Appendix B: Descriptive Crash Analysis

This document summarizes the results of the descriptive crash analysis conducted for the Northwest Arkansas Region Planning Commission (NWARPC) as part of the Vision Zero Plan development process. The focus of Vision Zero and the Safe System Approach is on eliminating deaths and serious injury crashes on roadways. Thus, this descriptive crash analysis aims to systematically analyze killed and serious injury (KSI) crashes—using the injury classification codes KA—as well as all reported crashes that have occurred throughout the region. The descriptive analysis uses pivot tables to provide an overview of factors and contexts that contribute to reported crashes on all roads in Northwest Arkansas from January 1st, 2017 through December 31st, 2021.

During this period, the United States experienced a variety of changes due to the global COVID-19 pandemic. While traffic volumes reduced during this time, fatal and serious crashes on roadways across the country and in Northwest Arkansas were sustained and, in many places, increased. This analysis does not specifically call out crashes during this pandemic era, rather, it focuses on a variety of characteristics of the region's roadways that may impact fatal and severe injury crashes.

The descriptive crash analysis methodology consisted of data collection, consolidation, processing, and contextualization based on available crash and roadway attribute data in Arkansas and Missouri to develop the results shown. A series of high-level descriptive summary tables capture relationships between region-wide crash data, infrastructure data, and contextual variables. These tables explore overall crash trends and patterns that can be used to guide the selection of variables warranting deeper analysis, new roadway behavior programs, policy changes, or the selection of safety countermeasures for project development. The Descriptive Crash Analysis Report information provides engineers and decision makers with more information to design roads that respond to historical crashes and determine where similar crash conditions exist across the system. This Report also provides information on education, engagement, and enforcement initiatives that can improve road user behaviors as well as policy changes that increase safety.

The Descriptive Crash Analysis Report relates to both the Crash Maps Report and the Equity Analysis Framework. These reports should be used to inform actions and project prioritization in the Vision Zero Plan.

Overview of State Crash Report Forms and Guidance

Police officers complete the Arkansas or Missouri Vehicle Accident Report Forms (Report Forms) when investigating a roadway crash.[1,2] The Report Forms allow responding officers to document information about the involved parties, location, crash factors, as well as the vehicle types involved in the crash.

The Arkansas Motor Vehicle Crash Report Instructions Guide and the Missouri Uniform Crash Report Preparation Manual (the Guides) provide police officers with guidance on completing the Report Forms.[3,4] Aside from providing instructions, these Guides stress the importance of accurate crash data reporting and usually note the time in which injury severity needs to be tracked and updated following a crash. The Report Forms and Guides outline how crash details are collected and guide accuracy of information collected that informs changes to projects, programs, and policies that can improve roadway safety.

1 https://www.dfa.arkansas.gov/images/uploads/driverServicesOffice/SR121.pdf
2 https://dor.mo.gov/forms/1140.pdf
3 https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/arcrash_report_instruction_manual_1_2007.pdf
4 https://www.mshp.dps.missouri.gov/MSHPWeb/PatrolDivisions/PRD/documents/SHP-2%20STARS%20Statewide%20Manual.pdf

Overview of Data Resources

The *Arkansas Crash Analytics Tool* (ACAT) and the *Missouri Statewide Traffic Accident Records System* (STARS) are online interactive mapping tools and data portals that allow users to access, query, and summarize crash data in the States of Arkansas and Missouri.[5,6] Users can use filters, such as geography or crash severity, to refine their queries and summarize the data through a variety of report types and chart types.

Descriptive Crash Analysis Methodology & Data Sources

This section describes the steps taken to assemble the working datasets (see Table 1), as well as the analytical framework used to develop pivot table results for all reported crashes using the same study period as the Crash Maps Report, from 2017 through 2021. The memo presents descriptive statistics of historical crashes stratified by various attributes, such as injury severity, environmental conditions, behaviors, and movement types.

Table 1: Data Sources

Dataset	State	Source	Dataset(s)
Crash Data	AR	ACAT	Crashes_FC
	MO	STARS	• rpc_crashes_2017_2021 • sequence_of_events • contributing_circumstances
Crash Driver Data	AR	ACAT	• Driver • DriverAction • DriverCondition
	MO	STARS	driver_passenger_nwarpc_2017_2021
Crash Passenger Data	AR	ACAT	Passenger
	MO	STARS	driver_passenger_nwarpc_2017_2021
Crash Vehicle Data	AR	ACAT	Vehicle
	MO	STARS	vehicle_nwarpc_2017_2021
Crash Non-Motorist Data	AR	ACAT	• NonMotorist • NonMotoristActionAtTimeOfCrash
	MO	STARS	N/A – part of driver_passenger_nwarpc_2017_2021
Centerline	Both	OSM	ways
Intersection	Both	OSM	N/A - derived from OSM ways
Functional Class	AR	ARDOT	SIR_TIS/Road_Inventory_Vector_Tiles/Functional Class
	MO	MDOT	SS_PAVEMENT_2021
Lane Count	AR	ARDOT	SIR_TIS/Road_Inventory_OnSystem/RoadInventory SemiLive - OnSystem
	MO	MODOT	SS_PAVEMENT_2021
AADT	AR	ARDOT	SIR_TIS/Combined_Traffic_Data/Average Daily Traffic Stations
	MO	MODOT	SS_PAVEMENT_2021
Speed	AR	ARDOT	TPP_GISMapping/Linear_Speed_Zones/Linear Speed Zones
	MO	MODOT	SS_PAVEMENT_2021
Traffic Control	MO	MODOT	SS_INTERSECTION_2021
	Both	OSM	nodes
Transit Stops	Both	Ozark Regional Transit and Razorback Transit	General Transit Feed Specification (GTFS) data feed
Population by Age	Both	US Census Bureau	2021 ACS 5-year estimates, Table B01001
Urban/Rural	Both	US Census Bureau	2020 Decennial Census Urbanized Areas and Urban Clusters

5 https://experience.arcgis.com/experience/1911f992cabc484a98f64e7c36c2b262/

6 https://www.mshp.dps.missouri.gov/TR15Map/index.jsp

Geocoding Crash Data

Geocoded crash data is critical to understanding crash patterns. Crash Report Forms completed by the police are the primary source for crash data. While this data only captures crashes reported to authorities, it is often the most complete data source and provides necessary details for informing engineering treatments, such as the location of the crash and dynamics between the primary parties involved in the crash.

Crash data used in this analysis were collected using the Arkansas and Missouri ACAT and STARS portals and processed by the consultant team. Crash data were filtered to include all crashes that occurred within the NWARPC boundary from 2017 through 2021 for all modes. The crash data used in this analysis was reviewed and assessed by the consultant team for accuracy and consistency.

It is important to note for this analysis, vulnerable road users include pedestrians, bicyclists, or motorcyclists. The consultant team coded crashes based on the most vulnerable road user involved, using the following order: pedestrian, bicycle, motorcycle, and motor vehicle. For example, a crash between a motor vehicle and pedestrian involves both of those modes, but since the pedestrian is the more vulnerable road user, the overall crash would be coded as pedestrian. When a crash occurred between users of the same mode, or if there was only mode type involved in a crash, the crash was coded to that mode. For example, a crash between two motor vehicles, or a crash of just a single motor vehicle would both be coded as a motor vehicle crash.

Crashes that occurred on the Interstate Highway System are sometimes excluded from crash analysis. Some of these reasons include different crash dynamics and safety countermeasures that are applicable for Interstate highways and less so with local roads, complex jurisdictional coordination required for addressing crash risk along the Interstate, and often enforcement efforts are used as a primary safety countermeasure. This crash analysis includes all crashes on all road types regardless of roadway ownership within the NWARPC to look at all roads as one system through the Safe System Approach.[7]

However, coordination for improvements may need to be coordinated with the entity that owns and maintains the right-of-way.

Spatial Data Consolidation

A full centerline dataset that covered both the Arkansas (AR) and Missouri (MO) portions of the NWA region was not available. There were centerline datasets available from Arkansas Department of Transportation (ARDOT) and Missouri Department of Transportation (MoDOT), however their geometries did not align at the border, nor did they use consistent conventions for street names, both of which would cause issues in the HIN analysis. Instead of attempting to rectify these differences, it was decided to use OpenStreetMap (OSM) data and conflate other attributes onto that. This was because the OSM dataset was consistent across the NWA region, and spatially aligned well with the other ARDOT and MoDOT datasets, giving the conflation process a higher degree of accuracy.

Like centerlines, a full intersection dataset for both the AR and MO portions of NWA region was not available. There was an intersection dataset from MoDOT, but not one from ARDOT. However, since the analysis used a topologically valid centerline network from OSM, it was decided to create a new intersection dataset based on this road network, and then assign the relevant information from other datasets to this new intersection layer. Intersection points were created at all segments start/end points. Then to filter out non-intersections (i.e., dead ends and breaks along a single segment due to an attribute change), only points with three or more legs were considered to be valid intersections.

Functional Classification

Functional classification data from ARDOT and MoDOT was available for a subset of the road network for both the AR and MO portions of the NWARPC region. Values between the two datasets were not the same in terms of spelling and grouping[8], so they were first consolidated into a single list. Then, these known values were conflated onto the OSM network using spatial matching. After known values were conflated, gaps were filled using known data by matching the known

7 https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf

8 For example, "Interstate Highway" might be used in one dataset while "IH" is used in another dataset. They mean the same thing but will be treated as different things when we use programming scripts to perform the analysis. Make them consistent is necessary to make sure our analysis results are accurate.

and unknown segments based on the OSM name, and the OSM highway tags (the OSM version of functional classification). Finally, for anything that remained unknown, functional classification was determined based on the most common functional classification type per OSM highway tag.

Lane Count

Lane count data from ARDOT and MoDOT was available for a subset of the MPO road network. The MoDOT lane data was provided as directional linework with values for each direction, which were first combined into a single dataset. These two datasets were then conflated onto the OSM network. Since lane count was an attribute within the crash datasets, road network segments with missing values were assigned the median lane count value of the crashes that occurred on them. Finally, remaining gaps were filled by matching segments with known values to those with unknown values based on matching name and functional classification. Finally, any remaining unknown segments were assigned a value based on an average known value for their functional classification.

Annual Average Daily Traffic (AADT)

AADT data was available from ARDOT and MoDOT, but not for all roads within the NWARPC region. The ARDOT AADT data was provided in point form, but with some linear referencing system (LRS) information about the segments of roadway that it encompassed. In order to transform it into segment data to conflate onto the OSM network, statewide LRS information was acquired, and using the LRS information in the points, extents along the LRS network were created. The MoDOT AADT data was provided in segment form, so it was not necessary to do a similar transformation. However, it was part of the same bidirectional dataset that contained lane data, so it was first pre-processed to create a combined AADT value. With known values in segment form created, these were then conflated onto the OSM network. These known values were then used to fill in gaps based on name and functional classification matches. For remaining gaps, a value was assigned based on the average value by functional classification.

Speed Limit

Speed limit was available from both ARDOT and MoDOT, although not with full coverage for the MPO. These known values were then spatially conflated to the OSM network. Like lane count, speed limit was an attribute of the crash data, so where these values were reported in the crashes, the median recorded value was assigned to the road network. Gaps in the data were then filled in by matching segments with known values to those with unknown values based on matching name and functional classification. Remaining gaps were then assigned a value based on the average value for their functional classification.

Intersection Control

Intersection control data was only available from MoDOT for the MO area of the NWA region, but were not available in the AR portion of the NWA region. The MoDOT intersection data was limited to signalization and those were assigned to the intersection dataset. Then for the rest of the intersections, signalization and stop control data were assigned from information available in OSM, including traffic lights in the AR portion of the NWA region. Any intersection with stops was assigned as stop controlled (i.e., both two-way and all-way stops). In lieu of any other data sources, the lack of any known control at an intersection was assumed to be uncontrolled.

Study Limitations

Multiple State Crash Data Standards

Since the NWARPC covers both Arkansas and Missouri, crash data from both states were used for this analysis. While both state's crash data generally tracked the same type of information, the nuances of how specific details were tracked varied between the two. Given that each state uses different forms and consolidates crash data differently, there were a few datasets that could only be analyzed in either Arkansas or Missouri that were not included in this report for the entire region. For the purpose of this report for NWARPC, only common datasets between both states were analyzed to understand crashes at a regional level. This provides consistency in analysis and methodology for the entire region.

As a result of this, the analysis preformed was limited to categories that were present in both datasets. For example, if one dataset listed the primary cause of a crash, and the other dataset listed multiple contributing causes, it would not be possible to create either a primary crash cause or a list of crash causes, because each of those datasets is not available in the other state. Additionally, in circumstances where there were matching overall categories but the values for each category differed, the lowest common denominator of coding was used. For example, if one dataset listed crashes with specific types of fixed objects (tree, guardrail, traffic signal, etc.), but the other data just listed all crashes with fixed objects the same, both datasets would be simplified to only list the crash as with a fixed object. Possible additional analysis of datasets unique to each state may be suggested to further understand crashes based on individual state data availability.

Temporal Consistency Limitations

The consultant team studied crashes that occurred over a period of five years, from 2017 through 2021. The compiled roadway data reflect current conditions according to the data made available at the time of this analysis. It can be assumed that some changes in roadway design and operations have occurred over the previous five years that cannot be accounted for. For example, if a crash occurred in 2016 and the posted speed limit changed from 35 mph down to 30 mph in 2018, this analysis would link the 2016 crash with the present day 30 mph configuration.

Roadway Improvements during Study Period

Results are based on crash data and current attribute data from 2017-2021 and do not account for any roadway improvements made during the study period. It is recommended that the NWA Region conduct a further before and after comparison analysis at any location with major safety improvements to determine if the roadway improvements had any effect on crash severity, crash frequency, crash causes, and/or crash types. This type of analysis would also inform the effectiveness of roadway safety improvements within the region.

Exposure data

Region-wide volumes via average annual daily traffic (AADT) for motor vehicles were available, however pedestrian and bicyclist volumes were not readily available. The analyses reported here do not adjust for exposure rates based on volumes by modes. Therefore, results show crash density but not frequency of crashes based on how many people are walking, which is also called exposure. For example, in many communities, pedestrian crashes are more common during daylight conditions than dark conditions. This does not mean that daylight conditions are more dangerous than dark conditions. Rather, it reflects the fact that people are more likely to travel, and especially more likely to travel by walking, in light conditions than in dark conditions. Having volume by mode would allow for understanding exposure and frequency for those two modes. Some proxies for exposure are noted in this analysis, such as land use, transit facilities and functional classification.

Transportation Data for Future Study

As the Safe System Approach is used throughout the region, additional data can assist communities to understand crash risk and take a more proactive approach to safety.

- Regionwide bicycle and pedestrian volume data were not available to more accurately measure crash risk for bicyclists and pedestrians.
- Several datasets listed below would help identify or refine risk factors but were either not available in GIS format, or were available, but with limited coverage:
  - » Roadway ownership and jurisdiction
  - » Vehicle operating speeds
  - » Crosswalk style
  - » Street width
  - » Traffic signal phasing
  - » Transit frequency and boarding/alighting counts
  - » Location of fixed objects (raised medians, barriers, utility poles, etc.)
  - » Marked crosswalks and crosswalk enhancements
  - » Sidewalks

Statistical Test Methodology

To test if a certain category of crashes has a significantly higher KA crash rate (defined as the number of KA crashes out of all crashes) than the average KA crash rate, a two-proportion Z-test was performed. When this test is applied to overall crash categories, the KA crash rate for each category is compared with the overall average KA crash rate (i.e., 1,369 out of 58,896 as shown in Table 2). When this test is applied to VRU crash categories, the KA crash rate for each category is compared with the VRU average KA rate (447 out of 1,644 as can be referred from Table 4) instead of the overall average KA rate to identify factors that are associated with significantly high KA rate for VRU crashes. The confidence level used for this test is 95%. Categories that have either less than 10 KA crashes or less than 10 non-KA crashes are excluded from the analysis because they don't meet the sample size requirement of the test. Throughout the report, statistically significant results are highlighted in red.

Summary of Key Findings

Year of crash data: 2017-2021

Total crashes: 58,896

Total fatal (K) crashes: 220

Total serious injury (A) crashes: 1,149

Crashes by Year:

While 2020 had the smallest share of all crashes across the five years (17.71%), it had the second highest percentage of KA crashes (20.45%) and the highest percentage of crashes resulting in KAs (2.68%).

Injury Severity:

While the majority of crashes result in less severe injuries in NWA, an average of 44 crashes resulted in death and 230 crashes resulted in serious injury in the NWA region.

Crashes by Mode:

- **Pedestrians:** Pedestrian cashes (320) made up 0.6% of all crashes with a known mode (57,087) and 9% of KA crashes with a known mode (1,345)
- **Bicycles:** Bicycle crashes (245) made up 0.4% of all crashes with a known mode (57,087) and 3% of KA crashes with a known mode (1,345)
- **Motorcycles:** Motorcycle crashes (1,079) made up 2% of all crashes with a known mode (57,087) and 21% of KA crashes with a known mode (1,345)
- **Motor Vehicles:** Motor vehicle crashes (55,443) made up 97% of all crashes with a known mode (57,087) and 67% of KA crashes with a known mode (1,345)

First Harmful Event:

Collision with vehicle in transport is a subset of the total crashes (37,499 crashes at 73.98% of all crashes and 572 KA crashes with 45.61% of all KA crashes) was the most common crash type, however, collision with a pedestrian was the collision type with the greatest risk of resulting in a KA (203 all crashes and 106 KA crashes with 34.30% resulting in a KA). See Table 6.

Bicycle Crashes:

Motorist traveling straight with bicyclist crossing road (36% crashes, 31% KA crashes) was the highest bicycle KA crash type (14 KA crashes)

Pedestrian Crashes:

Motorist traveling straight with pedestrian crossing road (39% crashes, 48% KA crashes) was the highest pedestrian KA crash type (56 KA crashes)

Motorcycle Crashes:

Motorist turning left with motorcycle traveling straight (30% crashes, 35% KA crashes) was the highest motorcycle KA crash type (52 KA crashes)

Motor Vehicle Crashes:

Vehicle 1 traveling straight with vehicle 2 straight (24% crashes, 42% KA crashes) was the highest motor vehicle KA crash type (224 KA crashes)

Speeding:

43% of speeding crashes resulted in a KA when a vulnerable roadway user was involved compared to just 6% for all modes.

Intersections vs. Segments:

Crashes occurred most often at intersections (65% of crashes, 54% of KA crashes). While segment crashes had a lower share of both overall crashes and KA crashes, segment crashes had a slightly higher rate of resulting in a KA outcome (3%).

Urban vs. Rural:

There are more crashes in urban areas (all, KA, and vulnerable road users) than rural areas in NWA. However, more rural crashes are likely to result in a KA outcome for all modes (4.46%) and vulnerable road users (35.75%).

Traffic Volume:

Streets with an AADT less than 5,000 had the largest share of both overall crashes (31%) and KA crashes (35%).

Functional Classification:

Most crashes (all, KA, and vulnerable road user) occurred on major and minor arterials in NWA.

Posted Speed Limit:

KA crashes occurred most often on streets with a 55mph posted speed limit (21% of KA crashes) and the highest percentage of crashes resulting in a KA (6.27%) also occurred on streets with a 55 mph posted speed limit. The majority of crashes and KA crashes involving a vulnerable road user occurred on streets with a posted speed limit of 45mph.

Number of Lanes:

Crashes occurred most often on four-lane roads (40% crashes, 38% KA crashes). For vulnerable road users, the most crashes (760, 46.63%) and the most KA crashes (194, 43.79%) occurred on two-lane roads.

One-Way vs. Two-Way Streets:

For all modes, crashes occurred most often on two-way streets (82% crashes, 85% KA crashes). Crashes on two-way roads were slightly more severe for all modes. Vulnerable modes followed a similar trend with the most crashes occurring on two-way roads (90% crashes, 87% KA crashes). However, the severity of crashes for vulnerable road users significantly increased on one-way streets, with 35% of crashes for vulnerable road users on one-way streets resulted in a KA.

Intersection Control:

For all modes, crashes occurred most often at intersections with no traffic control (58% crashes, 68% KA crashes). Crashes at stop sign controlled intersections were slightly more severe with 2.45% of crashes resulting in a KA outcome.

Historically Disadvantaged Communities and Areas of Persistent Poverty:

Areas where historically disadvantaged communities and persistent poverty overlap has 14% (8,174) of regional total crashes and 12% (165) KA crashes, despite having only 6% of the regional roadway centerline miles. For vulnerable road user involved crashes, areas where historically disadvantaged communities and persistent poverty overlap have 15% (246) of regional total crashes and 16% (71) KA crashes, despite only 6% of the regional roadway centerline miles.

Time of Day:

For all modes, crashes were fairly evenly distributed across the day but occurred most often between 3:00pm and 6:00pm (20% crashes, 16% KA crashes). Night crashes between 9:00pm and midnight were slightly more severe than other times of day with 4% of crashes resulting in a KA outcome.

Roadway Surface Condition:

For all modes, crashes occurred most often in dry conditions (80% crashes, 82% KA crashes). For all modes, crashes occurred most often in dry conditions (80% crashes, 82% KA crashes). This is true for vulnerable road users involved crashes as well as over 90% of overall crashes and KSI crashes happening in dry conditions.

Lighting Conditions:

For all modes, crashes occurred most often in daylight (74% crashes, 61% KA crashes). Dark crashes without lighting were the most severe with just under 5% of crashes resulting in a KA outcome.

Proximity to Transit, Schools, or Parks:

Most crashes do not happen within 500 feet of a transit stop, school, or park in the NWA region.

Crash Trends

The following sections summarize crash data from 2017 through 2021 to provide statistical trends into temporal patterns, actions leading up to a crash, and environmental characteristics.

Crashes by Year[9]

Table 2 summarizes the number of crashes and crashes that resulted in KA crashes from 2017 through 2021. The Percent KA Crashes by Year column shows the share of KA crashes in each year compared to the other years. The Percent Crashes resulting in a KA column show of all the crashes that occurred in that year, what percent resulted in a fatality or series injury.

While 2020 had the smallest share of all crashes across the five years (17.71%), it had the second highest percentage of KA crashes (20.45%) and the highest percentage of crashes resulting in KAs (2.68%). In 2021, the number of KA crashes and the percentage of crashes resulting in a KAs decreased, but the overall number of crashes rose to a record high of 12,336.

Injury Severity[10]

Table 3 summarizes crashes by injury severity based on the highest level of injury reported to be sustained in the crash. Based on this data, an average of 44 crashes resulted in death and 230 crashes resulted in serious injury in the NWA region. Less severe crashes account for the largest share of crashes, whereas the most severe crashes account for the lowest share of crashes. More details about the location of the crashes and the dynamics related to the crashes will be described throughout this analysis.

Table 3: Crashes by Injury Severity, 2017-2021

Injury Severity	# Crashes	% Crashes
Fatal injury (K)	220	0.37%
Suspected serious injury (A)	1,149	1.95%
Suspected minor injury (B)	4,705	7.99%
Possible injury (C)	7,186	12.20%
No apparent injury (O)	45,636	77.49%
Total	58,896	100.00%

Table 2: Crashes by Year, 2017-2021

Year	Total # of Crashes	% Crashes by Year	# KA Crashes	% KA Crashes by Year	% Crashes resulting in KA
2017	12,154	20.64%	284	20.75%	2.34%
2018	11,664	19.80%	266	19.43%	2.28%
2019	12,309	20.90%	264	19.28%	2.14%
2020	10,433	17.71%	280	20.45%	2.68%
2021	12,336	20.95%	275	20.09%	2.23%
Total	58,896	100.00%	1,369	100.00%	2.32%

9 Crash year was derived from the provided crash reports. For AR, that was the column `crash_date` in the table `crashes_fc`, and for MO that was the column `date_0` in the table `rpc_crashes_2017_2021`

10 Crash level injury severity was obtained directly from the crash reports. For AR, that was the column `crashseverity` in the table `crashes_fc`, and for MO that was the column `acc_svrty_rtng_nm` in the table `rpc_crashes_2017_2021`

Crashes by Mode[11]

Table 4 summarizes crashes by injury severity and mode. Motor vehicle crashes accounted for most of the crashes with 97% of total crashes. This is expected as most trips in the United States are typically made by motor vehicle. Motorcycles followed with roughly 2% of crashes. Pedestrian crashes ranked third highest with roughly 1% of the total crashes, while bicycle crashes had the lowest crash share at slightly less than 0.5%.

While motor vehicle crashes accounted for the largest share of both overall crashes and KA crashes, when vulnerable road users were involved in a crash, the risk of death or serious injury increased disproportionately (see Table 5 and Figure 1).

- Pedestrians: Pedestrian cashes made up 0.6% of all crashes but 9% of KA crashes
- Bicycles: Bicycle crashes made up 0.4% of all crashes but 3% of KA crashes
- Motorcycles: Motorcycle crashes made up 2% of all crashes but 21% of KA crashes
- Motor Vehicles: Motor vehicle crashes made up 97% of all crashes but only 67% of KA crashes

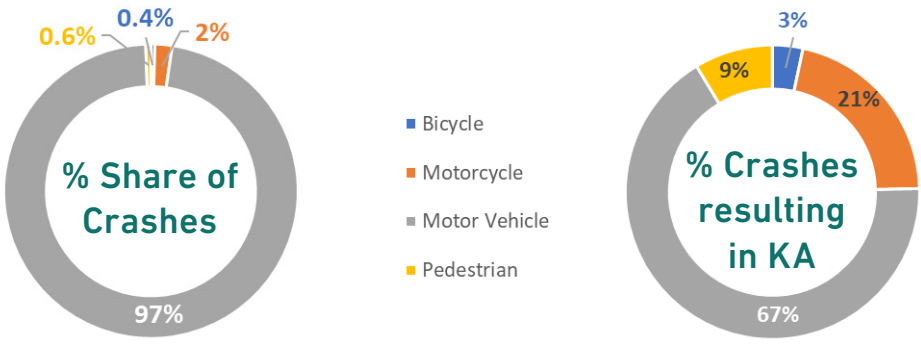
Table 4: Crashes by Injury Severity and Mode, 2017-2021

Injury Severity	Bicycle	Pedestrian	Motorcycle	Motor Vehicle	Unknown Mode
Fatal injury (K)	4	37	38	138	3
Suspected serious injury (A)	41	79	248	760	21
Suspected minor injury (B)	112	125	399	3,950	119
Possible injury (C)	51	59	167	6,743	166
No apparent injury (O)	37	20	227	43,852	1,500
Total	245	320	1,079	55,443	1,809

Table 5: Share of crashes compared to the % of crashes that resulted in a KA, 2017-2021

Mode	Total # of Crashes	% Share of Cashes	Total # of KA Crashes	%KA crashes by Mode	% Crashes resulting in KA
Bicycle	245	0.4%	45	3.3%	18.4%
Pedestrian	320	0.5%	116	8.5%	36.3%
Motorcycle	1,079	1.8%	286	20.9%	26.5%
Motor Vehicle	55,443	94.1%	898	65.6%	1.6%
Unknown	1,809	3.1%	24	1.8%	1.3%
Total	58,896	100.00%	1,369	100.00%	2.3%

Figure 19: Share of crashes compared to the % of crashes that resulted in a KA, 2017-2021



11 Crash mode was determined by the most vulnerable road user involved in the overall crash. Person mode was derived from various elements within the crash reports. For AR, pedestrians and bicycles were identified using the column `non_motorist_type` in the table `non_motorist`. Pedestrians were those with values 1 (`Pedestrian`) and 2 (`Other pedestrian (wheelchair)`). Bicycles were those with values 5 (`Bicyclist`) and 6 (`Other cyclist (tricycle, etc.)`). Motorcycles and motor vehicles were identified using the column `vehicle_type` in the table `vehicle`. Motorcycles were the values 30 (`Motorcycle`), 31 (`Motor scooter`), and 30 (`Moped`). Motor vehicles were all other values for `vehicle_type` For MO, pedestrian, bicycle, and motor vehicle were from the column `hp_person_invl_cd` of the table `driver_passenger`. Motor vehicles were the value 01 (`DRIVER`), pedestrians were the value 02 (`PEDESTRIAN`), and bicycles were the value 03 (`PEDALCYCLIST`). Motorcycles were identified as a subset of motor vehicles, using the column `vehicle_body_type` in the table `vehicle`, with the values 10 (`MOTORCYCLE`) and 12 (`MOTORIZED BICYCLE`).

Crash Causation

First Harmful Event[12]

Table 6 summarizes the crash causes based the recorded first harmful event for all crashes where first harmful event is known. The most common crashes were motor vehicle crashes, collisions with other vehicles, fixed objects, with parked vehicles or an animal. However, these types of crashes were less likely to result in KAs.

Collisions with pedestrians were the crash cause with the highest injury severity, with 34% of crashes resulting in KAs. Collisions with bicyclists were also significantly severe with 18% resulting in KAs. The following crash causes also lead to significantly higher rates of crashes resulting in KAs compared to the average rate: Fell or jumped from vehicle (29.17%), collision with a fixed object, collision with a non-fixed object, and overturn or rollover. Seven percent of crashes resulting in a KA were also caused by on unknown first harmful event.

Table 6: First Harmful Event by All Modes, 2017- 2021

Cause of Crash	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Collision with vehicle in transport	37,499	73.98%	572	45.61%	1.50%
Collision with fixed object	7,798	15.39%	356	28.39%	4.37%
Collision with parked vehicle	1,782	3.52%	17	1.36%	0.94%
Collision with animal	1,364	2.69%	9	0.72%	0.66%
Over turn or rollover	831	1.64%	109	8.69%	11.60%
Collision with pedestrian	203	0.40%	106	8.45%	34.30%
Collision with non-fixed object	242	0.48%	14	1.12%	5.47%
Other non-collision	219	0.43%	8	0.64%	3.52%
Cargo shift or loss	186	0.37%		0.00%	0.00%
Collision with bicycle	135	0.27%	30	2.39%	18.18%
Unknown	151	0.30%	11	0.88%	6.79%
Ran off road - right	80	0.16%	5	0.40%	5.88%
Fell or jumped from vehicle	34	0.07%	14	1.12%	29.17%
Ran off road - left	43	0.08%	1	0.08%	2.27%
Crossed centerline	42	0.08%	1	0.08%	2.33%
Jackknife	34	0.07%	1	0.08%	2.86%
Equipment failure	12	0.02%		0.00%	0.00%
Collision with railway vehicle	10	0.02%		0.00%	0.00%
Immersion	9	0.02%		0.00%	0.00%
Ran off road - other	5	0.01%		0.00%	0.00%
Fire or explosion	3	0.01%		0.00%	0.00%
Separation of units	2	0.00%		0.00%	0.00%
Crossed median	1	0.00%		0.00%	0.00%
Total	50,685[1]	100.00%	1,254	100.00%	2.41%

1 This number is different from the total number of crashes (58,896) because 6,842 crashes have no First Harmful Event identified and are excluded from this table.

12 Crash level first harmful event was derived from various elements of the crash reports. For AR, this was simply the column `first_harmful_event` in the table `crashes_fc`. For MO, it was derived from the column `event_code` in the table `sequence_of_events`. This table contained multiple events per person per crash. To get the first harmful event, the first harmful `event_code` value (`event_code` >= 16) was selected per person, using the order provided in `hp_seq_evnt_seq_no`. In crashes where there were multiple persons with a first harmful event, the event that happened to the person who sustained the highest injury level was used. For how the values between the AR and MO crash reports were recorded for consistency see Appendix A.

Bicycle Crashes

Table 7 summarizes bicycle crashes by the primary motorist's pre-crash movement and the bicyclist's pre-crash action to form bicycle "crash types".[13,14,15] While this data is limited it provides a glimpse into what actions were at play leading up to the crash.

The most common bicycle crash types in order of total KA crashes include:

- Motorist traveling straight – bicyclist crossing road (36% crashes, 31% KA crashes)
- Motorist traveling straight – bicyclist in roadway (12% crashes, 13% KA crashes)

Overall, motorists traveling straight led to the most crashes and the most severe crashes across all bicycle movements (70% of crashes and 71% of KA crashes). Crashes with a motorist traveling straight and bicyclist crossing the road resulted in a significantly higher-then-average percentage of KAs.

Table 7: Bicycle Crash Types with One or More KA Crashes, 2017-2021

Motorist Pre-Crash Movement	Bicyclist Pre-Crash Action	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Other	Unknown	1	0.59%	1	2.22%	100.00%
Other Total		**1**	**0.59%**	**1**	**2.22%**	**100.00%**
Parked	Crossing road	6	3.55%	1	2.22%	16.67%
	In roadway	1	0.59%	1	2.22%	100.00%
Parked Total		**7**	**4.14%**	**2**	**4.44%**	**28.57%**
Straight	Adjacent to roadway	13	7.69%	3	6.67%	23.08%
	Along roadway - with traffic	13	7.69%	5	11.11%	38.46%
	Crossing road	61	36.09%	14	31.11%	22.95%
	In roadway	20	11.83%	6	13.33%	30.00%
	Other	3	1.78%	1	2.22%	33.33%
	Unknown	8	4.73%	3	6.67%	37.50%
Straight Total		**118**	**69.82%**	**32**	**71.11%**	**27.12%**
Turn – left	Along roadway - with traffic	8	4.73%	2	4.44%	25.00%
	Crossing road	12	7.10%	2	4.44%	16.67%
	In roadway	3	1.78%	1	2.22%	33.33%
Turn – left Total		**23**	**13.61%**	**5**	**11.11%**	**21.74%**
Turn – right	Along roadway - with traffic	3	1.78%	1	2.22%	33.33%
	In roadway	12	7.10%	1	2.22%	8.33%
	Other	2	1.18%	1	2.22%	50.00%
	Unknown	3	1.78%	2	4.44%	66.67%
Turn – right Total		**20**	**11.83%**	**5**	**11.11%**	**25.00%**
Total		169	100.00%	45	100.00%	26.63%

13 Bicycle pre-crash movement was derived from data within the crash reports. For AR, the column `action_prior_to_crash` from the table `non_motorist` was used. See <APPENDIX> for how these values were recoded. For MO, since there were no bicycle crashes in the study area, this step was skipped.

14 Motor vehicle pre-crash movement was derived from the crash reports. For AR, the column `vehicle_maneuver` from the table `vehicle` was used. For MO, the column `event_code` from the table `sequence_of_events` was used. The first value for `event_code` as ordered by `hp_seq_evnt_seq_no` was assigned to the vehicle. See <APPENDIX> for how different values between these two datasets were consolidated.

15 To determine bicycle crash types, only crashes that involved one or more bicycle and one or more motor vehicle were used. In cases where there were multiples of the same mode, the pre-crash movement of the highest severity injury level of each mode was selected as that mode's pre-crash movement.

Pedestrian Crashes

Table 8 summarizes pedestrian crashes by derived crash types.[16] The same approach was used to develop the pedestrian crash types by combining the primary motorist pre-crash movement and the pre-crash pedestrian action.[17]

The most common pedestrian crash types in order of KA crashes include:

- Motorist traveling straight – pedestrian crossing road (39% crashes, 48% KA crashes)
- Motorist turning left – pedestrian crossing roadway (11% crashes, 3% KA crashes)
- Motorist traveling straight – pedestrian adjacent to roadway (9% crashes, 7% KA crashes)
- The combination of vehicles traveling straight and pedestrians either crossing the road or in the roadway resulted in a significantly higher KA crash rate than the average KA crash rate.

Motorcycle Crashes[18]

Table 9 summarizes motorcycle crashes by crash types. The same approach was used to develop the motorcycle crash types by combining the primary motorist pre-crash movement and the motorcycle pre-crash action.[19]

The most common motorcycle crash types in order of KA crashes include:

- Motorist turning left – motorcycle traveling straight (30% crashes, 35% KA crashes)
- Motorist traveling straight – motorcycle traveling straight (27% crashes, 28% KA crashes
- These two crash combinations also resulted in KAs at a significantly higher rate than the average KA crash rate.

16 To determine pedestrian crash types, only crashes that involved one or more pedestrian and one or more motor vehicle were used. In cases where there were multiples of the same mode, the pre-crash movement of the highest severity injury level of each mode was selected as that mode's pre-crash movement.

17 Pedestrian pre-crash movement was derived from data within the crash reports. For AR, the column `action_prior_to_crash` from the table `non_motorist` was used. See <APPENDIX> for how these values were recoded. For MO, there was only one pedestrian involved crash, so the pre-crash movement was manually coded to match the AR coding.

18 To determine motorcycle crash types, only crashes that involved one or more motorcycle and one or more motor vehicle were used. In cases where there were multiples of the same mode, the pre-crash movement of the highest severity injury level of each mode was selected as that mode's pre-crash movement.

19 Motorcycle pre-crash movement was derived from data within the crash reports. For AR, the column `vehicle_maneuver` from the table ` vehicle` was used. For MO, the column `event_code` from the table `sequence_of_events` was used. The first value for `event_code` as ordered by `hp_seq_evnt_seq_no` was assigned to the vehicle. See <APPENDIX> for how different values between these two datasets were consolidated.

Table 8: Pedestrian Crash Types with One or More KA Crashes, 2017-2021

Motorist Pre-Crash Movement	Pedestrian Pre-Crash Action	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Backing	Other	2	0.68%	1	0.86%	50.00%
	Unknown	3	1.02%	2	1.72%	66.67%
Backing Total		**5**	**1.69%**	**3**	**2.59%**	**60.00%**
Changing lanes	Adjacent to roadway	1	0.34%	1	0.86%	100.00%
	Crossing road	3	1.02%	2	1.72%	66.67%
Changing Lanes Total		4	1.36%	3	2.59%	75.00%
Other	On sidewalk	1	0.34%	1	0.86%	100.00%
	Other	2	0.68%	1	0.86%	50.00%
Other Total		3	1.02%	2	1.72%	66.67%
Parked	Adjacent to roadway	2	0.68%	1	0.86%	50.00%
Parked Total		2	0.68%	1	0.86%	50.00%
Stopped in traffic	In Roadway	1	0.34%	1	0.86%	100.00%
	Other	1	0.34%	1	0.86%	100.00%
Stopped in traffic Total		**2**	**0.68%**	**2**	**1.72%**	**100.00%**
Straight	Adjacent to roadway	26	8.81%	8	6.90%	30.77%
	Along roadway - against traffic	7	2.37%	3	2.59%	42.86%
	Along roadway - with traffic	14	4.75%	5	4.31%	35.71%
	Crossing road	116	39.32%	56	48.28%	48.28%
	In roadway	24	8.14%	10	8.62%	41.67%
	None	4	1.36%	1	0.86%	25.00%
	On sidewalk	5	1.69%	2	1.72%	40.00%
	Other	16	5.42%	4	3.45%	25.00%
	Unknown	5	1.69%	3	2.59%	60.00%
Straight Total		**217**	**73.56%**	**92**	**79.31%**	**42.40%**
Turn - left	Adjacent to roadway	6	2.03%	1	0.86%	16.67%
	Crossing Road	31	10.51%	3	2.59%	9.68%
	Unknown	3	1.02%	1	0.86%	33.33%
Turn – left Total		40	13.56%	5	4.31%	12.50%
Turn - Right	Crossing road	14	4.75%	3	2.59%	21.43%
	On sidewalk	2	0.68%	1	0.86%	50.00%
Turn – right Total		**16**	**5.42%**	**4**	**3.45%**	**25.00%**
Unknown	Crossing road	3	1.02%	2	1.72%	66.67%
	Unknown	3	1.02%	2	1.72%	66.67%
Unknown Total		6	2.03%	4	3.45%	66.67%
Total		**295**	**100.00%**	**116**	**100.00%**	**39.32%**

Table 9: Pre-Crash Movements for Non-Solo Motorcycle Crashes with One or More KA, 2017-2021

Motorist Pre-Crash Movement	Motorcyclist Pre-Crash Action	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Backing	Straight	3	0.54%	1	0.68%	33.33%
Backing total		**3**	**0.54%**	**1**	**0.68%**	**33.33%**
Changing lanes	Parked	1	0.18%	1	0.68%	100.00%
	Straight	13	2.34%	3	2.03%	23.08%
Changing lanes total		**14**	**2.52%**	**2.70%**	**28.57%**	**2.70%**
Other	Straight	4	0.72%	2	1.35%	50.00%
Other total		**4**	**0.72%**	**2**	**1.35%**	**50.00%**
Overtaking	Overtaking	1	0.18%	1	0.68%	100.00%
	Turn - left	1	0.18%	1	0.68%	100.00%
Overtaking total		**2**	**0.36%**	**2**	**1.35%**	**100.00%**
Parked	Parked	12	2.16%	1	0.68%	8.33%
	Stopped in traffic	6	1.08%	2	1.35%	33.33%
	Straight	21	3.78%	2	1.35%	9.52%
Parked total		**39**	**7.03%**	**5**	**3.38%**	**12.82%**
Slowing	Straight	11	1.98%	6	4.05%	54.55%
Slowing total		**11**	**1.98%**	**6**	**4.05%**	**54.55%**
Stopped in traffic	Straight	45	8.11%	4	2.70%	8.89%
Stopped in traffic total		**45**	**8.11%**	**4**	**2.70%**	**8.89%**
Straight	Changing lanes	13	2.34%	5	3.38%	38.46%
	Overtaking	4	0.72%	2	1.35%	50.00%
	Slowing	7	1.26%	2	1.35%	28.57%
	Stopped in traffic	23	4.14%	3	2.03%	13.04%
	Straight	148	26.67%	42	28.38%	28.38%
	Turn - left	23	4.14%	5	3.38%	21.74%
	Turn - right	9	1.62%	2	1.35%	22.22%
Straight total		**227**	**40.90%**	**61**	**41.22%**	**26.87%**
Turn - left	Overtaking	5	0.90%	3	2.03%	60.00%
	Straight	164	29.55%	52	35.14%	31.71%
	Turn - left	6	1.08%	1	0.68%	16.67%
	Turn - right	2	0.36%	1	0.68%	50.00%
Turn – left total		**177**	**31.89%**	**57**	**38.51%**	**32.20%**
Turn - right	Straight	21	3.78%	3	2.03%	14.29%
	Turn - right	4	0.72%	1	0.68%	25.00%
Turn – right total		**25**	**4.50%**	**4**	**2.70%**	**16.00%**
Unknown	Straight	8	1.44%	2	1.35%	25.00%
Unknown - total		**8**	**1.44%**	**2**	**1.35%**	**25.00%**
Total		**555**	**100.00%**	**148**	**100.00%**	**26.67%**

Motor Vehicle Crashes[20]

Table 10 summarizes motor vehicle crashes by crash types.[21] A similar approach was used to develop the motor vehicle crash types by combining the primary motorist pre-crash movement (motorist 1) and the motorist 2 pre-crash action. Motor vehicle crash types were determined based on crashes involving one or more motor vehicles. Crashes involving only one motor vehicle were considered solo crashes, and therefore the only had one pre-crash action assigned. For crashes involving two or more motor vehicles, the pre-crash actions of the first two motor vehicles were selected by order of injury severity, which the most severely injured assigned as the first movement and the second most severely injured assigned as the second. In cases where the injury levels were the same, the first two motor vehicles were selected based on their vehicle ID values within the crash report.

The most common motor vehicle crash types in order of KA crashes include:

- Vehicle 1 traveling straight – vehicle 2 straight (24% crashes, 42% KA crashes)
- Vehicle 1 turning left – vehicle 2 traveling straight (12% crashes, 15% KA crashes)
- Vehicle 1 traveling straight – vehicle 2 turning left (9% crashes, 12% KA crashes)

Vehicles traveling straight accounted for the greatest percent of KA crashes (65%), however no pre-crash movement or crash combination had a statistically significant percent of crashes resulting in a KA compared to the average KA crash rate.

Table 10: Pre-Crash Movements for Multi-Motor Vehicle Crashes with One or More KA Crashes, 2017-2021

Motorist 1 Pre-Crash Movement	Motorist 2 Pre-Crash Action	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Backing	Overtaking	6	0.01%	1	0.19%	16.67%
	Solo	120	0.30%	1	0.19%	0.83%
Backing total		**126**	**0.31%**	**2**	**0.38%**	**1.59%**
Changing lanes	Changing lanes	86	0.21%	1	0.19%	1.16%
	Other	4	0.01%	1	0.19%	25.00%
	Straight	1,501	3.74%	8	1.51%	0.53%
	Turn - left	43	0.11%	1	0.19%	2.33%
	Turn - right	34	0.08%	1	0.19%	2.94%
	Solo	273	0.68%	11	2.08%	4.03%
Changing lates total		**1,941**	**4.84%**	**23**	**4.35%**	**1.18%**
Other	Straight	145	0.36%	5	0.95%	3.45%
	Solo	172	0.43%	4	0.76%	2.33%
Other total		**317**	**0.79%**	**9**	**1.70%**	**2.84%**
Overtaking	Other	3	0.01%	1	0.19%	33.33%
	Straight	102	0.25%	3	0.57%	2.94%
	Turn - left	56	0.14%	2	0.38%	3.57%
Overtaking total		**161**	**0.40%**	**6**	**1.13%**	**3.73%**

20 Motor vehicle pre-crash movement was derived from the crash reports. For AR, the column `vehicle_maneuver` from the table `vehicle` was used. For MO, the column `event_code` from the table `sequence_of_events` was used. The first value for `event_code` as ordered by `hp_seq_evnt_seq_no` was assigned to the vehicle. See <APPENDIX> for how different values between these two datasets were consolidated.

21 Motor vehicle pre-crash movement was derived from the crash reports. For AR, the column `vehicle_maneuver` from the table `vehicle` was used. For MO, the column `event_code` from the table `sequence_of_events` was used. The first value for `event_code` as ordered by `hp_seq_evnt_seq_no` was assigned to the vehicle. See <APPENDIX> for how different values between these two datasets were consolidated.

Motorist 1 Pre-Crash Movement	Motorist 2 Pre-Crash Action	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Parked	Parked	637	1.59%	3	0.57%	0.47%
	Stopped in traffic	533	1.33%	1	0.19%	0.19%
	Straight	905	2.26%	3	0.57%	0.33%
	Turn - right	23	0.06%	1	0.19%	4.35%
	Solo	53	0.13%	1	0.19%	1.89%
Parked total		**2,151**	**5.37%**	**9**	**1.70%**	**0.42%**
Slowing	Straight	791	1.97%	9	1.70%	1.14%
Slowing total		**791**	**1.97%**	**9**	**1.70%**	**1.14%**
Stopped in traffic	Parked	468	1.17%	3	0.57%	0.64%
	Stopped in traffic	628	1.57%	5	0.95%	0.80%
	Straight	3,676	9.17%	18	3.40%	0.49%
Stopped in traffic total		**4,772**	**11.90%**	**26**	**4.91%**	**0.54%**
Straight	Changing lanes	1197	2.99%	4	0.76%	0.33%
	Other	145	0.36%	3	0.57%	2.07%
	Overtaking	53	0.13%	2	0.38%	3.77%
	Parked	1257	3.14%	8	1.51%	0.64%
	Slowing	358	0.89%	7	1.32%	1.96%
	Stopped in traffic	4675	11.66%	25	4.73%	0.53%
	Straight	9,650	24.07%	224	42.34%	2.32%
	Turn - left	3584	8.94%	61	11.53%	1.70%
	Turn - right	839	2.09%	6	1.13%	0.72%
	Unknown	99	0.25%	2	0.38%	2.02%
Straight total		**21,857**	**54.52%**	**342**	**64.65%**	**1.56%**
Turn - left	Overtaking	55	0.14%	1	0.19%	1.82%
	Straight	4775	11.91%	81	15.31%	1.70%
	Turn - left	598	1.49%	1	0.19%	0.17%
	Turn - right	136	0.34%	2	0.38%	1.47%
	Solo	328	0.82%	7	1.32%	2.13%
Turn – left total		**5,892**	**14.70%**	**92**	**17.39%**	**1.56%**
Turn - right	Straight	1161	2.90%	3	0.57%	0.26%
	Turn - left	203	0.51%	1	0.19%	0.49%
	Solo	320	0.80%	2	0.38%	0.63%
Turn – right total		**1,684**	**4.20%**	**6**	**1.13%**	**0.36%**
U-Turn	Straight	101	0.25%	1	0.19%	0.99%
U-turn total		**101**	**0.25%**	**1**	**0.19%**	**0.99%**
Unknown	Straight	70	0.17%	2	0.38%	2.86%
	Solo	227	0.57%	2	0.38%	0.88%
Unknown - total		**297**	**0.74%**	**4**	**0.76%**	**1.35%**
Total		**40,090**	**100.00%**	**529**	**100.00%**	**1.32%**

Parties Involved

In addition to identifying the conditions under which crashes occurred and the specifics of crashes, it is also critical to understand who was most affected by unsafe roadway conditions in the Northwest Arkansas region. In the following section, the distribution of parties (people) involved in a crash is compared overall and for fatal or serious injury outcomes for age groups. These comparisons are based on the number of parties, not the number of crashes, therefore the total numbers at the bottom of Table 11 are different than the totals in tables that are based on number of crashes. Any given crash may injure multiple parties, at different levels of severity.

Parties by Age[22]

Table 11 compares the crash party age breakdown against the age breakdown of residents in the Northwest Arkansas Region. To compare these distributions, the percentage of crash victims and of KA crash victims within a given age range is divided by the percentage share in the population overall. Values greater than 1 (red cells) indicate that a given age group is overrepresented in the crash data. Values less than 1 (blue cells) indicate that age group is underrepresented in the crash data.

The percent of parties resulting from a KA field was calculated by dividing the number of KA parties by the total number of parties. This field is similar to the percent of crashes resulting in a KA field in previous tables that were based on number of crashes rather than number of parties.

The age percent of population field is the total age brackets percentage of the region's total population. For example, 20–24-year-old people make up 8.16% of the total population in the region.

Table 11: Parties by Age[1], 2017-2021

Age	# of Parties	% of Parties	# of KA Parties	% of KA Parties	% of parties resulting from a KA	Age % of Population	All Crashes: Population Ratio	KA: Population Ratio
0-4	4,672	3.46%	20	1.24%	0.43%	6.88%	0.5	0.18
5-9	4,385	3.25%	20	1.24%	0.46%	7.62%	0.43	0.16
10-14	4,170	3.09%	29	1.80%	0.70%	6.91%	0.45	0.26
15-19	17,803	13.18%	140	8.67%	0.79%	7.96%	1.66	1.09
20-24	19,145	14.17%	192	11.90%	1.00%	8.16%	1.74	1.46
25-29	14,341	10.62%	170	10.53%	1.19%	7.74%	1.37	1.36
30-34	12,223	9.05%	153	9.48%	1.25%	7.72%	1.17	1.23
35-39	10,995	8.14%	155	9.60%	1.41%	7.19%	1.13	1.34
40-44	9,097	6.73%	119	7.37%	1.31%	6.83%	0.99	1.08
45-49	8,084	5.98%	120	7.43%	1.48%	6.15%	0.97	1.21
50-54	7,142	5.29%	106	6.57%	1.48%	5.41%	0.98	1.21
55-59	6,658	4.93%	112	6.94%	1.68%	5.53%	0.89	1.26
60-64	5,225	3.87%	97	6.01%	1.86%	4.46%	0.87	1.35
65-69	4,025	2.98%	66	4.09%	1.64%	3.98%	0.75	1.03
70-74	3,042	2.25%	58	3.59%	1.91%	3.02%	0.75	1.19
75-79	1,873	1.39%	27	1.67%	1.44%	2.04%	0.68	0.82
80-84	1,093	0.81%	17	1.05%	1.56%	1.23%	0.66	0.86
85-over	1,117	0.83%	13	0.81%	1.16%	1.17%	0.71	0.69
Total	135,090	100.00%	1,614	100.00%	1.19%	100.00%	1	1

1 Where age is known.

22 Age was derived from the crash reports. For AR, this was the column `age` from the table `person_index`. For MO, it was determined from comparing the column `date_of_birth` from the table `driver_passenger` to the column `date_0` from the table `rpc_crashes_2017_2021` to determine the persons age at the time of the crash.

In general, younger travelers were involved in a larger share of total crashes and KA outcomes. People aged 20-24 were the most overrepresented for all crashes and for KA outcomes. Older age brackets were less represented in both crashes and KA outcomes. Interestingly, people in their 50s and 60s were slightly under-represented in overall crashes but overrepresented in KA outcomes. This may point to drivers becoming more experienced with age but also becoming increasingly frail and more likely to be killed or seriously injured if involved in a crash.

Behaviors

Alcohol Impairment[23]

Table 12 summarizes crashes by alcohol impairment. These crashes include both when the alcohol level was reported as over the legal limit as well as when alcohol use was listed as a contributing crash factor in the collision report. Most crashes (96%) did not include an alcohol impairment party. Despite there being only 4% of crashes that involved alcohol impaired, these crashes accounted for 8% of KAs.

The impact of alcohol on KA outcomes was even more pronounced when analyzed for vulnerable road users. Table 13 shows when a vulnerable roadway user was involved in an alcohol related crash, the outcomes were more severe with 48% of crashes resulting in a KA outcome.

Table 12: Crashes by Reported DUI, All Modes, 2017-2021

Alcohol Impaired	# of Crashes	% of Crashes	# of KA Crashes	% of KA Crashes	% of Crashes that Resulted in KA
Yes	2,132	3.62%	173	12.64%	8.11%
No	56,764	96.38%	1196	87.36%	2.11%
Total	58,896	100.00%	1369	100.00%	2.32%

Table 13: Crashes by Reported DUI, Vulnerable Road Users, 2017-2021

Alcohol Impaired	# of Crashes	% of Crashes	# of KA Crashes	% of KA Crashes	% of Crashes that Resulted in KA
Yes	71	4.32%	34	7.61%	47.89%
No	1,573	95.68%	413	92.39%	26.26%
Total	1,644	100.00%	447	100.00%	27.19%

23 Alcohol impairment was derived from the crash reports. For AR, alcohol was determined from multiple sources: the column `condition` with the value of 7 (`Under the influence of alcohol`) from the table `driver_condition`; the column `driver_action` with the value 28 (`Under the influence of alcohol`) in the table `driver_action`; the column `blood_alcohol_content` with a value >= 0.08 from the table `driver`; and the column `blood_alcohol_content` with a value >= 0.08 from the table `non_motorist`. For MO, alcohol was determined using the column `code` in the table `contributing_circumstances`, using the value 18 (`ALCHOL`). If any one of these conditions for any one person involved was true, then the crash was considered alcohol involved.

Speeding[24]

Table 14 summarizes crashes where either exceeding the speed limit or driving too fast for the conditions was noted in the collision report. The 4,339 crashes that involved speeding made up only 7% of all crashes but 18% of KAs.

While the percentages of crashes involving speeding for vulnerable road users are similar to those for all modes, there is a significant jump in severity. Table 15 shows that 43% of speeding crashes resulted in a KA when a vulnerable roadway user was involved compared to just 6% in the previous table. Nationally, speeding remains the largest contributing factor influencing fatal and sever injury crashes.[25] The data below shows that in Northwest Arkansas, even though vehicle crashes make up a large portion of the total crashes, the impact of speed remains significant. Pedestrians, bicyclists, and motorcyclists are referred to as vulnerable modes specially because of their exposure to high impacts and their lack of additional protection such as air bags or bumpers in in a high-speed crash.

Table 14: Crashes by Reported Speeding, All Modes, 2017-2021

Speeding	# of Crashes	% of Crashes	# of KA Crashes	% of KA Crashes	% of Crashes that Resulted in KA
Yes	4,339	7.37%	249	18.19%	5.74%
No	54,557	92.63%	1,120	81.81%	2.05%
Total	58,896	100.00%	1,369	100.00%	2.32%

Table 15: Crashes by Reported Speeding, Vulnerable Road Users, 2017-2021

Speeding	# of Crashes	% of Crashes	# of KA Crashes	% of KA Crashes	% of Crashes that Resulted in KA
Yes	137	8.33%	59	13.20%	43.07%
No	1,507	91.67%	388	86.80%	25.75%
Total	1,644	100.00%	447	100.00%	27.19%

24 Speeding was determined based on the data in the crash reports. For AR, this was the column `speeding_relation` in the table `driver`, where the value any of: 2 (`Racing`), 3 (`Exceeded Speed Limit`), or 4 (`Too fast for conditions`). For MO, the column was `code` in the table `contributing_circumstances` where the value was any of: 04 (`SPEED EXCEEDED LIMIT`), 05 (`TOO FAST FOR CONDITIONS`), or 42 (`EXCESSSIVE SPEED`). If any one of these conditions for any one vehicle involved was true, then the crash was considered speeding.

25 https://www.nhtsa.gov/campaign/speeding-catches-up-with-you

Roadway Characteristics

Crash Location (Intersection vs. Segment) [26,27]

Table 16 below summarizes crash frequencies by location type for all modes. Crashes were identified as an intersection crash if the crash data point was located within 250 ft of an intersection, and if the closest segment was a part of that intersection (i.e., preventing a crash along a highway to be assigned to intersection of a nearby frontage road). Crashes not assigned as intersection crashes were assumed as segment crashes. Crashes occurred most often at intersections (65% of crashes, 54% of KA crashes) with roughly 2% of crashes resulting in a KA. For more details on the traffic control present at intersections see Table 32 and Table 33.

While segment crashes had a lower share of both overall crashes and KA crashes, segment crashes had a slightly higher rate of resulting in a KA outcome (3%).

Table 17 summarizes crashes by location for vulnerable road users. Like above, most crashes occurred at intersections (67% crashes, 62% KA crashes) compared to segment locations (32% crashes, 38% KA crashes).

Segment crashes were not the most frequent crash location for vulnerable road users, but they tended to be more severe than intersection crashes with 32% of crashes resulting in a KA (compared to 25% at intersections).

Table 16: Crashes by Location, All Modes, 2017-2021

Crash Location	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Intersection	37,870	64.68%	732	54.02%	1.93%
Segment	20,682	35.32%	623	45.98%	3.01%
Total	**58,552**	**100.00%**	**1,355**	**100.00%**	**2.31%**

Table 17: Crashes by Location, Vulnearble Road Users 2017-2021

Crash Location	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Intersection	1,102	67.61%	275	62.08%	24.95%
Segment	528	32.39%	168	37.92%	31.82%
Total	**1,630**	**100.00%**	**443**	**100.00%**	**27.18%**

26 Segment crashes were all non-intersection crashes that occurred within 50 ft of a roadway segment.

27 Intersection involved crashes were determined spatially rather than by crash report. They were within 250 ft of an intersection that connects to the segment which they occurred (as defined by street name).

Urban vs. Rural[28]

Table 18 and Table 21 summarize crashes that occurred in urban versus rural areas. Urban crashes were identified as any crashes that occurred within 2020 Census defined urban areas. All crashes outside of these areas were designed as rural crashes. There are more crashes in urban areas (all, KA, and vulnerable road users) than rural areas in NWA. However, more rural crashes are likely to result in a KA outcome for all modes (4.46%) and vulnerable road users (35.75%). For all modes, there were slightly more KA crashes in urban areas (57% of KA crashes in urban versus 43% of KA crashes in rural). This difference was more pronounced for vulnerable road users where 66% of KA crashes occurred in urban areas and 34% in rural areas.

Table 18: Crashes in urban vs. rural areas, All Modes 2017-2021

Crash Location	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Urban	45,806	77.77%	785	57.34%	1.71%
Rural	13,090	22.23%	584	42.66%	4.46%
Total	**58,896**	**100.00%**	**1,369**	**100.00%**	**2.32%**

Table 19: Crashes in urban vs. rural areas, Vulnerable Road Users 2017-2021

Crash Location	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Urban	1,216	73.97%	294	65.77%	24.18%
Rural	428	26.03%	153	34.23%	35.75%
Total	**1,644**	**100.00%**	**447**	**100.00%**	**27.19%**

28

Traffic Volume[29]

Table 20 summarizes crashes by AADT for all modes. Streets with an AADT less than 5,000 had the largest share of both overall crashes (31%) and KA crashes (35%). However, the majority of the street network throughout the region has an AADT less than 5,000 (i.e., local and residential streets), resulting in relatively low crashes per mile and KA crashes per mile. Streets that had an AADT between 5,000 and 9,999 and over 30,000 had the second highest shares of KA crashes (16% and 15% respectively).

It's important to keep in mind that streets with higher traffic volumes often have higher crash frequencies. While AADT estimates are available, it is not available citywide for motorcycles, bicyclists, and pedestrians. Having detailed citywide volumes estimates would allow for the estimation of crash risk for each mode.

Table 21 summarizes crashes by traffic volume on a roadway where vulnerable road users were involved. Like Table 20, most crashes occurred on streets with lower AADT which is due to the overall network coverage of those streets. Crashes along lower volume street also tended to be less severe on average with roughly 24% of crashes resulting in a KA compared to 32% of crashes resulting in a KA along streets with an AADT of at least 25,000.

While the above two tables provide insight into the relationship between AADT and crashes they do not capture the distribution of those crashes along roadway miles across the region. Table 22 highlights the mileage and percentage of the entire roadway network for each AADT category as well as the ratio of the percent of crashes to percent of overall mileage. While, low AADT roadways had a high number of crashes, they also accounted for 88% of all the roadways in the region.

Table 20: Crashes by AADT, All Modes, 2017-2021

AADT	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
0 – 4,999	18,000	30.82%	476	35.16%	2.64%
5,000 – 9,999	7,984	13.67%	214	15.81%	2.68%
10,000 – 14,999	6,243	10.69%	159	11.74%	2.55%
15,000 – 19,999	4,017	6.88%	79	5.83%	1.97%
20,000 – 24,999	4,720	8.08%	109	8.05%	2.31%
25,000 – 29,999	6,098	10.44%	113	8.35%	1.85%
30,000 - over	11,351	19.43%	204	15.07%	1.80%
Grand Total	**58,413**	**100.00%**	**1,354**	**100.00%**	**2.32%**

Table 21: AADT on Roadways where Crashes involved Vulnerable Road Users, 2017-2021

AADT	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
0 – 4,999	635	38.98%	153	34.54%	24.09%
5,000 – 9,999	234	14.36%	59	13.32%	25.21%
10,000 – 14,999	171	10.50%	46	10.38%	26.90%
15,000 – 19,999	85	5.22%	27	6.09%	31.76%
20,000 – 24,999	136	8.35%	41	9.26%	30.15%
25,000 – 29,999	140	8.59%	45	10.16%	32.14%
30,000 - over	228	14.00%	72	16.25%	31.58%
Grand Total	**1629**	**100.00%**	**443**	**100.00%**	**27.19%**

29 Includes both known and assumed traffic volumes.

Conversely, roads with over 30,000 AADT made up only 1% of total roadway mileage but the highest percentage of crashes.

The crash ratios below were calculated by the percent of total crashes, KAs and non-KA that occurred within each AADT category divided by the category's percent of mileage in the overall roadway network. Values above 1 (shown in red) indicate that there was a higher percent of crashes relative to mileage, while values below 1 (in blue) have a lower percent of crashes relative to mileage.

Table 22: AADT Ratios

AADT	Mileage	% of Mileage	Crash Ratio: All Crashes	Crash Ratio: KA Crashes
0 – 4,999	5,996	88%	0.35	0.40
5,000 – 9,999	319	5%	2.91	3.37
10,000 – 14,999	162	2%	4.48	4.93
15,000 – 19,999	78	1%	5.99	5.08
20,000 – 24,999	75	1%	7.31	7.28
25,000 – 29,999	71	1%	10.05	8.03
30,000 - over	88	1%	15.02	11.65
Total	**6,788**	**100%**	**1.00**	**1.00**

Functional Classification[30]

Table 23 below outlines crashes by roadway classification for all modes. Major arterials had the most crashes of with 17,216 crashes (29% of all crashes). However, minor arterials had a higher number of KA crashes (406, 29% of KAs). Minor collectors had the greatest risk for a crash resulting in a KA outcome, where 5.44% of all crashes resulted in KA outcomes.

Table 24 summarizes crashes by functional classification for crashes involving vulnerable road users. As in the previous table, major and minor arterials had a higher number of crashes and KA outcomes. The greatest risk of a crash resulting in a KA outcome was on interstates (39.47%)

Table 25 highlights the mileage of each functional class category as a percent of the overall roadway mileage and compares it to the percent of crashes occurring within each category. The crash ratio fields were calculated by the percent of total crashes, KAs and non-KA that occurred within each Functional Class category divided by that category's percent of mileage in the overall roadway network. Values above 1 (shown in red) indicate that there was a higher percent of crashes relative to mileage, while values below 1 (in blue) have a lower percent of crashes relative to mileage.

This analysis highlights the disproportionate share of crashes that occur on Arterials. The combined 10% of Major and Minor Arterial roadway mileage accounts for 56% of KA crashes. Meanwhile local roads which make up 62% of all road miles carry less than 10% of KA crashes.

Table 23: Crashes by Functional Classification, All Modes, 2017-2021

Functional Classification	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Interstate	6,067	10.36%	126	9.30%	2.08%
Freeway	584	1.00%	17	1.25%	2.91%
Major Arterial	17,216	29.40%	352	25.98%	2.04%
Minor Arterial	15,560	26.57%	406	29.96%	2.61%
Major Collector	11,813	20.18%	294	21.70%	2.49%
Minor Collector	478	0.82%	26	1.92%	5.44%
Local	6,834	11.67%	134	9.89%	1.96%
Grand Total	**58552**	**100.00%**	**1355**	**100.00%**	**2.31%**

Table 24: Crashes by Functional Classification, Vulnerable Road Users, 2017-2021

Functional Classification	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Interstate	76	4.66%	30	6.77%	39.47%
Freeway	11	0.67%	7	1.58%	63.64%
Major Arterial	434	26.63%	132	29.80%	30.41%
Minor Arterial	438	26.87%	126	28.44%	28.77%
Major Collector	431	26.44%	94	21.22%	21.81%
Minor Collector	18	1.10%	6	1.35%	33.33%
Local	222	13.62%	48	10.84%	21.62%
Grand Total	**1630**	**100.00%**	**443**	**100.00%**	**27.18%**

30 Includes both known and assumed functional classifications.

Table 25: Functional Classification Ratios

Functional Classification	Mileage	% of Mileage	Crash Ratio: All Crashes	Crash Ratio: KA Crashes
Interstate	184	2.71%	3.82	3.43
Freeway	20	0.30%	3.34	4.20
Major Arterial	180	2.66%	11.07	9.78
Minor Arterial	499	7.34%	3.62	4.08
Major Collector	1,436	21.14%	0.95	1.03
Minor Collector	292	4.30%	0.19	0.45
Local	4,181	61.55%	0.19	0.16
Grand Total	**6,793**	**100.00%**	**1.00**	**1.00**

Posted Speed Limit[31]

Table 26 summarizes crashes and by posted speed limit for all roadway users. Crashes occurred most often on roadways with a posted speed limit of 45mph (23% crashes, 20% KA crashes) followed by streets with a posted speed limit of 40mph (18% crashes, 14% KA crashes). KA crashes occurred most often on streets with a 55mph posted speed limit (21% of KA crashes) and the highest percentage of crashes resulting in a KA (6.27%) also occurred on streets with a 55 mph posted speed limit.

Table 26: Crashes by Posted Speed Limit, All Modes, 2017-2021

Posted Speed Limit (MPH)	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
10	16	0.03%	1	0.07%	6.25%
15	98	0.17%	1	0.07%	1.02%
20	554	0.95%	8	0.59%	1.44%
25	6,918	11.82%	101	7.45%	1.46%
30	4,707	8.04%	96	7.08%	2.04%
35	9,691	16.55%	172	12.69%	1.77%
40	10,725	18.32%	195	14.39%	1.82%
45	13,528	23.10%	274	20.22%	2.03%
50	1,752	2.99%	55	4.06%	3.14%
55	4,565	7.80%	286	21.11%	6.27%
60	401	0.68%	21	1.55%	5.24%
65	1,380	2.36%	40	2.95%	2.90%
70	2,978	5.09%	75	5.54%	2.52%
75	1,238	2.11%	30	2.21%	2.42%
Grand Total	**58,5511**	**100.00%**	**1355**	**100.00%**	**2.31%**

1 This number is less than the total number of crashes (58,896) because crashes are joined to the nearby roadway to extract the speed limit information from the roadway segment. Crashes that are located too far away from a roadway will not be assigned to a roadway segment, hence no speed limit information.

31 Includes both known and assumed posted speed limits

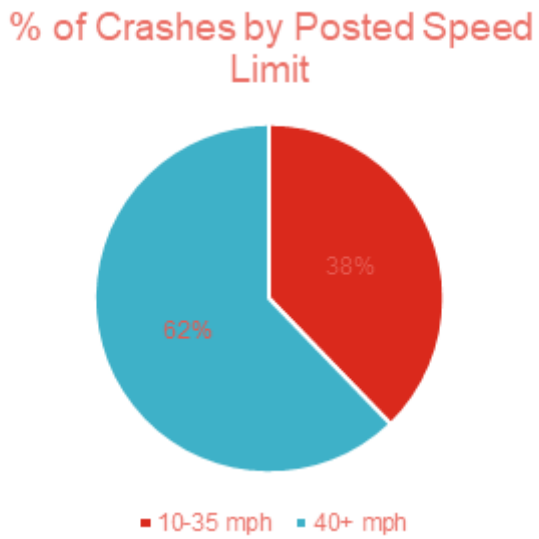
Summaries for crashes involving a vulnerable roadway user by posted speed limit are shown in Table 27 and follows a similar trend as the table above with the majority crashes and KA crashes involving a vulnerable road user occurred on streets with a posted speed limit of 45mph. However, the highest risk of a crash resulting in a KA outcome was on streets with a posted speed of 70mph when a vulnerable road user was involved.

Table 28 below takes the information from the two previous tables and highlights the ratio of crashes to each speed category's percentage of the total mileage. The crash ratio fields were calculated by taking the percent of total crashes, KAs and non-KA that occurred within each Speed category divided by that category's percent of mileage in the overall roadway network. Values above 1 (shown in red) indicate that there was a higher percent of crashes relative to mileage, while values below 1 (in blue) have a lower percent of crashes relative to mileage.

While 25mph streets make up over half of all roadway miles, they account for only a small percentage of crashes. Higher speed roadways make up smaller shares of the overall roadway network but had increasing numbers of fatal and severe injury crashes.

Table 27: Crashes by Posted Speed Limit, Vulnerable Road Users, 2017-2021

Posted Speed Limit (MPH)	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
10	1	0.06%	0	0.00%	0.00%
15	5	0.31%	1	0.23%	20.00%
20	20	1.23%	3	0.68%	15.00%
25	273	16.75%	48	10.84%	17.58%
30	155	9.51%	34	7.67%	21.94%
35	238	14.60%	58	13.09%	24.37%
40	274	16.81%	71	16.03%	25.91%
45	317	19.45%	94	21.22%	29.65%
50	46	2.82%	18	4.06%	39.13%
55	201	12.33%	71	16.03%	35.32%
60	18	1.10%	10	2.26%	55.56%
65	29	1.78%	10	2.26%	34.48%
70	39	2.39%	17	3.84%	43.59%
75	14	0.86%	8	1.81%	57.14%
Grand Total	1,630	100.00%	443	100.00%	27.18%



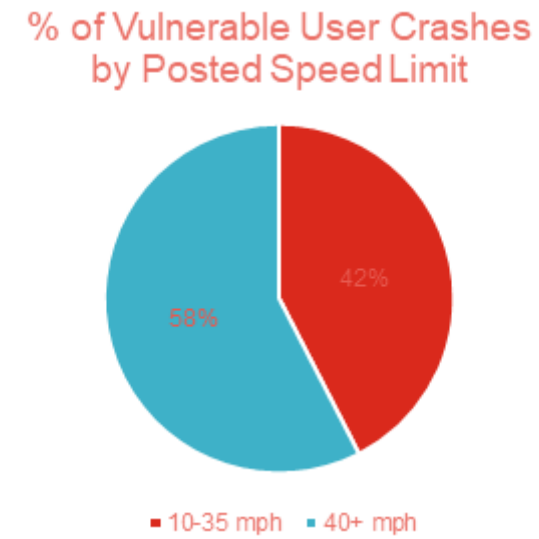


Table 28: Crash Speed Ratios

Crash Speed (MPH)	Mileage	% of Mileage	Crash Ratio: All Crashes	Crash Ratio: KA Crashes
10 - 14	3	0%	0.62	1.68
15 - 19	9	0%	1.33	0.59
20 - 24	77	1%	0.84	0.52
25 - 29	3724	55%	0.22	0.14
30 - 34	441	6%	1.24	1.09
35 - 39	654	10%	1.72	1.32
40 - 44	551	8%	2.26	1.77
45 - 49	376	6%	4.17	3.65
50 - 54	155	2%	1.31	1.78
55 - 59	557	8%	0.95	2.58
60 - 64	20	0%	2.31	5.23
65 - 69	93	1%	1.72	2.15
70 - 74	71	1%	4.88	5.31
75 - over	61	1%	2.37	2.48
Grand Total	**6,792**	**100%**	**1.00**	**1.00**

Number of lanes[32]

Table 29 summarizes crashes by number of lanes for all roadway users. Crashes occurred most often on four-lane roads (40% crashes, 38% KA crashes) followed by two-lane roads (36% crashes, 46% KA crashes). KA crashes occurred most often on two-lane roads and these crashes also tended to be the most severe, with 3% of all crashes on 2 lane roads resulted in KAs.

Table 30 summarizes crashes by number of lanes for vulnerable road users only. Data for these modes follows a similar trend as the table above, but the impact of two-lane road crashes is more pronounced. For vulnerable road users, the most crashes (760, 46.63%) and the most KA crashes (194, 43.79%) occurred on two-lane roads. However, crashes with the greatest risk of resulting in a KA involving a vulnerable road users occurred on six-lane roads as these are corridors with higher-speed free-flowing vehicle traffic.

Table 31 below takes the information from the two previous tables and highlights the ratio of crashes to each lane category's percentage of the total mileage. While the two previous tables showed the most crashes occurring on two-lane roads, these roads also make up almost 90% of the roadways in Northwest Arkansas. While fewer crashes occur on six and eight-lane roads the roads they account for a proportionally much higher rate of crashes per mile.

32 Through lanes only. Includes both known lane count and assumed lane count.

Table 29: Crashes by Number of Lanes, All Modes, 2017-2021

Number of Lanes	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
1	1,709	2.92%	20	1.48%	1.17%
2	20,858	35.62%	627	46.27%	3.01%
3	3,390	5.79%	54	3.99%	1.59%
4	23,466	40.08%	511	37.71%	2.18%
5	5,231	8.93%	66	4.87%	1.26%
6	3,442	5.88%	71	5.24%	2.06%
7	114	0.19%	0	0.00%	0.00%
8	342	0.58%	6	0.44%	1.75%
Grand Total	**58,552**	**100.00%**	**1.355**	**100.00%**	**2.31%**

Table 30: Crashes by Number of Lanes, Vulnerable Road Users, 2017-2021

Number of Lanes	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
1	20	1.23%	6	1.35%	30.00%
2	760	46.63%	194	43.79%	25.53%
3	96	5.89%	18	4.06%	18.75%
4	584	35.83%	185	41.76%	31.68%
5	116	7.12%	22	4.97%	18.97%
6	46	2.82%	16	3.61%	34.78%
7	1	0.06%	0	0.00%	0.00%
8	7	0.43%	2	0.45%	28.57%
Grand Total	**1630**	**100.00%**	**443**	**100.00%**	**27.18%**

Table 31: Number of Lanes Ratios

Number of Lanes	Mileage	% of Mileage	Crash Ratio: All Crashes	Crash Ratio: KA Crashes
1	119	2%	1.69	0.84
2	6,007	88%	0.40	0.52
3	151	2%	2.62	1.79
4	379	6%	7.19	6.76
5	82	1%	7.49	4.04
6	50	1%	8.00	7.11
7	0.1	0%	109.59	0.00
8 and over	4	0%	10.48	7.90
Total	**6,792**	**100%**	**1.00**	**1.00**

One-way vs. Two-Way Streets[33]

Table 32 and Table 33 summarize crashes by street direction for all modes and for vulnerable road users. For all modes, crashes occurred most often on two-way streets (82% crashes, 85% KA crashes). Crashes on two-way roads were slightly more severe for all modes. Vulnerable modes followed a similar trend with the most crashes occurring on two-way roads (90% crashes, 87% KA crashes). However, the severity of crashes for vulnerable road users significantly increased on one-way streets, with 35% of crashes for vulnerable road users on one-way streets resulted in a KA compared to just under 2% for all modes.

Intersection Control[34]

Table 34 and Table 35 summarize crashes by intersection control for all modes and for vulnerable road users. For all modes, crashes occurred most often at intersections with no traffic control (58% crashes, 68% KA crashes). Crashes at stop sign controlled intersections were slightly more severe with 2.45% of crashes resulting in KAs.

These trends were even more pronounced for vulnerable road users. Again, the most crashes occurred at intersections with no signal control (66% crashes, 71% KA crashes). Stop controlled intersection crashes were also the most severe for vulnerable modes with 29% resulting in a KA outcome.

Table 32: Street Direction, All Modes, 2017-2021

Street Direction	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Two-way	47,987	81.96%	1147	84.65%	2.39%
One-way	10,565	18.04%	208	15.35%	1.97%
Total	**58,552**	**100%**	**1,355**	**100.00%**	**2.31%**

Table 33: Street Direction, Vulnerable Road Users, 2017-2021

Street Direction	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Two-way	1,460	89.57%	384	86.68%	26.30%
One-way	170	10.43%	59	13.32%	34.71%
Total	**1,630**	**100.00%**	**443**	**100.00%**	**27.18%**

Table 34: Intersection Control, All Modes, 2017-2021

Intersection Control Device	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Signal	14,016	37.01%	190	25.96%	1.36%
Stop Sign	1,918	5.06%	47	6.42%	2.45%
None	21,936	57.92%	495	67.62%	2.26%
Total	**37,870**	**100.00%**	**732**	**100.00%**	**1.93%**

Table 35: Intersection Control, Vulnerable Road Users, 2017-2021

Intersection Control Device	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Signal	310	28.13%	61	22.18%	19.68%
Stop Sign	70	6.35%	20	7.27%	28.57%
None	722	65.52%	194	70.55%	26.87%
Total	**1,102**	**100.00%**	**275**	**100.00%**	**24.95%**

33 All streets were assumed two-way unless otherwise noted.

34 Only applies to intersection crashes. Where no data is present, intersection is assumed uncontrolled.

Environmental Characteristics

Historically Disadvantaged Communities and Areas of Persistent Poverty

Table 36 to Table 39 summarize crashes by historically disadvantaged communities and areas of persistent poverty for all modes and for vulnerable road users. Despite having only about 14% of the regional roadway centerline miles, historically disadvantaged communities have about 23% of all crashes and the same share of KA crashes for all modes. Similarly, about 22% of all crashes and 18% of KA crashes happened within areas of persistent poverty, though only about 8% of regional roadway centerline miles fall in these areas. This indicates historically disadvantaged communities and areas of persistent poverty may have disproportionately higher crash risks. Areas where historically disadvantaged communities and persistent poverty overlap has 14% and 12% of regional total crashes and KA crashes respectively, despite having only 6% of the regional roadway centerline miles (see Table 38).

The vulnerable road users involved crashes tell a very similar story, with about 25% of both all crashes and KA crashes happen in historically disadvantaged communities and the percentage of crashes that resulted in KA in these communities is about the same as the regional level. A slightly lower percentage of KA crashes happened in areas of persistent poverty compared to all crashes. The percentage of crashes that resulted in KA in these areas is about 3% lower than the regional value. However, they are still much higher than the share of roadway centerline miles in these areas. Similarly, for vulnerable road user involved crashes, areas where historically disadvantaged communities and persistent poverty overlap have 15% of regional total crashes and 16% KA crashes, respectively, despite only 6% of the regional roadway centerline miles (see Table 41).

Table 36: Crashes by Historically Disadvantaged Communities, All Modes, 2017-2021

Historically Disadvantaged Communities	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA	% of roadway centerline miles
Yes	13,900	23.6%	305	22.3%	2.19%	14%
No	44,996	76.4%	1,064	77.7%	2.36%	86%
Total	**58,896**	**100%**	**1,369**	**100%**	**2.32%**	**100%**

Table 37: Crashes by Areas of Persistent Poverty, All Modes, 2017-2021

Areas of Persistent Poverty	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA	% of roadway centerline miles
Yes	12,682	21.5%	239	17.5%	1.88%	8%
No	46,214	78.5%	1,130	82.5%	2.45%	92%
Total	**58,896**	**100%**	**1,369**	**100%**	**2.32%**	**100%**

Table 38: Crashes in Areas where Historically Disadvantaged Communities and Areas of Persistent Poverty Overlap, All Modes, 2017-2021

Areas where Historically Disadvantaged Communities and Areas of Persistent Poverty Overlap	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA	% of roadway centerline miles
Yes	8,174	13.9%	165	12.1%	2.02%	6%
No	50,722	86.1%	1,204	87.9%	2.37%	94%
Total	**58,896**	**100%**	**1,369**	**100%**	**2.32%**	**100%**

Table 39: Crashes by Historically Disadvantaged Communities, Vulnerable Road Users, 2017-2021

Historically Disadvantaged Communities	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Yes	422	25.7%	110	24.6%	26.07%
No	1,222	74.3%	337	75.4%	27.58%
Total	**1,644**	**100%**	**447**	**100%**	**27.19%**

Table 40: Crashes by Areas of Persistent Poverty, Vulnerable Road Users, 2017-2021

Areas of Persistent Poverty	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Yes	422	25.7%	102	22.8%	24.17%
No	1,222	74.3%	345	77.2%	28.23%
Total	**1,644**	**100%**	**447**	**100%**	**27.19%**

Table 41: Crashes in Areas where Historically Disadvantaged Communities and Areas of Persistent Poverty Overlap, Vulnerable Road Users, 2017-2021

Areas where Historically Disadvantaged Communities and Areas of Persistent Poverty Overlap	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA	% of roadway centerline miles
Yes	246	15.0%	71	15.9%	28.9%	6%
No	1398	85.0%	376	84.1%	26.9%	94%
Total	**1,644**	**100%**	**447**	**100%**	**27.2%**	**100%**

Time of Day[35]

Table 42 and Table 43 summarize crashes by time of day for all modes and for vulnerable road users. For all modes, crashes were fairly evenly distributed across the day but occurred most often between 3:00pm and 6:00pm (20% crashes, 16% KA crashes). Night crashes between 9:00pm and midnight were slightly more severe than other times of day with 4% of crashes resulting in a KA outcome.

Like many of the tables above, these trends were even more pronounced for vulnerable road users. Again, crashes for vulnerable modes were fairly evenly distributed across the day but occurred most often between 3:00pm and 6:00pm (21% crashes, 17% KA crashes). The severity of nighttime crashes between 9pma and midnight increased significantly for vulnerable modes with 37% of crashes during this time period resulting in KAs.

Table 42: Crashes by Time of Day, All Modes, 2017-2021

Time of Day	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
12:00-2:59 AM	3,866	6.56%	140	10.23%	3.62%
3:00-5:59 AM	5,428	9.22%	129	9.42%	2.38%
6:00-8:59 AM	10,338	17.56%	210	15.34%	2.03%
9:00-11:59 AM	8,965	15.22%	192	14.02%	2.14%
12:00-2:59 PM	99,48	16.89%	191	13.95%	1.92%
3:00-5:59 PM	12,044	20.45%	225	16.44%	1.87%
6:00-8:59 PM	5,964	10.13%	187	13.66%	3.14%
9:00-11:59 PM	2,336	3.97%	95	6.94%	4.07%
Total	**58,889**	**100.00%**	**1369**	**100.00%**	**2.32%**

Table 43: Crashes by Time of Day, Vulnerable Road Users, 2017-2021

Time of Day	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
12:00-2:59 AM	103	6.27%	24	5.37%	23.30%
3:00-5:59 AM	124	7.54%	33	7.38%	26.61%
6:00-8:59 AM	230	13.99%	65	14.54%	28.26%
9:00-11:59 AM	229	13.93%	68	15.21%	29.69%
12:00-2:59 PM	248	15.09%	68	15.21%	27.42%
3:00-5:59 PM	353	21.47%	78	17.45%	22.10%
6:00-8:59 PM	264	16.06%	77	17.23%	29.17%
9:00-11:59 PM	93	5.66%	34	7.61%	36.56%
Total	**1644**	**100.00%**	**447**	**100.00%**	**27.19%**

35 Time of day was obtained from the crash reports. For AR, the time was extracted from the column `crash_date` from the table `crashes_fc`, and for MO, the time was from the column `time` in the table `rpc_crashes_2017_2021`.

Roadway Surface Condition[36]

Table 44 and Table 45 summarize crashes by reported roadway condition for all modes and for vulnerable road users. For all modes, crashes occurred most often in dry conditions (80% crashes, 82% KA crashes). Crashes with "other" roadway conditions were the most severe with just under 6% resulting in a KA outcome.

Crashes involving vulnerable road users were similar with the most crashes again occurring on dry roads (92% crashes, 91% KA crashes). Despite a higher number of vulnerable mode crashes on dry roads, the severity of crashes for vulnerable modes shifted significantly for wet and icy roads. 33% of crashes on icy roads and 32% of crashes on wet roads resulted in a KA outcome.

Table 44: Table 44: Crashes by Reported Roadway Condition, All Modes, 2017-2021

Reported Roadway Condition	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Dry	47,180	80.11%	1128	82.40%	2.39%
Ice	914	1.55%	25	1.83%	2.74%
Other	286	0.49%	17	1.24%	5.94%
Snow	252	0.43%	3	0.22%	1.19%
Unknown	293	0.50%	-	0.00%	0.00%
Wet	9,969	16.93%	196	14.32%	1.97%
Grand Total	**58,894**	**100.00%**	**1369**	**100.00%**	**2.32%**

Table 45: Table 45: Crashes by Reported Roadway Condition, Vulnerable Road Users, 2017-2021

Reported Roadway Condition	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Dry	1,511	91.97%	406	90.83%	26.87%
Ice	9	0.55%	3	0.67%	33.33%
Other	12	0.73%	4	0.89%	33.33%
Snow	2	0.12%	0	0.00%	0.00%
Unknown	4	0.24%	0	0.00%	0.00%
Wet	105	6.39%	34	7.61%	32.38%
Grand Total	**1,643**	**100.00%**	**447**	**100.00%**	**27.21%**

36 Road surface condition was derived from data within the crash reports. For AR, the column `roadway_surface_condition` from the table `crashes_fc` was used. For MO, the column `rd_surf_cond_type` from the table `rpc_crashes_2017_2021` was used. See <APPENDIX> for how values between these two datasets were consolidated.

Lighting Condition[37]

Table 46 and Table 47 summarize crashes by reported lighting condition for all modes and for vulnerable road users. For all modes, crashes occurred most often in daylight (74% crashes, 61% KA crashes). Dark crashes without lighting were the most severe with just under 5% of crashes resulting in a KA outcome.

Crashes for vulnerable modes were similar with the most crashes again occurring in daylight conditions (71% crashes, 62% KA crashes). For vulnerable modes the most severe crashes also occurred in dark conditions without lighting. The severity however increased significantly over that of all crashes with 42% of "dark-without lighting" crashes for vulnerable modes resulting in a KA.

Table 46: Crashes by Reported Lighting Condition, All Modes, 2017-2021

Reported Lighting Condition	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Dark - unknown lighting	1,027	1.74%	34	2.48%	3.31%
Dark - with lighting	5.309	9.01%	150	10.96%	2.83%
Dark - without lighting	6.435	10.93%	295	21.55%	4.58%
Daylight	43,439	73.76%	836	61.07%	1.92%
Dusk/dawn	2354	4.00%	51	3.73%	2.17%
Other	57	0.10%	1	0.07%	1.75%
Unknown	273	0.46%	2	0.15%	0.73%
Grand total	**58,894**	**100.00%**	**1,369**	**100.00%**	**2.32%**

Table 47: Crashes by Reported Lighting Condition, Vulnerable Road Users, 2017-2021

Reported Lighting Condition	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Dark - unknown lighting	45	2.74%	15	3.36%	33.33%
Dark - with lighting	167	10.16%	56	12.53%	33.53%
Dark - without lighting	202	12.29%	84	18.79%	41.58%
Daylight	1,165	70.86%	278	62.19%	23.86%
Dusk/dawn	62	3.77%	12	2.68%	19.35%
Other	2	0.12%	1	0.22%	50.00%
Unknown	1	0.06%	1	0.22%	100.00%
Grand total	**1,644**	**100.00%**	**447**	**100.00%**	**27.19%**

37 Lighitng condition was derived from data within the crash reports. For AR, the column `lighting_condition` from the table `crashes_fc` was used. For MO, the column `light_cond_name` from the table `rpc_crashes_2017_2021` was used. See <APPENDIX> for how values between these two datasets were consolidated.

Proximity to Transit

Table 48 and Table 49 summarize crashes by proximity to transit stops for all modes and for vulnerable road users. For all modes, crashes occurred most often beyond 500 ft of a transit stop (90% crashes, 93% KA crashes). It should be noted that a robust transit system does not currently exist throughout the entirety of the region.

For Vulnerable Road Users, slightly more crashes occurred within 500 ft of a transit stop but crashes still occurred most often beyond 500 ft (87% crashes, 89% KA crashes). These figures may point to the fact that transit users are often reliant on a vulnerable mode (walking or biking) to travel to or from a transit stop. Pedestrians and bicyclists may have higher crash exposure near transit stops as well as they are more likely to include public transit in their trip compared to motorists. The location of transit stops however are often tightly correlated with other factors such as density, land use, roadway functional class which make it difficult to draw transit-specific conclusions based on this data.

Table 48: Crashes by Proximity to Transit Stops, All Modes, 2017-2021

Proximity to Transit Stop	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Within 500 feet	5,743	9.75%	91	6.65%	1.58%
Greater than 500 feet	53,153	90.25%	1,278	93.35%	2.40%
Total	**58,896**	**100.00%**	**1,369**	**100.00%**	**2.32%**

Table 49: Crashes by Proximity to Transit Stops, Vulnerable Road Users, 2017-2021

Proximity to Transit Stop	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Within 500 feet	223	13.56%	48	10.74%	21.52%
Greater than 500 feet	1,421	86.44%	399	89.26%	28.08%
Total	**1,644**	**100.00%**	**447**	**100.00%**	**27.19%**

Proximity to Schools

Table 50 and Table 51 summarize crashes by proximity to schools for all modes and for vulnerable road users. For all modes, KA crashes occurred most often beyond 500 ft of a school (95% crashes, 97% KA crashes).

Proximity to Parks

Table 52 and Table 53 summarize crashes by proximity to parks for all modes and for vulnerable road users. For all modes, crashes occurred most often beyond 500 ft of a park (94% crashes, 95% KA crashes). Vulnerable modes saw a similar trend with 92% of total crashes and 93% of KA crashes occurring beyond 500ft of a par**k.**

Table 50: Crashes by Proximity to Schools, All Modes, 2017-2021

Proximity to a School	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Within 500 feet	2752	4.67%	40	2.92%	1.45%
Greater than 500 feet	56,144	95.33%	1,329	97.08%	2.37%
Total	**58,896**	**100.00%**	**1,369**	**100.00%**	**2.32%**

Table 51: Crashes by Proximity to Schools, Vulnerable Road Users, 2017-2021

Proximity to a School	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Within 500 feet	83	5.05%	14	3.13%	16.87%
Greater than 500 feet	1,561	94.95%	433	96.87%	27.74%
Total	**1,644**	**100.00%**	**447**	**100.00%**	**27.19%**

Table 52: Crashes by Proximity to Parks, All Modes, 2017-2021

Proximity to a Park	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Within 500 feet	3,823	6.49%	71	5.19%	1.86%
Greater than 500 feet	55,073	93.51%	1,298	94.81%	2.36%
Total	**58,896**	**100.00%**	**1,369**	**100.00%**	**2.32%**

Table 53: Crashes by Proximity to Parks, Vulnerable Road Users, 2017-2021

Proximity to a Park	# of Crashes	% of Crashes	# of KA	% KA	% of Crashes that Resulted in KA
Within 500 feet	124	7.54%	32	7.16%	25.81%
Greater than 500 feet	1520	92.46%	415	92.84%	27.30%
Total	**1644**	**100.00%**	**447**	**100.00%**	**27.19%**

Appendix A - Crash Code Value Consolidations

First harmful event

Value	Decoded Value	Consolidated Value
4	Jackknife	jackknife
5	Cargo/equipment loss or shift	cargo shift or loss
6	Equipment failure (blown tire, brake failure, etc.)	equipment failure
7	Separation of units	separation of units
8	Ran off roadway right	ran off road - right
9	Ran off roadway left	ran off road - left
10	Deliberately crossed median	crossed median
11	Unintentionally crossed median	crossed median
12	Crossed centerline	crossed centerline
13	Downhill runaway	downhill runaway
14	Fell/jumped from motor vehicle	fell or jumped from vehicle
15	Reentering roadway	reentering road
16	Object thrown or fallen on or near motor vehicle	cargo shift or loss
17	Other non-collision	other non-collision
18	Collision with pedestrian	collision with pedestrian
19	Collision with pedalcycle	collision with bicycle
20	Collision with other non-motorist	collision with non-fixed object
21	Collision with railway vehicle (train, engine)	collision with railway vehicle
22	Collision with animal (live)	collision with animal
23	Collision with motor vehicle in transport	collision with vehicle in transport
24	Collision with parked motor vehicle	collision with parked vehicle
25	Collision with falling/shifting cargo or anything set in motion by motor vehicle	cargo shift or loss
26	Collision with work zone/maintenance equipment	collision with non-fixed object
27	Collision with other non-fixed object	collision with non-fixed object
28	Collision with impact attenuator/crash cushion	collision with fixed object
29	Collision with bridge overhead structure	collision with fixed object
30	Collision with bridge pier or support	collision with fixed object
31	Collision with bridge rail	collision with fixed object
32	Collision with cable barrier	collision with fixed object
33	Collision with culvert	collision with fixed object
34	Collision with curb	collision with fixed object
35	Collision with ditch	collision with fixed object
36	Collision with embankment	collision with fixed object
37	Collision with guardrail face	collision with fixed object
38	Collision with guardrail end	collision with fixed object
39	Collision with concrete traffic barrier	collision with fixed object
40	Collision with other traffic barrier	collision with fixed object
41	Collision with tree (standing)	collision with fixed object
42	Collision with utility pole/light support	collision with fixed object
43	Collision with traffic sign support	collision with fixed object
44	Collision with traffic signal support	collision with fixed object
45	Collision with other post, pole, or support	collision with fixed object

Value	Decoded Value	Consolidated Value
46	Collision with fence	collision with fixed object
47	Collision with mailbox	collision with fixed object
48	Collision with other fixed object	collision with fixed object
49	Unknown	unknown
50	Collision with building	collision with fixed object

Value	Decoded Value	Consolidated Value
16	CROSS MEDIAN	crossed median
17	CROSS CENTER OF ROAD	crossed centerline
18	CROSS ROAD	crossed centerline
19	AIRBORNE	airborne
20	RAN OFF ROAD - RIGHT	ran off road - right
21	RAN OFF ROAD - LEFT	ran off road - left
22	OVERTURN / ROLLOVER	over turn or rollover
23	FIRE / EXPLOSION	fire or explosion
24	IMMERSION	immersion
25	JACKKNIFE	jackknife
26	CARGO LOSS / SHIFT	equipment failure
27	EQUIPMENT FAILURE	equipment failure
28	SEPARATION OF UNITS	separation of units
29	RETURNED TO ROAD	reentering road
30	COLLISION INV PEDESTRIAN	collision with pedestrian
31	COLLISION INV. BICYCLE / PEDALCYCLE	collision with bicycle
32	COLLISION INV. RAILWAY VEH.	collision with railway vehicle
33	COLLISION INV ANIMAL	collision with animal
34	COLLISION INV MV IN TRANSPORT	collision with vehicle in transport
35	COLLISION INV PARKED MV	collision with parked vehicle
36	COLLISION INV FIXED OBJECT	collision with fixed object
37	COLLISION INV OTHER OBJECT	collision with non-fixed object
38	OTHER NON COLLISION	other non-collision
39	COLLISION INV. BICYCLE / PEDALCYCEL IN BICYCLE LANE	collision with bicycle
40	COLLISION INV ANIMAL DRAWN VEH / ANIMAL RIDDEN FOR TRANSPORTATION	collision with animal
41	COLLISION INV. WORKING MV	collision with non-fixed object
42	DOWNHILL RUNAWAY	downhill runaway
43	FELL / JUMPED FROM MV	fell or jumped from vehicle
44	THROWN / FALLNG OBJECT	collision with non-fixed object
45	STRUCK BY FALLING, SHIFTING CARGO, OBJECT SET IN MOTION BY OWN MV	cargo shift or loss
46	RAN OFF ROADWAY - OTHER	ran off road - other
47	CROSS SEPARATOR	crossed median
U	UNKNOWN	unknown

Maneuvers

Value	Decoded Value	Consolidated Value
1	Movement essentially straight ahead	straight

Value	Decoded Value	Consolidated Value
2	Negotiating a curve	straight
3	Backing	backing
4	Changing lanes	chaing lanes
5	Overtaking/passing	overtaking
6	Turning right	turn - right
7	Turning left	turn - left
8	Making U-turn	turn - U
9	Leaving traffic lane	chaing lanes
10	Entering traffic lane	slowing
11	Slowing	parked
12	Parked	parked
13	Stopped in traffic	stopped in traffic
14	Other	other
15	Unknown	unknown

Value	Decoded Value	Consolidated Value
1	None	none
2	Crossing roadway	crossing road
3	Waiting to cross roadway	adjacent to roadway
4	Walking/cycling along roadway with traffic (in or adjacent to travel lane)	along roadway - with traffic
5	Walking/cycling along roadway against traffic (in or adjacent to travel lane)	along roadway - against traffic
6	Walking/cycling on sidewalk	on sidewalk
7	In roadway - other	in roadway
8	Adjacent to roadway (e.g., shoulder, median)	adjacent to roadway
9	Working in trafficway (incident response)	in roadway
10	Other	other
11	Unknown	unknown

Value	Decoded Value	Consolidated Value
01	GOING STRAIGHT	straight
02	OVERTAKING	overtaking
03	MAKING RIGHT TURN	turn - right
04	RIGHT TURN ON RED	turn - right
05	MAKING LEFT TURN	turn - left
06	MAKING U-TURN	turn - U
07	SKIDDING / SLIDING	other
08	SLOWING OR STOPPING	slowing
09	START IN TRAFFIC	other
10	START FROM PARKED	parked
11	BACKING	backing
12	STOPPED IN TRAFFIC	stopped in traffic
13	PARKED	parked
14	CHANGING LANES	chaing lanes
15	AVOIDING	other

Surface Condition

Value	Decoded Value	Consolidated Value
1	Dry	dry
2	Wet	wet
3	Snow	snow
4	Slush	snow
5	Ice/Frost	ice
6	Water	wet
7	Sand	other
8	Mud, Dirt, or Gravel	other
9	Oil	other
10	Other	other

The column `rd_surf_cond_type` was not listed in the received data dictionary. Therefore, the table below does only contain the full list of possible values, and instead only that were present in the received crash data. Additionally, the decode values were determined based on professional judgement.

Value	Decoded Value (assumed)	Consolidated Value
DRY	Dry	dry
WET	Wet	wet
SNOW	Snow	snow
ICE	Ice	ice
SWTR	unsure of value	unknown

Lighting Condition

Value	Decoded Value	Consolidated Value
1	Daylight	daylight
2	Dawn	dusk/dawn
3	Dusk	dusk/dawn
4	Dark - Lighted	dark - with lighting
5	Dark - Not Lighted	dark - without lighting
6	Dark - Unk. Lighting	dark - unknown lighting
7	Other	other
8	Unknown	unknown

The column ` light_cond_name` was not listed in the received data dictionary. Therefore, the table below does only contain the full list of possible values, and instead only that were present in the received crash data. Additionally, the decode values were determined based on professional judgement.

Value	Decoded Value (assumed)	Consolidated Value
DRY	Dry	dry
WET	Wet	wet
SNOW	Snow	snow
ICE	Ice	ice
SWTR	unsure of value	unknown

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