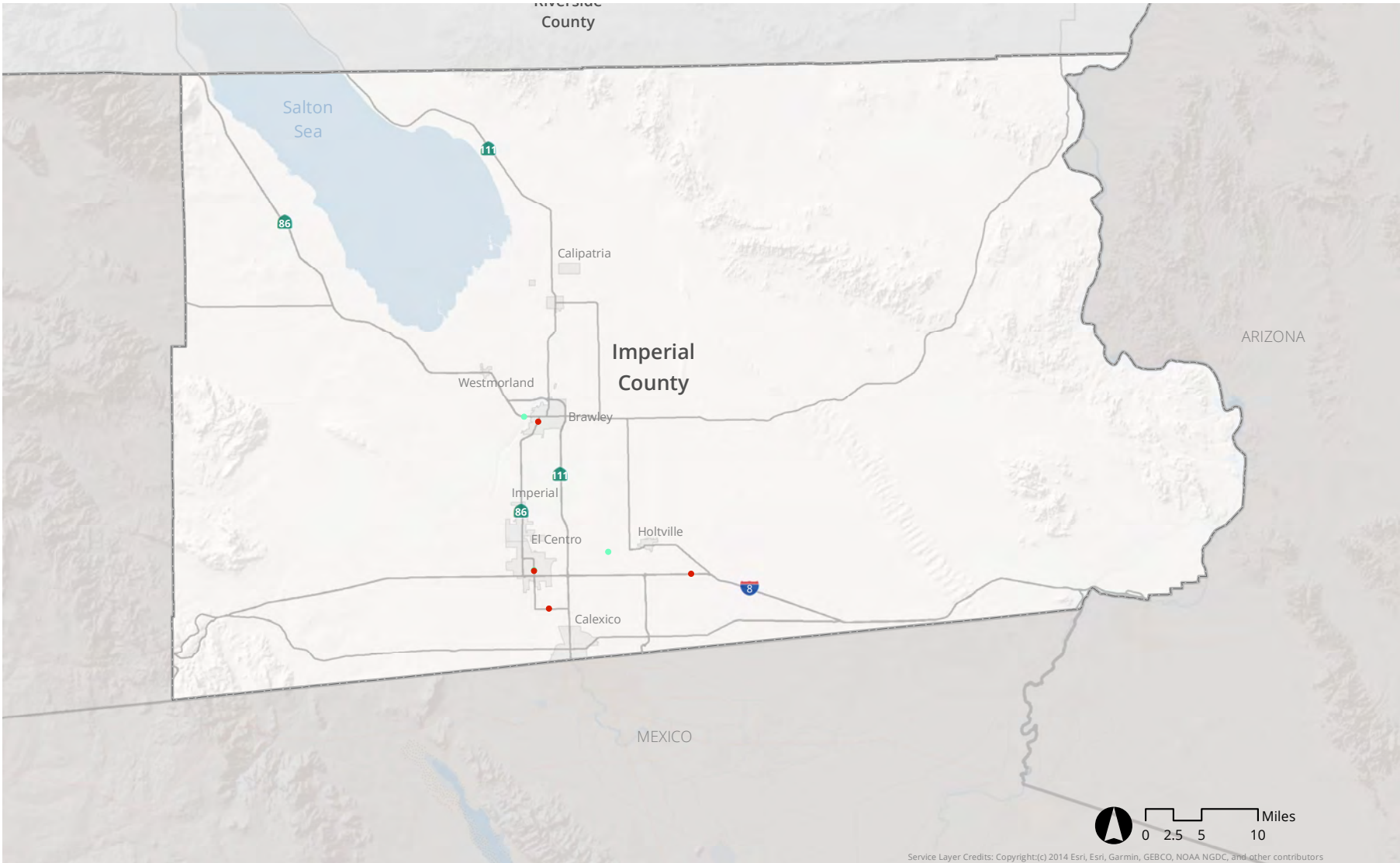
Service Layer Credits: Copyright:(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

- County Boundaries
- City Boundaries
- Freeway
- Imperial County 2019 Serious Injury Collisions



Source: SCAG, SWITRS, TIMS

Map 3: Imperial County, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions



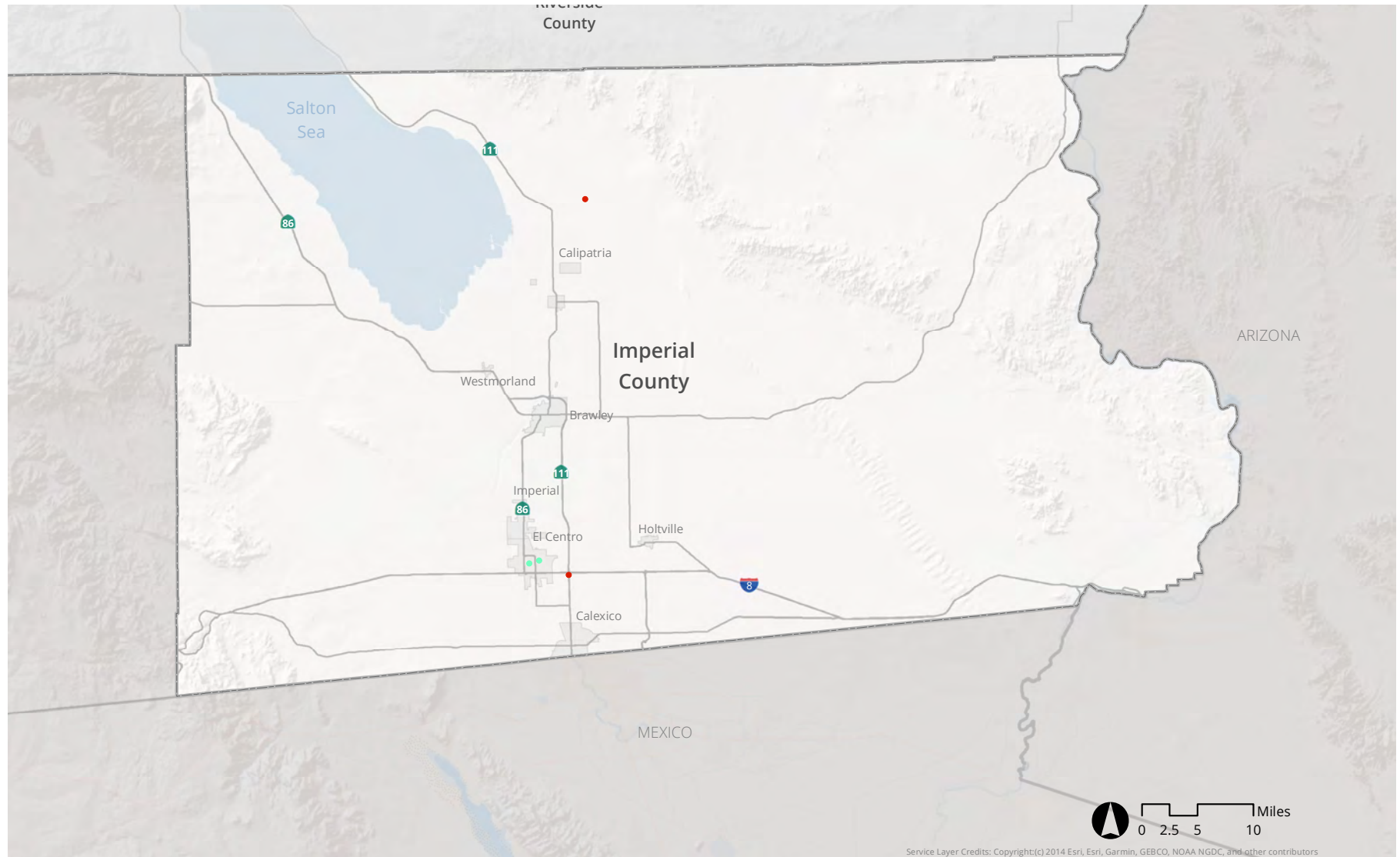
- County Boundaries
- Imperial County 2019 Pedestrian-Involved Fatal Collisions
- City Boundaries
- Imperial County 2019 Pedestrian-Involved Serious Injury Collisions
- Freeway






Source: SCAG, SWITRS, TIMS



Service Layer Credits: Copyright(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Map 4: Imperial County, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions

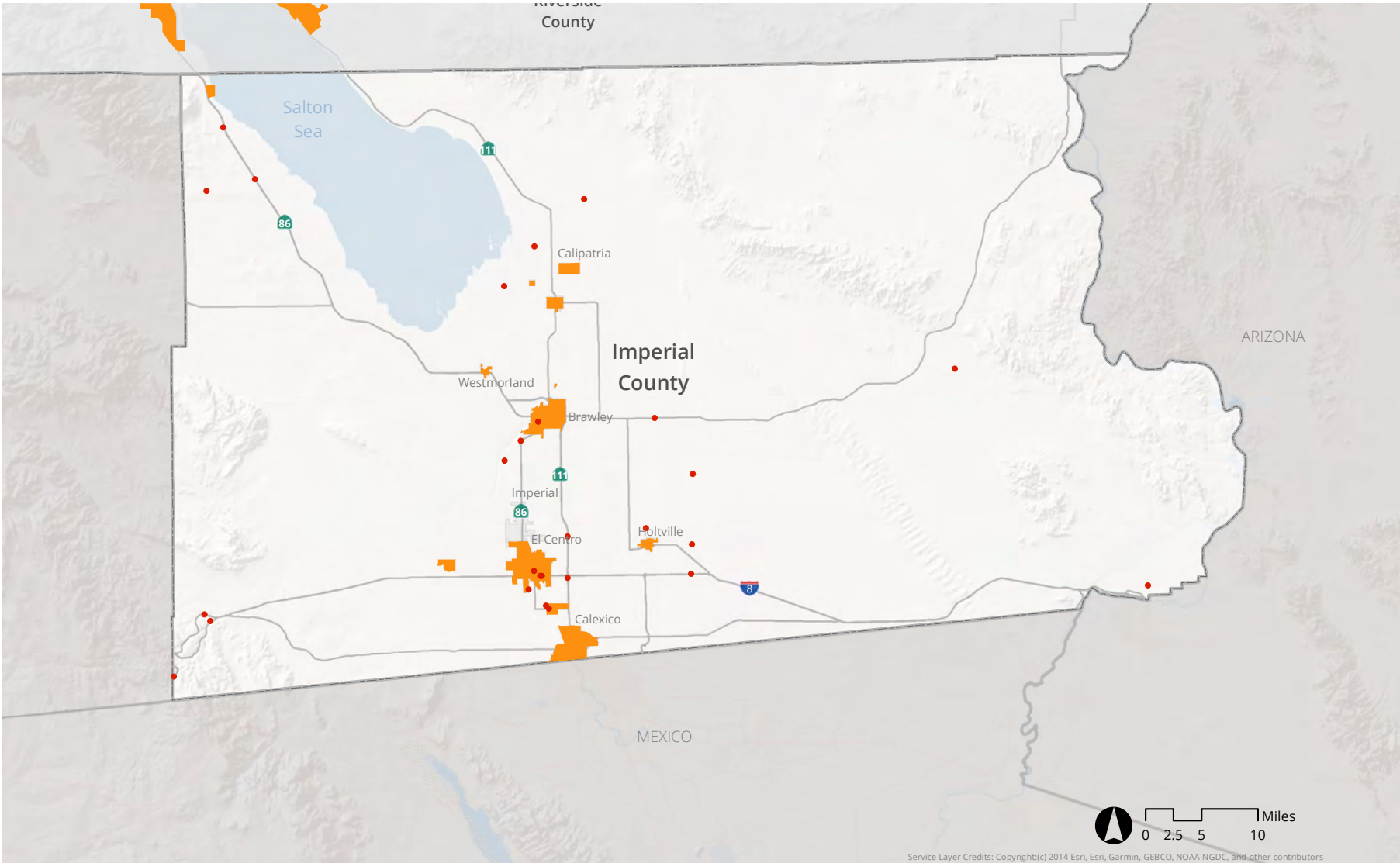


-  County Boundaries
-  Imperial County 2019 Bicyclist-Involved Fatal Collisions
-  City Boundaries
-  Imperial County 2019 Bicyclist-Involved Serious Injury Collisions
-  Freeway

Source: SCAG, SWITRS, TIMS



Map 5: Imperial County, 2019 Fatal Collisions in Communities of Concern

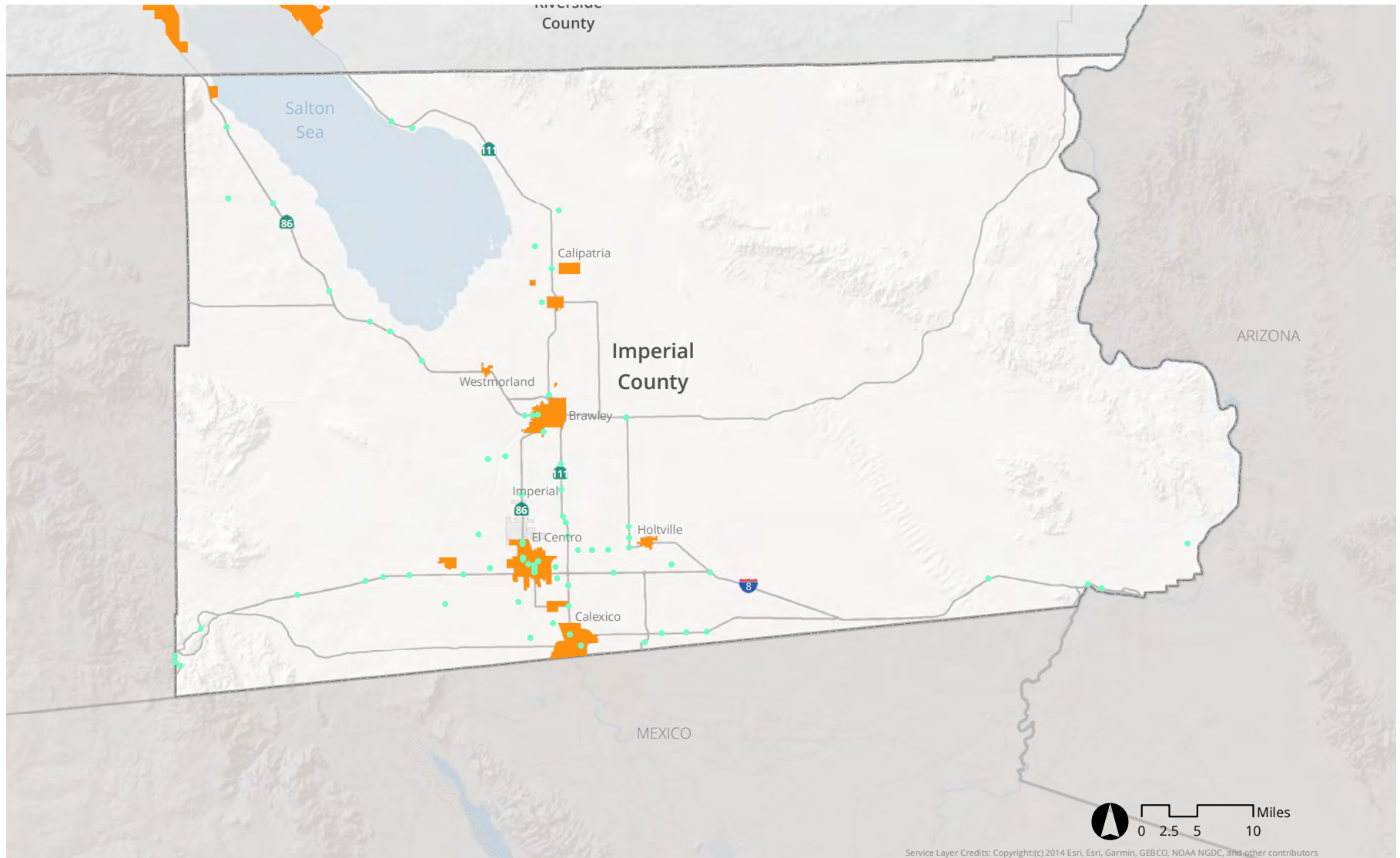


- County Boundaries
- City Boundaries
- Freeway
- Imperial County 2019 Fatal Collisions
- Communities of Concern

Source: SCAG, SWITRS, TIMS



Map 6: Imperial County, 2019 Serious Injury Collisions in Communities of Concern

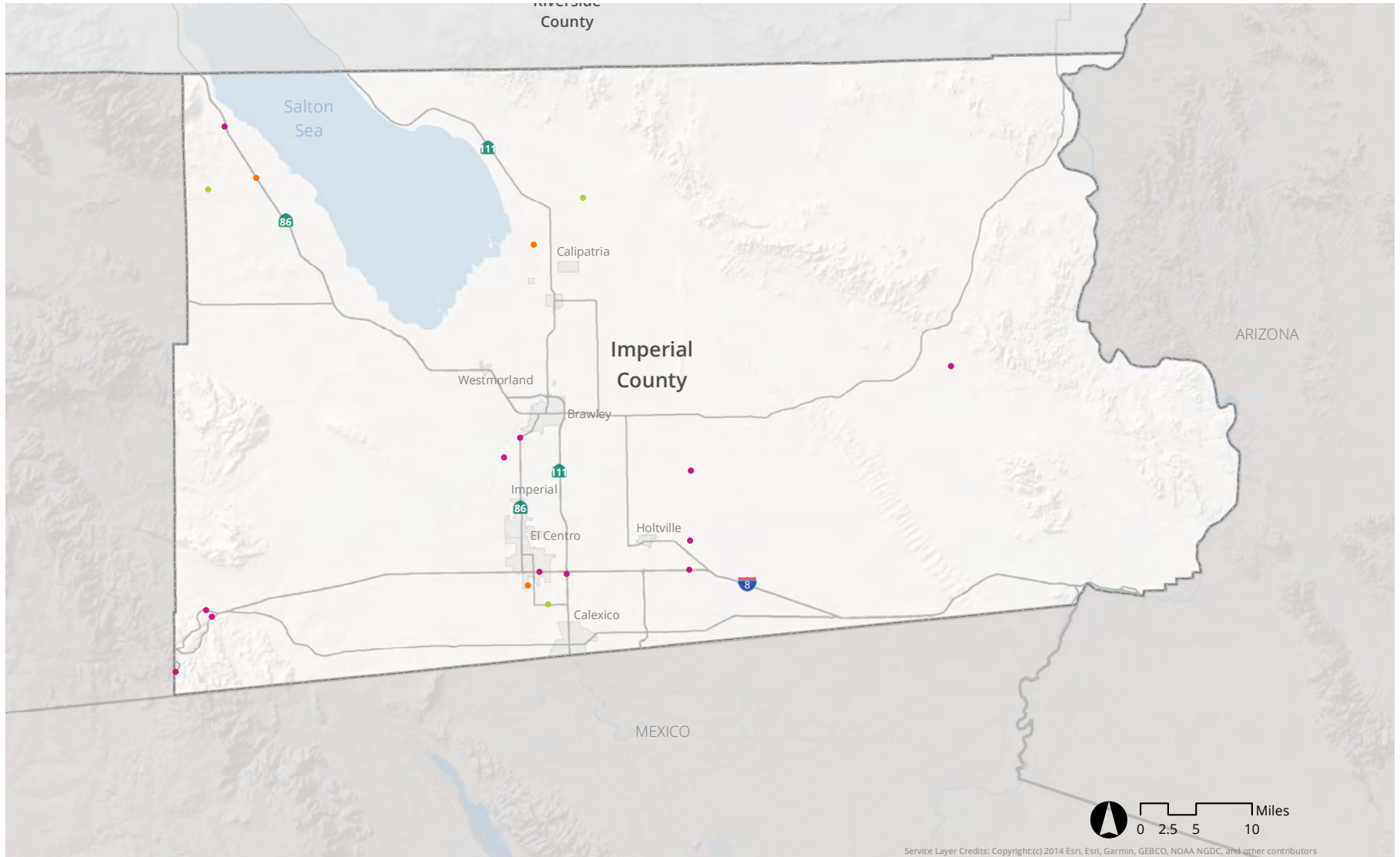


- County Boundaries
- City Boundaries
- Freeway
- Imperial County 2019 Serious Injury Collisions
- Communities of Concern

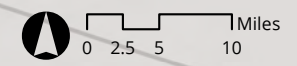


Source: SCAG, SWITRS, TIMS

Map 7: Imperial County, 2019 Primary Collision Factors of Fatal Collisions



- Imperial County 2019 Primary Collision Factors of Fatal Collisions**
- County Boundaries
 - City Boundaries
 - Freeway
 - Improper Turning
 - Unsafe Speed
 - Automobile Right of Way

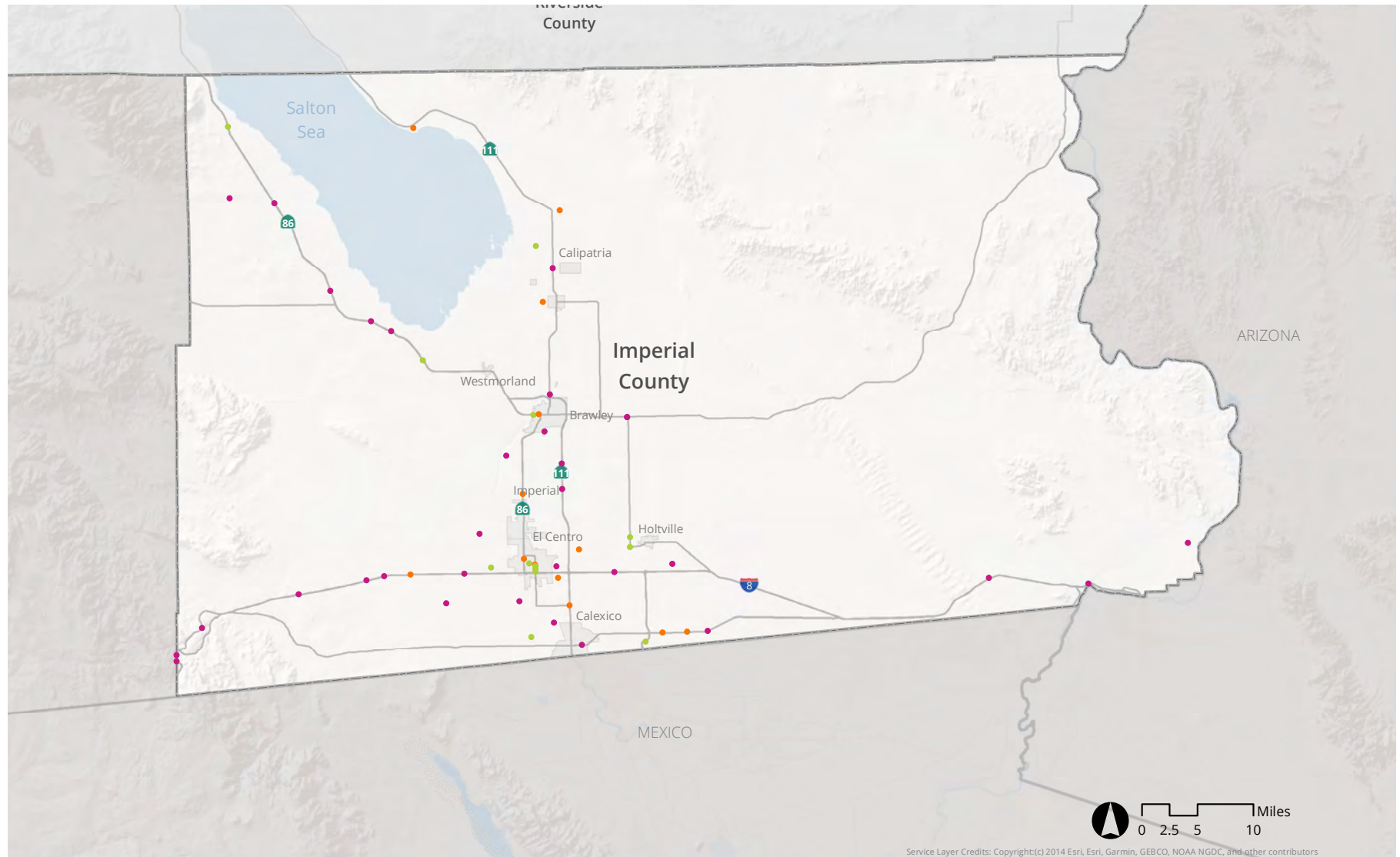


Service Layer Credits: Copyright:(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors



Source: SCAG, SWITRS, TIMS

Map 8: Imperial County, 2019 Primary Collision Factors of Serious Injury Collisions

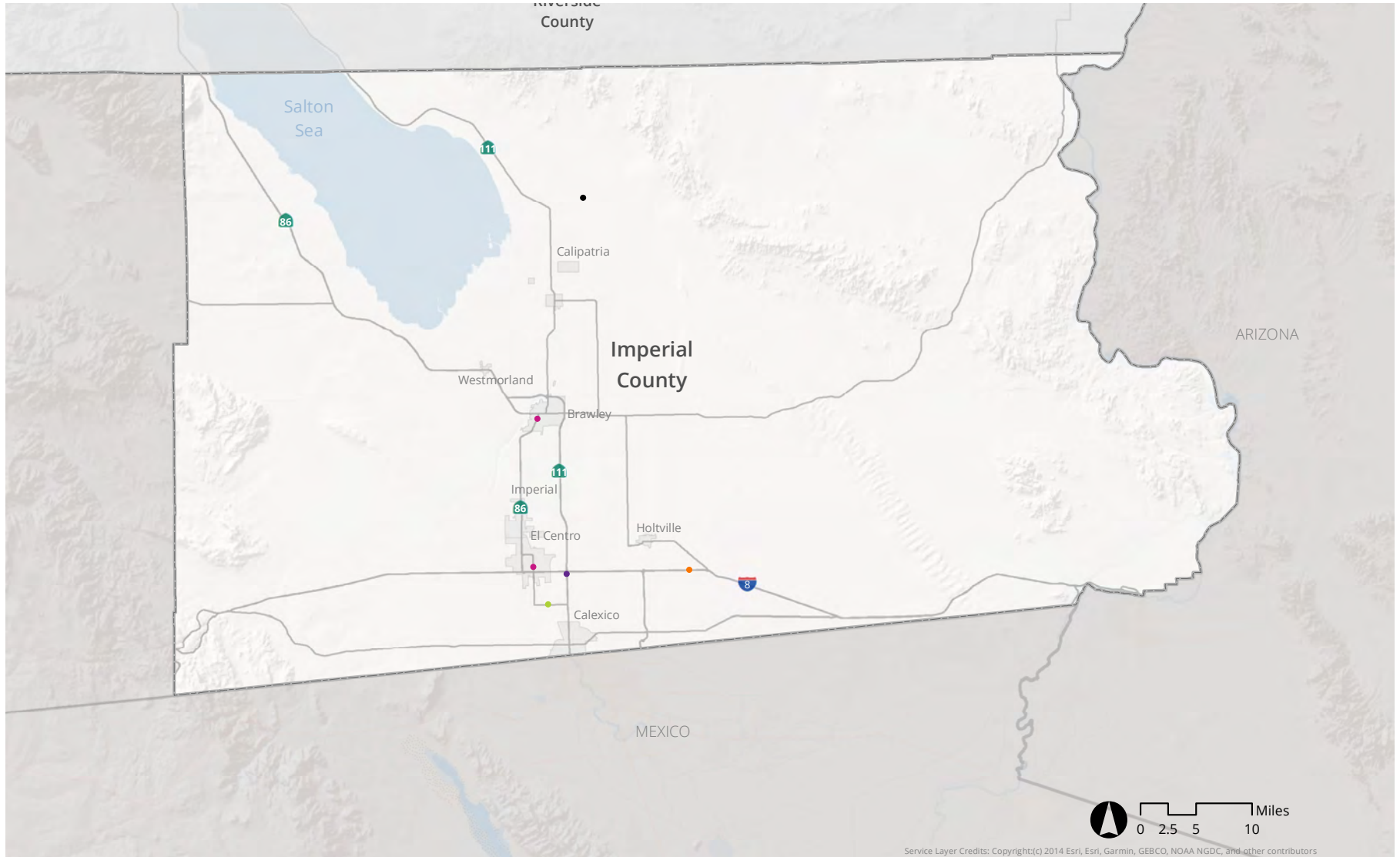


- Imperial County 2019 Primary Collision Factors of Serious Injury Collisions**
- County Boundaries
 - City Boundaries
 - Freeway
 - Improper Turning
 - Automobile Right of Way
 - Driving or Bicycling Under the Influence of Alcohol or Drugs

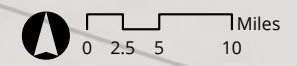


Source: SCAG, SWITRS, TIMS

Map 9: Imperial County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions



- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Fatal Collisions | Primary Collision Factors of Bicyclist-Involved Fatal Collisions |
| City Boundaries | Pedestrian Violation | Improper Turning |
| Freeway | Unsafe Speed | Unsafe Speed |
| | Improper Turning | |

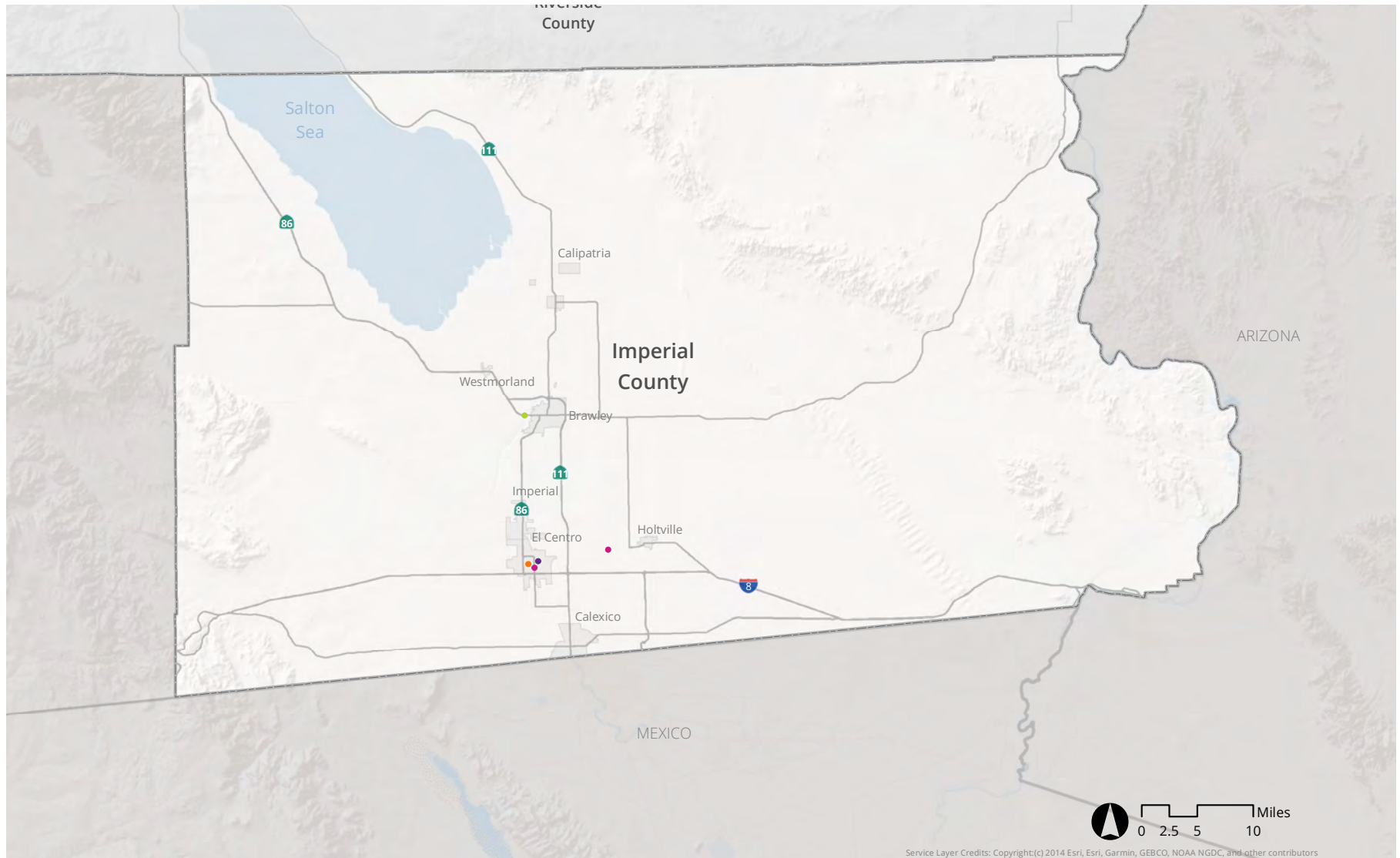


Service Layer Credits: Copyright(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors



Source: SCAG, SWITRS, TIMS

Map 10: Imperial County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



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- | | | |
|-------------------|---|--|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions |
| City Boundaries | Automobile Right of Way | Automobile Right of Way |
| Freeway | Unknown | Unknown |



Source: SCAG, SWITRS, TIMS



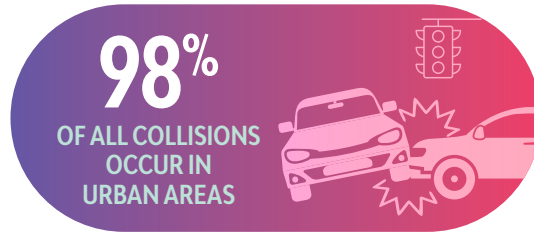


REGIONAL EXISTING CONDITIONS

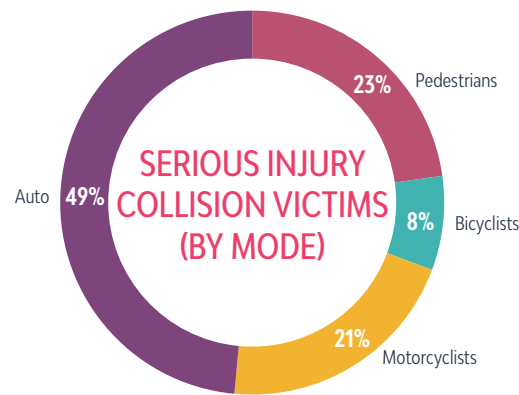
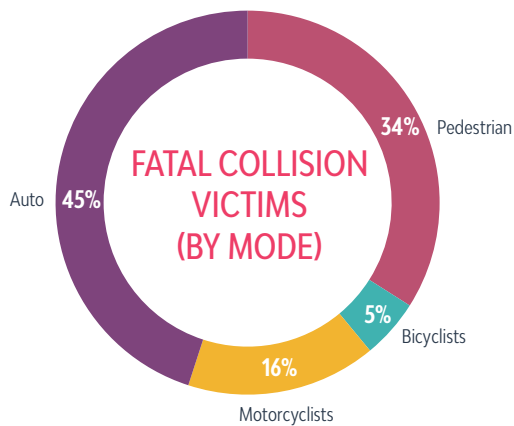
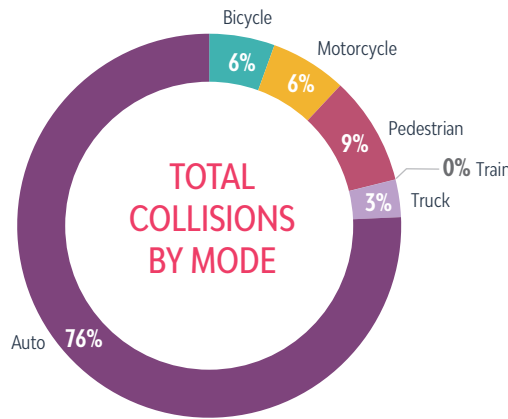
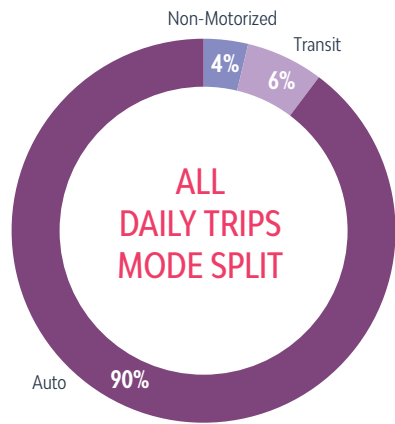
Los Angeles
County

Los Angeles County

BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





REGIONAL EXISTING CONDITIONS

Los Angeles County

Los Angeles County borders the counties of Kern (north), Orange (Southeast), San Bernardino (east), and Ventura (northwest). To the west, Los Angeles County borders 70 miles of the Pacific Ocean. It contains 4,057 square miles of land and 10 million residents. Residents of Los Angeles County drove an average of 7,870 Vehicle Miles Traveled (VMT) per capita per year from 2014 to 2019, less than any other county in the region. This may be due to the density of land uses and options for alternative forms of transportation (e.g., light rail, active transportation, etc.).

WHAT ARE THE OVERALL TRENDS?

On average, 660 people die in traffic collisions, 3,000 people are seriously injured, and 55,000 people are injured each year in Los Angeles County. Over the past decade, the total number of fatal victims steadily increased until 2016, when they peaked at 847 fatal victims. Since 2016, the number of fatal victims have decreased, as shown in [Figure 1](#). In contrast, in 2014, the number of serious injury victims began to increase until they peaked at nearly 3,900 in 2019. Serious injury victims dipped back down in 2020, likely a result of the COVID-19 pandemic ([Figure 2](#)). [Maps 1](#) and [2](#) reflect the locations of all collisions resulting in fatalities or serious injuries in Los Angeles County in 2019.

Over the past decade, about 61 percent of those killed were in vehicles or on motorcycles while the other 39 percent of fatal victims were walking or biking. Of the roughly 660 fatal collisions that occurred each year, about 259 were active transportation collisions. The numbers of fatal active transportation victims have increased over the years.

[Figure 3](#) reflects the total numbers of pedestrian fatal and serious injury victims from 2009 to 2020. Overall, fatal and serious injury victims both increased. More specifically, pedestrian fatal victims reached a peak in 2016 (286 fatalities) and decreased slightly before beginning to rise again prior to 2020. The number of pedestrians sustaining serious injuries, on the other hand, steadily increased from 2009 to 2019, at an average of 4 percent per year. [Map 3](#) highlights all of the pedestrian-involved collisions resulting in a fatality or serious injury that occurred in Los Angeles County in 2019.

[Figure 4](#) reflects bicyclist fatal and serious injury victims between 2009 to 2020. These trends deviate slightly from pedestrian trends. More specifically, while there was an uptick in bicyclist fatal victims leading up to 2013 (36), they generally decreased over the length of the entire time period. The number of bicyclists sustaining serious injuries generally increased and peaked in 2018

(275). **Map 4** highlights all of the bicyclist-involved collisions resulting in a fatality or serious injury that occurred in Los Angeles County in 2019.

Figure 5 shows the historical rates of the number of fatal and serious injury victims per 1,000 people over the last decade from 2010 to 2020. Both of the rates of fatal and serious injury victims followed relatively similar trends to **Figures 1** and **2**. Overall, serious injury victims are increasing and there was a 2016 peak in fatal victims before decreasing- suggesting that population changes did not impact these values. Similarly, normalizing by vehicle miles traveled (VMT) reveals similar trends to non-normalized numbers, where total fatal victims increased in 2016 before decreasing, and total serious injury victims increased. (**Figures 6** and **7**).

However, when VMT per capita is considered, trends remained relatively consistent, before increasing in 2015. Considering VMT was generally increasing from 2010 to a high of approximately 223 million daily VMT in 2017, these differences in the VMT per capita suggest that changes in the population have made a difference to the amount of VMT generated. There may be a variety of reasons that lead to shifts or changes in any of the indicators (i.e., fatalities, serious injuries, VMT, or population) not restricted to and including transportation technology changes, changing demographics, saturated highways, and/or preferences for living in more compact neighborhoods that reduce the need for driving. Los Angeles County generally has the lowest VMT per capita of all the counties, a yearly average of 7,870 VMT per capita.

WHERE ARE COLLISIONS OCCURRING?

In Los Angeles County, the majority of fatal and serious injury collisions occurred in urbanized areas. Nearly all fatal and serious injury collisions (99 percent) occurred in urbanized areas across all modes of transportation. All bicyclist fatal collisions and nearly all pedestrian fatal collisions (99 percent) occurred in urbanized areas. In total, over 99 percent of the population lives in urbanized

areas, while less than 1 percent lives in urban clusters or rural areas in Los Angeles County. **Maps 1-4** display collisions (by mode) resulting in fatal and serious injury collisions, highlighting their concentrations in the urbanized areas of Los Angeles County in 2019.

Los Angeles County includes a large roadway network, with 515 highway centerline miles, 4,675 arterial centerline miles, 3,196 collector centerline miles, and 13,570 local road centerline miles. Local roads account for 62 percent of all roadways in terms of mileage within Los Angeles County. Los Angeles County is also home to 352 miles of Class I bikeways, 1,186 Class II bikeways, 658 Class III bikeways, and just under 10 miles of Class IV bikeways.

In 2019, almost three quarters of fatal collisions across all modes occurred on local roads, while about 5 percent on arterials, and 17 percent occurred on highways. Seventy-three percent of serious injury collisions occurred on local roads, while 5 percent occurred on arterials and 21 percent on highways.

In 2019, 81 percent of pedestrian-involved fatal collisions occurred on local roads, 7 percent on arterials and the rest on arterials. Seventy-seven percent of bicyclist-involved fatal collisions occurred on local roads, 15 percent on arterials, and 8 percent on highways. For pedestrian-involved serious injury collisions, 89 percent occurred on local roads (and 5 percent each on arterials and highways), while 92 percent bicyclist-involved collisions occurred on local roads (with 7 percent on arterials and 2 percent on highways).

WHEN ARE COLLISIONS OCCURRING?

In Los Angeles County, across all modes, more people were killed and seriously injured during the afternoon and evening than other parts of day. In 2019, more than a third of fatal collisions across all modes occurred in the evening between 6:00 – 11:59pm (**Figure 8**), and more than a third of serious injury collisions occurred earlier in the afternoon and the evening, from 3:00 – 8:59pm (**Figure 9**).

When examining trends by time of day for pedestrian- and bicyclist-involved collisions, the majority of pedestrian fatal collisions also occurred in the evening when there is generally reduced visibility. In 2019, nearly 150 pedestrian fatal collisions occurred between 6:00 - 11:59pm (Figure 10). Bicyclist fatal collisions were highest in the late evening, although they also notably increased during both the morning and evening rush hours. Bicyclist serious injury collisions peaked in the late afternoon and early evening between 3:00 – 8:59pm (Figure 11).

By day of week, fatal and serious injury collisions across all modes peaked on Sundays in 2019 in Los Angeles (Figure 12). There was no consistent trend in the day of the week for fatal pedestrian collisions, though pedestrian serious injury collisions increased over the course of the work week (Figure 13). Bicyclist fatal and serious injury collisions were higher on Thursday and Friday than any other day of the week (Figure 14).

Across all modes, on average, there were 60 fatal collisions and 320 serious injury collisions per month in Los Angeles County in 2019 (Figure 15). Fatal collisions peaked in November (73 fatalities), potentially because of Daylight Savings Time, which impacts daylight and visibility during typical commutes. Figure 16 displays the fatality and serious injury trends for pedestrian-involved collisions by month. Pedestrian-involved fatal collisions peaked in November (30 fatal collisions), similar to the broader fatality trends across all modes. There was no distinctive pattern for bicyclist-involved fatal collisions, while bicyclist-involved serious injury collisions generally increased over the course of the year and peaked during the summer (Figure 17).

WHO IS BEING HURT?

In Los Angeles County, out of all the fatal collisions that occurred from 2009 to 2020, pedestrians and bicyclists accounted for nearly 40 percent of all fatal collision victims, disproportionately higher than the 4 percent of daily trips that

were made via walking or biking.

Three times more men died in traffic collisions than women in 2019. Across all modes, 75 percent of fatal victims were men (533) and men sustained more serious injuries than women (2,640 men in total, or 69 percent of all serious injury victims). This is compared to 25 percent of women (179) being fatal victims and 1,124 women sustaining serious injuries (29 percent of all serious injury victims).

As observed in Figure 18, when stratified by age group, the largest number of fatalities occurred in those aged 25-34 as compared to other age groups, in total representing 21 percent of all fatalities in Los Angeles County in 2019. Similarly, those aged 25-34 sustained more serious injuries than any other age group – 736 males, 252 females, and 16 people with no gender stated – constituting 26 percent of all serious injuries (Figure 19). An additional 18 percent of serious injuries occurred in the age group 18-24 years.

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), additional patterns emerge. Drivers experienced the largest number of fatalities (295), followed by pedestrians (283), passengers (85), and bicyclists (41). More than five times as many drivers who were killed during a collision were male drivers (247) than female (47) as illustrated in Figure 20. Of all men killed in traffic collisions in 2019, 46 percent were male, followed by 37 percent who were pedestrians. Of the women killed in traffic collisions, 47 percent were killed as a pedestrian, followed by driver (26 percent) and as a passenger (23 percent).

Overall, male drivers constituted 35 percent of all fatalities across gender, age, and victim status. Dissecting these factors further, male drivers between the ages of 25-34 experienced the highest number of fatalities (126) in 2019.

When broken down by race, it is clear that some people of color are

disproportionately represented in fatalities and serious injuries (**Figure 21**). Black individuals were overrepresented in fatal and serious injury victims compared to the proportion of the County's population: while they represent just under 8 percent of the County's population, Black individuals constituted over 15 percent of all fatal victims and 12 percent of serious injury victims. Individuals who were identified as Other (including American Indian, Alaska Native, Native Hawaiian and other Pacific Islander, along with mixed race individuals) represent only 3 percent of the County's population, but constituted almost 5 percent of fatal victims and nearly 7 percent of serious injury victims. Interestingly, white individuals were also overrepresented in both fatal and serious injury victims, as they represent 26 percent of the County's population, but constituted 28 percent of fatal victims and 31 percent of serious injury victims.

Maps 5 and **6** highlight the concentration of fatalities and serious injuries that have occurred in Communities of Concern in 2019.

WHY ARE COLLISIONS OCCURRING?

Maps 7-10 reflect the top three contributing factors for all fatal and serious collisions and bicycle- and pedestrian-involved fatal and serious collisions in 2019. The top three contributing factors in fatal collisions across the region were Pedestrian Violations (22 percent), Unsafe Speed (20 percent), and Driving or Bicycling Under the Influence of Alcohol or Drugs (11 percent). For collisions resulting in serious injuries, the top three contributing factors were Unsafe Speed (20 percent), Automobile Right of Way (14 percent), and Improper Turning (13 percent).

For pedestrian-involved fatal collisions, the top three contributing factors were Pedestrian Violations (56 percent) and Pedestrian Right of Way (19 percent). In general, Pedestrian Violations were the most significant contributor to pedestrian fatalities across all counties in 2019. The third contributing factor

was tied between Driving or Bicycling Under the Influence of Alcohol or Drugs and an Unknown Factor (6 percent each). The top three contributing factors for bicyclist-involved fatal collisions were Unsafe Speed (22 percent), Automobile Violations (20 percent), and Other (12 percent).

Figure 1: Los Angeles County
Total Number of Fatal Victims (2009 - 2020)

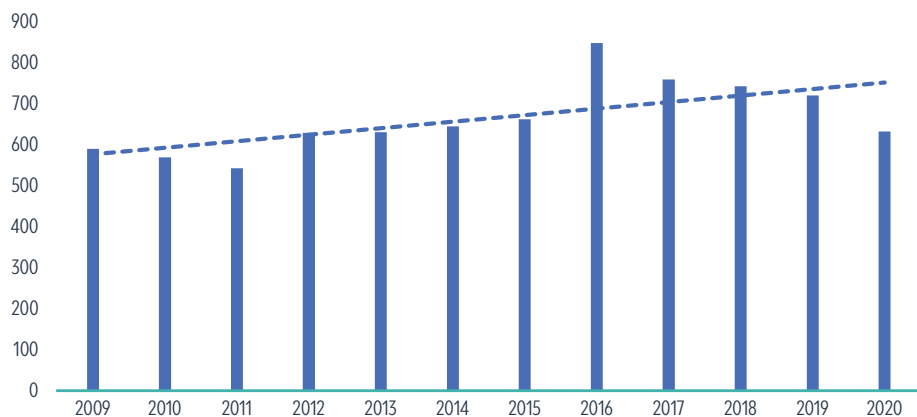


Figure 2: Los Angeles County
Total Number of Serious Injury Victims (2009 - 2020)

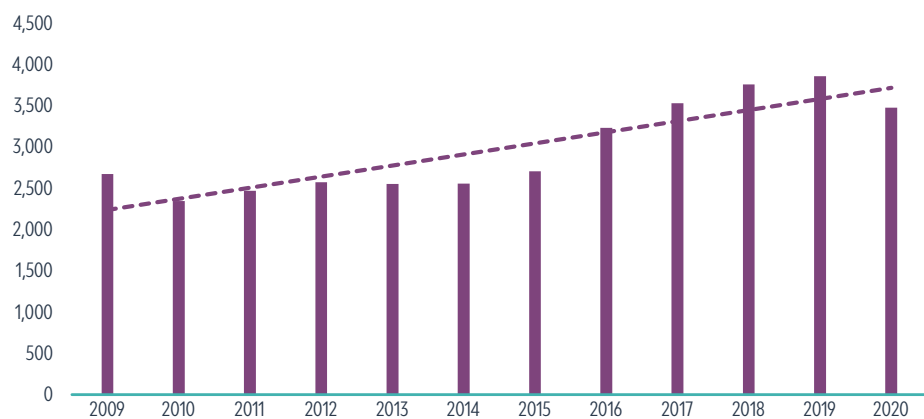


Figure 3: Los Angeles County
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

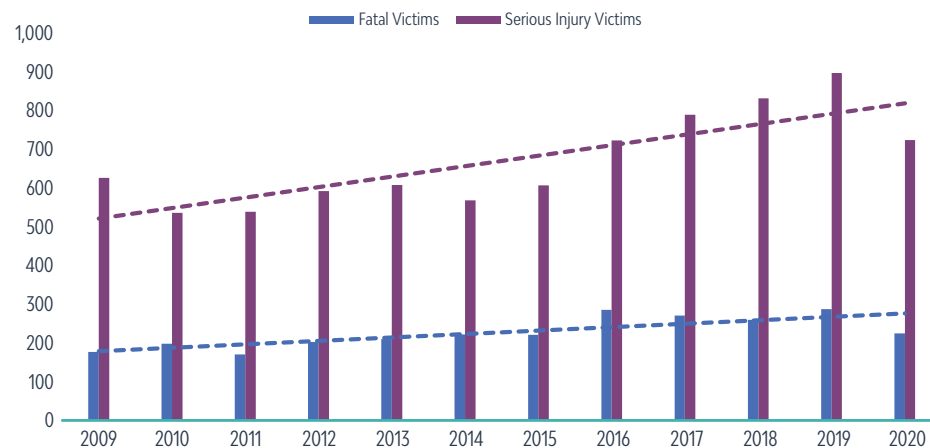


Figure 4: Los Angeles County
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)

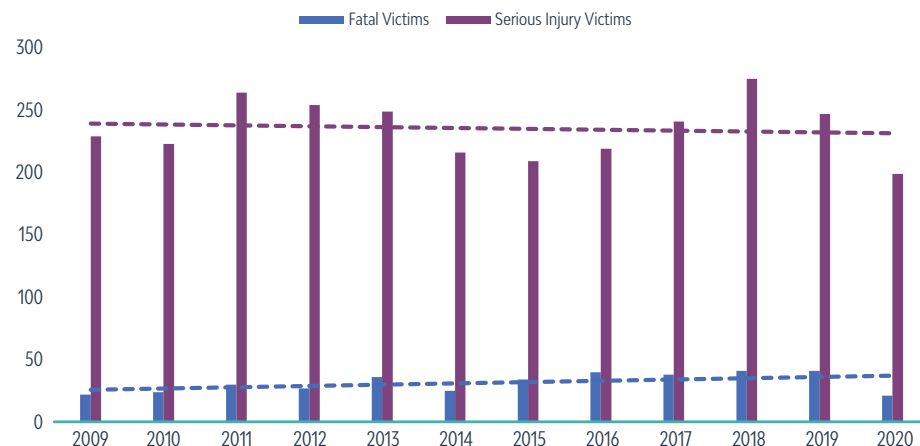


Figure 5: Los Angeles County
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

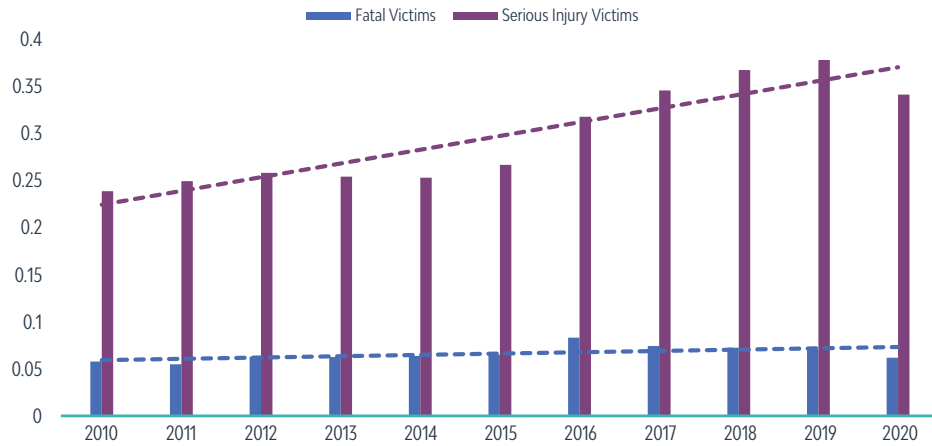


Figure 7: Los Angeles County
Total Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

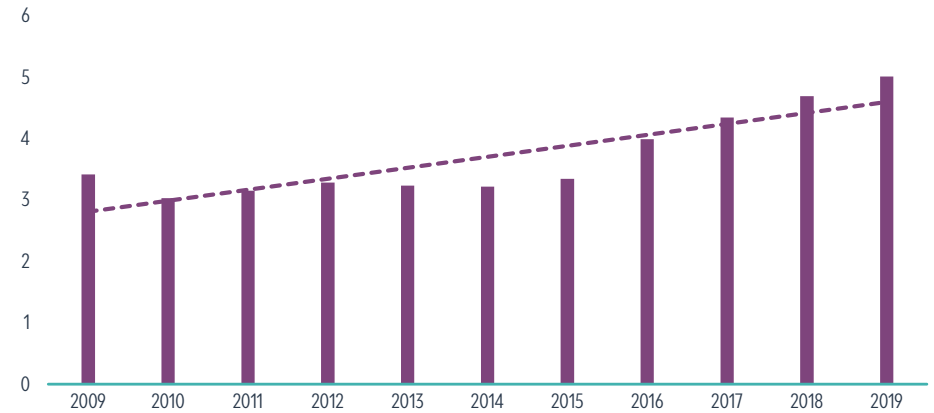


Figure 6: Los Angeles County
Total Fatal Victims, Normalized by 100M VMT (2009 - 2019)

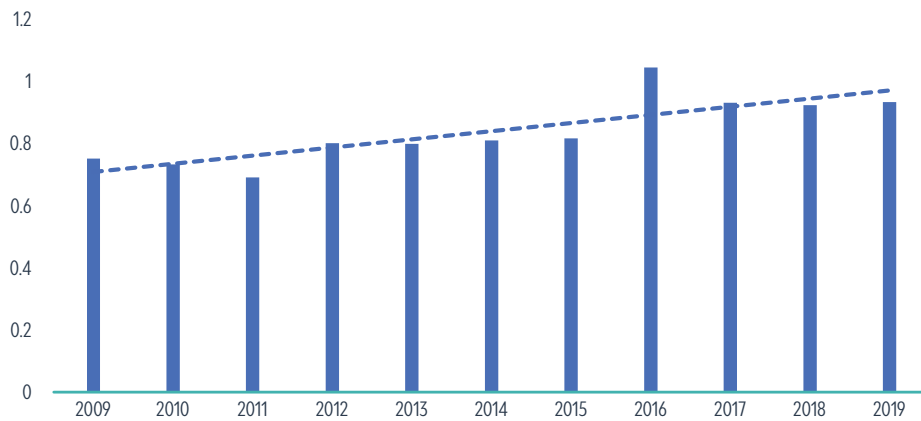


Figure 8: Los Angeles County
Fatal Collisions by Time of Day (2019)

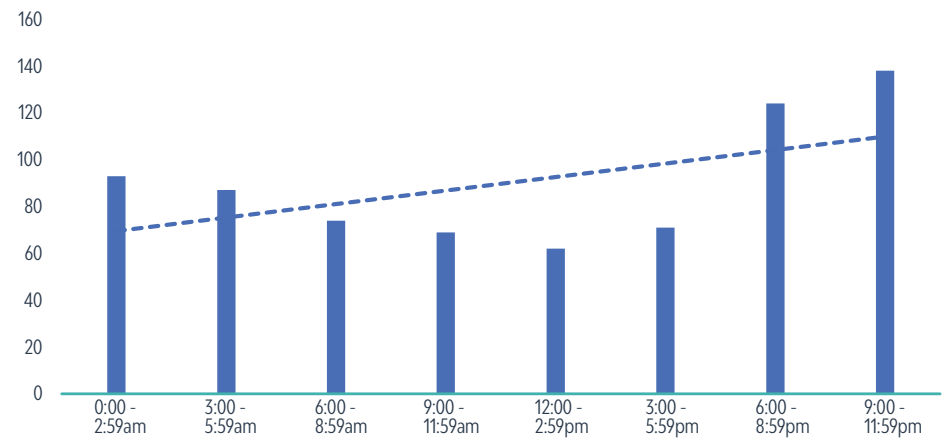


Figure 9: Los Angeles County
Serious Injury Collisions by Time of Day (2019)

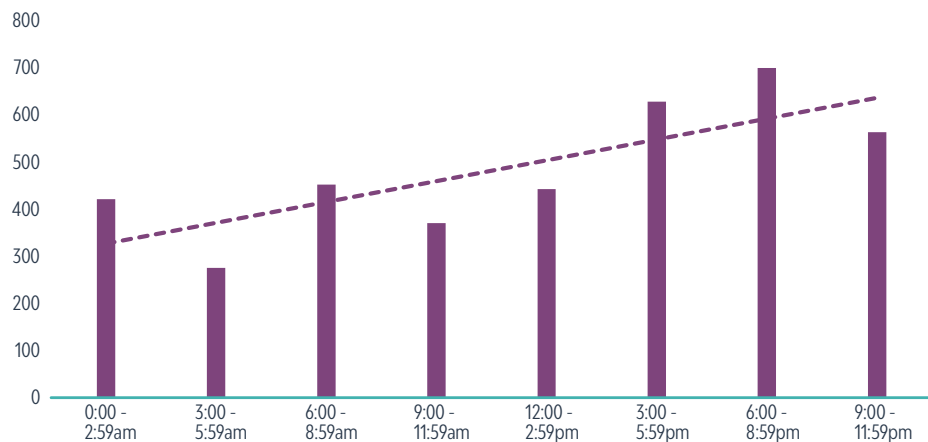


Figure 10: Los Angeles County
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

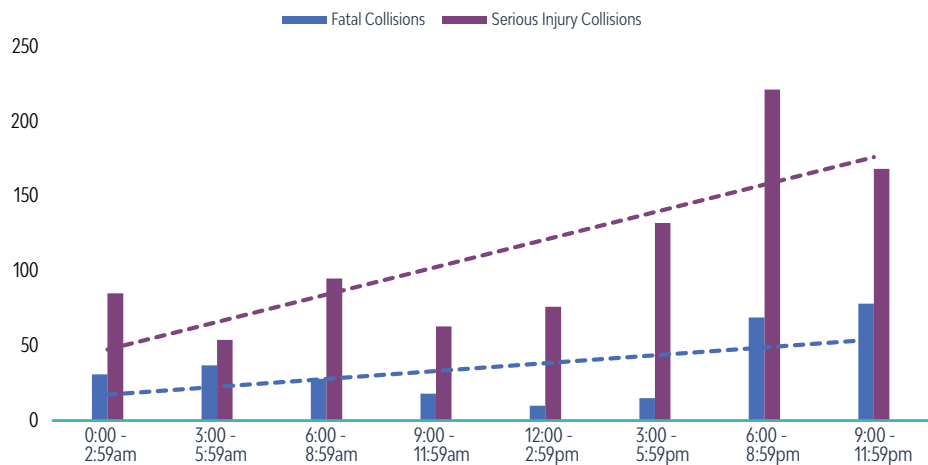


Figure 11: Los Angeles County
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

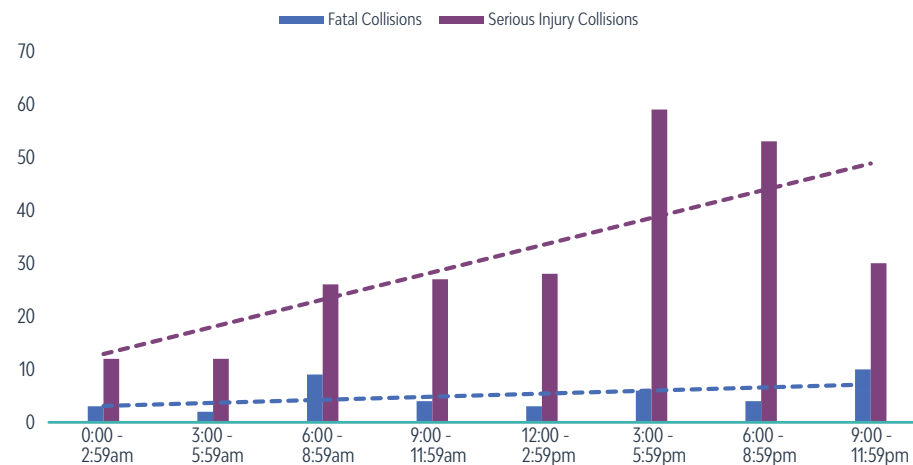


Figure 12: Los Angeles County
Fatal and Serious Injury Collisions by Day of Week (2019)

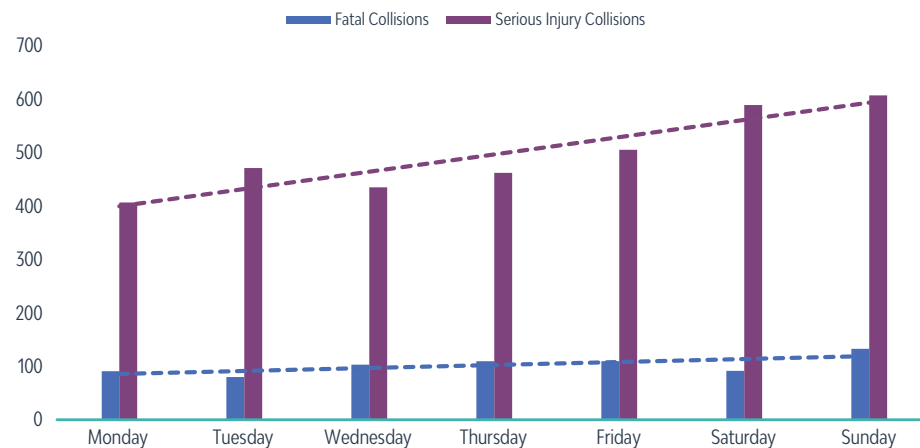


Figure 13: Los Angeles County
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

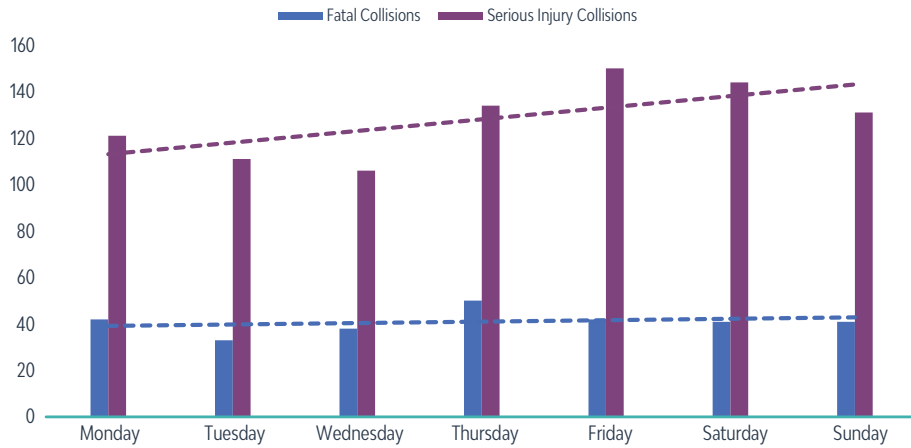


Figure 15: Los Angeles County
Fatal and Serious Injury Collisions by Month (2019)

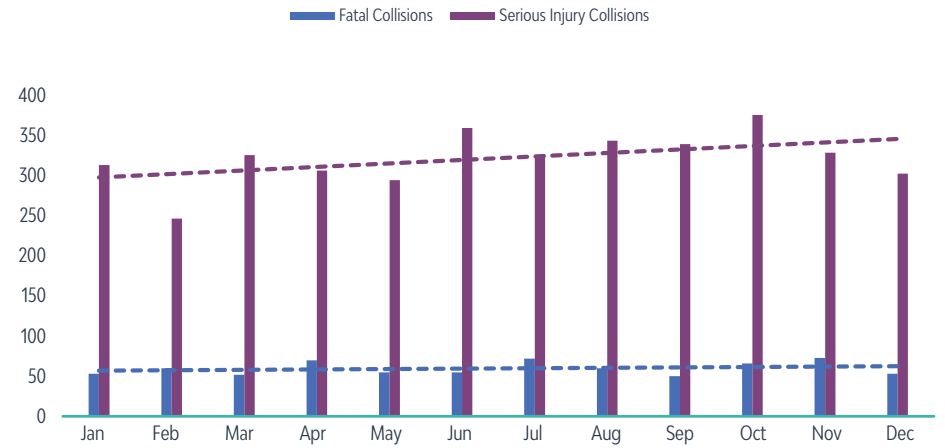


Figure 14: Los Angeles County
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

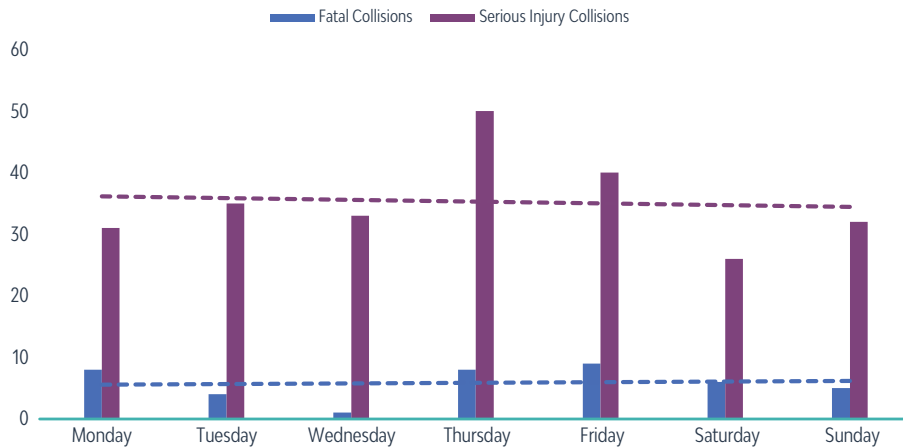


Figure 16: Los Angeles County
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

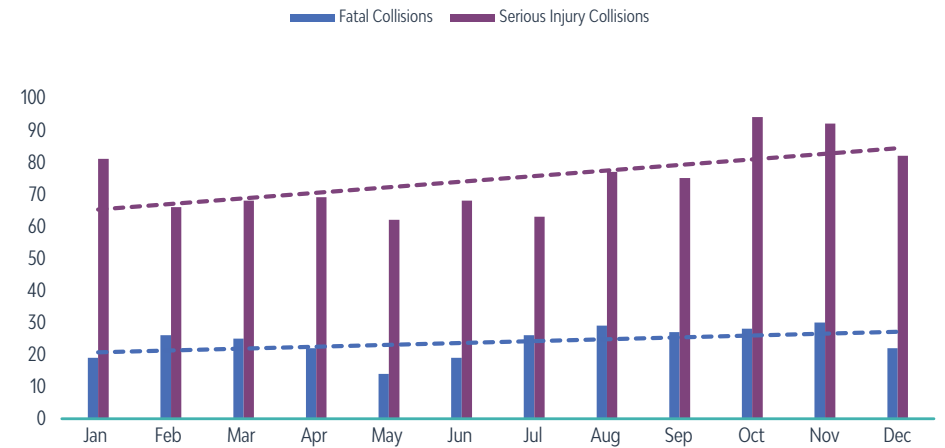


Figure 17: Los Angeles County
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

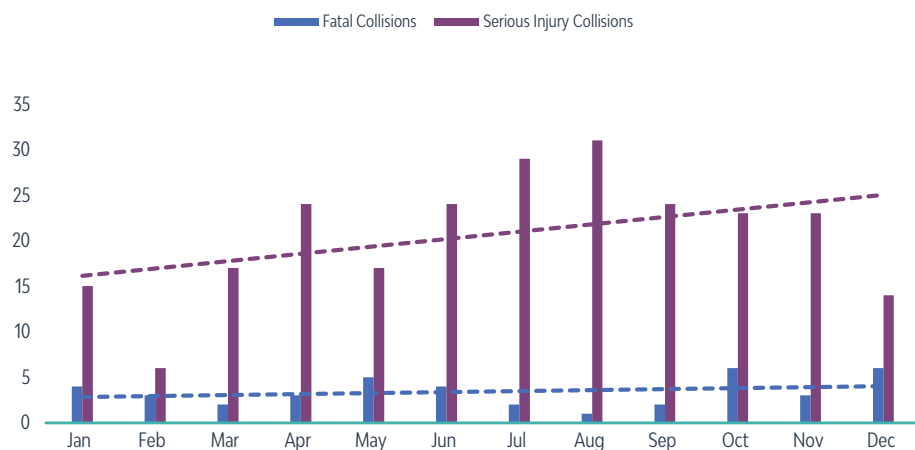


Figure 19: Los Angeles County
Serious Injury Victims by Age and Gender (2019)

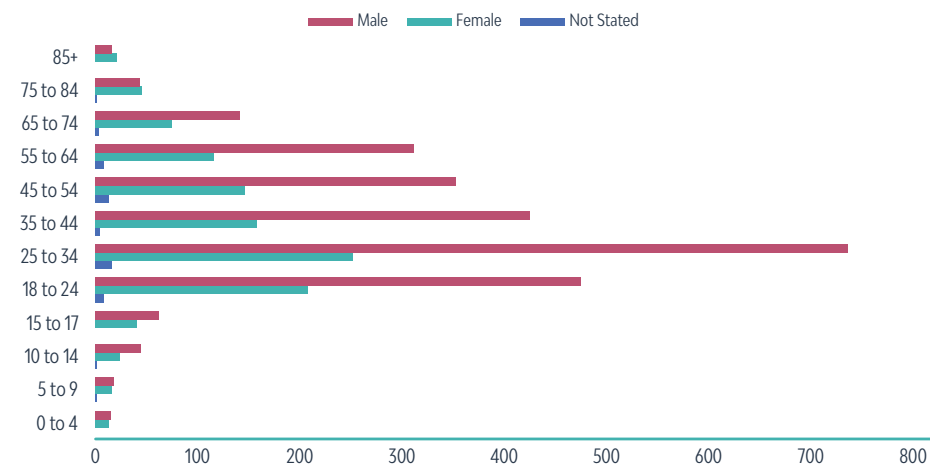


Figure 18: Los Angeles County
Fatal Victims by Age and Gender (2019)

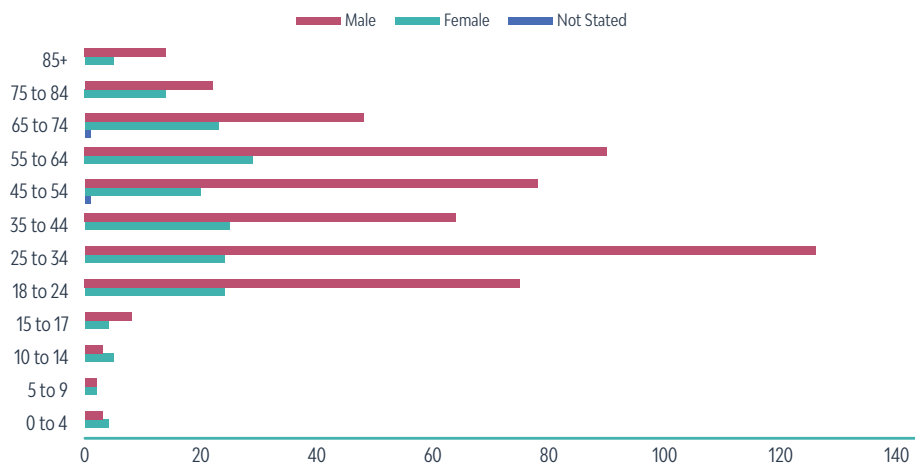


Figure 20: Los Angeles County
Fatal Victims by Involvement in Collision by Gender (2019)

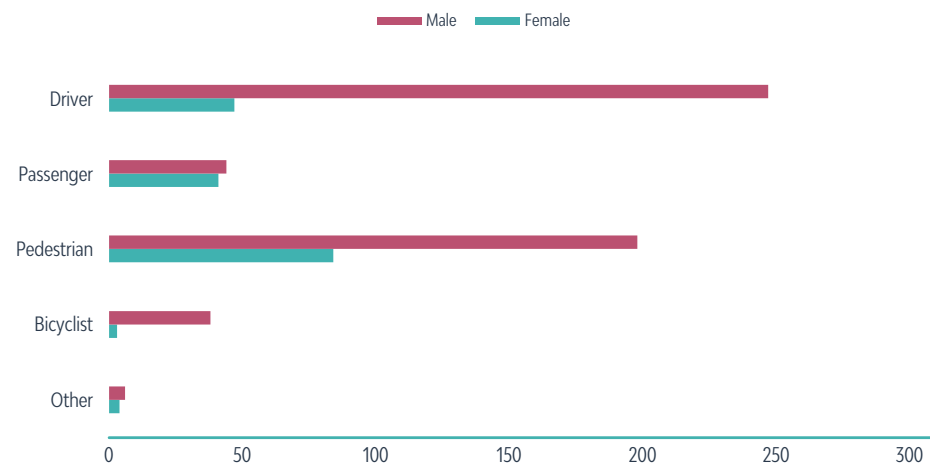
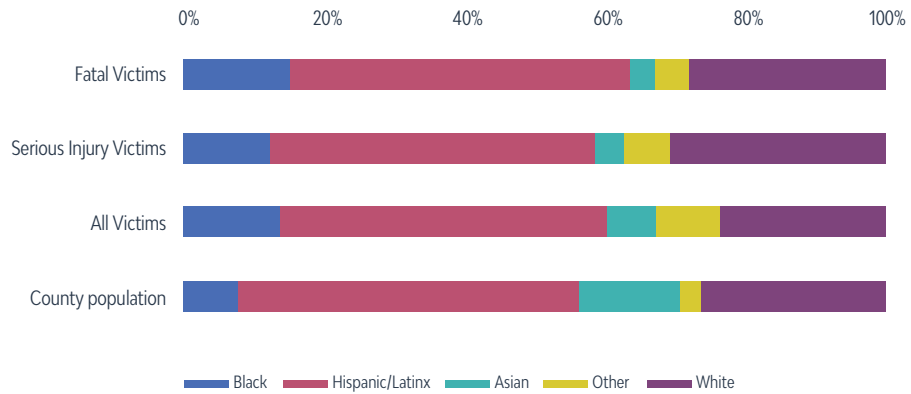
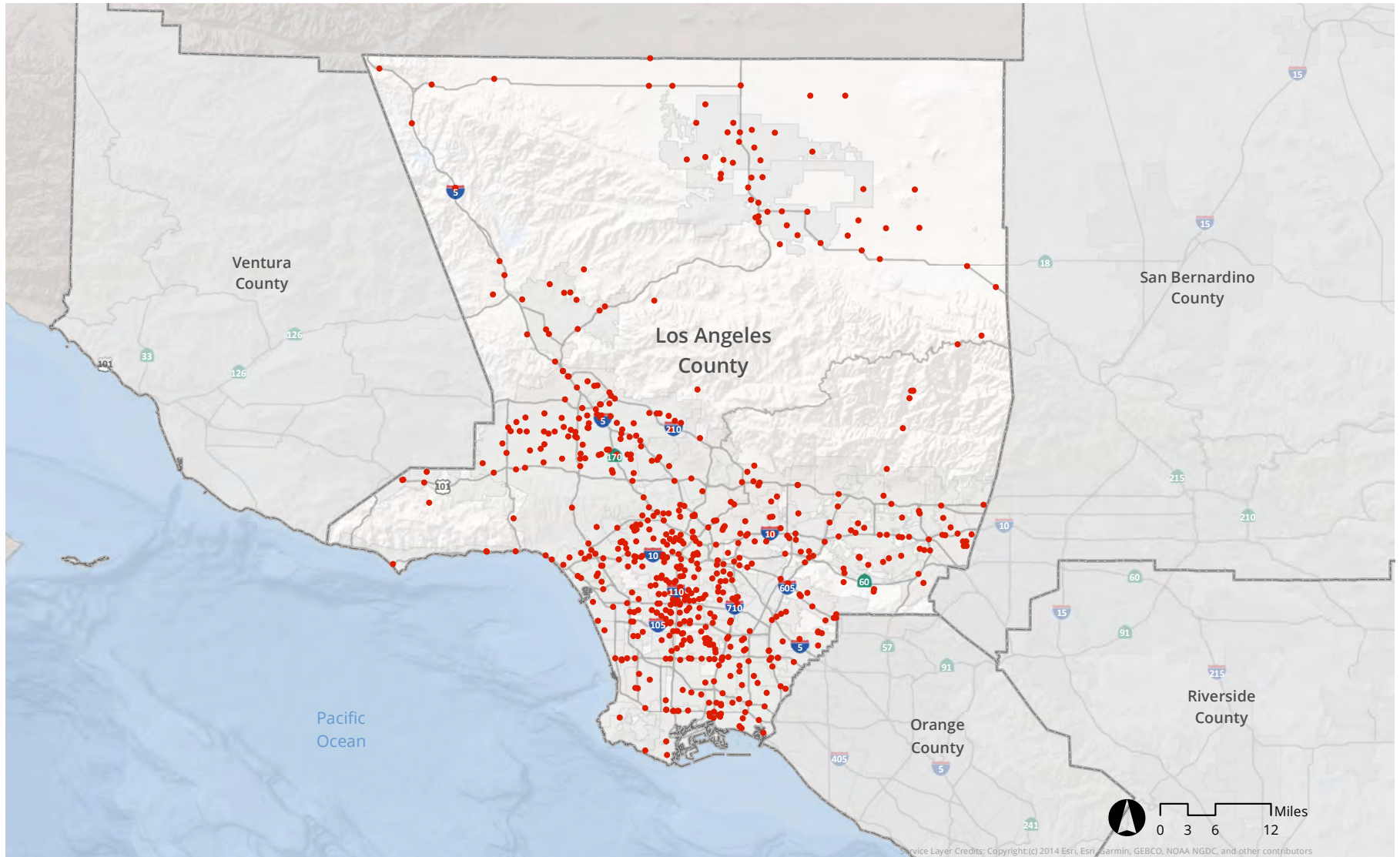


Figure 21: Los Angeles County
Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)

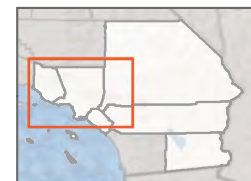


Map 1: Los Angeles County, 2019 Fatal Collisions

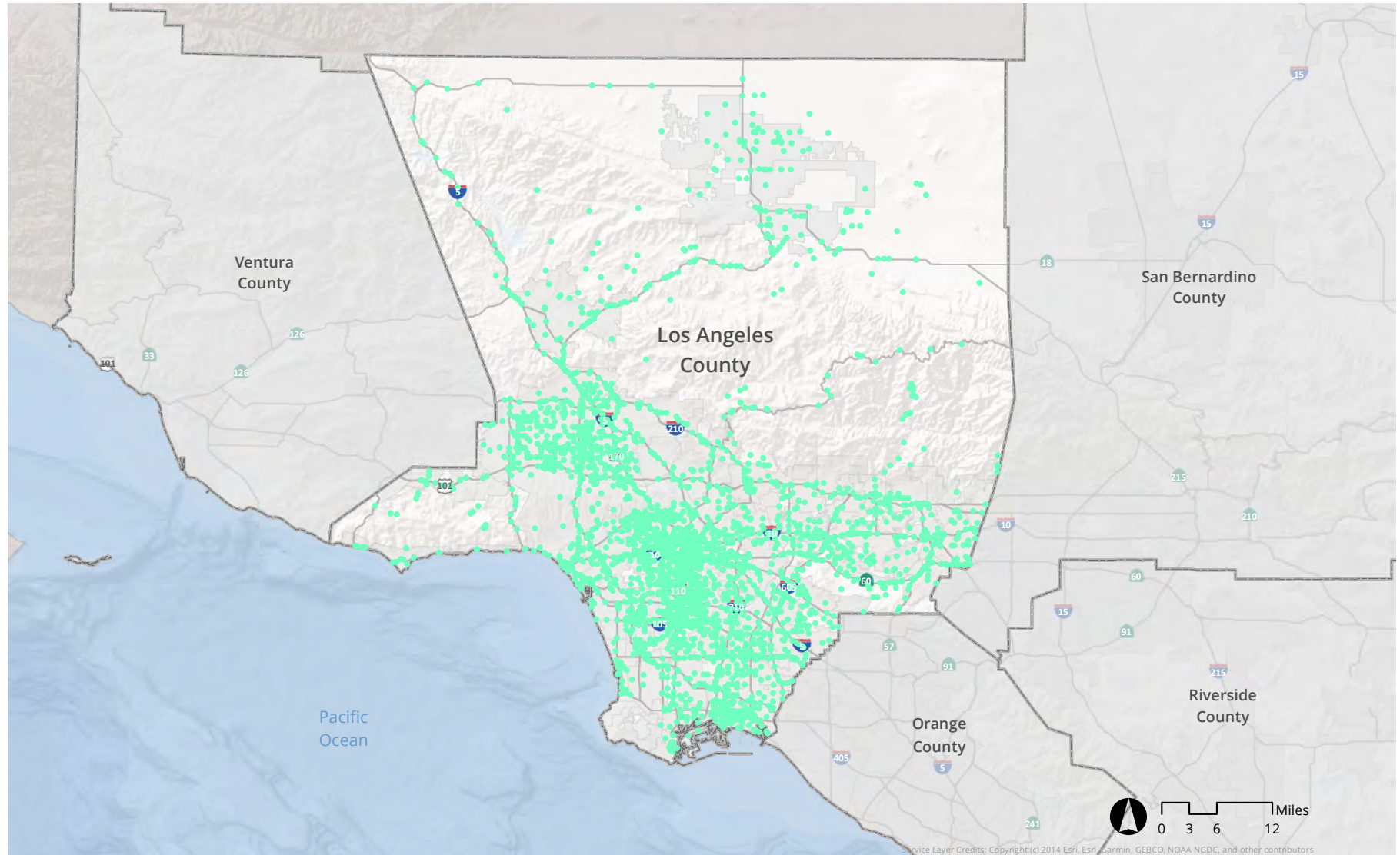






- County Boundaries
- City Boundaries
- Freeway
- Los Angeles County 2019 Fatal Collisions

Source: SCAG, SWITRS, TIMS

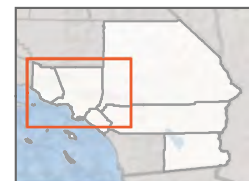


Map 2: Los Angeles County, 2019 Serious Injury Collisions

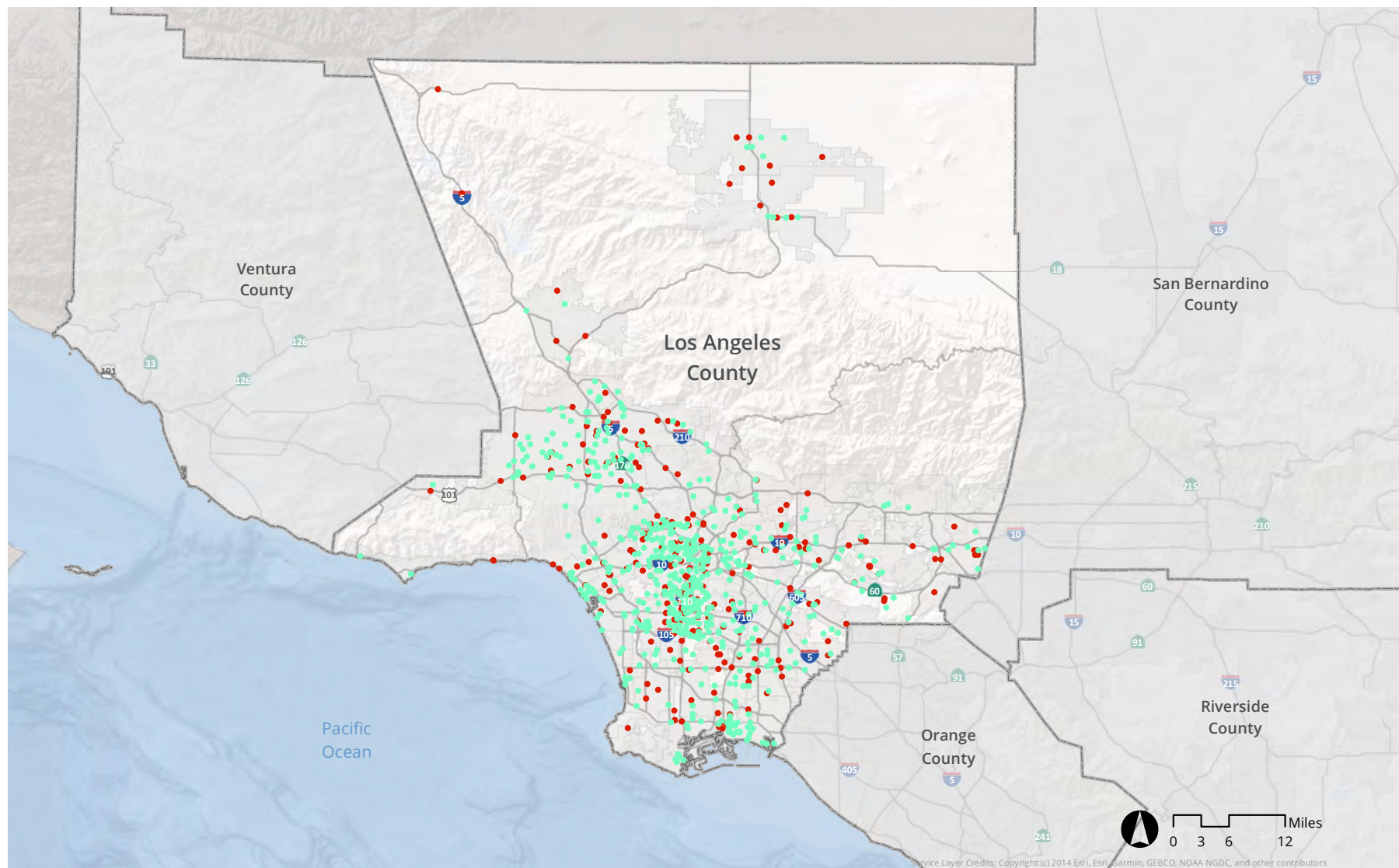


-  County Boundaries
-  City Boundaries
-  Freeway
-  Los Angeles County 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

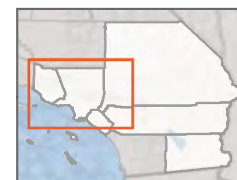


Map 3: Los Angeles County, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions

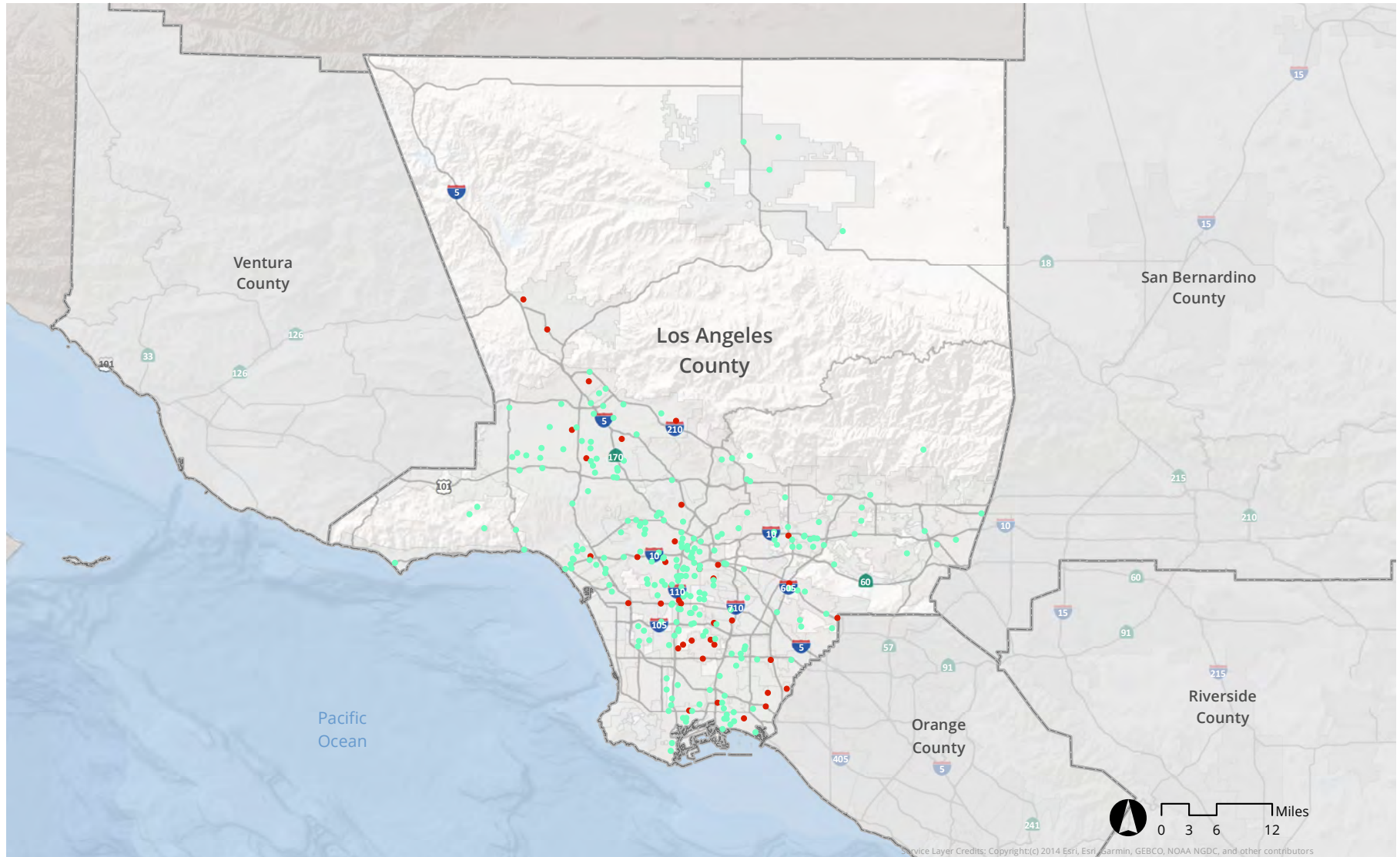


- County Boundaries
- City Boundaries
- Freeway
- Los Angeles County 2019 Pedestrian-Involved Fatal Collisions
- Los Angeles County 2019 Pedestrian-Involved Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

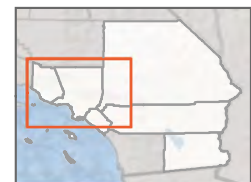


Map 4: Los Angeles County, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions

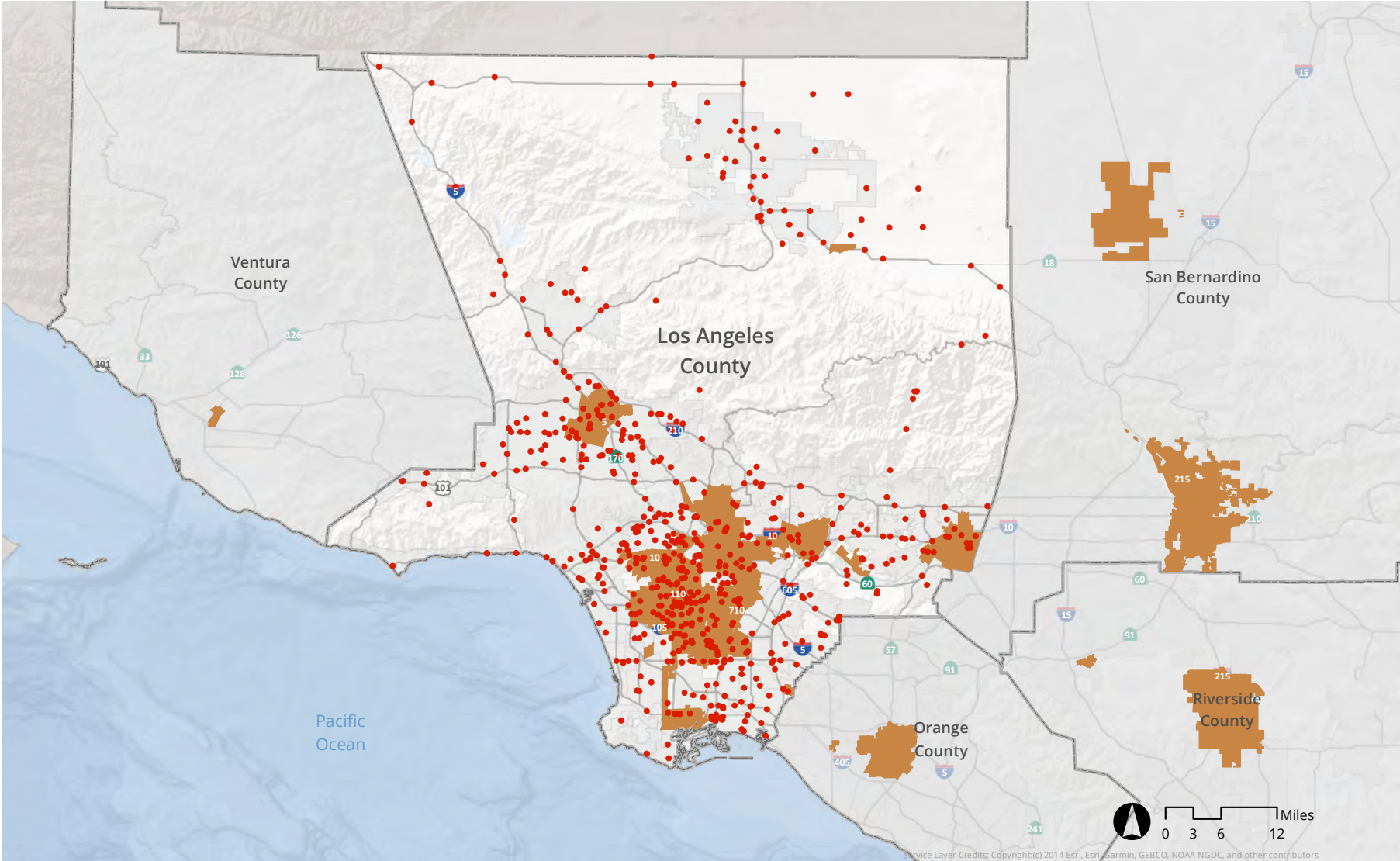


- County Boundaries
- City Boundaries
- Freeway
- Los Angeles County 2019 Bicyclist-Involved Fatal Collisions
- Los Angeles County 2019 Bicyclist-Involved Serious Injury Collisions

Source: SCAG, SWITRS, TIMS



Map 5: Los Angeles County, 2019 Fatal Collisions in Communities of Concern

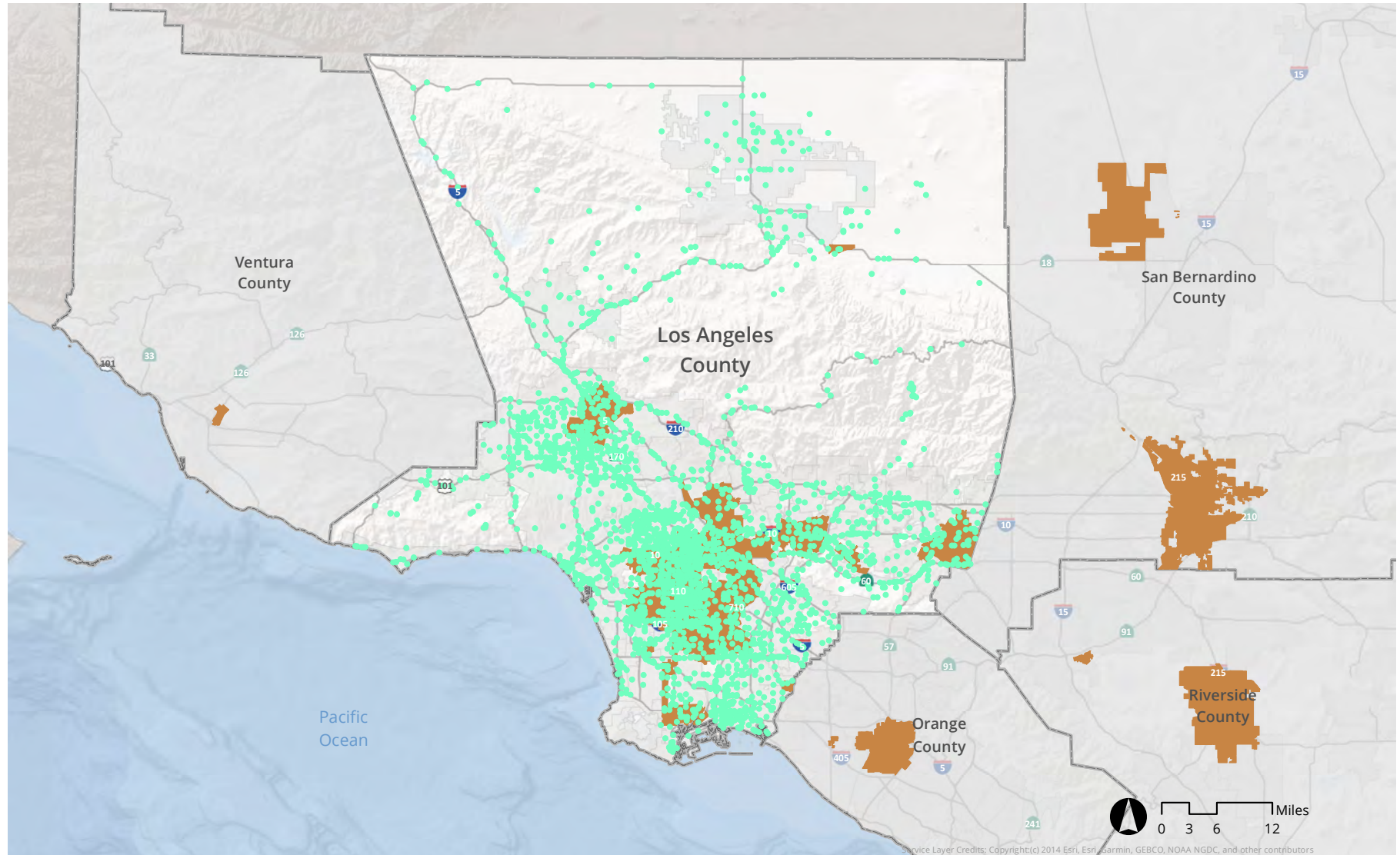


- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- Los Angeles County 2019 Fatal Collisions



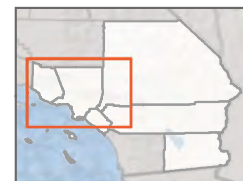
Source: SCAG, SWITRS, TIMS

Map 6: Los Angeles County, 2019 Serious Injury Collisions in Communities of Concern

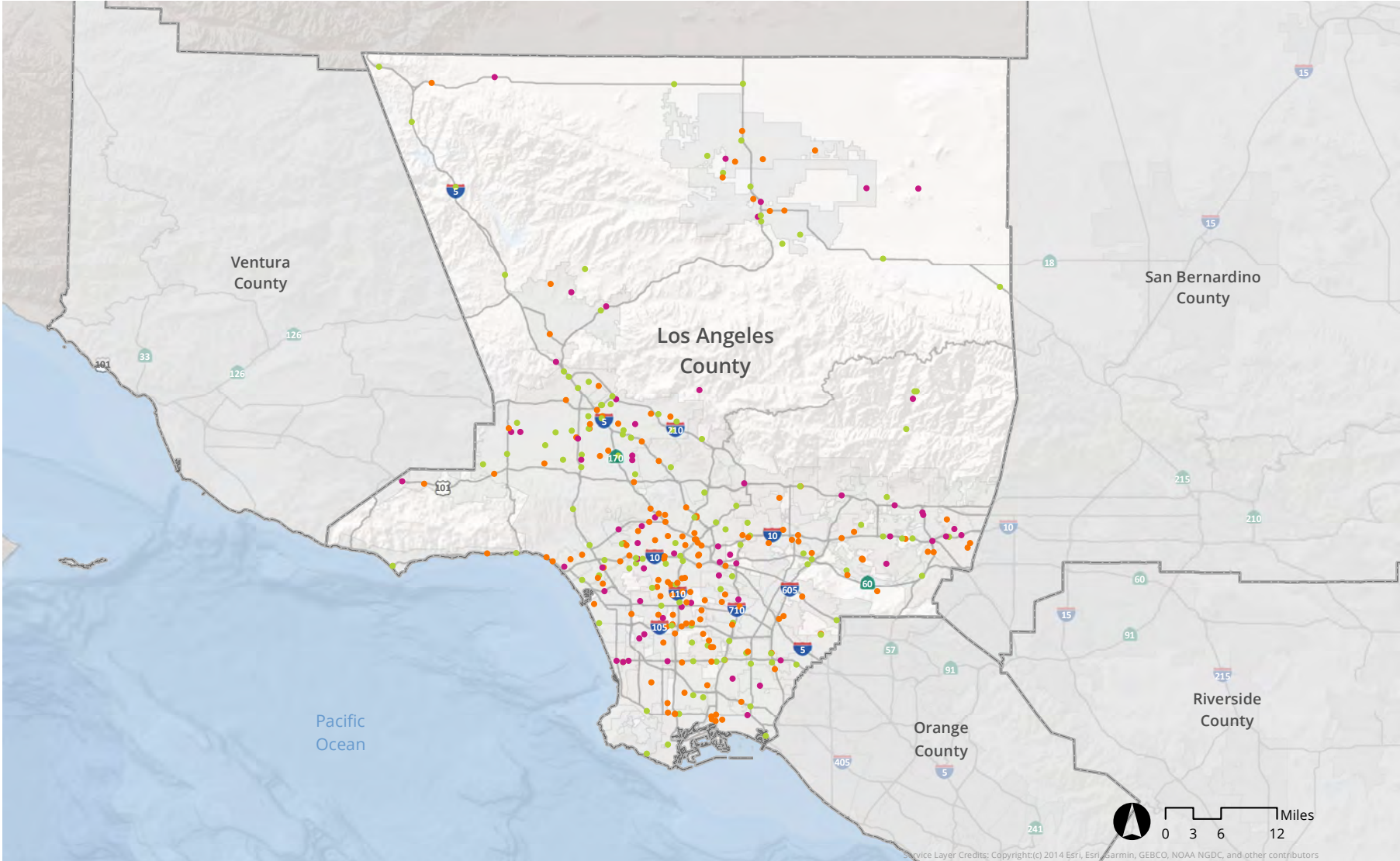


- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- Los Angeles County 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

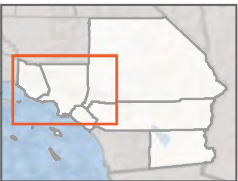


Map 7: Los Angeles County, 2019 Primary Collision Factors of Fatal Collisions

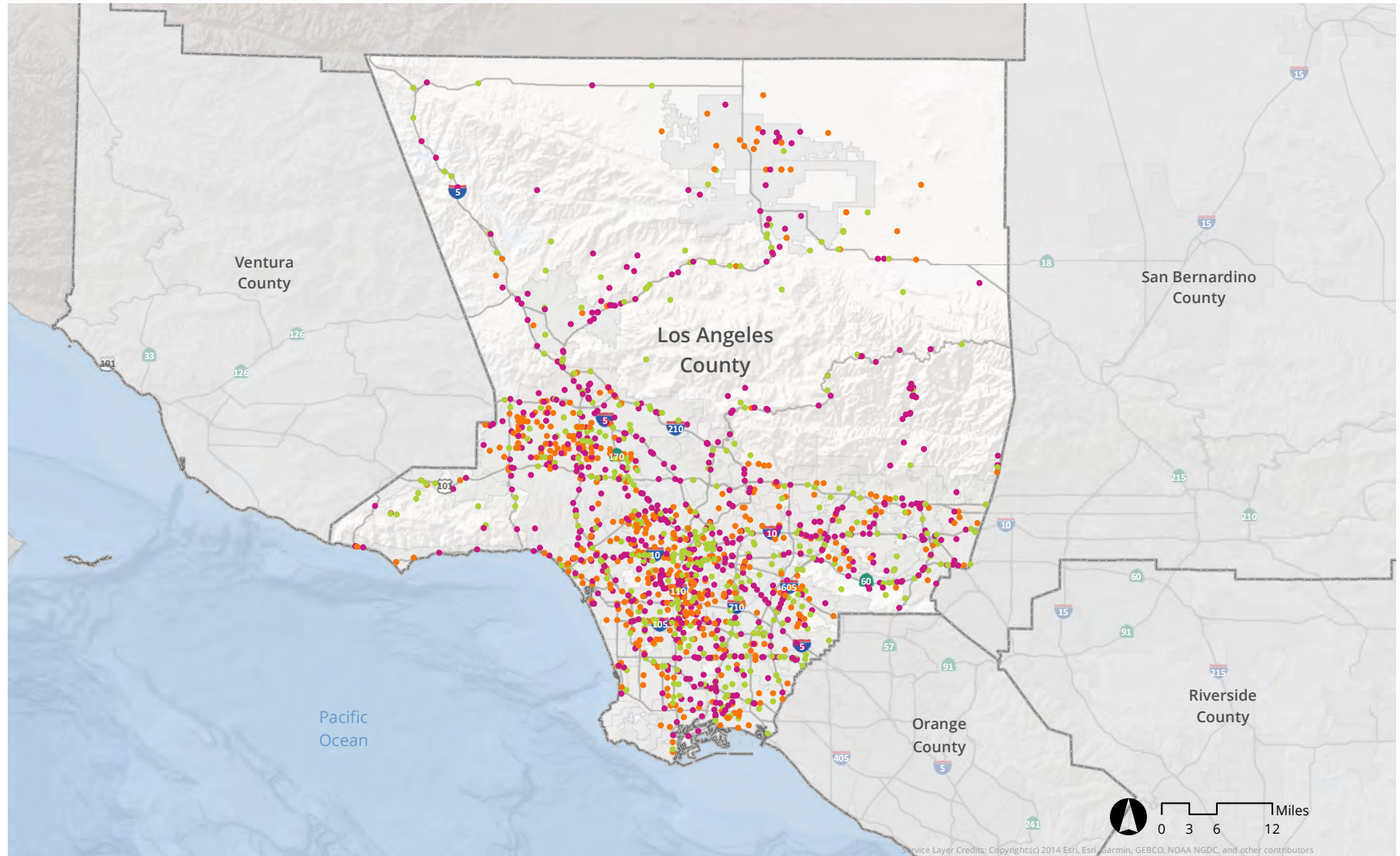


- County Boundaries
- City Boundaries
- Freeway
- Driving or Bicycling Under the Influence of Alcohol or Drug
- Unsafe Speed
- Pedestrian Violation

Source: SCAG, SWITRS, TIMS

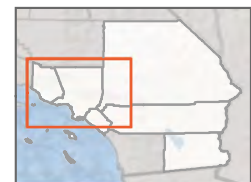


Map 8: Los Angeles County, 2019 Primary Collision Factors of Serious Injury Collisions

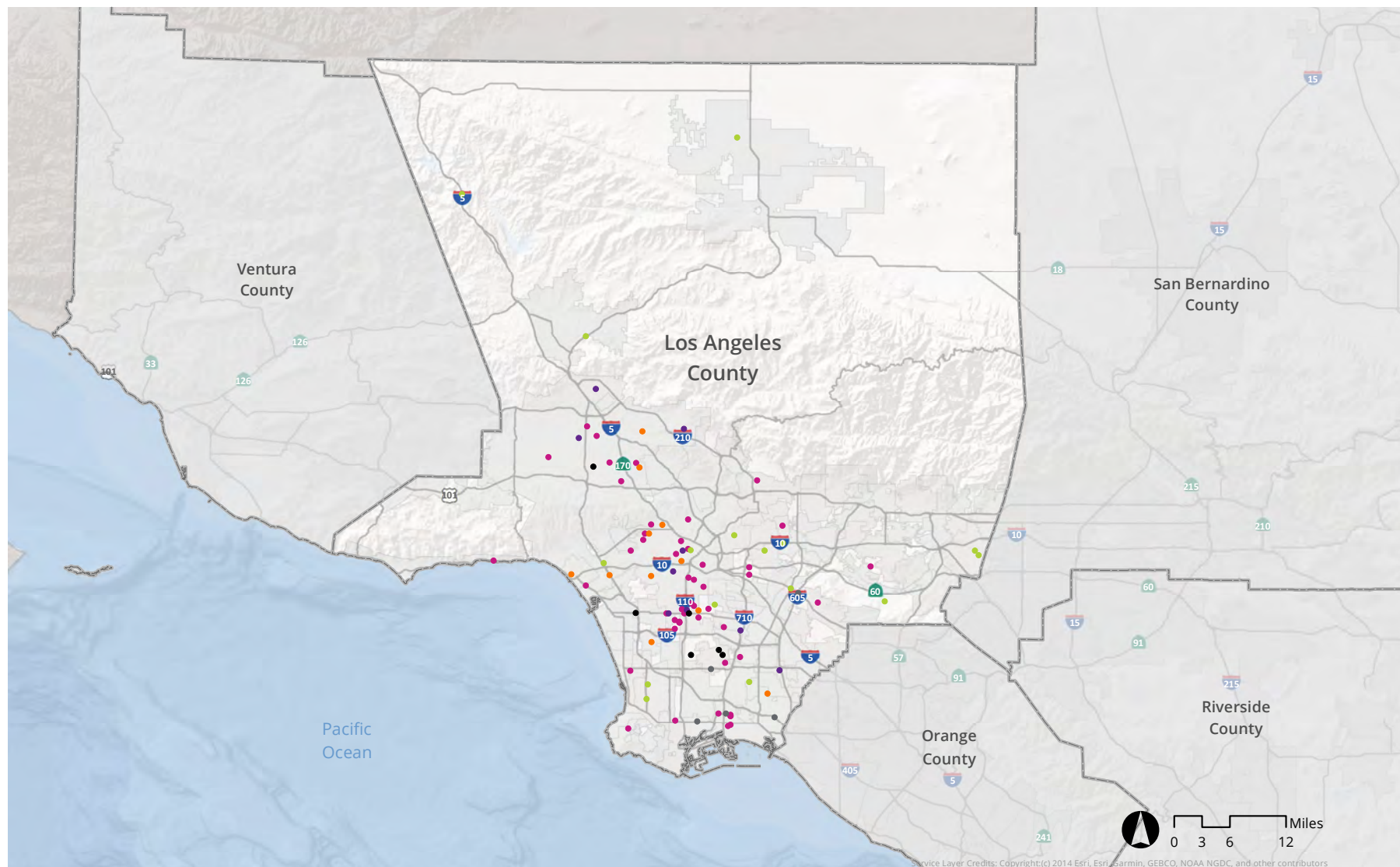


- County Boundaries
- City Boundaries
- Freeway
- Los Angeles County 2019 Primary Collision Factors of Serious Injury Collisions
- Unsafe Speed
- Improper Turning
- Automobile Right of Way

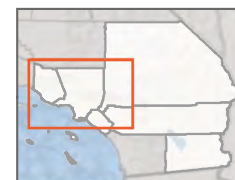
Source: SCAG, SWITRS, TIMS



Map 9: Los Angeles County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions

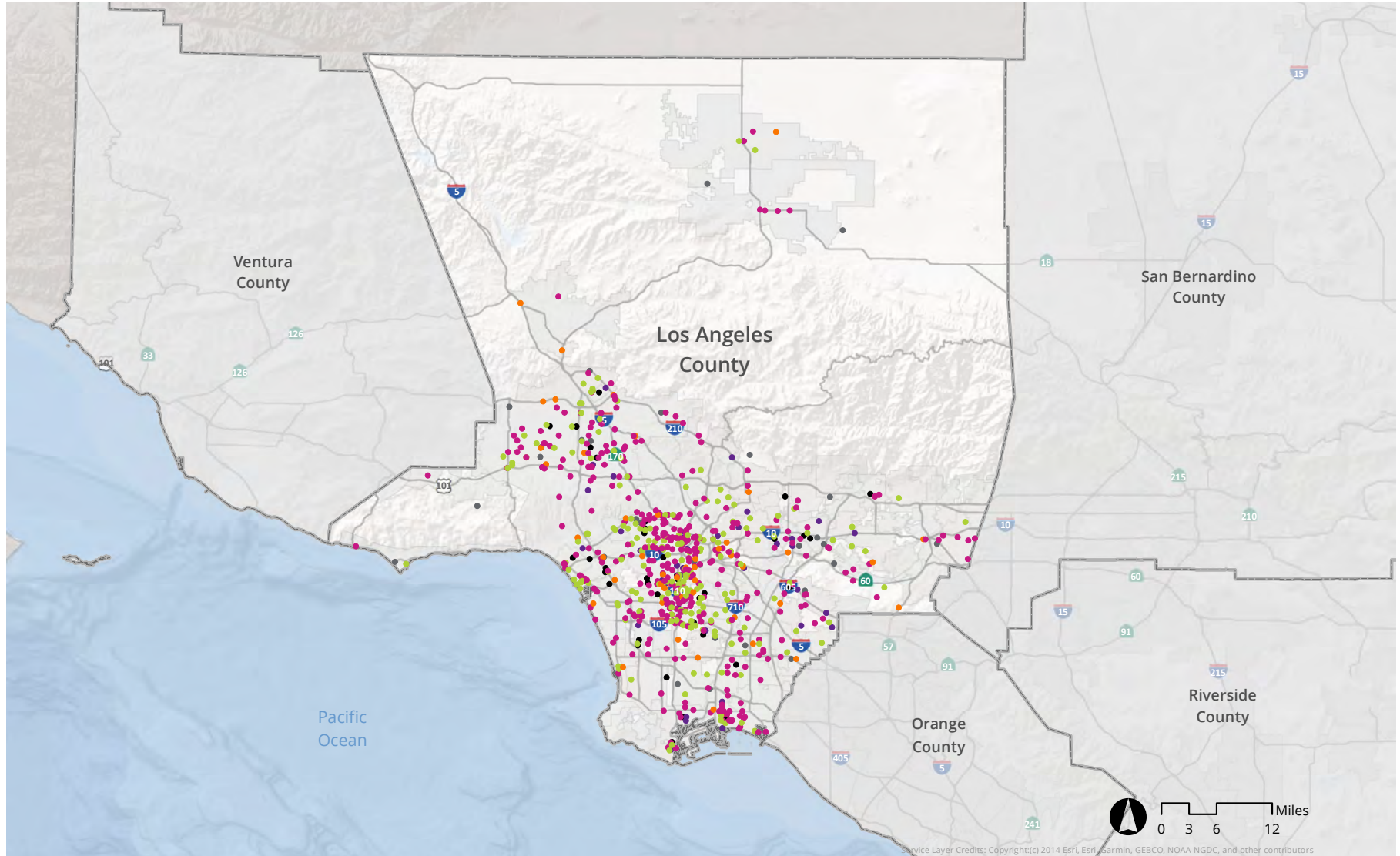


- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Fatal Collisions | Primary Collision Factors of Bicyclist-Involved Fatal Collisions |
| City Boundaries | Pedestrian Right of Way | Unsafe Speed |
| Freeway | Unknown | Automobile Right of Way |
| | Driving or Bicycling Under the Influence of Alcohol or Drug | Other Hazardous Violation |



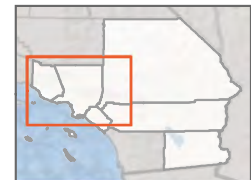
Source: SCAG, SWITRS, TIMS

Map 10: Los Angeles County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions |
| City Boundaries | Pedestrian Violation | Traffic Signals and Signs |
| Freeway | Pedestrian Right of Way | Automobile Right of Way |
| | Unsafe Speed | Improper Turning |

Source: SCAG, SWITRS, TIMS







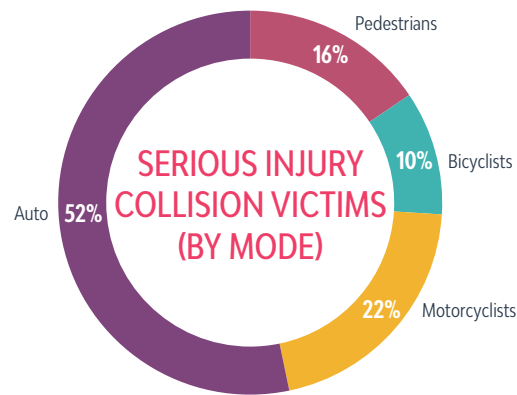
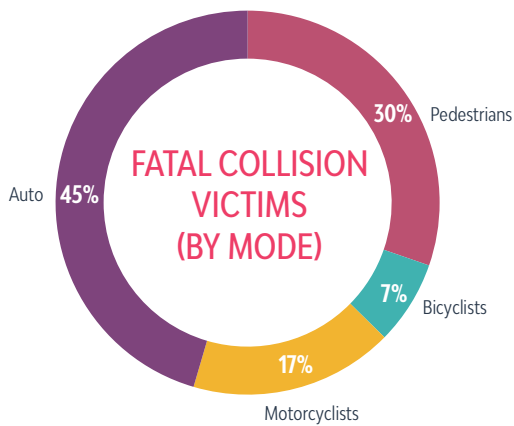
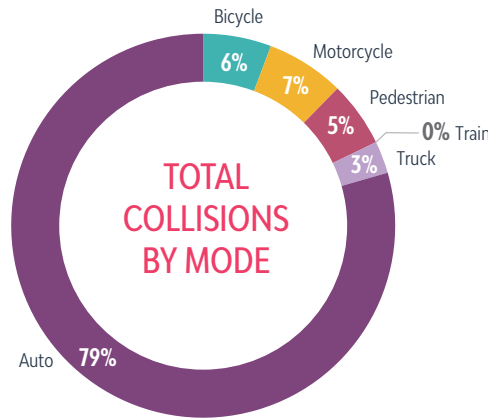
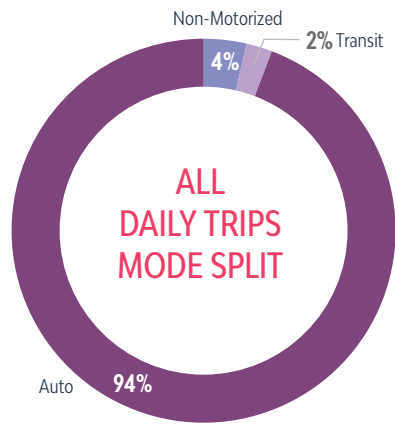
REGIONAL EXISTING CONDITIONS

Orange County

Orange County BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





REGIONAL EXISTING CONDITIONS

Orange County

Orange County borders the counties of Los Angeles (northwest), Riverside (east), San Bernardino (northeast), and San Diego (south). To the west, Orange County borders 42 miles of the Pacific Ocean. Orange County consists of 790 square miles and more than 3 million residents. Residents of Orange County on average drive an average of 8,650 miles each year.

WHAT ARE THE OVERALL TRENDS?

On average, nearly 170 people die in traffic collisions, 720 people are seriously injured, and more than 18,000 people are injured each year in Orange County ([Figures 1](#) and [2](#)). The total number of fatal victims increased in recent years from a low in 2010 (106) to their highest in 2017 (212), more than doubling the number of fatal victims over the past decade. Similarly, serious injury victims increased from 2009 to 2017 to their highest in more than a decade (847 serious injury victims in 2017). The number of people seriously injured from traffic-related collisions was at their lowest in 2020 (627), likely in part due to the COVID-19 pandemic. [Maps 1](#) and [2](#) reflect the locations of all collisions that resulted in a fatality or serious injury in Orange County in 2019.

About 62 percent of those killed were in vehicles or on motorcycles and 38 percent were walking or bicycling. Of the roughly 170 fatal collisions occurring annually, about 64, or well over a third, were active transportation collisions. The numbers of fatal active transportation victims have remained fairly constant over the years.

[Figure 3](#) reflects the total numbers of pedestrian fatal and serious injury victims from 2009 to 2020. The number of pedestrian fatal victims more than doubled over the past decade, from a low of 32 pedestrian fatal victims in 2010 to a peak of 68 fatal victims in 2018. Pedestrian serious injury victims, on the other hand, remained fairly stable from 2009 (117) to 2019 (119). Both the number of pedestrian fatal and serious injury victims dramatically declined in 2020 from their prior trends, likely a result of the COVID-19 pandemic. [Map 3](#) highlights the pedestrian-involved fatal or serious injury collisions that occurred in Orange County in 2019.

Bicyclist fatal and serious injury victims displayed similar trends to pedestrian victims in Orange County, as observed in [Figure 4](#). Bicyclist fatal victims slowly trended upward from 2009 to 2020, peaking at 17 bicyclist fatal victims in 2014,

2015, and 2020 respectively, while bicyclist fatal victims were at their lowest in the past decade in 2010 (three). On the other hand, bicyclist serious injury victims slowly declined in recent years, with a low of 57 bicyclist serious injury victims in 2020. **Map 4** highlights all of the bicyclist-involved collisions resulting in a fatality or serious injury that occurred in Orange County in 2019.

Figure 5 shows the historical rates of fatal and serious injury victims per 1,000 people over the last decade from 2010 to 2020. Both of the rates of fatal and serious injury victims followed relatively similar trends as **Figures 1 and 2**, despite normalizing by population, suggesting that population change did not impact these numbers. Similarly, normalizing by vehicle miles traveled (VMT) reveals similar trends to non-normalized numbers, where total fatal and serious injury victims trended upward (**Figures 6 and 7**).

However, when VMT per capita is considered, trends remained relatively consistent. Considering VMT was generally increasing from 2009 to a high of approximately 75 million daily VMT in 2017, these differences in the VMT per capita suggest that changes in the population have made a difference to the amount of VMT generated. There may be a variety of reasons that lead to shifts or changes in any of the indicators (i.e., fatalities, serious injuries, VMT, or population) not restricted to and including transportation technology changes, changing demographics, saturated highways, and/or preferences for living in more compact neighborhoods that reduce the need for driving. Overall, VMT per capita has remained relatively stable, at an average of about 8,650 VMT per capita.

WHERE ARE COLLISIONS OCCURRING?

In Orange County, nearly all collisions (over 99 percent) occurred in urbanized areas. Similarly, nearly all residents live in urbanized areas (over 99 percent). Out of all the fatal and serious injury collisions, 85 percent occurred in urbanized areas. **Maps 1-4** display fatal and serious injury collisions (by mode), highlighting

their concentrations in the urbanized areas of Orange County in 2019.

Orange County includes an extensive roadway network consisting of 188 highway centerline miles, 1,395 arterial centerline miles, 382 collector centerline miles, and 4,455 local road centerline miles. In total, local roads account for 70 percent of all mileage of roadways within Orange County. Orange County is also home to about 267 miles of Class I bikeways, 775 miles of Class II bikeways, and 105 miles of Class III bikeways.

In 2019, 64 percent of fatal collisions across all modes occurred on local roads, while 16 percent occurred on arterials, and 20 percent on highways. Of total serious injury collisions, 59 percent occurred on local roads, while 10 percent occurred on arterials and 31 percent on highways.

In the same year, 77 percent of pedestrian-involved fatal collisions occurred on local roads, 15 percent occurred on arterials, and 8 percent on highways. Seventy-nine percent of bicyclist-involved fatal collisions occurred on local roads, 21 percent occurred on arterials, and none on highways. For pedestrian-involved serious injury collisions, 81 percent occurred on local roads (with 9 percent on arterials and 10 percent on highways), while 85 percent of bicyclist-involved collisions occurred on local roads (with 14 percent on arterials and 1 percent on highways).

WHEN ARE COLLISIONS OCCURRING?

In Orange County, across all modes, more people were killed and seriously injured in traffic collisions during the evening than any other time of day. In 2019, the largest number of fatal collisions occurred in the later evening during periods of reduced visibility, between 9:00 – 11:59pm (38 fatal collisions), than any other time period, followed by 6:00 – 8:59pm (28 fatal collisions) as highlighted in **Figure 8**. Serious injury collisions were highest during the evening commute from 3:00 – 5:59pm (152 serious injury collisions) than any other time period, followed

by the later evening hours (Figure 9).

When examining trends by time of day for pedestrian-involved collisions, the majority of pedestrian fatal collisions occurred during the evening (Figure 10). In 2019, there were 35 pedestrian-involved fatal collisions from 6:00 – 11:59pm, likely in part due to reduced visibility, while there was just one pedestrian-involved fatal collision during the morning from 6:00 – 11:59am. Figure 11 reveals that there was not a distinctive pattern in 2019 for the time of day of bicyclist-involved fatal collision, although they did peak during the morning commute from 6:00 – 8:59am (four bicyclist-involved fatal collisions) as compared to other time periods. Bicyclist-involved serious injury collisions generally increased throughout the day and were highest during mid-day. Although bicyclist-involved fatal collisions were lowest in the late morning between 9:00 – 11:59am (zero), bicyclist-involved serious injury collisions peaked during this same time period (19).

By day of week, fatal collisions across all modes peaked on Sundays (36), while they were lowest on Thursdays (12) in 2019. Serious injury collisions remained relatively consistent throughout the week except for a peak of 149 serious injury collisions on Saturday (Figure 12). As highlighted in Figure 13, there were significantly more pedestrian-involved fatal collisions on Friday and Saturday (11 pedestrian-involved fatal collisions each) than any other days of the week. Just two pedestrian-involved fatal collisions occurred on Thursdays in 2019. On the other hand, bicyclist-involved fatal collisions peaked on Monday (four fatal collisions) in 2019, and slowly declined over the rest of the week. The greatest number of bicyclist-involved serious injury collisions occurred on Saturday (19) as illustrated in Figure 14. Although bicyclist fatal collisions peaked on Monday, the least number of bicyclist-involved serious injury collisions occurred on Mondays (six) as compared to other days of the week.

Across all modes, on average, there were about 14 fatal collisions and 64 serious injury collisions per month in Orange County in 2019 (Figure 15). Fatal

collisions peaked in June (20), followed closely by winter months in November and January (19 fatal collisions each). Figure 16 displays the fatality and serious injury trends for pedestrian-involved collisions by month. Pedestrian-involved fatal collisions also peaked in November (seven fatal collisions), which could be in part a result of Daylight Savings Time which has been found to heighten collision rates. The summer months, June and July, experienced similarly high numbers of pedestrian-involved fatal collisions at six fatal collisions each. There was no distinctive pattern for bicyclist-involved fatal collisions by month as illustrated in Figure 17, in part due to the small dataset. The greatest number of bicyclist-involved fatal collisions occurred in December (three), while bicyclist-involved serious injury collisions dramatically peaked in July at 15.

WHO IS BEING HURT?

In Orange County, out of all the fatal collision victims from 2009 to 2020, pedestrians and bicyclists accounted for about 38 percent of all fatal collision victims, disproportionately higher than the less than 3 percent of daily trips that were made via walking or biking.

Three times more men were killed or sustained serious injuries during a traffic collision than women in 2019. Across all modes, 75 percent of fatal and serious injury victims were men: in total, 175 men were killed in fatal collisions and nearly 550 men sustained serious injuries. This is compared to 59 women killed in fatal collisions and 218 women sustaining serious injuries in the same year.

As observed in Figure 18, when stratified by age group, the largest number of fatalities occurred in those ages 55-64 and 25-34, in total representing 21 percent and 19 percent of all fatal victims in Orange County, a consistent pattern across genders. Similarly, those ages 25-34 sustained more serious injuries than any other age group – 130 males, 35 females, and 33 people with no gender specified sustained serious injuries in 2019. (Figure 19).

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), additional patterns emerge. Drivers experienced the largest number of fatalities (79), followed by pedestrians (54), passengers (31), and bicyclists (15). Five times as many drivers who were killed during a collision were male drivers (66) than female (13) as illustrated in **Figure 20**. Of all men killed in traffic collisions in 2019, 50 percent were male drivers, followed by 28 percent who were male pedestrians. Of the women killed in traffic collisions, the same number of women died as a passenger or pedestrian, each making up about 36 percent of all female fatal victims, or 17 each.

Overall, male drivers constituted 37 percent of all fatal victims across gender, age, and victim status. Dissecting these factors further, male drivers between the ages of 25-34 experienced the highest number of fatalities (20) in 2019, twice as many fatalities as the next highest group - male drivers between the ages of 55-64 (10 fatal victims).

When broken down by race, it is evident that some people of color were disproportionately represented in fatal and serious injury victims (**Figure 21**). Black individuals were overrepresented in fatal and serious injury victims as compared to their proportion of the County's population. While they make up just under 2 percent of the County's population, Black individuals constituted about 3 percent of all fatal and 4 percent of serious injury victims. Individuals categorized as Other race/ethnicity (here including American Indian, Alaska Native, Native Hawaiian, Pacific Islander, and those identifying as mixed race) constituted slightly more than 4 percent of the County's population, but represented nearly 6 percent of fatal and 5 percent of serious injury victims. Interestingly, white individuals were also overrepresented in both fatal and serious injury victims, as they represent nearly 41 percent of the County's population, but constituted 50 percent of fatal and nearly 49 percent of all serious injury victims.

Maps 5 and **6** highlight the concentration of fatal and serious injury collisions

that occurred in Communities of Concern in 2019.

WHY ARE COLLISIONS OCCURRING?

Maps 7-10 reflect the top three contributing factors of 2019 for all fatal and serious collisions, and bicycle- and pedestrian-involved fatal and serious collisions.

The top three contributing factors for fatal collisions in Orange County were Driving or Bicycling Under the Influence of Alcohol or Drugs (28 percent), Pedestrian Violations (19 percent), and Unsafe Speed (11 percent). For serious injury collisions, the top three contributing factors were Driving or Bicycling Under the Influence of Alcohol or Drugs (21 percent), Unsafe Speed (20 percent), and Improper Turning (13 percent).

For pedestrian-involved fatal collisions, the top contributing factors included Pedestrian Violations (64 percent), and Pedestrian Right of Way (10 percent). In general, Pedestrian Violations were considered the most significant contributor to pedestrian-involved fatal collisions across the region in 2019. The third contributing factor was Unknown at 8 percent.

For bicyclist-involved fatal collisions, Improper Turning and Wrong Side of Road were tied for the top contributing factors at 25 percent each, followed by an Unknown Factor at 17 percent.

Figure 1: Orange County
Total Number of Fatal Victims (2009 - 2020)

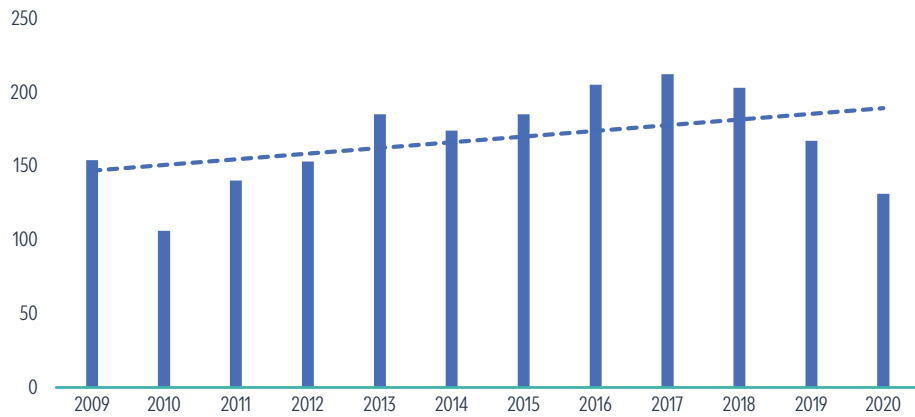


Figure 2: Orange County
Total Number of Serious Injury Victims (2009 - 2020)

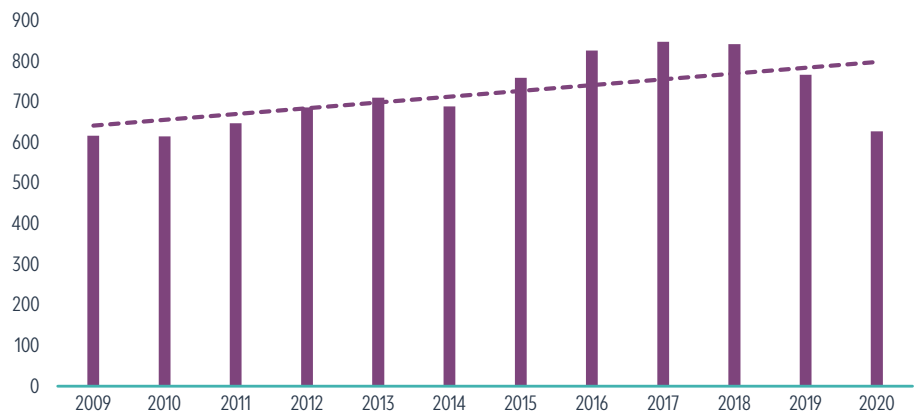


Figure 3: Orange County
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

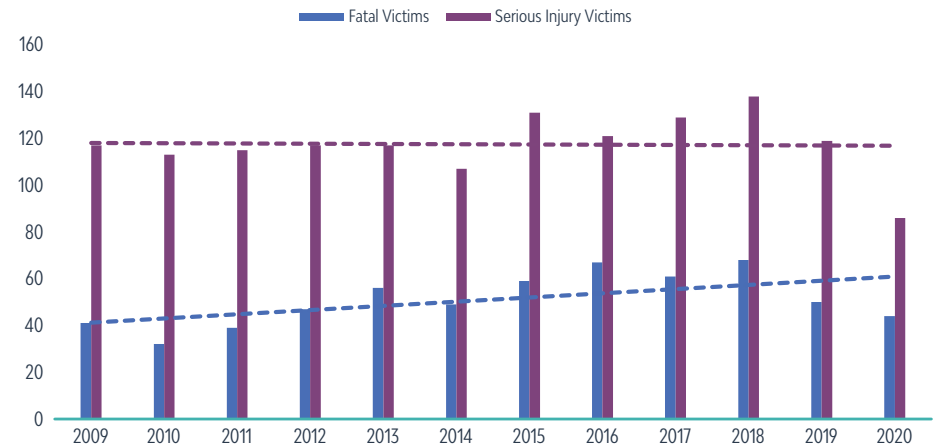


Figure 4: Orange County
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)

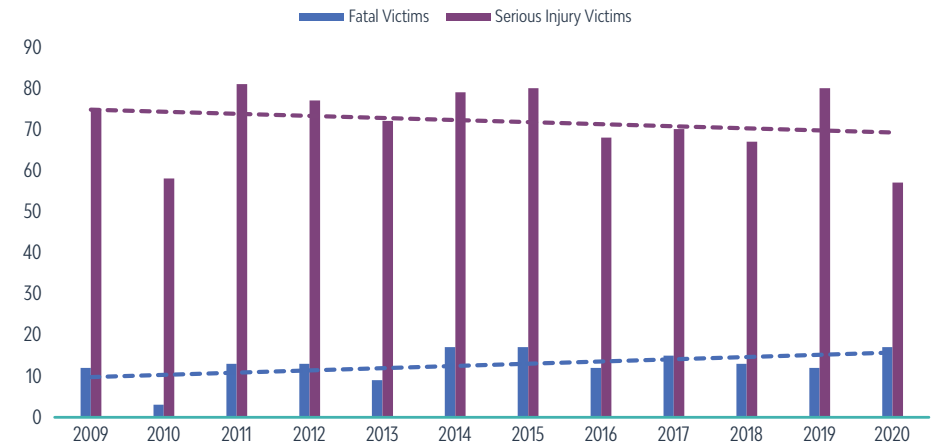


Figure 5: Orange County
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

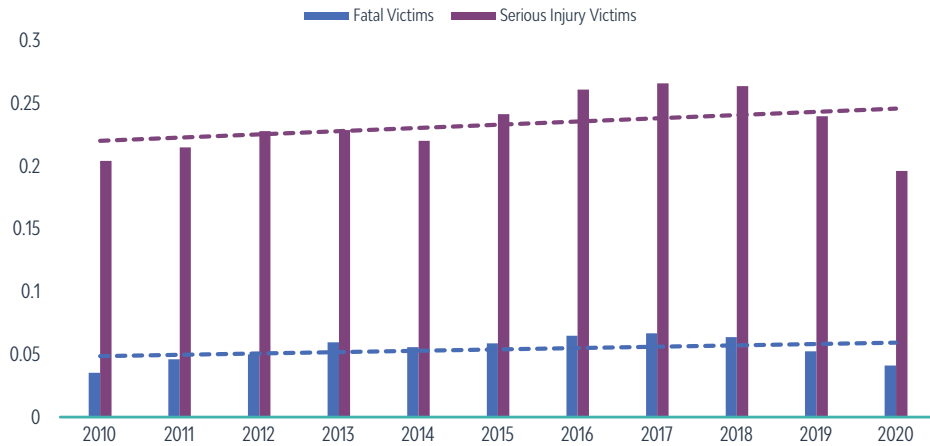


Figure 7: Orange County
Total Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

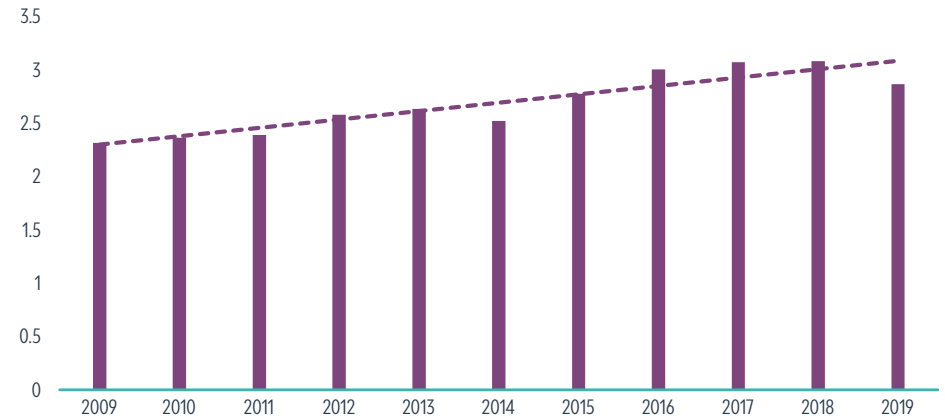


Figure 6: Orange County
Total Fatal Victims, Normalized by 100M VMT (2009 - 2019)

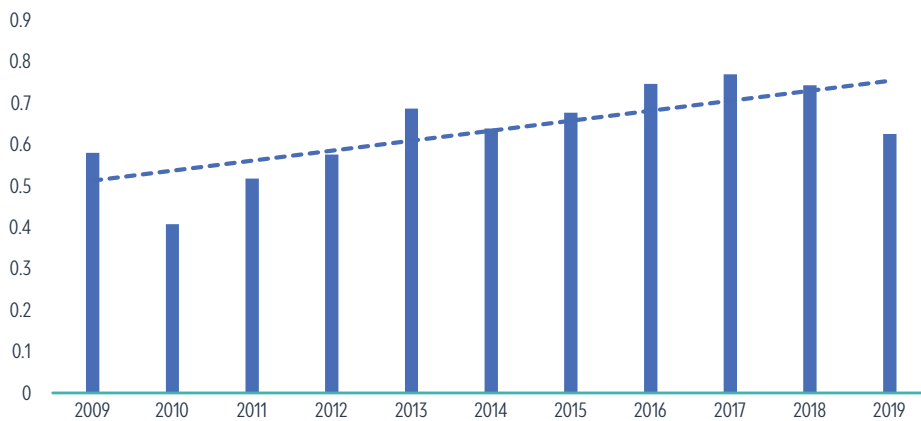


Figure 8: Orange County
Fatal Collisions by Time of Day (2019)

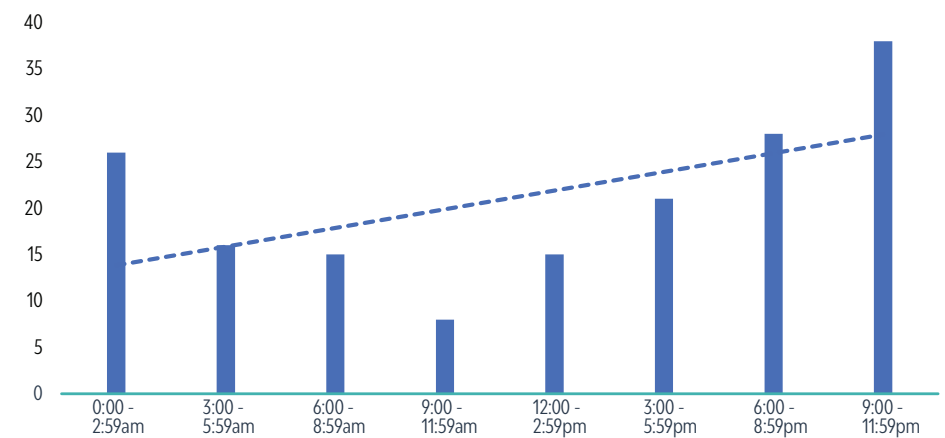


Figure 9: Orange County
Serious Injury Collisions by Time of Day (2019)

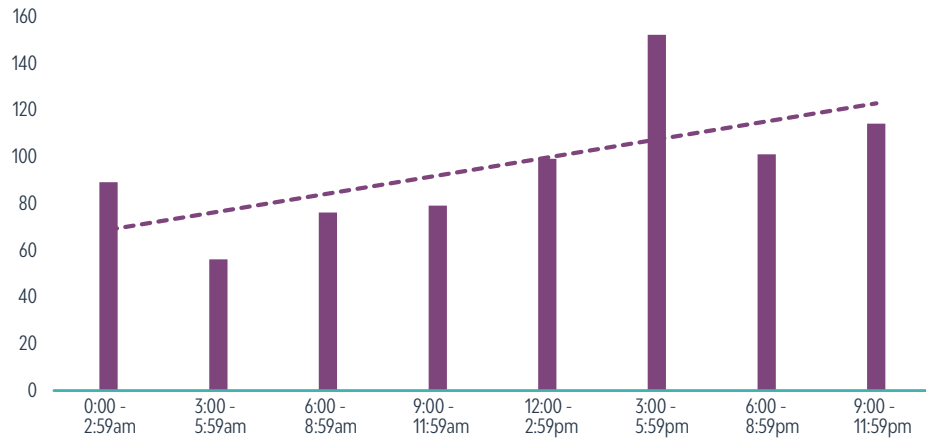


Figure 10: Orange County
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

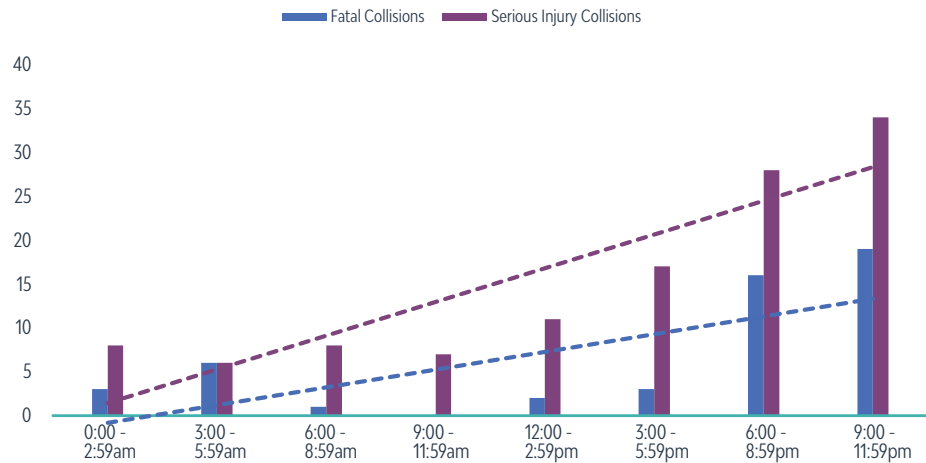


Figure 11: Orange County
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

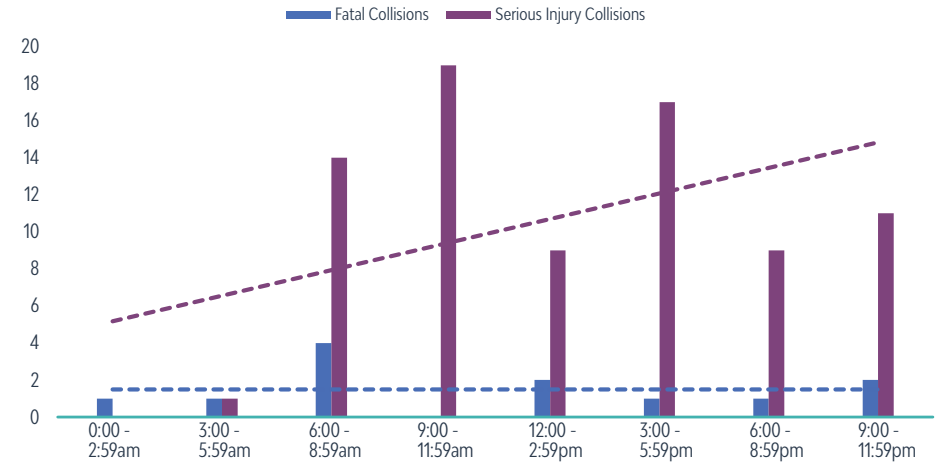


Figure 12: Orange County
Fatal and Serious Injury Collisions by Day of Week (2019)

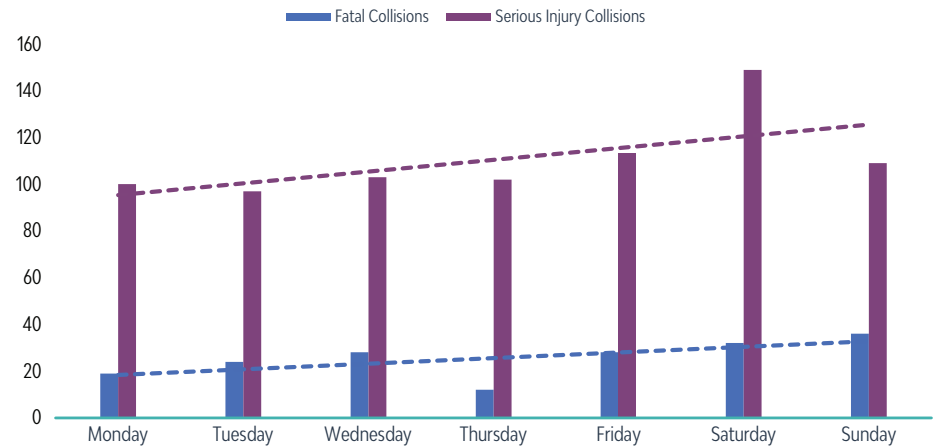


Figure 13: Orange County
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

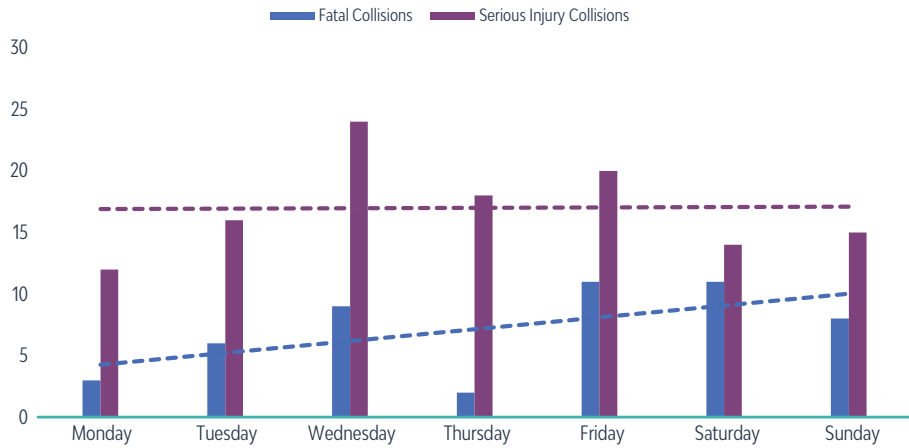


Figure 15: Orange County
Fatal and Serious Injury Collisions by Month (2019)

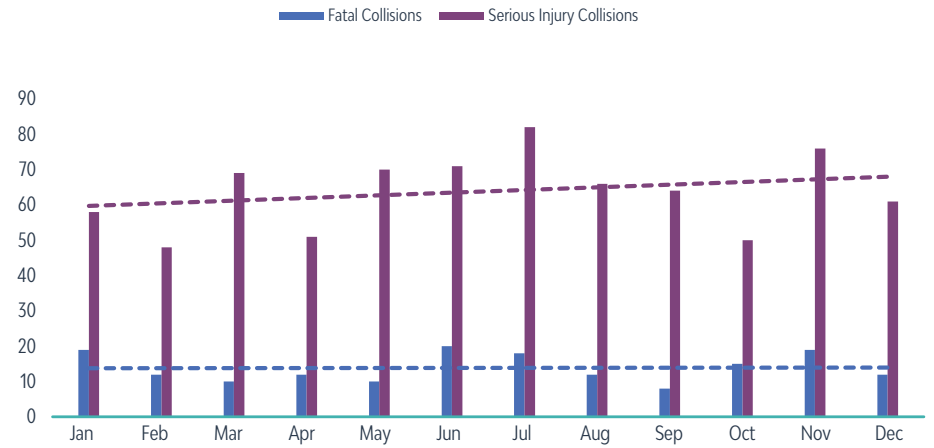


Figure 14: Orange County
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

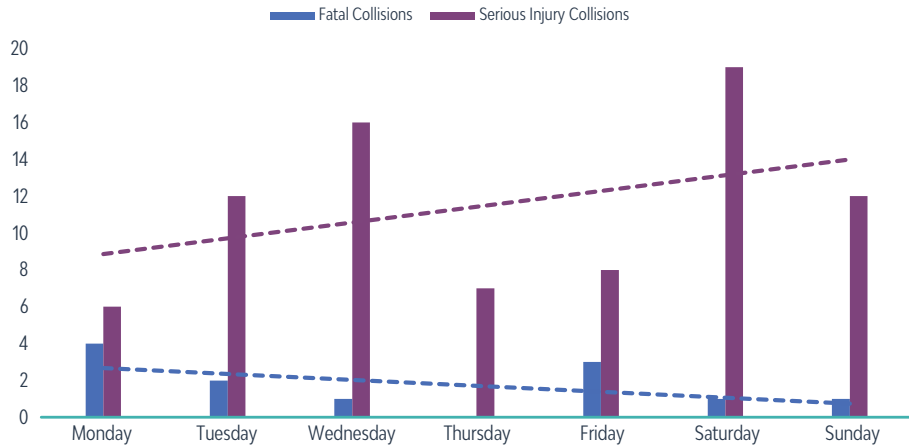


Figure 16: Orange County
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

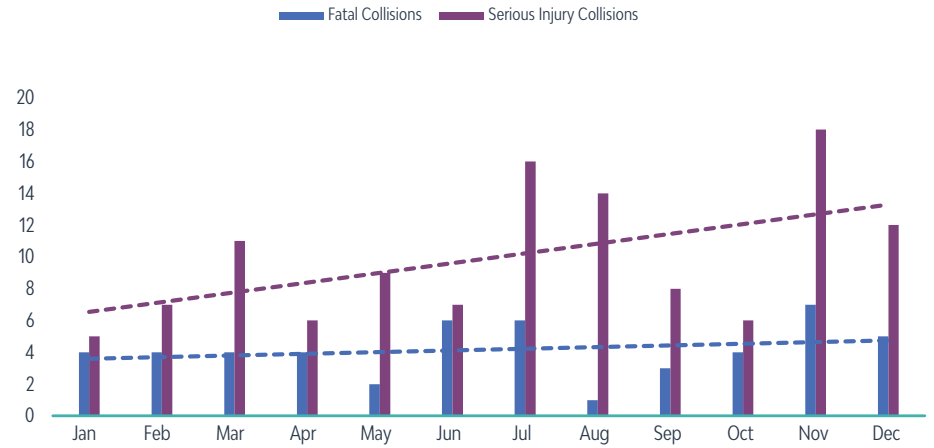


Figure 17: Orange County
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

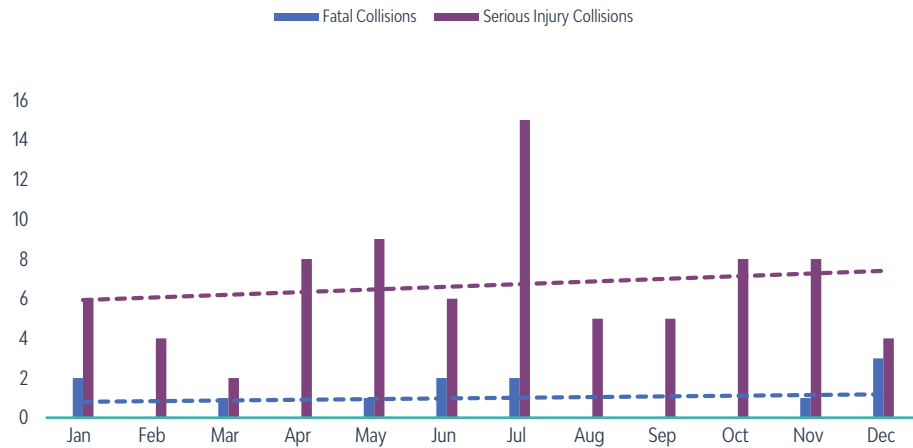


Figure 19: Orange County
Serious Injury Victims by Age and Gender (2019)

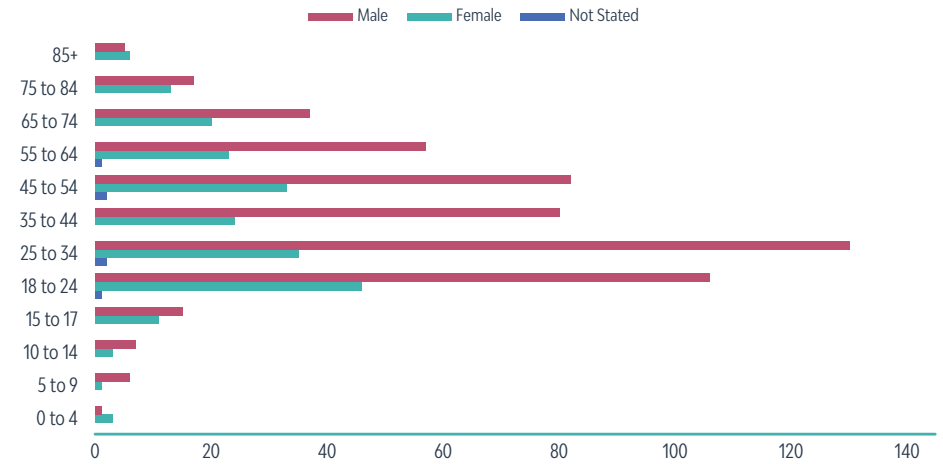


Figure 18: Orange County
Fatal Victims by Age and Gender (2019)

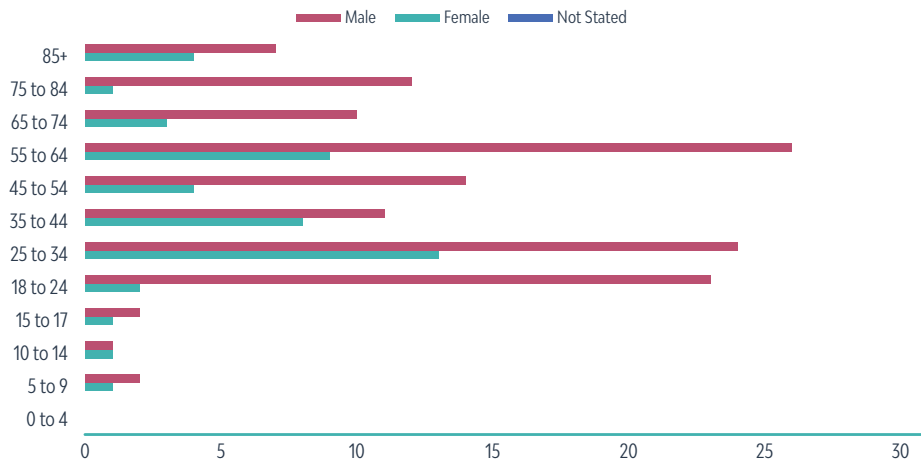


Figure 20: Orange County
Fatal Victims by Involvement in Collision by Gender (2019)

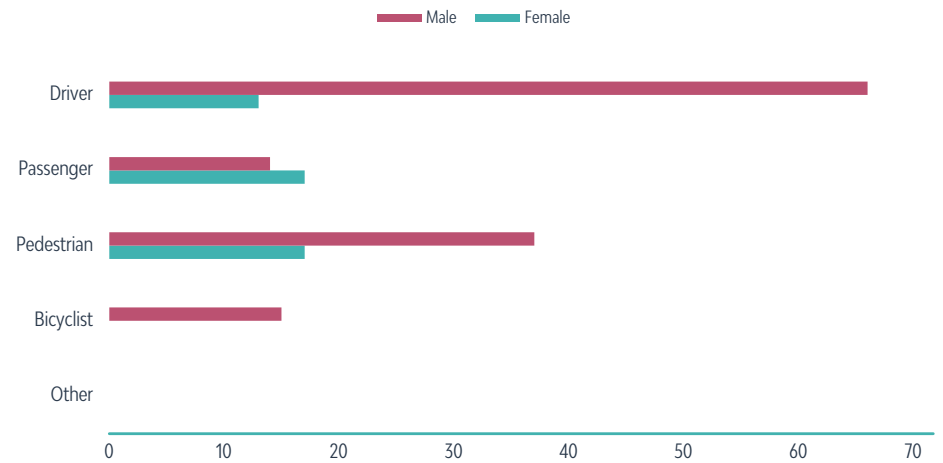
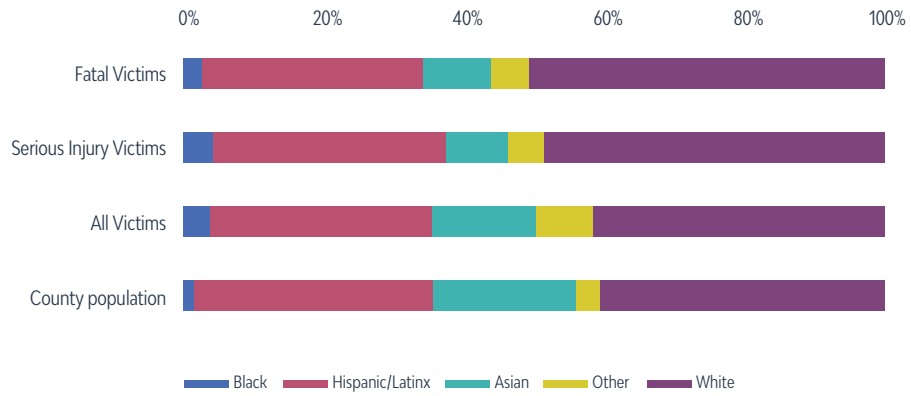
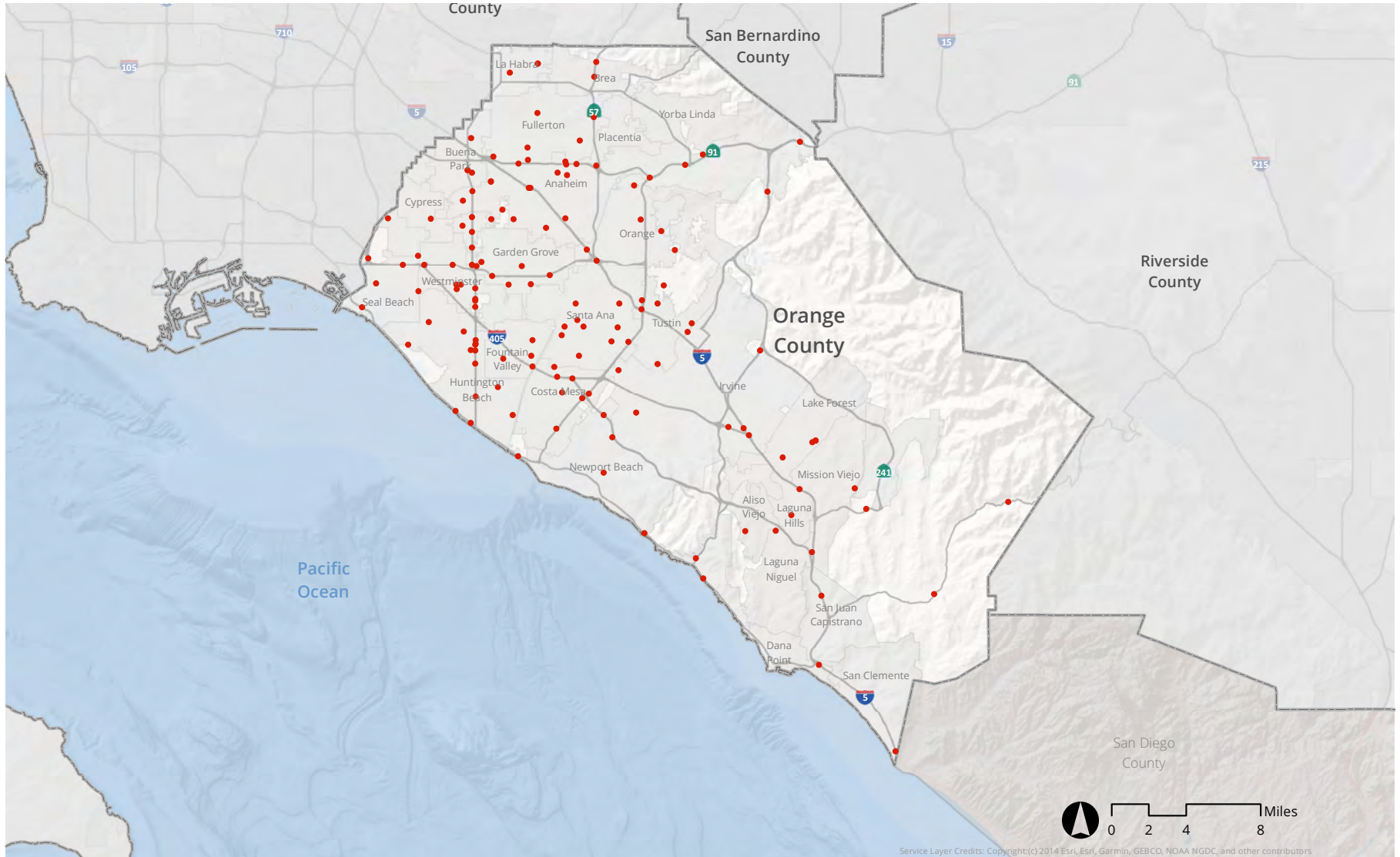


Figure 21: Orange County
Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)

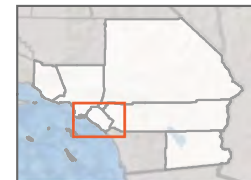


Map 1: Orange County, 2019 Fatal Collisions



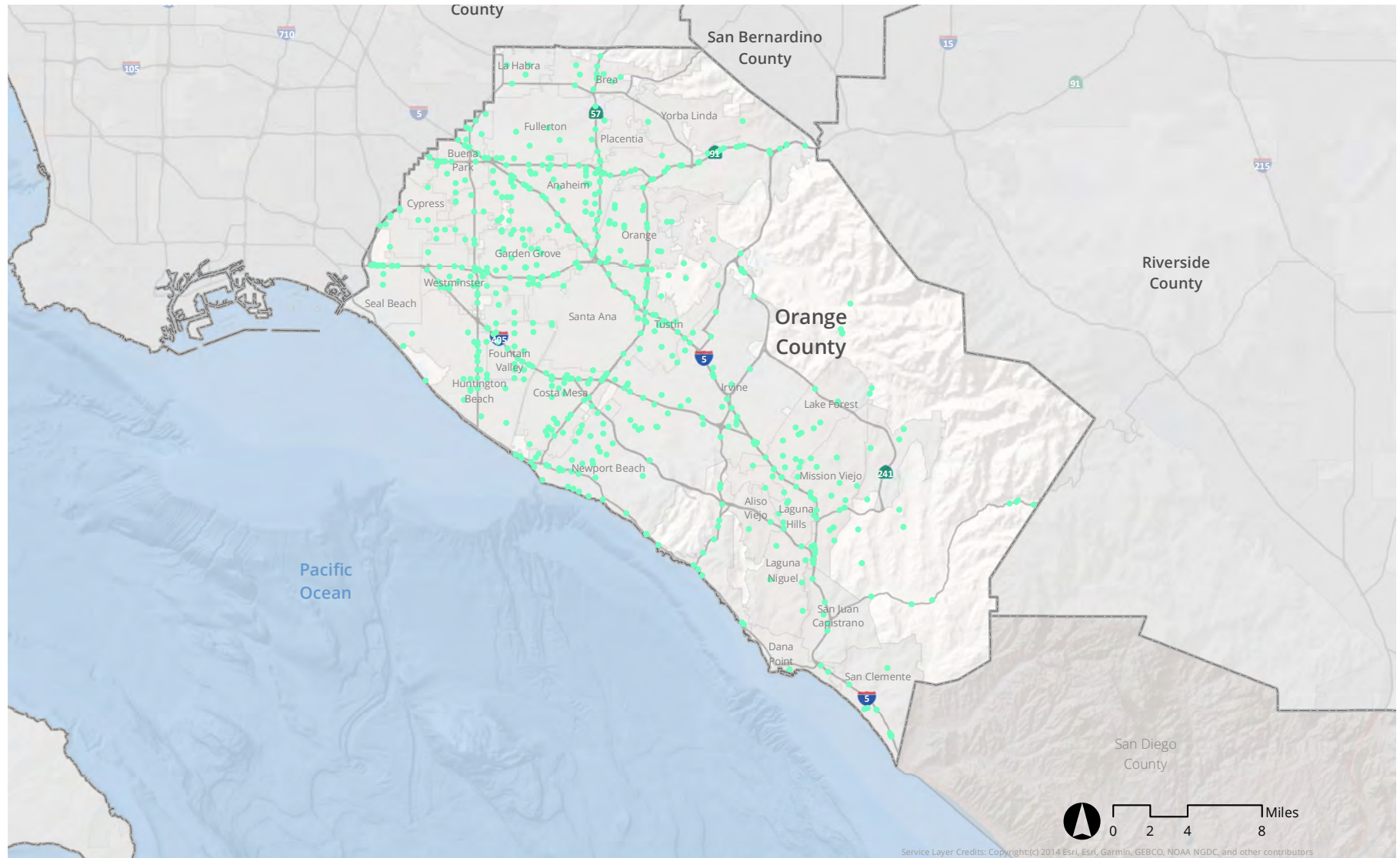
- County Boundaries
- Orange County 2019 Fatal Collisions
- City Boundaries
- Freeway

Source: SCAG, SWITRS, TIMS



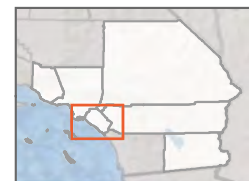
Service Layer Credits: Copyright (c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Map 2: Orange County, 2019 Serious Injury Collisions

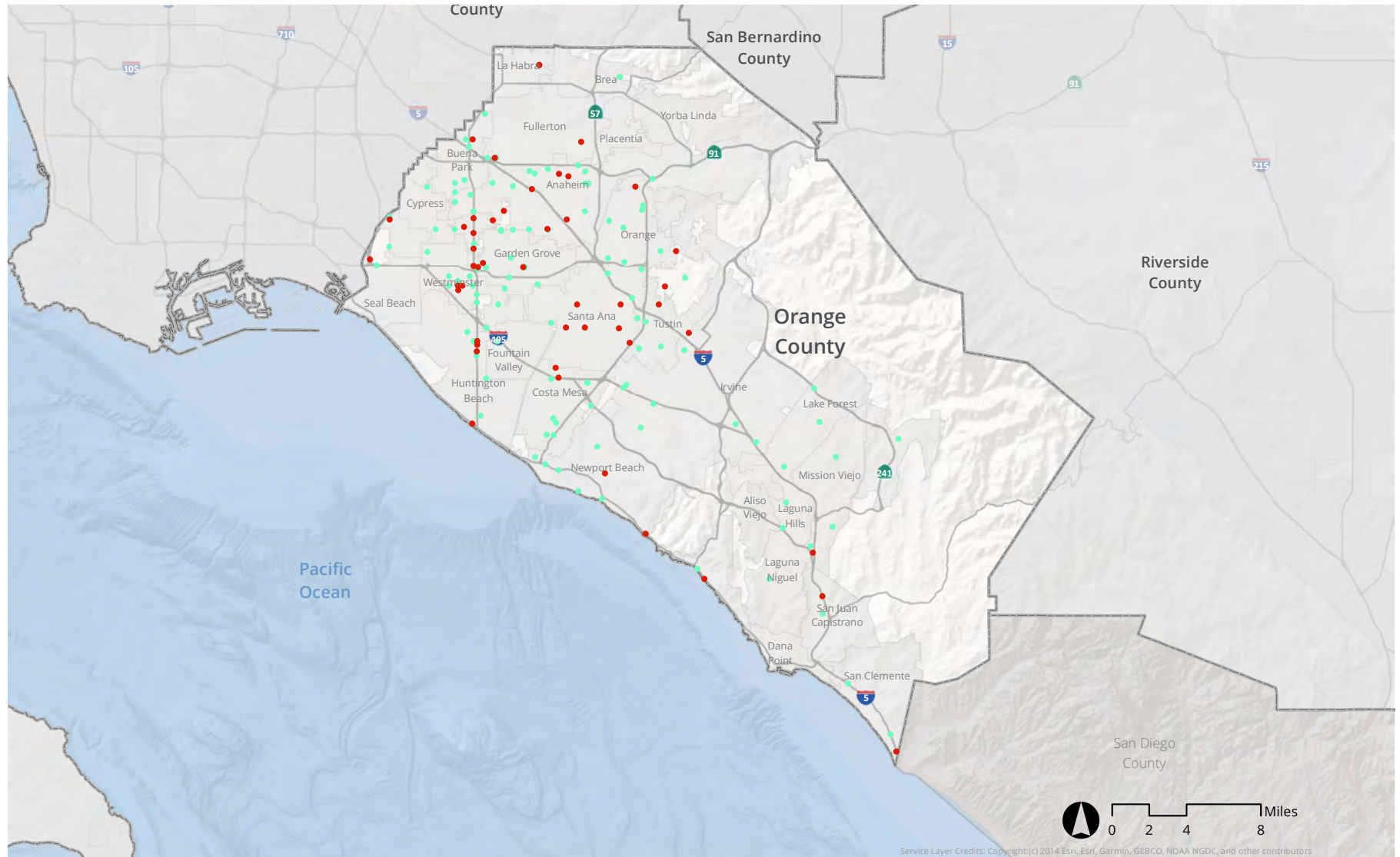


- County Boundaries
- City Boundaries
- Freeway
- Orange County 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

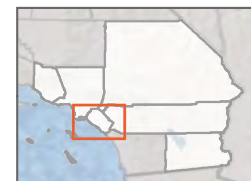


Map 3: Orange County, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions

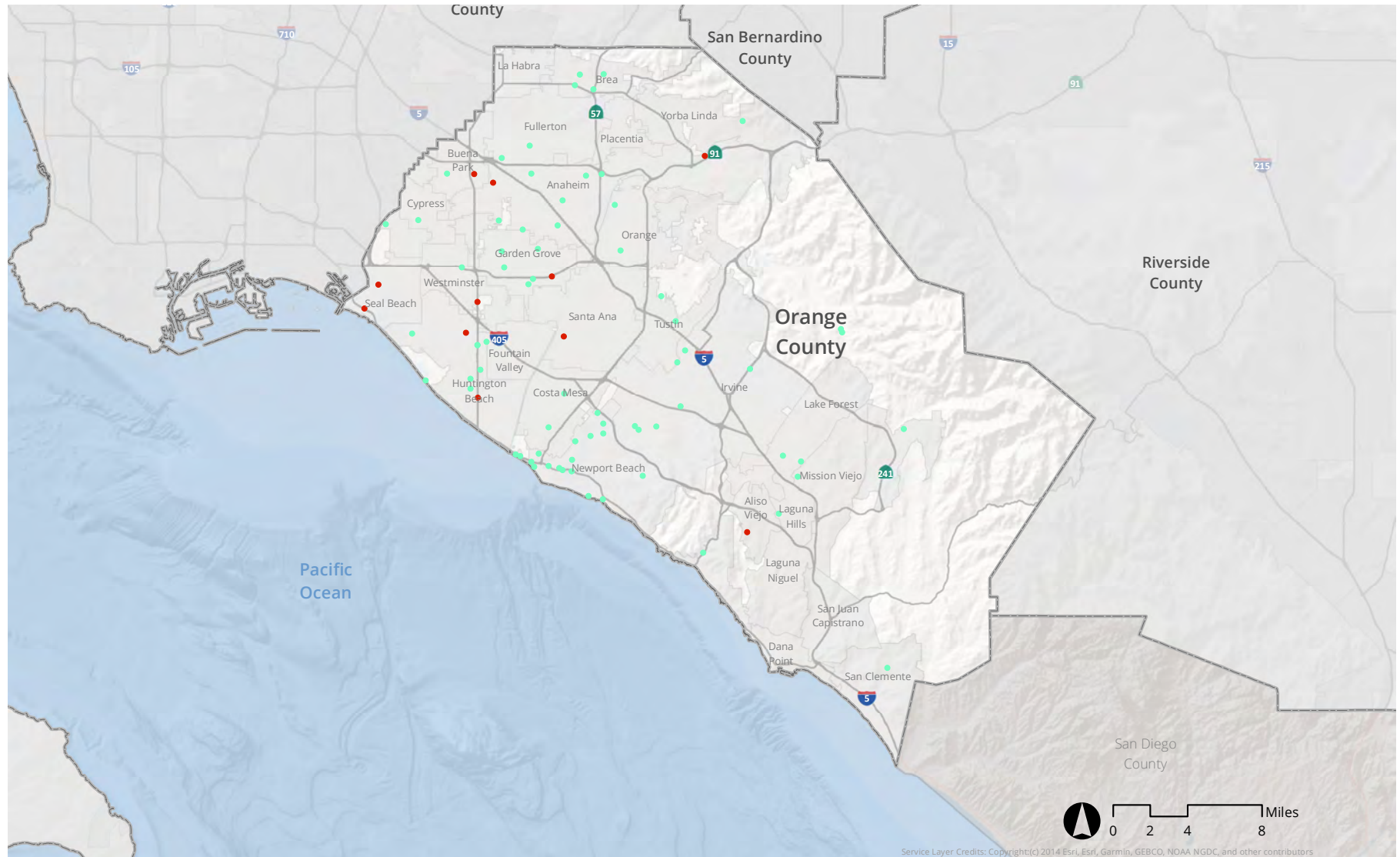


- County Boundaries
- City Boundaries
- Freeway
- Orange County 2019 Pedestrian-Involved Fatal Collisions
- Orange County 2019 Pedestrian-Involved Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

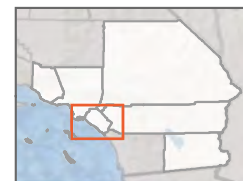


Map 4: Orange County, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions

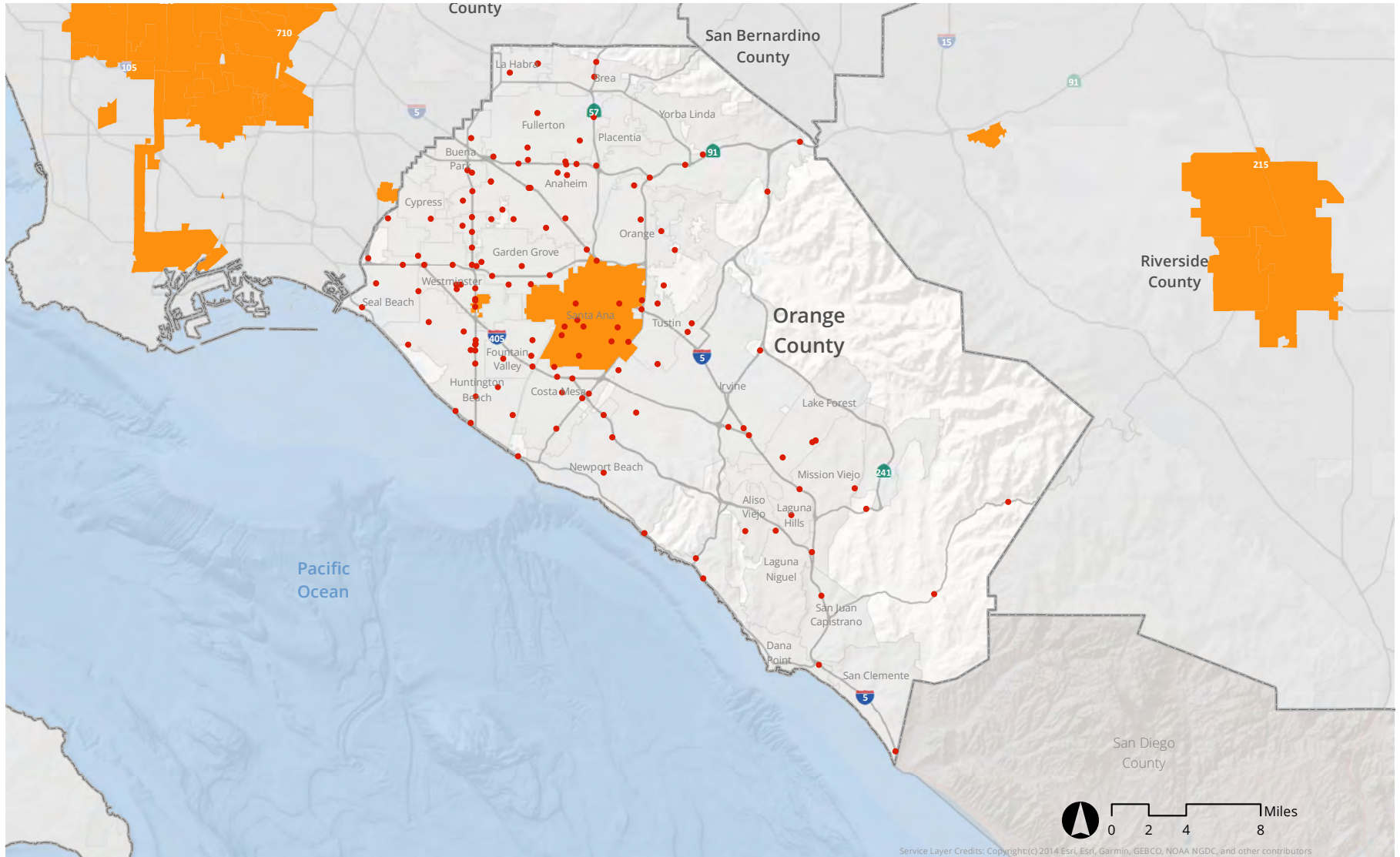


- County Boundaries
- City Boundaries
- Freeway
- Orange County 2019 Bicyclist-Involved Fatal Collisions
- Orange County 2019 Bicyclist-Involved Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

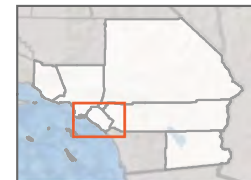


Map 5: Orange County, 2019 Fatal Collisions in Communities of Concern



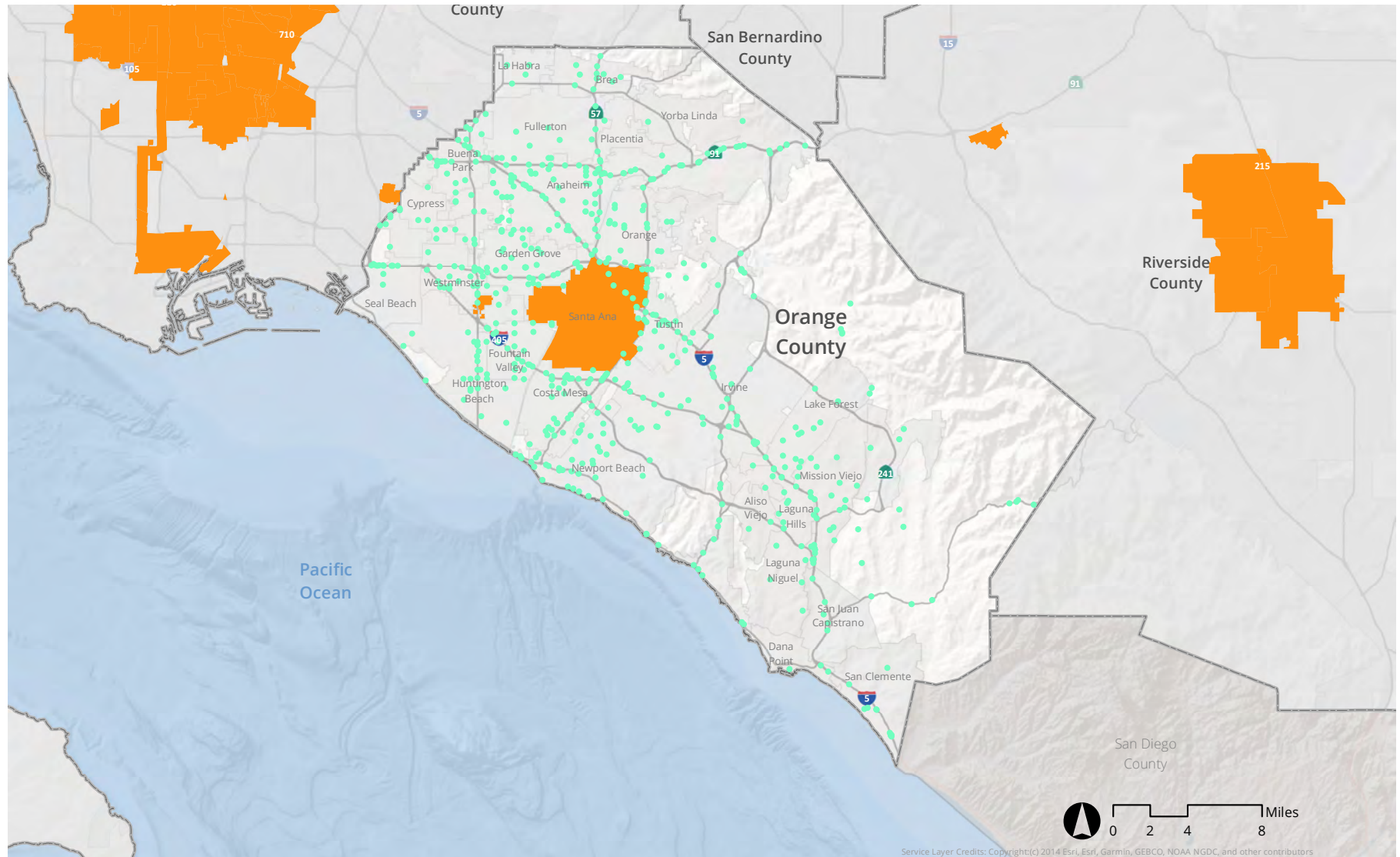
- County Boundaries
- Communities of Concern
- City Boundaries
- Orange County 2019 Fatal Collisions
- Freeway

Source: SCAG, SWITRS, TIMS



Service Layer Credits: Copyright (c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

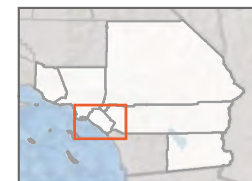
Map 6: Orange County, 2019 Serious Injury Collisions in Communities of Concern



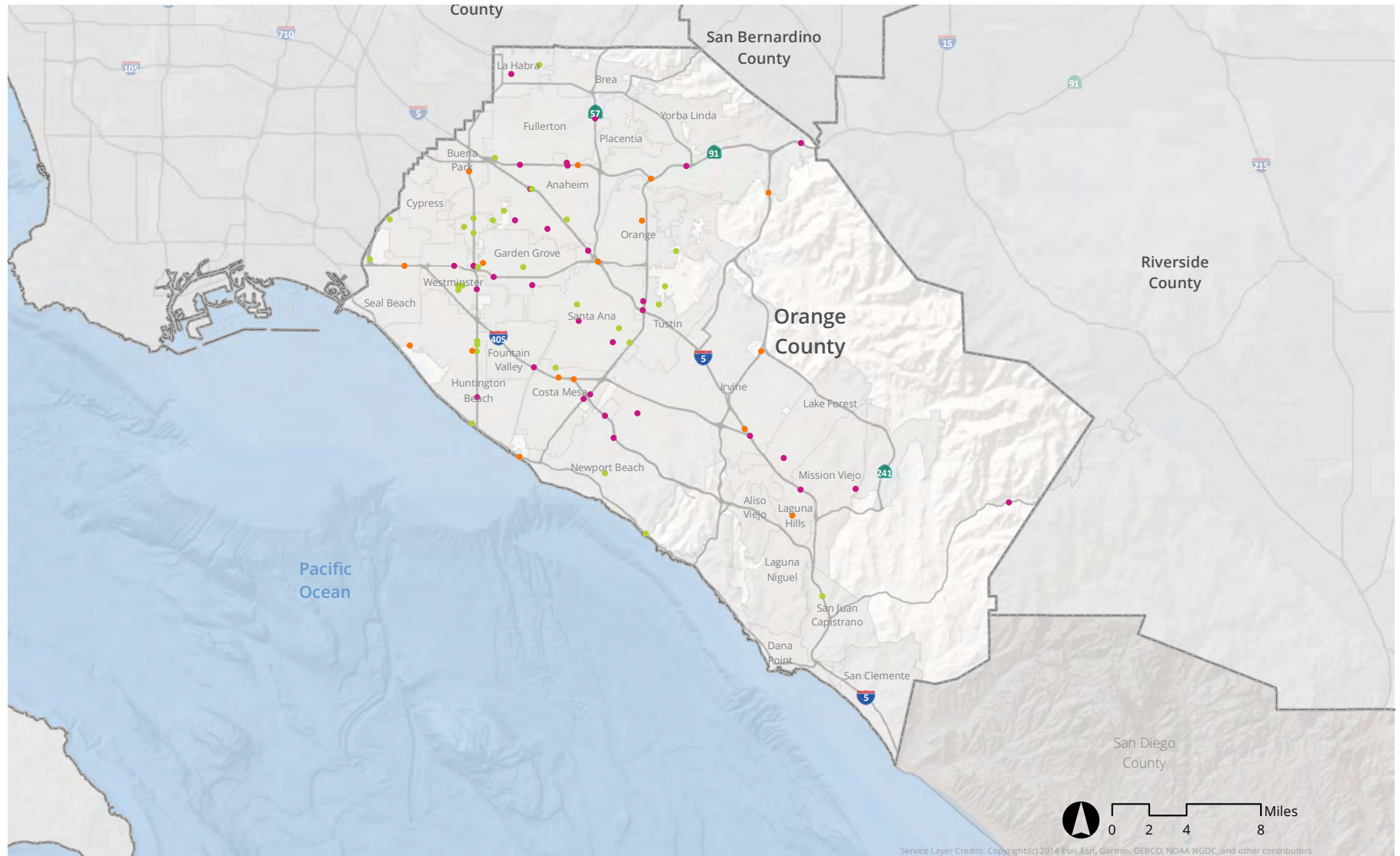
Service Layer Credits: Copyright(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- Orange County 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

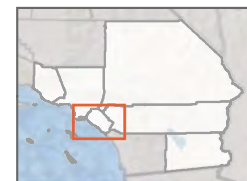


Map 7: Orange County, 2019 Primary Collision Factors of Fatal Collisions



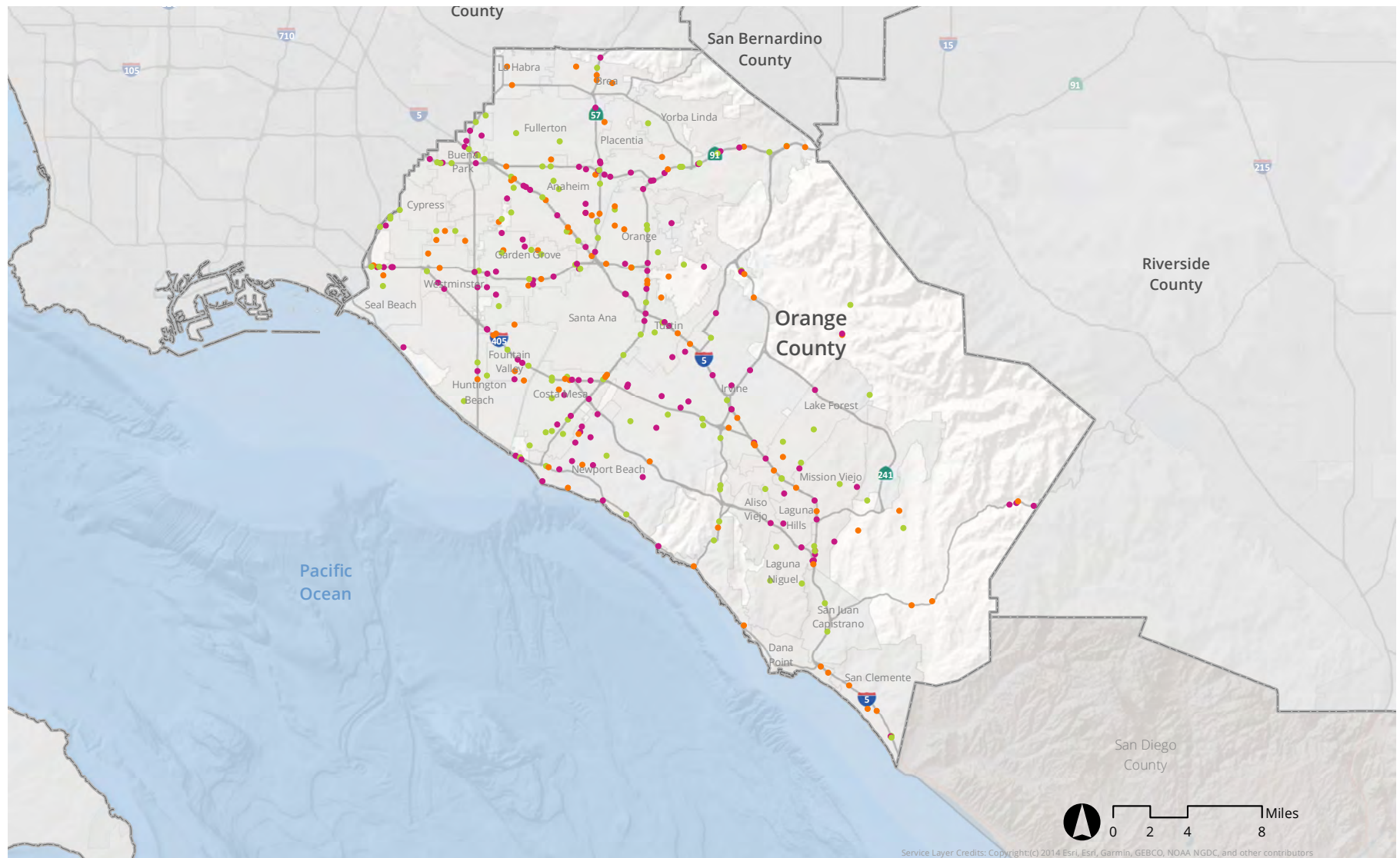
- County Boundaries
- City Boundaries
- Freeway
- Orange County 2019 Primary Collision Factors of Fatal Collisions
- Driving or Bicycling Under the Influence
- Pedestrian Violation
- Unsafe Speed

Source: SCAG, SWITRS, TIMS



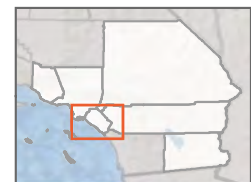
Service Layer Credits: Copyright (c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Map 8: Orange County, 2019 Primary Collision Factors of Serious Injury Collisions

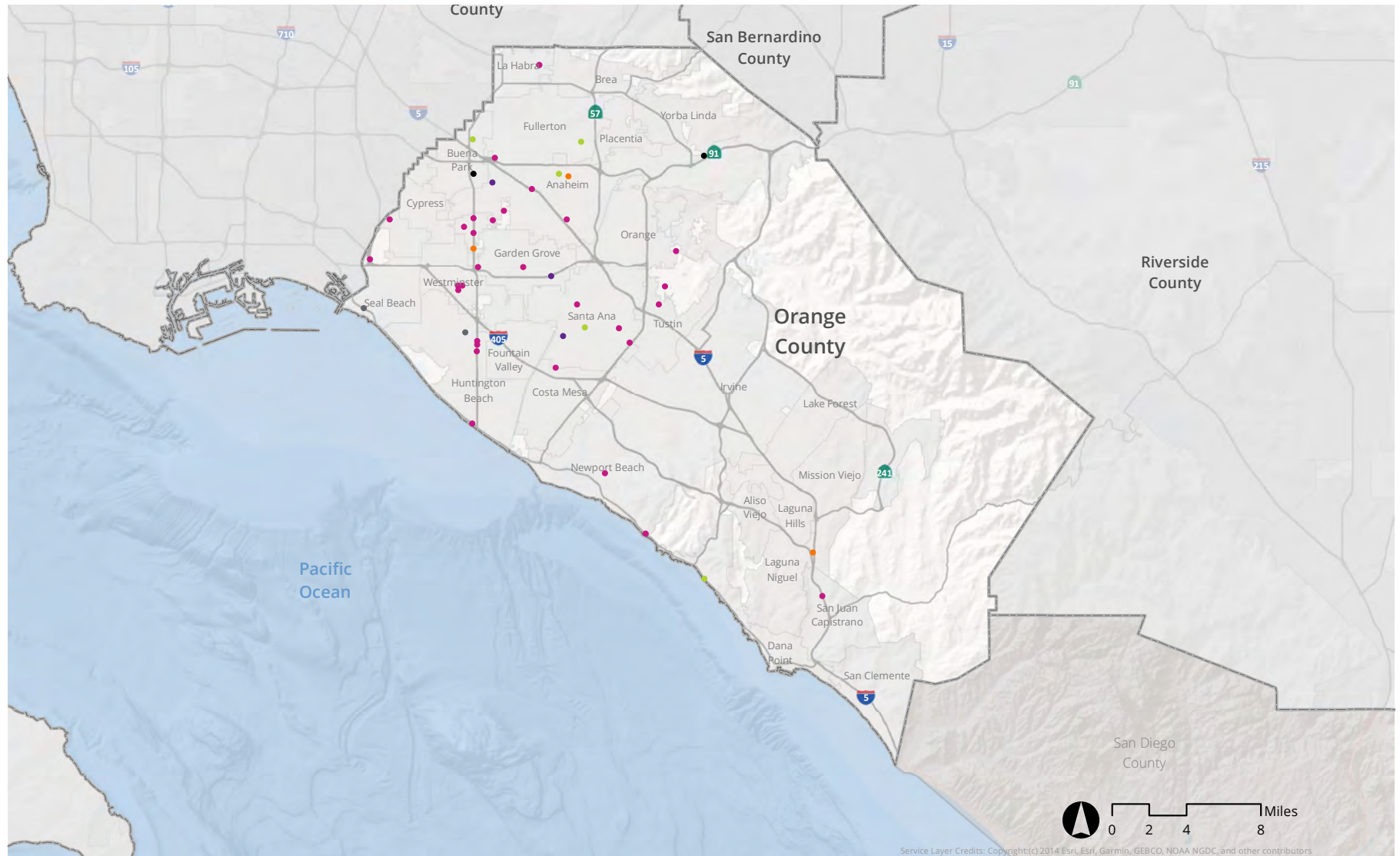


- County Boundaries
- City Boundaries
- Freeway
- Orange County 2019 Primary Collision Factors of Serious Injury Collisions
 - Unsafe Speed
 - Driving or Bicycling Under the Influence of Alcohol or Drugs
 - Improper Turning

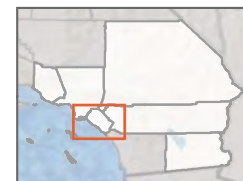
Source: SCAG, SWITRS, TIMS



Map 9: Orange County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions



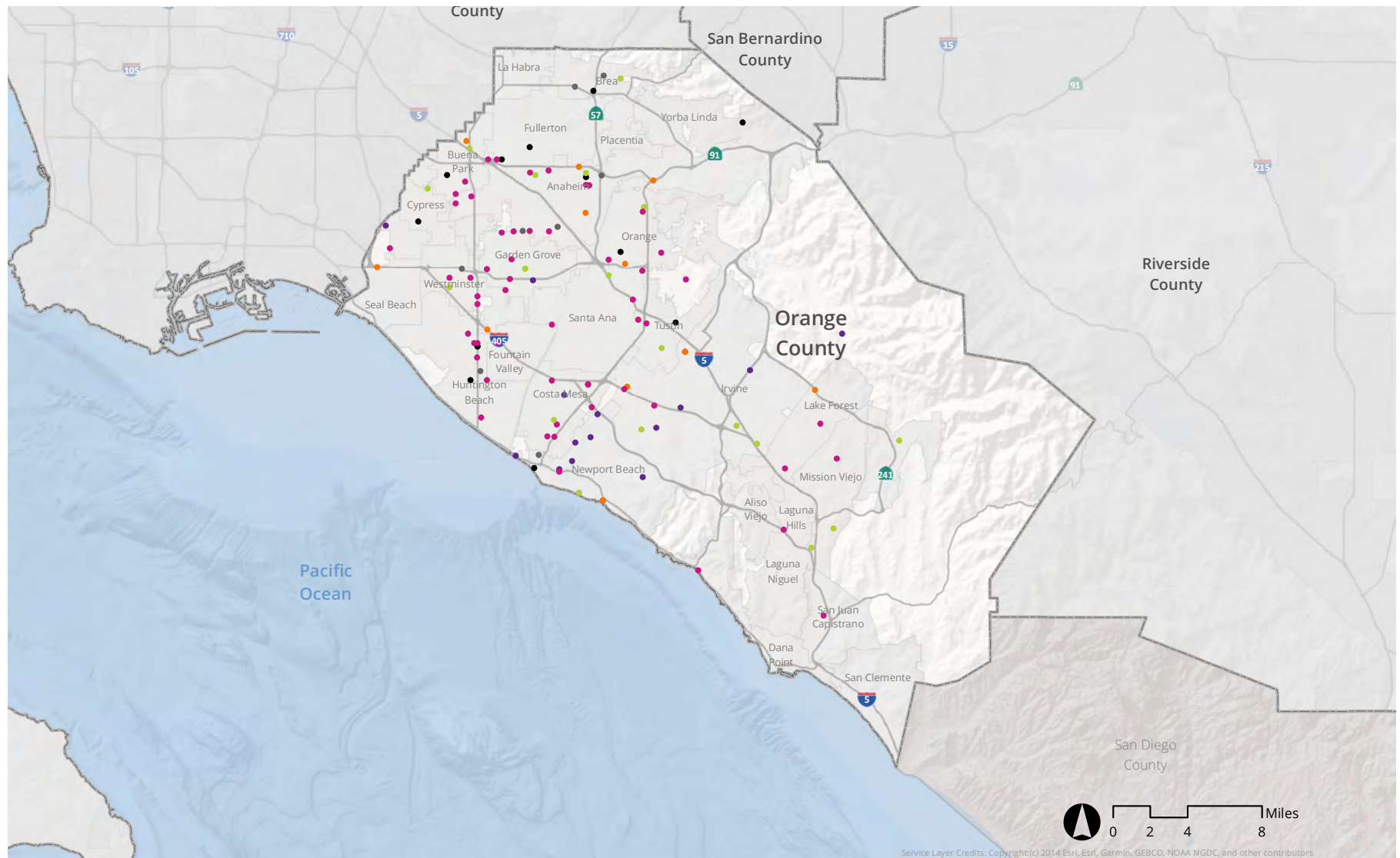
- | | | |
|-------------------|---|--|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Fatal Collisions | Primary Collision Factors of Bicyclist-Involved Fatal Collisions |
| City Boundaries | Pedestrian Violation | Improper Turning |
| Freeway | Pedestrian Right of Way | Wrong Side of the Road |
| | Unknown | Unknown |



Source: SCAG, SWITRS, TIMS

Service Layer Credits: Copyright (c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Map 10: Orange County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions |
| City Boundaries | Pedestrian Violation | Unsafe Speed |
| Freeway | Pedestrian Right of Way | Automobile Right of Way |
| | Unsafe Speed | Wrong Side of the Road |



Source: SCAG, SWITRS, TIMS





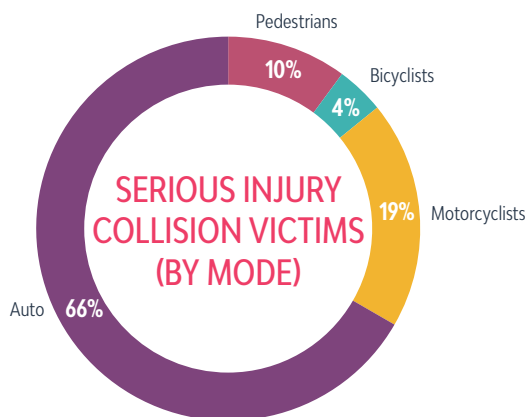
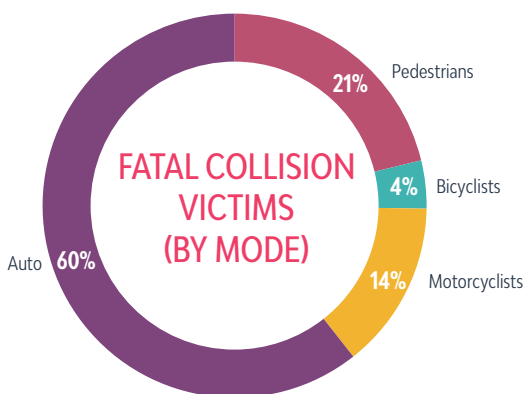
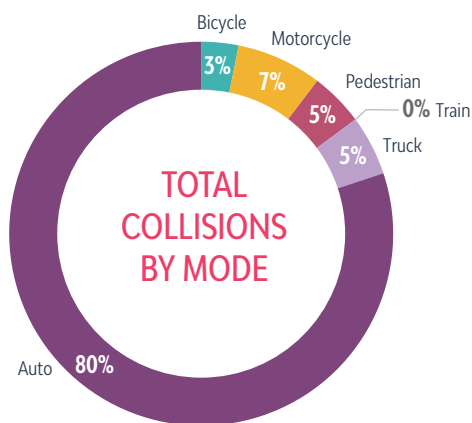
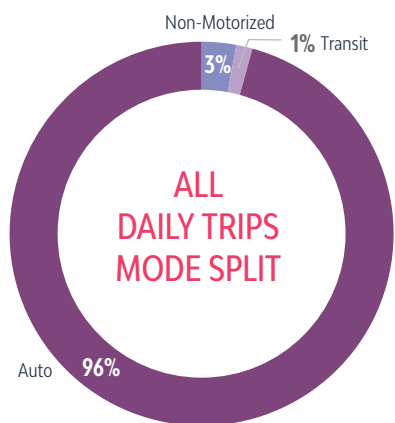
REGIONAL EXISTING CONDITIONS

Riverside County

Riverside County BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





REGIONAL EXISTING CONDITIONS

Riverside County

Riverside County borders the counties of Imperial (south), Orange (west), San Bernardino (north) and San Diego (south). It is one of the nation's largest counties, with 7,206 square miles of land. More than 2.3 million people call it home, and residents of Riverside County drive an average of just under 9,000 miles per year.

WHAT ARE THE OVERALL TRENDS?

On average, 250 people die in traffic collisions, 740 people are seriously injured, and 11,200 people are injured each year in Riverside County. Over the past decade, fatal victims have continued to increase from a low in 2010 and 2011 of 203 to a high of 318 in 2018 (**Figure 1**). Similarly, serious injuries steadily increased since 2009 to a high of 1,030 serious injuries in 2019 as shown in **Figure 2**. **Maps 1** and **2** reflect the locations of all collisions resulting in a fatality or serious injury in Riverside County in 2019.

Over the past decade, about 74 percent of those killed were in vehicles or on motorcycles, while the other approximately 25 percent of fatal victims were walking or biking. Of the roughly 254 fatal collisions that occurred each year, about 64 were active transportation collisions. The numbers of fatal active transportation victims have slowly increased since 2009.

Figure 3 reflects the total numbers of pedestrian fatal and serious injury victims from 2009 to 2020. Since 2009, pedestrian fatal and serious injury victims have steadily increased. Pedestrian fatal victims peaked in 2018 at 81 fatalities, nearly triple from their lowest in 2010 (31), increasing at an average rate of 7 percent per year. Pedestrian serious injury victims followed a similar trend, peaking in 2018 (98), after increasing at an average rate of 2 percent each year. **Map 3** illustrates the pedestrian-involved fatal and serious injury collisions that occurred in Riverside County in 2019.

Figure 4 highlights bicyclist fatal and serious injury victims from 2009 to 2020. Bicyclist fatal and serious injury victims did not illustrate clear or distinct trends. **Map 4** highlights the bicyclist-involved collisions resulting in a fatality or serious injury that occurred in Riverside County in 2019.

Figure 5 shows the historical rates of fatal and serious injury victims per 1,000 people from 2010 to 2020 and shows they followed similar trendlines to their

non-normalized counterparts (i.e., their absolute numbers) as shown in **Figures 1 and 2**. This suggests that changes in fatal and serious injury victims were not impacted by population changes. Similarly, when normalized by Vehicle Miles Traveled (VMT), fatal and serious injury victims also followed similar trends, suggesting that the changes in VMT did not impact the changes in total fatal or serious injury victims (**Figures 6 and 7**).

In general, daily VMT increased from 2009 to 2019 from 54 million to 58 million, though VMT per capita trended downward from 2010 to 2020. This means that the total population increased at a faster pace than VMT, though this could be attributed to changing demographics, saturated highways, and/or a preference for living in more compact neighborhoods, which can reduce the need for driving. Overall, VMT per capita averaged about 9,000 from 2010 to 2020.

WHERE ARE COLLISIONS OCCURRING?

In Riverside County, the majority of fatal and serious injury collisions occurred in urbanized areas and urban clusters: about 78 percent of fatal collisions and 79 percent of serious injury collisions occurred in urbanized areas and urban clusters areas. All bicyclist-involved fatal collisions (100 percent) occurred in urbanized areas, and the overwhelming majority of pedestrian-involved fatal collisions occurred in urbanized areas and urban clusters at 94 percent. In total, 92 percent of the population lives in urbanized areas, 3 percent live in urban clusters and 5 percent of the population lives in rural areas. Despite only 5 percent of the population residing in rural areas, 21 percent of fatal and serious injury collisions occurred in rural areas. **Maps 1-4** detail the locations of collisions (by mode) that resulted in fatalities and serious injuries, highlighting their concentration in the urban areas of Riverside County.

Riverside County has a roadway network consisting of 300 highway centerline miles, 1,213 arterial centerline miles, 1,447 collector centerline miles and 6,434 local road centerline miles. Local roads account for nearly 69 percent of all

roadways within Riverside County. Riverside County is also home to 44 miles of Class I bikeways, 334 miles of Class II bikeways, and 158 miles of Class III bikeways.

In 2019, 61 percent of fatal collisions across all modes occurred on local roads, while 18 percent occurred on arterials, and 22 percent on highways. Of the total number of serious injury collisions, 58 percent occurred on local roads, while 16 percent occurred on arterials, and 26 percent occurred on highways.

In the same year, 71 percent of pedestrian-involved fatal collisions occurred on local roads, 15 percent on arterials, and 14 percent on highways. Eighty-three percent of bicyclist-involved fatal collisions occurred on local roads, 17 percent occurred on arterials, and none on highways. For pedestrian-involved serious injury collisions, 76 percent occurred on local roads (with 16 percent on arterials and 8 percent on highways), while 88 percent of bicyclist-involved collisions occurred on local roads (with 12 percent on arterials and none on highways).

WHEN ARE COLLISIONS OCCURRING?

In Riverside County, across all modes, more fatal collisions occurred in the evening than any other time of day. In 2019, the greatest number of fatal collisions occurred between 6:00 – 8:59pm (54 fatal collisions), followed by 9:00 – 11:59pm (49 fatal collisions) as highlighted in **Figure 8**. As illustrated in **Figure 9**, serious injury collisions peaked during the evening rush hour. The greatest number of serious injury collisions occurred between 6:00 – 8:59pm (201 serious injury collisions), closely followed by 3:00 – 5:50pm (170 serious injury collisions). Similar to Riverside County, regional trends illustrate that fatal and serious injury collisions typically occur later in the afternoon and evening hours when visibility is often reduced.

When examining trends by time of day for pedestrian-involved collisions, the majority of pedestrian-involved fatal collisions occurred during the evening

(Figure 10). In 2019, there were 20 pedestrian-involved fatal collisions that occurred between 6:00 – 8:59pm, followed by 18 pedestrian-involved fatal collisions between 9:00 – 11:59pm. In total, 55 percent of all pedestrian-involved fatal collisions occurred in the evening. Similarly, pedestrian-involved serious injury collisions peaked during the evening hours; nearly 50 percent occurred between 6:00 – 11:59pm. There was not a clear or distinct pattern in 2019 for the time of day of bicyclist-involved fatal collisions, in part due to the limited number of bicyclist-involved fatal collisions that occurred (six) (Figure 11). Significantly more bicyclist-involved serious injury collisions occurred in the late evening, peaking from 6:00 – 8:59pm at 10 serious injury collisions.

By day of the week, fatal collisions across all modes in 2019 peaked on Saturday (55 cumulatively), while serious injury collisions steadily increased over the week and peaked on Sunday at 198 (Figure 12). As highlighted in Figure 13, there were significantly more pedestrian-involved fatal (21) and serious injury collisions (198) on Friday. There were six bicyclist-involved fatal collisions that occurred (two each on Monday, Friday, and Saturday), as seen in Figure 14. Bicyclist-involved serious injury collisions peaked on Monday and Friday (six each).

Across all modes, on average, there were 24 fatal collisions and 86 serious injury collisions per month in Riverside County in 2019 (Figure 15). Fatal collisions peaked in November (36), potentially because of Daylight Savings Time impacting daylight and visibility during typical commutes. Figure 16 displays the pedestrian-involved fatal and serious injury collision trends by month. Pedestrian-involved fatal collisions were highest in April (10), while pedestrian-involved serious injury collisions peaked in July (14). There was no distinctive pattern for bicyclist-involved fatal collisions over the months as illustrated in Figure 17.

WHO IS BEING HURT?

In Riverside County, out of all the fatal collision victims from 2009 to 2020,

pedestrians and bicyclists accounted for about 25 percent, disproportionately higher than the 3 percent of daily trips that were made via walking or biking.

Nearly three times more men died in traffic collisions than women in 2019. Across all modes, 74 percent of fatal victims were men (211), and men sustained more serious injuries (703 men, or 74 percent). This is compared to women making up 25 percent of fatalities (72), and 26 percent of all serious injuries (315 women).

When broken down by age, there were distinct patterns in fatal and serious injury victims. Those between the ages of 25-34 constituted the largest number of fatalities: there were 58 fatalities for men in 2019, compared to 15 fatalities for women (Figure 18). For serious injury victims (Figure 19), both men and women between the ages of 25-34 constituted the greatest number of victims (189 men and 66 women) as compared to other age groups.

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), both male and female drivers constituted the most significant demographic of fatal victims occurring in 2019 (Figure 20). Male pedestrians, bicyclists, and drivers died at far greater rates than female pedestrians, bicyclists, and drivers: almost three times the number of male pedestrians died compared to female pedestrians (55 compared to 13), and more than three times the number of male drivers died compared to female drivers (127 compared to 36). However, more female passengers died compared to male passengers.

When broken down by race, Black, Other racialized people (including American Indian and Alaska Native, Pacific Islanders, and mixed race individuals), and white individuals were overrepresented in fatal and serious injury victims (Figure 21). While representing only 6 percent of the County's population, 8 percent of fatalities and 9 percent of serious injuries were Black. White individuals constituted 39 percent of fatal and serious injury victims, while making up 36

percent of the County's population.

Maps 5 and 6 highlight the concentration of fatal and serious injury collisions that have occurred in Communities of Concern in 2019.

WHY ARE COLLISIONS OCCURRING?

Maps 7-10 reflect the top three contributing factors for all fatal and serious collisions, and bicycle- and pedestrian-involved fatal and serious collisions in 2019. The top three contributing factors in fatal collisions in Riverside County were Driving or Bicycling Under the Influence of Alcohol or Drugs (23 percent), Improper Turning (20 percent), and Pedestrian Violations (17 percent). For collisions resulting in serious injuries, the top three contributing factors were Driving or Bicycling Under the Influence of Alcohol or Drug (23 percent), Unsafe Speed (22 percent), and Improper Turning (20 percent).

For pedestrian-involved fatal collisions, the top three contributing factors were Pedestrian Violations (68 percent), Driving or Bicycling Under the Influence of Alcohol or Drugs (7 percent) and an Unknown Factor (7 percent). The top contributing factors for bicyclist-involved fatal collisions were Unsafe Speed (33 percent), followed by a tie between Traffic Signals and Signs, Pedestrian Violations, Unsafe Lane Change, or Wrong Side of the Road (17 percent each).

Figure 1: Riverside County
Total Number of Fatal Victims (2009 - 2020)

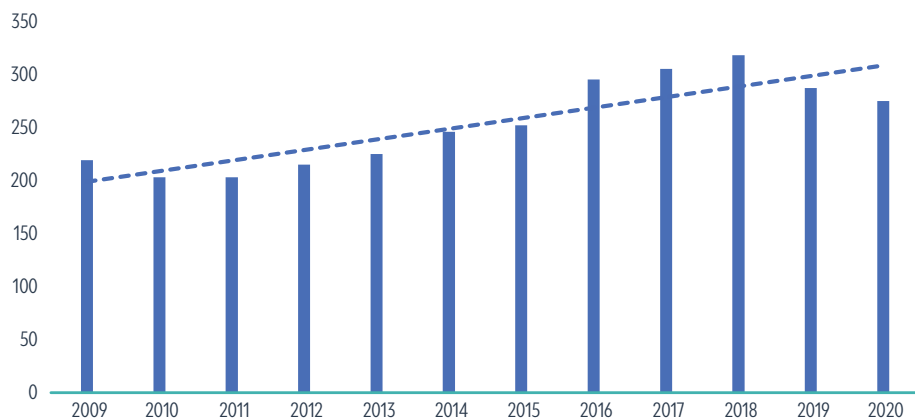


Figure 2: Riverside County
Total Number of Serious Injury Victims (2009 - 2020)

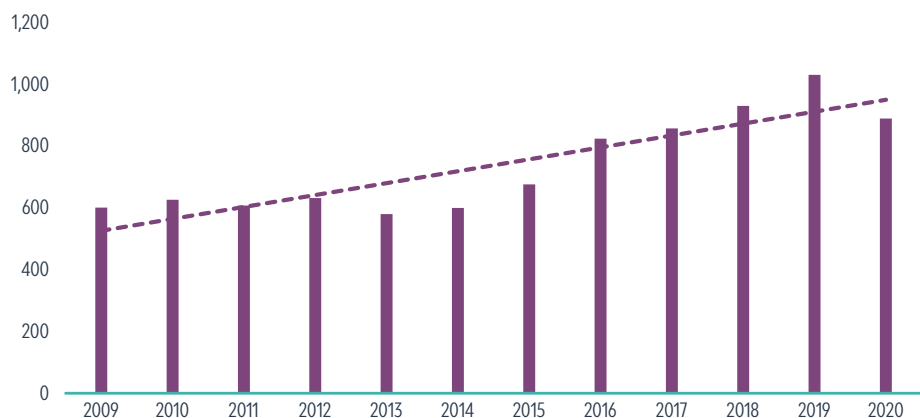


Figure 3: Riverside County
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

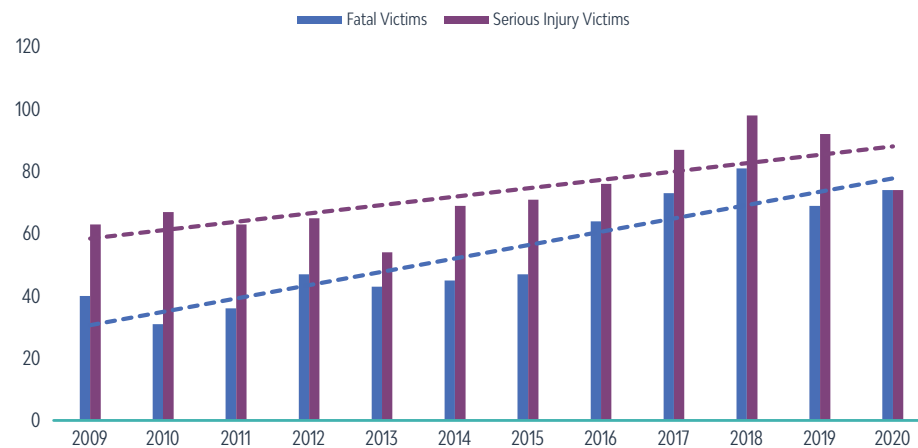


Figure 4: Riverside County
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)



Figure 5: Riverside County
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

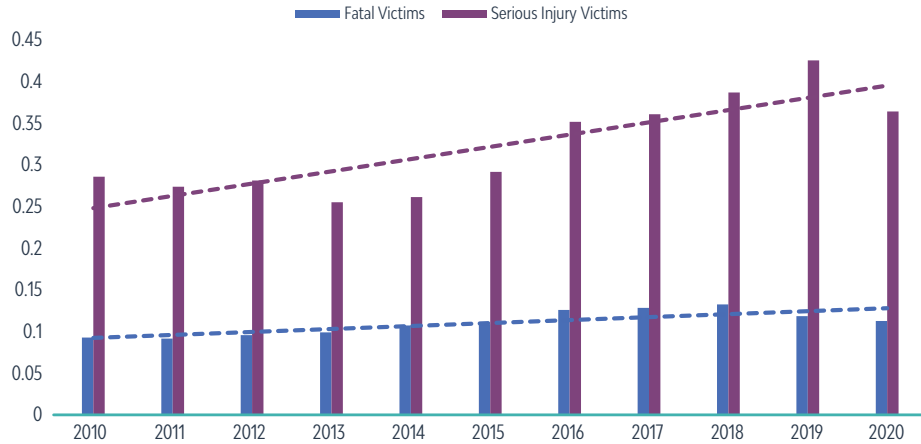


Figure 7: Riverside County
Total Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

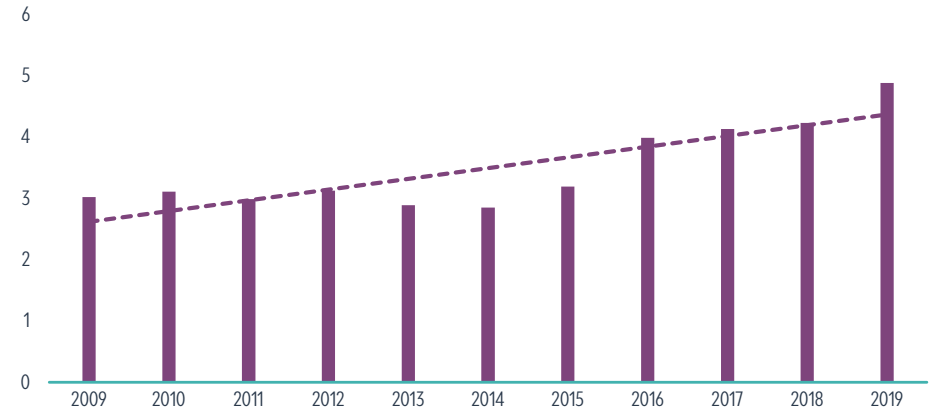


Figure 6: Riverside County
Total Fatal Victims, Normalized by 100M VMT (2009 - 2019)

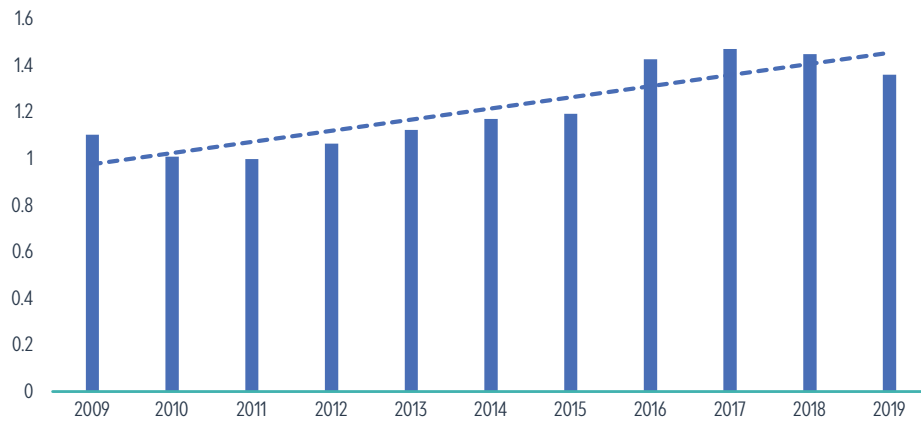


Figure 8: Riverside County
Fatal Collisions by Time of Day (2019)

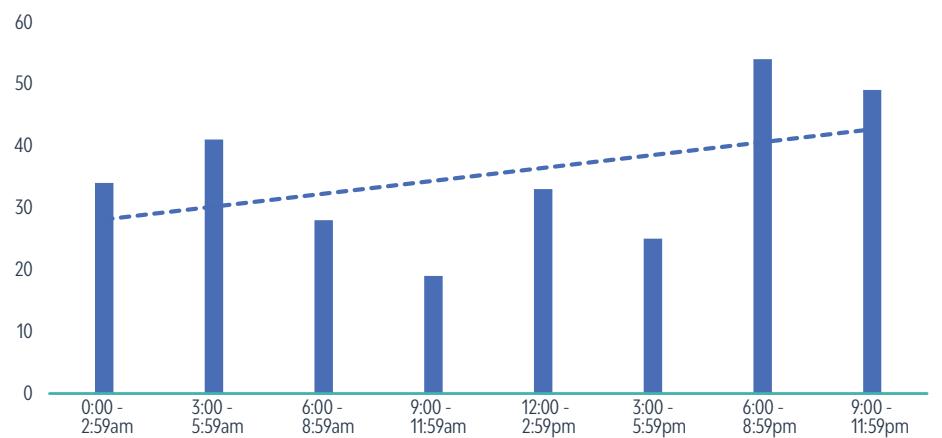


Figure 9: Riverside County
Serious Injury Collisions by Time of Day (2019)

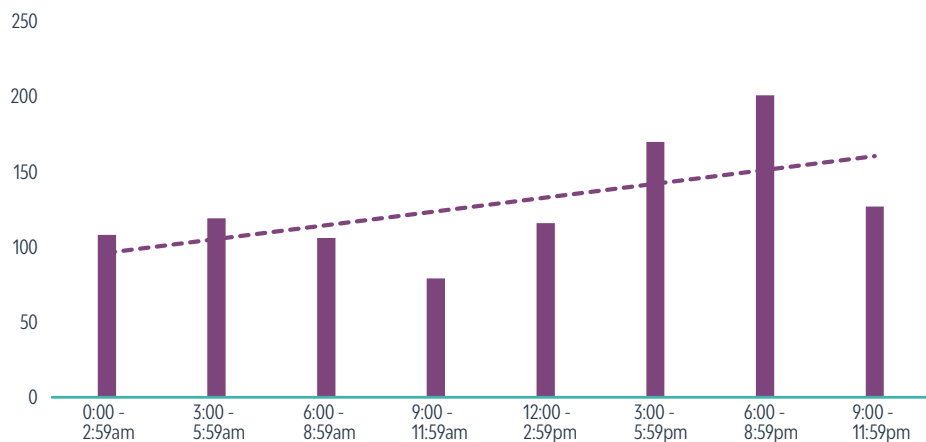


Figure 11: Riverside County
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

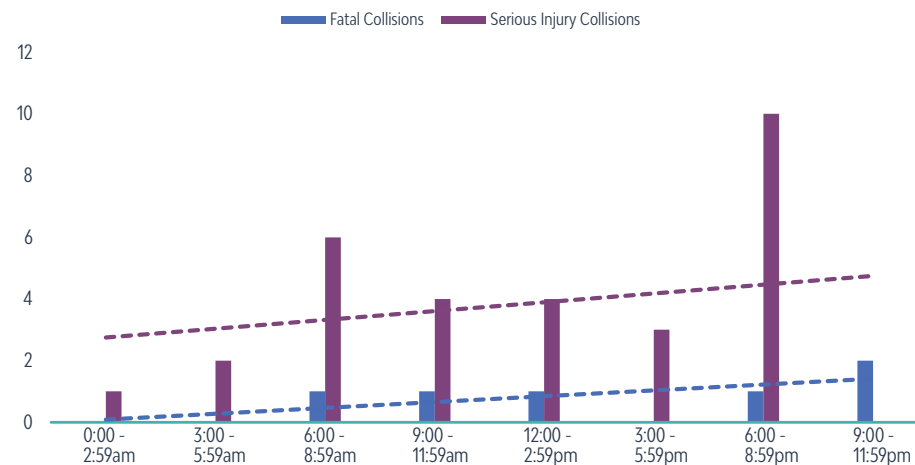


Figure 10: Riverside County
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

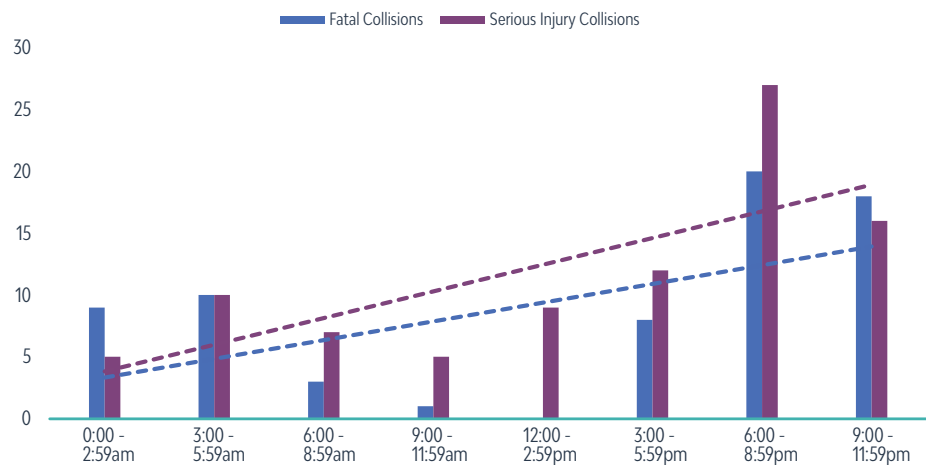


Figure 12: Riverside County
Fatal and Serious Injury Collisions by Day of Week (2019)

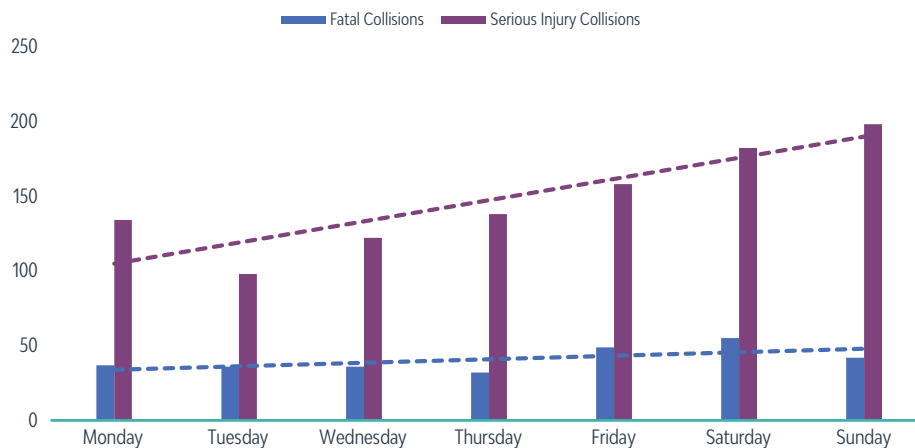


Figure 13: Riverside County
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

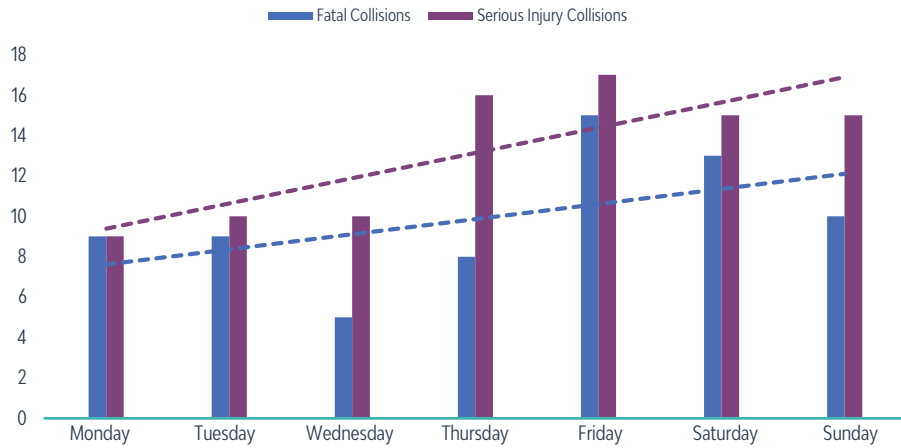


Figure 15: Riverside County
Fatal and Serious Injury Collisions by Month (2019)

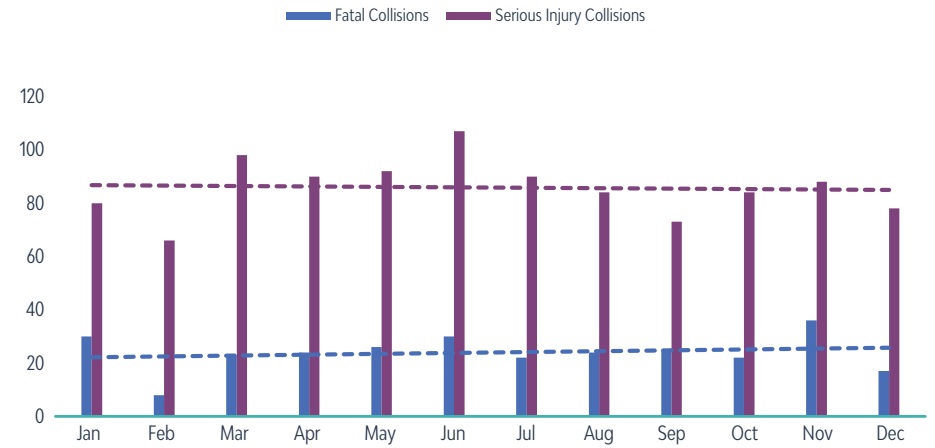


Figure 14: Riverside County
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

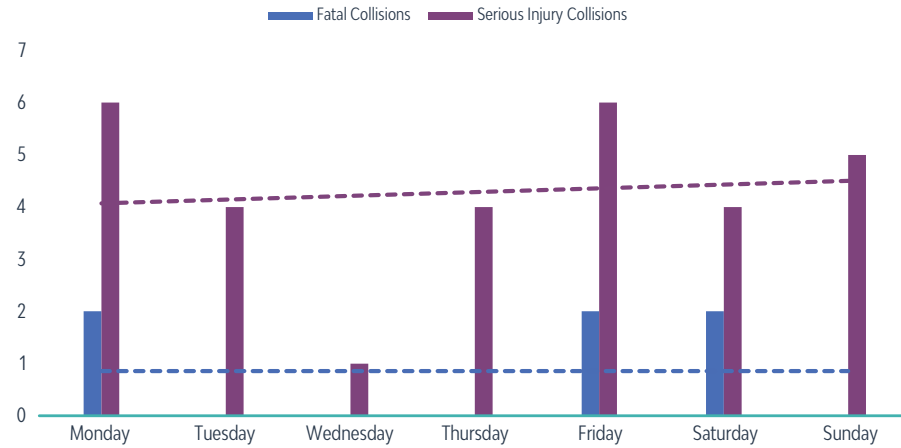


Figure 16: Riverside County
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

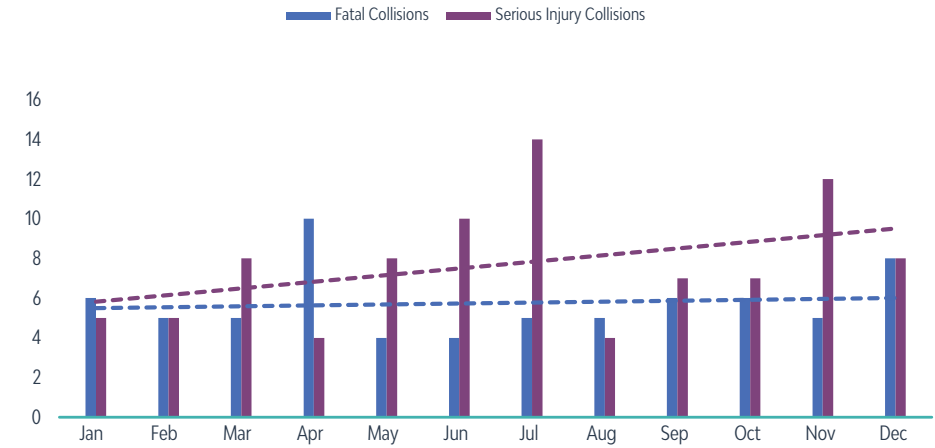


Figure 17: Riverside County
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

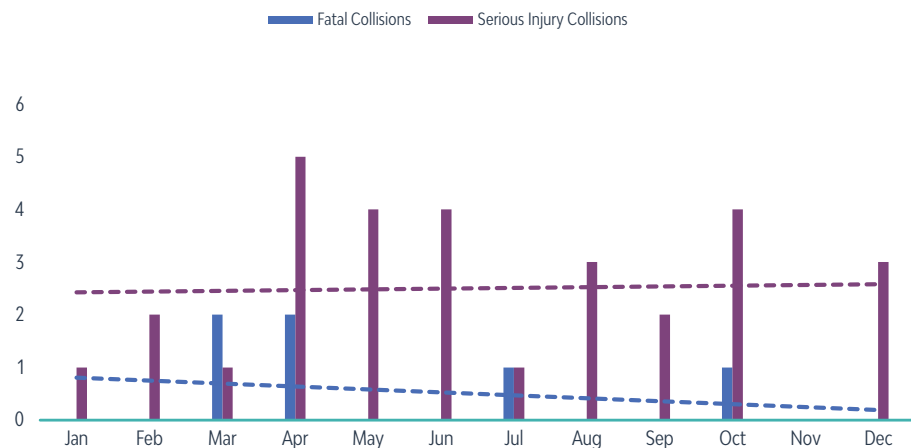


Figure 19: Riverside County
Serious Injury Victims by Age and Gender (2019)

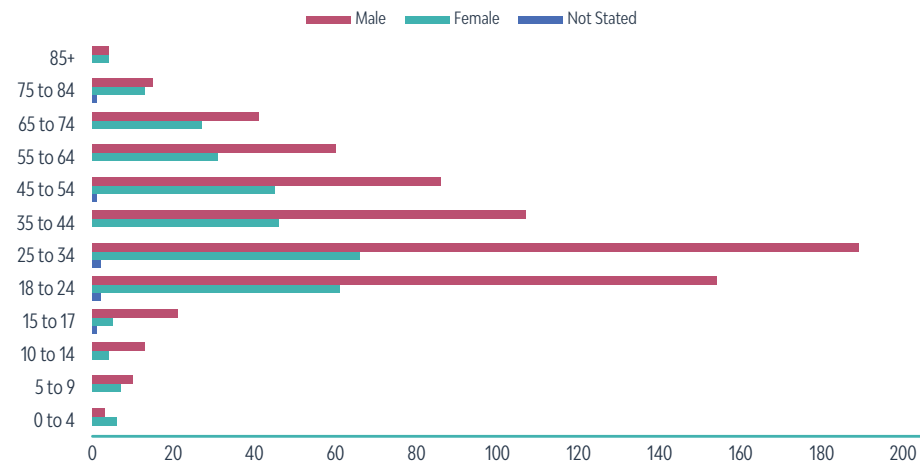


Figure 18: Riverside County
Fatal Victims by Age and Gender (2019)

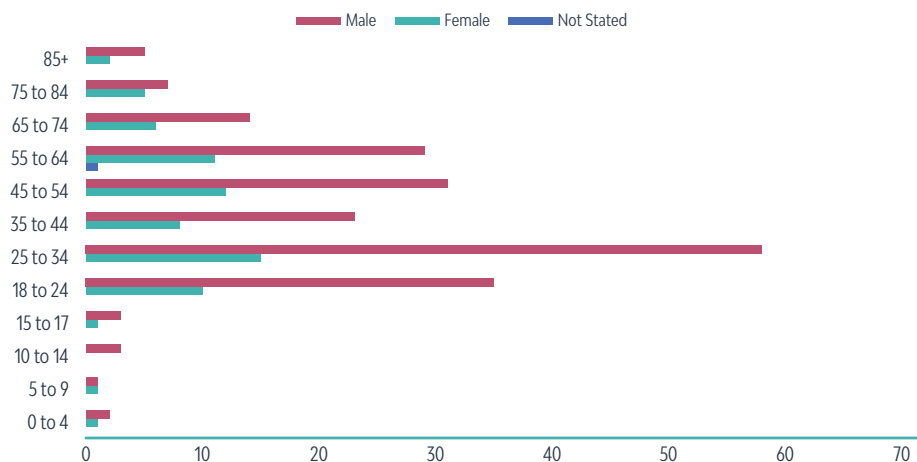


Figure 20: Riverside County
Fatal Victims by Involvement in Collision by Gender (2019)

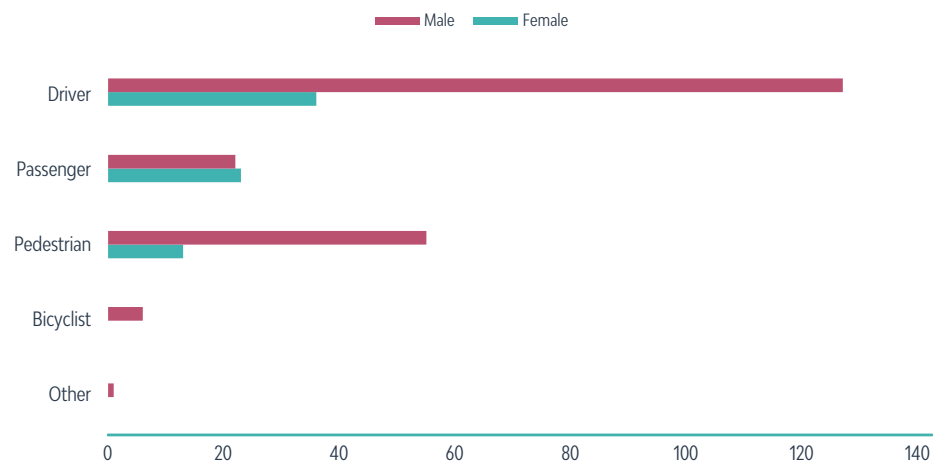
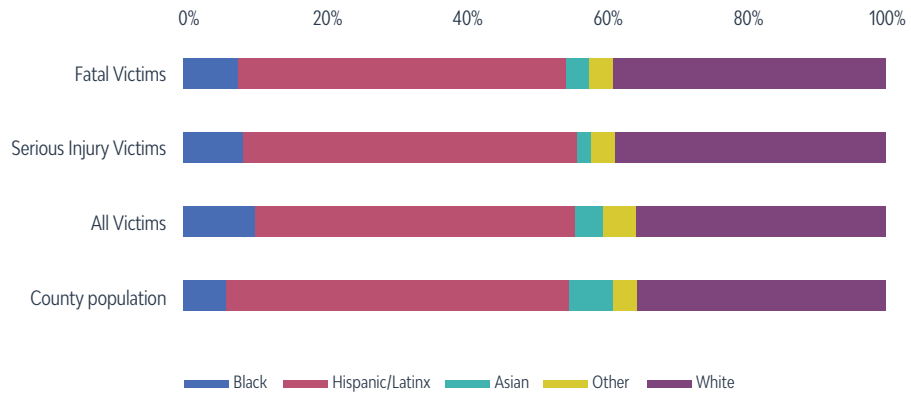
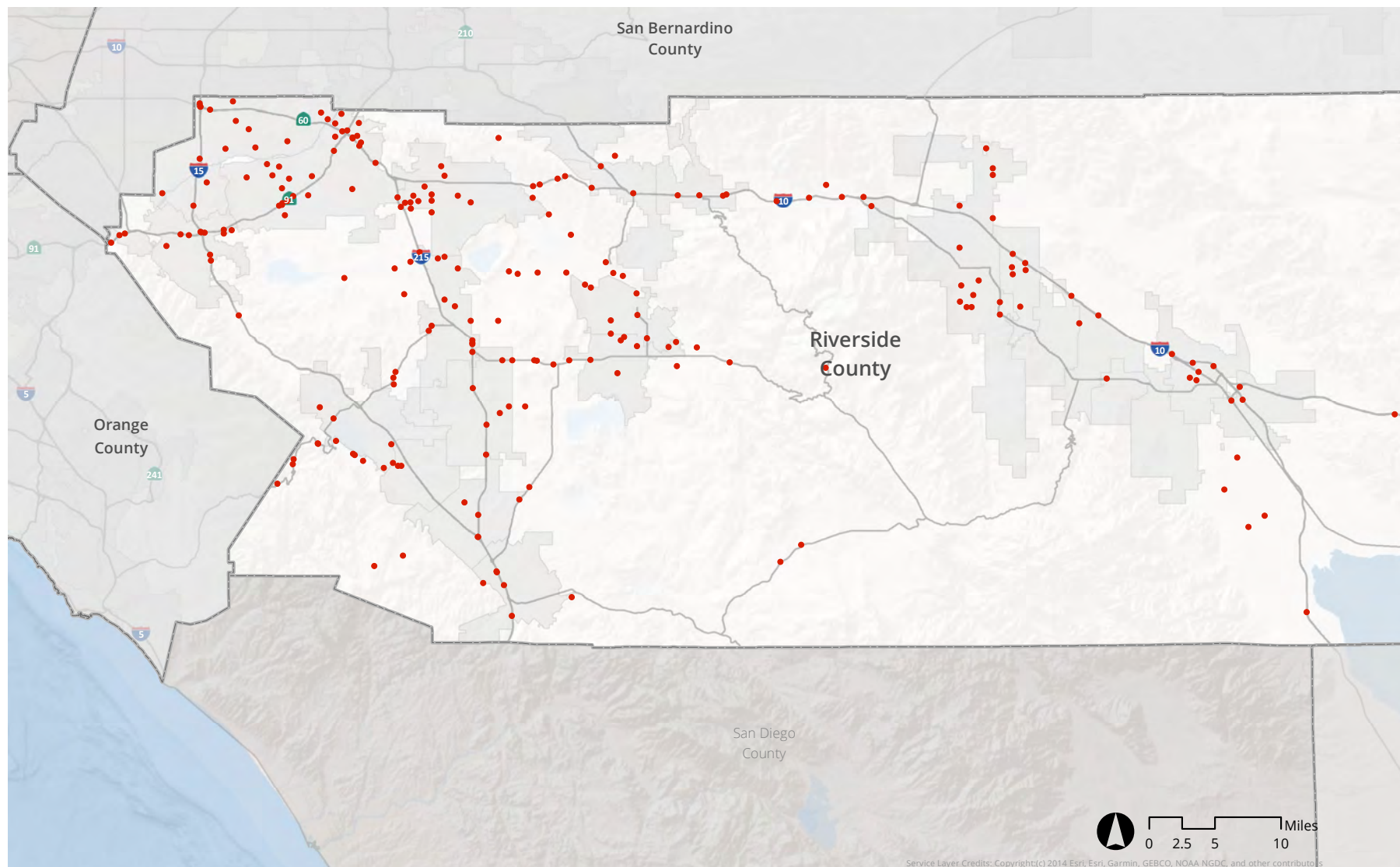


Figure 21: Riverside County
 Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)

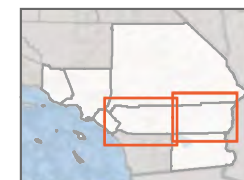


Map 1: Riverside County, 2019 Fatal Collisions

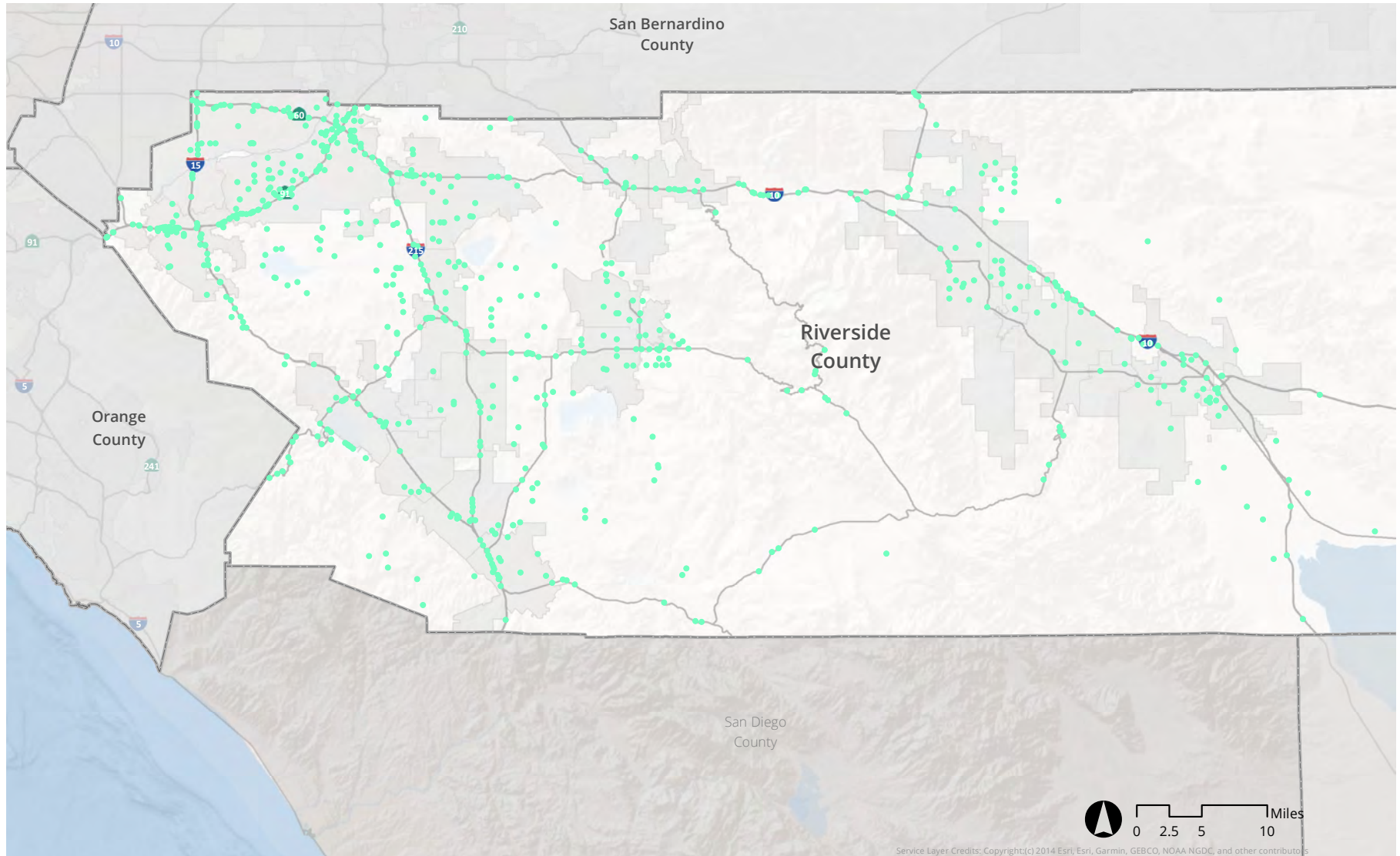


- County Boundaries
- City Boundaries
- Freeway
- Riverside County 2019 Fatal Collisions

Source: SCAG, SWITRS, TIMS

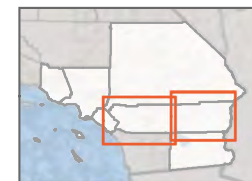


Map 2: Riverside County, 2019 Serious Injury Collisions

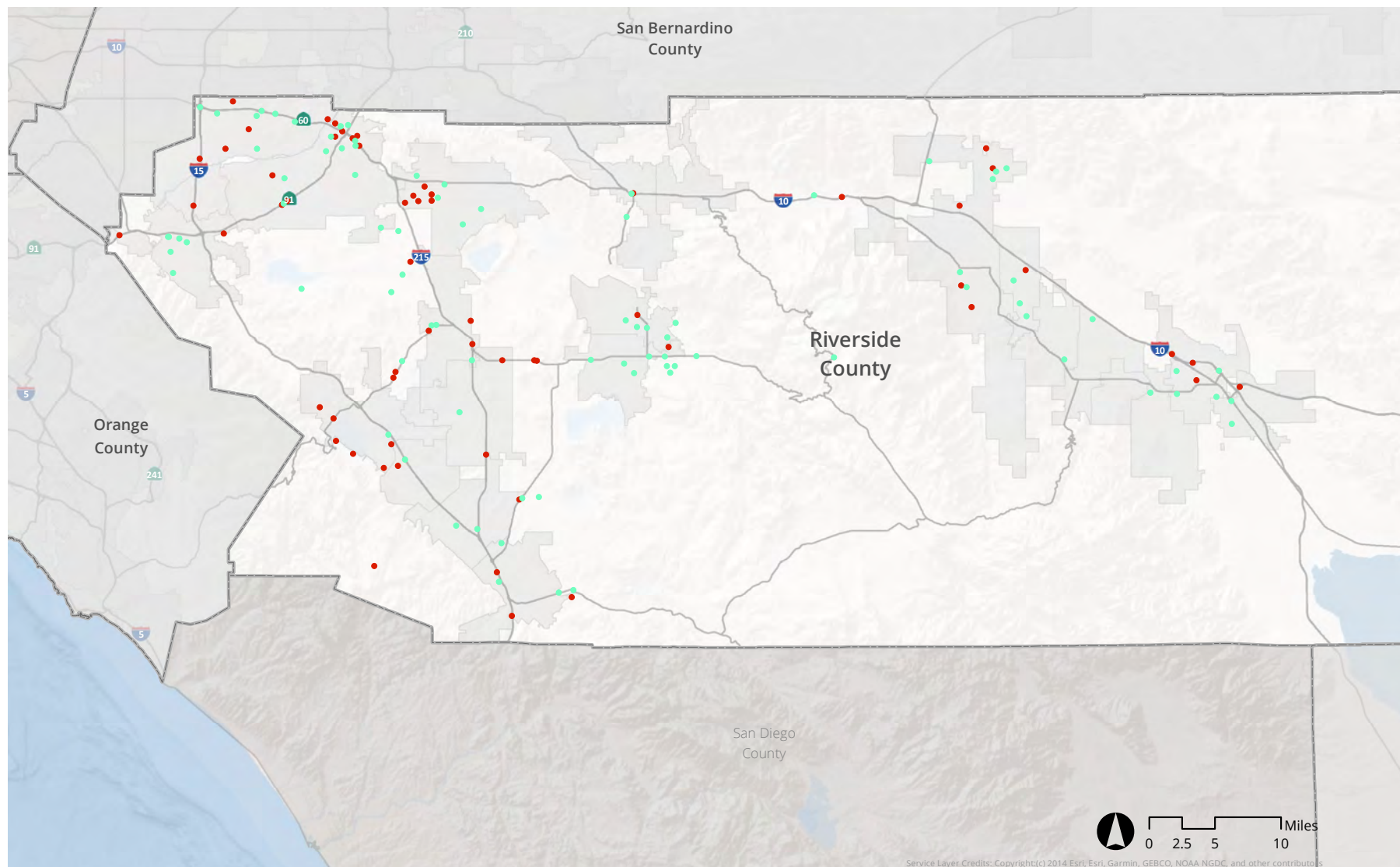


- County Boundaries
- City Boundaries
- Freeway
- Riverside County 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

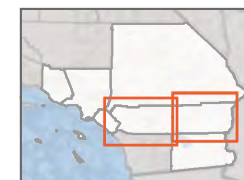


Map 3: Riverside County, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions

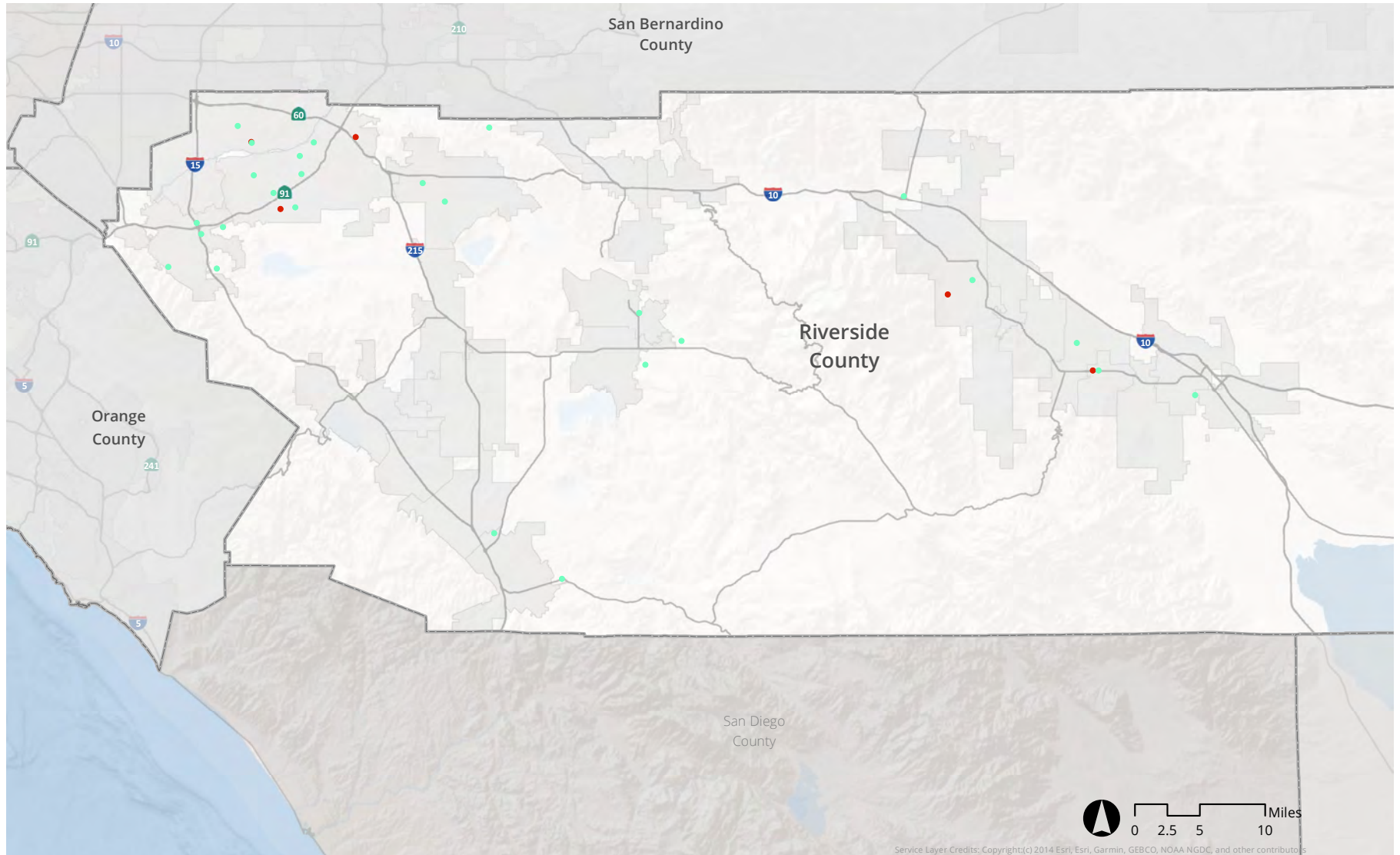


- County Boundaries
- City Boundaries
- Freeway
- Riverside County 2019 Pedestrian-Involved Fatal Collisions
- Riverside County 2019 Pedestrian-Involved Serious Injury Collisions




Source: SCAG, SWITRS, TIMS



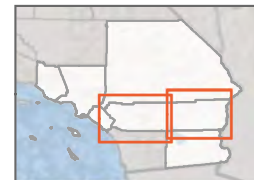
Map 4: Riverside County, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions



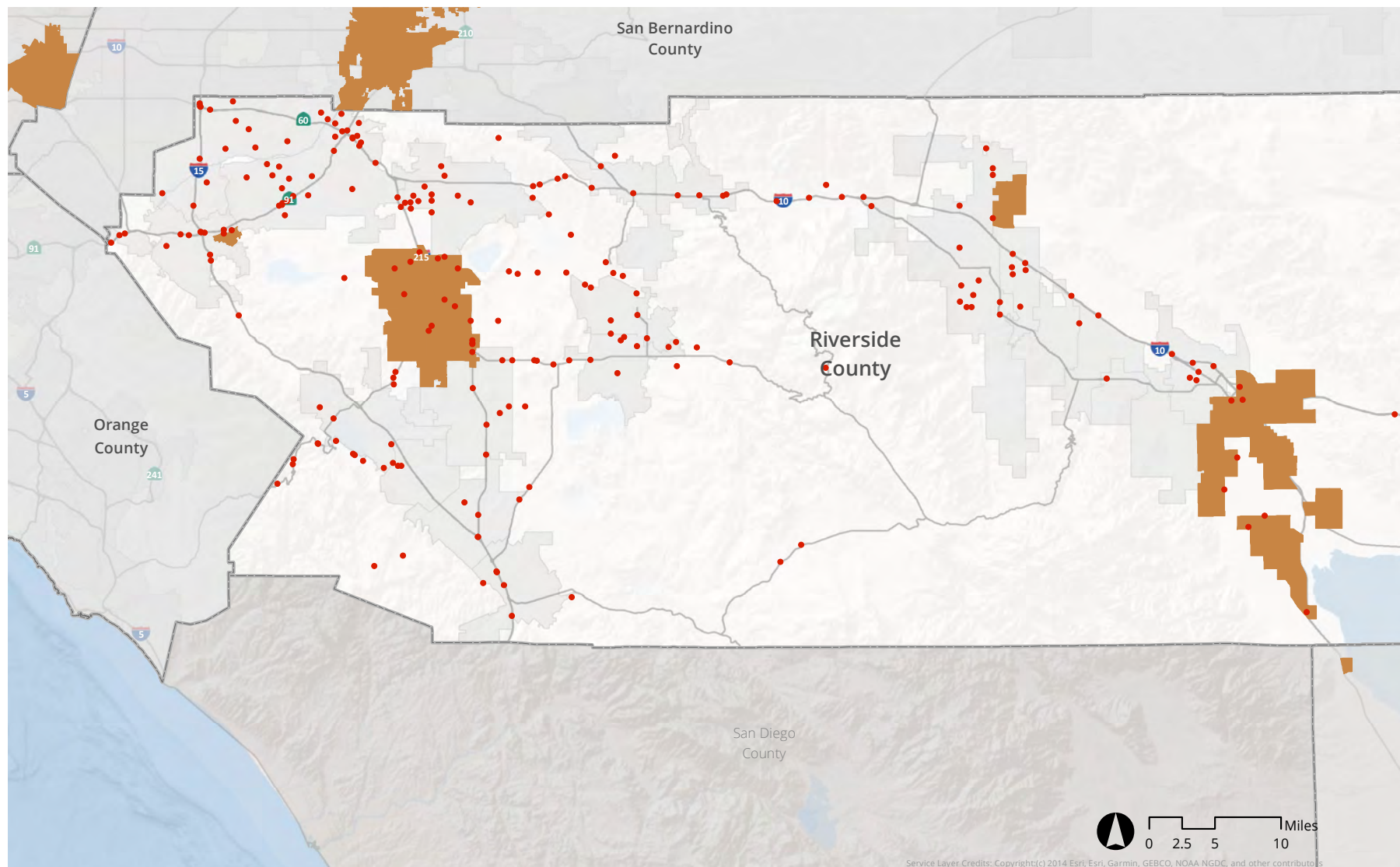
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-  County Boundaries
-  Riverside County 2019 Bicyclist-Involved Fatal Collisions
-  City Boundaries
-  Riverside County 2019 Bicyclist-Involved Serious Injury Collisions
-  Freeway

Source: SCAG, SWITRS, TMS

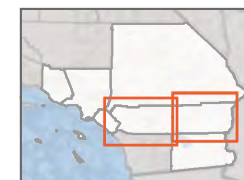


Map 5: Riverside County, 2019 Fatal Collisions in Communities of Concern

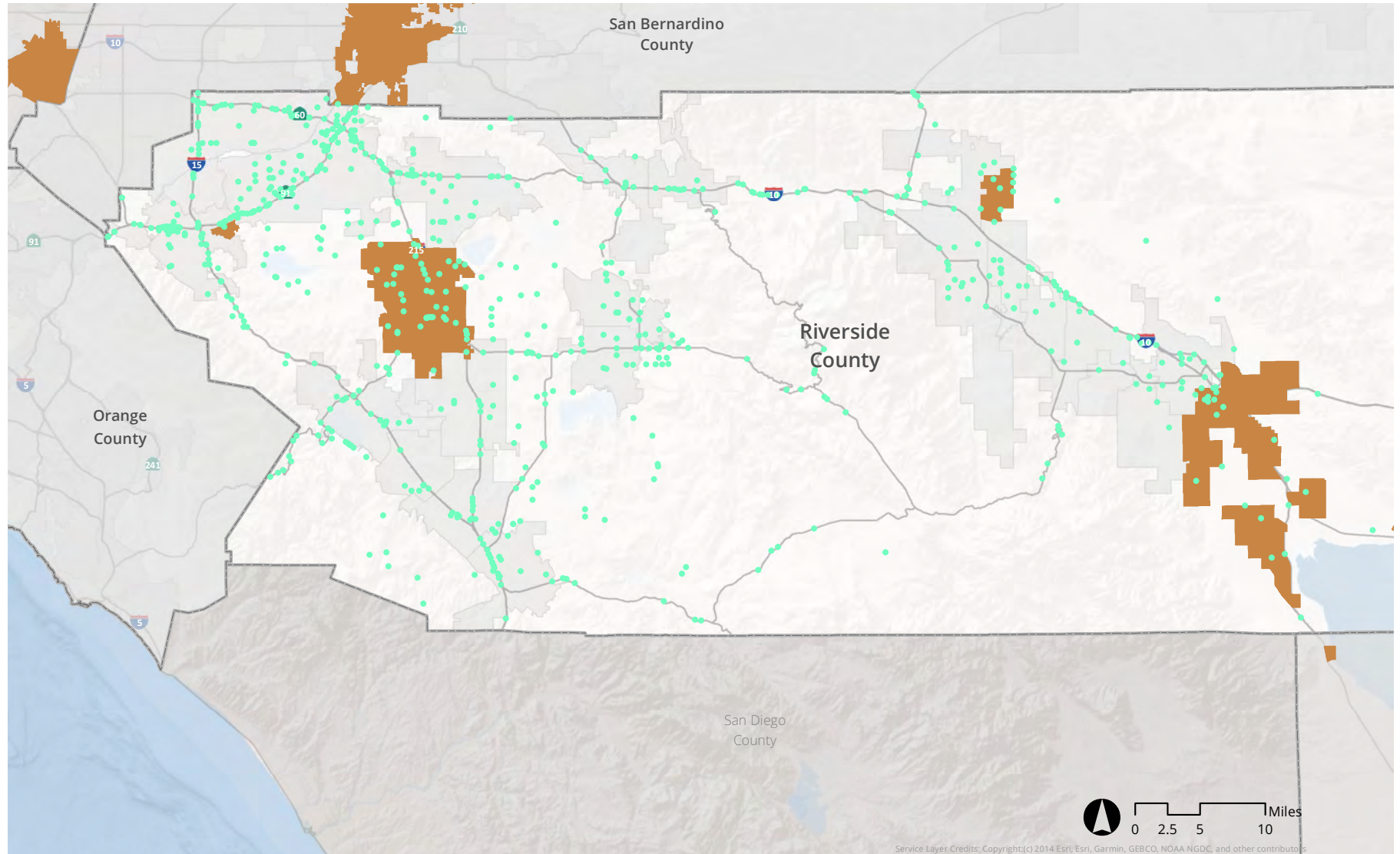


- County Boundaries
- Communities of Concern
- City Boundaries
- Riverside County 2019 Fatal Collisions
- Freeway

Source: SCAG, SWITRS, TIMS

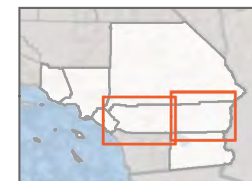


Map 6: Riverside County, 2019 Serious Injury Collisions in Communities of Concern

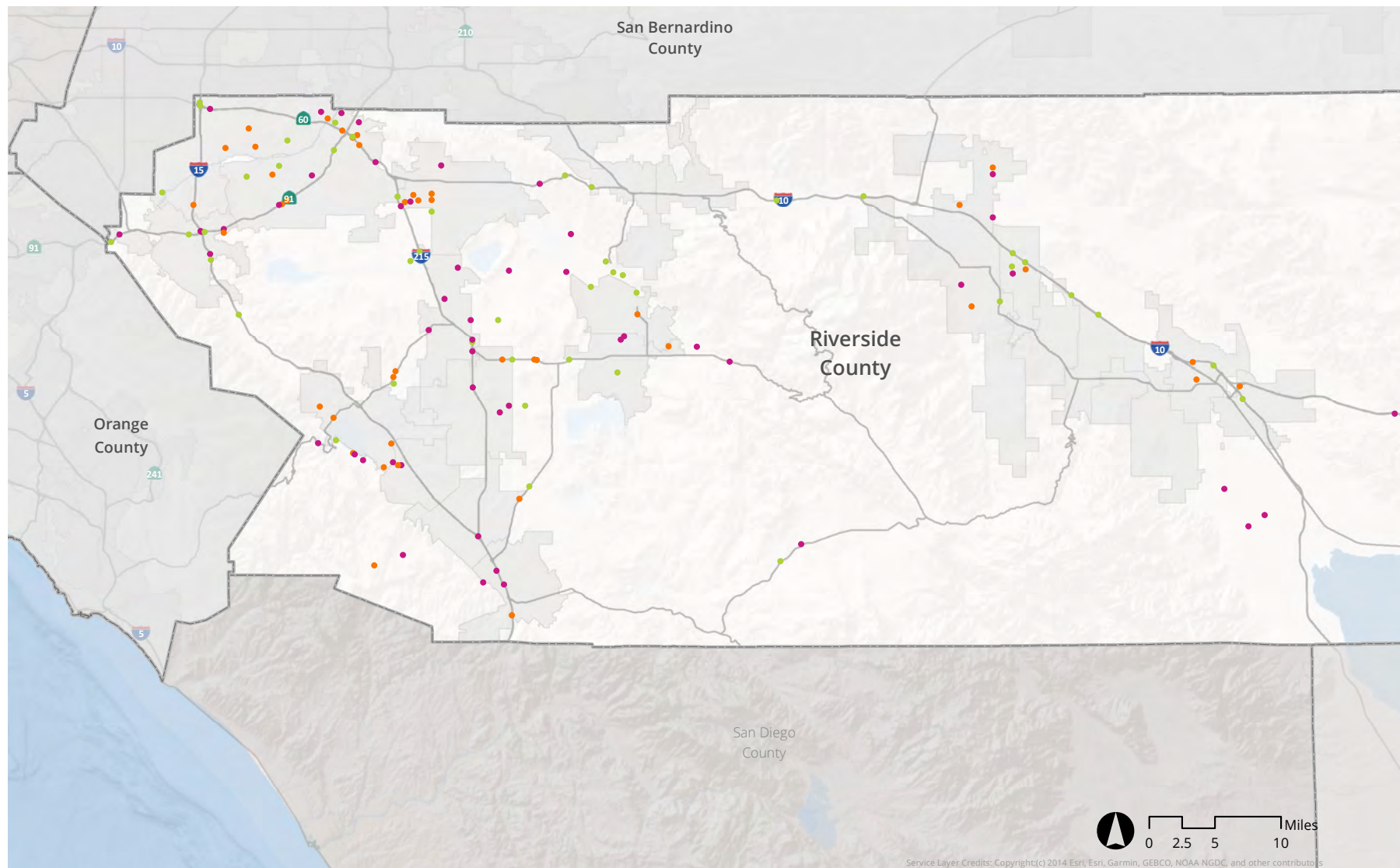


- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- Riverside County 2019 Serious Injury Collisions

Source: SCAG, SWITRS, TIMS

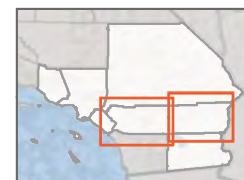


Map 7: Riverside County, 2019 Primary Collision Factors of Fatal Collisions



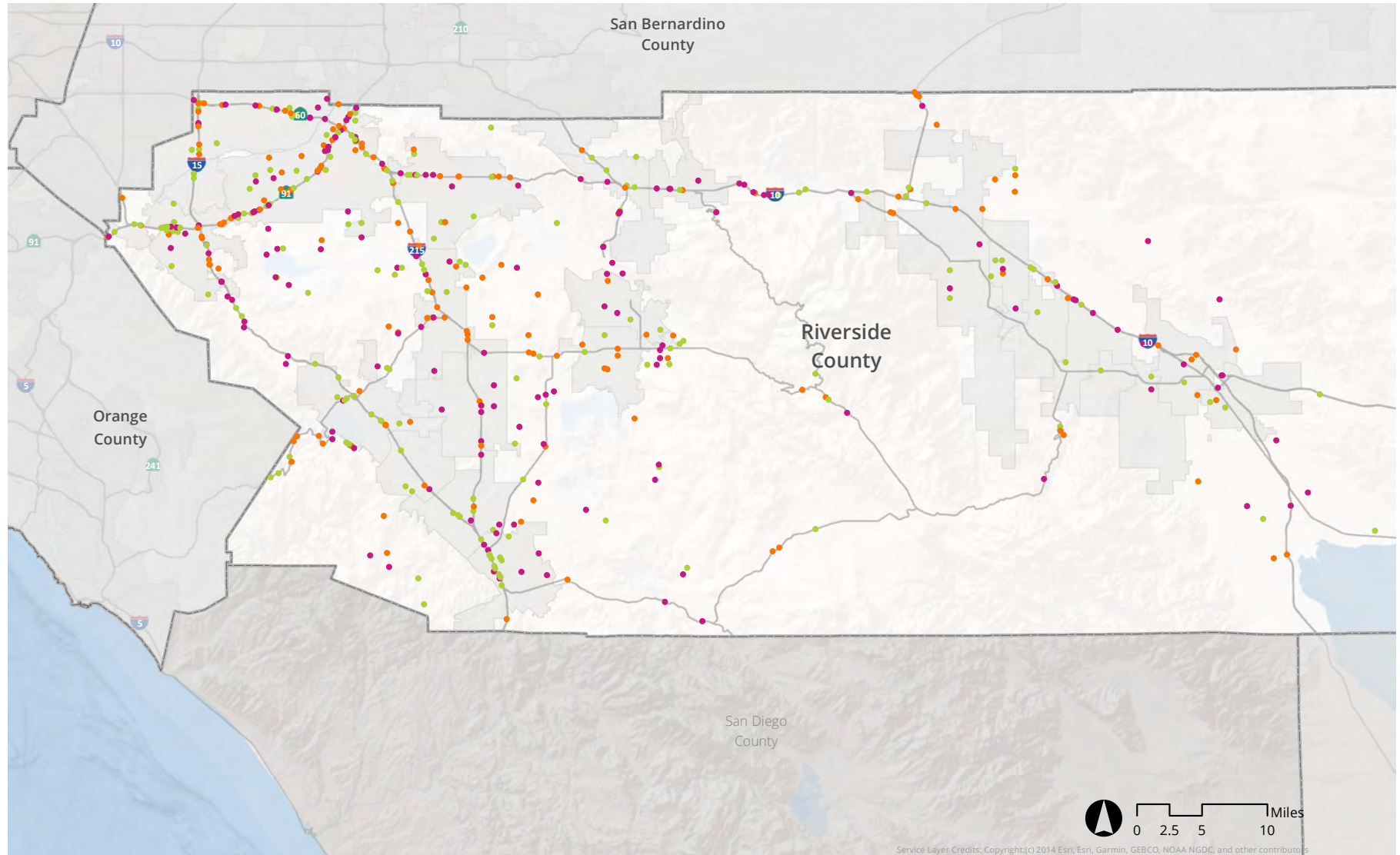
- County Boundaries
- City Boundaries
- Freeway
- Driving or Bicycling Under The Influence of Alcohol or Drug
- Improper Turning
- Pedestrian Violation

Source: SCAG, SWITRS, TIMS



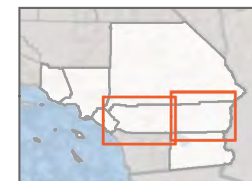
Service Layer Credits: Copyright(c) 2014 Esri, Esri, Garmin, GEBCO, NOAA NGDC, and other contributors

Map 8: Riverside County, 2019 Primary Collision Factors of Serious Injury Collisions

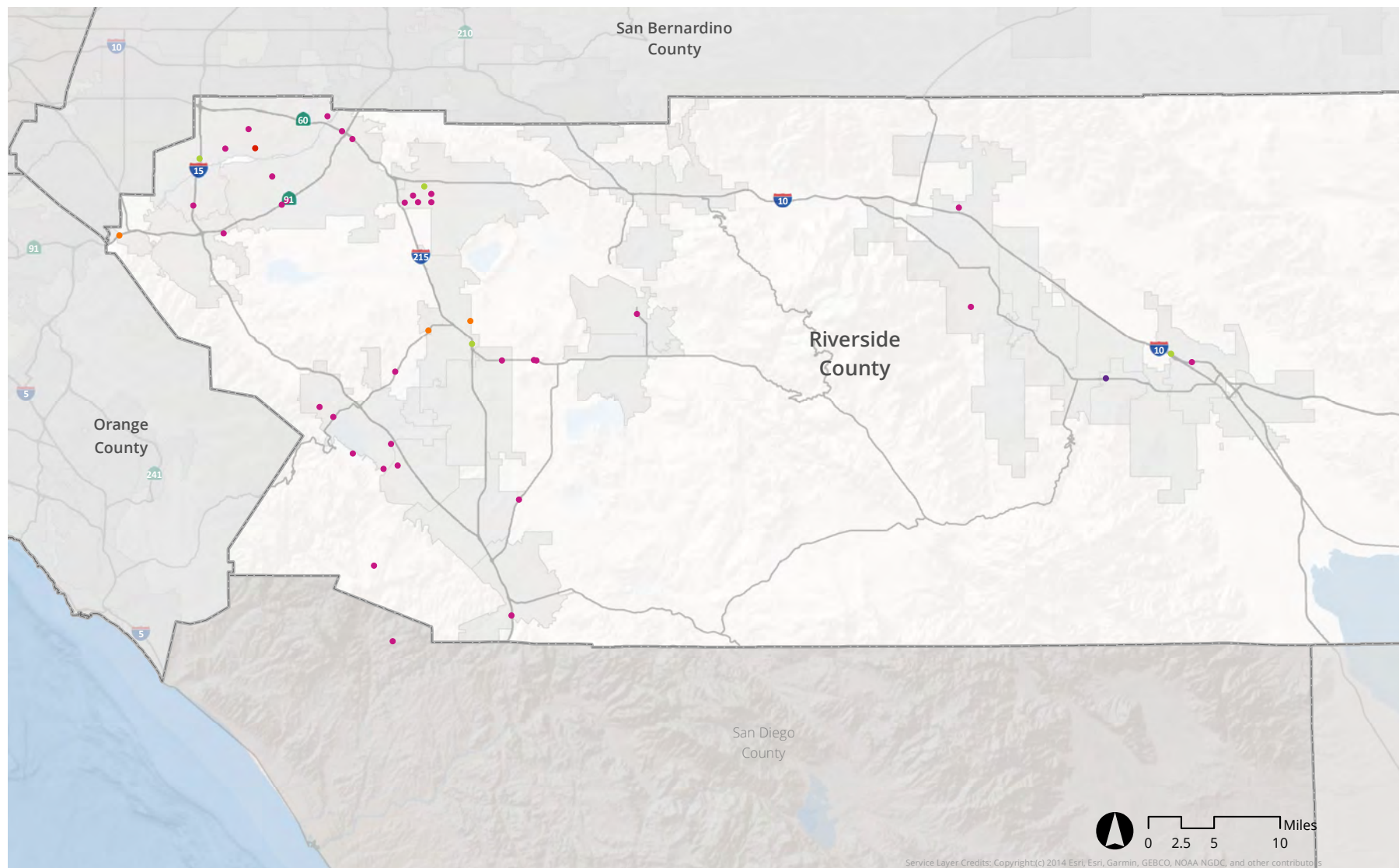


- County Boundaries
- City Boundaries
- Freeway
- Driving or Bicycling Under the Influence of Alcohol or Drug
- Unsafe Speed
- Improper Turning

Source: SCAG, SWITRS, TIMS

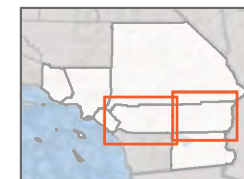


Map 9: Riverside County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions

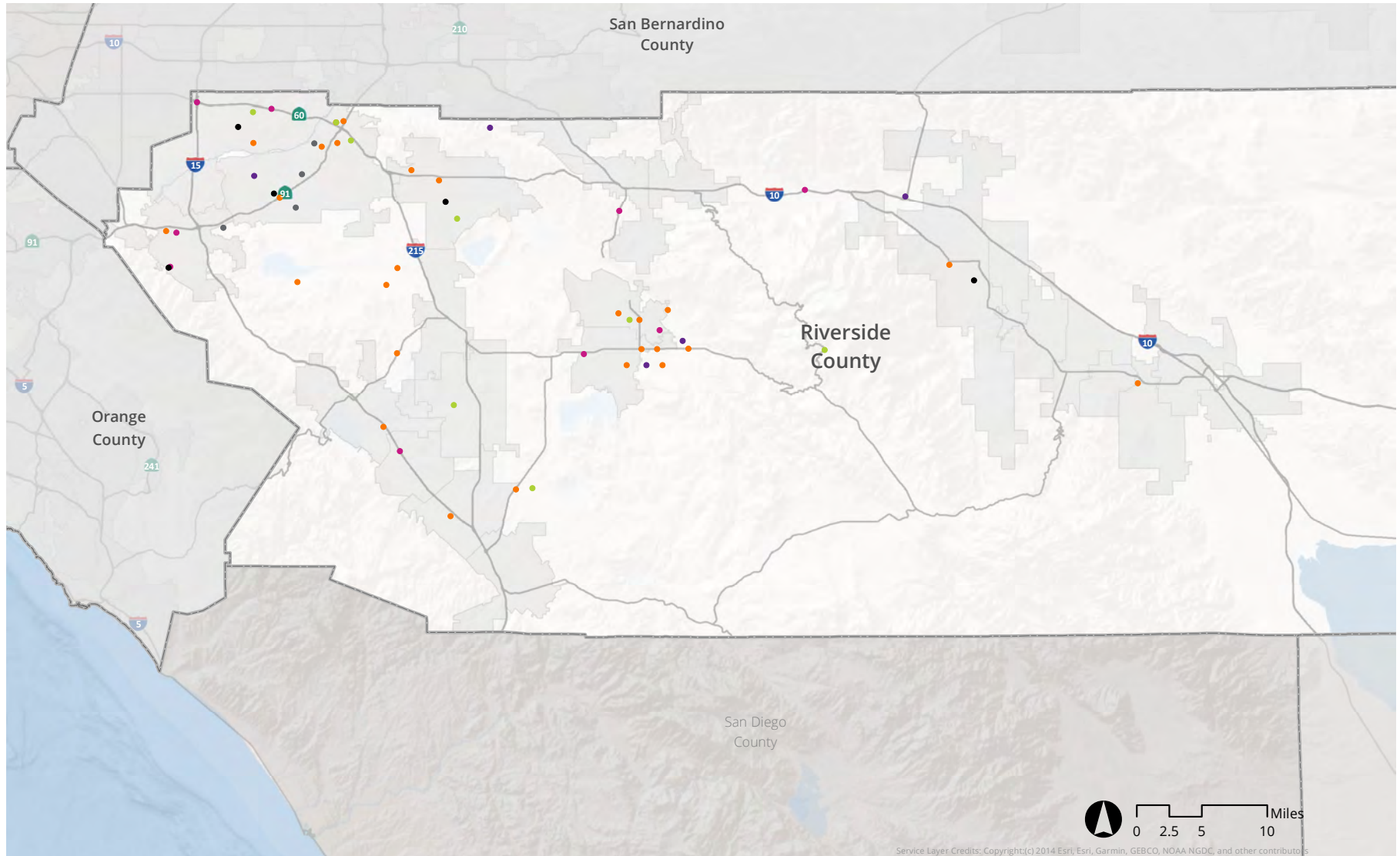


- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Fatal Collisions | Primary Collision Factors of Bicyclist-Involved Fatal Collisions |
| City Boundaries | Pedestrian Violation | Unsafe Speed |
| Freeway | Unknown | Wrong Side of the Road |
| | Driving or Bicycling Under the Influence of Alcohol or Drugs | Unsafe Lane Change |
| | | Pedestrian Violation |

Source: SCAG, SWITRS, TIMS



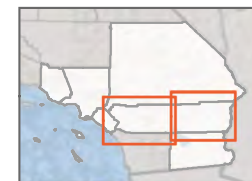
Map 10: Riverside County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



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- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions |
| City Boundaries | Unsafe Speed | Unsafe Speed |
| Freeway | Pedestrian Right of Way | Wrong Side of Road |
| | Pedestrian Violation | Traffic Signals and Signs |

Source: SCAG, SWITRS, TIMS





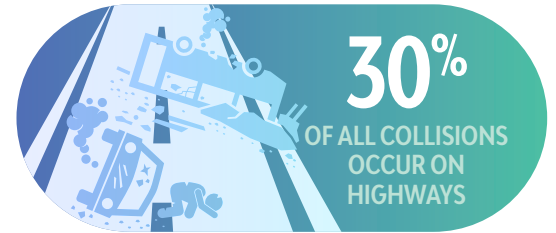


REGIONAL EXISTING CONDITIONS

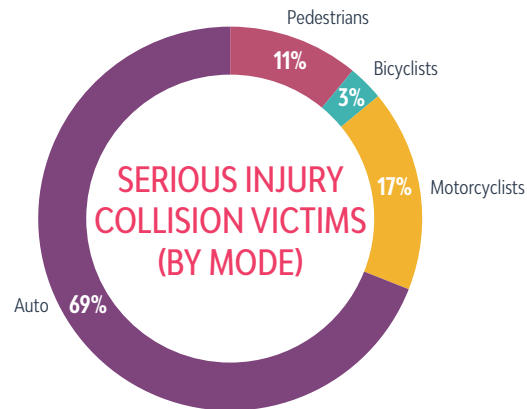
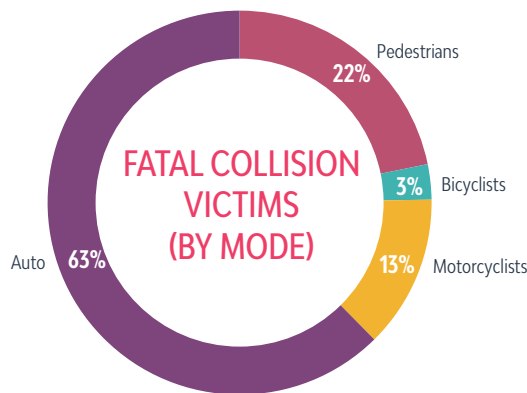
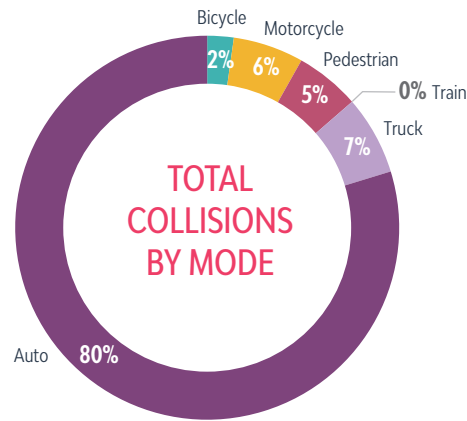
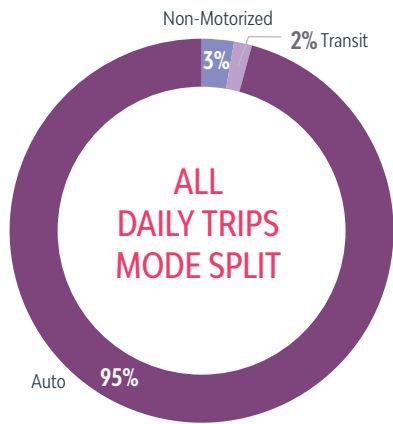
San Bernardino
County

San Bernardino County

BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



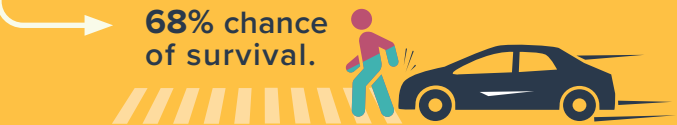
Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





REGIONAL EXISTING CONDITIONS

San Bernardino County

San Bernardino County borders the counties of Inyo (north), Kern (northwest), Los Angeles (west), Orange (southwest), and Riverside (south). It contains 20,056 square miles of land, making it the largest county in the region. Approximately 2.2 million people call it home. Residents of San Bernardino County drive an average of 10,500 miles each year.

WHAT ARE THE OVERALL TRENDS?

On average more than 275 people die in traffic collisions, nearly 750 people are seriously injured, and almost 13,000 people are injured each year in San Bernardino County. Over the past decade, San Bernardino County experienced a sharp increase in fatal and serious injury victims, as observed in [Figures 1 and 2](#). The number of fatal victims peaked in 2017 at nearly 350, and although fatal victims mildly declined over the past three years, they have not dipped below 300 since 2016. Serious injury victims dramatically increased since 2009 from their lowest in 2014 (605), to a peak of over 1,050 in 2019. [Maps 1 and 2](#) reflect the locations of all collisions resulting in a fatality or serious injury in San Bernardino County in 2019.

About 76 percent of those killed were in vehicles or on motorcycles, while the other 24 percent of fatal victims were walking or biking. Of the roughly 276 fatal collisions occurring annually, about 68, or one in four, were active transportation collisions. The number of fatal active transportation victims have remained fairly constant over the years.

[Figure 3](#) reflects the total numbers of pedestrian fatal and serious injury victims from 2009 to 2020. Since 2009, pedestrian fatal and serious injury victims have steadily increased. Pedestrian fatal victims have nearly tripled from their lowest in 2010 (33) to a peak of 87 in 2018. [Map 3](#) highlights all of the pedestrian-involved serious injury and fatal collisions that occurred in San Bernardino County in 2019.

[Figure 4](#) reflects bicyclist fatal and serious injury victims between 2009 to 2020. Bicyclist fatal and serious injury victims did not illustrate clear or distinct trends. Bicyclist fatal victims peaked in 2013 (12), while 2015 experienced the lowest number (two). Similarly, bicyclist serious injury victims peaked in 2012 (32), doubling from their lowest in 2009 at 16. [Map 4](#) highlights all of the bicyclist-involved collisions resulting in a fatality or serious injury that occurred in San

Bernardino County in 2019.

Figure 5 shows the historical rates of fatal and serious injury victims per 1,000 people over the last decade from 2010 to 2020. Both the rates of fatal and serious injury victims followed relatively similar trends as **Figures 1 and 2**, despite normalizing by population, suggesting that population change did not impact these numbers. Similarly, normalizing by vehicle miles traveled (VMT) reveals similar trends to non-normalized numbers, where total fatal and serious injury victims trended upward (**Figures 6 and 7**).

However, when VMT per capita is considered, trends remained relatively consistent from 2010 to 2020. Considering VMT generally rose from 58 million daily VMT in 2009 to 62 million VMT in 2019, these differences in the VMT per capita indicate that changes in the population positively correlated to the number of VMT generated. There may be a variety of reasons that lead to shifts or changes in any of the indicators (i.e., fatalities, serious injuries, VMT, or population) not restricted to and including transportation technology changes, changing demographics, saturated highways, and/or preferences for living in more compact neighborhoods that reduce the need for driving. Overall, VMT per capita has remained relatively stable, at an average of about 10,500 VMT per capita.

WHERE ARE COLLISIONS OCCURRING?

In San Bernardino County, the majority of fatal and serious injury collisions occurred in urbanized areas: about 60 percent of all fatal collisions and 62 percent of serious injury collisions occurred in urbanized areas. For reference, nearly 88 percent of the County's population live in urbanized areas, although these areas constitute less than 3 percent of the total area in San Bernardino County. Over 7 percent of the overall population lives in urban clusters despite making up less than 1 percent of the total area. Just under 5 percent of the County's population lives in rural areas, which make up nearly 97 percent of the

total area. All bicyclist-involved fatal collisions occurred in urbanized areas, and the overwhelming majority of pedestrian-involved fatal collisions occurred in urbanized areas at 80 percent. **Maps 1-4** display collisions (by mode) resulting in fatalities and serious injuries, highlighting their concentrations in the urbanized areas of San Bernardino County in 2019.

San Bernardino County includes an extensive roadway network consisting of 459 highway centerline miles, 1,893 arterial centerline miles, 1,960 arterial centerline miles, 7,487 collector centerline miles, and 11,798 local road centerline miles. Local roads account for nearly 64 percent of all roadways in terms of mileage within San Bernardino County. San Bernardino County is also home to 104 miles of Class I bikeways, 308 miles of Class II bikeways, and 122 miles of Class III bikeways.

In 2019, 53 percent of fatal collisions across all modes occurred on local roads, while 19 percent occurred on arterials, and 28 percent on highways. Of total serious injury collisions, 50 percent occurred on local roads, while 15 percent occurred on arterials, and 35 percent on highways.

In the same year, 50 percent of pedestrian-involved fatal collisions occurred on local roads, 24 percent on arterials, and 26 percent on highways. Eighty-six percent of bicyclist-involved fatal collisions occurred on local roads, 14 percent occurred on arterials, and none occurred on highways. For pedestrian-involved serious injury collisions, 74 percent occurred on local roads (with 12 percent on arterials and 14 percent on highways), while 71 percent of bicyclist-involved collisions occurred on local roads (25 percent on arterials and 4 percent on highways).

WHEN ARE COLLISIONS OCCURRING?

In San Bernardino County, across all modes, more people were killed and seriously injured from traffic collisions in the evening than any other time of day.

In 2019, the largest number of fatalities occurred in the later evening from 9:00 – 11:59pm (70 fatal collisions), followed second in number by 6:00 – 8:59pm (58 fatal collisions) as highlighted in [Figure 8](#). As illustrated in [Figure 9](#), serious injury collisions peaked during the evening rush hour from 3:00 – 5:59pm (200 serious injury collisions).

When examining trends by time of day for pedestrian-involved collisions, the majority of pedestrian fatal collisions (60 percent) occurred during the evening when visibility is lower ([Figure 10](#)). In 2019, there were 48 pedestrian-involved fatal collisions from 6:00 – 11:59pm, again, when visibility is lower, while just one pedestrian-involved fatal collision occurred during the late morning from 9:00 – 11:59am. [Figure 11](#) reflects that there was not a distinctive pattern in 2019 for the time of day of bicyclist-involved fatal collisions, in part due to the small dataset. Bicyclist-involved serious injury collisions occurred more frequently during the evening hours.

By day of week, fatal collisions across all modes remained relatively steady over the course of the week, while serious injury collisions were highest over the weekend. Both the number of fatal and serious injury collisions peaked on Saturday at 57 fatal collisions and 198 serious injury collisions, respectively ([Figures 12](#)). As highlighted in [Figure 13](#), there were significantly more pedestrian-involved fatal collisions on Saturday (21), closely followed by Tuesday (19), than any other day of the week. Just three pedestrian-involved fatal collisions occurred on Mondays in 2019, in total. Pedestrian-involved serious injury collisions slowly increased over the course of the week, resulting in the largest number of pedestrian-involved serious injury collisions that occurred on the weekend. On the other hand, more bicyclist-involved fatal collisions occurred at the beginning of the work week, while no bicyclists were killed over the weekend or on Thursday, as seen in [Figure 14](#). There was no clear trend for bicyclist-involved serious injury collisions by day of week in 2019.

Across all modes, on average, there were 27 fatal and 88 serious injury collisions

per month in San Bernardino County in 2019 ([Figure 15](#)). Fatal collisions peaked in November (44), potentially because of Daylight Savings Time impacting daylight and visibility during typical commutes. [Figure 16](#) displays the fatal and serious injury collision trends for pedestrians by month. Pedestrian-involved fatal collisions peaked in November (15), similar to the broader fatality trends across all modes. There was no distinctive pattern for bicyclist-involved fatal and serious injury collisions over the months as illustrated in [Figure 17](#).

WHO IS BEING HURT?

In San Bernardino County, out of all the fatal collision victims that occurred from 2009 to 2020, pedestrians and bicyclists accounted for about 25 percent of all fatal collision victims, disproportionately higher than the 3 percent of daily trips that were made via walking or biking.

Three times more men died in traffic collisions than women in 2019. Across all modes, 71 percent of fatal victims were men (232), and men sustained serious injuries twice as often as women: nearly 700 men sustained serious injuries (66 percent of all serious injury victims). This is compared to 28 percent of women making up fatal victims (90), and compared to 343 women (33 percent) sustaining serious injuries.

As observed in [Figure 18](#), when stratified by age group, the largest number of fatal victims occurred in those ages 25-34 as compared to other age groups, in total, representing 23 percent of all fatal victims in San Bernardino County in 2019. Similarly, those ages 25-34 sustained more serious injuries than any other age group – 180 males, 80 females, and two not stated – constituting 25 percent of all serious injury victims ([Figure 19](#)). An additional 20 percent of serious injury victims occurred in the age group 18-24 years.

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), additional patterns emerge. Drivers experienced

the largest number of fatalities (183 fatalities), followed by pedestrians (83), and passengers (54). Five times as many drivers who were killed during a collision were male drivers (148) than female (32) as illustrated in [Figure 20](#). Of all men killed in traffic collisions in 2019, 64 percent were male drivers, followed by 25 percent who were male pedestrians. Of the women killed in traffic collisions, the same number of women died as the driver or as passenger, each making up 35 percent of all female fatalities, or 32 fatal victims.

Overall, male drivers constituted 45 percent of all fatal victims across gender, age, and victim status. Dissecting these factors further, male drivers between the ages of 25-34 experienced the highest number of fatalities (37) in 2019.

When broken down by race, it is evident that some people of color were disproportionately represented in fatal and serious injury victims ([Figure 21](#)). Black individuals were overrepresented in fatal and serious injury victims as compared to their proportion of the County's population: while they represent just under 8 percent of the County's population, Black individuals constituted nearly 10 percent of all fatal victims and over 10 percent of serious injury victims. Individuals categorized as Other Race/Ethnicity (here including American Indian, Alaska Native, Native Hawaiian, Pacific Islander, and those identifying as mixed race) constituted slightly more than 3 percent of the County's population, but represented nearly 6 percent of fatal victims and 5 percent of serious injury victims. Interestingly, white individuals were also overrepresented in both fatal and serious injury victims, as they represent nearly 29 percent of the County's population, but constituted 41 percent of fatal victims and nearly 38 percent of all serious injury victims.

[Maps 5](#) and [6](#) highlight the concentration of fatal and serious injury collisions that occurred in Communities of Concern in 2019.

WHY ARE COLLISIONS OCCURRING?

[Maps 7-10](#) reflect the top three contributing factors for all fatal and serious injury collisions and pedestrian- and bicyclist-involved fatal and serious injury collisions in 2019. The top three contributing factors for fatal collisions across San Bernardino County were Improper Turning (23 percent), Pedestrian Violations (19 percent), and Unsafe Speed (19 percent). For collisions resulting in serious injuries, the top three contributing factors were Unsafe Speed (24 percent), Improper Turning (22 percent) and Driving or Bicycling Under the Influence of Alcohol or Drugs (18 percent).

For pedestrian-involved fatal collisions, the top three contributing factors were Pedestrian Violations (78 percent), and Pedestrian Right of Way and Unsafe Speed tied for second (5 percent each). In general, Pedestrian Violations were the most significant contributor to pedestrian fatalities across all counties in 2019. The top three contributing factors for bicyclist-involved fatal collisions were Improper Turning and Traffic Signals and Signs tied at 43 percent, followed by Driving or Bicycling Under the Influence of Alcohol or Drugs (14 percent).

Figure 1: San Bernardino County
Total Number of Fatal Victims (2009 - 2020)

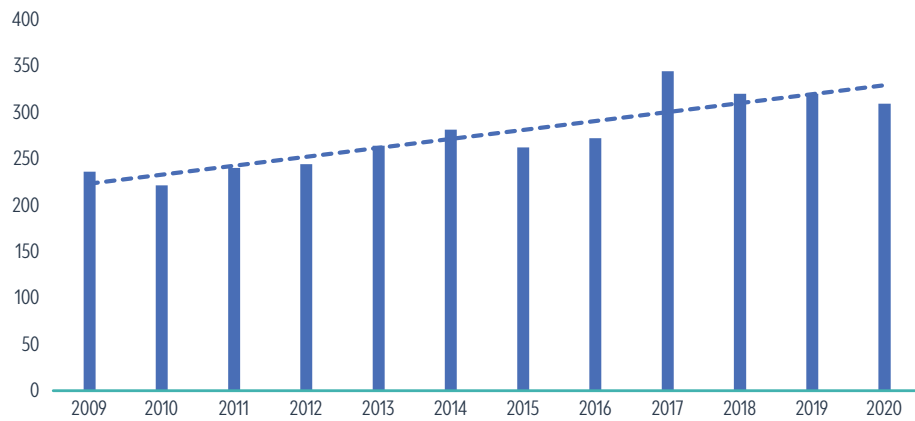


Figure 2: San Bernardino County
Total Number of Serious Injury Victims (2009 - 2020)

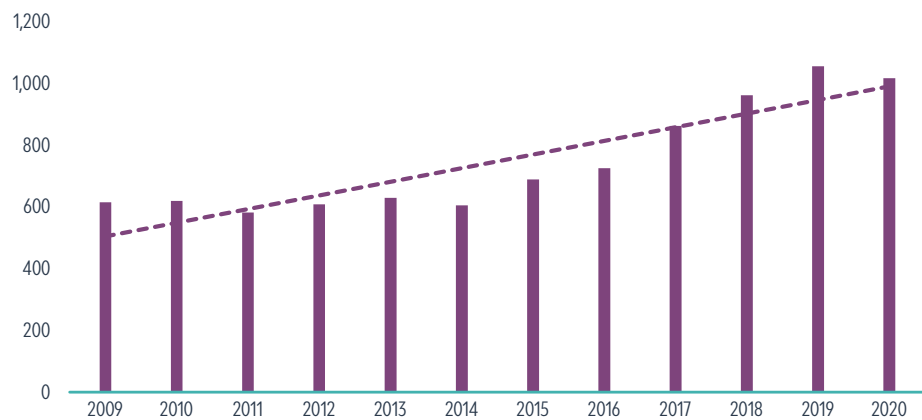


Figure 3: San Bernardino County
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

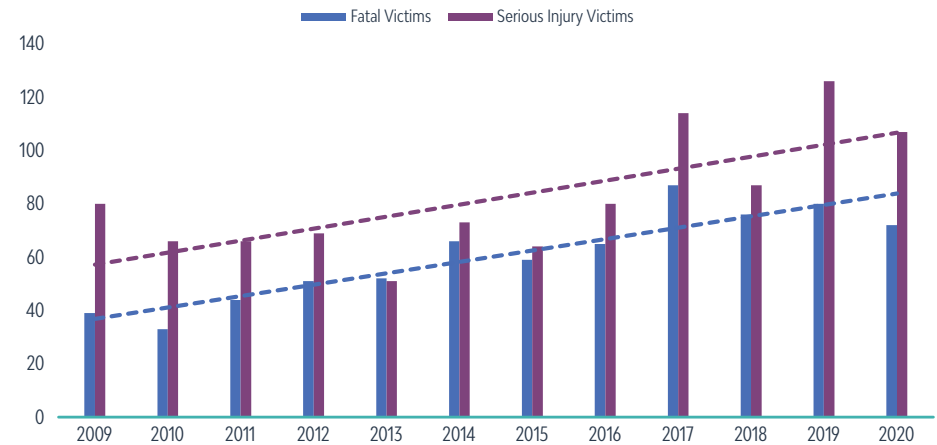


Figure 4: San Bernardino County
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)

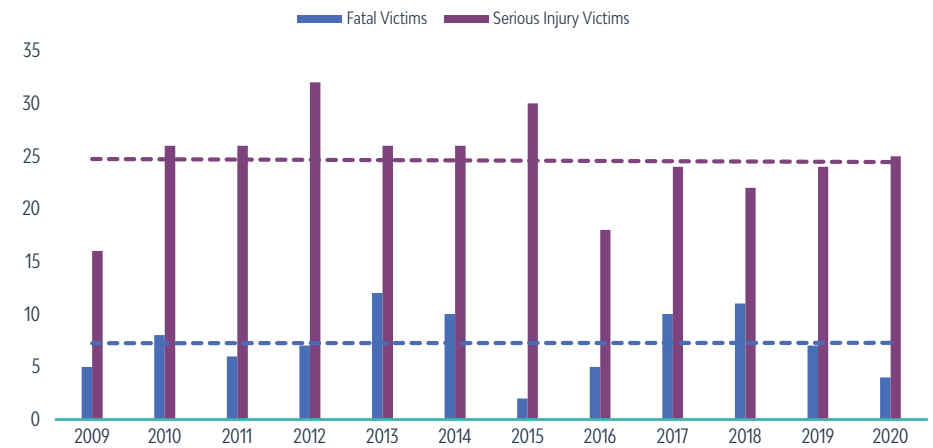


Figure 5: San Bernardino County
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

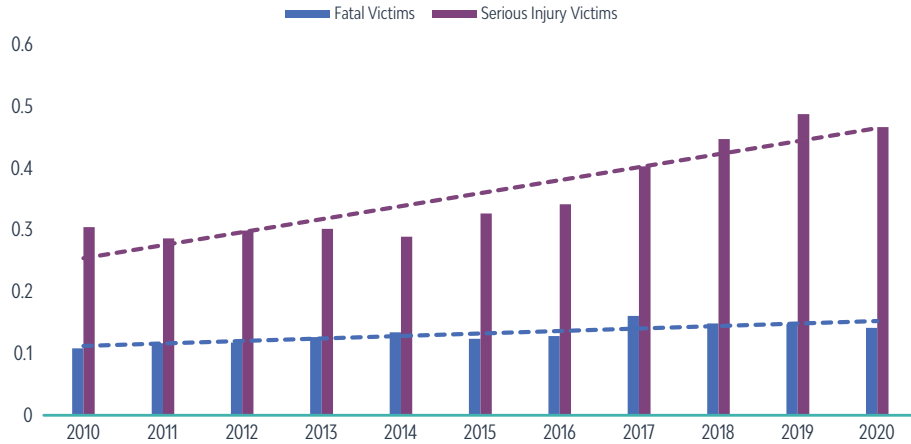


Figure 7: San Bernardino County
Total Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

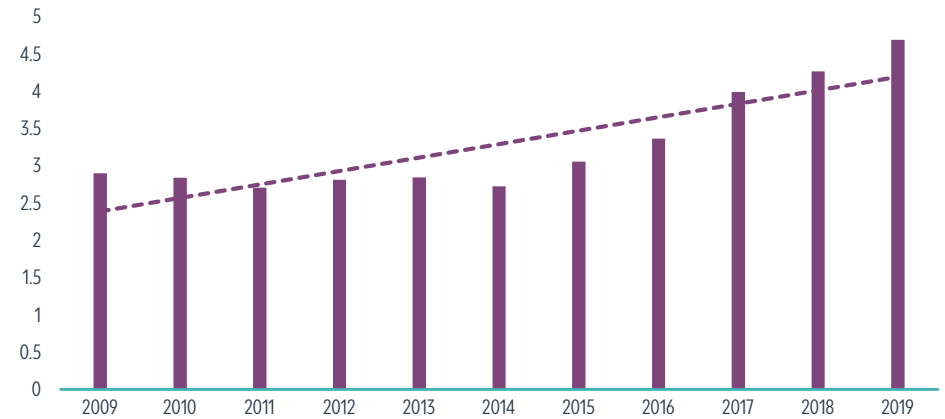


Figure 6: San Bernardino County
Total Fatal Victims, Normalized by 100M VMT (2009 - 2019)

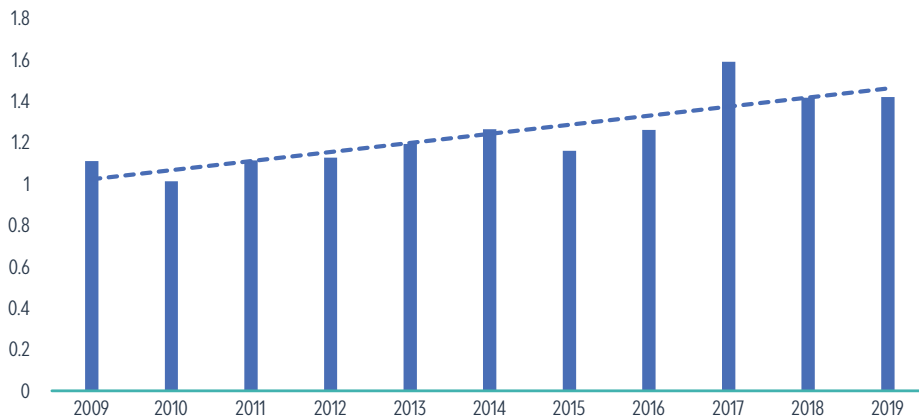


Figure 8: San Bernardino County
Fatal Collisions by Time of Day (2019)

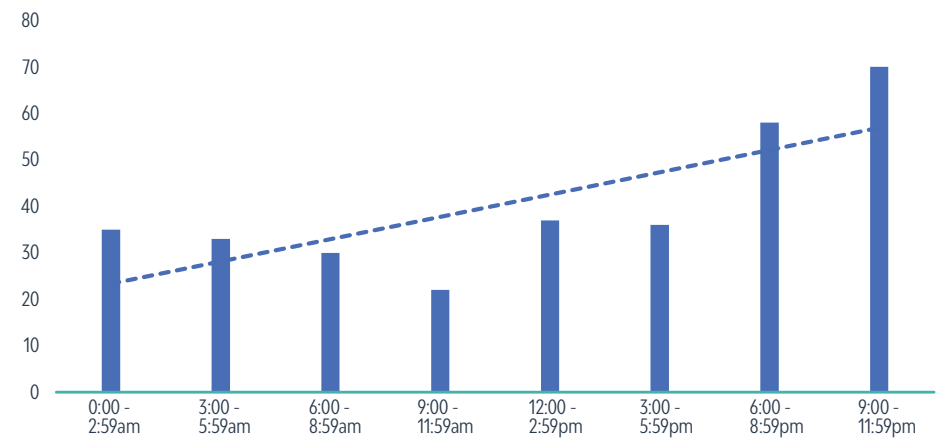


Figure 9: San Bernardino County
Serious Injury Collisions by Time of Day (2019)

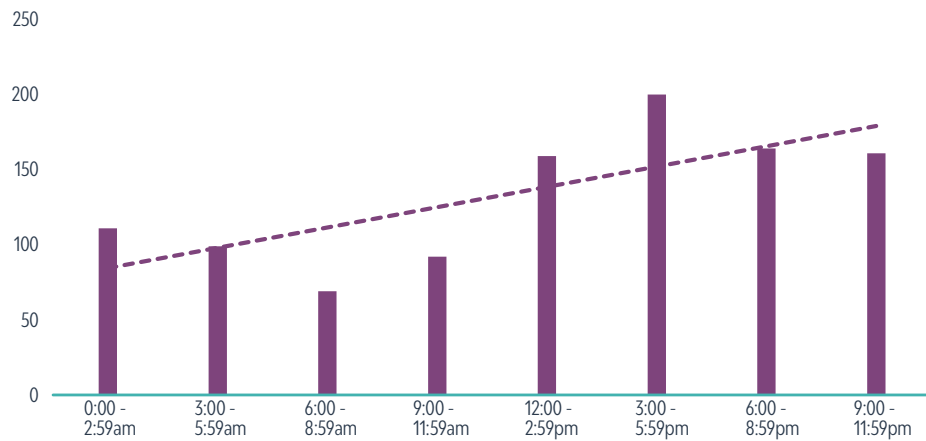


Figure 10: San Bernardino County
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

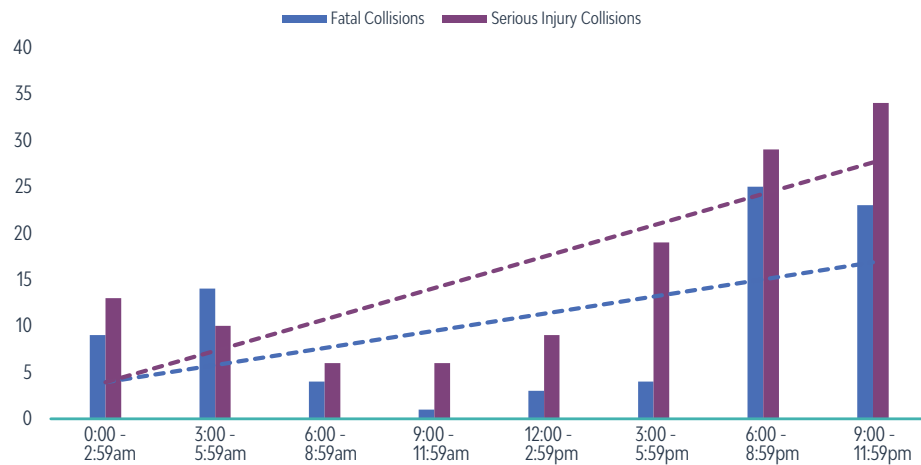


Figure 11: San Bernardino County
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

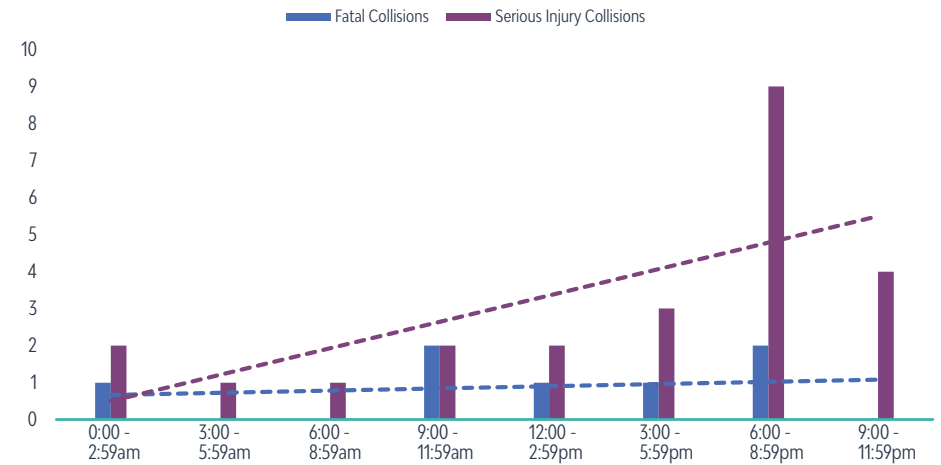


Figure 12: San Bernardino County
Fatal and Serious Injury Collisions by Day of Week (2019)

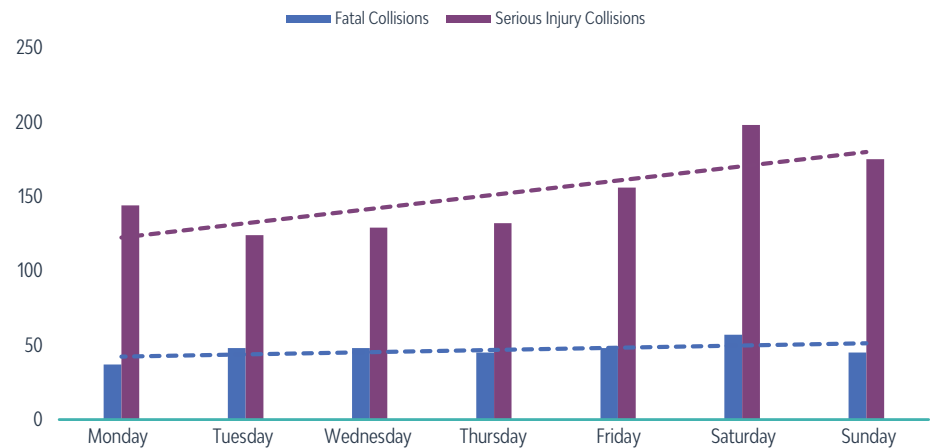


Figure 13: San Bernardino County
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

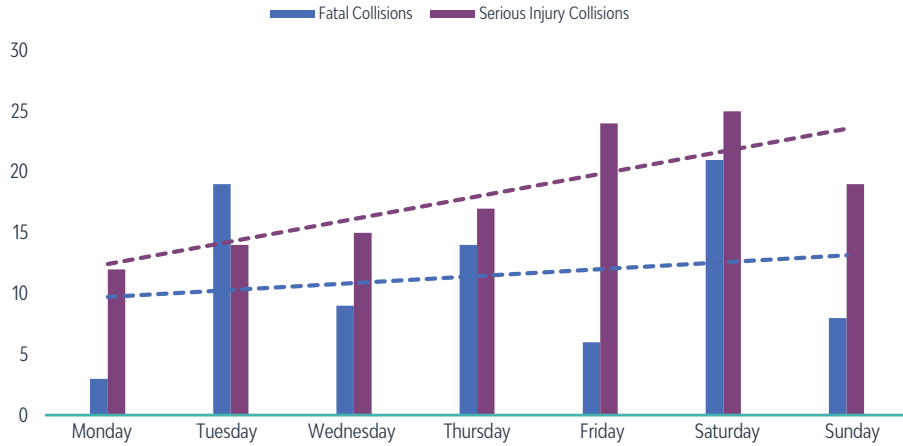


Figure 15: San Bernardino County
Fatal and Serious Injury Collisions by Month (2019)

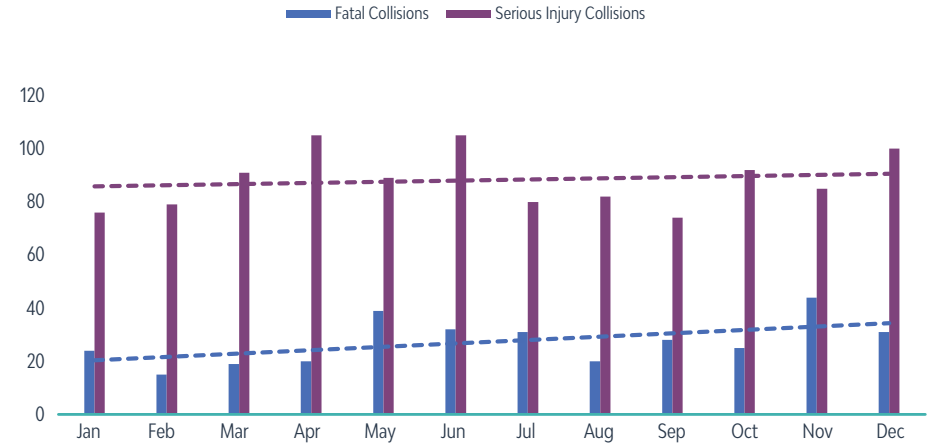


Figure 14: San Bernardino County
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

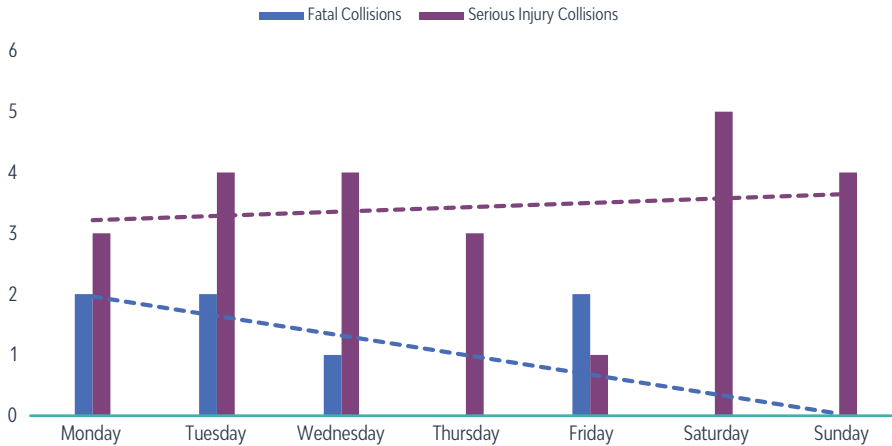


Figure 16: San Bernardino County
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

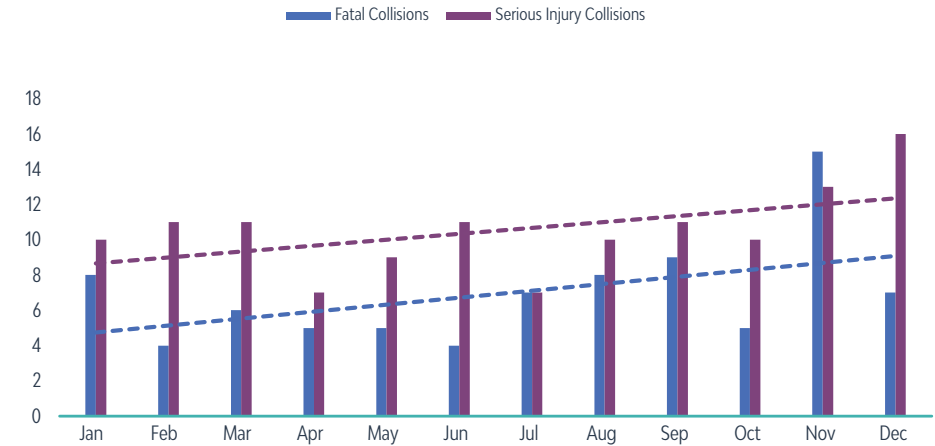


Figure 17: San Bernardino County
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

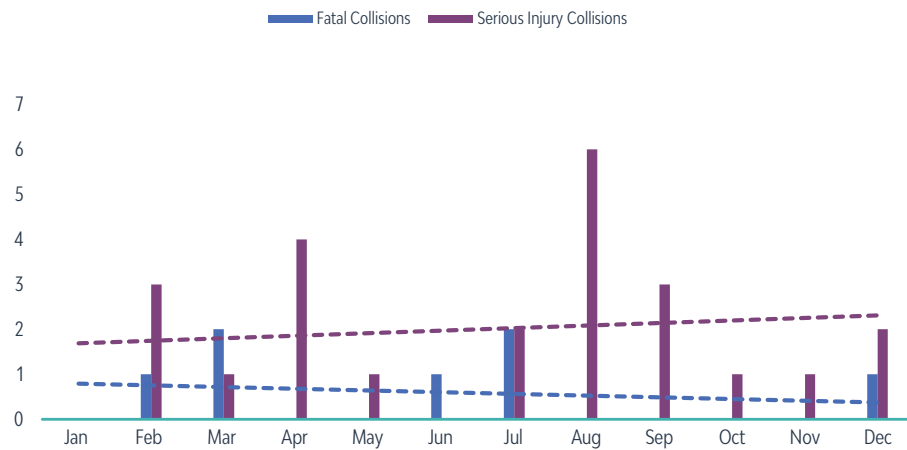


Figure 19: San Bernardino County
Serious Injury Victims by Age and Gender (2019)

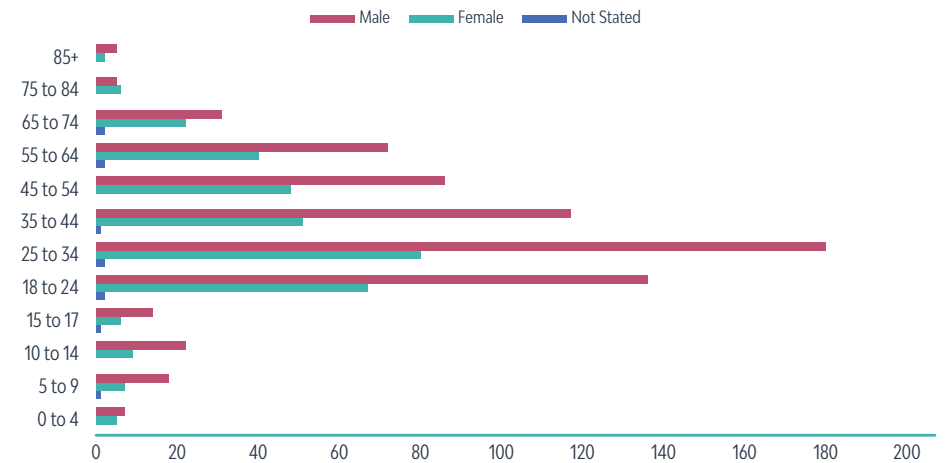


Figure 18: San Bernardino County
Fatal Victims by Age and Gender (2019)

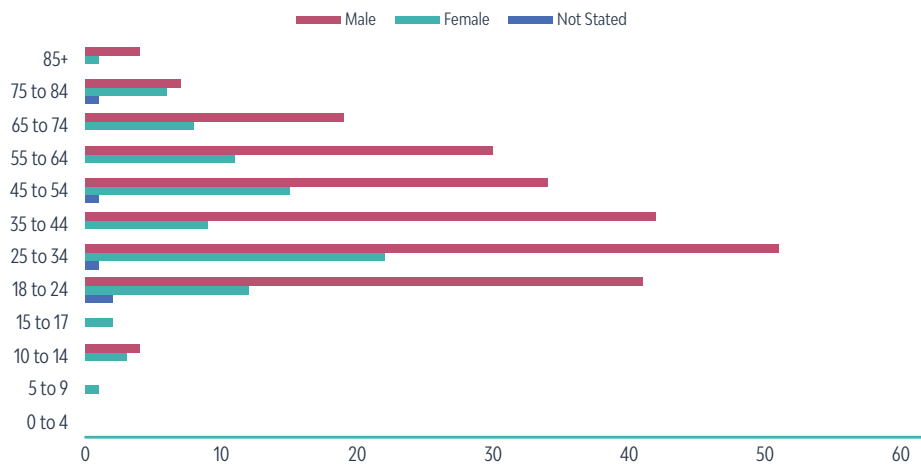


Figure 20: San Bernardino County
Fatal Victims by Involvement in Collision by Gender (2019)

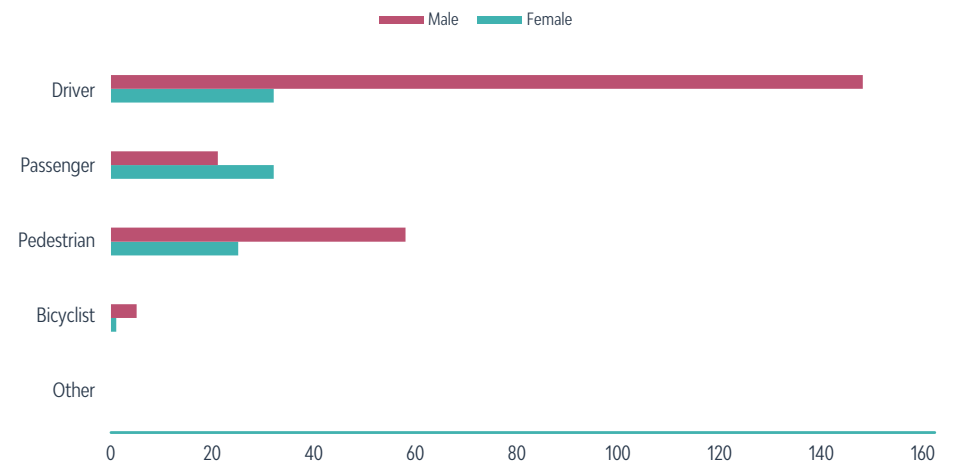
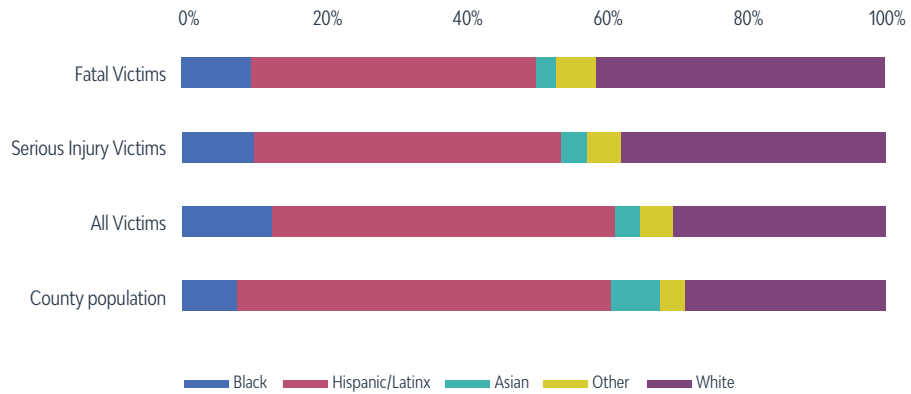
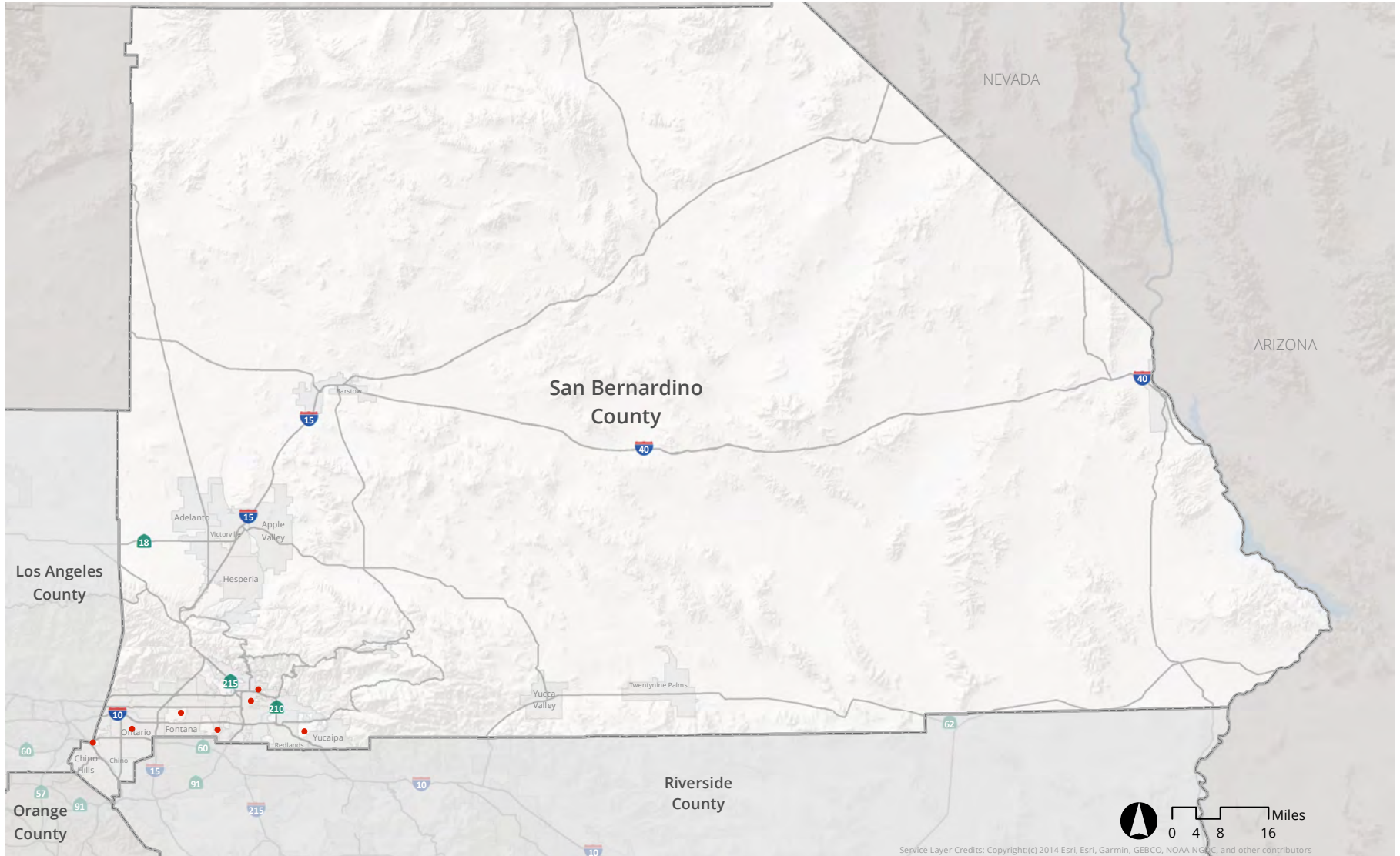


Figure 21: San Bernardino County
 Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)



Map 1: San Bernardino County, 2019 Fatal Collisions

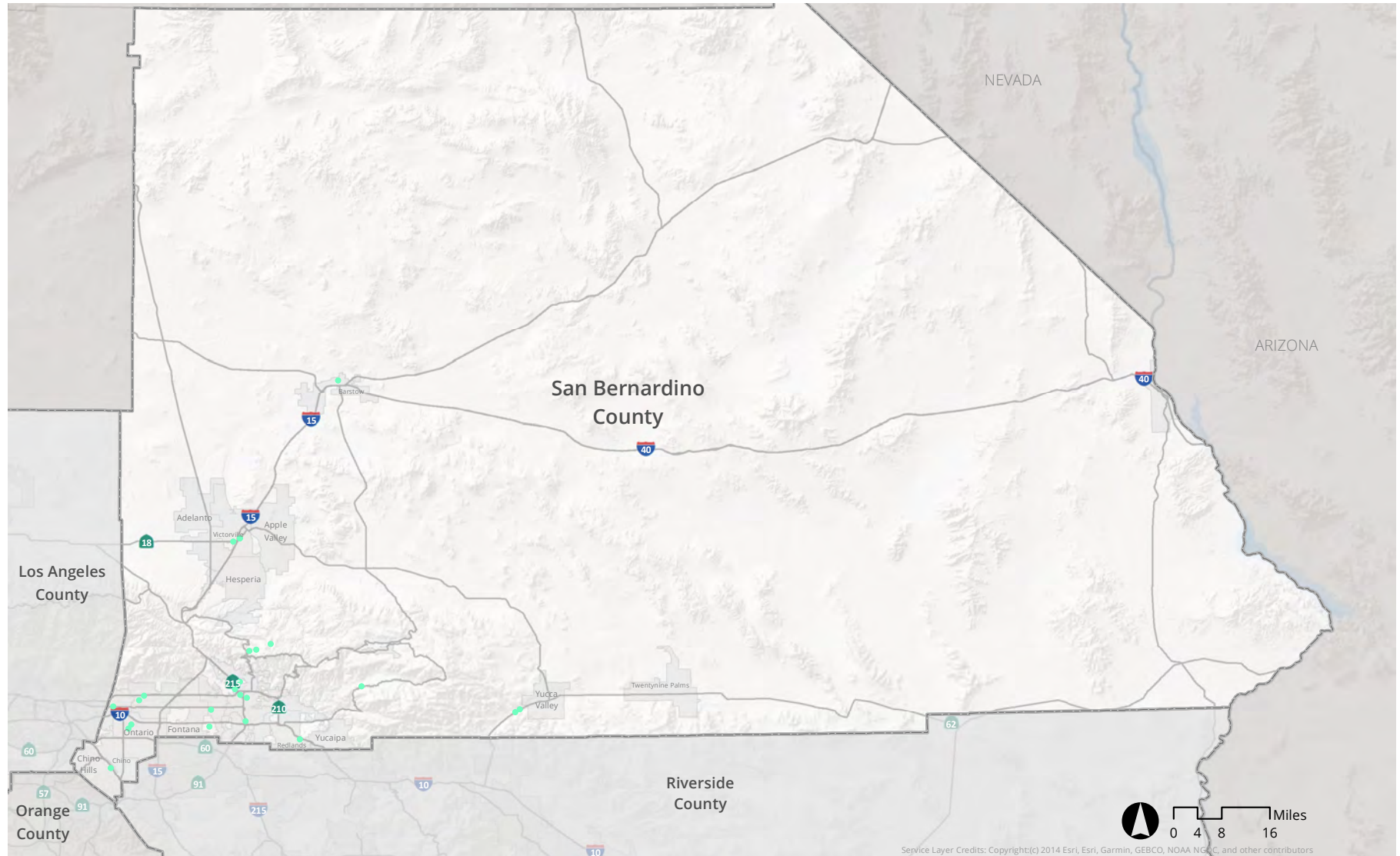


- County Boundaries
- City Boundaries
- Freeway
- San Bernardino County 2019 Fatal Collisions



Source: SCAG, SWITRS, TIMS

Map 2: San Bernardino County, 2019 Serious Injury Collisions

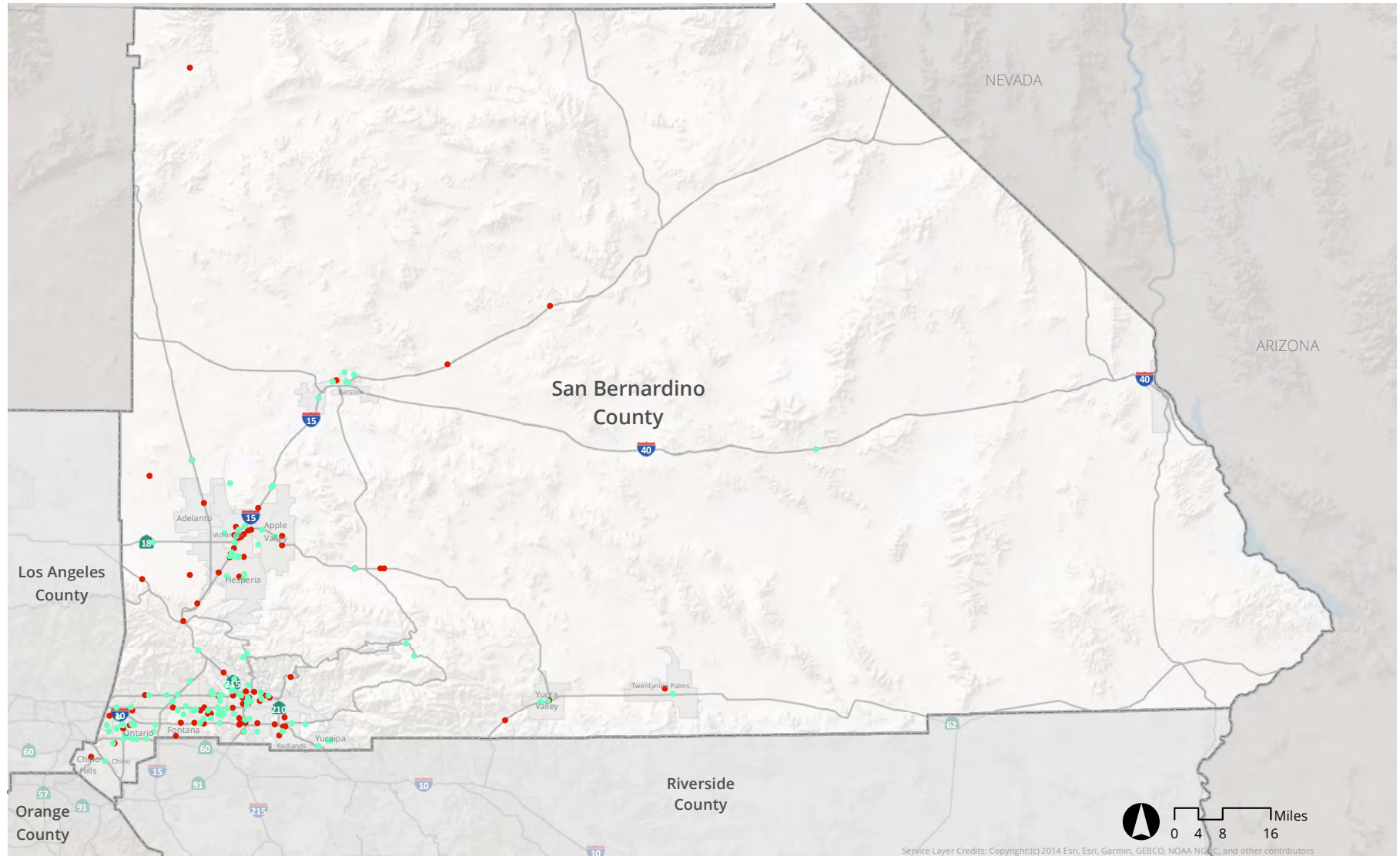


- County Boundaries
- City Boundaries
- Freeway
- San Bernardino County 2019 Serious Injury Collisions



Source: SCAG, SWITRS, TIMS

Map 3: San Bernardino County, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions

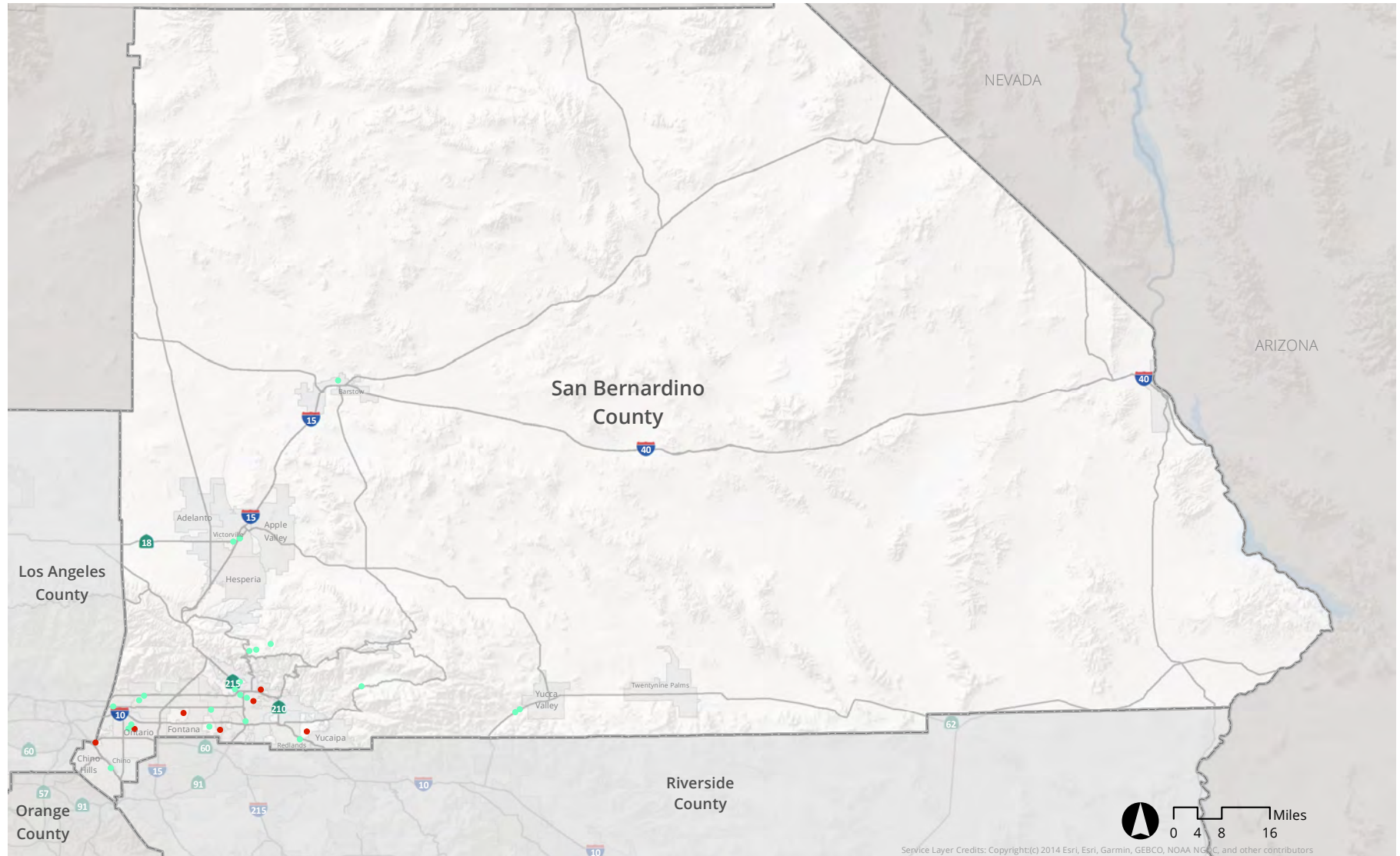


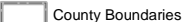
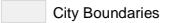
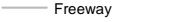


- County Boundaries
- City Boundaries
- Freeway
- San Bernardino County 2019 Pedestrian-Involved Fatal Collisions
- San Bernardino County 2019 Pedestrian-Involved Serious Injury Collisions



Source: SCAG, SWITRS, TIMS

Map 4: San Bernardino County, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions

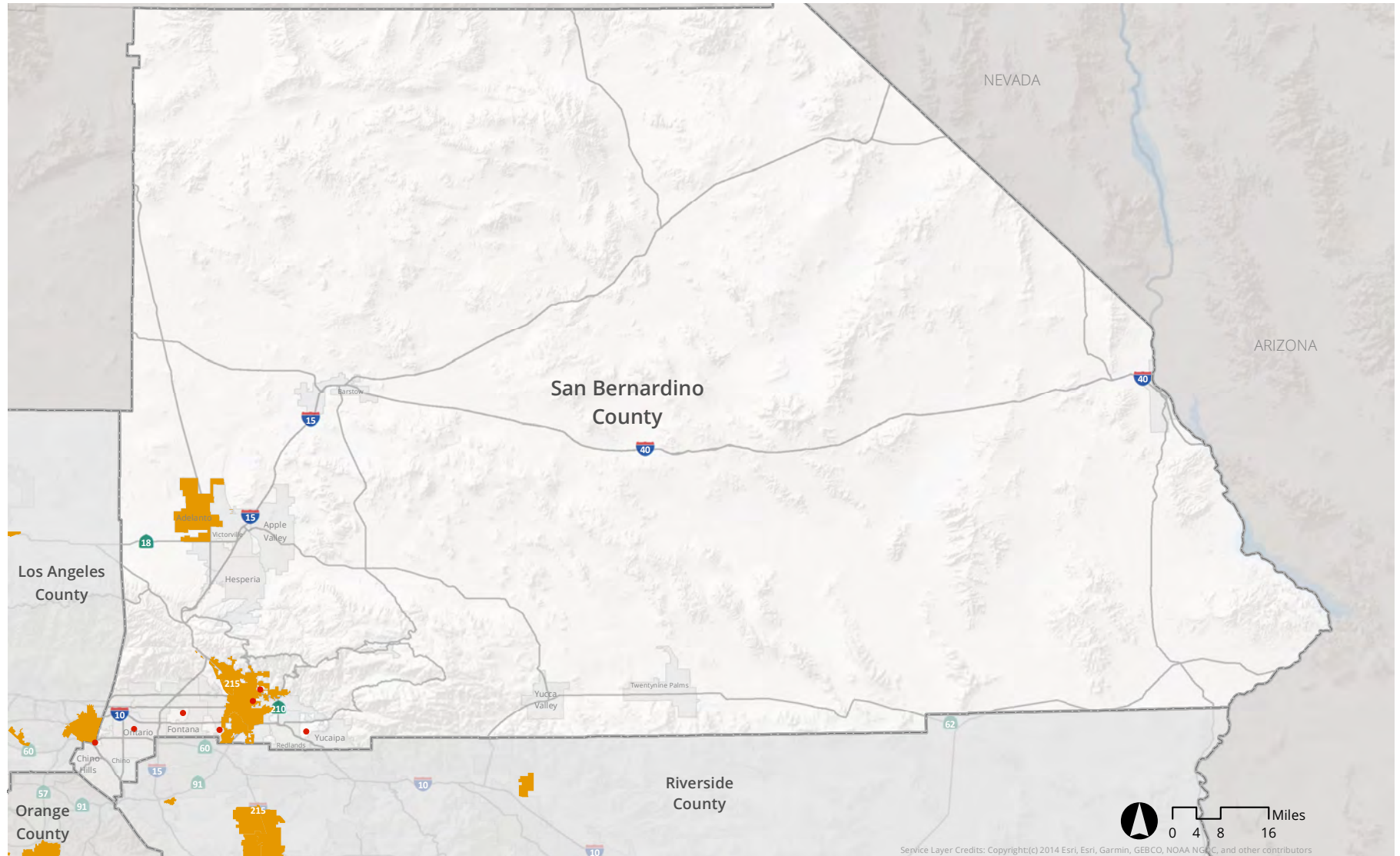


-  County Boundaries
-  City Boundaries
-  Freeway
-  San Bernardino County 2019 Bicyclist-Involved Fatal Collisions
-  San Bernardino County 2019 Bicyclist-Involved Serious Injury Collisions

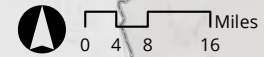


Source: SCAG, SWITRS, TIMS

Map 5: San Bernardino County, 2019 Fatal Collisions in Communities of Concern



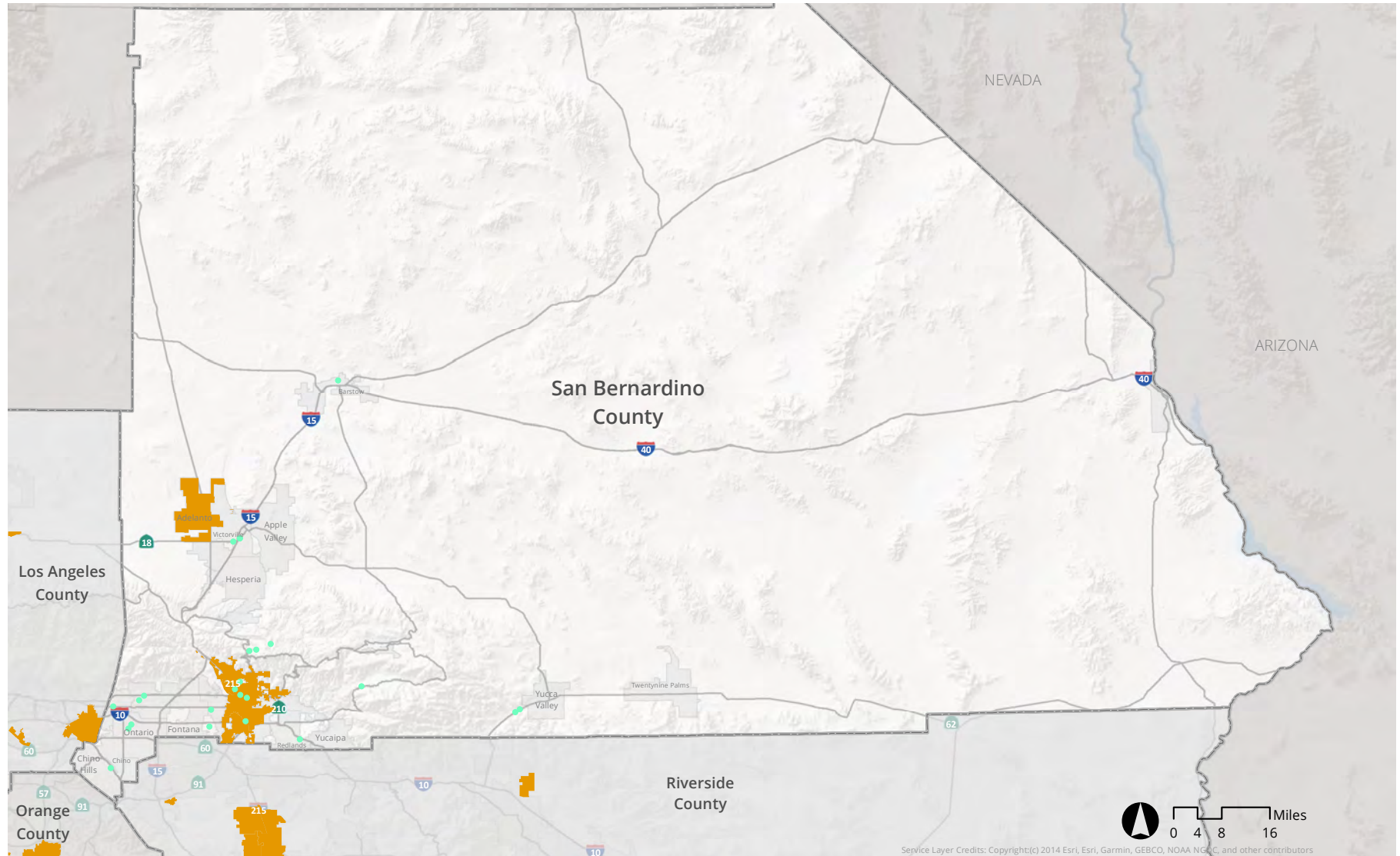
- County Boundaries
- Communities of Concern
- City Boundaries
- San Bernardino County 2019 Fatal Collisions
- Freeway


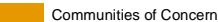
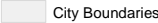




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Map 6: San Bernardino County, 2019 Serious Injury Collisions in Communities of Concern

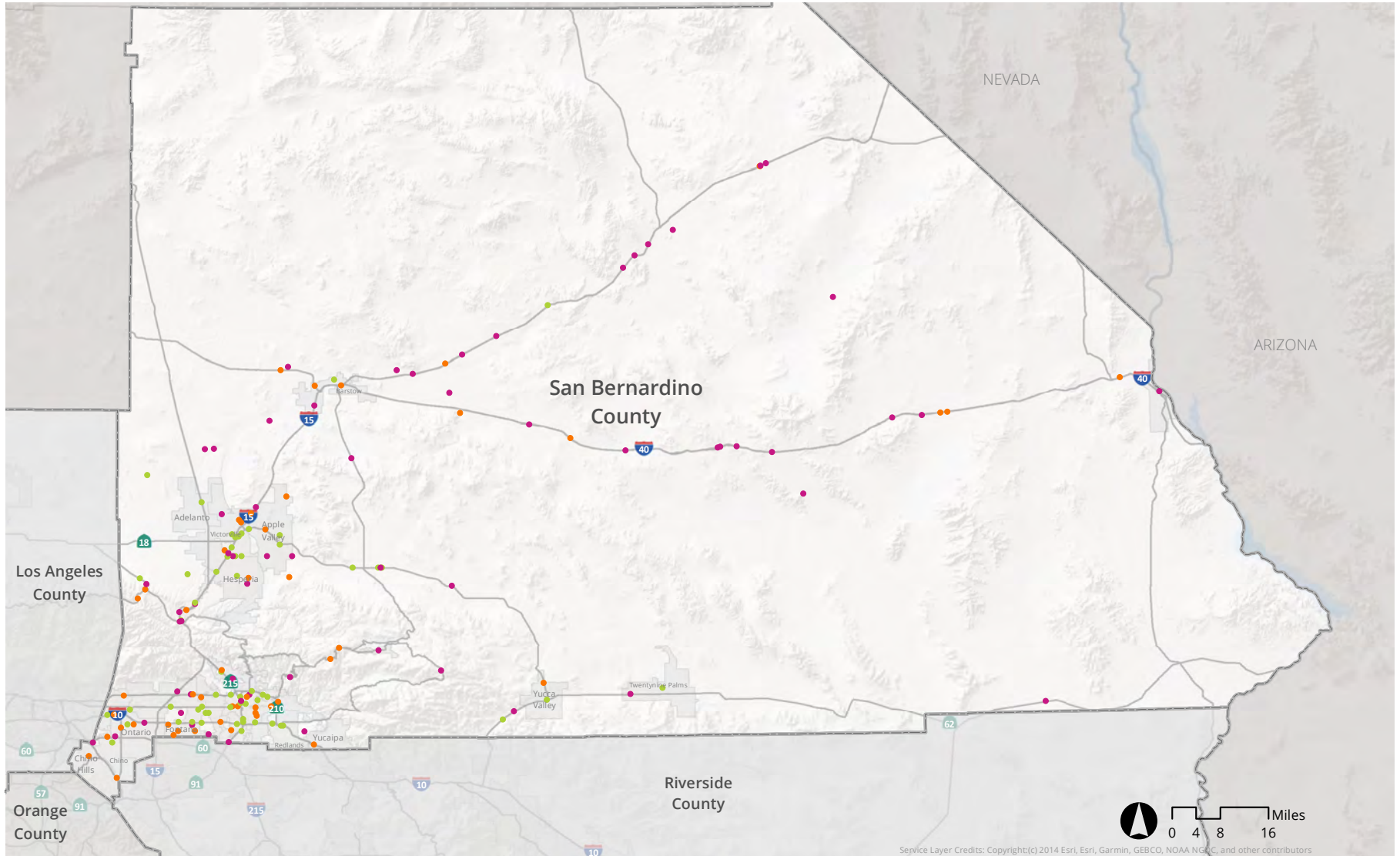


-  County Boundaries
-  Communities of Concern
-  City Boundaries
-  San Bernardino County 2019 Serious Injury Collisions
-  Freeway

Source: SCAG, SWITRS, TIMS



Map 7: San Bernardino County, 2019 Primary Collision Factors of Fatal Collisions

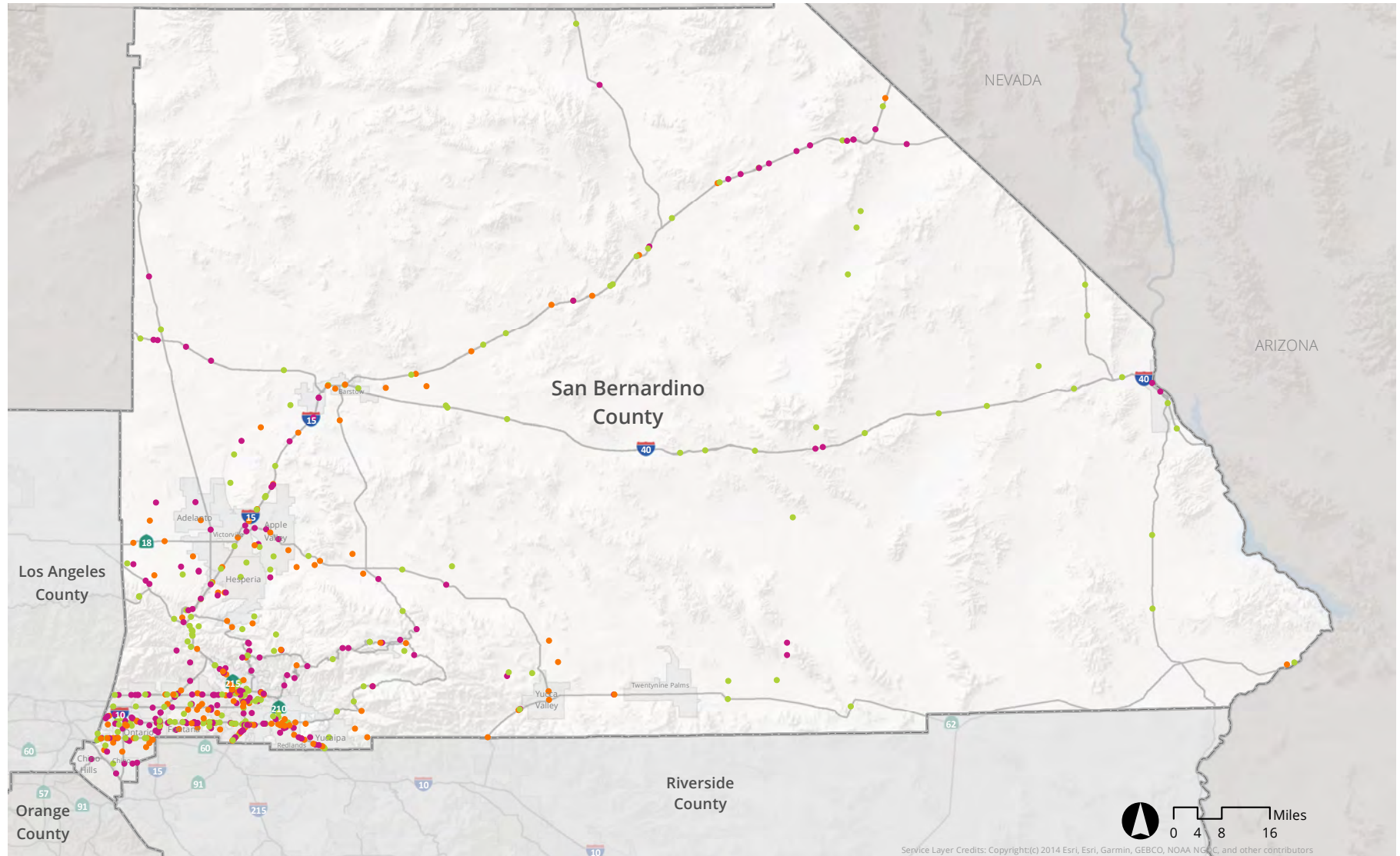


- | | | |
|--|-------------------|---|
| | County Boundaries | San Bernardino County 2019 Primary Collision Factors of Fatal Collisions |
| | City Boundaries | Improper Turning |
| | Freeway | Pedestrian Violation |
| | | Unsafe Speed |



Source: SCAG, SWITRS, TIMS

Map 8: San Bernardino County, 2019 Primary Collision Factors of Serious Injury Collisions

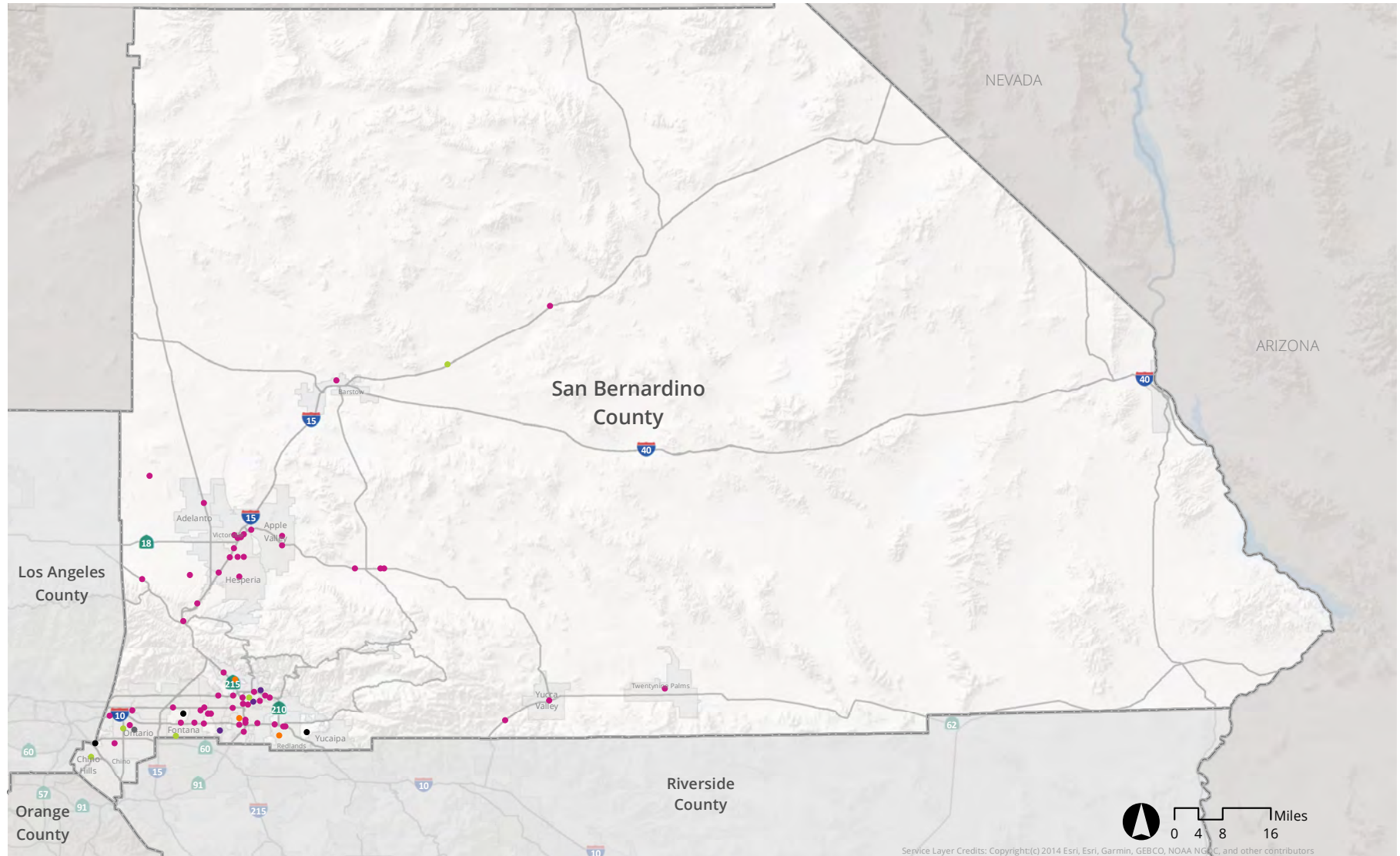


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|--|-------------------|---|---|
| | County Boundaries | San Bernardino County 2019 Primary Collision Factors of Serious Injury Collisions | |
| | City Boundaries | | Unsafe Speed |
| | Freeway | | Improper Turning |
| | | | Driving or Bicycling Under the Influence of Alcohol or Drug |



Source: SCAG, SWITRS, TIMS

Map 9: San Bernardino County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions

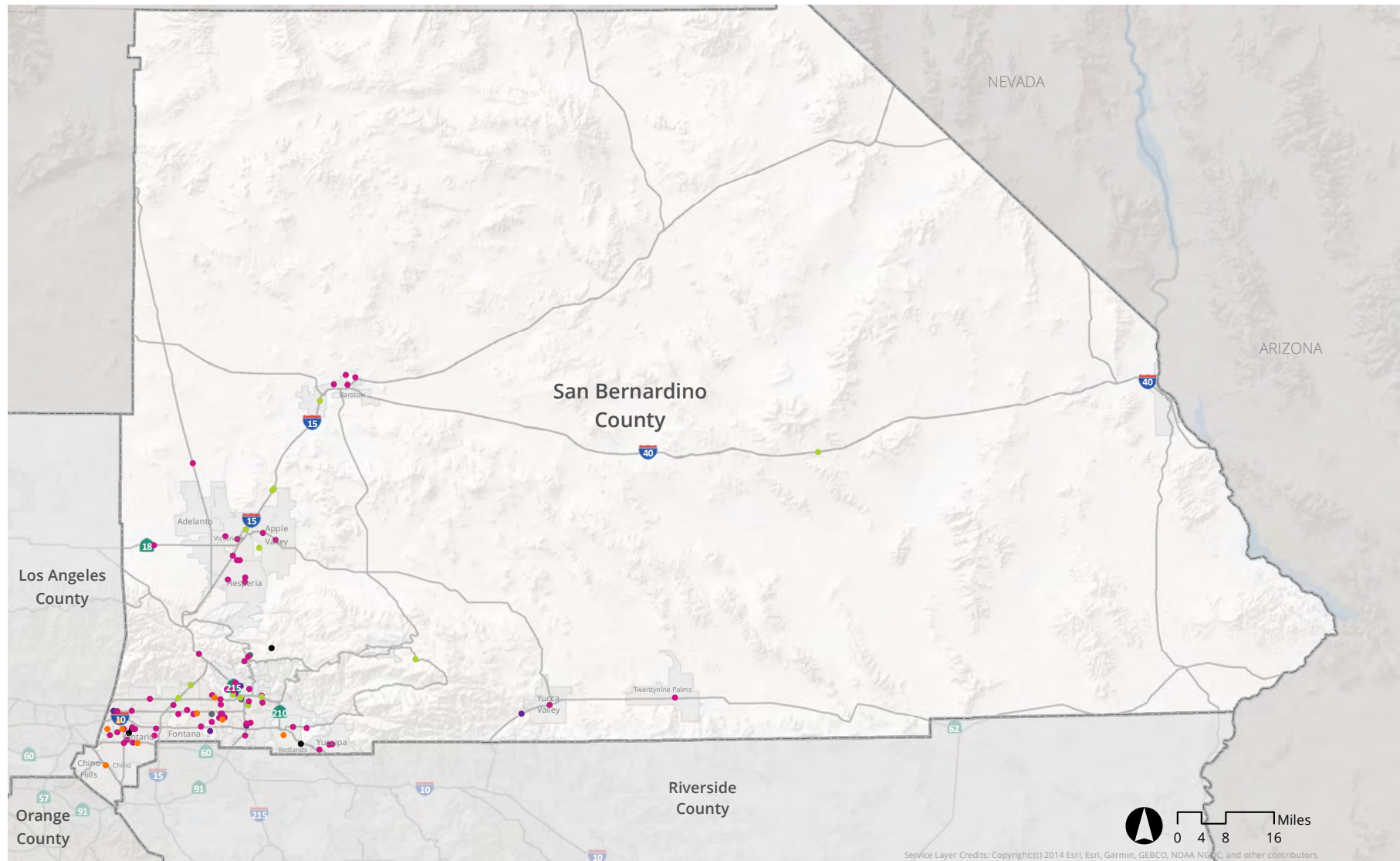


- | | | |
|-------------------|--|---|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Fatal Collisions | Primary Collision Factors of Bicyclist-Involved Fatal Collisions |
| City Boundaries | Pedestrian Violation | Driving or Bicycling Under the Influence of Alcohol or Drug |
| Freeway | Unsafe Speed | Traffic Signals and Signs |
| | Pedestrian Right of Way | Improper Turning |

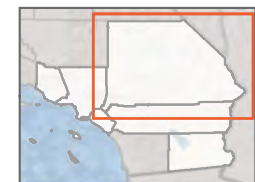


Source: SCAG, SWITRS, TIMS

Map 10: San Bernardino County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



- | | | |
|-------------------|---|--|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions |
| City Boundaries | Pedestrian Violation | Improper Turning |
| Freeway | Unsafe Speed | Traffic Signals and Signs |
| | Pedestrian Right of Way | Unsafe Speed |



Source: SCAG, SWITRS, TIMS

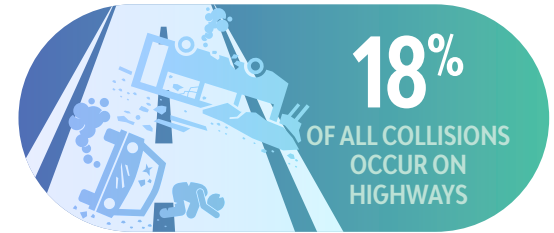
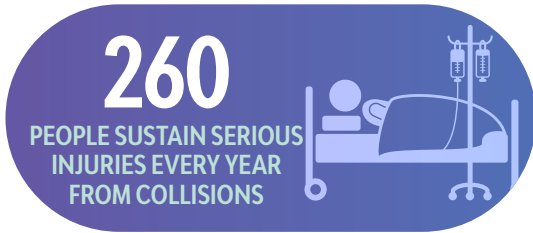




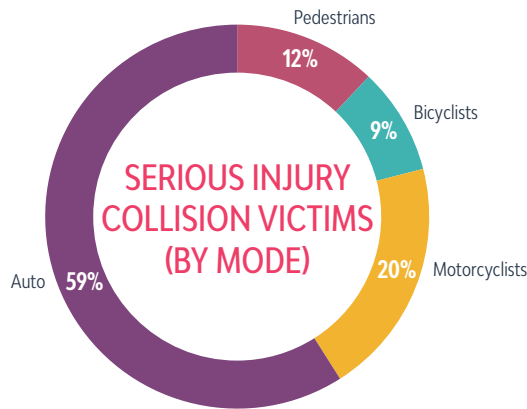
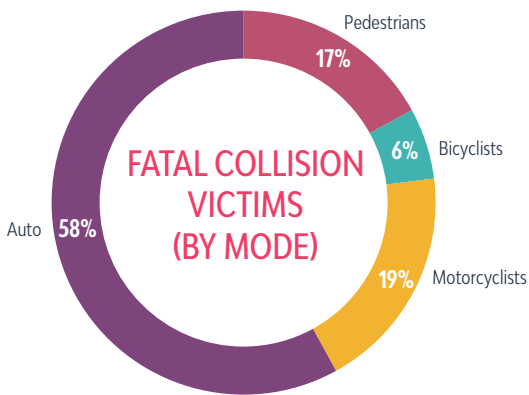
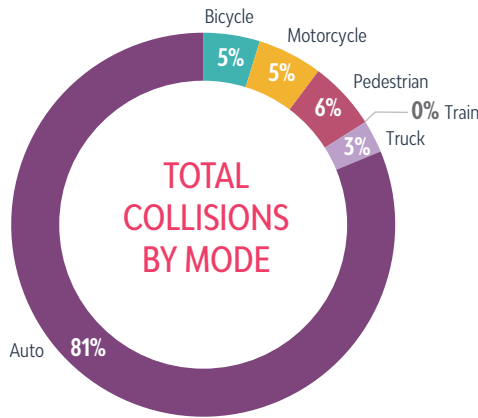
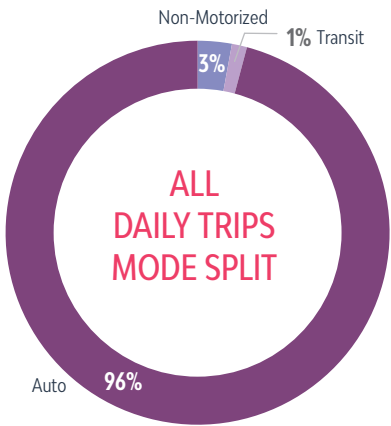
REGIONAL EXISTING CONDITIONS

Ventura County

Ventura County BY THE NUMBERS



PEOPLE WALKING AND BICYCLING ARE OVER-REPRESENTED AMONG TRAFFIC DEATHS COMPARED TO THEIR TOTAL MODE SHARE.



Why are collisions occurring?



Speed is the critical factor in the severity of collisions.



HIT BY A VEHICLE TRAVELING AT 25 MPH



HIT BY A VEHICLE TRAVELING AT 35 MPH



HIT BY A VEHICLE TRAVELING AT 40 MPH





REGIONAL EXISTING CONDITIONS

Ventura County

Ventura County borders the counties of Kern (north), Los Angeles (southeast), and Santa Barbara (northwest). Ventura County contains 1,843 square miles of land. Approximately 850,000 people call it home. Residents of Ventura County drive on average 8,000 miles a year.

WHAT ARE THE OVERALL TRENDS?

On average 60 people die in traffic collisions, 260 people are seriously injured, and 4,700 people are injured each year in Ventura County. Over the past decade, Ventura County experienced an overall decline in the total number of fatal victims from a high of 74 in 2011 to a low of 49 in 2019 (**Figure 1**). In contrast, serious injury victims increased, as highlighted in **Figure 2**, from a low of 194 in 2015 to 314 in 2019. **Maps 1** and **2** reflect the locations of all collisions that resulted in a fatal or serious injury in Ventura County in 2019.

Over the past decade, about 77 percent of those killed were in vehicles or on motorcycles while the other 23 percent of fatal victims were walking or biking. Of the roughly 55 fatal collisions occurring annually, about 13 were active transportation collisions. The number of active transportation victims have remained fairly constant over the years.

Figure 3 reflects pedestrian fatal and serious injury victims between 2009 to 2020. There were no distinct trends in either, though the number of fatal victims reached a peak in 2018 while serious injury victims peaked in 2012. **Map 3** highlights the pedestrian-involved collisions resulting in a fatality or serious injury that occurred in Ventura County in 2019.

Figure 4 reflects bicyclist fatal and serious injury victims between 2009 to 2020. Overall there were no distinct trends. Bicyclist fatal victims were at their highest in 2013 at seven fatalities, while serious injuries were relatively consistent over the same time frame, from a low of 17 serious injury victims in 2009 to a high of 28 serious injury victims in 2018. **Map 4** highlights all of the bicyclist-involved collisions resulting in a fatality or serious injury that occurred in Ventura County in 2019.

Figure 5 shows the historical rates of fatal and serious injuries per 1,000 people over the last decade from 2010 to 2020. Compared to the non-normalized

fatalities see in **Figures 1 and 2** (which generally trended slightly downward), there was an increasing trendline in population-normalized fatalities. This means that fatal victims were increasing at a rate disproportionate to the increases in population. While the rate of normalized serious injury victims were generally decreasing, non-normalized serious injuries increased. This suggests that serious injuries were not increasing at a rate equal to changes in the population. **Figures 6 and 7** reflect that when the number of fatal and serious injury victims are normalized by vehicle miles traveled (VMT), they follow similar trendlines to their non-normalized counterparts.

Vehicle miles traveled per capita decreased consistently from 2010 to 2019 (a 10 percent decrease from 2010 to 2019) which means that population increases were outpacing VMT increases. Considering VMT stayed relatively consistent around 18.7 million VMT until 2018 (when it started to decrease), population changes outpaced changes in VMT. This could be due to a variety of factors, such as housing-related (where residents are choosing to live in denser neighborhoods closer to desired amenities), and demographic changes. Overall, VMT per capita averaged about 8,100 VMT per capita per year from 2010 to 2019.

WHERE ARE THE COLLISIONS OCCURRING?

In 2019, in Ventura County, the vast majority of fatal and serious injury collisions occurred in urbanized areas and urban clusters. Nearly all collisions (92 percent), 69 percent of fatal collisions, and 82 percent of serious injury collisions occurred in urbanized areas and clusters. All pedestrian-involved fatal collisions (100 percent) and the majority of bicyclist-involved fatal collisions (75 percent) occurred in urbanized areas and urban clusters. In total, 91 percent of the population in Ventura County lives in urbanized areas, 5 percent in urban clusters, and 3 percent in rural areas. Despite just 3 percent of the population residing in rural areas, 31 percent of fatal collisions and 18 percent of serious

injury collisions occurred in rural areas in 2019. **Maps 1-4** display fatal and serious injury collisions (by mode), highlighting their concentrations, largely in the urbanized areas of Ventura County in 2019.

Ventura County includes a roadway network consisting of 78 highway centerline miles, 579 arterial centerline miles, 376 collector centerline miles, and 1,921 local road centerline miles. Local roads account for 65 percent of all roadways within Ventura County. Ventura County is also home to a bikeway network with 78 miles of Class I bikeways, 382 miles of Class II bikeways, 95 miles of Class III bikeways, and six miles of Class IV bikeways.

In 2019, 56 percent of fatal collisions across all modes occurred on local roads, while 38 percent occurred on arterials, and 6 percent on highways. Of total serious injury collisions, 65 percent occurred on local roads, while 18 percent occurred on arterials, and 17 percent occurred on highways.

In the same year, 40 percent of pedestrian-involved fatal collisions occurred on local roads, and the rest on arterials. Four fatal bicyclist-involved collisions occurred in 2019: three on local roads, and the other on highways (none on arterials). For pedestrian-involved serious injury collisions, 84 percent occurred on local roads (with 13 percent on arterials and 3 percent on highways), while 75 percent of bicyclist-involved collisions occurred on local roads (with 15 percent on arterials and 10 percent on highways).

WHEN ARE COLLISIONS OCCURRING?

In Ventura County, across all modes, more people were killed from traffic collisions during the early afternoon between 12:00 – 2:59pm (10 fatal collisions) than any other time of day in 2019 (**Figure 8**). The greatest number of serious injury collisions (67) occurred during the peak commuting hours, from 3:00 – 5:59pm (**Figure 9**).

The greatest number of pedestrian-involved fatal and serious injury collisions occurred between 3:00 – 5:59pm, as outlined in [Figure 10](#). However, the small dataset limits the ability to detect distinct trends for bicyclist-involved fatal collisions by time of day: only four bicyclist-involved fatal collisions occurred in 2019, and each fatal collision occurred at a different time ([Figure 11](#)). However, bicyclist-involved serious injury collision peaked in the morning from 9:00 – 11:59am with seven serious injuries (also [Figure 11](#)).

By day of week, fatal collisions across all modes increased over the course of the week and were highest on Sunday, while serious injury collisions peaked on Friday and Saturday ([Figure 12](#)). The greatest number of pedestrian-involved fatal collisions occurred at the beginning and end of the week, while pedestrian-involved serious injury collisions increased over the course of the week and peaked on Saturday ([Figure 13](#)). Bicyclist-involved fatal collisions were steady throughout the work week (one bicyclist-involved fatal collision each day from Tuesday through Friday). Bicyclist-involved serious injury collisions were highest on Tuesday and Friday, although there was no other discernible pattern due to the small dataset ([Figure 14](#)).

Across all modes, on average, there were about four fatal collisions and 26 serious injury collisions per month in Ventura County in 2019 ([Figure 15](#)). Both fatal collisions (11) and serious injury collisions (36) peaked in May. [Figure 16](#) displays the pedestrian-involved fatal and serious injury collisions by month. The greatest number of pedestrian-involved fatal collisions occurred during the spring (April and May), while pedestrian-involved serious injury collisions peaked in December (seven), as shown in [Figure 16](#). The greatest number of bicyclist-involved fatal collisions occurred in October (two), while bicyclist-involved serious injury collisions peaked in both June and October (three bicyclist-involved serious injury collisions each) as illustrated in [Figure 17](#).

WHO IS BEING HURT?

In Ventura County, out of all the fatal collision victims that occurred from 2009 to 2020, pedestrians and bicyclists accounted for about 23 percent of all fatal collision victims, disproportionately higher than the 3 percent of daily trips that were made via walking or biking.

In 2019, men were killed or sustained serious injuries from traffic collisions at more than twice the rate of women. Thirty-five men were killed in collisions and 201 men sustained serious injuries. This is compared to 24 women killed in collisions, and 107 women sustaining serious injuries. This is consistent with regional and national trends where a higher number of men were fatal or serious injury victims.

As observed in [Figure 18](#), when stratified by age group, the largest number of fatalities occurred in those aged 18-24, in total representing 18 percent of all fatal victims in Ventura County, a consistent pattern across genders. Those aged 25-34 sustained more serious injuries than any other age group – 55 males, 19 females, and two people with no gender specified sustained serious injuries in 2019 ([Figure 19](#)).

When analyzing trends by victim (i.e., whether the victim is a driver, passenger, bicyclist, pedestrian or other), additional patterns emerge. Drivers experienced the largest number of fatalities (24), followed by passengers (11), pedestrians (10), and bicyclists (four). Nearly all drivers who were killed during a collision were male drivers (23 fatal victims) versus female drivers (one) as illustrated in [Figure 20](#). Of all men killed in traffic collisions in 2019, 66 percent were male drivers, followed by 14 percent of men who were pedestrians. Of the women killed in traffic collisions, the majority of women died as a passenger (seven fatal victims or 50 percent of all female fatal victims), followed by female pedestrians at 36 percent (five fatal victims).

Overall, male drivers constituted 47 percent of all fatal victims across gender, age, and victim status. Dissecting these factors further, male drivers between the ages of 18-25 had the highest number of fatal victims (six) in 2019, followed by the next highest group - male drivers between the ages of 25-34 (five fatal victims).

When broken down by race, it is evident that some people of color were disproportionately represented in fatalities and serious injuries ([Figure 21](#)). Black individuals make up 2 percent of the County's population, but constituted 4 percent of fatal victims across the County. Other racialized people (i.e., those who were American Indian, Alaska Native, Hawaiian/Pacific Islander, or mixed race) make up 3 percent of the County's population, but constituted 5 percent of serious injuries across the County. White individuals in Ventura County make up 45 percent of the population, but constituted almost 60 percent of the fatal victims and just over 50 percent of serious injury victims.

[Maps 5](#) and [6](#) highlight the concentration of fatalities and serious injuries that occurred in Communities of Concern in 2019.

WHY ARE COLLISIONS OCCURRING?

[Maps 7-10](#) reflect the top three contributing factors for all fatal and serious collisions, and pedestrian- and bicyclist-involved fatal and serious collisions in 2019.

The top three contributing factors for fatal collisions in Ventura County were Driving or Bicycling Under the Influence of Alcohol or Drugs (27 percent), Unsafe Speed (19 percent), and Pedestrian Violations (14 percent). For serious injury collisions, the top three contributing factors were similar: Driving or Bicycling Under the Influence of Alcohol or Drugs (23 percent), Unsafe Speed (21 percent), and Improper Turning (17 percent).

For pedestrian-involved fatal collisions, the top three contributing factors were Pedestrian Violations (70 percent), Pedestrian Right of Way (20 percent), and an Unknown Factor (10 percent). For bicyclist-involved fatal collisions, the top contributing factors were tied at 25 percent each between Improper Turning, Wrong Side of Road, Other Hazardous Violations, and an Unknown Factor.

Figure 1: Ventura County
Total Number of Fatal Victims (2009 - 2020)

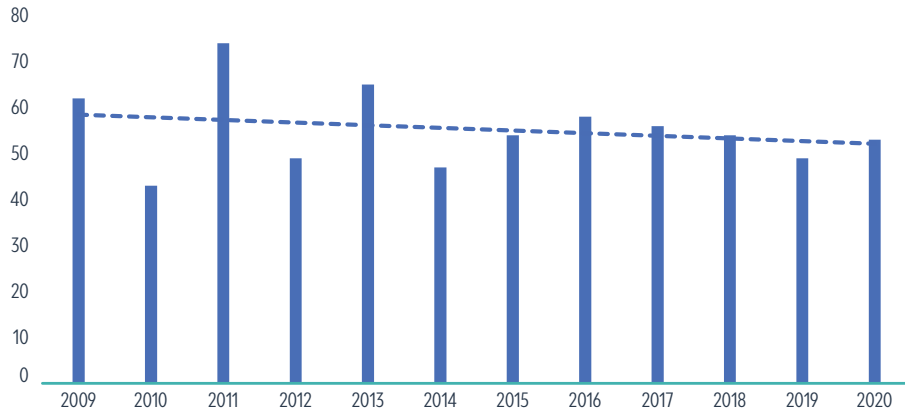


Figure 2: Ventura County
Total Number of Serious Injury Victims (2009 - 2020)

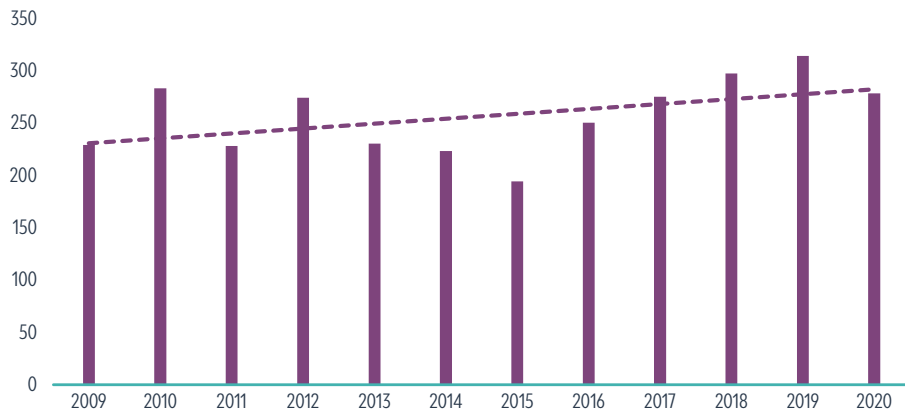


Figure 3: Ventura County
Total Number of Pedestrian Fatal and Serious Injury Victims (2009 - 2020)

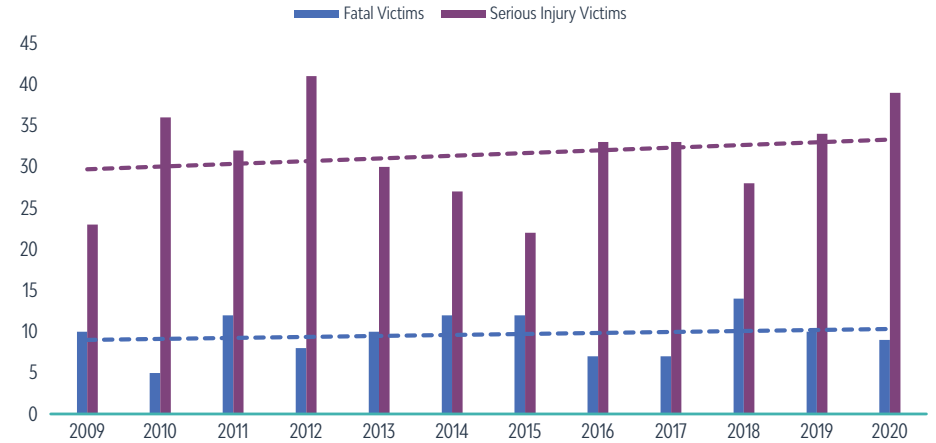


Figure 4: Ventura County
Total Number of Bicyclist Fatal and Serious Injury Victims (2009 - 2020)

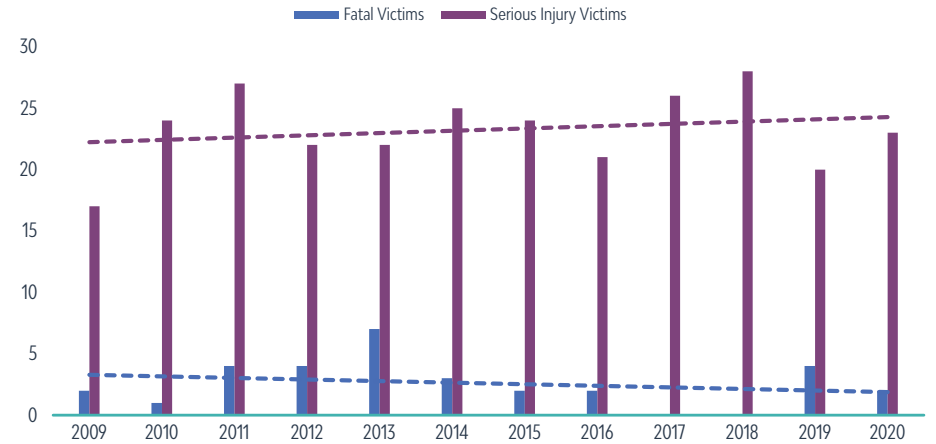


Figure 5: Ventura County
Fatal and Serious Injury Victims per 1,000 Population (2010 - 2020)

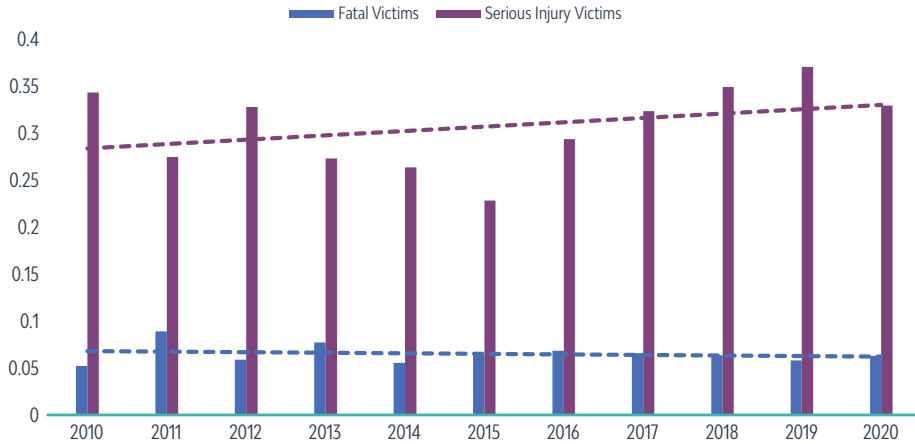


Figure 7: Ventura County
Total Serious Injury Victims, Normalized by 100M VMT (2009 - 2019)

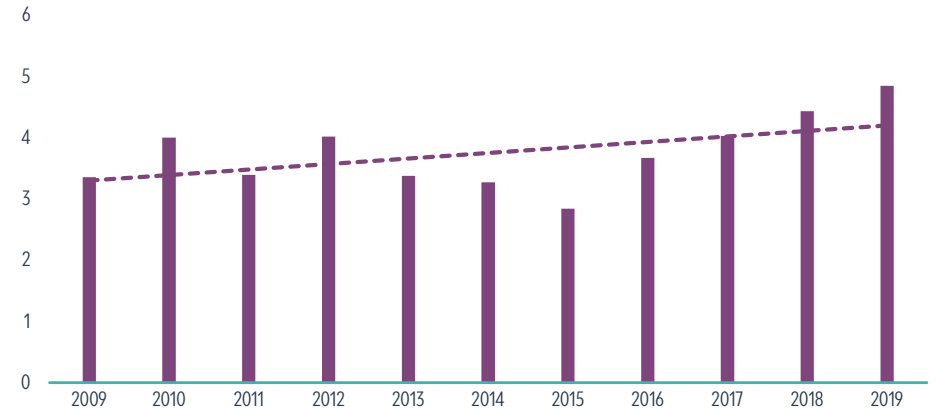


Figure 6: Ventura County
Total Fatal Victims, Normalized by 100M VMT (2009 - 2019)

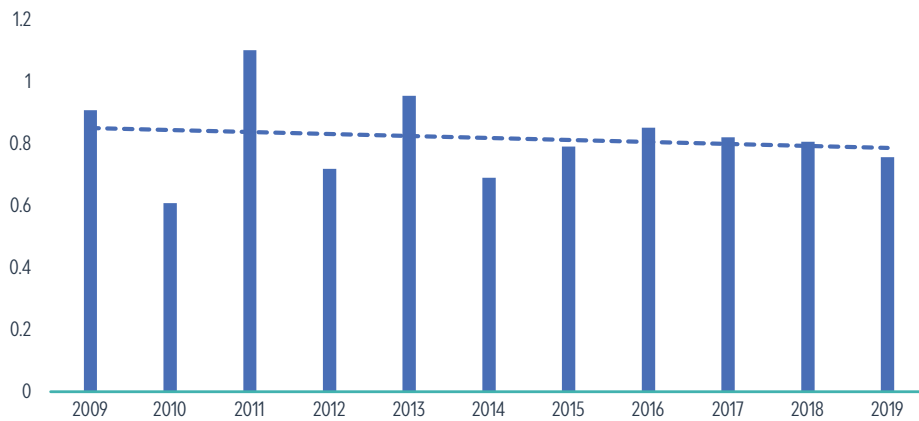


Figure 8: Ventura County
Fatal Collisions by Time of Day (2019)

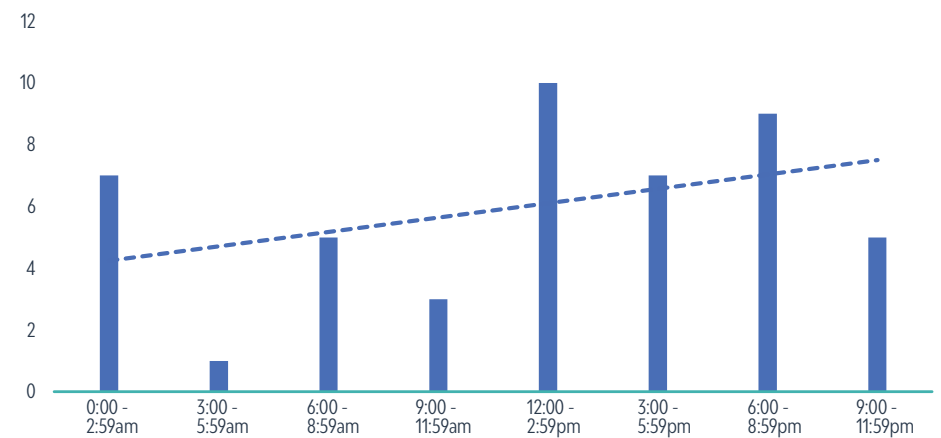


Figure 9: Ventura County
Serious Injury Collisions by Time of Day (2019)

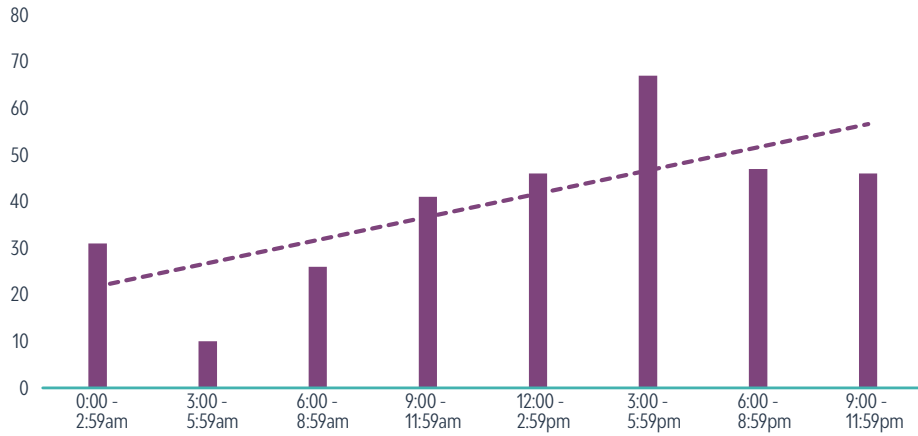


Figure 10: Ventura County
Pedestrian-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

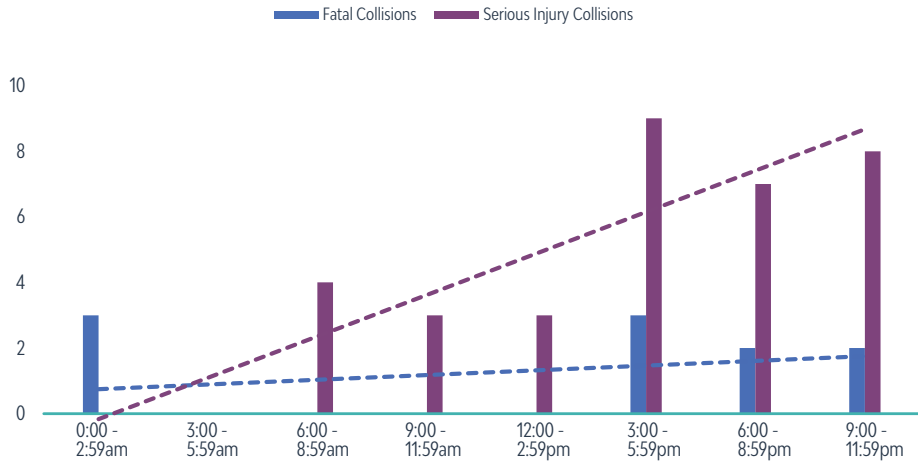


Figure 11: Ventura County
Bicyclist-Involved Fatal and Serious Injury Collisions by Time of Day (2019)

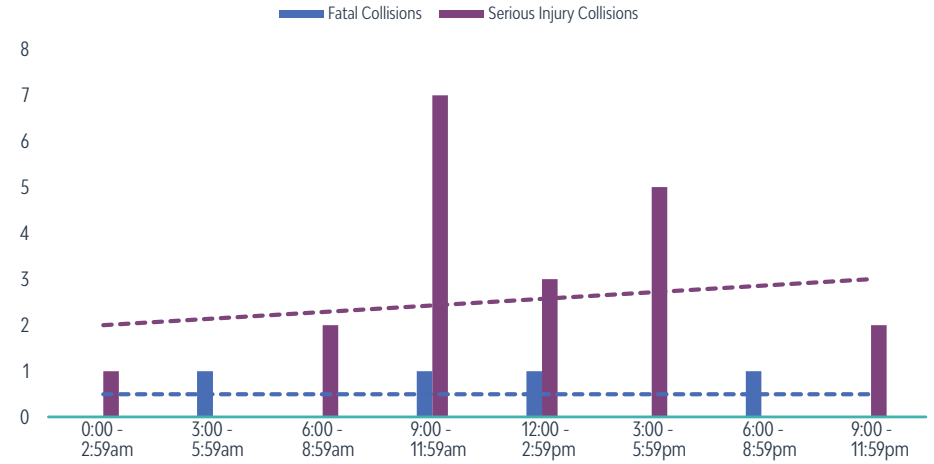


Figure 12: Ventura County
Fatal and Serious Injury Collisions by Day of Week (2019)

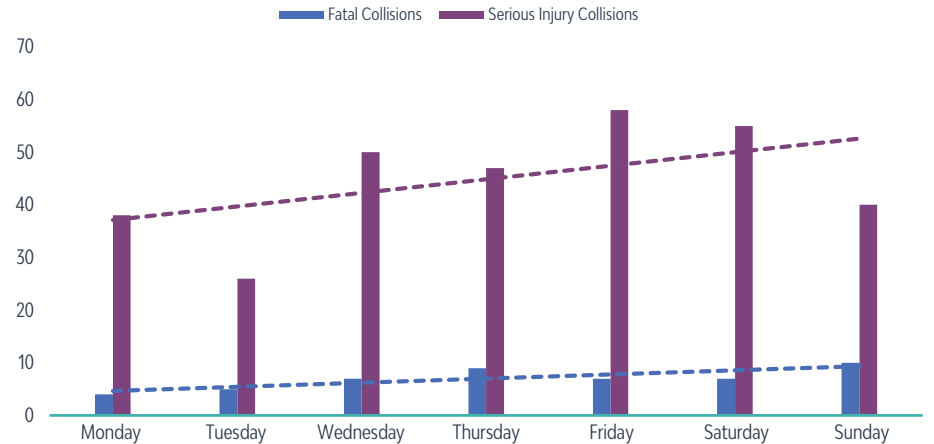


Figure 13: Ventura County
Pedestrian-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

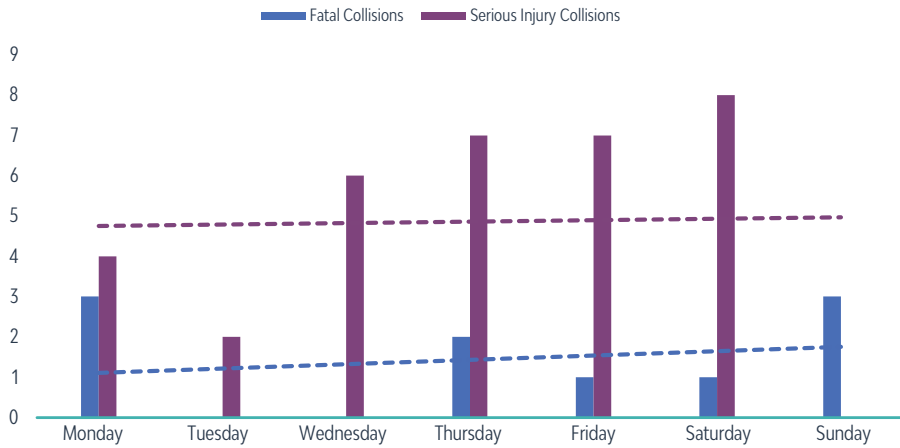


Figure 15: Ventura County
Fatal and Serious Injury Collisions by Month (2019)

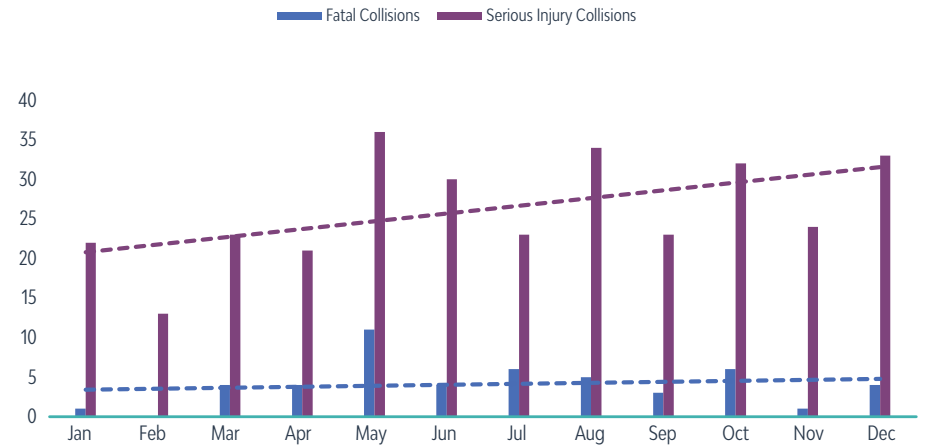


Figure 14: Ventura County
Bicyclist-Involved Fatal and Serious Injury Collisions by Day of Week (2019)

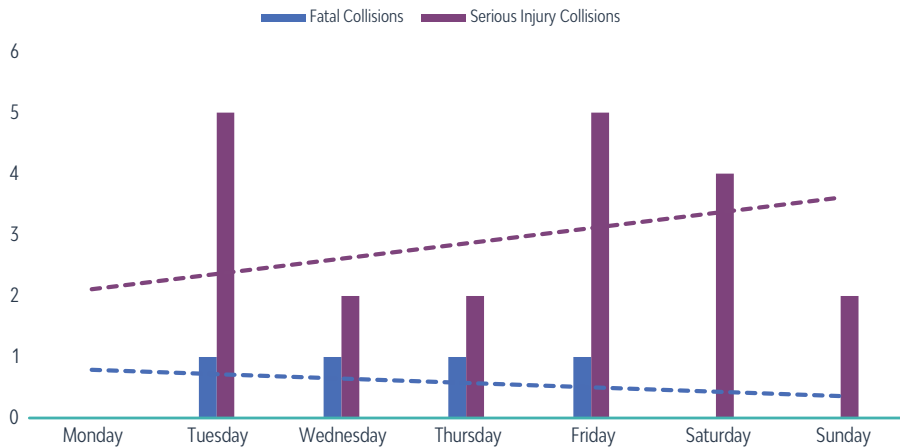


Figure 16: Ventura County
Pedestrian-Involved Fatal and Serious Injury Collisions by Month (2019)

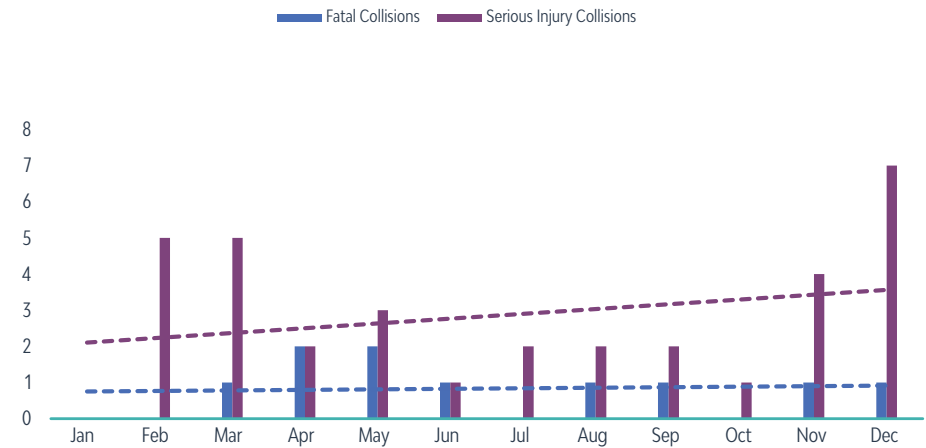


Figure 17: Ventura County
Bicyclist-Involved Fatal and Serious Injury Collisions by Month (2019)

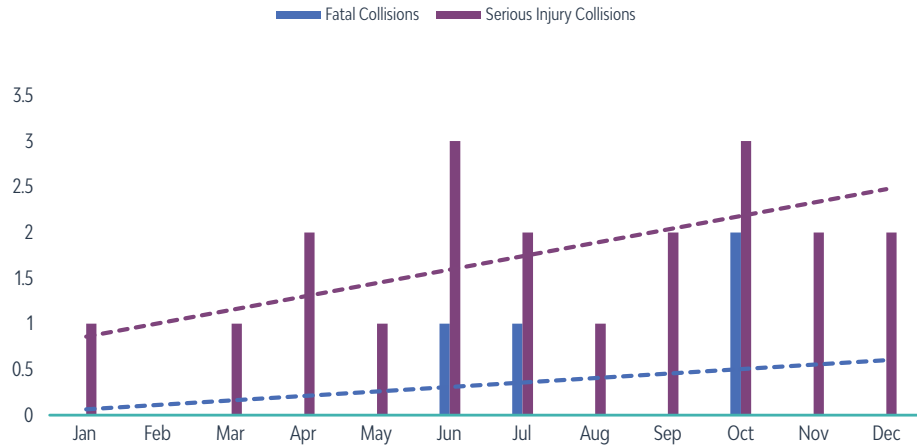


Figure 19: Ventura County
Serious Injury Victims by Age and Gender (2019)



Figure 18: Ventura County
Fatal Victims by Age and Gender (2019)

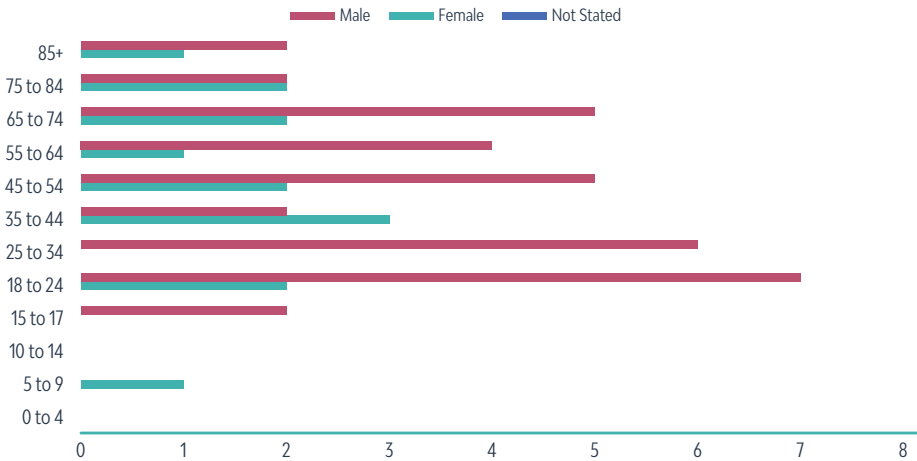


Figure 20: Ventura County
Fatal Victims by Involvement in Collision by Gender (2019)

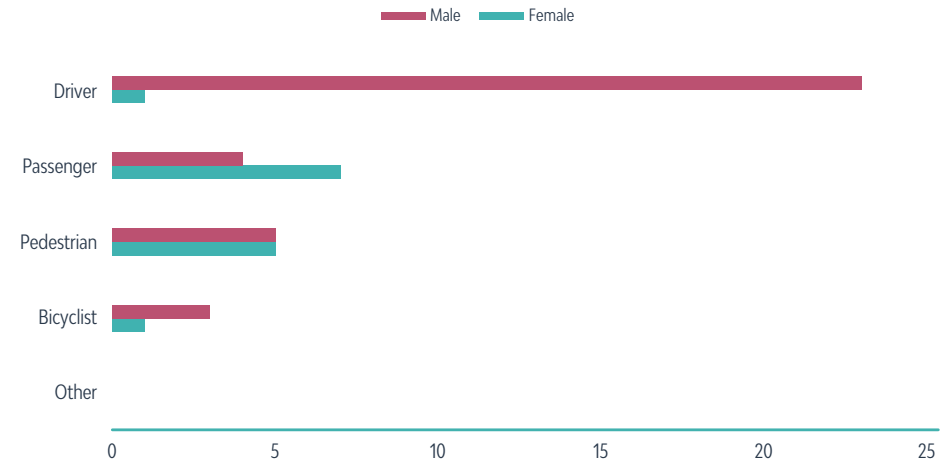
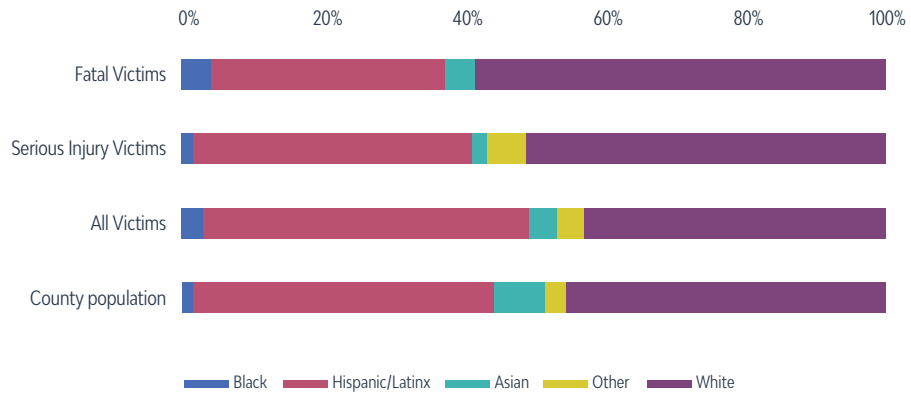
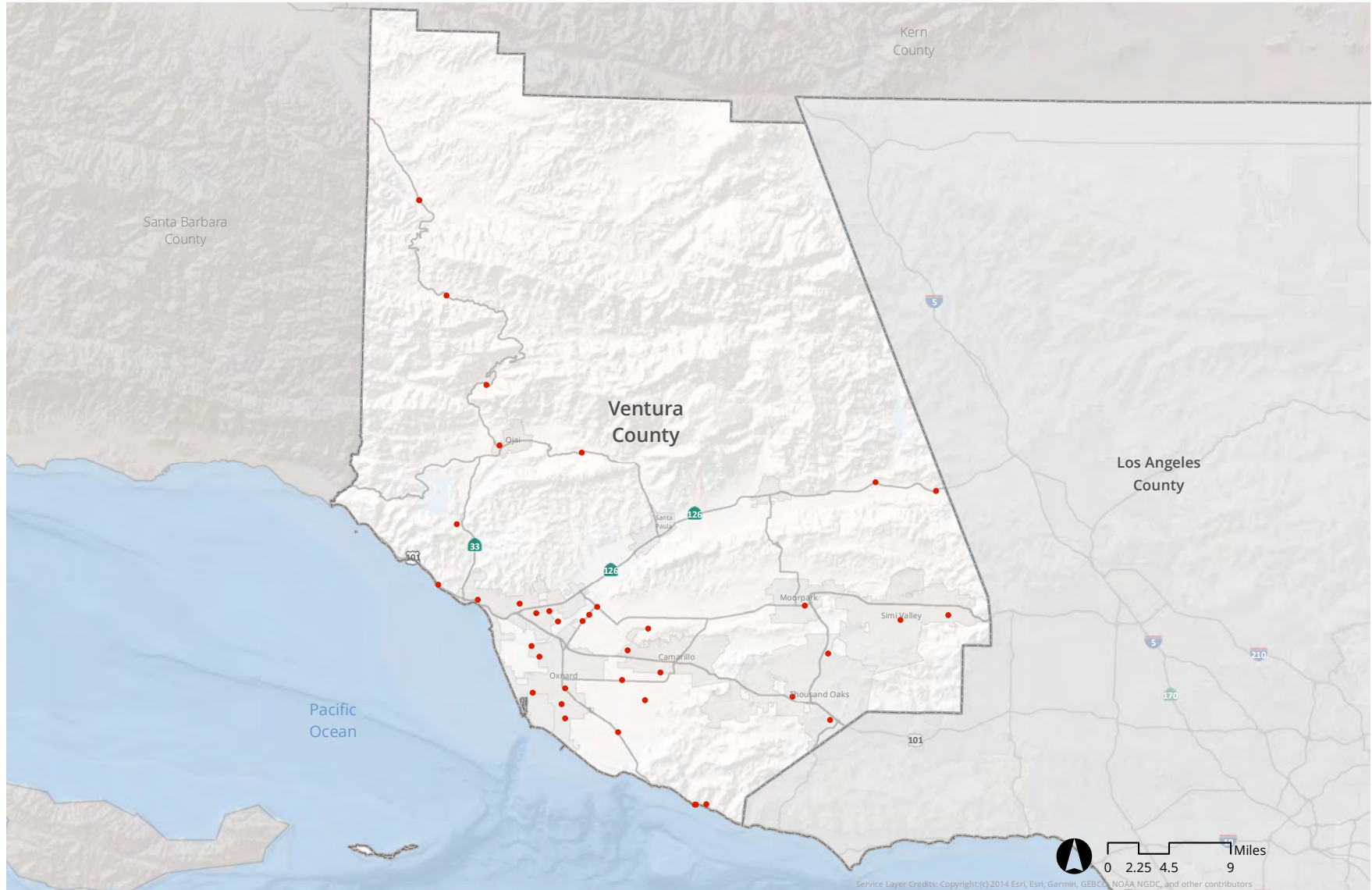


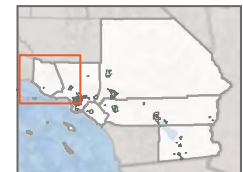
Figure 21: Ventura County
Fatal, Serious Injury and All Victims by Race/Ethnicity (2019)



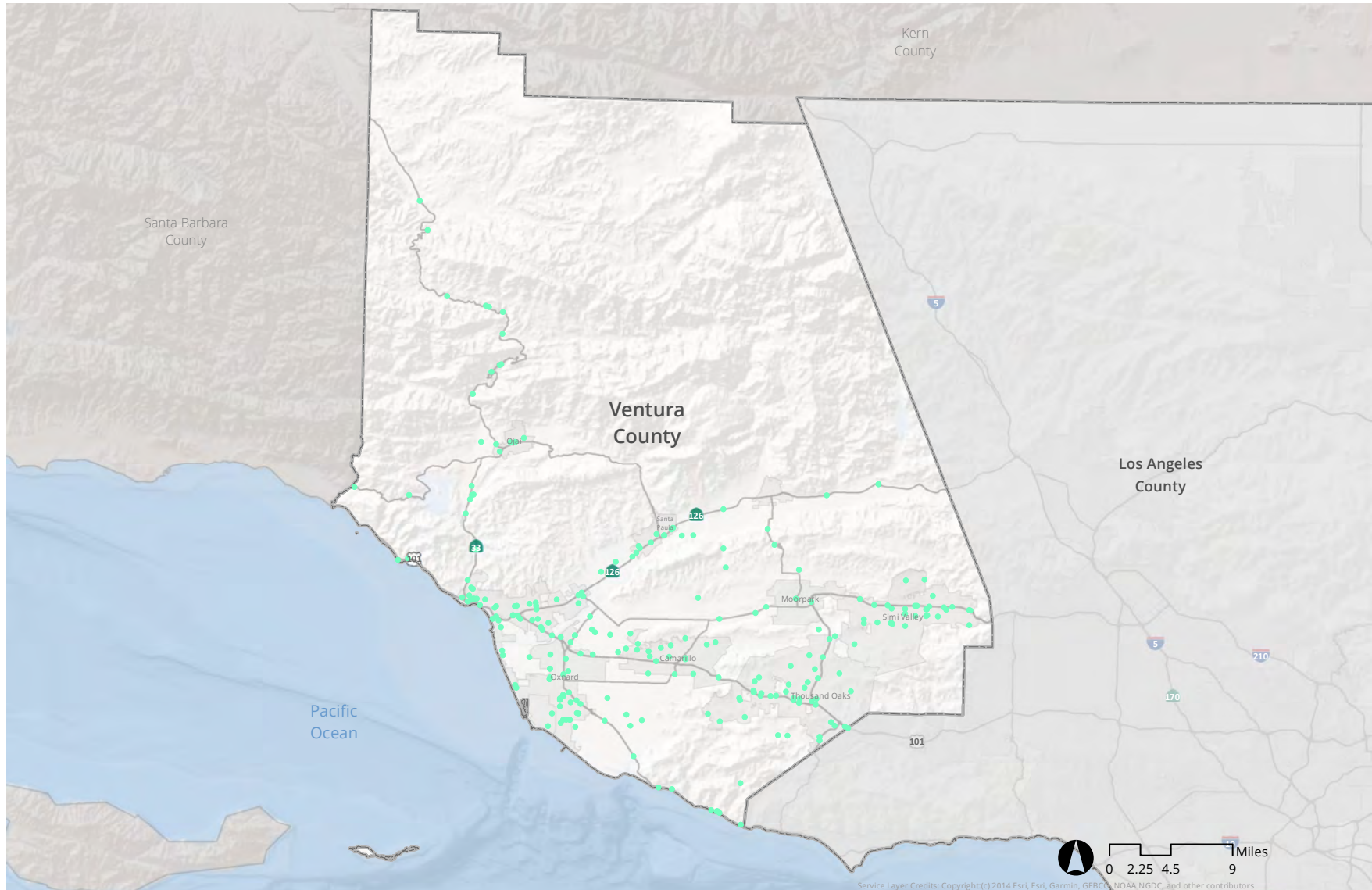
Map 1: Ventura County, 2019 Fatal Collisions



- County Boundaries
- City Boundaries
- Freeway
- Ventura County 2019 Fatal Collisions



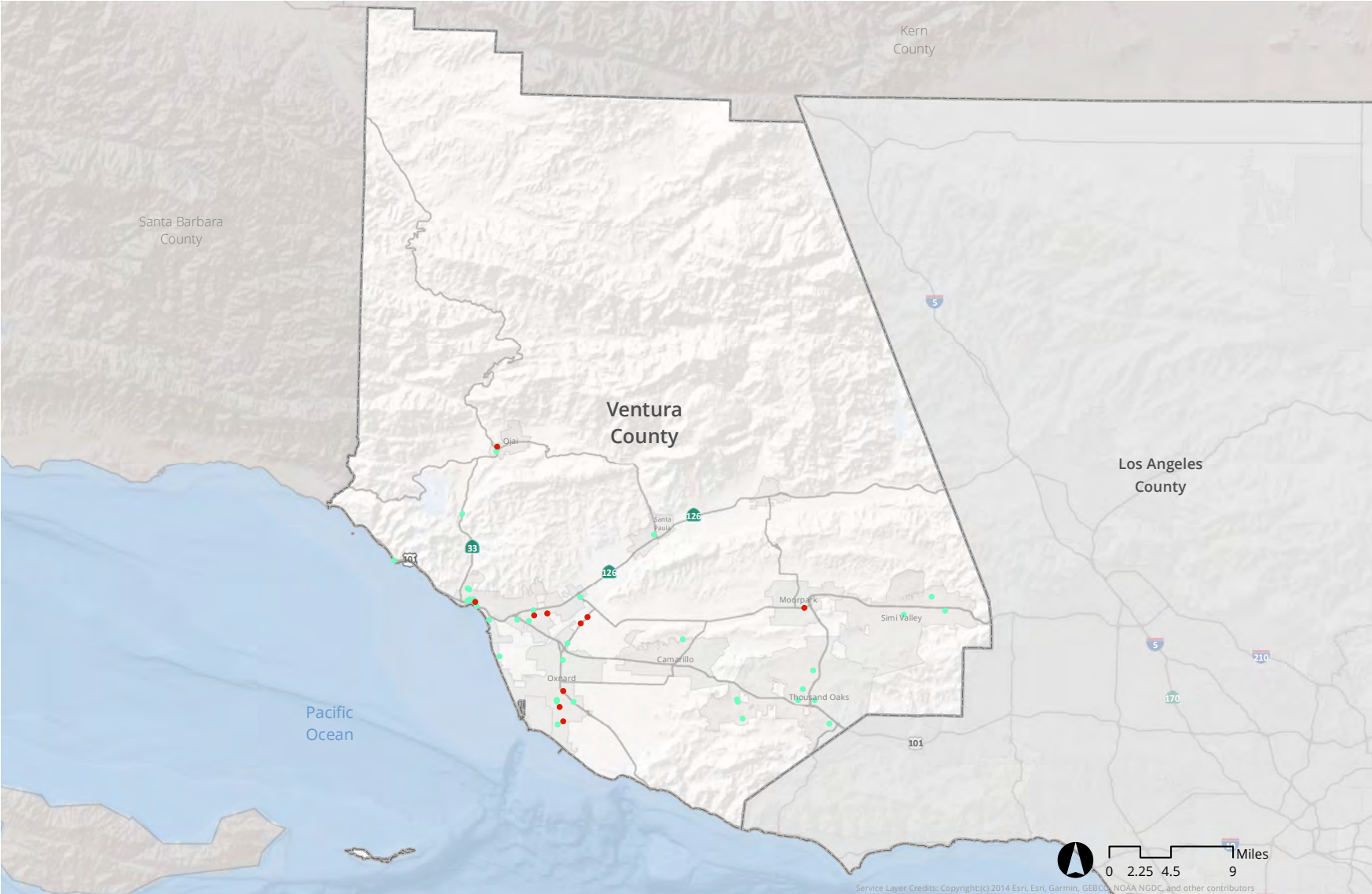
Map 2: Ventura County, 2019 Serious Injury Collisions



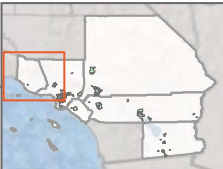
- County Boundaries
- City Boundaries
- Freeway
- Ventura County 2019 Serious Injury Collisions



Map 3: Ventura County, 2019 Pedestrian-Involved Fatal and Serious Injury Collisions



- County Boundaries
- City Boundaries
- Freeway
- Ventura County 2019 Pedestrian-Involved Fatal Collisions
- Ventura County 2019 Pedestrian-Involved Serious Injury Collisions



Source: SWITRS, TIMS, SCAG

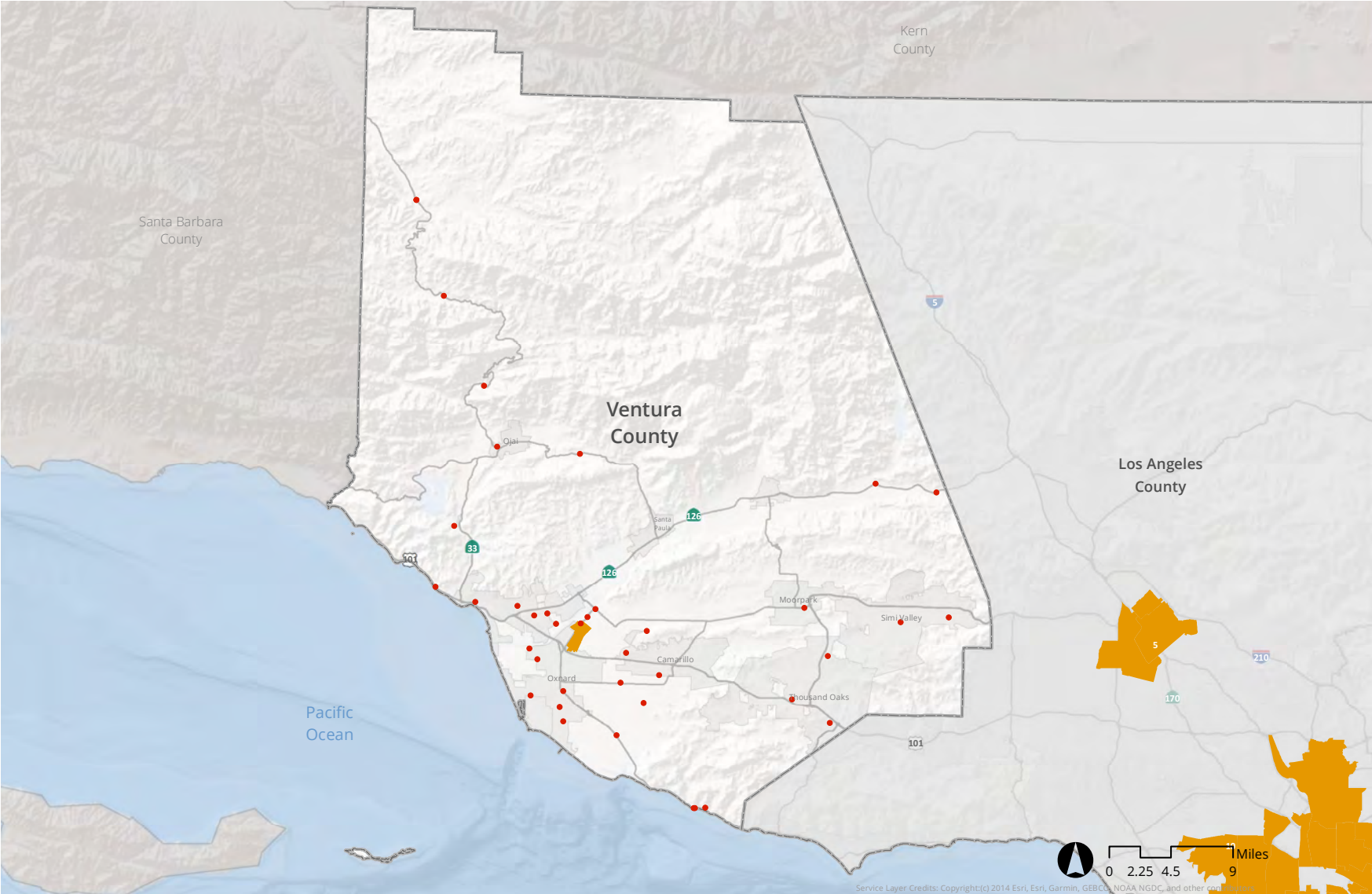
Map 4: Ventura County, 2019 Bicyclist-Involved Fatal and Serious Injury Collisions



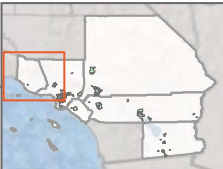
- County Boundaries
- City Boundaries
- Freeway
- Ventura County 2019 Bicyclist-Involved Fatal Collisions
- Ventura County 2019 Bicyclist-Involved Serious Injury Collisions



Map 5: Ventura County, 2019 Fatal Collisions in Communities of Concern

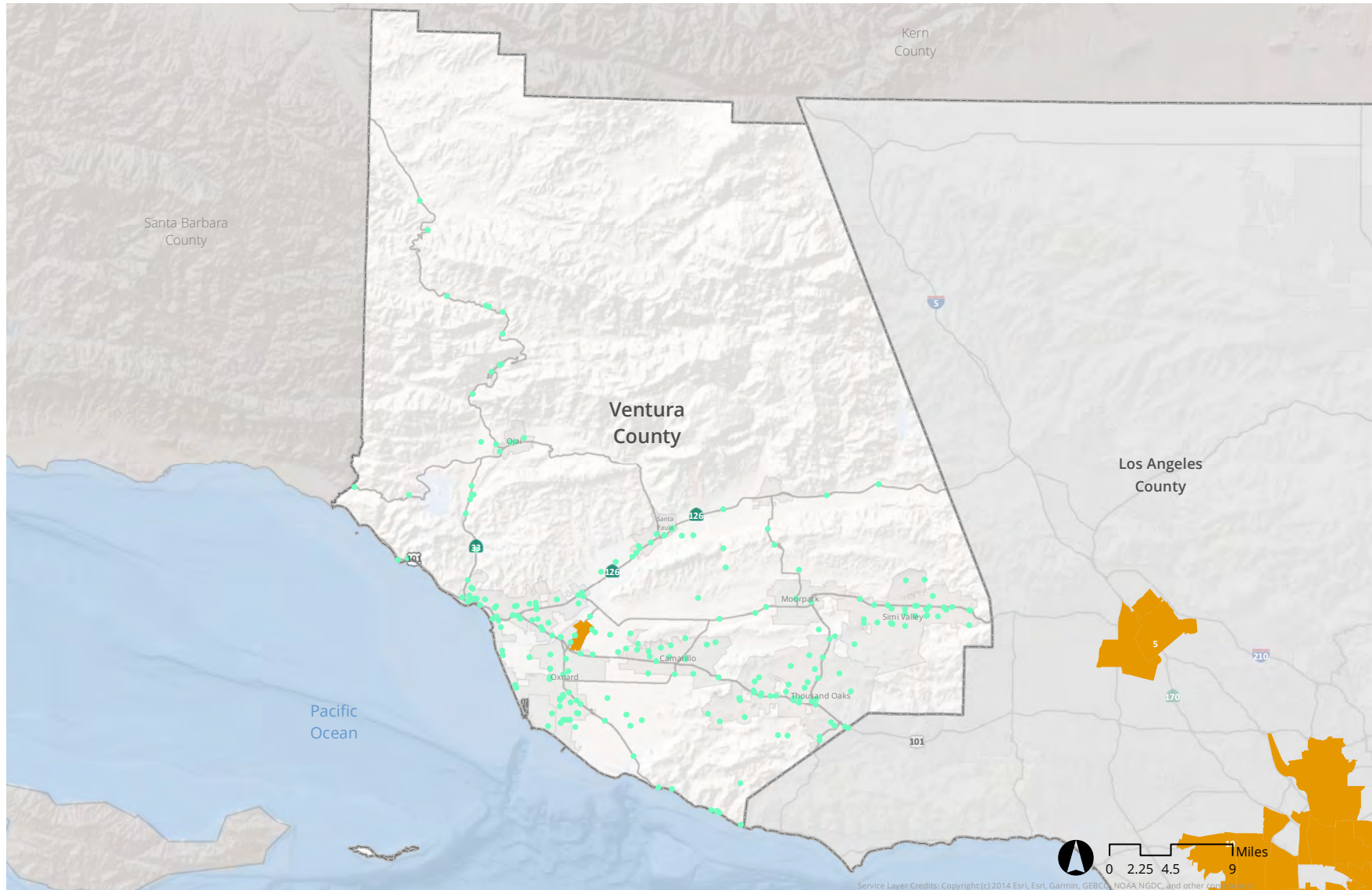


- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- Ventura County 2019 Fatal Collisions



Source: SWITRS, TIMS, SCAG

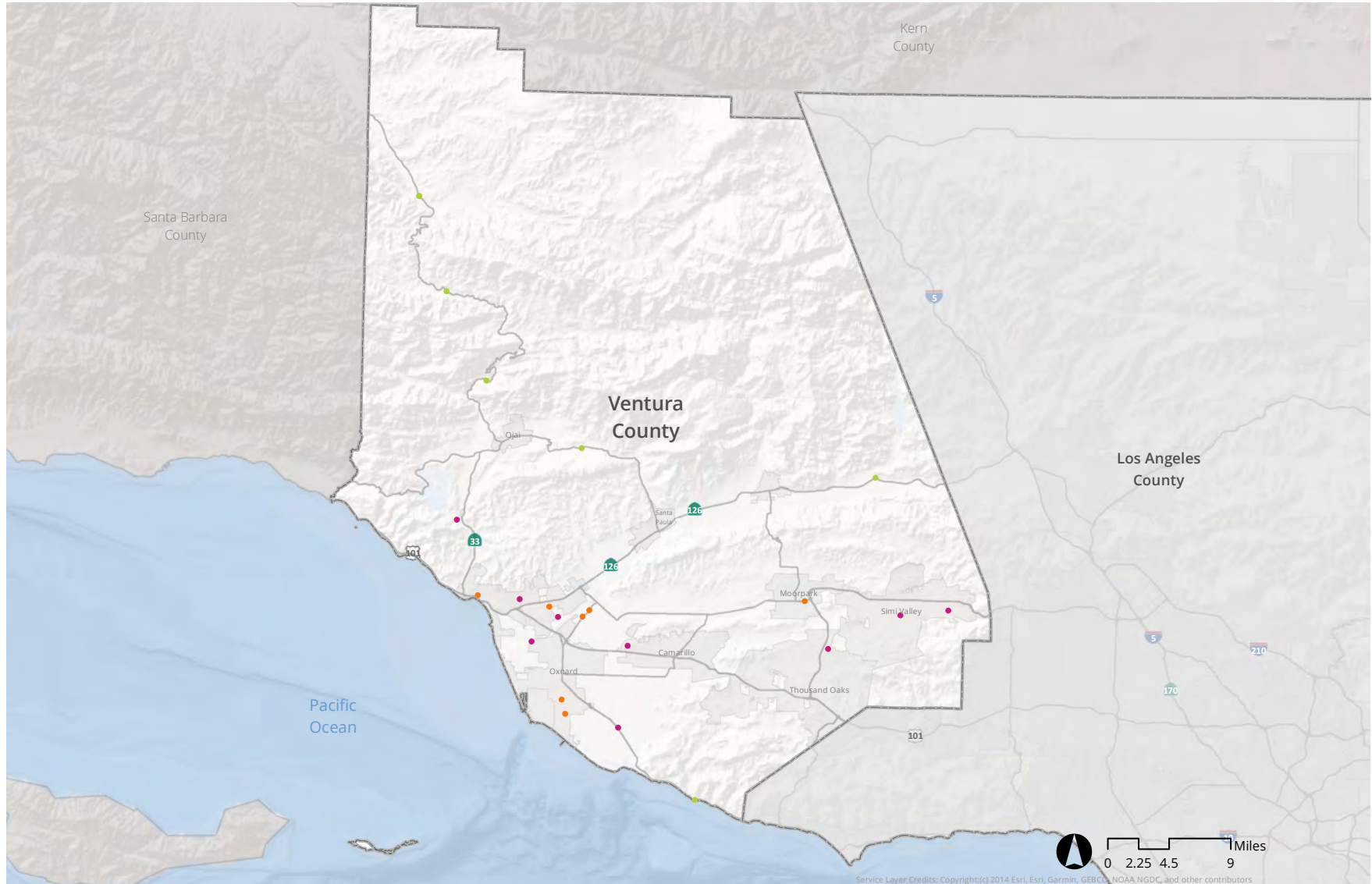
Map 6: Ventura County, 2019 Serious Injury Collisions in Communities of Concern



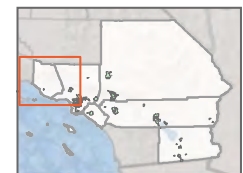
- County Boundaries
- City Boundaries
- Freeway
- Communities of Concern
- Ventura County 2019 Serious Injury Collisions



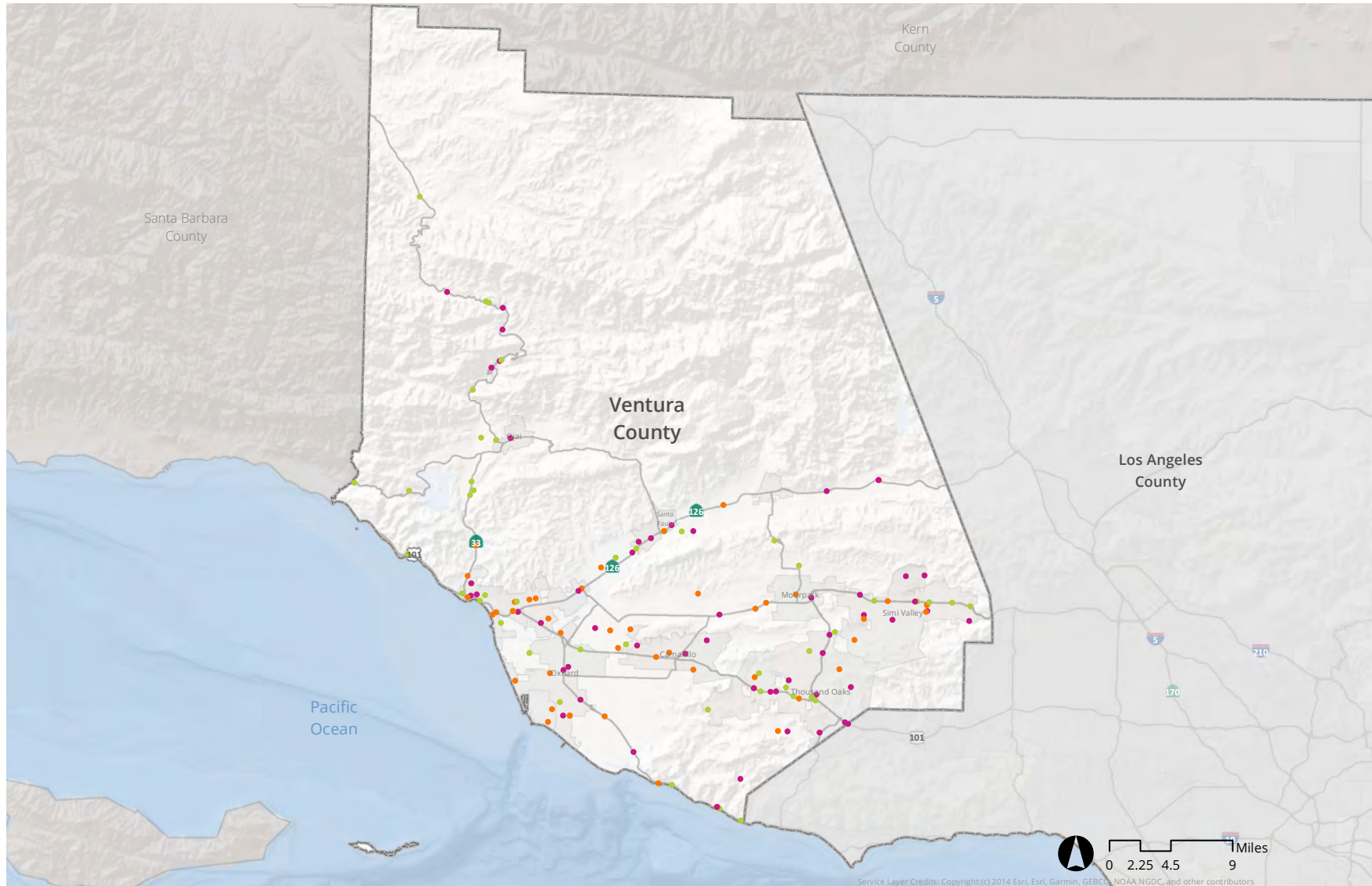
Map 7: Ventura County, 2019 Primary Collision Factors of Fatal Collisions



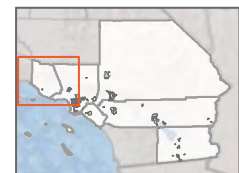
- Ventura County 2019 Primary Collision Factors of Fatal Collisions**
- County Boundaries
 - City Boundaries
 - Freeway
 - Driving or Bicycling Under the Influence of Alcohol or Drug
 - Unsafe Speed
 - Pedestrian Violation



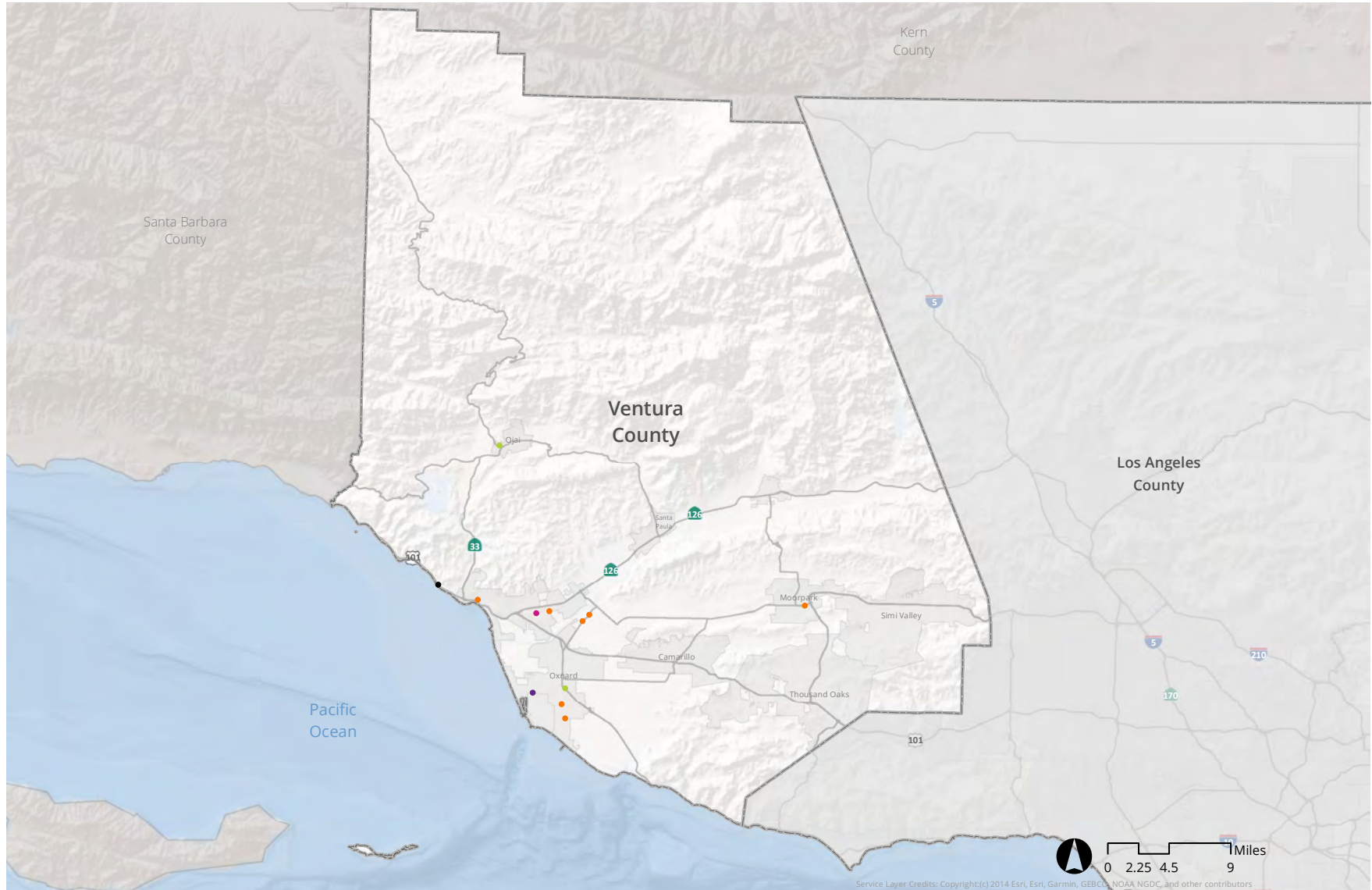
Map 8: Ventura County, 2019 Primary Collision Factors of Serious Injury Collisions



- Ventura County 2019 Primary Collision Factors of Serious Injury Collisions**
- County Boundaries
 - City Boundaries
 - Freeway
 - Unsafe Speed
 - Improper Turning
 - Driving or Bicycling Under the Influence of Alcohol or Drug



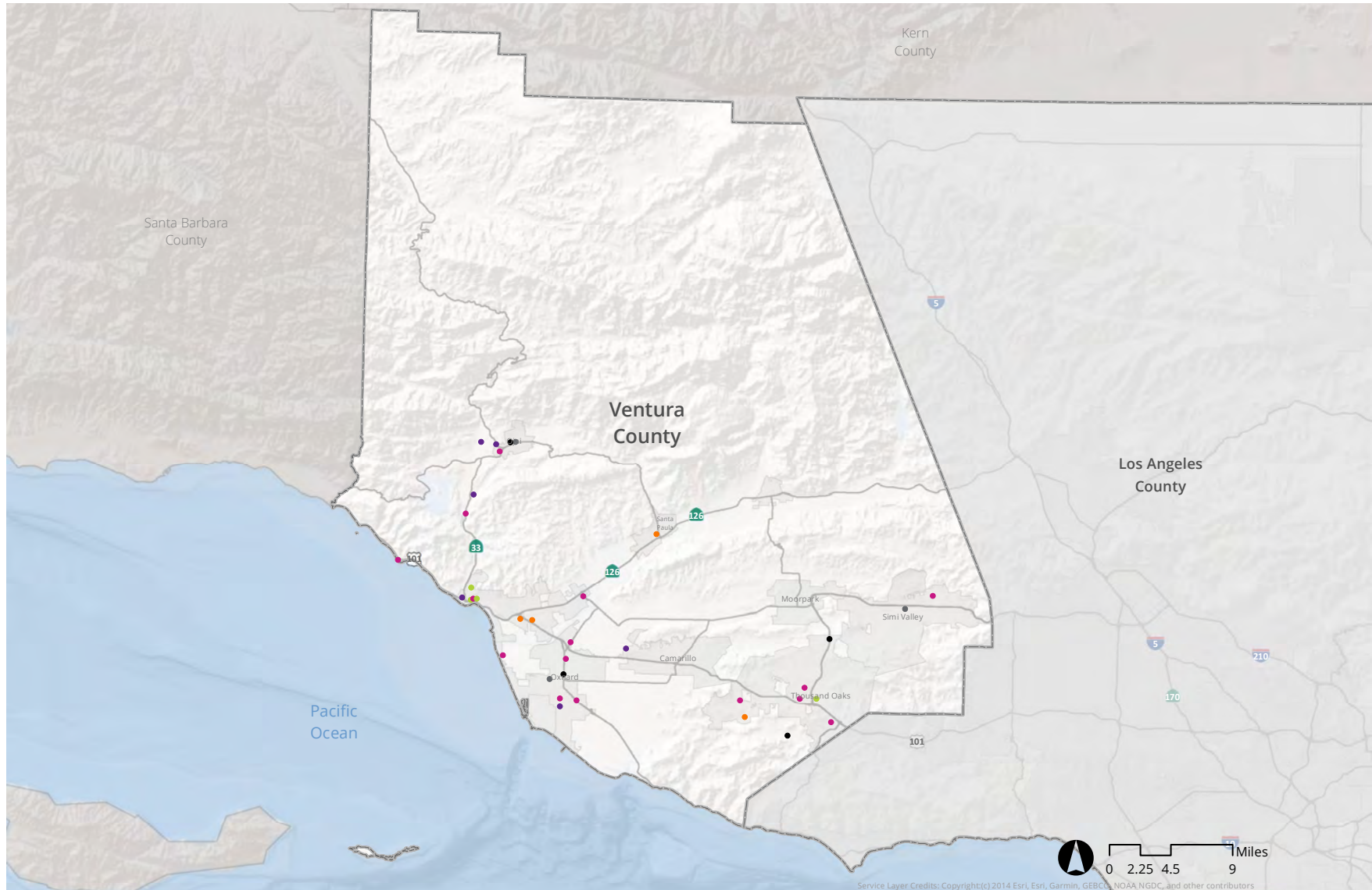
Map 9: Ventura County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Fatal Collisions



- | | | |
|--|---|--|
| <ul style="list-style-type: none"> County Boundaries City Boundaries Freeway | <p>Primary Collision Factors of Pedestrian-Involved Fatal Collisions</p> <ul style="list-style-type: none"> Pedestrian Violation Pedestrian Right of Way Unknown | <p>Primary Collision Factors of Bicyclist-Involved Fatal Collisions</p> <ul style="list-style-type: none"> Improper Turning Other Hazardous Violation |
|--|---|--|



Map 10: Ventura County, 2019 Primary Collision Factors of Bicyclist- and Pedestrian-Involved Serious Injury Collisions



- | | | |
|-------------------|---|--|
| County Boundaries | Primary Collision Factors of Pedestrian-Involved Serious Injury Collisions | Primary Collision Factors of Bicyclist-Involved Serious Injury Collisions |
| City Boundaries | Pedestrian Violation | Improper Turning |
| Freeway | Unsafe Speed | Unsafe Speed |
| | Pedestrian Right of Way | Automobile Right of Way |



