County of San Diego

Local Roadway Safety Plan

April 7, 2022

REPORT INFORMATION

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(ALPHABETICAL ORDER)

CA SHSP	California Strategic Highway Safety Plan
CVC	California Vehicle Code
F	Fatal
FHWA	Federal Highway Safety Administration
F+SI	Fatal plus Severe Injuries
GIS	Geographic Information System
HHSA	Health and Human Services Agency
HPI	Healthy Places Index
HSIP	Highway Safety Improvement Program
ITS	Intelligent Transportation System
LLG	Linscott, Law and Greenspan
LRSP	Local Roadway Safety Plan
PE	Professional Engineer
RSA	Road Safety Audit
SI	Severe Injuries
TAC	Traffic Advisory Committee
TE	Transportation Engineer
TSM&O	Transportation System Management and Operations

INTRODUCTION

1.0 INTRODUCTION

The County of San Diego (herein referred to as the County) is committed to improving the transportation system to enhance the safety of all roadway users. As part of an ongoing effort to enhance the transportation system safety, this Local Roadway Safety Plan (LRSP) was developed as a step towards this commitment. In addition, an LRSP is now required to apply for future Highway Safety Improvement Program (HSIP) funding.

What is an LRSP?

An LRSP provides a framework for analyzing, identifying, and prioritizing roadway safety improvements to reduce severe injury and fatal collisions on local roadways. It is a living document that should be continually reviewed and updated to reflect changing local needs and priorities.

This report documents the process used to collect and analyze collision data on County maintained roadways and identifies recommendations that the County should implement. The LRSP development process is shown in **Figure 1-1**.

Figure 1-1

LRSP Development Process

The Benefits of an LRSP?

According to Federal Highway Safety Administration's (FHWA) *Developing Safety Plans: A Manual for Local Rural Road Owners*, there are several benefits of a local road safety plan. These benefits are detailed in **Table 1-1**.

TABLE 1–1
BENEFITS OF AN LRSP

Benefits	Detail
Proactive Approach	An LRSP offers a proactive approach for local road agencies to address safety issues. An LRSP can show the public and policymakers that something is being done to systematically reduce severe crashes, thereby building trust with local government officials, key stakeholders, and the general public.
Develop Partnerships	An LRSP provides local agencies with an opportunity to improve relationships with the public, stakeholders, and governmental agencies by working through a collaborative process. Improving road safety is a benefit for everyone involved.
Multi-Disciplinary Cooperation	An LRSP is a multi-disciplinary approach to addressing safety. Agencies can develop more effective solutions and leverage resources by considering and coordinating engineering, enforcement, education, and emergency service strategies.
Safer Roadways	An LRSP facilitates a comprehensive approach to addressing road safety that–if successfully implemented–can lead to projects that reduce severe crashes.
Safety Funding	An LRSP with a prioritized list of improvements can help agencies better justify funding requests by documenting specific needs, particularly if they are consistent with emphasis/challenge areas and strategies identified in the State's SHSP. An LRSP also shows that an agency has done its due diligence and can help an agency compete more effectively for limited funds.
Managing Liability	An LRSP is one of several proactive risk management techniques that demonstrate an agency's responsiveness to the safety needs of the public.

Source: FHWA's *Developing Safety Plans - A Manual for Local Rural Road Owners*

WORKING GROUP AND STAKEHOLDERS

2.0 WORKING GROUP AND STAKEHOLDERS

A key component to the success of an LRSP is the establishment of a collaborative partnership with stakeholders. Traffic Advisory Committee (TAC) meetings were determined to be the means by which open communication between the working group and stakeholders was established to support, develop, and implement the LRSP. **Table 2-1** tabulates the working group and stakeholders that collaborated on this LRSP.

TABLE 1–1
WORKING GROUP AND STAKEHOLDERS

WORKING GROUP	• County of San Diego, Public Works • Linscott, Law & Greenspan, Engineer
STAKEHOLDERS	• County of San Diego Departments: – Health & Human Services Agency – Sheriff – Ethics & Compliance – District Attorney – Planning and Development Services – Fire Authority • California Highway Patrol • Planning Communities: – Alpine, Bonsall, Central Mountain, County Islands, Crest-Dehesa, Desert, Fallbrook, Jamul/Dulzura, Julian, Lakeside, Mountain Empire, North County Metro, North Mountain, Otay, Pala/Pauma, Pendleton-De Luz, Rainbow, Ramona, San Dieguito, Spring Valley, Sweetwater, Valle De Oro and Valley Center

GUIDING PRINCIPLES

3.0 GUIDING PRINCIPLES

Vision, Mission, and Goal

To guide the development of the LRSP, a clear vision was established to describe the long-term outcome that is desired. Mission and goal statements were also developed to provide support and direction to achieve the LRSP vision.

Transportation, Health, and Equity

There is a direct relationship between health, equity, and the built environment. Although many factors affect equity, research shows that there is a direct link between transportation and equity. Unfortunately, in the past, some federal, state, and local policies implemented have not succeeded in providing everyone with access to affordable, safe, convenient, and reliable transportation options, leading to socioeconomic and racial disparities. The County of San Diego is committed to being a part of the solution to tackle the challenges of dismantling the injustices in the transportation system and is working towards providing equal access to healthy, reliable, and practical transportation to all.

The first step towards social justice and equity in transportation is acknowledging the existing disparities, inequalities, and roots to establish a clear understanding of both the underlying and explicit issues. In January 2021, the Board of Supervisors voted to declare racism a public health crisis. In doing so, the County acknowledges that racism underpins health inequities and has a substantial correlation to poor outcomes in multi-facets of life. The measures proposed will ensure that the County is making substantive changes to County operations to transform values, policies, and practices to promote equity based on data and community engagement. **Appendix A** contains the resolution.

The County of San Diego is making strides to ensure equity by incorporating public health metrics as an additional facet in the data-driven approach of the LRSP. This differs from the traditional method by accounting for collisions in underserved areas. The Healthy Places Index (HPI) tool was utilized in the priority location assessment in **Chapter 7**. HPI is an online data-mapping tool developed by the Public Health Alliance of Southern California that weighs eight (8) policy action areas to determine a score for each census tract.

Healthy Places Index	1) Economic 2) Social 3) Education 4) Transportation 5) Neighborhood 6) Housing 7) Clean Environment 8) Healthcare Access

HPI is being used at the state, regional, and local levels in equitable grantmaking, assessment, decision-making, planning guidance, prioritizing investments, and many more. The HPI and collision data were utilized to provide a holistic and equitable approach to roadway safety in this Local Roadway Safety Plan. Additional information on each policy action area is provided in **Appendix B**.

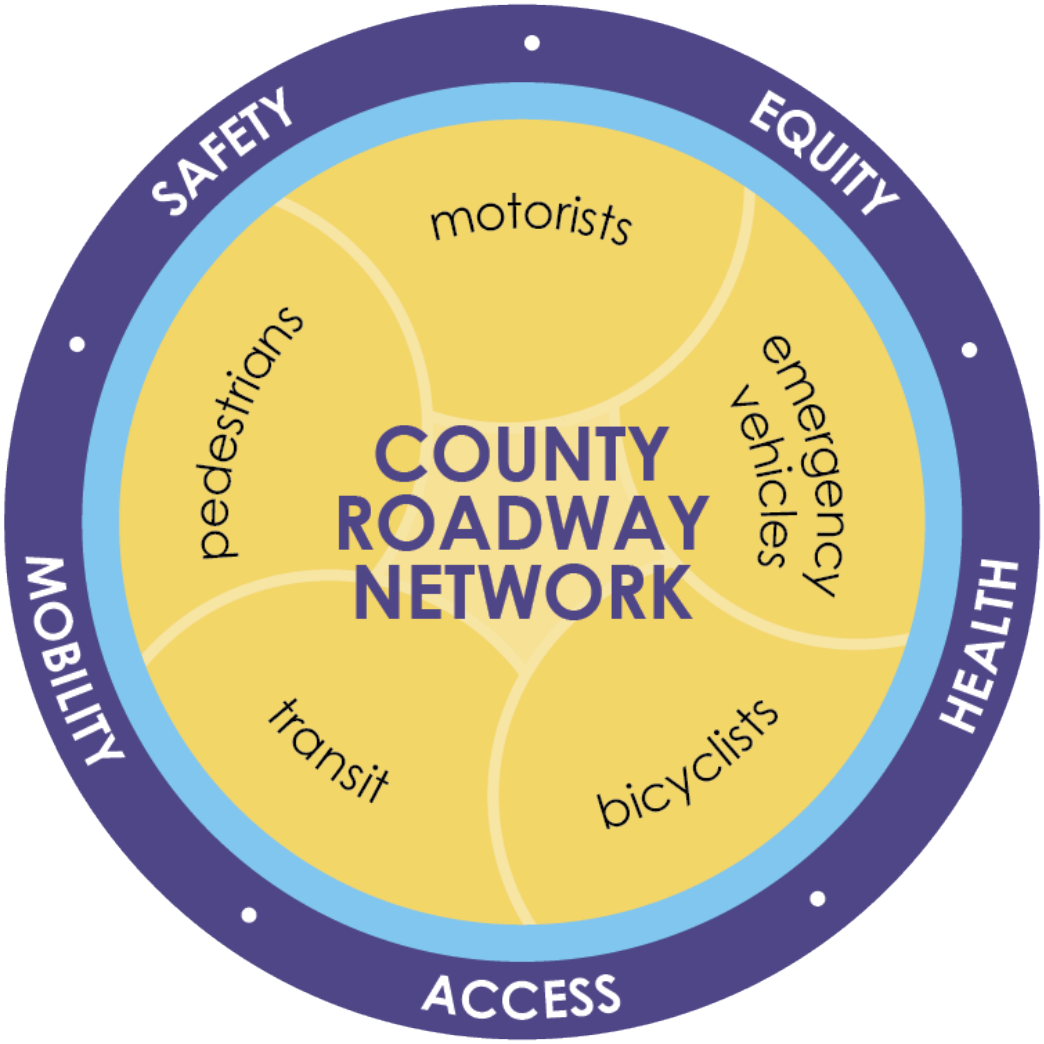
SAFE SYSTEM PRINCIPLES

1) Fatal/Serious Injury is Unacceptable
2) Responsibility is Shared
3) Humans make Mistakes
4) Safety is Proactive
5) Humans are Vulnerable
6) Redundance is Crucial

Road safety is a complex public health issue that requires a multi-disciplinary holistic approach. The California Highway Safety Plan integrates this multi-disciplinary approach through the four (4) Es of roadway safety. This approach involves roadway design (**Engineering**), changing user behavior and culture through institutionalized practices (**Enforcement** of traffic laws and **Education**), and improving emergency services (**Emergency Response**). Also incorporated in the LRSP

development process are the six (6) safe systems principles to help us work towards the County of San Diego's vision, mission, and goal.

The County of San Diego recognizes that there is more work left to do and looks forwards to being a part of the solution in applying these guiding principles and taking a holistic approach on the County roadway network and its users through the lens of safety, equity, health, mobility, and access.



DATA RESOURCES

4.0 DATA RESOURCES

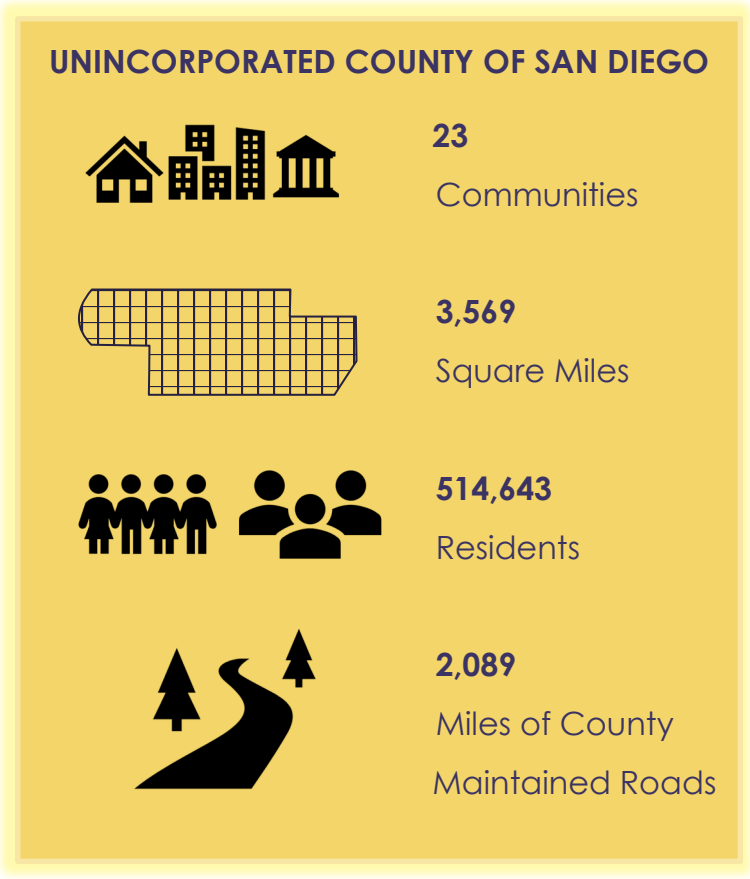
A Geographic Information System (GIS) database was developed, containing the roadway network, community planning areas, HPI and collision information.

Roadway Network and Planning Communities

Using County GIS files of the roadway network and community planning areas, the collision data was spatially plotted. The post-processing of the collision data is further detailed in the next sub-chapter.

The analyses included in this report are of county-maintained roadways and intersections within the planning community areas listed below. This list is consistent with the County of San Diego General Plan Mobility Element. **Figure 4-1** shows the County of San Diego Planning communities. This LRSP does not include analyses of private roadways and freeways/state routes within Caltrans's right-of-way.

1. Alpine
2. Bonsall
3. Central Mountain
4. County Islands
5. Crest-Dehesa
6. Desert
7. Fallbrook
8. Jamul/Dulzura
9. Julian
10. Lakeside
11. Mountain Empire
12. North County Metro
13. North Mountain
14. Otay
15. Pala/Pauma
16. Pendleton-De Luz
17. Rainbow
18. Ramona
19. San Dieguito
20. Spring Valley
21. Sweetwater
22. Valle De Oro
23. Valley Center



Collision Data

The data contained in this report was obtained from the County of San Diego's collisions database. The database is a compilation of anonymized collision report information from law enforcement agencies that includes but are not limited to the following collision details:

- Date/Time/Location
- Severity
- CVC Violation
- Roadway Condition
- Weather
- Safety Equipment
- Collision Type
- Party Information
- Victim Information

CASE ID	YEAR	DATE	TIME	DAY OF WEEK
6735593	2015	20150101	840	4
6781275	2015	20150101	1053	4
6782303	2015	20150101	300	4
6782306	2015	20150101	500	4
6785310	2015	20150101	1045	4
6789197	2015	20150101	753	4
6798405	2015	20150101	1735	4
6775159	2015	20150102	1600	5
6782194	2015	20150102	1412	5
6782305	2015	20150102	1540	5
6782550	2015	20150102	2310	5
6799409	2015	20150102	1040	5
6782195	2015	20150103	1358	6

COLLISION_DATE	COLLISION_TIME	DAY_OF_WEEK	CHP_SHIFT	SPECIAL_COND	BEAT_TYPE	CHP_BEAT_TYPE	CHP_BEAT_CLASS	BEAT_NUMBER	
20150101	840	4	1	0	3	5	2	213	RICE CANYON RD
20150101	1053	4	1	0	3	5	1	212	W OAK GLEN RD
20150101	300	4	3	0	2	4	1	96	HIGHLAND VALLE
20150101	500	4	3	0	2	4	1	26	JAMACHA BL
20150101	1045	4	1	0	3	5	2	211	MOUNTAIN LILAC
20150101	753	4	1	0	3	5	2	213	PALA TEMECULA
20150101	1735	4	2	0	2	4	1	12	LAKE JENNINGS
20150102	1600	5	2	0	3	5	2	1	PEPPER DR
20150102	1412	5	2	0	3	5	2	2	ESTRELLA DR
20150102	1540	5	2	0	2	4	1	21	WILLOW GLEN DR
20150102	2310	5	3	0	3	5	2	6	N MAIN ST
20150102	1040	5	1	0	3	5	2	1	PINEHURST RD
20150103	1358	6	1	0	2	4	1	20	CALLE VERDE
20150103	1140	6	1	0	3	5	2	9	BOUNDARY AV
20150103	1639	6	2	0	3	5	2	230	DEL DIOS HWY
20150103	146	6	3	0	3	5	2	211	PARADISE MOUN
20150103	2325	6	3	0	3	5	2	2	HIDDEN MESA RD
20150104	1331	7	1	0	3	5	2	231	BEAR VALLEY PK
20150104	1754	7	2	0	3	5	2	2	PORTOLA AV
20150104	48	7	3	0	3	5	2	211	PARADISE MOUN
20150104	1545	7	2	0	3	5	2	24	BERNARDO CENT
20150104	1409	7	2	0	3	5	2	70	RAMBLA DE LAS
20150105	640	1	1	0	2	4	2	61	EAST MISSION RD
20150105	740	1	1	0	2	4	1	21	WILLOW GLEN DR
20150105	1841	1	2	0	3	5	2	70	EL CAMINIO DEL
20150105	1750	1	2	0	1	1	2	84	OLDE HIGHWAY 8
20150105	1455	1	2	0	3	5	2	6	AMMUNITION RD
20150106	815	2	1	0	3	5	2	170	SOUTH SANTA FE
20150106	1422	2	2	1	3	5	2	230	VIA RANCHO PKW
20150106	1615	2	2	0	3	5	2	3	ARNOLD WY
20150106	215	2	3	0	3	5	2	211	WOODS VALLEY
20150106	1625	2	2	0	2	4	1	20	AVOCADO AV
20150106	1815	2	2	0	2	4	1	95	SAN VICENTE RD
20150106	2210	2	3	0	3	5	2	24	ALVA RD
20150107	1915	3	2	0	2	4	2	63	RECHE RD

This database is continuously updated and maintained by the County of San Diego Public Works Department. The timeline selected for the analyses is the five years from January 1, 2015 to December 31, 2019. The obtained data set was processed further to create a final data set of collisions for the analyses. This post-processing included the following:

- Removing collisions that occurred in incorporated areas.
- Removing collisions that occurred in Caltrans's right-of-way, such as freeway, on-ramps and off-ramps, and state routes (freeway or conventional types).
- Removing collisions that occurred at Caltrans-controlled intersections.
- Removing collisions that occurred on private roadways.

Utilizing the latitude and longitude information provided in the data set, the collisions were spatially mapped using GIS software. It should be noted that the latitude and longitude coordinates were utilized as-is and were not further validated due to the magnitude of the data set.

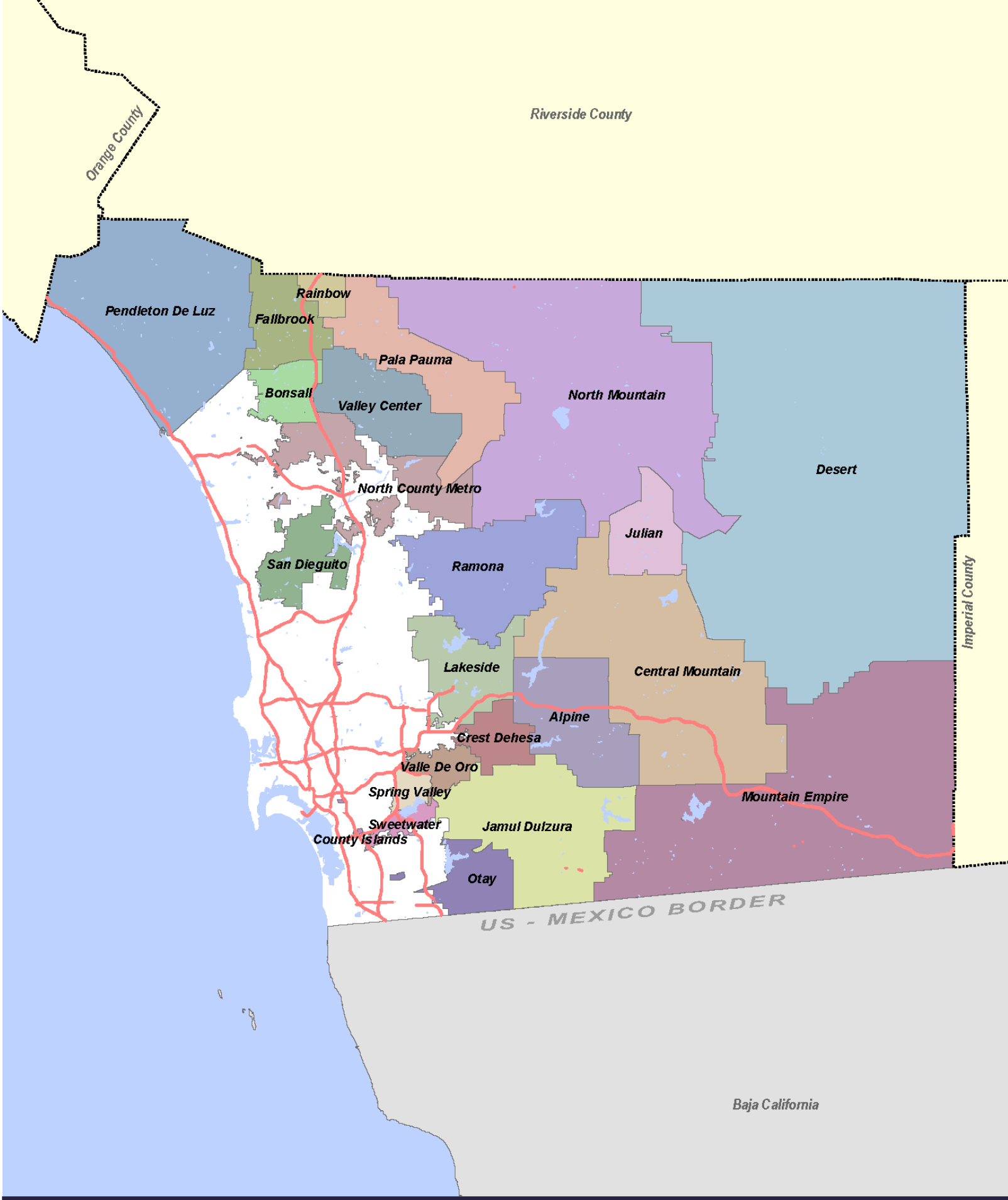


Figure 4-1
County of San Diego Planning Communities

COLLISION ANALYSIS

5.0 COLLISION ANALYSIS

The analysis presented in this chapter is a summary of the collision trends between January 1, 2015, to December 31, 2019.

Total Collisions

Over the five years between 2015-2019, a total of 16,245 collisions have occurred. The number of collisions had steadily increased over the first four years but declined in 2019. The highest occurrence of collisions was recorded in 2018 and the lowest in 2015. Over the five years, collisions increased by approximately 18%. See **Figure 5-1**.

Severe Injury Collision

Over the five years between 2015-2019, a total of 683 severe injury collisions have occurred. Severe injury collisions are collisions that result in broken bones, dislocated or distorted limbs, and other severe characteristics. It has steadily increased over the five years. The highest occurrence of collisions was recorded in 2019 and the lowest in 2015. Over the five years, severe injury collisions increased by approximately 22%. See **Figure 5-2**.

Fatal Collisions

Over the five years between 2015-2019, a total of 160 fatal collisions have occurred. Fatal collisions are collisions that result in a victim's death. It has held steady over the five years. The highest occurrence of fatal collisions was recorded in 2017 and the lowest in 2016. Over the five years, fatal collisions increased by approximately 20%. See ***Figure 5-2***.

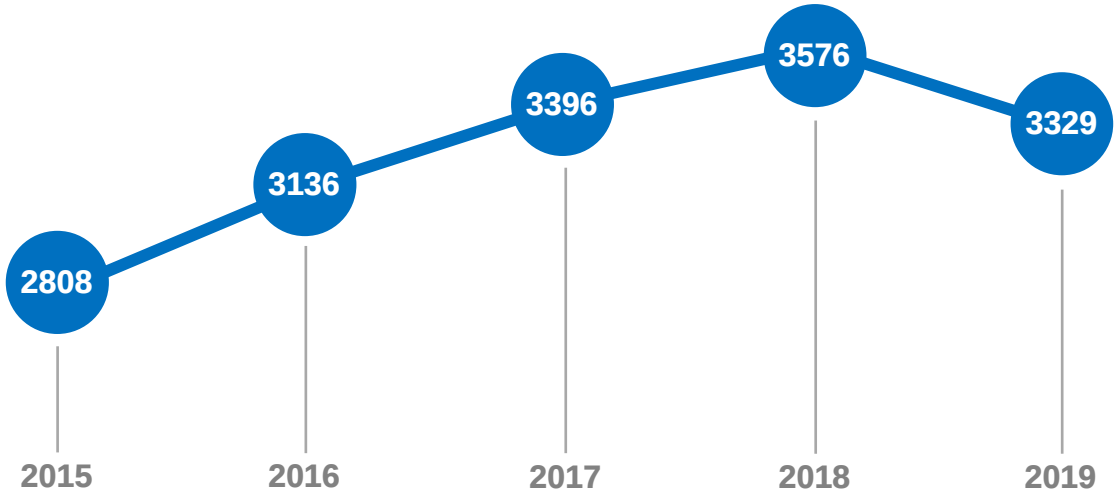


Figure 5–1 Five-Year Total Collision Trend

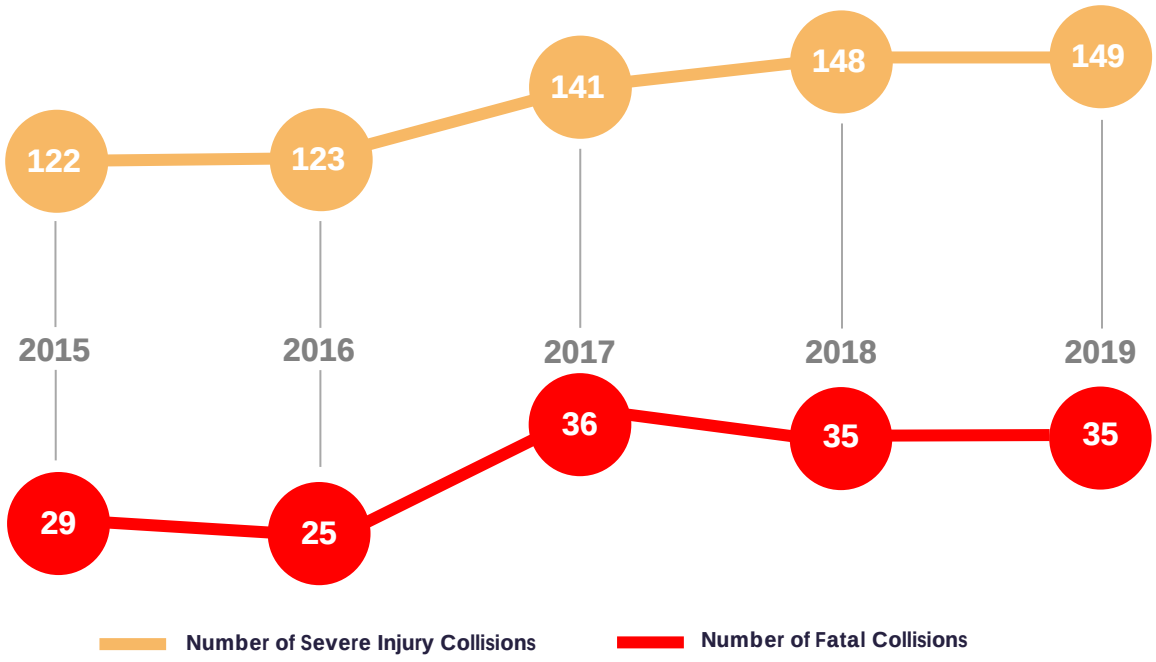


Figure 5–2 Five-Year Fatal and Severe Injury Trends

Specific Collision Trends

An in-depth review of the collision data revealed the following insights on the collisions that occurred over the five years.

- Collision occurrences tend to be higher on Friday and Saturday.
- Nearly 22% of the collisions occurred between 3:00-6:00 PM.
- Nearly 60% of the collisions were property damage only.
- Nearly 53% of the collision involved another motor vehicle and nearly 29% of the collisions involved a fixed object.
- Nearly 97% of the collisions were a result of a California Vehicle Code violation.
- The top primary collision factor of the collisions are the following:
  - Improper turning (29.7%)
  - Unsafe speeds (22.2%)
  - Automobile right-of-way (15.8%)
  - Operating under the influence (11.8%)
- Nearly 85% of the collision comprise the following types of collisions:
  - Hit object (30.0%)
  - Broadside (20.9%)
  - Rear-end (19.9%)

- Sideswipe (19.9%)

- Nearly 21% of collisions involved an older driver (65 years or older).
- Approximately 13% of collisions involved a younger driver (15 to 20 years old).
- Approximately 2% of collisions involved a pedestrian.
- Nearly 2% of collisions involved a bicyclist.
- Nearly 18% of collisions occurred at an intersection. These are collisions that occurred within the intersection footprint or occurred within the intersection influence area of 100 feet.

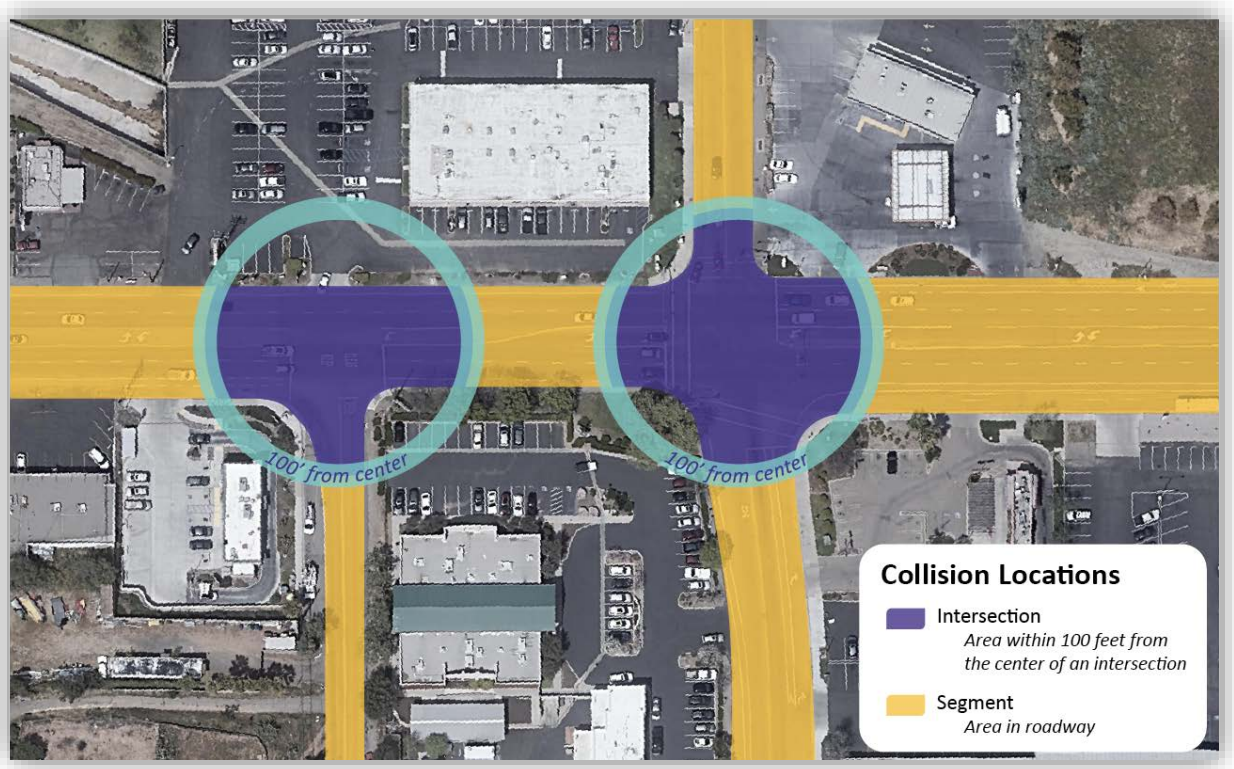
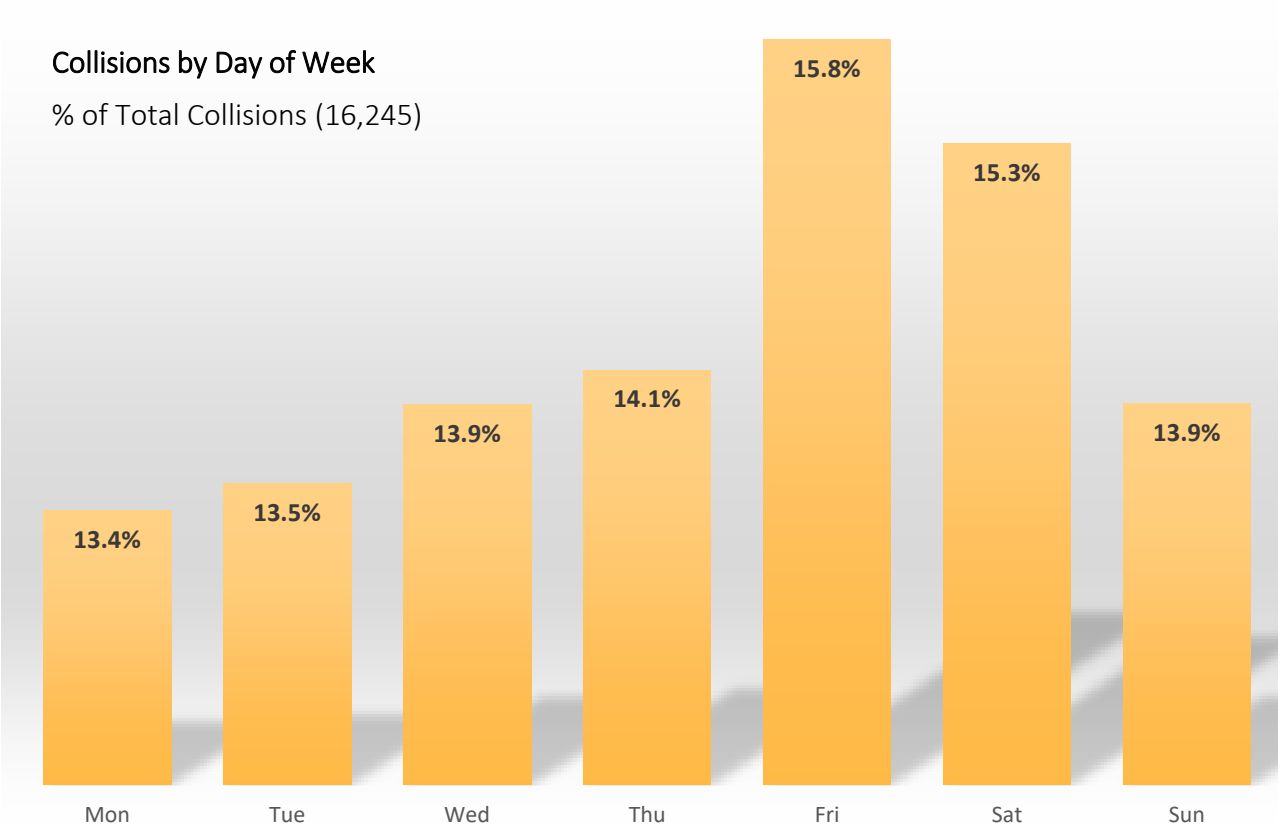


Figure 5-4 graphically details the trends above. Additional queries were also conducted and summarized in **Appendix C**.

Collision Overview for Communities

Figure 5-5 summarizes the collision overview for each of the 23 community planning areas. **Appendix D** contains a more detailed collision analysis for each community.



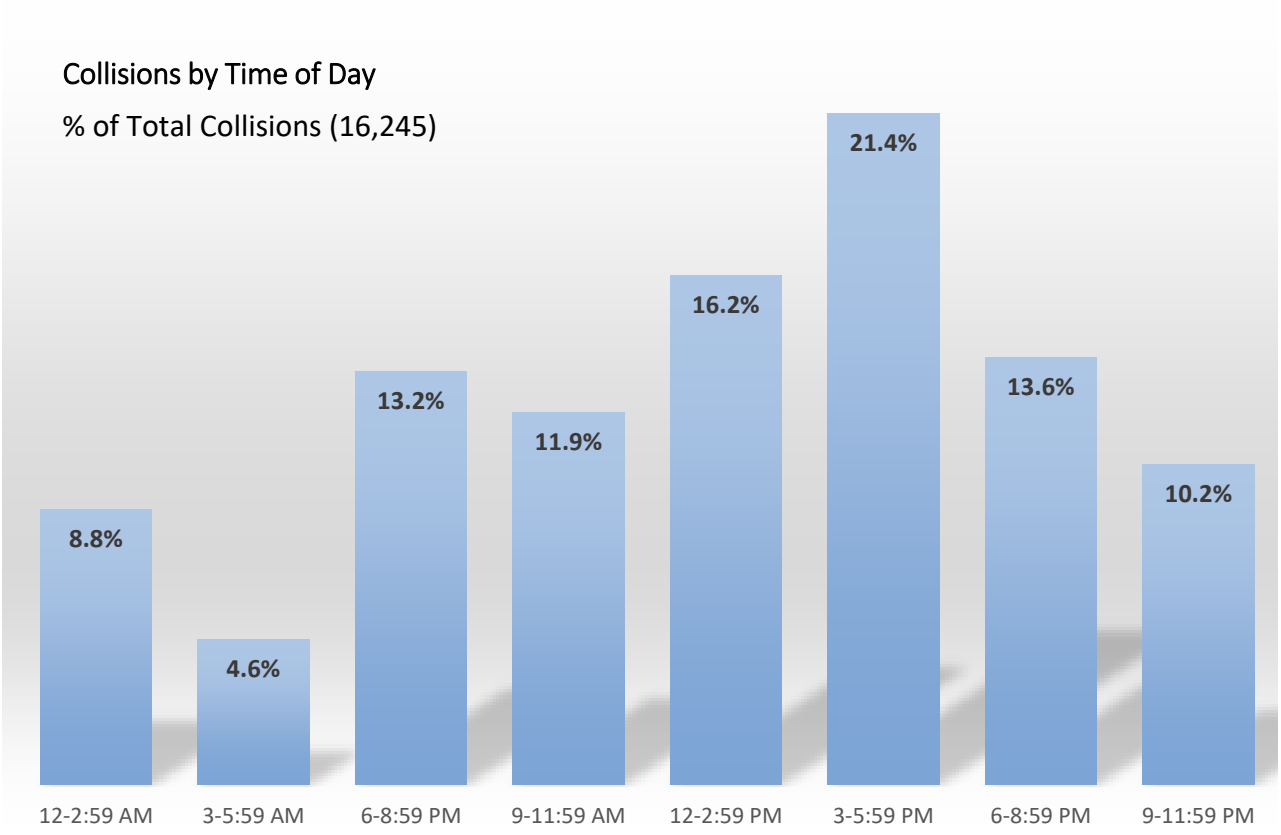
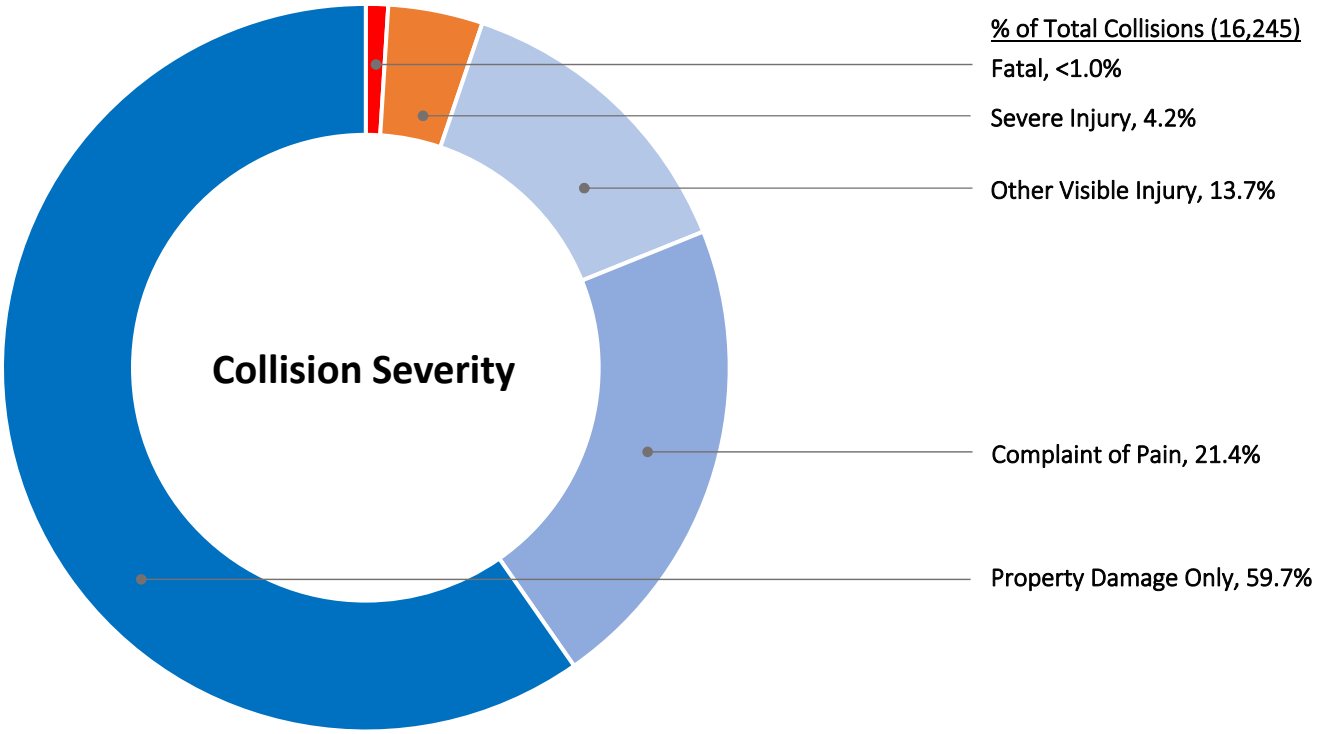


Figure 5-4
Specific Collision Trends (1 of 4)



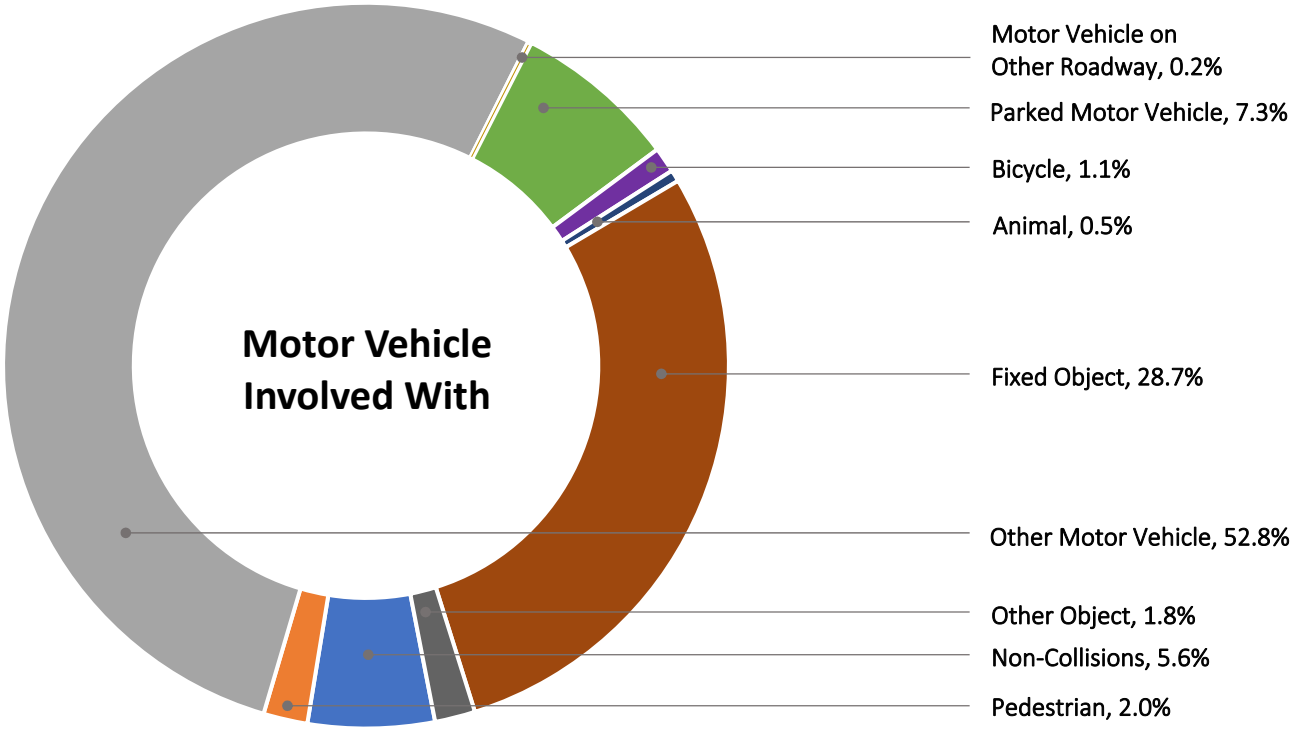
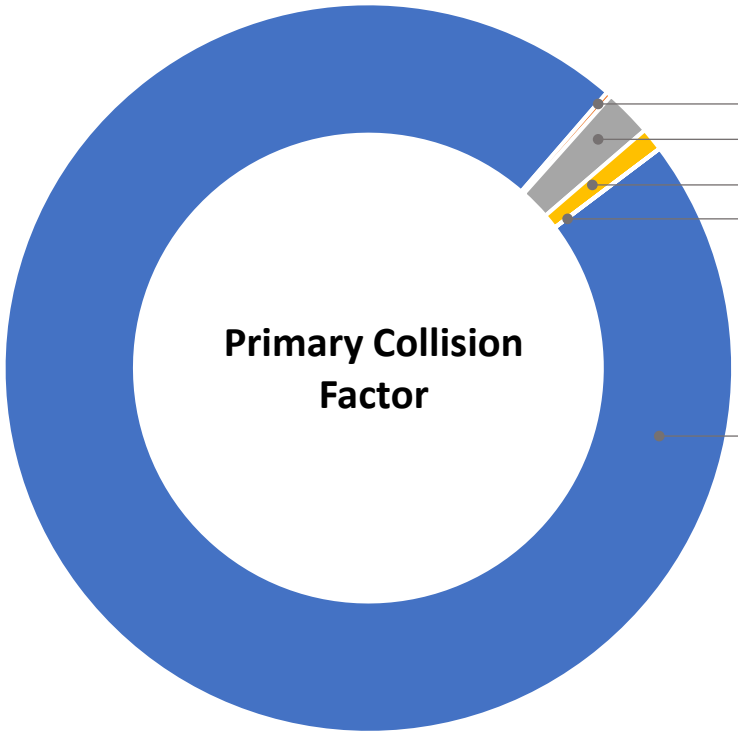
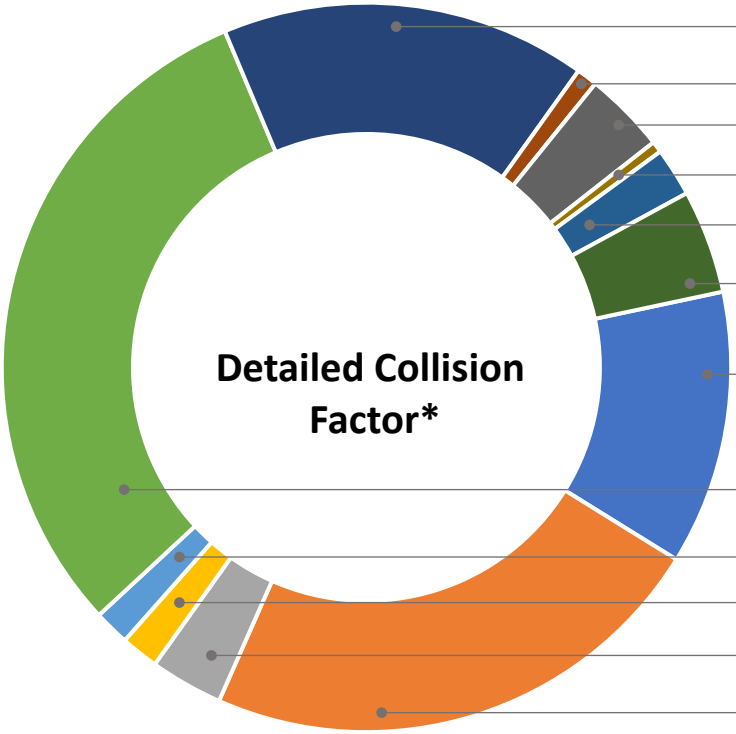


Figure 5-4
Specific Collision Trends (2 of 4)



% of Total Collisions (16,245)

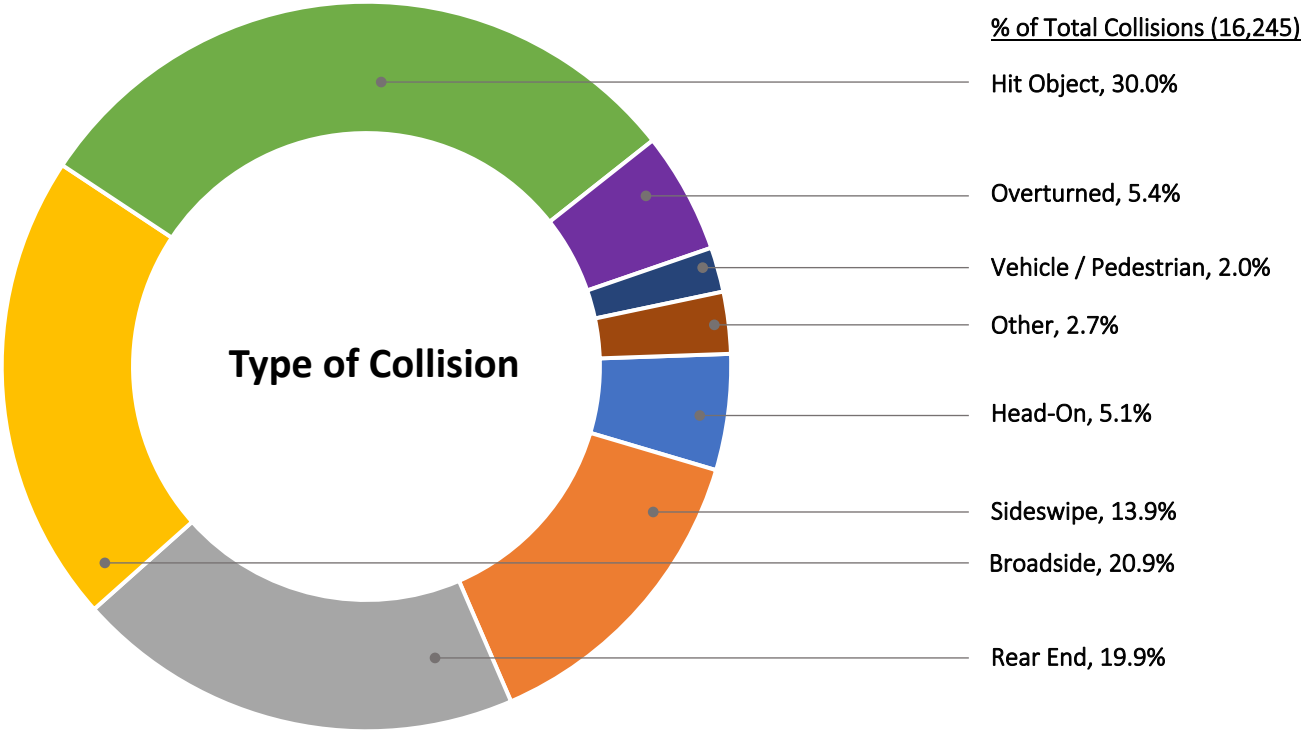
Other Improper Driving, 0.23%
Other Than Driver, 2.10%
Unknown, 1.03%
Not Stated, 0.01%
Code Violation, 96.63%



Automobile ROW, 15.8%
Pedestrian Violation, 0.9%
Traffic Signals & Signs, 3.5%
Other Hazardous Violation, 0.5%
Other Than Driver, 2.1%
Unsafe Starting or Backing, 4.5%
DUI / BUI, 11.8%
Improper Turning, 29.7%
Unsafe Lane Change, 1.5%
Improper Passing, 1.6%
Wrong Side of Road, 3.1%
Unsafe Speed, 22.2%

*Collision factors with <0.5% are not shown

Figure 5-4
Specific Collision Trends (3 of 4)



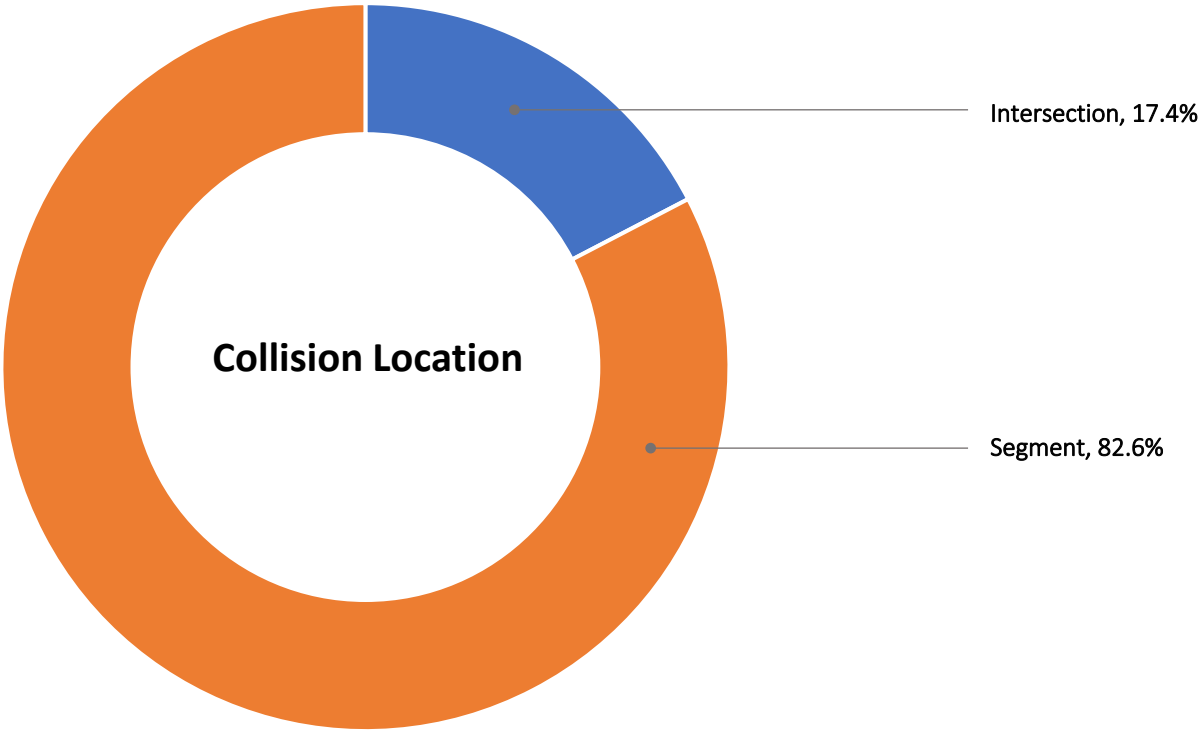


Figure 5-4
Specific Collision Trends (4 of 4)

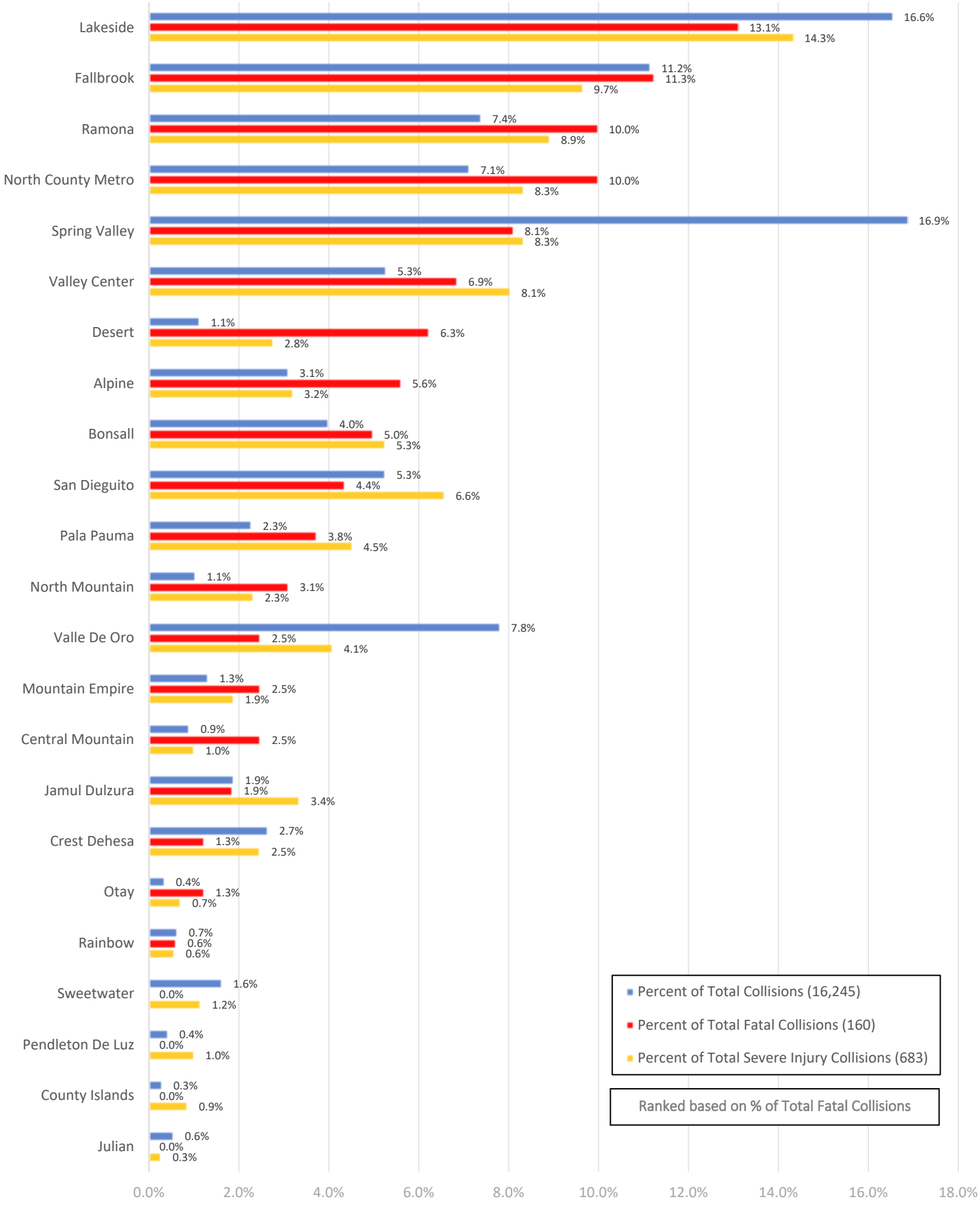


Figure 5-5
Collision Overview by Community Planning Areas

CHALLENGE AREAS & RECOMMENDATIONS

6.0 CHALLENGE AREAS & RECOMMENDATIONS

Challenge Areas

A challenge area (also known as an emphasis area) is an area of opportunity to improve transportation safety. Identification of a challenge area helps focus the recommendations/countermeasures to provide the greatest opportunity for reducing fatal and severe injury collisions. Based on the collision analysis and other metrics, below is a list of the sixteen (16) challenge areas that have been identified specific to the County of San Diego. Each challenge area is described further at the end of the chapter.

County Local Roadway Challenge Areas

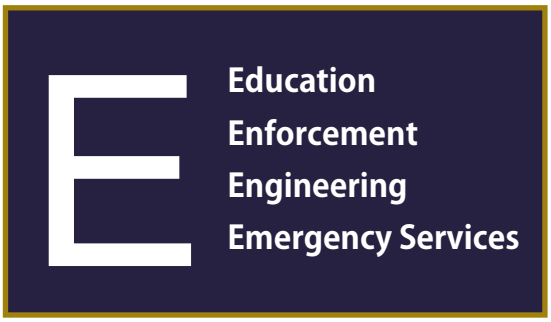
- Emerging Technologies
- Impaired Drivers
- Aggressive Driving
- Motorcyclists
- Lane Departure
- Emergency Response
- Intersections
- Public Health/Equity
- Occupant Protection
- Pedestrians
- Aging Drivers
- Young Drivers
- Bicyclists
- Commercial Vehicles
- Keeping Drivers Alert
- Work Zones

Table 6-1 tabulates the collision data by challenge areas. **Figure 6-1** graphically illustrates the collision data by challenge areas and is ranked from highest to lowest based on the total number of fatal and severe injury collisions.

Relationship to the California Strategic Highway Safety Plan (CA SHSP)

The most current CA SHSP is in effect until 2024. The CA SHSP identifies 16 challenge areas. See **Appendix E** for more information on the CA SHSP's challenge areas. The County's challenge areas align with CA SHSP in all but two categories – Driver Licensing, which is a challenge area identified in the CA SHSP, and Public Health/Equity, which is a challenge area identified in the County LRSP.

The 4 Es of Safety



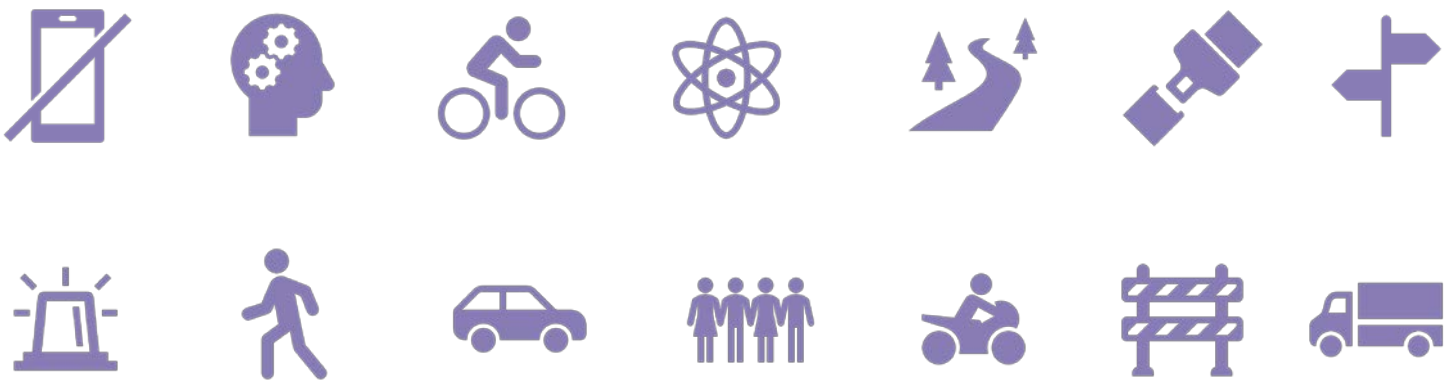
In line with the CA SHSP, there are four Es to traffic safety. Education provides roadway users information about making good choices and about the rules of the road. Enforcement involves officers engaging with the general public to help prevent and deter roadway users from unsafe behaviors and uphold roadway safety laws. Engineering addresses roadway infrastructure and elements to prevent crashes or reduce the severity of collisions when they occur. Emergency Response can make all the difference in saving the lives of crash victims through rapid response, securing the collision site, and quality of care.

What is a Countermeasure?

Drawing from the 4Es of safety, a countermeasure is a specific action to improve transportation safety and therefore help decrease the number of fatal and severe injury collisions. A comprehensive approach utilizing the 4 E's of Safety was applied in determining the appropriate countermeasures for each challenge area. This approach recognizes that not all collisions can be addressed solely by infrastructure improvements. Countermeasures can also be behavioral and programmatic/policy changes, such as a public campaign such as "Click it or Ticket."

TABLE 6–1
COLLISION DATA BY CHALLENGE AREAS

Challenge Area	Number of Collisions							
	Total		Fatal (F)		Severe Injury (SI)		F+SI	
Total Collisions	**16245**		**160**		**683**		**843**	
Emerging Technologies								
Unsafe Speed	3603	22.2%	22	13.8%	141	20.6%	163	19.3%
Ran off the Road	1395	8.6%	24	15.0%	46	6.7%	70	8.3%
Rear End	3232	19.9%	6	3.8%	38	5.6%	44	5.2%
Unsafe Lane Change	249	1.5%	0	0.0%	1	0.1%	1	0.1%
Collision with Other Object	292	1.8%	0	0.0%	7	1.0%	7	0.8%
Crossed Into Opposing Lane	523	3.2%	26	16.3%	59	8.6%	85	10.1%
TOTAL	*9294*	*57.2%*	*78*	*48.8%*	*292*	*42.8%*	*370*	*43.9%*
Impaired Drivers	*1923*	*11.8%*	*50*	*31.3%*	*163*	*23.9%*	*213*	*25.3%*
Aggressive Driving								
Unsafe Speed	3603	22.2%	22	13.8%	141	20.6%	163	19.3%
Following Too Closely	45	0.3%	0	0.0%	1	0.1%	1	0.1%
Traffic Signals and Signs	571	3.5%	2	1.3%	18	2.6%	20	2.4%
TOTAL	*4219*	*26.0%*	*24*	*15.0%*	*160*	*23.4%*	*184*	*21.8%*
Motorcyclists	1007	6.2%	50	31.3%	120	17.6%	170	20.2%
Intersections	2820	17.4%	14	8.8%	104	15.2%	118	14.0%
Occupant Protection								
Unrestrained Occupants	298	1.8%	25	15.6%	29	4.2%	54	6.4%
Helmet Not Used	128	0.8%	6	3.8%	12	1.8%	18	2.1%
TOTAL	*426*	*2.6%*	*31*	*19.4%*	*41*	*6.0%*	*72*	*8.5%*
Lane Departure								
Crossed Into Opposing Lane	523	3.2%	26	16.3%	*59*	8.6%	85	10.1%
Ran off the Road	1395	8.6%	24	15.0%	46	6.7%	70	8.3%
TOTAL	*1918*	*11.8%*	*50*	*31.3%*	*105*	*15.4%*	*155*	*18.4%*
Pedestrians	341	2.1%	30	18.8%	35	5.1%	65	7.7%
Aging Drivers	3336	20.5%	21	13.1%	42	6.1%	63	7.5%
Young Drivers	2112	13.0%	15	9.4%	30	4.4%	45	5.3%
Bicyclists	267	1.6%	8	5.0%	22	3.2%	30	3.6%
Commercial Trucks	389	2.4%	1	0.6%	12	1.8%	13	1.5%
Keeping Drivers Alert								
Fell Asleep	0	0.0%	0	*0.0%*	0	0.0%	0	0.0%
Distracted	559	3.4%	0	*0.0%*	6	0.9%	6	0.7%
TOTAL	*559*	*3.4%*	*0*	*0.0%*	*6*	*0.9%*	*6*	*0.7%*
Work Zones	103	0.6%	1	0.6%	3	0.4%	4	0.5%
Emergency Response	1204	7.4%	28	17.5%	101	14.8%	129	15.3%
Public Health/Equity	1678	10.3%	17	10.6%	77	11.3%	94	11.2%



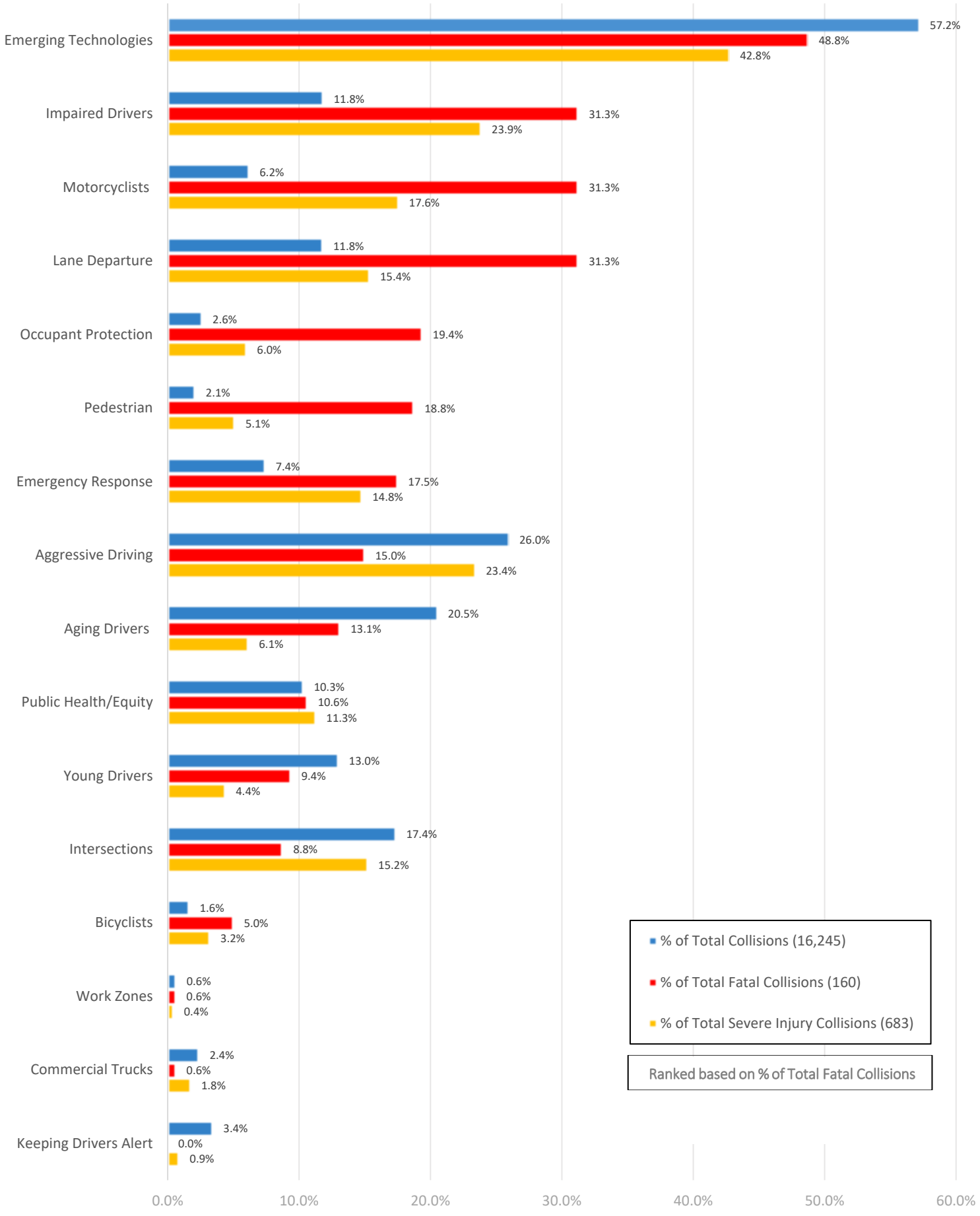
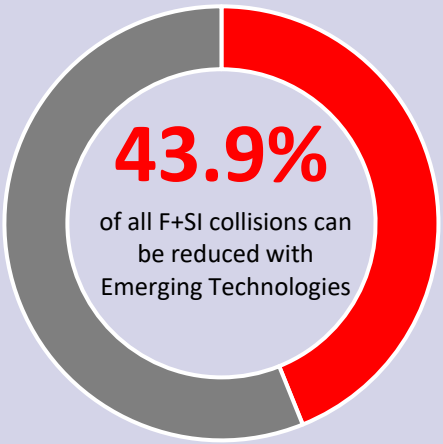


Figure 6-1
Ranked Challanege Areas

Emerging Technologies

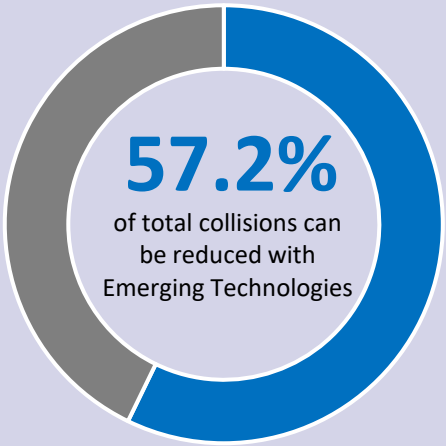
Emerging Technologies is a County of San Diego Local Roadway Safety Plan challenge area that focuses on in-roadway technologies and the infrastructure to support advancing technologies to prevent collisions. Collisions caused by drivers traveling at unsafe speeds, running off the roadway, rear-ending other vehicles, making unsafe lane changes, colliding with roadside objects, and crossing into opposing lanes are collision types that can be reduced with emerging technologies. See **Appendix J** for more information on Emerging Technologies.

Percent & Number of Fatalities + Severe Injuries



370 of all F+SI collisions could be reduced with Emerging Technologies

Percent & Number of Total

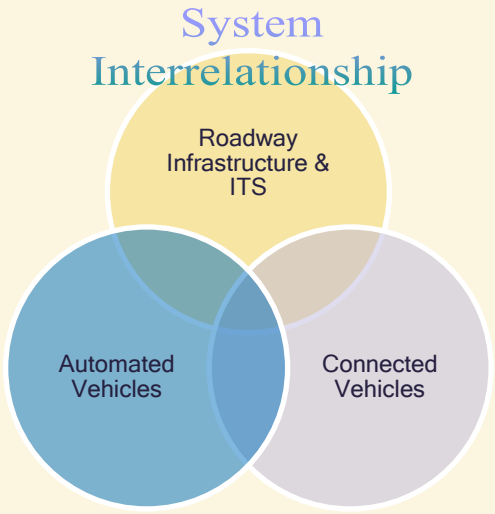


9,294 of total collisions could be reduced with Emerging Technologies

Recommendations:

- Develop an Intelligent Transportation System/Transportation System Management and Operations (ITS/TSM&O) master plan that details how emerging technologies can be integrated into the roadway network to communicate to drivers or automated/connected vehicles to help motorists travel safely on County roads.
- Identify implementable best practices to support emerging technologies and ensure that they are reflected in roadway design processes, standards, and guidelines.
- Pursue grant funding to develop the ITS/TSM&O Master Plan as well as grant funding to identify specific corridors as ITS opportunity area

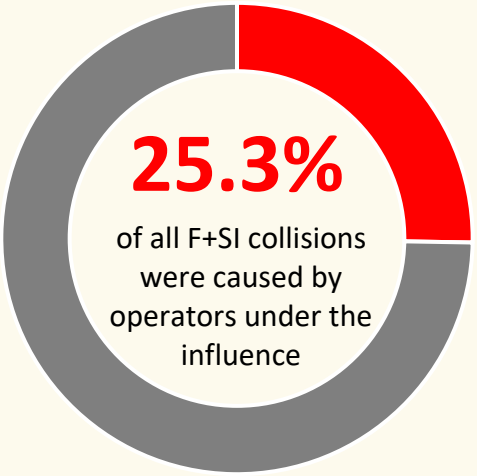
See **Appendix F** of the LRSP report for more information.



Impaired Drivers

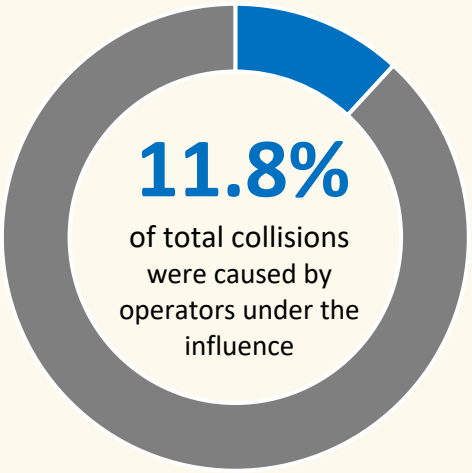
Impaired Drivers is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions where the operator of a motor vehicle or bicycle was under the influence of alcohol or drugs.

Percent & Number of Fatalities + Severe Injuries



213 of all F+SI collisions were caused by operators under the influence

Percent & Number of Total



1,923 of total collisions were caused by operators under the influence

Recommendations:

Continue to monitor, invest, and assess effective ways to prevent driving under the influence and repeat offenders, such as the following:

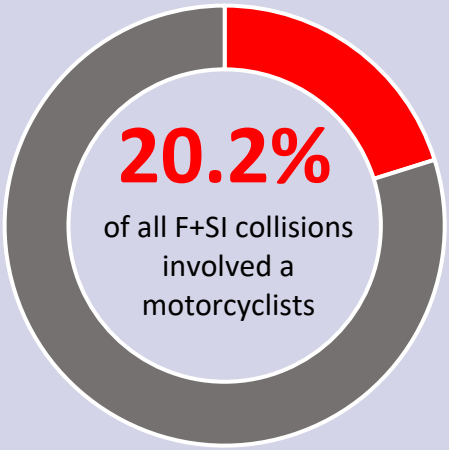
- High visibility patrol, targeted saturation patrols, and checkpoints
- Training/classes for patrol offices
- Educational, public awareness, outreach efforts
- Assessment, intervention, and treatment programs
- Collaboration efforts
- Alcohol/cannabis sales compliance and service training
- Laws and consequences

See **Appendix F** of the LRSP report for more information.

Motorcyclists

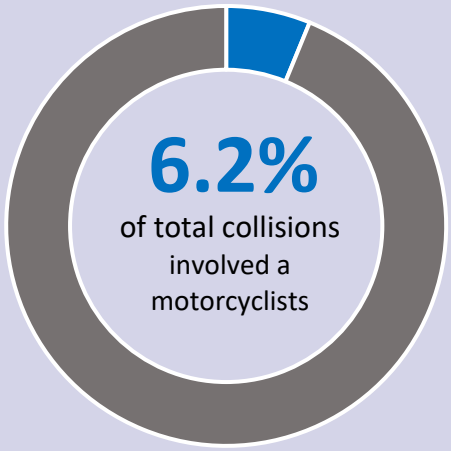
Motorcyclists is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions involving a motorcyclist.

Percent & Number of Fatalities + Severe Injuries



170 of all F+SI collisions were caused by operators under the influence

Percent & Number of Total



1,007 of total collisions were caused by operators under the influence

Recommendations:

- Continue to monitor, invest, and assess effective law enforcement efforts to prevent motorcycle collisions.
- Assess and evaluate effective ways to enhance awareness and deter behaviors on the road, such as the following:
  - Educational, public awareness, and outreach efforts
  - Partnerships and programs
- Conduct an engineering study to further assess and identify issues related to this challenge area. The study should establish a framework to apply appropriate countermeasures for the study segment and proactively along segments with similar characteristics throughout the County.

See **Appendix F** of the LRSP report for more information

Lane Departure

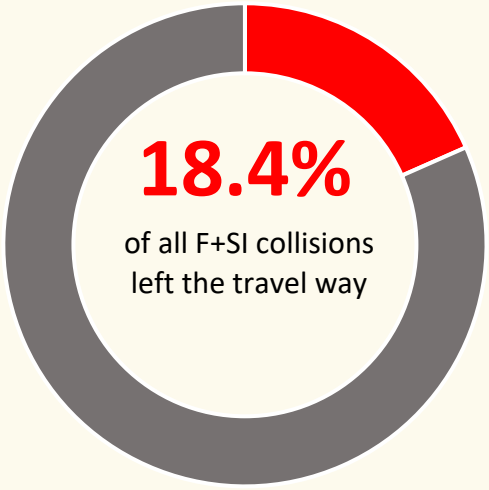
Lane Departure is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions involving vehicles leaving the travel way. Collisions preceded by drivers crossing into the opposing lane or running off the roadway are types of lane departures.

Recommendations:

- Develop an Intelligent Transportation System/Transportation System Management and Operations (ITS/TSM&O) master plan that details how emerging technologies can be integrated into the roadway network to communicate to drivers or automated/connected vehicles of potential lane departure hazards.
- Conduct an engineering study for several segments to further assess and identify issues related to this challenge area. Establish a framework to apply appropriate countermeasures for the segments and proactively throughout the County.

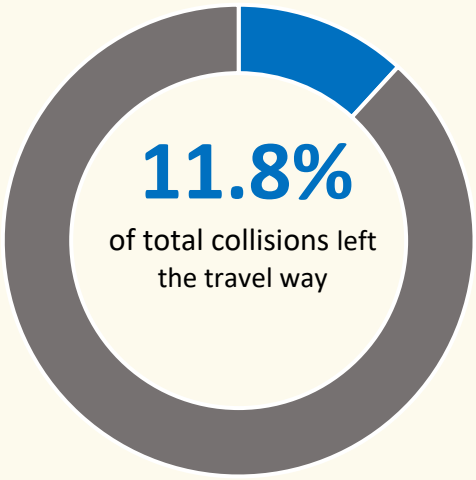
See **Appendix F** of the LRSP report for more information

Percent & Number of Fatalities + Severe Injuries



155 of all F+SI collisions were lane departures

Percent & Number of Total



1,918 of total collisions were lane departures

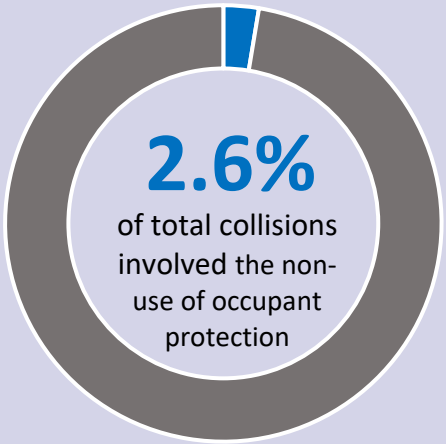
Occupant Protection

Occupant Protection is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions involving the non-use or lack of safety equipment – particularly restraints in vehicles and helmets for bicyclists and motorcyclists.

Percent & Number of Fatalities + Severe Injuries

72 of all F+SI collisions involved the use of non-use of occupant protection

Percent & Number of Total



426 of total collisions involved the use of non-use of occupant protection

Recommendations:

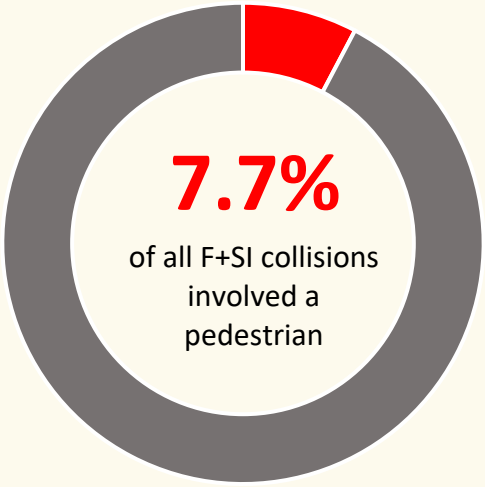
- Assess and evaluate effective ways to enhance awareness and deter behaviors, such as the following:
  - Educational, public awareness, outreach efforts
  - Partnerships and programs
- Continue to monitor, invest, and assess effective ways to increase California Vehicle Code compliance, prevent collisions, and deter behaviors associated with this challenge area.

See **Appendix F** of the LRSP report for more information

Pedestrians

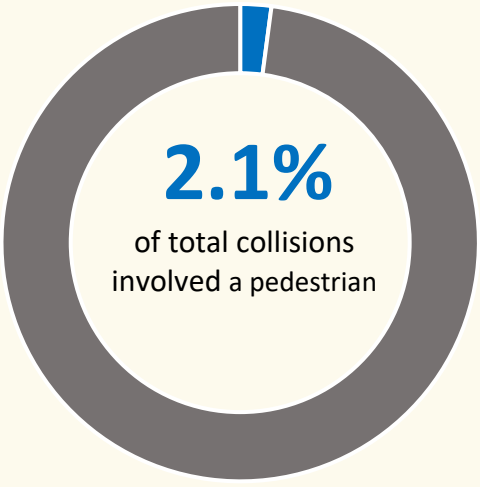
Pedestrians is a County of San Diego Local Roadway Safety Plan challenge area that focuses on motor vehicles involved in a collision with a pedestrian.

Percent & Number of Fatalities + Severe Injuries



65 of all F+SI collisions involved a pedestrian

Percent & Number of Total



341 of total collisions involved a pedestrian

Recommendations:

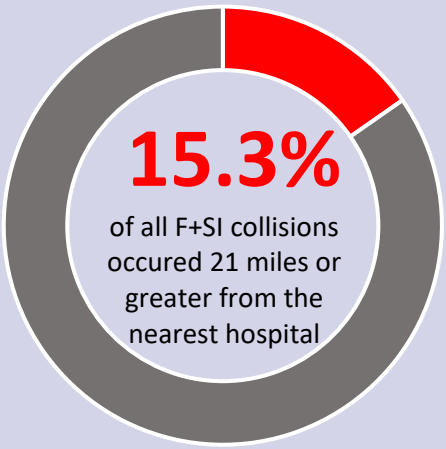
- Develop and implement a complete streets checklist to ensure that pedestrian standards, goals, objectives, guidelines, and actions are implemented.
- Conduct an engineering study to further assess and identify issues related to this challenge area. Establish a framework to apply appropriate countermeasures proactively throughout the County.
- Assess and evaluate effective ways to enhance awareness and deter behaviors on the road, such as the following:
  - Educational, public awareness, outreach efforts
  - Partnerships and programs

See **Appendix F** of the LRSP report for more information

Emergency Response

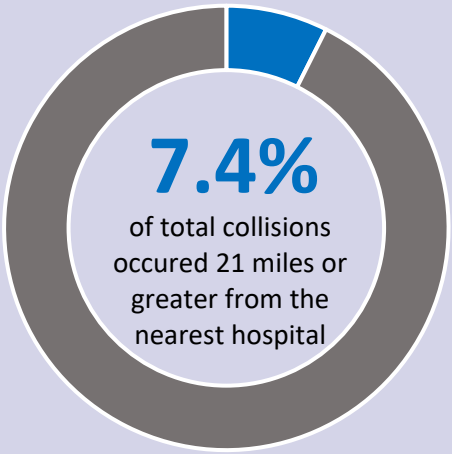
Emergency Response is a County of San Diego Local Roadway Safety Plan challenge area that focuses on rapid transportation of victims to a hospital/trauma center. This challenge area pertains to collisions occurring 21 miles or further from the nearest hospital.

Percent & Number of Fatalities + Severe Injuries



129 of all F+SI collisions occurred 21 miles or greater from the nearest hospital

Percent & Number of Total



1,204 of total collisions 21 miles or greater from the nearest hospital

Recommendations:

- Develop an Intelligent Transportation System/Transportation System Management and Operations (ITS/TSM&O) master plan that details how emerging technologies can be integrated into the roadway network to communicate with motorists in the event of emergency response conditions on the road.
- Identify best practices to help reduce emergency response times and ensure that they are reflected in emergency response operations or roadway design processes, standards, and guidelines.
- Incorporate roadway design processes and ITS/TSM&O elements in a future County of San Diego/Community level evacuation plan.
- Implement existing County policies related to emergency response and hospital facility locations such as policies in the General Plan Safety Element

See **Appendix F** of the LRSP report for more information.

Aggressive Driving

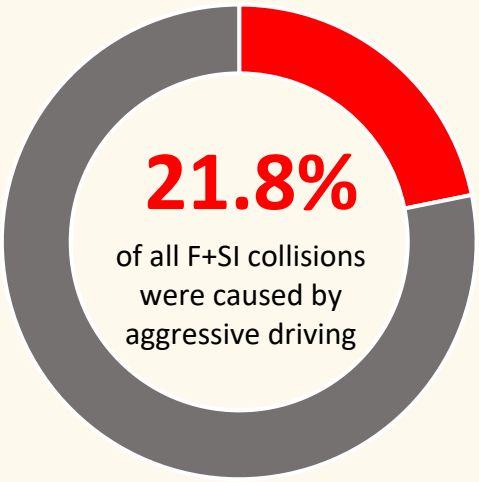
Aggressive Driving is a County of San Diego Local Roadway Safety Plan challenge area that focuses on aggressive driving behaviors such as unsafe speeds, following too closely, and failure to heed traffic control devices.

Recommendations:

- Develop an Intelligent Transportation System/Transportation System Management and Operations (ITS/TSM&O) master plan that details how emerging technologies can be integrated into the roadway network to communicate to drivers or automated/connected vehicles to help reduce aggressive driving.
- Assess and evaluate effective ways to enhance awareness and deter behaviors on the road, such as the following:
    - Engage with law enforcement officers on implementing best practices.
    - Educational, public awareness, outreach efforts
    - Partnerships and programs
    - Law and consequences
- Conduct an engineering study for several segments to further assess and identify issues related to this challenge area. Establish a framework to apply appropriate countermeasures for the segments and proactively throughout the County.

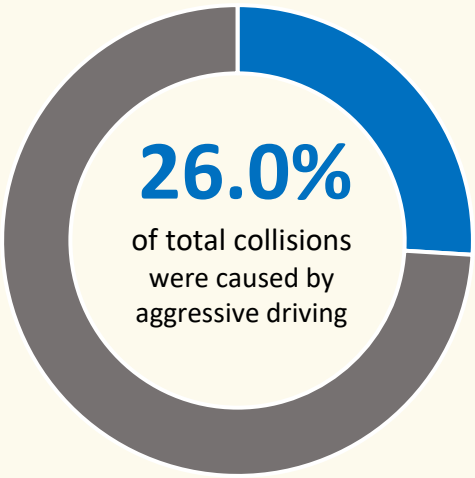
See **Appendix F** of the LRSP report for more information.

Percent & Number of Fatalities + Severe Injuries



184 of all F+SI collisions were caused by aggressive driving370 of all F+SI

Percent & Number of Total

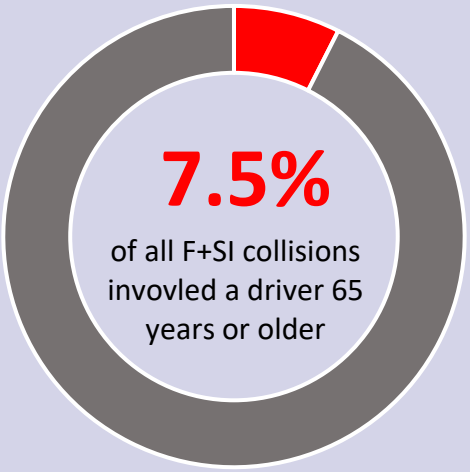


4,219 of total collisions were caused by aggressive driving

Aging Drivers

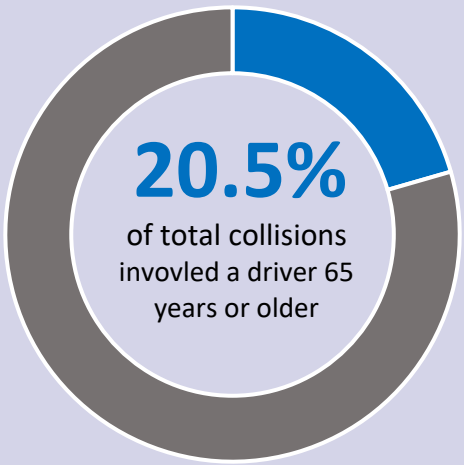
Aging Drivers is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions that involve a driver 65 years or older.

Percent & Number of Fatalities + Severe Injuries



63 of all F+SI collisions involved a driver 65 years or older

Percent & Number of Total



3,336 of total collisions involved a driver 65 years or older

Recommendations:

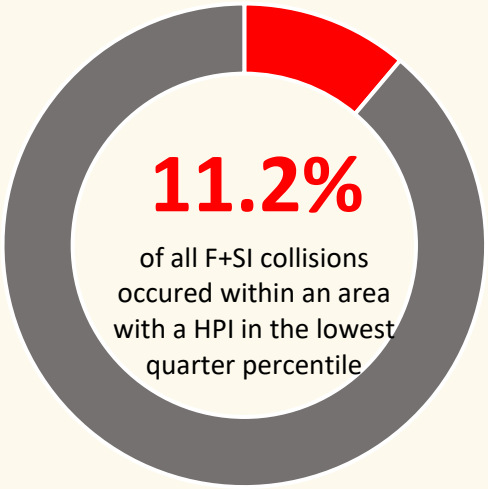
- Identify best practices to help reduce aging driving-related collisions and ensure that they are reflected in the roadway design processes, standards, and guidelines.
- Assess the need for partnership between County departments and/or private organizations to expand communications, outreach, educational programs, and mobility options for aging drivers.
- Consider safety in ongoing and existing planning efforts and implement existing County policies.

See **Appendix F** of the LRSP report for more information.

Public Health/Equity

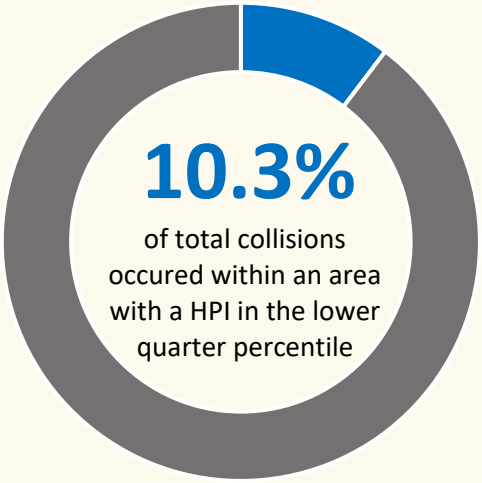
Public Health/Equity is a County of San Diego Local Roadway Safety Plan challenge area that focuses on improving transportation safety for areas in underserved areas. This challenge area pertains to collisions that occurred in areas with a Healthy Places Index in the lower quarter percentile.

Percent & Number of Fatalities + Severe Injuries



94 of all F+SI collisions occurred within an area with a HPI in the lower quarter percentile

Percent & Number of Total



1,678 of total collisions occurred within an area with a HPI in the lower quarter percentile

Recommendation:

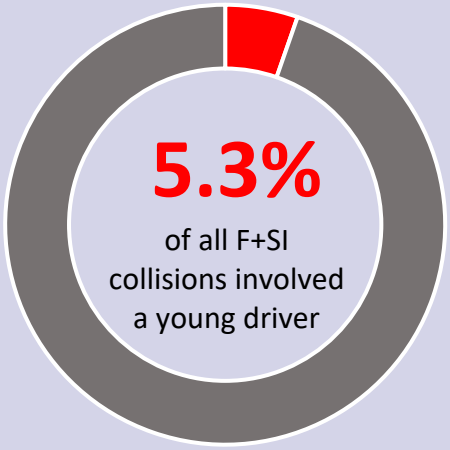
- Continue to utilize the Healthy Places Index in making transportation engineering and planning-related decisions for underserved areas of the County of San Diego.

Appendix F of the LRSP report for more information.

Younger Drivers

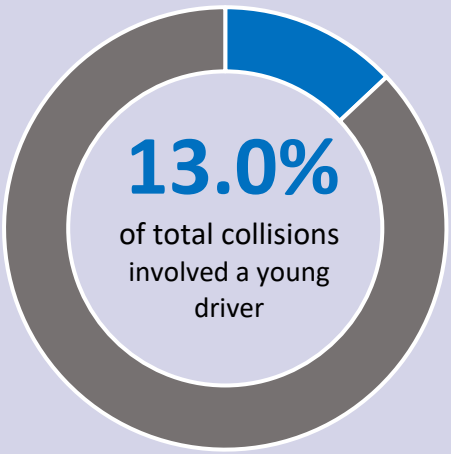
Younger Drivers is a County of San Diego LRSP challenge area that focuses on collisions that involve a driver 15 to 20 years of age.

Percent & Number of Fatalities + Severe Injuries



45 of all F+SI collisions involved a young driver

Percent & Number of Total



2,112 of total collisions involved a young driver

Recommendations:

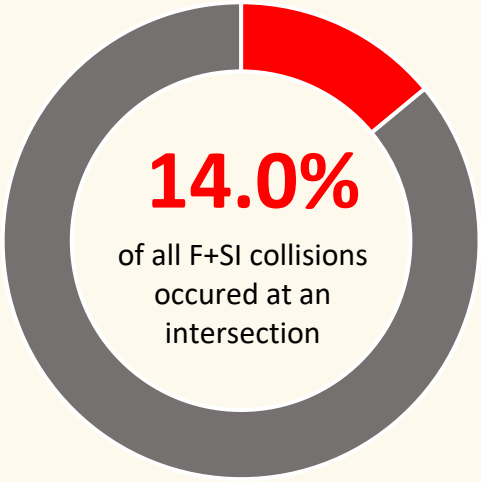
- Research, assess, and evaluate effective ways to enhance awareness, increase California Vehicle Code compliance, and deter behaviors on the road, such as the following:
  - Educational, public awareness, outreach efforts
  - Partnerships and programs
  - Laws and consequences

See **Appendix F** of the LRSP report for more information.

Intersections

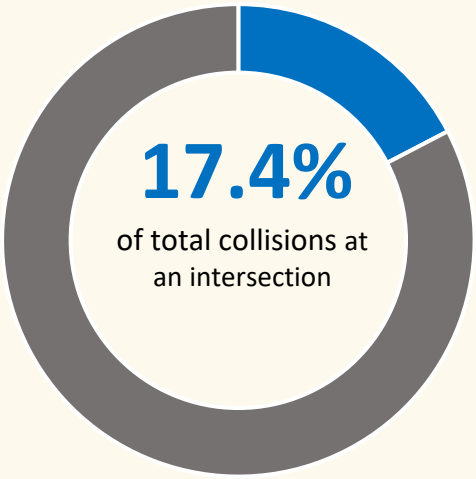
Intersections is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions within or the sphere of influence of an intersection.

Percent & Number of Fatalities + Severe Injuries



118 of all F+SI collisions occurred at an intersection

Percent & Number of Total



2,820 of total collisions occurred at an intersection

Recommendations:

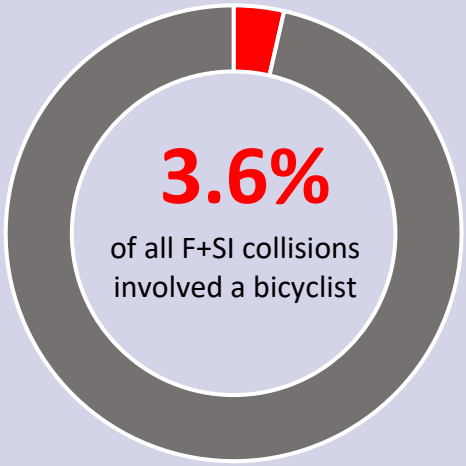
- Develop an ITS/TSM&O master plan that details how emerging technologies can be integrated into the roadway network to communicate to drivers or automated/connected vehicles of conflict areas at intersections.
- Apply for grants to complete roadway safety assessments, such as road safety audits, in a systematic way using the ranked list provided in **Appendix G**.

Appendix F of the LRSP report for more information.

Bicyclists

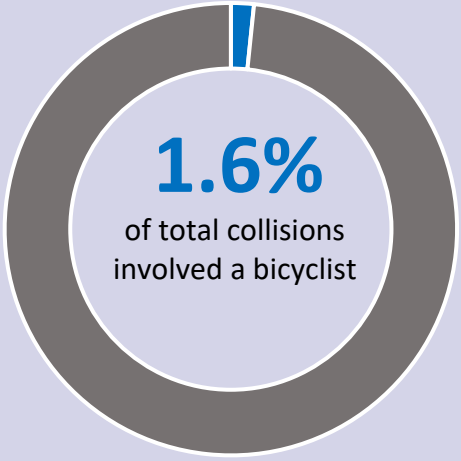
Bicyclists is a County of San Diego LRSP challenge area that focuses on motor vehicles involved in a collision with a bicyclist.

Percent & Number of Fatalities + Severe Injuries



30 of all F+SI collisions involved a bicyclist

Percent & Number of Total



267 of total collisions involved a bicyclist

Recommendations:

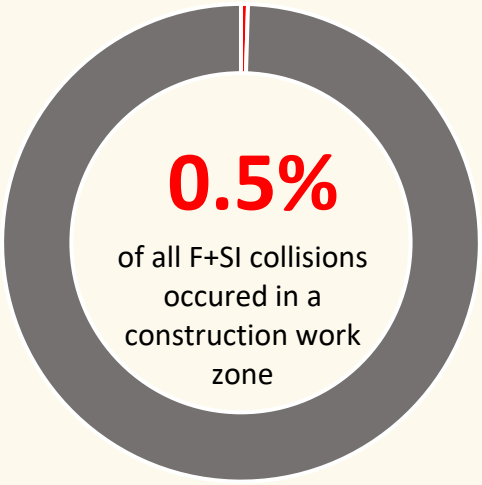
- Develop and implement a complete streets checklist to ensure that bicyclist standards, goals, objectives, guidelines, and actions are implemented.
- Conduct an engineering study to further assess and identify issues related to this challenge area. Establish a framework to apply appropriate countermeasures proactively throughout the County.
- Assess and evaluate effective ways to enhance awareness, increase California Vehicle Code compliance, and deter behaviors on the road, such as the following:
    - Educational, public awareness, outreach efforts
    - Engaging with law enforcement officers
    - Partnerships and programs

See **Appendix F** of the LRSP report for more information.

Work Zones

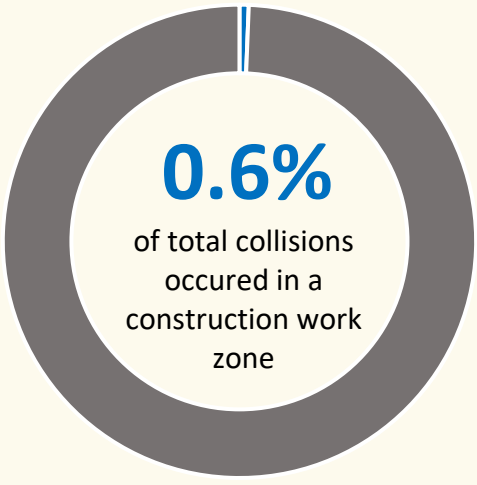
Work Zones is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions that occur in a construction zone.

Percent & Number of Fatalities + Severe Injuries



4 of all F+SI collisions occurred within a construction work zone

Percent & Number of Total



103 of total collisions occurred within a construction work zone

Recommendations:

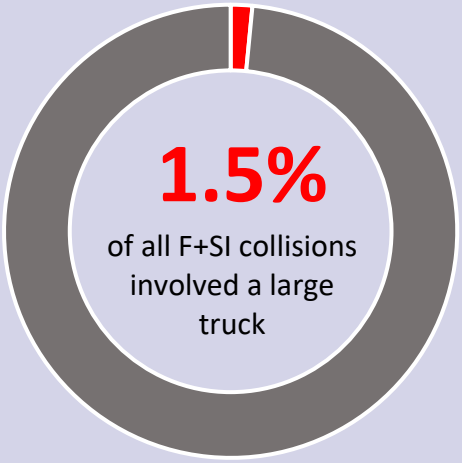
- Identify implementable best practices to reduce collisions within work zones and ensure that they are reflected in traffic control design processes, standards, and guidelines.
- Continue to monitor and invest in effective ways to increase California Vehicle Code compliance, prevent collisions, and deter undesirable behaviors within the work zone.

Appendix F of the LRSP report for more information.

Commercial Trucks

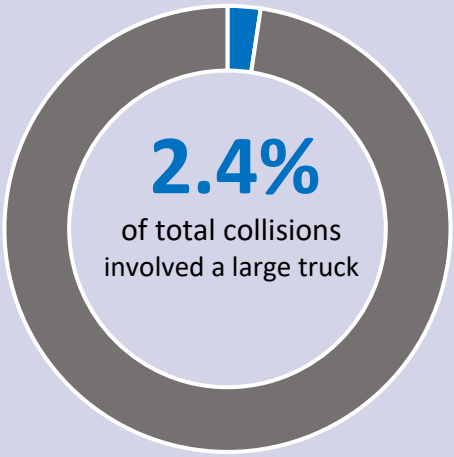
Commercial Trucks is a County of San Diego Local Roadway Safety Plan challenge area that focuses on motor vehicles involved in a collision with a large truck.

Percent & Number of Fatalities + Severe Injuries



13 of all F+SI collisions involved a large truck

Percent & Number of Total



389 of total collisions involved a large truck

Recommendations:

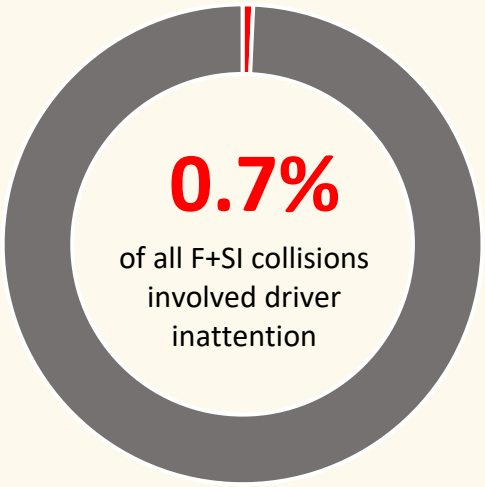
- Identify implementable best practices for the County to help reduce commercial truck collisions and ensure that they are reflected in roadway design processes, standards, and guidelines.
- Assess and evaluate effective ways to enhance awareness and deter behaviors on the road, such as the following:
    - Educational, public awareness, outreach efforts
    - Partnerships and programs

See **Appendix F** of the LRSP report for more information.

Keeping Drivers Alert

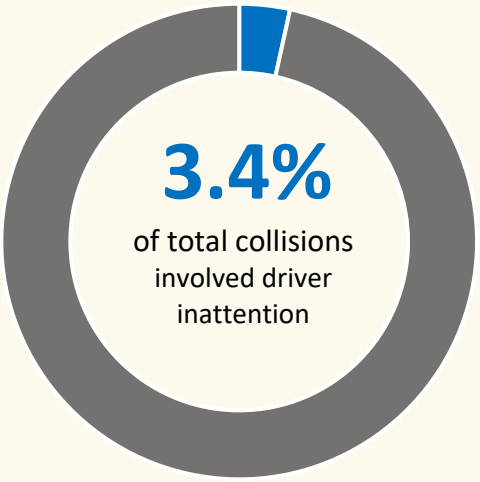
Keeping Drivers Alert is a County of San Diego Local Roadway Safety Plan challenge area that focuses on collisions involving driver inattention. This challenge area pertains to collisions of distracted drivers and drivers who fell asleep.

Percent & Number of Fatalities + Severe Injuries



6 of all F+SI collisions involved driver inattention

Percent & Number of Total



559 of total collisions involved driver inattention

Recommendations:

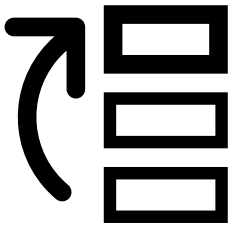
Continue to monitor, evaluate and invest in effected ways to increase California Vehicle Code compliance, enhance awareness, prevent collisions, and deter behavior, such as the following:

- Educational, public awareness, outreach efforts
- Engage with law enforcement officers
- Partnerships and programs
- Laws and consequences

Appendix F of the LRSP report for more information.

PRIORITY INTERSECTION/SEGMENT SELECTION

7.0 PRIORITY INTERSECTION/SEGMENT SELECTION



A typical approach to determining the priority intersection and segment locations for targeted assessment and improvements to enhance transportation safety is to determine high-risk locations based on a criterion, such as intersections or segments with the highest collision frequency. A more encompassing approach was taken by developing a method that accounts for the collision rate, collision severity, and Healthy Places Index. Each is briefly described below.

Collision Rate

The collision rate is defined as the number of collisions that occur at a determined intersection or segment over a specified time (i.e., collision frequency) and dividing it by a measure of exposure. For collision rates, the measure of exposure is in terms of traffic volumes for intersections and traffic volumes and length for segments.

Collision Severity

The collision severity is the classification of the collision based on the highest injury severity for any person involved in the crash. Each collision is classified as Fatal, Severe Injury, Other Injury, or Property Damage Only.

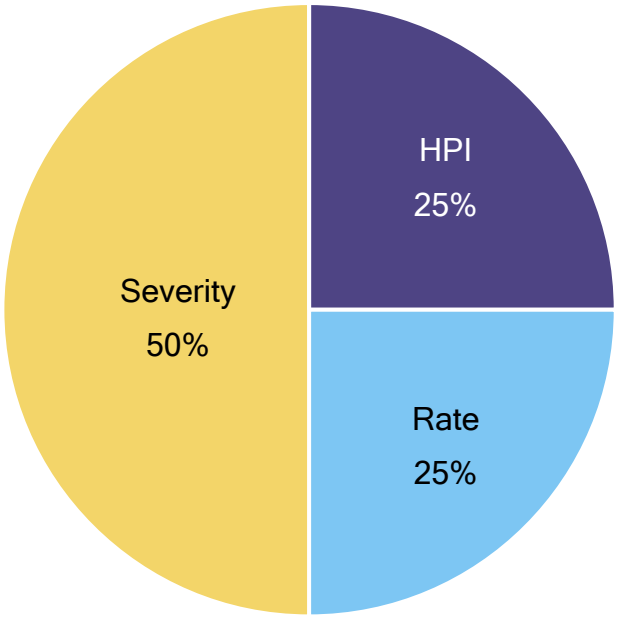
Healthy Places Index

The Healthy Places Index (HPI) is an additional facet in the data-driven approach for the LRSP. This criterion helps ensure equitability and other public health elements are accounted for in the selection process. **Attachment B** contains more information on HPI.

Appendix G contains a technical memorandum that further details this priority project selection process.

Weightage

A weighted average was utilized to calculate the final ranking score for both intersections and segments. This weighted average considers the varying degrees of importance to each score. Based on collaboration with County staff, the weightage for each score is shown below.



Ranked Intersections and Segments

Based on the priority project selection process, a list of 65 ranked intersections and the 60 ranked segments were compiled for targeted assessments and improvements to enhance transportation safety. **Table 7-1** and **Table 7-2** lists the ranked intersections and segments, respectively. See **Appendix G** for more information. See **Appendix H** for location maps.

Priority Intersection/Segment Recommendations

As a result of developing this recommended process for ranking intersections and segments, it was observed that collisions are more frequent and severe along roadway segments when compared to intersections. This is partly due to the rural settings of County roadways, the geometrics, and the exposure. Therefore, it is recommended that the County apply for grants to complete roadway safety assessments such as road safety audits, in a systematic way, using the ranked list provided in **Appendix G**. A road safety audit (RSA) is a formal safety performance examination of an existing or future road. A RSA should consider all potential roadway users and intersections along the segment and should consider crash prediction model evaluations.

TABLE 7–1
RANKED INTERSECTION LOCATIONS

Priority Rank	Intersection (Major/Minor)
1	Main Avenue / Aviation Road
2	Jamacha Boulevard / Grand Avenue
3	Green Canyon Road / Sycamore Drive
4	Sweetwater Road / Troy Street
5	Sweetwater Road / Jamacha Road
6	Jamacha Road / Darby Street
7	Old Highway 395 / Dulin Road (North)
8	Bear Valley Parkway / Bear Valley Road
9	Valley Center Road / Lilac Road
10	Old Highway 395 / W. Lilac Road
11	Green Canyon Road / S. Mission Road
12	Valley Center Road / Cole Grade Road
13	Campo Road / Conrad Drive
14	Jamacha Boulevard / Felicita Avenue
15	Bancroft Drive / Valencia Street
16	Magnolia Avenue / Cypress Lane
17	Woodside Avenue / Riverview Avenue
18	Main Avenue / Lakeshore Drive
19	Winter Gardens Boulevard / Winter Gardens Drive
20	Winter Gardens Boulevard / Winter Crest Drive
21	Fallbrook Street / Heald Lane
22	2nd Street / Pepper Drive
23	Estrelita Drive / Palmyra Drive
24	San Vicente Road / Green Haven Lane
25	Dye Road / Ramona Street
26	Wildcat Canyon Road / Dump Road

Continued on Next Page

TABLE 7–1
RANKED INTERSECTION LOCATIONS

Priority Rank	Intersection (Major/Minor)
27	Hi Ridge Road / Valle Vista Road
28	Campo Road / Kenwood Drive
29	Victoria Park Terrace / Tavern Road
30	South Santa Fe Avenue / Montgomery Drive
31	Dehesa Road / Harbison Canyon Rd Road
32	Fallbrook Street / S. Mission Road
33	Jamacha Boulevard / Whitestone Road
34	San Vicente Road / Vista Vicente Drive
35	Paradise Valley Road / Elkelton Boulevard
36	Highland Valley Road / Sky Valley Road
37	Woodside Avenue / Winter Gardens Boulevard
38	Camino Del Rey / Camino Del Cielo
39	Mapleview Street / Ashwood Street
40	Winter Gardens Boulevard / Lemon Crest Drive
41	Warnock Drive / Ramona Street
42	Pepper Drive / Peerless Drive
43	Mission Road / Willow Glen Road
44	Olive Vista Drive / Jefferson Road
45	Deer Springs Road / Champagne Boulevard
46	Deer Springs Road / Sarver Lane
47	Old Highway 395 / Dulin Road (South)
48	Osborne Street / Hutchinson Street
49	Lilac Road / Old Castle Road
50	Willow Glen Drive / Medinah Drive
51	Rock Springs Road / Nordahl Road
52	Paradise Valley Road / Worthington Street

Continued on Next Page

TABLE 7–1
RANKED INTERSECTION LOCATIONS

Priority Rank	Intersection (Major/Minor)
53	Linea Del Cielo / Calzada Del Bosque
54	South Santa Fe Avenue / Azalea Drive
55	Del Dios Highway / El Camino Del Norte
56	Bancroft Drive / Campo Road
57	Valley Center Road / Woods Valley Road
58	Linea Del Cielo / Rambla De Las Flores
59	Bear Valley Parkway / Idaho Avenue
60	Via De La Valle / Calzada Del Bosque
61	S. Mission Road / Olive Hill Road
62	Buena Creek Road / Monte Vista Drive
63	East Vista Way / Gopher Canyon Road
64	Avocado Boulevard / Fuerte Drive
65	El Camino Real / Linea Del Cielo
End of Table	
General Note: -See **Appendix H** for location maps	

TABLE 7–2
RANKED SEGMENT LOCATIONS

Priority Rank	Segment	From	To
1	Woodside Avenue	Winter Gardens Boulevard	Prospect Avenue
2	Mesa Grande Road	Cattle Guard	Mile Post 8.0
3	Jamacha Road	Sweetwater Road	Helix Street
4	Sweetwater Road	Jamacha Road	Saint George Street
5	Jamacha Boulevard	Sweetwater Road	Park Access
6	Campo Road	Conrad Drive	Bonita Street
7	Pala Temecula Road	Mile Post 4.0	Temepa Road
8	Buckman Springs Road	Lake Morena Drive	Mile Post 1.0
9	Champagne Boulevard	Deer Springs Road	Champagne Village Drive
10	Otay Lakes Road	Mile Post 6.0	Mile Post 5.0
11	South Santa Fe Avenue	Woodland Drive	Robelini Drive
12	South Santa Fe Avenue	Poinsettia Avenue	Smilax Road
13	South Santa Fe Avenue	Montgomery Drive	Woodland Drive
14	Winter Gardens Boulevard	Winter Crest Drive	Woodside Avenue
15	Willows Road	Mile Post 2.0	Viejas Grade Road
16	Pala Temecula Road	Mile Post 3.0	Mile Post 4.0
17	Olde Highway 80	Soldin Lane	Flinn Crest Street
18	Highland Valley Road	Adrienne Way	Traylor Road
19	Old Highway 395	2nd Street	Rainbow Valley Boulevard
20	Wildcat Canyon Road	Barona Driveway	Mile Post 7.0
21	Rice Canyon Road	Mile Post 4.0	Rainbow Heights Road
22	Bear Valley Parkway	Bear Valley Road	SR-78
23	Old Highway 395	Rainbow Glen Road	5th Street
24	Ammunition Road	S. Mission Road	Altura Street
25	Valley Center Road	Miller Road	Cole Grade Road
26	Pala Temecula Road	Mile Post 2.0	Mile Post 3.0

Continued on Next Page

TABLE 7–2
RANKED SEGMENT LOCATIONS

Priority Rank	Segment	From	To
27	Old Highway 395	West Lilac Road	Dulin Road
28	Ashwood Street	Mapleview Street	Willow Road
29	S. Mission Road	Green Canyon Road	Quail Knoll Road
30	Olive Vista Drive	Lyons Valley Road	Jefferson Road
31	Old Highway 80	Mile Post 22.0	Royal Drive
32	Alpine Boulevard	Vista Alpine Road	Bay Meadows Drive
33	San Vicente Road	Arena Drive	Wildcat Canyon Road
34	Jamacha Boulevard	Trace Road	SR-94
35	S. Mission Road	SR-76	La Canada Road
36	Ammunition Road	Alturas Street	End of County Maintained Road
37	Buckman Springs Road	Corral Canyon Trail	Mile Post 6.0
38	Dehesa Road	Harbison Canyon Road	Mile Post 6.0
39	East Vista Way	Gopher Canyon Road	Mason Road
40	Buckman Springs Road	Mile Post 6.0	Oak Drive
41	Ridgeway Drive	Euclid Avenue	Gwynne Avenue
42	Alpine Boulevard	Tavern Road	Victoria Drive
43	Mission Road	Davis Drive	Hamilton Lane
44	De Luz Road	Mile Post 5.0	Green Valley Road
45	Camino Del Norte	County/City of San Diego Limit	Camino San Bernardo Ramps
46	Lilac Road	Anthony Road	Mile Post 11.0
47	Wildcat Canyon Road	Mile Post 5.0	Mile Post 6.0
48	Old Castle Road	Mile Post 8.0	Pamoosa Lane
49	Deer Springs Road	Mesa Rock Road	Sarver Lane
50	Avocado Boulevard	Fuerte Drive	Puebla Drive
51	Dehesa Road	Singing Vista Drive	Willow Glen Drive
52	Dehesa Road	Mile Post 3.0	Mile Post 4.0

Continued on Next Page

TABLE 7–2
RANKED SEGMENT LOCATIONS

Priority Rank	Segment	From	To
53	Bonita Road	Acacia Avenue	Central Avenue
54	El Camino Del Norte	Del Dios Highway	Aliso Canyon Road
55	Gopher Canyon Road	El Paseo	Disney Lane
56	Bonita Road	Randy Lane	County Limit
57	Lyons Valley Road	SR-94	Olive Vista Drive
58	Del Dios Highway	El Camino Del Norte	Via Cuatro Camino
59	Del Dios Highway	Mile Post 10.0	Mile Post 11.0
60	Skyline Truck Trail	Hidden Trail Drive	Lawson Valley Road
End of Table			

General Note:
-See **Appendix H** for location maps

IMPLEMENTATION APPROACH

8.0 IMPLEMENTATION APPROACH

The County's Local Roadway Safety Plan is a critical tool to proactively implement safety countermeasures by systematically requesting funding to complete transportation safety assessment and improvement projects. The recommendations provided in **Chapter 7** provide the framework to achieve the County of San Diego's Local Roadway Safety Plan Vision, Mission, and Goal. The real work in achieving the LRSP mission is in the **successful implementation of this plan, which depends on everyone**.

In addition to the recommendations provided in **Chapter 7**, a toolbox of engineering safety countermeasures is provided in **Appendix I.** This toolbox can be utilized when funding is secured to implement systemic countermeasures or to help determine potential solutions as part of future transportation safety engineering studies.

Since the LRSP utilizes a multi-disciplinary holistic approach, it is critical to continue to foster collaboration and cooperation between various County departments and stakeholders. The LRSP is living documents that should be updated periodically to reflect new collision data, trends, and updated recommendations.

WORKS CITED

9.0 WORKS CITED

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