



2015-2019 RTCSNV CRASH ANALYSIS REPORT

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Data used in this report is provided by Nevada Department of Transportation Dated January 1st 2015 to December 31st 201. Data transmitted by NDOT to the RTC on December 31, 2021



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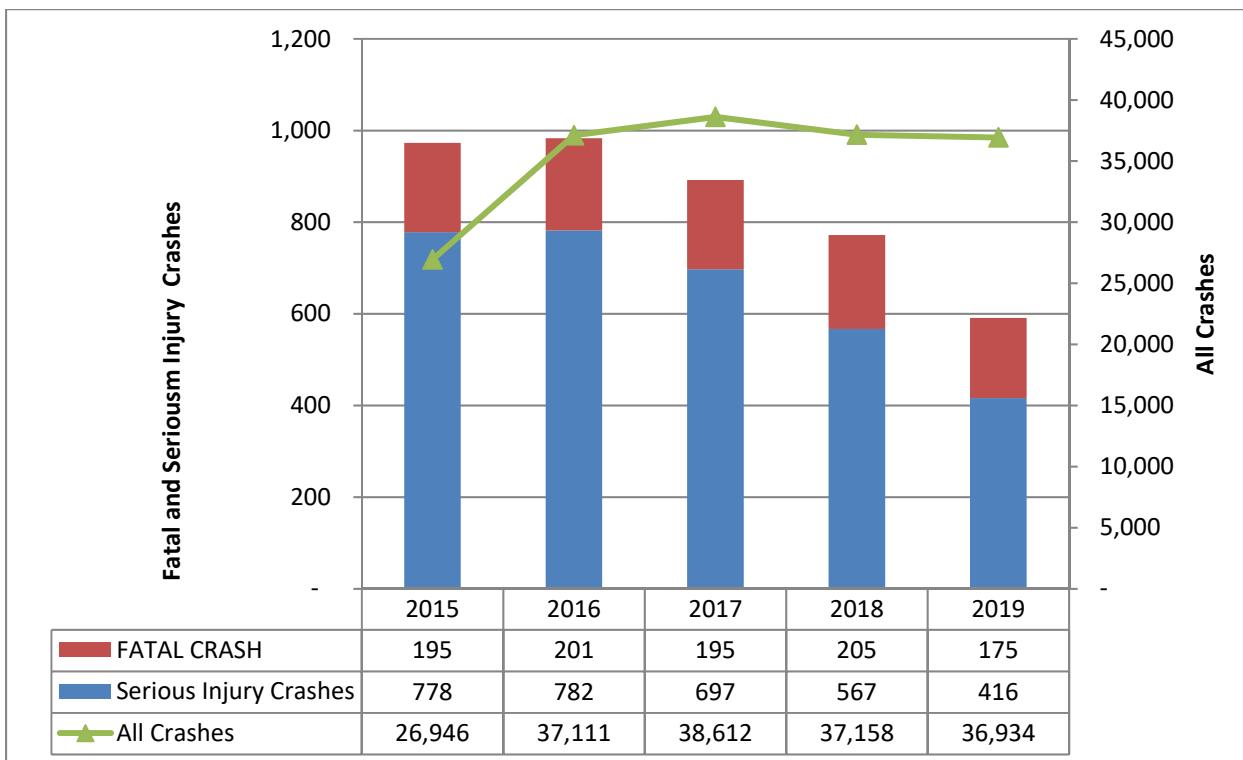
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SUMMARY

This report summarized the crashes took place from 2015 to 2019 that were reported to Nevada Department of Transportation (NDOT)¹. The report tackled the roadway safety issues by examining 1. Overall Crash Statistics 2. Non-Motorized Related Crashes 3. Driver Behavior, and 4. Bus Related Crashes. The result can be used to developing the strategies in policy, education, law reinforcement and roadway projects to improve the roadway safety.

From 2015 to 2019, there were 35,352 crashes per year in average in Clark County. Figure 1 shows the number of crashes reported. The significant drop in 2015 is affected by the Las Vegas Metropolitan Police Department stopped reporting to the non-serious crashes in 2014-2015 due to the funding shortage. There is also a downward trend for serious injury crashes.

FIGURE 1: FATAL, INCAPACITATING CRASH FREQUENCY 2015-2019



¹ All the records are subjected to be revised or updated due to the reporting process. Not all the crash records are geocoded.

CRASH TYPES

There were four different categories of crashes identified in the crash database (Table 1). The categories group different types of crashes to set apart different crashes' characteristics.

TABLE 1: CRASH TYPES

Category	Types
Passenger Vehicle	One Car, Two Cars, Three or More Cars
Commercial	Truck, Bus
Motor Cycle	Motor Cycle
Non-Motorized	Bicycle, Pedestrian

Nevada's KABCU Injury Classification Scale System provides different crash-severity levels, they are:

- Fatal (K):** The code is entered if a victim is pronounced dead because of the crash.
- Incapacitating (A):** This means that the victim must be carried or otherwise helped from the scene.
- Non-Incapacitating (B):** If the victim has visible signs of injury, either in a physical or mental sense, but is judged able to walk away from the scene without help.
- No Injury (C)/Unknown (U):** No evident of injury or not reported.

As shown in

Table 2, from 2015 to 2019, passenger-vehicle crash type is the most common crash type (89%-91%), then the non-motorized crashes (4-6%), commercial-vehicle crashes (4%), and Motor-Cycle Crashes (3%).

TABLE 2: NUMBER OF CRASHES BY CRASH TYPE AND SEVERITY 2015-2019

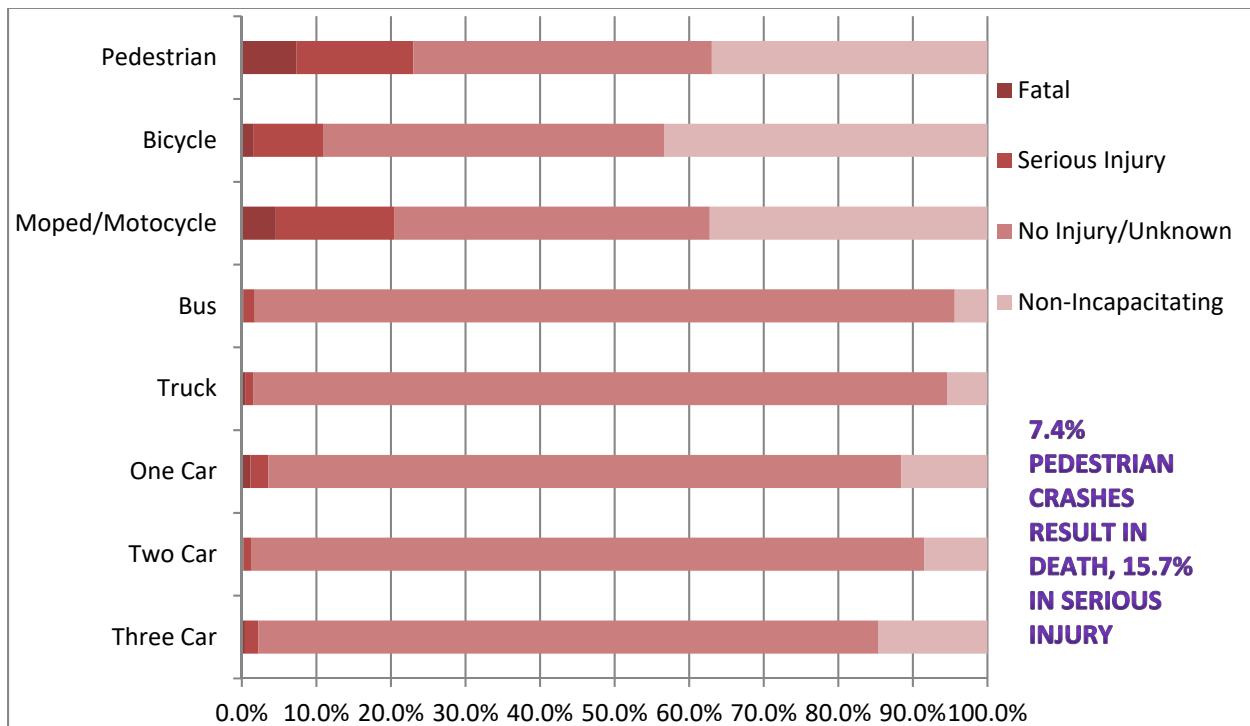
	Crash Type	Severity				Annual Total	Percent of Annual
		Fatal	Incapacitating	Non-Incapacitating	No Injury/Unknown		
2015	One Car	44	110	499	3,606	4,259	15.8%
	Two Car	51	334	1,959	15,332	17,676	65.7%
	Three Car	17	88	486	2,338	2,929	10.9%
	Truck	3	7	23	429	462	1.7%
	Bus	0	3	10	106	119	0.4%
	Bicycle	7	36	144	124	311	1.2%
	Moped/Motorcycle	23	90	237	227	577	2.1%
	Pedestrian	50	110	219	209	588	2.2%
	Total	195	778	3,577	22,371	26,921	
	Percent of Annual Total	0.72%	2.89%	13.29%	83.10%		
2019	One Car	38	102	587	3,972	4,699	12.7%

2016	Two Car	44	313	2,306	23,440	26,103	70.3%
	Three Car	19	82	577	3,180	3,858	10.4%
	Truck	5	14	35	592	646	1.7%
	Bus	1	1	7	157	166	0.4%
	Bicycle	5	41	139	171	356	1.0%
	Moped/Motorcycle	40	118	222	245	625	1.7%
	Pedestrian	49	111	235	261	656	1.8%
	Total	201	782	4,108	32,018	37,109	
	Percent of Annual Total	0.54%	2.11%	11.07%	86.28%		
2017	One Car	38	107	514	3,819	4,478	11.6%
	Two Car	54	283	2,241	25,111	27,689	71.7%
	Three Car	13	66	576	3,344	3,999	10.4%
	Truck	2	9	41	669	721	1.9%
	Bus	0	3	2	142	147	0.4%
	Bicycle	6	29	158	148	341	0.9%
	Moped/Motorcycle	25	87	215	245	572	1.5%
	Pedestrian	57	113	227	262	659	1.7%
	Total	195	697	3,974	33,740	38,606	
	Percent of Annual Total	0.51%	1.81%	10.29%	87.40%		
2018	One Car	49	84	303	2,463	2,899	7.8%
	Two Car	68	235	2,139	25,524	27,966	75.3%
	Three Car	12	57	577	3430	4,076	11.0%
	Truck	3	4	31	648	686	1.8%
	Bus	1	3	6	163	173	0.5%
	Bicycle	4	27	129	134	294	0.8%
	Moped/Motorcycle	24	81	164	220	489	1.3%
	Pedestrian	44	76	231	223	574	1.5%
	Total	205	567	3,580	32,805	37,157	
	Percent of Annual Total	0.55%	1.53%	9.63%	88.29%		
2019	One Car	46	47	251	1,996	2,340	6.3%
	Two Car	62	163	2,134	26,039	28,398	76.9%
	Three Car	18	44	507	3240	3,809	10.3%
	Truck	2	3	44	698	747	2.0%
	Bus	0	2	10	184	196	0.5%
	Bicycle	4	19	133	163	319	0.9%
	Moped/Motocycle	13	58	180	221	472	1.3%
	Pedestrian	30	80	243	296	649	1.8%

Total	175	416	3,502	32,837	36,930	
Percent of Annual Total	0.47%	1.13%	9.48%	88.92%		

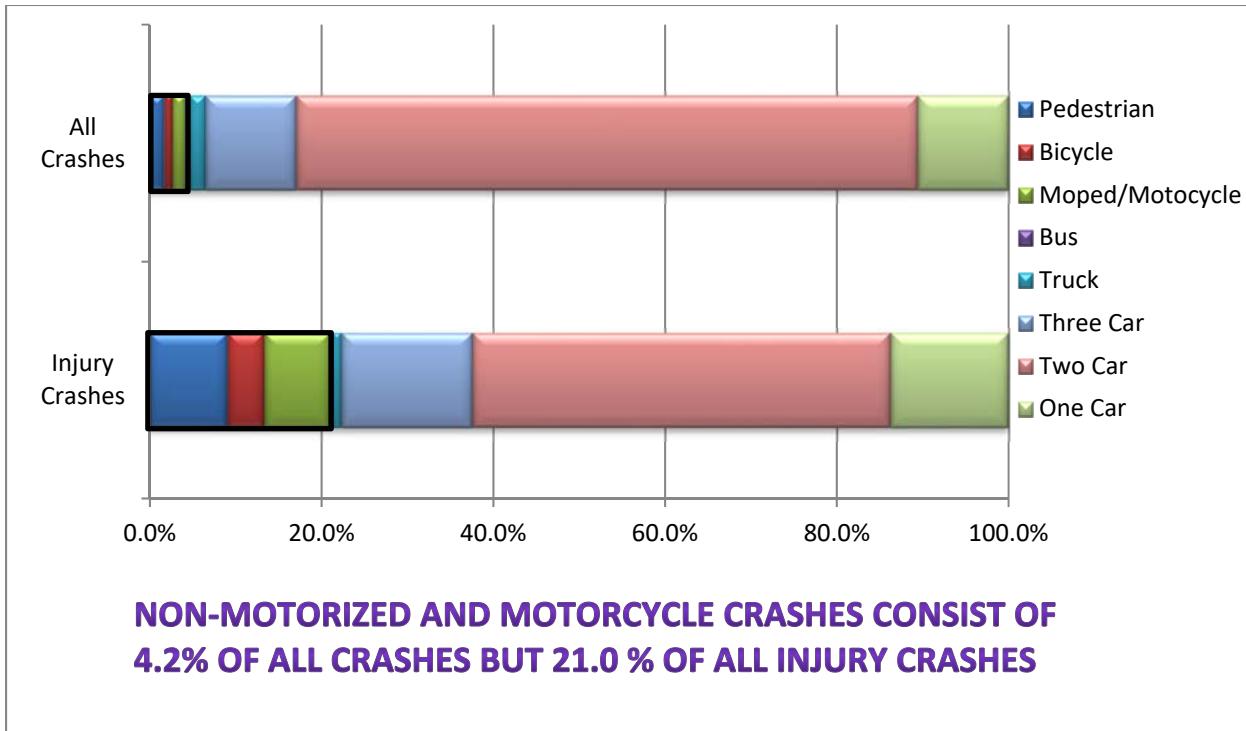
The likelihood of being injured varies from different crash types; however, motorcycle, bicycle and pedestrian crashes are more likely to result in fatal and serious injury (Figure 2: Percentage of Crash SEVERITY by Crash Types 2015-2019).

FIGURE 2: PERCENTAGE OF CRASH SEVERITY BY CRASH TYPES 2015-2019



Furthermore, Figure 3 shows the bicycle, motorcycle, and pedestrian crashes consist of 4.2% of all crashes, but they consist of 21.0% of all injury crashes. In other words, bicyclist, motorcyclist, and pedestrians have a 400% greater likelihood of being injured in a crash event.

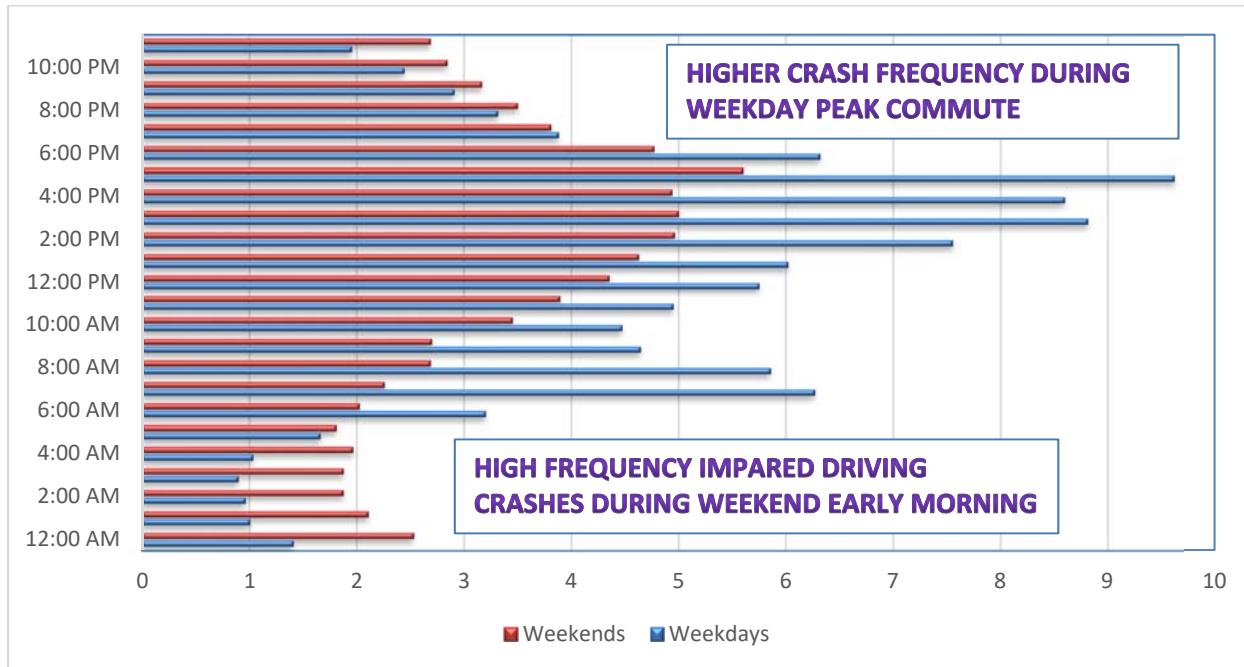
FIGURE 3: CRASH TYPE FOR INJURY CRASHES AND ALL CRASHES 2015-2019



TIME AND DAY OF CRASHES

On the weekdays, number of crashes peaked at 7:00 a.m. and 5:00 p.m. (Figure 4). The peaks coincide with the commute peak hours identified in the 2014 household travel survey and the 2019 NDOT traffic counts. The weekend pattern is similar to the weekday pattern, except the number of crashes is much lower during the morning peak period. The early mornings during the weekends have higher number of crashes due to the impaired driving².

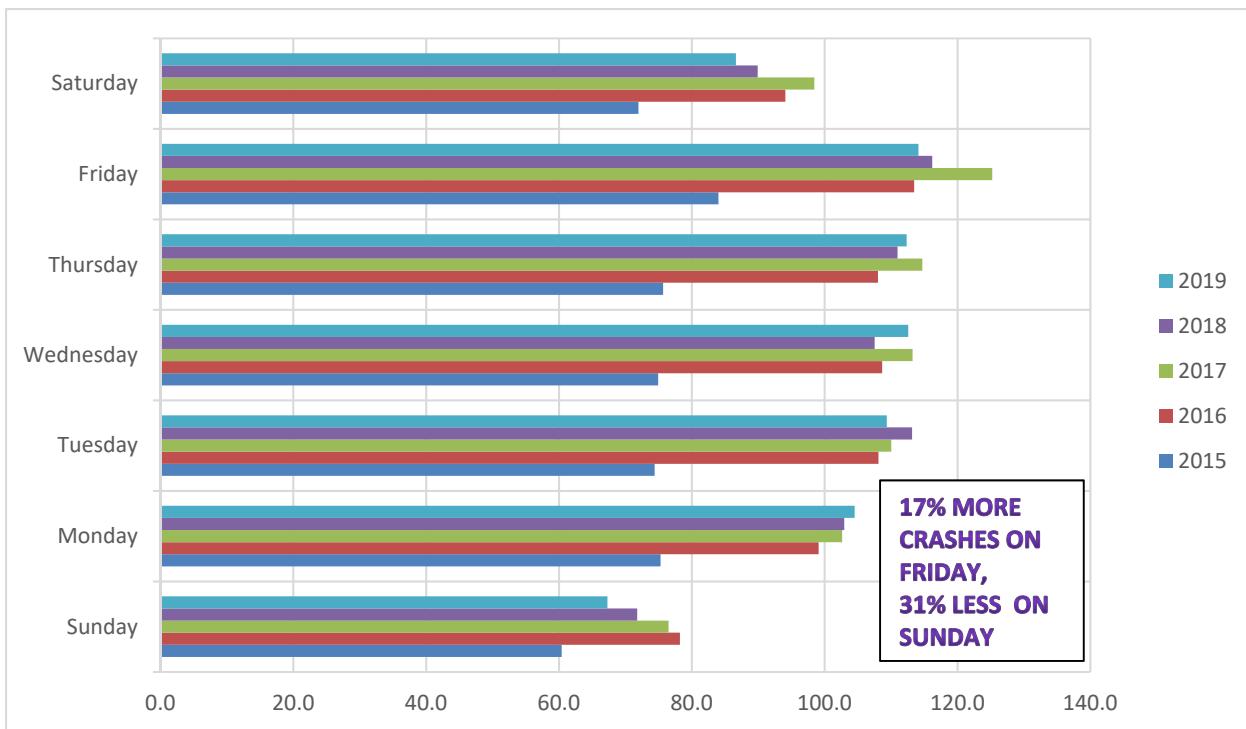
FIGURE 4: AVERAGE CRASHES PER HOUR BY TIME OF DAY 2015-2019



² S17.8, 2016-2020 Nevada Strategic Highway Safety Plan, Nevada Department of Transportation

It averages 96.8 crashes per day during 2015 to 2019. The averages are higher on the Fridays and lower on the Sundays (Figure 5).

FIGURE 5: AVERAGE CRASHES PER DAY BY DAY OF THE WEEK 2015-2019



CRASH FACTORS

Crash factors are the main causes of reported crashes. 16.1% of vehicle failed to yield right of way and 13.0% of crashes have no reported cause in the NDOT database. (Table 3)

TABLE 3: TOP 10 PRIMARY CRASH FACTORS BY SEVERITY, 2015-2019

RANK	Primary Factor	Severity				Total Crashes	Percentage
		Fatal	Incapacitating	Non-Incapacitating	No Injury / Unknown		
1	FAILED TO YIELD RIGHT OF WAY	11 5	876	5,699	25,643	32,333	18.3%
2	UNKNOWN	41 2	663	2,475	21,461	25,011	14.1%
3	FOLLOWED TOO CLOSELY	2	84	1,297	20,973	22,356	12.6%
4	FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	98	416	2,108	15,500	18,122	10.3%
5	DRIVING TOO FAST FOR CONDITIONS	47	170	1,098	14,522	15,837	9.0%
6	UNSAFE LANE CHANGE	5	69	516	10,948	11,538	6.5%
7	HIT AND RUN	27	117	650	10,402	11,196	6.3%
8	DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	68	311	2,020	8,652	11,051	6.3%
9	OTHER IMPROPER DRIVING	11	120	986	9,854	10,971	6.2%
10	MADE AN IMPROPER TURN	4	76	471	4,810	5,361	3.0%

FATALITIES

Among all the crash types, pedestrian and motorcycle crashes were more likely to result in fatalities.

TABLE 4: FATALITIES BY CRASH TYPE PER 100,000-POPULATION 2015-2019

Year	Number of Fatal Crashes by Type								Fatal Crashes Per 100,000 Population
	One Car	Two Car	Three Car	Truck	Bus	Bicycle	Moped/Motocycle	Pedestrian	
2015	2.10	2.43	0.81	0.14	0.00	0.33	1.10	2.38	9.30
2016	1.78	2.06	0.89	0.23	0.05	0.23	1.87	2.29	9.40
2017	1.74	2.47	0.60	0.09	0.00	0.27	1.15	2.61	8.94
2018	2.20	3.05	0.54	0.13	0.04	0.18	1.08	1.98	9.21
2019	2.03	2.73	0.79	0.09	0.00	0.18	0.57	1.32	7.72

Table 5: Top 10 Primary Crash Factors for Fatal Crashes 2015-2019 shows the top factors that caused fatal crashes; the most commonly reported factor is speeding.

TABLE 5: TOP 10 PRIMARY CRASH FACTORS FOR FATAL CRASHES 2015-2019

Rank	Primary Factor	Number of Fatal Crashes	Percentage of All Fatal Crashes
1	UNKNOWN/NOT REPORTED	412	42%
2	EXCEEDED AUTHORIZED SPEED LIMIT	123	13%
3	FAILED TO YIELD RIGHT OF WAY	115	12%
4	FAILURE TO KEEP IN PROPER LANE OR RUNNING OFF ROAD	98	10%
5	DISREGARDED TRAFFIC SIGNS, SIGNALS, ROAD MARKINGS	68	7%
6	DRIVING TOO FAST FOR CONDITIONS	47	5%
7	HIT AND RUN	27	3%
7	WRONG SIDE OR WRONG WAY	14	1%
9	OVER-CORRECTING/OVER-STEERING	11	1%
10	OTHER IMPROPER DRIVING	11	1%

CRASH LOCATIONS

Density map method utilized in this section identified the relative dangerous locations in the valley. Three density maps in this section are all-type crash density, fatal crash density, and serious-injury crash density map.

In Figure 6, it shows that the I-15 corridor between the downtown and the strip has the highest crash frequency in the valley.

FIGURE 6: CRASH DENSITY HOTSPOT RANKS 2015-2019

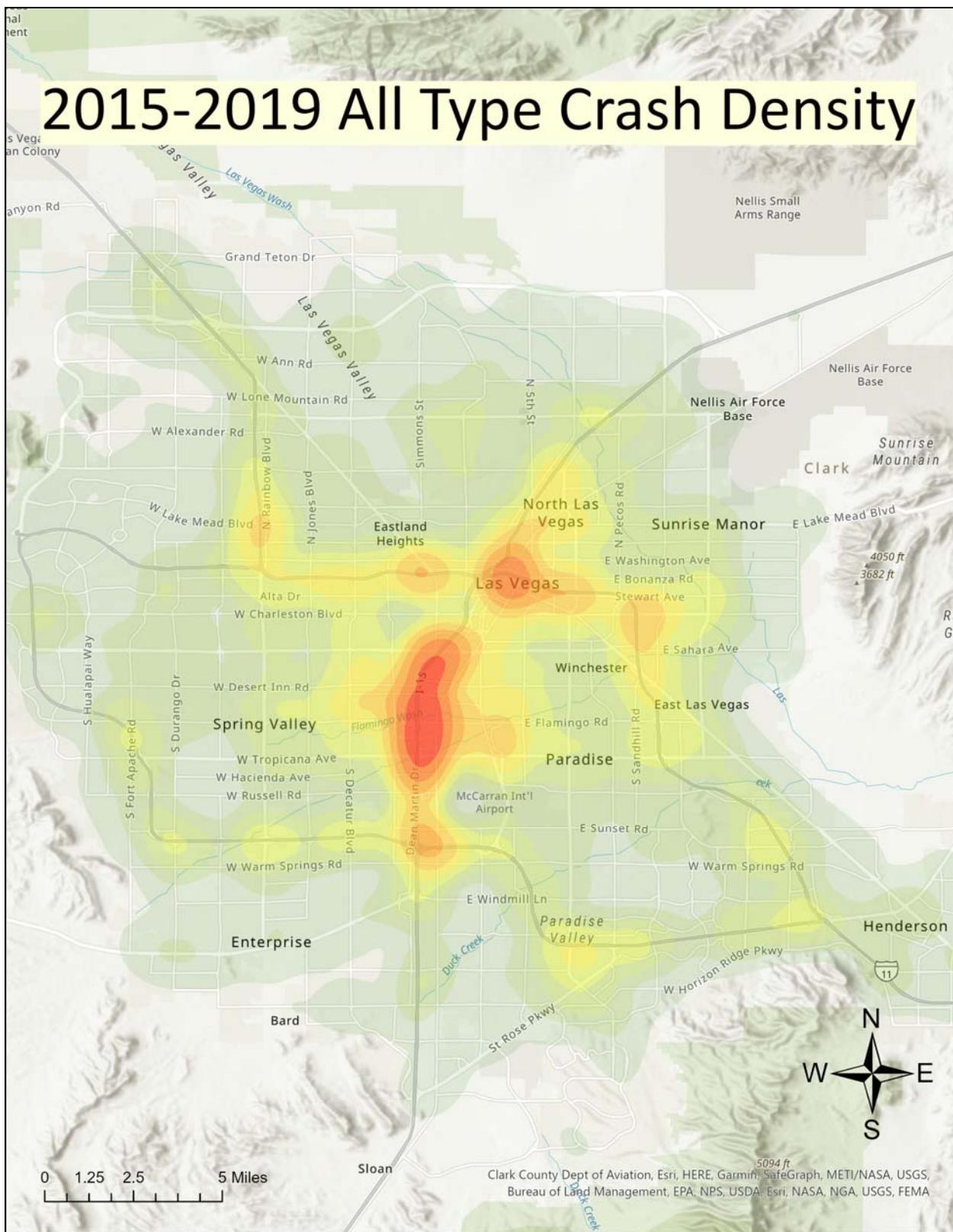


Figure 7 shows the fatal crashes concentrated in the downtown, the strip, and the Boulder highway corridor.

FIGURE 7: FATAL CRASH HOTSPOTS 2015-2019

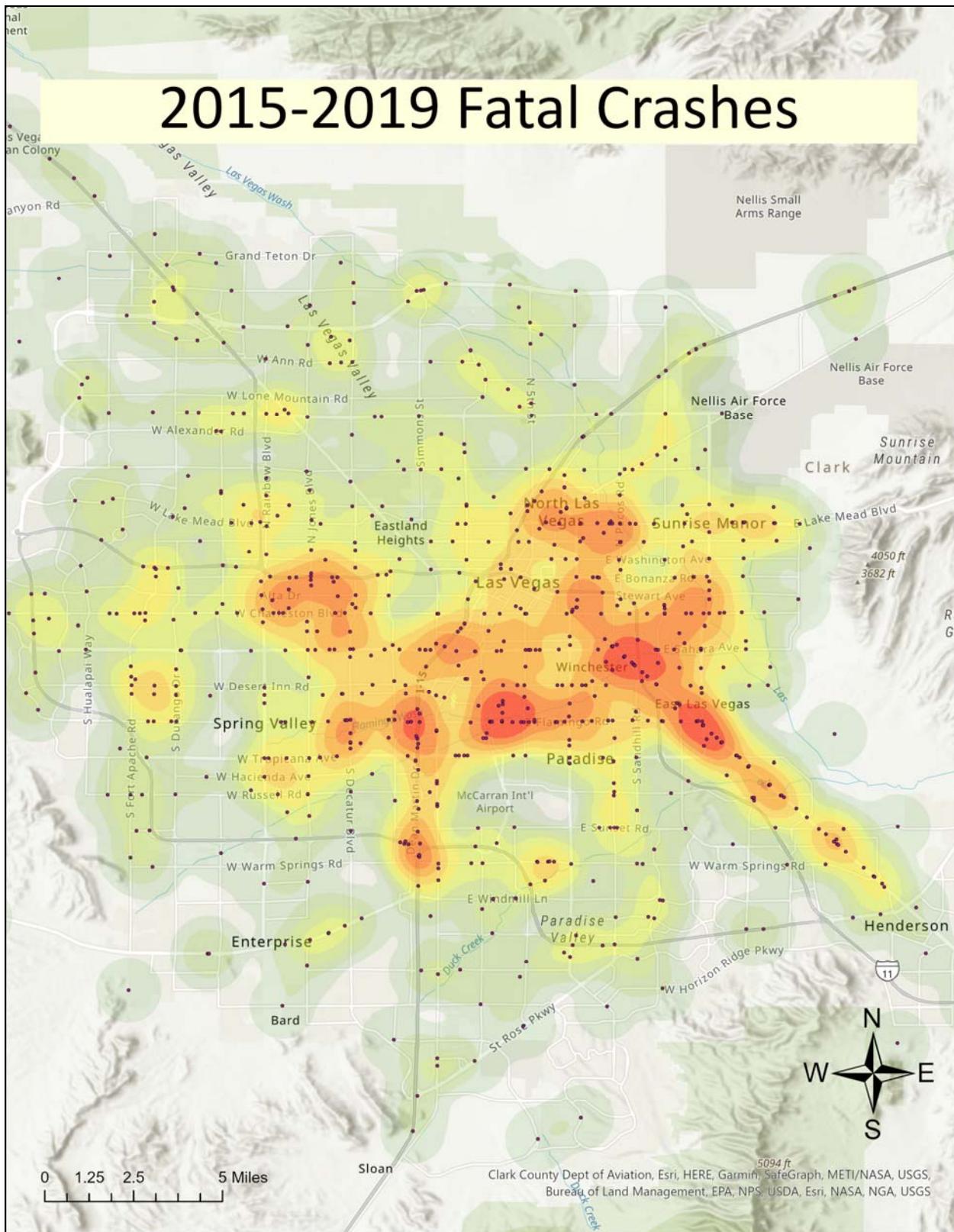
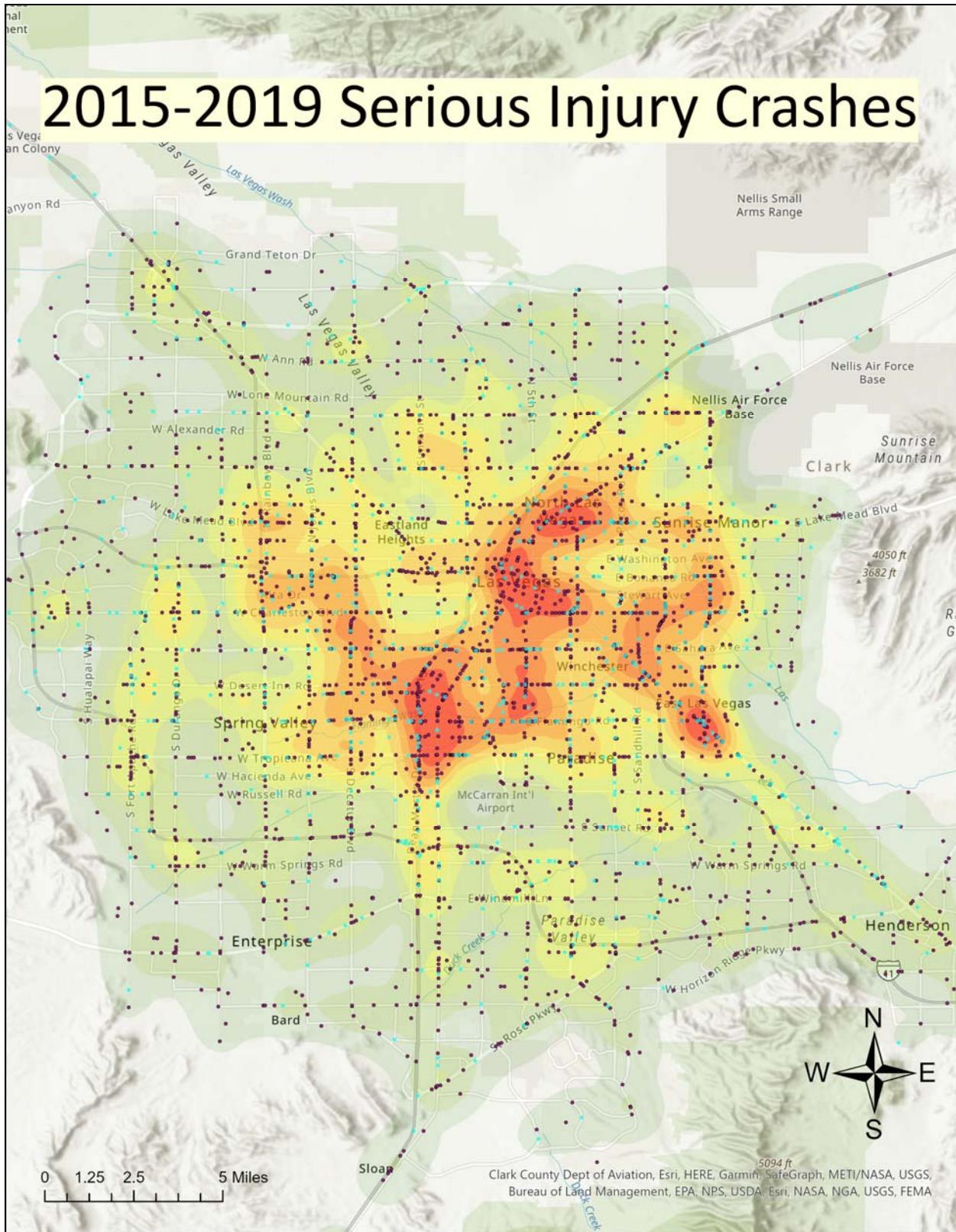


Figure 8 shows the serious injury crash locations, they are similar to the fatal crash locations, but a lot more scattered in the valley area.

FIGURE 8: SERIOUS INJURY CRASH HOTSPOTS 2015-2019



DRIVER'S BEHAVIOR

24.2% of the drivers involved in crashes were reported with an abnormal physical condition while 75.8% of the drivers were either reported to be normal or unknown.

TABLE 6: DRIVER'S FACTORS 2015-2019

Driver Factor	Annual Average	Percentage
APPARENTLY NORMAL	26,806	75.83%
UNKNOWN	2,108	5.96%
HAD BEEN DRINKING	2,007	5.68%
OTHER IMPROPER DRIVING	1,753	4.96%
INATTENTION/DISTRACTED	1,387	3.92%
FELL ASLEEP, FAINTED, FATIGUED, ETC.	455.8	1.29%
DRUG INVOLVEMENT	320.2	0.91%
ILLNESS	195	0.55%
HIT AND RUN	152.8	0.43%
OBSTRUCTED VIEW	99	0.28%
PHYSICAL IMPAIRMENT	67.6	0.19%
OTHER	0.8	0.00%

Among the 24% of the abnormal drivers, 35% of them were driving under the influence (DUI) effected either by drug or by alcohol, 21% of them were distracted

FIGURE 9: ABNORMAL DRIVER'S FACTORS 2015-2019

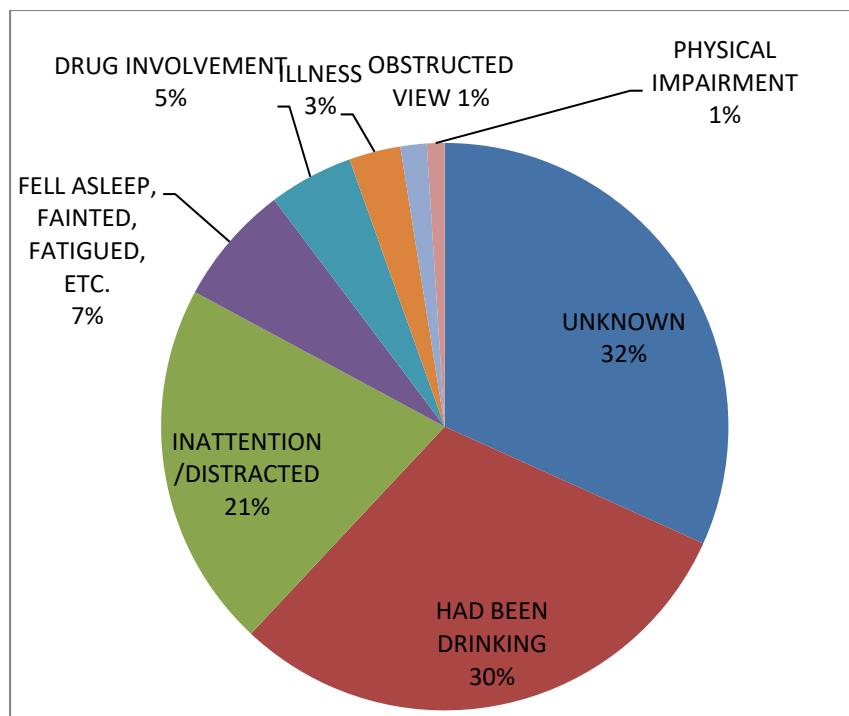


Table 7 below shows the severity levels of DUI related crashes. A drug related crash had 6.8 times more chance to result in fatal than other non-DUI related crashes.

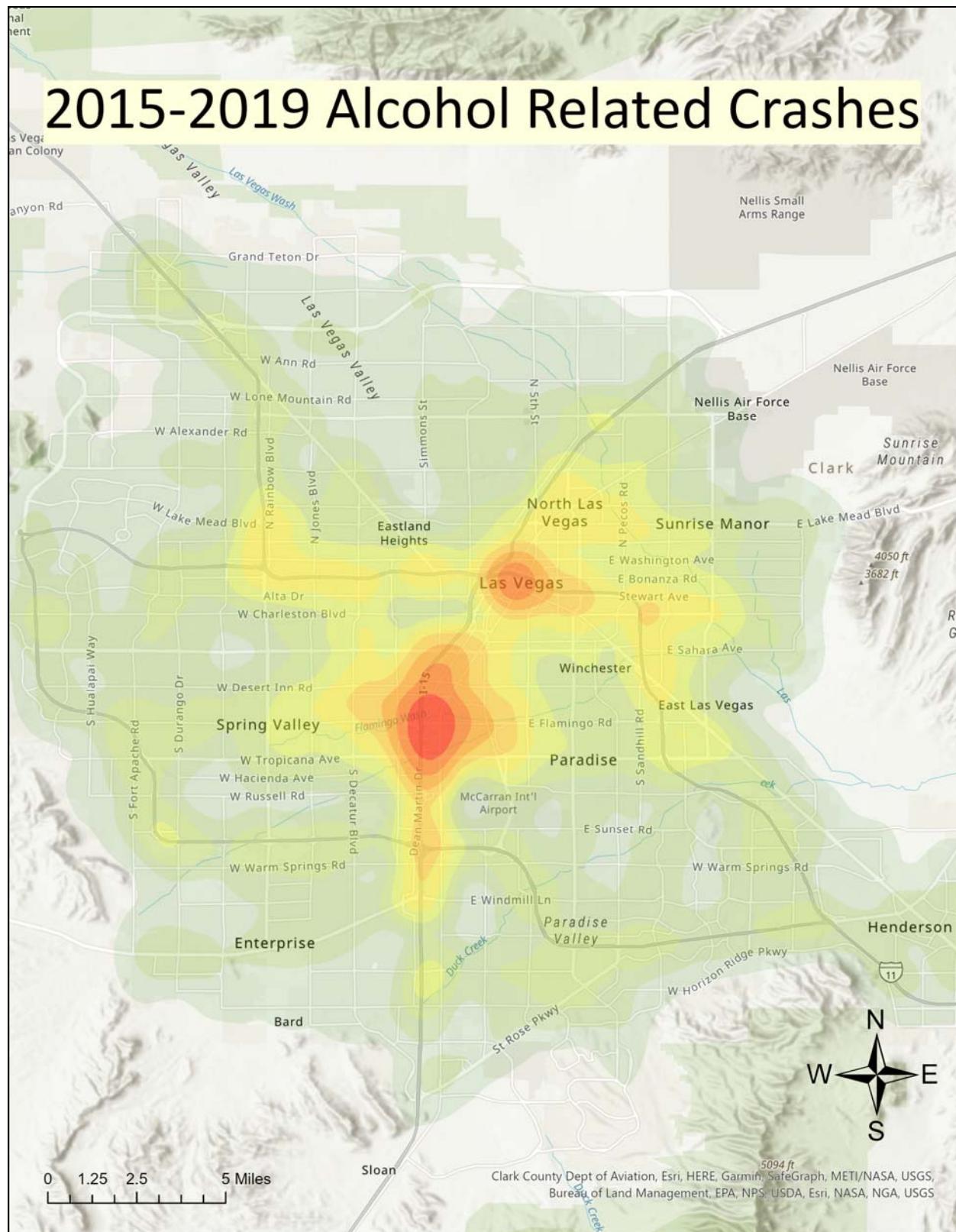
TABLE 7: DRIVING UNDER THE INFLUENCE

Year	DUI	Fatal	Serious Injury	Injury	Non-Injury	Sum	Percentage
2015	Drug	13	21	56	233	323	1.2%
	Alcohol	47	96	413	1665	2221	8.2%
	Others	135	661	3108	20498	24402	90.6%
2016	Drug	19	18	70	334	441	1.2%
	Alcohol	46	93	428	1918	2485	6.7%
	Others	136	671	3611	29767	34185	92.1%
2017	Drug	12	18	59	295	384	1.0%
	Alcohol	31	97	352	1687	2167	5.6%
	Others	152	582	3563	31764	36061	93.4%
2018	Drug	4	16	46	222	288	0.8%
	Alcohol	11	60	278	1427	1776	4.8%
	Others	190	491	3257	31156	35094	94.4%
2019	Drug	5	13	44	193	255	0.7%
	Alcohol	25	52	234	1318	1629	4.4%
	Others	145	351	3224	31330	35050	94.9%
Total	Drug	53	86	275	1277	1691	1.0%
	Alcohol	160	398	1705	8015	10278	5.8%
	Others	758	2756	16763	144515	164792	93.2%
2015-2019 Total	Crash Type	Percentage Result in Fatal		Percentage Result in Serious Injury			
	Drug Related	3.13%		5.09%			
	Alcohol Related	1.56%		3.87%			
	All Others	0.46%		1.67%			



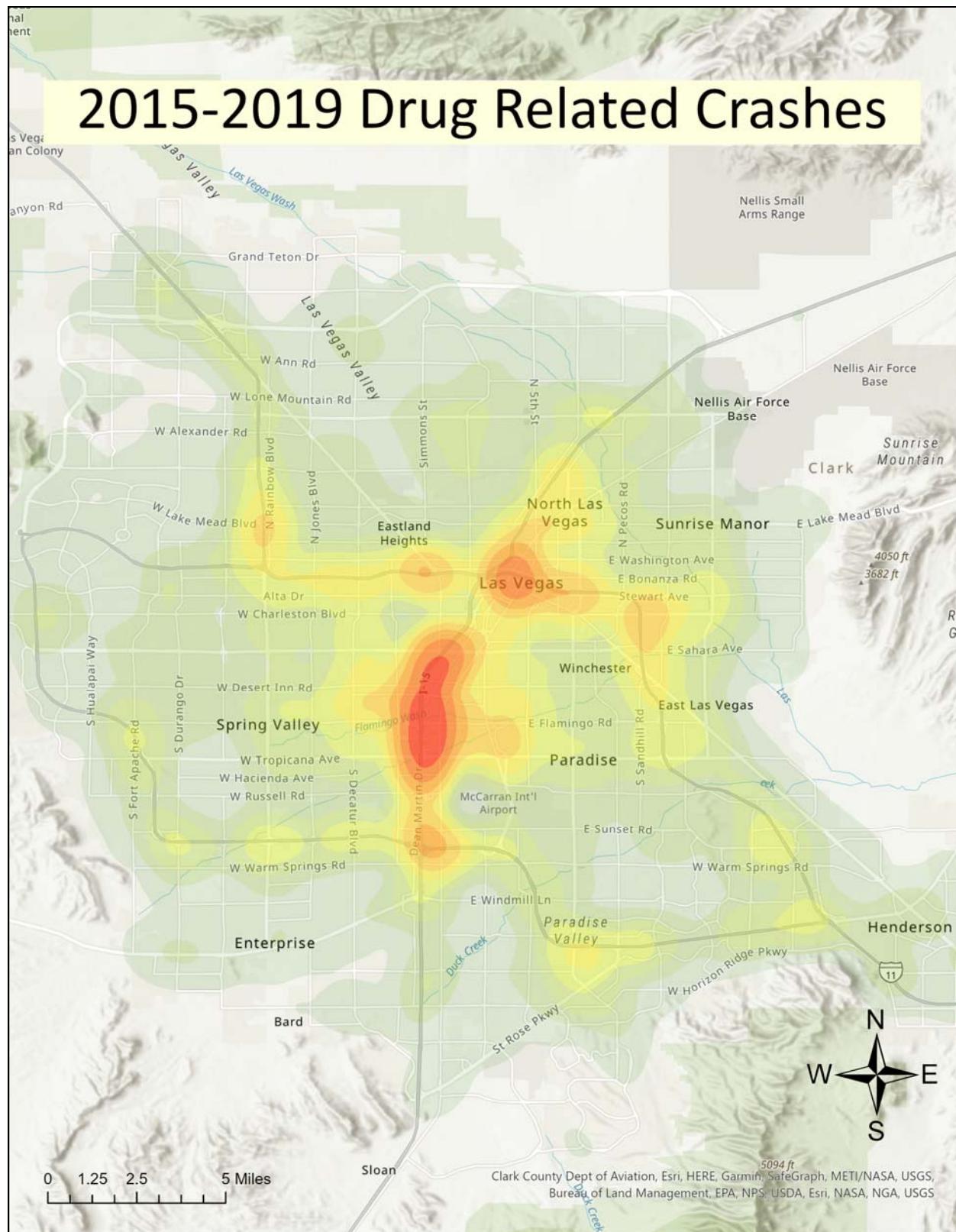
Figure 10 below shows the high-percentage-DUI-related crashes locations.

FIGURE 10: HIGH PERCENTAGE ALCOHOL CRASH HEAT MAP 2015-2019



Error! Not a valid bookmark self-reference. shows locations with most drug related crashes. Both drug and alcohol related crashes show the similar concentration pattern near the strip area.

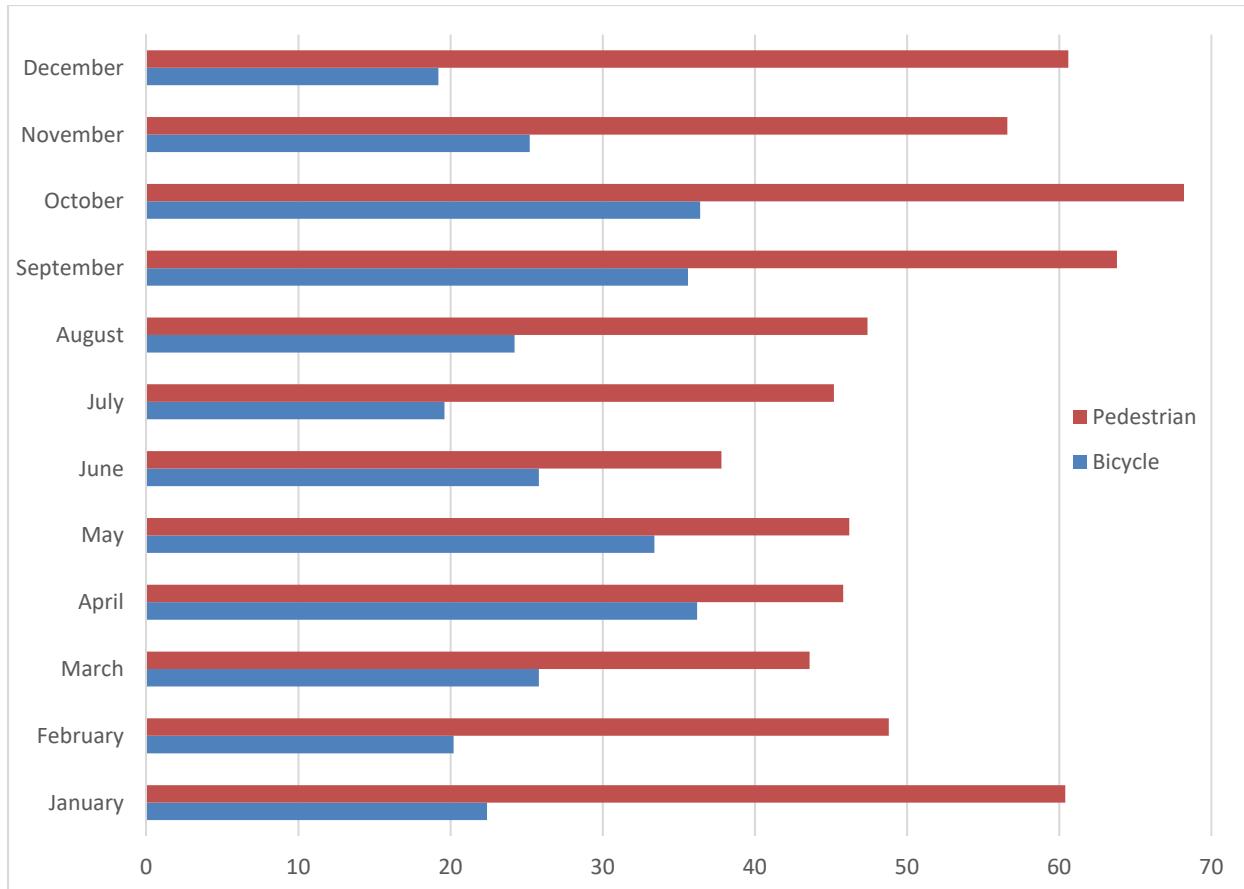
FIGURE 11: DRUG RELATED CRASH HEAT MAP 2015-2019



NON-MOTORIZED CRASHES

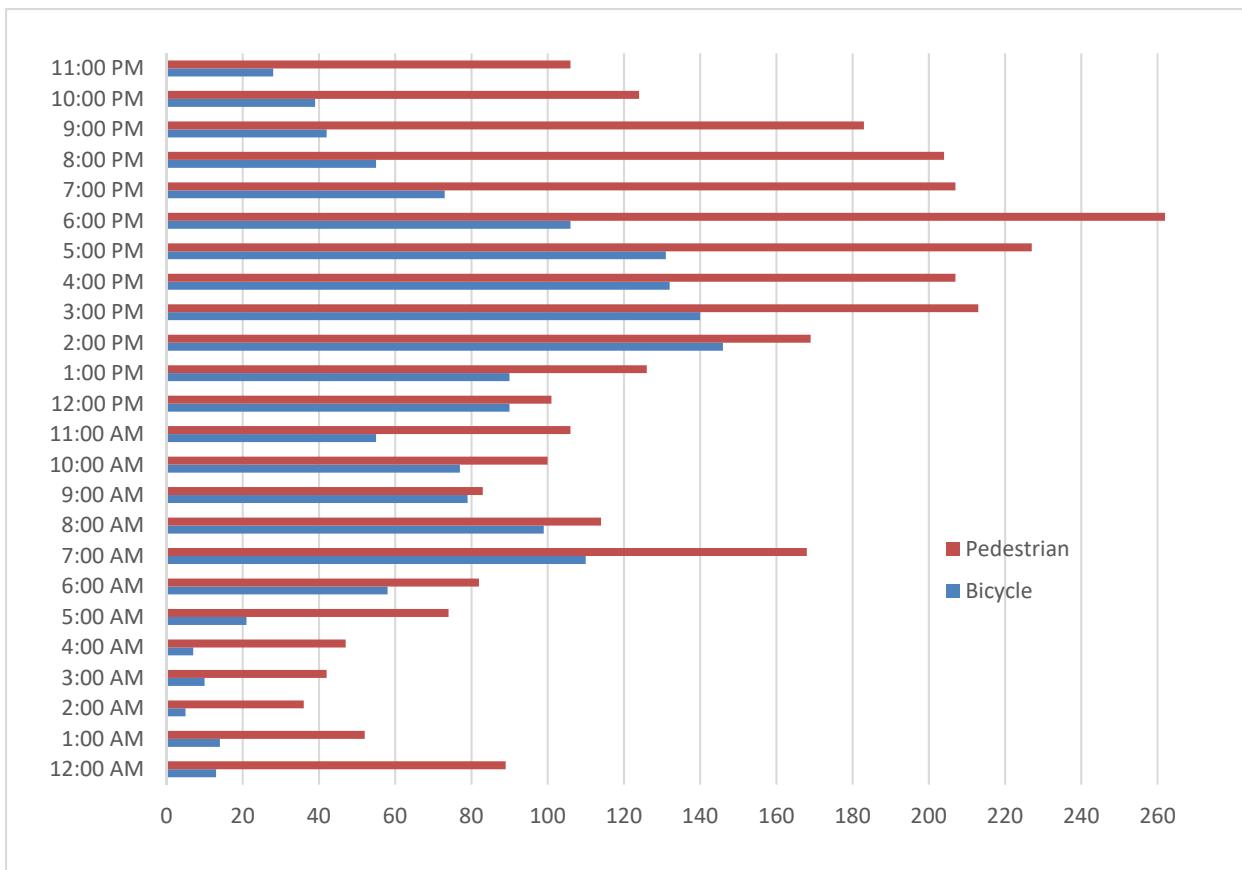
In Clark County, the bicycle and pedestrian crashes occurred more frequently in the winter and the spring during 2015-2019.

FIGURE 12: AVERAGE BICYCLE AND PEDESTRIAN CRASHES PER MONTH 2015-2019



The number of non-motorized crashes peaks during the PM peak periods. The pattern is similar to the vehicular crashes, except the morning peak is not as high.

FIGURE 13: TOTAL NUMBER OF BICYCLE AND PEDESTRIAN CRASHES BY TIME OF DAY 2015-2019



Most of the non-motorized serious injury and fatal crashes took place near the strip and the downtown area (Figure 14).

FIGURE 14: ALL PEDESTRIAN CRASH HEAT MAP 2015-2019

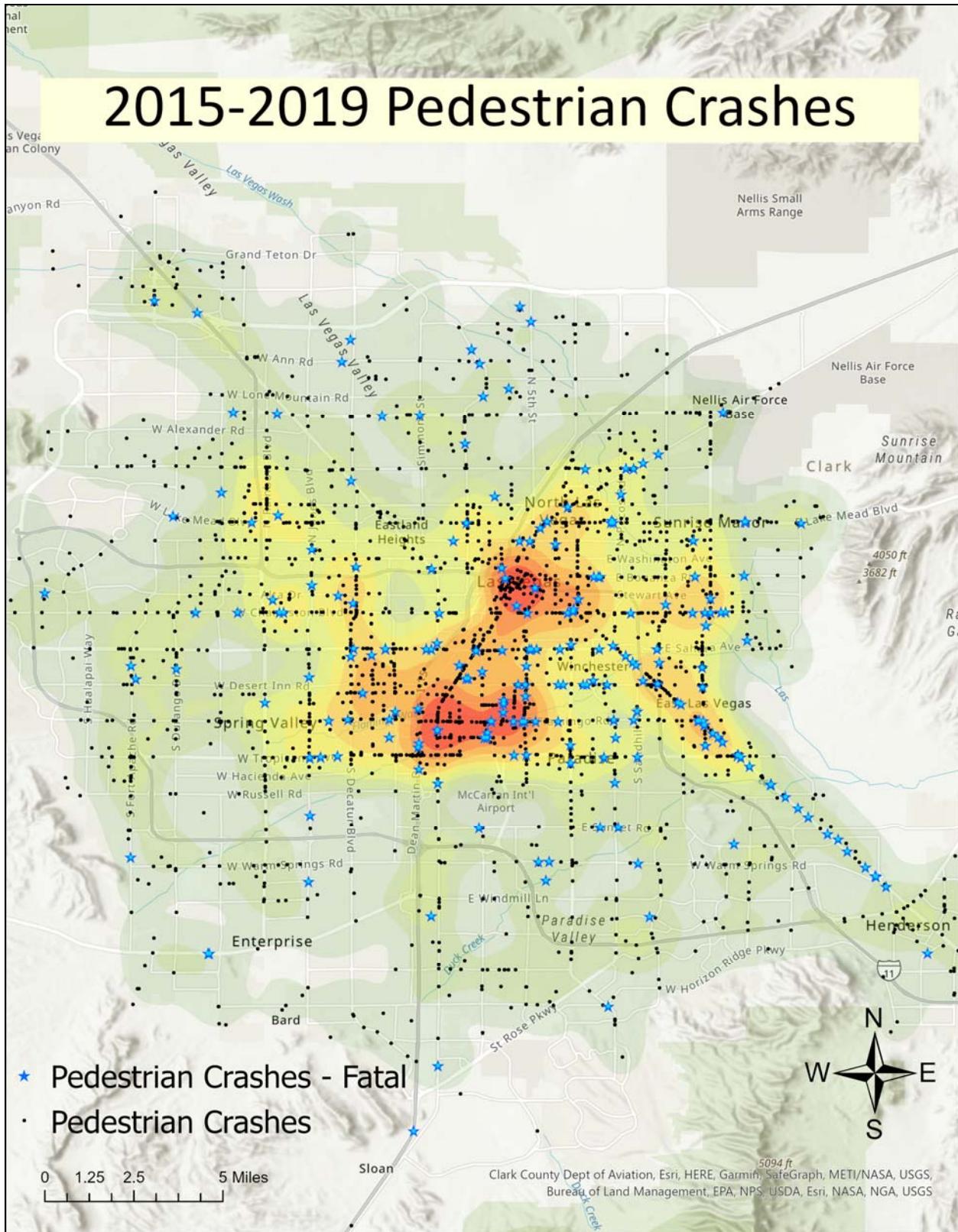
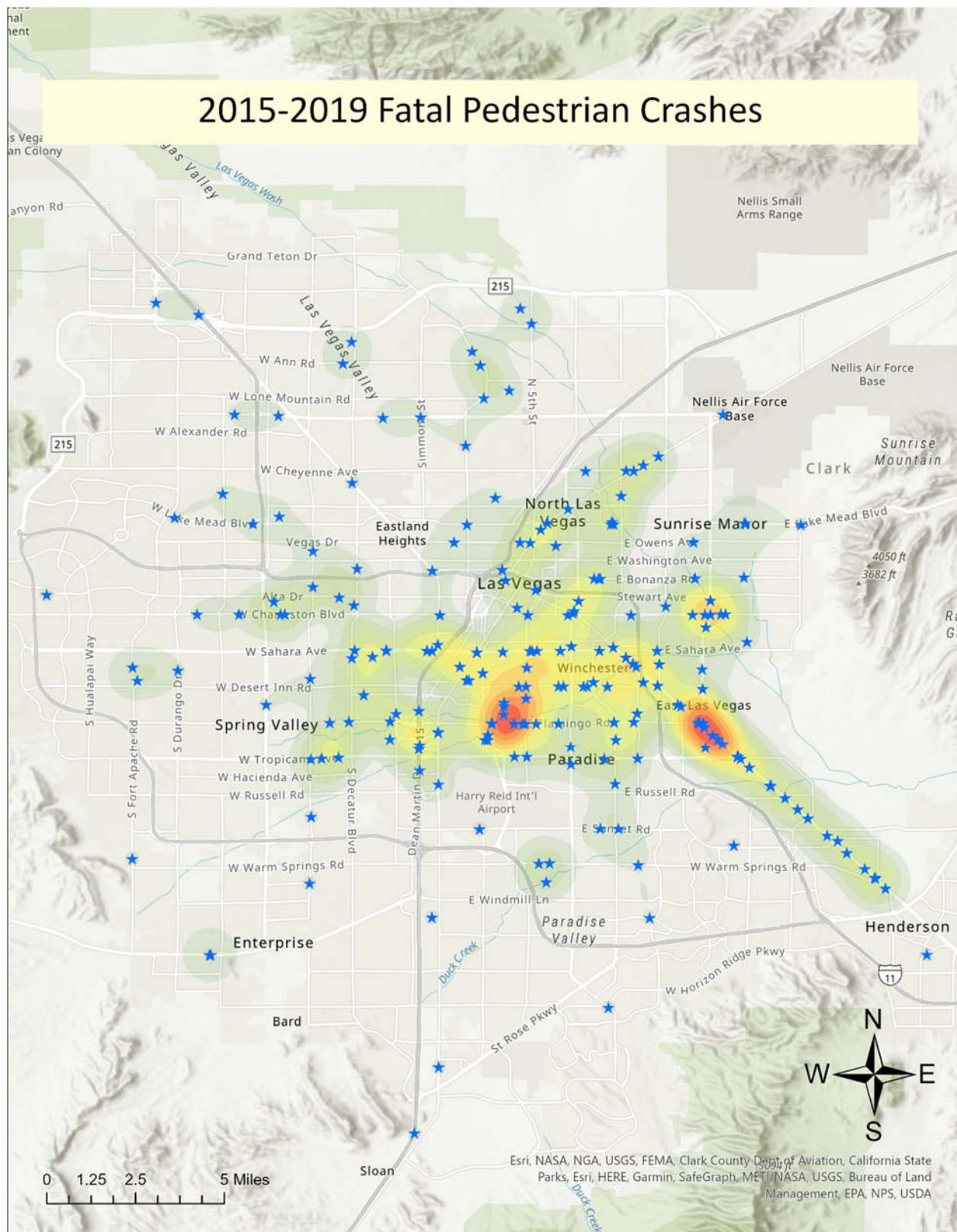


FIGURE 15: FATAL PEDESTRIAN CRASH HEAT MAP 2015-2019



THE NUMBER OF PEDESTRIAN CRASHES IS ALSO RELATED TO THE HOUSEHOLD INCOME IN THE AREA.
 (FIGURE 16: HOUSEHOLD POVERTY PERCENTAGE AND PEDESTRIAN CRASH HEAT MAP 2015-2019).

FIGURE 16: HOUSEHOLD POVERTY PERCENTAGE AND PEDESTRIAN CRASH HEAT MAP 2015-2019

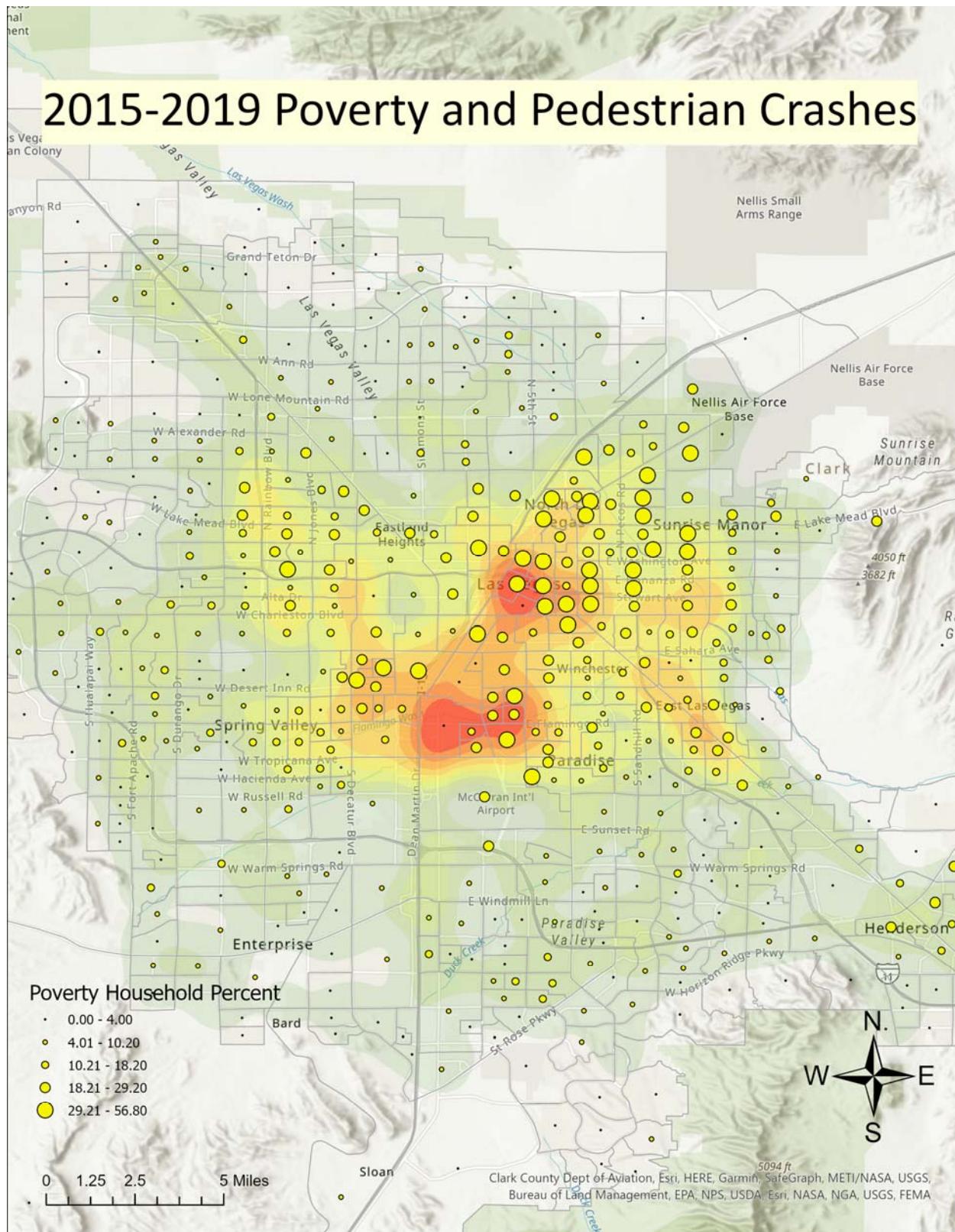


FIGURE 17: MINORITY POPULATION AND PEDESTRIAN CRASHES

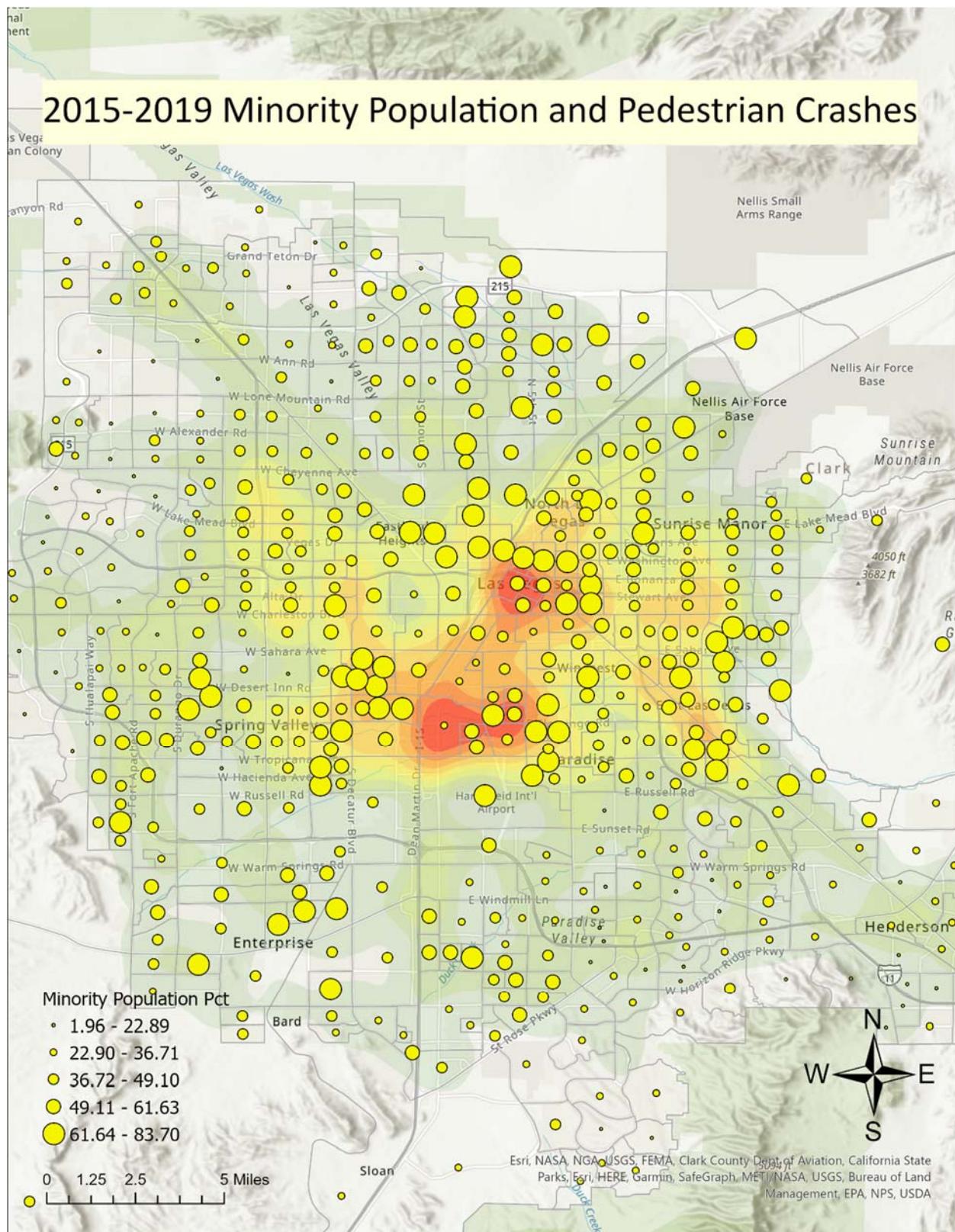
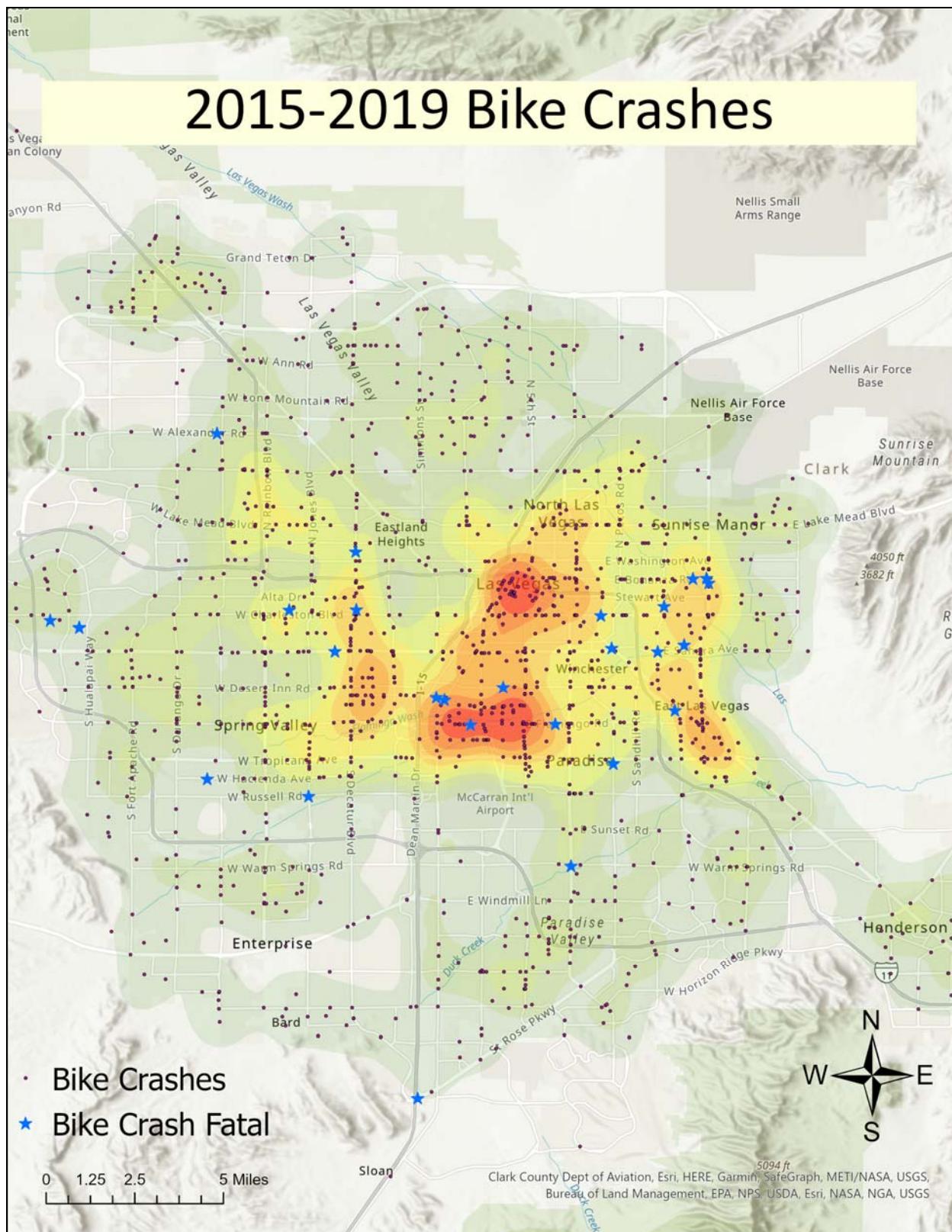


FIGURE 18: BICYCLE CRASH HEAT MAP 2015-2019

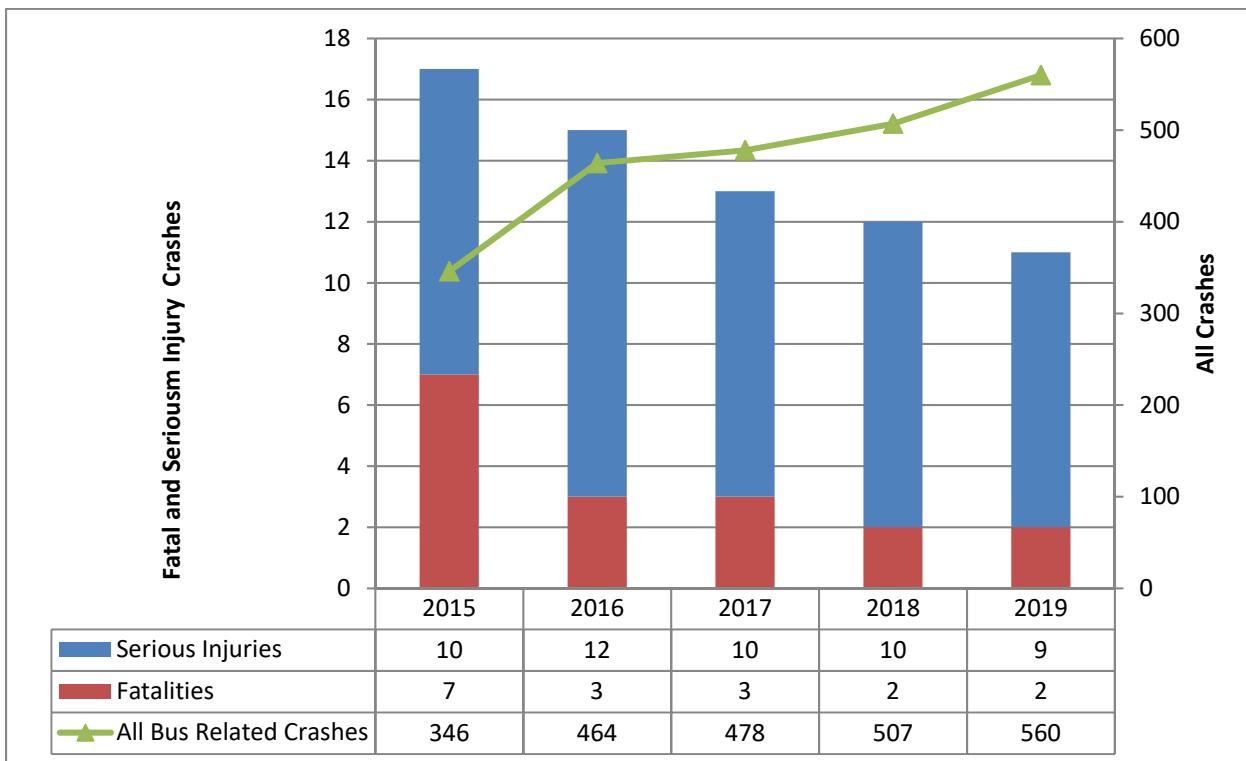


BUS AND COACH CRASHES

There were total of 2,355 bus and coach bus related crashes reported in the 2015-2019 NDOT crash database. In this report, the bus category includes RTC buses, hotel buses, school buses, long distance coach buses, and other vehicle designed to carry many passengers.

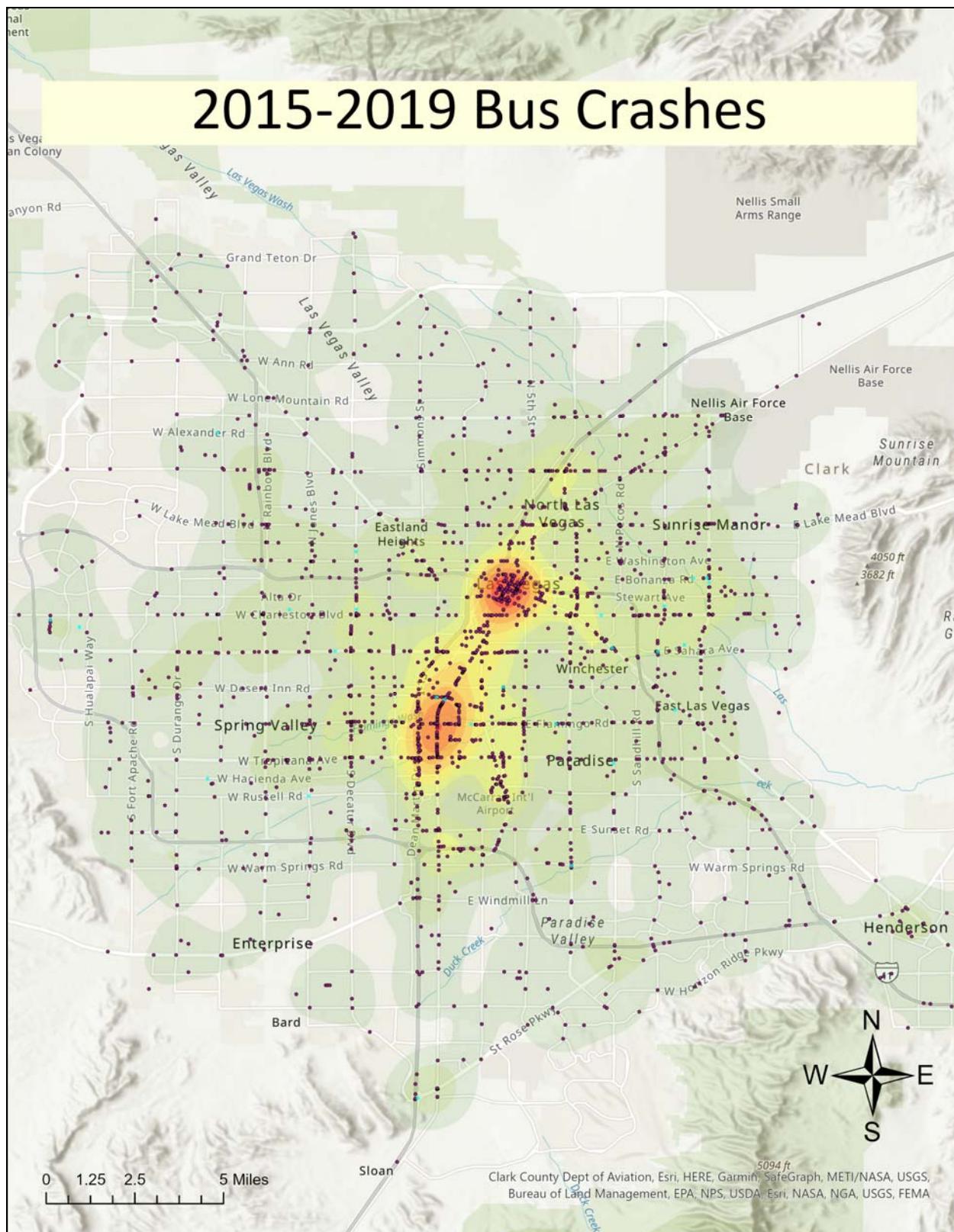
Due to the non-reporting crashes in 2015, the reported bus crashes are lower. Overall, the number of bus related crashes has a slight increase in 2017 comparing to 2016 numbers.

FIGURE 19: 2015-2019 BUS AND COACH RELATED CRASHES



For crash locations, crashes are concentrated in the Strip and Downtown area. Crashes near Tropicana and Boulder Highway tend to result in higher percentage of serious injury and fatal rate. See Figure 20: 2015-2019 Bus Related Crash Density Map below for detail.

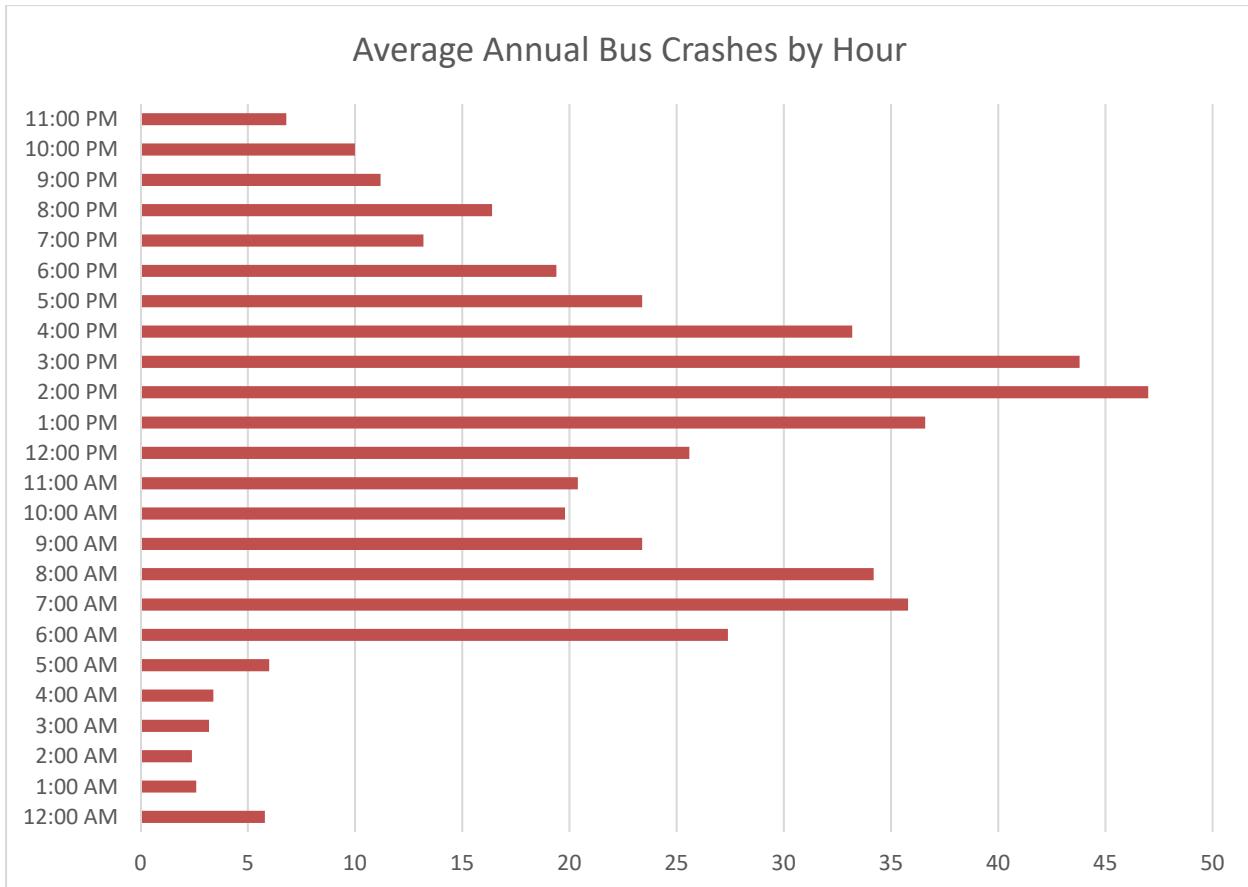
FIGURE 20: 2015-2019 BUS RELATED CRASH DENSITY MAP



TIME OF DAY

In Figure 21: 2015-2019 Average Annual Bus Crashes by Hour, bus related crashes shows the similar twin-peak pattern as other crashes, except the second peak reaches the highest point at 2:00PM instead 5:00PM in all other crashes.

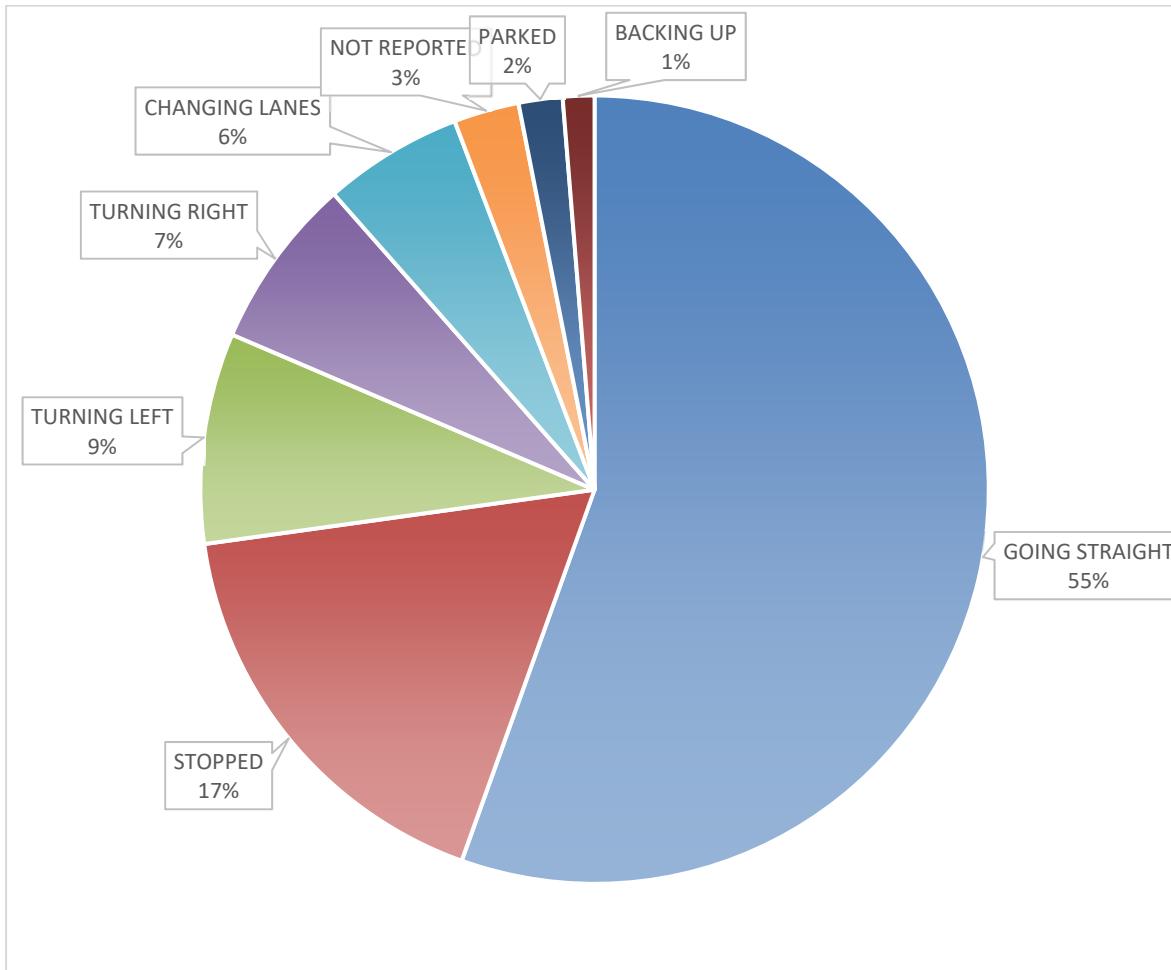
FIGURE 21: 2015-2019 AVERAGE ANNUAL BUS CRASHES BY HOUR



VEHICLES AND CRASH FACTORS

Bus actions are reported actions during the crash. 55% of the Buses were going straight and 17% were stopped during crash.

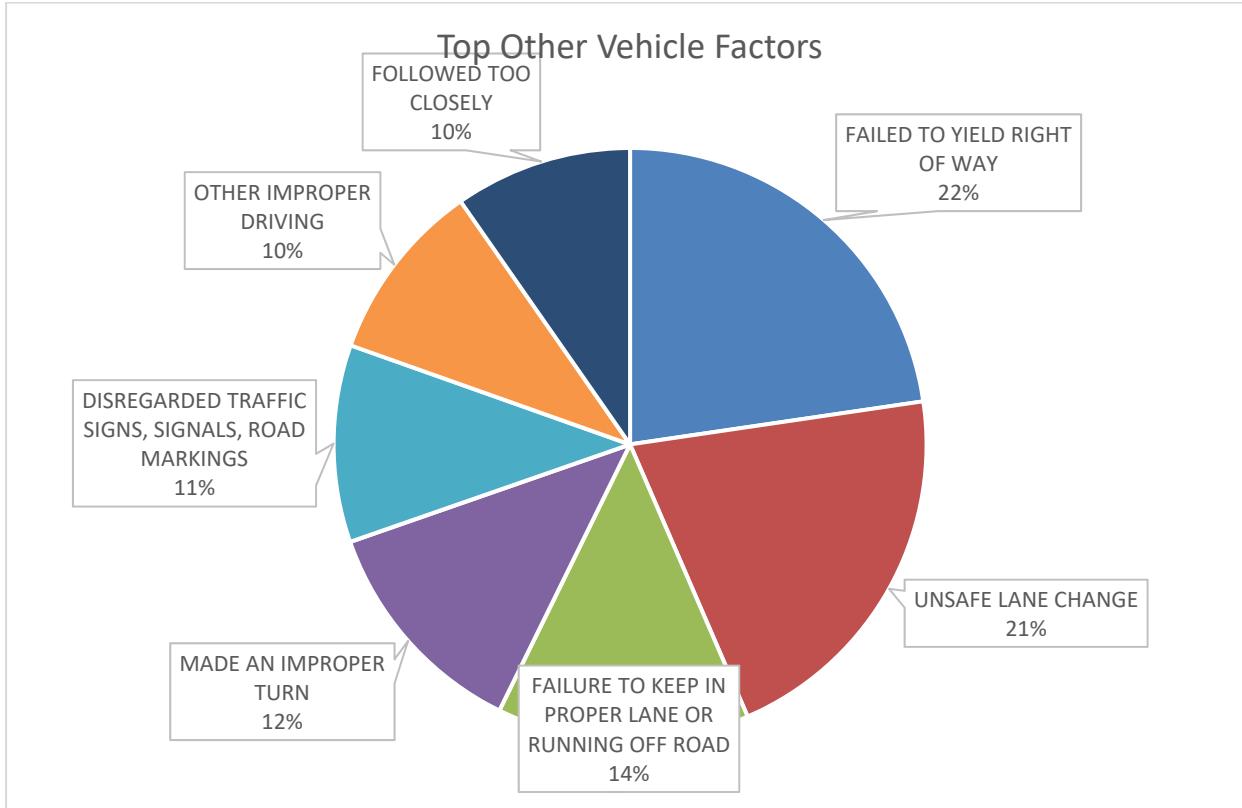
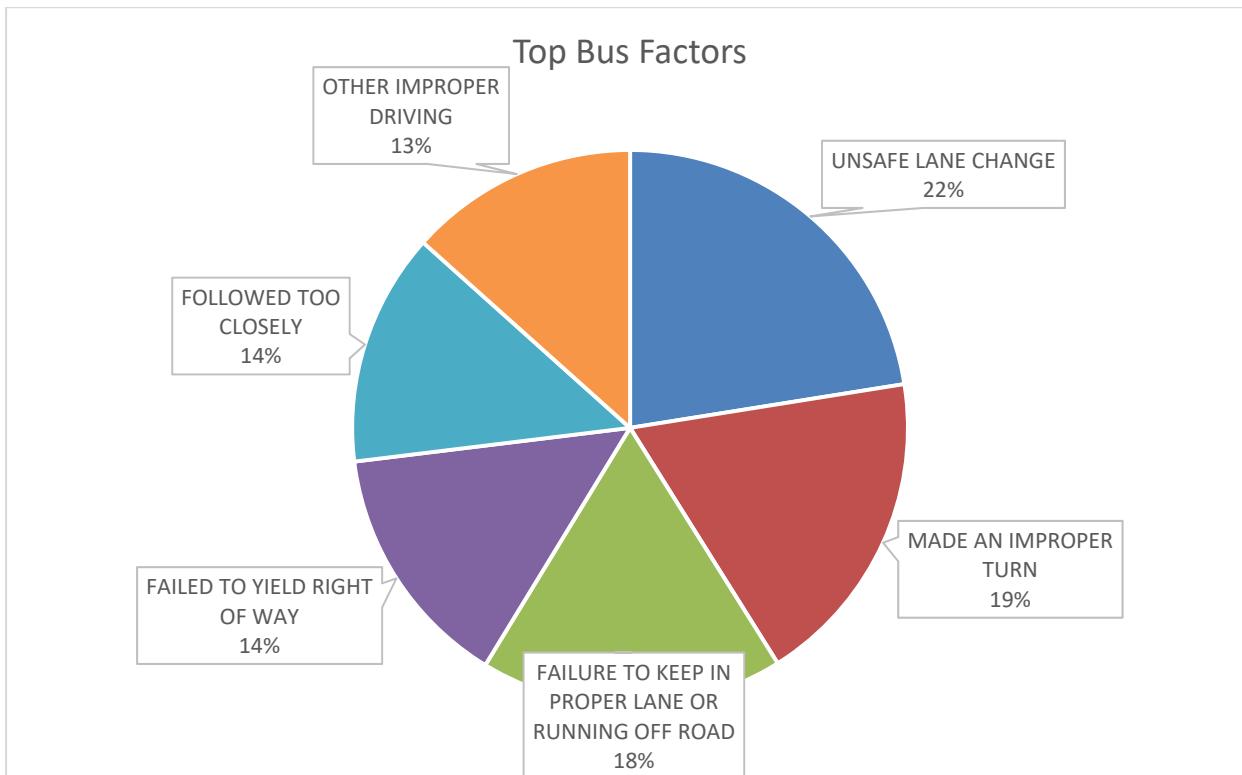
FIGURE 22: 2015-2019 TOP BUS ACTIONS DURING THE CRASHES



In the 2,355 reported bus crashes, 28% of them reported with bus improper movements, 55% of them reported with other vehicle improper movements that caused crash. The top 3 vehicle factors for both buses and other vehicles are 1. Unsafe Lane Change 2. Failure to keep in proper lane 3. Failed to yield right of way.

Due to the size of a bus, unsafe-lane-change vehicle factor has much higher percentage (22%) when compared to other vehicle crashes (6.6%).

FIGURE 23: TOP VEHICLE FACTORS FOR BUS RELATED CRASHES



DRIVER FACTORS

Table 8: Bus Driver Factors below shows 87% of the bus drivers appeared normal and 4% were in inattention or distracted. The percentage of abnormal driver's factors is a lot lower than other types of crashes. In all crashes, only 78% of the drivers appeared normal during the crashes.

As for other drivers involved with the bus related crashes, 83% appeared normal, 3% were distracted, 1% were DUI, 3% were involved with other improper driving. The normal driver's factor is also higher when compared to the all-crash driver's factors.

TABLE 8: BUS DRIVER FACTORS

Other Driver Factors	Number of Drivers	Percentage
APPARENTLY NORMAL	1517	87%
INATTENTION/DISTRACTED	69	4%
HAD BEEN DRINKING	69	4%
OTHER IMPROPER DRIVING	46	3%
FELL ASLEEP, FAINTED, FATIGUED, ETC.	17	1%
ILLNESS	10	1%
DRUG INVOLVEMENT	6	0%
PHYSICAL IMPAIRMENT	2	0%
OBSTRUCTED VIEW	1	0%

TABLE 9: OTHER DRIVER FACTORS

Other Driver Factor	CountOfOther Driver Factor	
APPARENTLY NORMAL	1669	83%
OTHER IMPROPER DRIVING	84	4%
INATTENTION/DISTRACTED	69	3%
HAD BEEN DRINKING	62	3%
UNKNOWN	58	3%
FELL ASLEEP, FAINTED, FATIGUED, ETC.	20	1%
HIT AND RUN	12	1%
ILLNESS	11	1%
DRUG INVOLVEMENT	11	1%
OBSTRUCTED VIEW	3	0%
PHYSICAL IMPAIRMENT	2	0%