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City of Palm Springs Pedestrian and Safe Routes to School Plan

Pedestrian and Bicycle Involved Collision Analysis Memo

INTRODUCTION

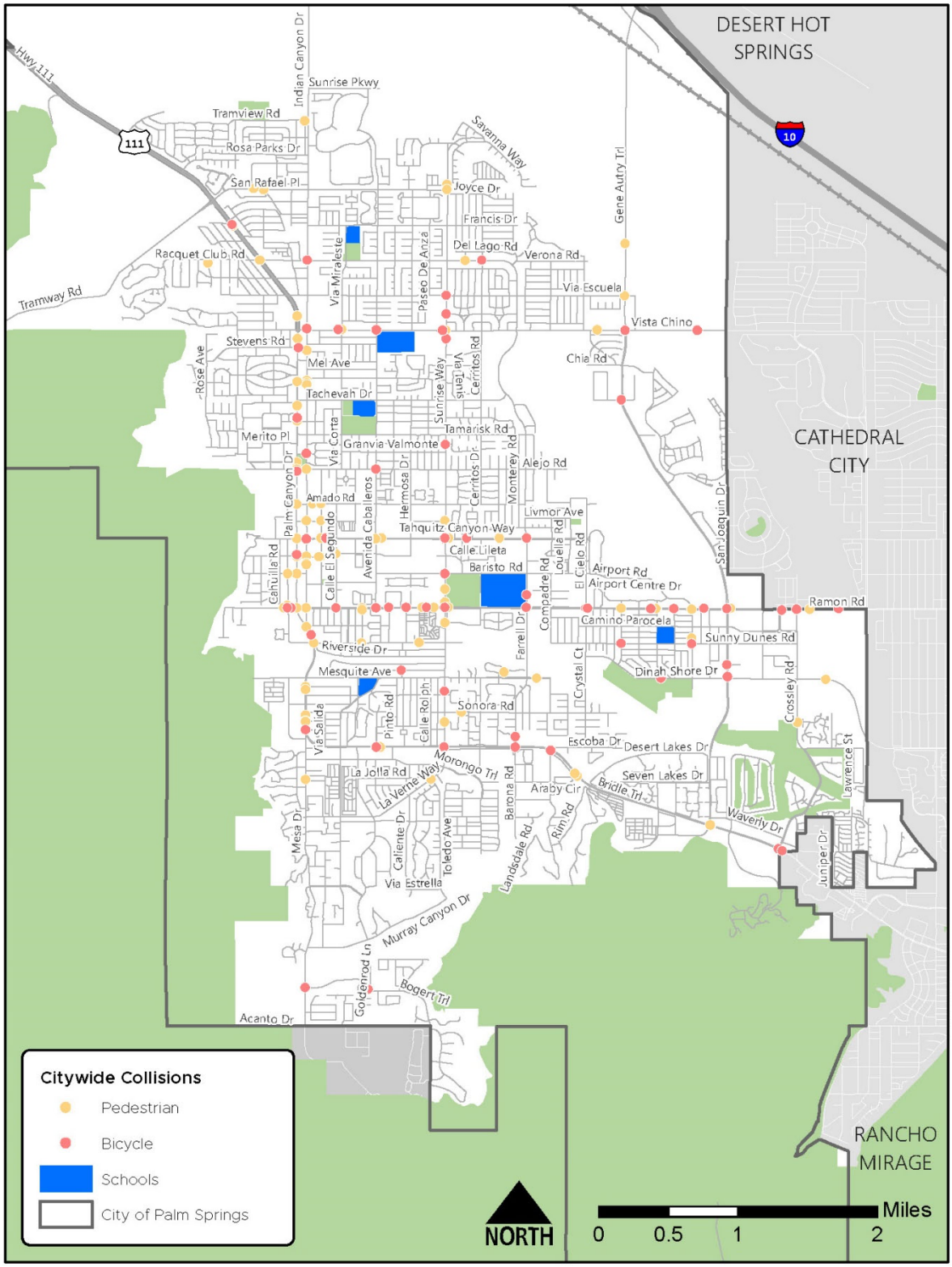
The purpose of this document is to review the historical data of collisions within the City of Palm Springs. By reviewing the locations, causes, and context surrounding pedestrian and bicycle collisions, the Project Team will be able to better address safety concerns at high collision areas.

The California Office of Traffic Safety (OTS) develops rankings for comparison of traffic safety statistics between cities with similar-sized populations. The OTS provides statistics based on rates of victims killed and injured per "1,000 daily-vehicle-miles-of-travel" (Caltrans), per "1,000 average population" (Department of Finance), and groups cities based on population. The City of Palm Springs is ranked in a 94-city group (OTS Group D) classified by populations between 25,001 and 50,000. According to the 2017 OTS report, Palm Springs ranked 10th among its 94-city group for collisions that resulted in a fatality or injury. The City also ranked 15th for pedestrian collisions, 4th for pedestrian collisions involving someone 65 years of age or older, 59th for bicycle collisions, and 5th for a composite score of all the categories considered. Although the OTS collision rankings tend to fluctuate based on the type of collision, Palm Springs generally sees a higher rate of collisions than most cities with comparable populations.

CITYWIDE COLLISIONS

Analyzing historical collision data is an essential task in understanding pedestrian conditions within the City.
The Traffic Injury Mapping System, or TIMS, compiles and analyzes vehicle collisions resulting in a complaint of pain, injury, or fatality across all cities in California. According to TIMS, 1,606 non-freeway collisions occurred within the City of Palm Springs between 2014 and 2018. Of the 1,606 total collisions within the City, 139 collisions (8.7%) involved a pedestrian and 75 collisions (4.7%) involved a bicyclist. The following sections summarize collisions involving a pedestrian or bicyclist within the City of Palm Springs. Figure 1 displays the location of pedestrian and bicycle involved collisions throughout the City during the study period.

Figure 1 - Pedestrian Involved and Bicycle Involved Collision Locations (2014-2018)



ANNUAL COLLISIONS

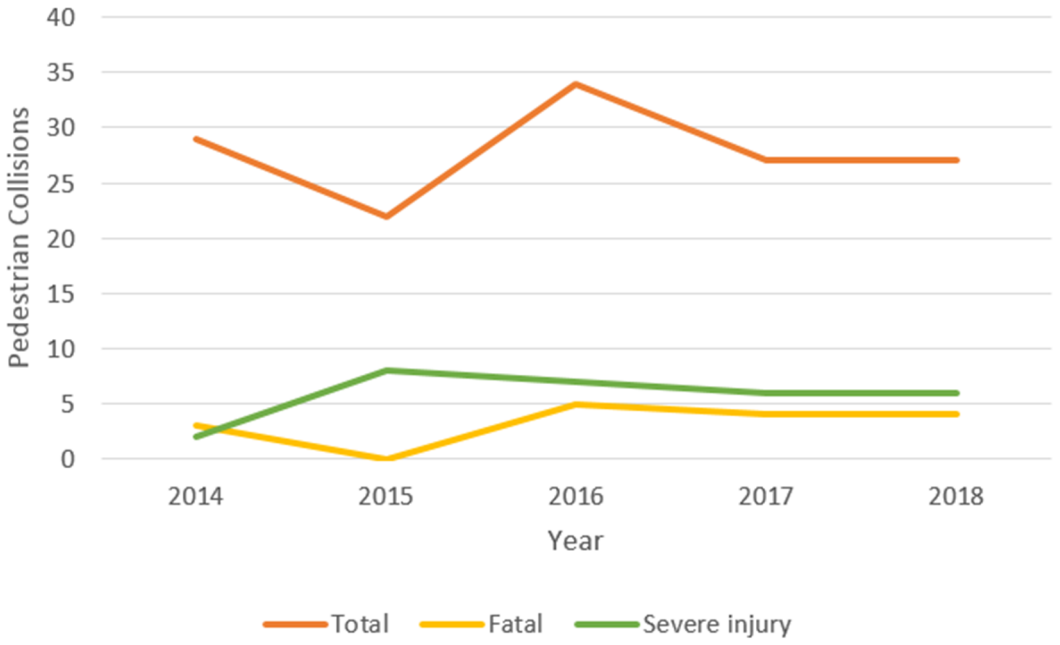
Pedestrian Involved Collisions

There were 139 pedestrian involved collisions between 2014 and 2018. Pedestrian involved collisions within Palm Springs remained relatively consistent during the 5-year study period. 2015 had the fewest pedestrian collisions, 22. The following year, 2016, had the greatest number of pedestrian collisions during the study period at 34. 2017 and 2018 each had 27 pedestrian collisions. Table 1 and Figure 2 summarize pedestrian involved collisions by year and include the total number of collisions that resulted in fatal and severe injuries.

Table 1 - Pedestrian Involved Collisions by Year (2014-2018)

Year	Total	Fatal	Severe injury	Fatal & Severe Injury
2014	29	3	2	5
2015	22	0	8	8
2016	34	5	7	12
2017	27	4	6	10
2018	27	4	6	10
Total	**139**	**16**	**29**	**45**

Figure 2 - Pedestrian Involved Collisions by Year (2014-2018)



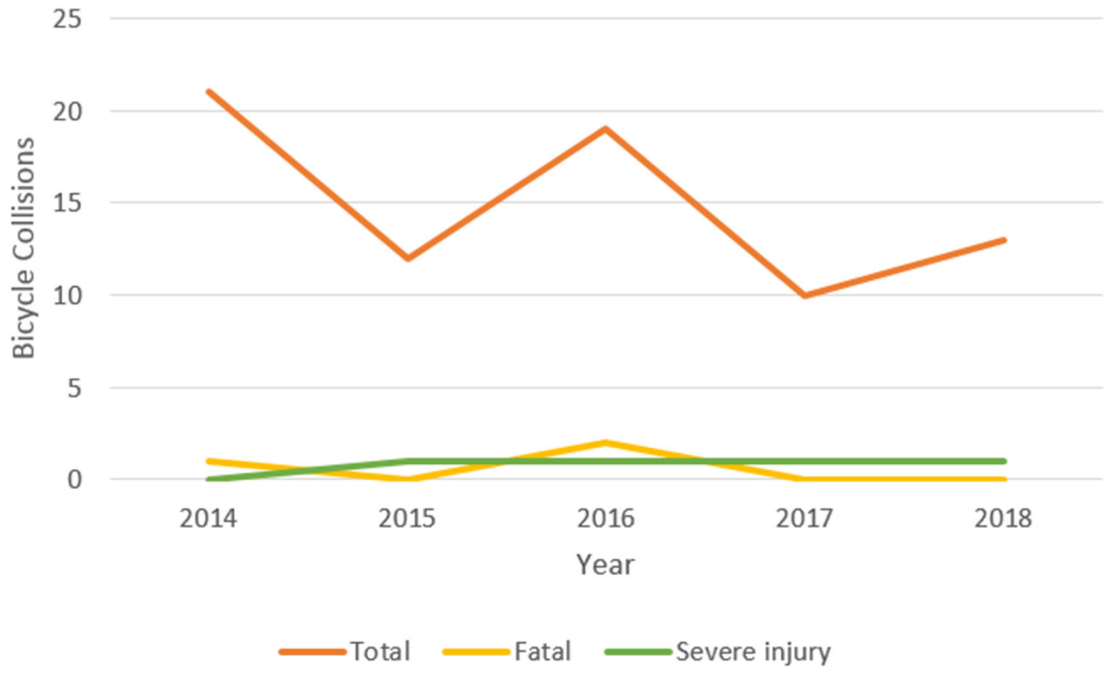
Bicycle Involved Collisions

There were 75 bicycle involved collisions between 2014 and 2018. Bicycle involved collisions within Palm Springs have generally decreased since 2014, which saw 21 bicycle involved collisions. 2017 had the fewest bicycle involved collisions, at 10. 2018 saw a slight increase in bicycle involved collisions to 13. Table 2 and Figure 3 summarize bicycle involved collisions by year and include the total number of collisions that resulted in fatal and severe injuries.

Table 2 - Bicycle Involved Collisions by Year (2014-2018)

Year	Total	Fatal	Severe injury	Fatal & Severe Injury
2014	21	1	0	1
2015	12	0	1	1
2016	19	2	1	3
2017	10	0	1	1
2018	13	0	1	1
Total	**75**	**3**	**4**	**7**

Figure 3 - Bicycle Involved Collisions by Year (2014-2018)



TIME OF DAY AND TYPE OF LIGHTING

A time of day analysis for collisions can help identify safety concerns under specific circumstances such as poor lighting and visibility. According to the FHWA, in 2017 26 percent of all pedestrian collisions reported throughout the country occurred between 6:00 PM and 8:59 PM and 24 percent between 9:00 PM and 11:59 PM.

Pedestrian Involved Collisions

Pedestrian Collisions within Palm Springs follow a similar distributions as the national trend. The 6:00 PM and 8:59 PM time period saw the greatest number of pedestrian collisions at 21 percent, or 29 pedestrian involved collisions, followed by the 9:00 PM to 11:59 PM time period with 19 percent of collisions, or 26 pedestrian involved collisions. This may indicate that lighting conditions may contribute to the high rate of pedestrian collisions occurring during this time period. Pedestrian involved collisions by time of day are summarized in Table 3.

When reviewing the lighting conditions surrounding all pedestrian involved collisions, nearly 67 percent occurred when it is dark. Furthermore, nearly a 1 in 4 collisions occurred when it was dark and there were no street lights present. This may be a result of the semi-rural character of some of the portions of the City that can lead to less than favorable conditions for pedestrians. Lighting conditions surrounding pedestrian involved collisions are summarized in Table 4.

Table 3 - Pedestrian Involved Collisions by Time of Day (2014-2018)

Time of Day	12:00 - 2:59 AM	3:00 - 5:59 AM	6:00 - 8:59 AM	9:00 - 11:59 AM	12:00 - 2:59 PM	3:00 - 5:59 PM	6:00 - 8:59 PM	9:00 - 11:59 PM
Collision Share	6.60% (9)	4.40% (6)	5.80% (8)	11.70% (16)	14.60% (20)	16.80% (23)	21.20% (29)	19.00% (26)

Table 4 - Pedestrian Involved Collisions by Lighting Type (2014-2018)

Lighting Type	Daylight	Dark - Street Lights	Dark - No Street Lights	Dark - Lights Not Functioning	Dusk - Dawn	Not Stated
Collision Share	40.30% (56)	32.40% (45)	23.70% (33)	0.70% (1)	2.20% (3)	0.70% (1)

Bicycle Involved Collisions

Bicycle involved collisions do not follow a similar time of day distribution as pedestrian involved collisions. The 9:00 AM and 11:59 AM time period saw the greatest number of bicycle involved collisions at almost 27 percent, or 20 bicycle involved collisions, followed by the 12:00 PM to 2:59 PM time period with 21 percent of collisions, or 16 bicycle involved collisions. This may indicate that bicycle involved collisions are less of a result of visibility when compared to pedestrian involved collisions. Other factors such as the high volume of vehicle traffic or traffic violations may play a larger role in bicycle involved collisions.

Furthermore, reviewing the lighting conditions surrounding bicycle involved collisions shows that almost 80 percent, or 59 total collisions, occurred during daylight. This may further support the idea that bicycle involved collisions occur less as a result of visibility concerns and more as a result of other factors.

Bicycle involved collisions by time of day are summarized in Table 5 and bicycle involved collisions by lighting condition are summarized in Table 6.

Table 5 - Bicycle Involved Collisions by Time of Day (2014-2018)

Time of Day	12:00 - 2:59 AM	3:00 - 5:59 AM	6:00 - 8:59 AM	9:00 - 11:59 AM	12:00 - 2:59 PM	3:00 - 5:59 PM	6:00 - 8:59 PM	9:00 - 11:59 PM
Collision Share	1.30% (1)	2.70% (2)	20.00% (15)	26.70% (20)	21.30% (16)	16.00% (12)	6.70% (5)	5.30% (4)

Table 6 - Bicycle Involved Collisions by Lighting Type (2014-2018)

Lighting Type	Daylight	Dark - Street Lights	Dark - No Street Lights	Dark - Lights Not Functioning	Dusk - Dawn	Not Stated
Collision Share	78.70% (59)	13.30% (10)	4.00% (3)	0.00% (0)	4.00% (3)	0.00% (0)

COLLISION SEVERITY

Collision severity is divided into five categories ranging from Property Damage Only to Fatal. However, as discussed earlier, TIMS does not collect and interpret collisions that result in Property Damage Only.

Pedestrian Involved Collisions

Within the City of Palm Springs, more than 1 in 10 study collisions resulted in a pedestrian fatality. Furthermore, nearly 1 in 3 resulted in either a fatality or a severe injury. While there are many factors that determine the severity of pedestrian collisions, two of the most significant factors include vehicle speed and vehicle type. While these factors may play a part in the severity of a collision, further analysis should be conducted to determine concrete results. Figure 4 displays the locations of fatal and severe pedestrian involved collisions.

Table 7 - Pedestrian Involved Collisions by Severity (2014-2018)

Severity	Collision Count	Percent
Visible Injury	56	40.3%
Complaint of Pain	38	27.3%
Severe Injury	29	20.9%
Fatal	16	11.5%
Property Damage only	0	0.0%
Total	**139**	**100.0%**

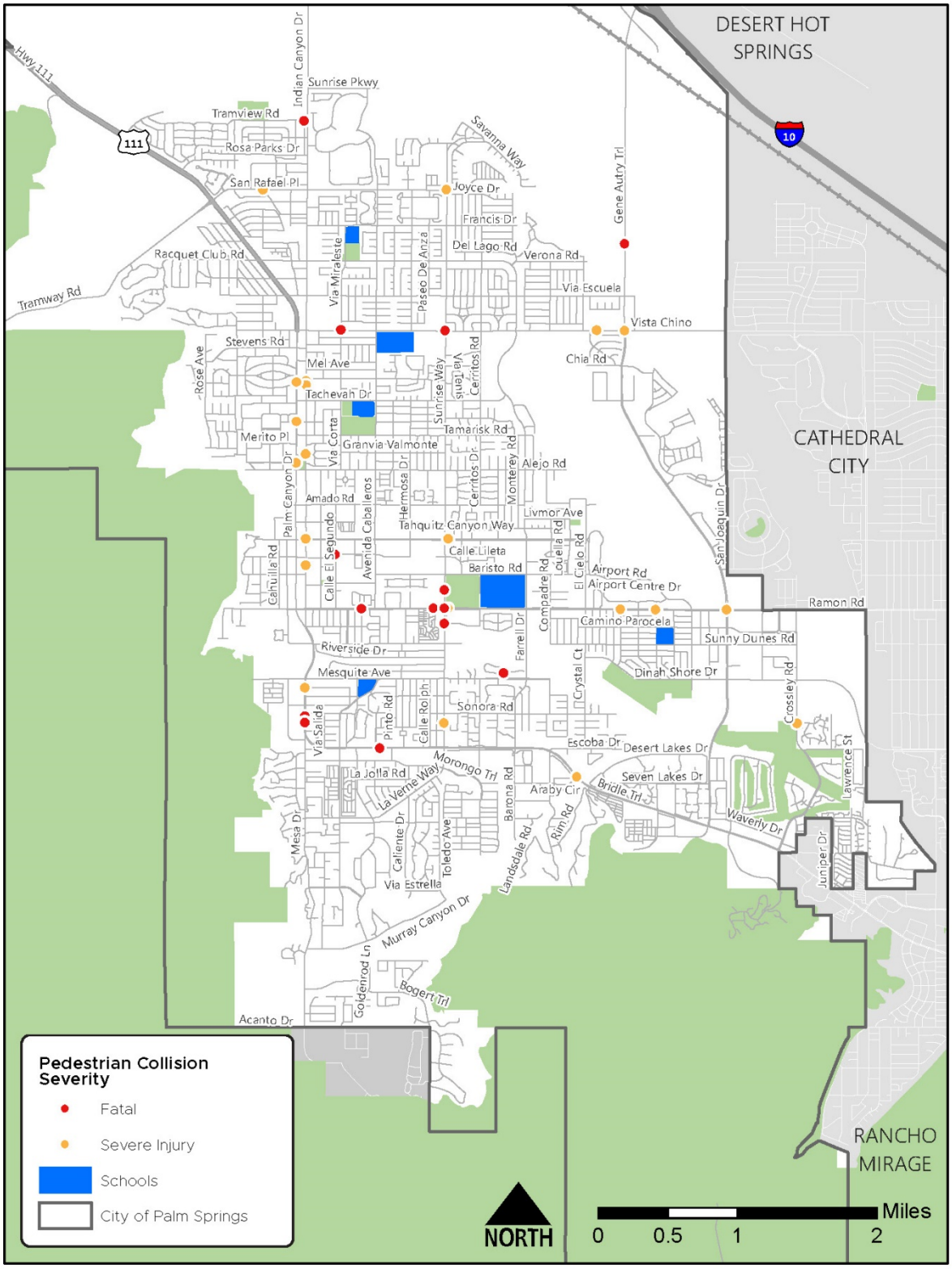
Bicycle Involved Collisions

When compared to pedestrian involved collisions, bicycle involved collisions tend to result in more favorable outcomes. Bicycle involved collisions resulting in severe injury or fatality account for only 10 percent of collisions, compared to pedestrian involved severe injury and fatal collisions which account for 32 percent.

Table 8 - Bicycle Involved Collisions by Severity (2014-2018)

Lighting Type	Collision Count	Percent
Visible Injury	41	54.7%
Complaint of Pain	27	36.0%
Severe Injury	4	5.3%
Fatal	3	4.0%
Property Damage only	0	0.0%
Total	**75**	**100.0%**

Figure 4 – Fatal and Severe Injury Pedestrian Involved Collisions (2014-2018)



PRIMARY COLLISION FACTOR

The violation of a transportation law that likely caused a collision to occur is classified as the Primary Collision Factor (PCF).

Pedestrian Involved Collisions

The distribution of PCF for pedestrian involved collisions can be seen in Table 9. Of the 139 pedestrian involved collisions, 48 percent involved a pedestrian violation. This generally refers to instances where a vehicle violates the right-of-way of a pedestrian crossing a street. In general this categories results in the driver being at fault. However, nearly 29 percent of pedestrian involved collisions had a PCF listed as Pedestrian ROW (right-of-way). This category generally refers to a pedestrian violating the right-of-way of a vehicle, including jaywalking. While these two PCF categories may seem contradictory, both of these factors could indicate a need for improved pedestrian infrastructure such as adding more safe crossing locations, pedestrian refuge islands, and improved visibility.

Table 9 – Primary Collision Factor for Pedestrian Involved Collisions (2014-2018)

Violation Category	Count	Percent
Pedestrian Violation	67	48.2%
Pedestrian ROW	40	28.8%
Unknown	9	6.5%
Automobile ROW	4	2.9%
Unsafe Speed	3	2.2%
Other Hazardous Violation	3	2.2%
Unsafe Lane Change	3	2.2%
Improper Turning	2	1.4%
Driving or Bicycling Under the Inf.	2	1.4%
Other Than Driver	2	1.4%
Traffic Signals & Signs	1	0.7%
Unsafe Starting or Backing	1	0.7%
Hazardous Parking	1	0.7%
Impeding Traffic	1	0.7%
Total	**139**	**100.0%**

Bicycle Involved Collisions

The distribution of PCF for bicycle involved collisions can be seen in Table 10. Of the 75 bicycle involved collisions, 48 percent of collisions involved an automobile ROW (right-of-way) violation. This generally refers to instances where a bicyclist violates the right-of-way of a vehicle. Additionally, 1 in 5 bicycle involved collisions had a PCF listed as wrong side of road. This category refers to a bicyclist riding in the opposite direction of travel. Both of the PCFs are generally related to behavior with regards to cycling, but may also indicate a need for additional bicycle infrastructure and bicycle safety education.

Table 10 – Primary Collision Factor for Bicycle Involved Collisions (2014-2018)

Violation Category	Count	Percent
Automobile ROW	20	26.7%
Wrong Side of Road	15	20.0%
Traffic Signals & Signs	14	18.7%
Unknown	5	6.7%
Improper Turning	4	5.3%
Unsafe Lane Change	4	5.3%
Unsafe Speed	3	4.0%
Pedestrian Violation	3	4.0%
Other Hazardous Violation	2	2.7%
Not Stated	2	2.7%
Improper Passing	2	2.7%
Other Improper Driving	1	1.3%
Total	**75**	**100.0%**

TOP COLLISION LOCATIONS

Pedestrian Involved by Intersection

Table 11 displays the top 5 intersections for pedestrian collisions. The intersection of Sonora Road at South Palm Canyon Road and the intersection of Ramon Road at Sunrise Way each had three pedestrian involved collisions. The intersections of Paseo Dorotea at Ramon Road, Highway 111 at Via Miraleste, and Camino Real at Ramon Road each saw two collisions within the same study period. While several other intersections had two pedestrian collisions, the selected intersection saw the most fatal and severe collisions. Figure 5 displays the density of pedestrian involved collisions.

Reviewing these locations can help to determine why these areas see a greater share of collisions compared to other intersections. The context can reveal things such as a lack of traffic control devices at intersections such as Sonora Road and South Palm Canyon Road, the concentration of popular commercial and retail destinations at Ramon Road and Sunrise Way, and the large 85 foot crossing distances throughout Ramon Road. While these factors may not be the cause of the collisions, understanding the context can help develop improvements.

Table 11 - Top 5 Pedestrian Involved Collisions Intersections (2014-2018)

Intersection Name	Total	Fatal	Severe injury	Visible Injury	Complaint of Pain
SONORA RD & SOUTH PALM CANYON DR	**3**	1	1	0	1
RAMON RD & SUNRISE WY	**3**	1	1	1	0
PASEO DOROTEA & RAMON RD	**2**	0	2	0	0
HWY 111 & VIA MIRALESTE	**2**	2	0	0	0
CAMINO REAL & RAMON RD	**2**	1	0	1	0

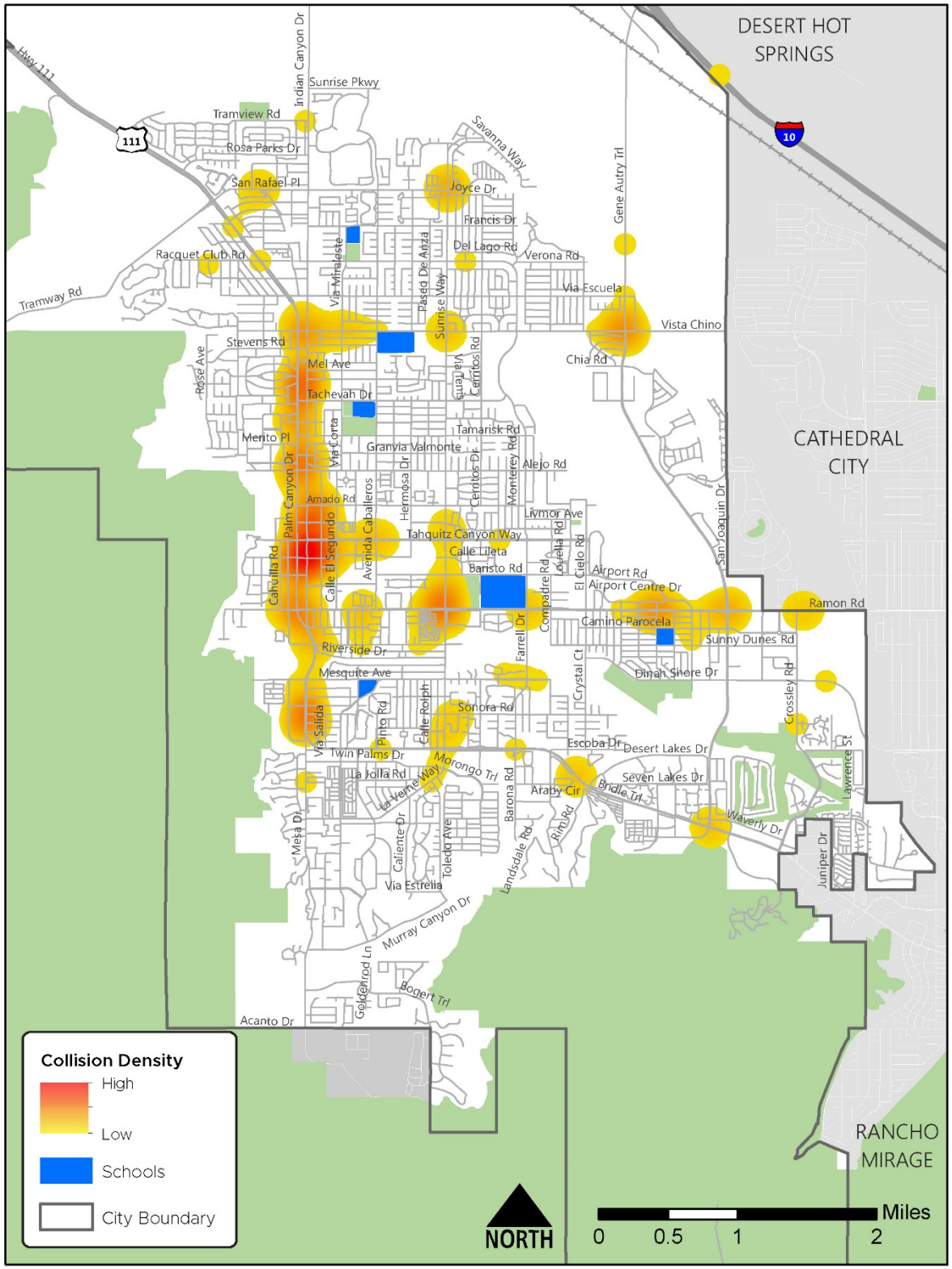
Pedestrian Involved by Corridor

When reviewing pedestrian involved collisions at the corridor level some of the trends noted in the intersection analysis are seen at the corridor level. Ramon Road was part of three of the top five pedestrian involved collision intersection and is the top pedestrian involved collision corridor. Ramon Road alone accounts for 14 percent of all pedestrian involved collisions. Overall, the top five pedestrian involved collision corridors account for 40 percent of all collisions.

Table 12 - Top 5 Pedestrian Involved Collision Corridors (2014-2018)

Intersection Name	Total	Fatal	Severe injury	Visible Injury	Complaint of Pain
RAMON RD	**20**	2	5	9	4
HWY 111	**11**	3	3	2	3
NORTH PALM CANYON DR	**10**	0	2	7	1
NORTH INDIAN CANYON DR	**8**	0	3	4	1
SOUTH PALM CANYON DR	**7**	1	2	2	2

Figure 5 – Pedestrian Involved Collision Density (1/4 mile)



Bicycle Involved by Intersection

Table 14 displays the top 4 intersections for bicycle involved collisions. The intersections of Golf Club Drive at Highway 111, Crossley Road at Ramon Road, and Paseo Dorotea at Ramon Road each saw three bicycle involved collisions between 2014 and 2018. While various intersections also had one bicycle involved collision, Paseo Dorotea at Ramon Road was selected because it was the only intersection with a bicycle involved collisions resulting in a fatality. Figure 6 displays the density of bicycle involved collisions.

Table 14 - Top 4 Bicycle Involved Collisions Intersections (2014-2018)

Intersection Name	Total	Fatal	Severe injury	Visible Injury	Complaint of Pain
GOLF CLUB DR & HWY 111	**2**	0	0	0	2
CROSSLEY RD & RAMON RD	**2**	1	0	0	1
BELARDO RD & RAMON RD	**2**	0	0	1	1
PASEO DOROTEA & RAMON RD*	**1**	1	0	0	0

Bicycle Involved by Corridor

When reviewing bicycle involved collisions at the corridor level, Ramon Road stands out as the top corridor. Ramon Road alone accounts for 24 percent of all bicycle involved collisions. Overall, the top five bicycle involved collision corridors account for 46 percent of all collisions. Ramon Road was part of three of the top five bicycle involved collision intersection and is the top bicycle involved collision corridor.

Table 14 - Top 5 Bicycle Involved Collision Corridors (2014-2018)

Intersection Name	Total	Fatal	Severe injury	Visible Injury	Complaint of Pain
RAMON RD	**18**	2	0	11	5
EAST PALM CANYON DR	**5**	1	0	1	3
SOUTH PALM CANYON DR	**5**	0	1	3	1
TAHQUITZ CANYON WY	**4**	0	0	1	3
VISTA CHINO	**3**	0	1	1	1

Figure 6 - Bicycle Involved Collision Density (1/4 mile)