

Final Report: Measuring and Benchmarking Automated Vehicle Safety



Karen Dixon, Ph.D., P.E., Senior Research Engineer

Subasish Das, Ph.D., Associate Transportation Researcher

Robert Wunderlich, P.E., Senior Research Engineer

3135 TAMU
College Station, TX 77843-3135
Texas A&M Transportation Institute
The Texas A&M University System
400 Harvey Mitchell Parkway South, Suite 300
College Station, TX 77845-4375

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DEFINITION OF ABBREVIATIONS OR ACRONYMS

Abbreviation or Acronym	Definition
A	Incapacitating injury
AVMT	Annual vehicle miles traveled
B	Non-incapacitating injury
C	Possible Injury
CRIS	Crash Records Information System (Texas)
DVMT	Daily vehicle miles traveled
K	Fatal injury
KABCO	Crash reporting scale that represent severity level of crashes
MVMT	Million vehicle miles traveled
NHTS	National Household Travel Survey
NHTSA	National Highway Traffic Safety Administration
O	Property damage only
RHiNO	Roadway Highway Inventory Network Offload
RID	Roadway Information Database
SUV	Sports Utility Vehicle
TTI	Texas A&M Transportation Institute
TxDOT	Texas Department of Transportation
VMT	Vehicle miles traveled
WSDOT	Washington State Department of Transportation

MEASURING AND BENCHMARKING AUTOMATED VEHICLE SAFETY

With rapid change in motor vehicles, roadways, and the interface between these two key elements of the transportation system, there is a growing need to better understand the crash condition and how it relates to driver performance. With this information, automobile manufacturers can begin to establish a benchmark that represents the level of safety that the average competent and experienced driver regularly achieves. This benchmark could then be used to develop a design goal for automated vehicle safety performance that exceeds this benchmark. It is expected that this benchmark can ultimately be used to express the probability of one or more types of crashes per unit of travel. In the traffic safety industry, this is also known as crash risk.

Defining the Benchmark (Probability of a Crash)

Typically, crash safety performance is expressed as the number of crashes (of any given type – fatal, injury or property damage only, or a combination of these) per the amount of exposure or travel (typically expressed as vehicle-miles). For example, the overall fatality rate for all travel in the United States was reported by the National Highway Traffic Safety Administration (NHTSA) as 1.08 fatalities per 100 million vehicle miles traveled (MVMT) in 2014. Because more than one fatality can occur per crash, the fatal crash rate, which indicates the likelihood that any given vehicle will be involved in a fatal crash, is 0.99 fatal crashes per 100 MVMT. It is possible that other exposure measures could be important, particularly in urban areas, where the exposure to conflicting traffic at intersections may be more influential than miles traveled.

Study Scope

To assist with determining potential safety-related benchmarks, researchers from the Texas A&M Transportation Institute (TTI) met with key researchers for Hyundai MOBIS to determine road types and characteristics that should be the focus of this initial research effort. Ultimately, the MOBIS researchers selected rural freeways and rural two-lane roads as the focus for this analysis. Using a variety of regional and national data sources, TTI has focused on crash characteristics related to the road environment, the driver, and the motor vehicle. TTI researchers conducted an in-depth assessment of Texas crash characteristics and then contrasted this information to crash information from the State of Washington, a region with very different topography and driver characteristics.

Background

In an effort to understand the characteristics of an average competent and experienced driver, a reasonable starting point is to determine a better understanding of the crash condition and the involved drivers for the target road types of rural freeways and rural two-lane roads. This section reviews general crash nomenclature and common database characteristics. In addition, information about the general driving population and their travel patterns can help to better

explain the expected exposure of these drivers, and this information could help identify thresholds that can contribute to the crash condition.

The following sections review: 1) the available crash information including some limitations of the data and a review of common terminology as well as a summary of the crash and road characteristic data sources used for this analysis; and 2) driver exposure as it relates to road type and driver characteristics.

Texas Crash Information and Data

Crash data is collected and archived uniquely for each state. In Texas, as an example, law enforcement is responsible for documenting and reporting crash information. TxDOT is responsible for assembling and maintaining this information in a crash database known as the Crash Records Information System (CRIS). CRIS contains multiple tables that are linked by a common crash designation identification number. These tables summarize information related to the crash, each vehicle (also referred to as a unit), and each person involved in the crash. A schematic format of this configuration is shown in Figure 1.

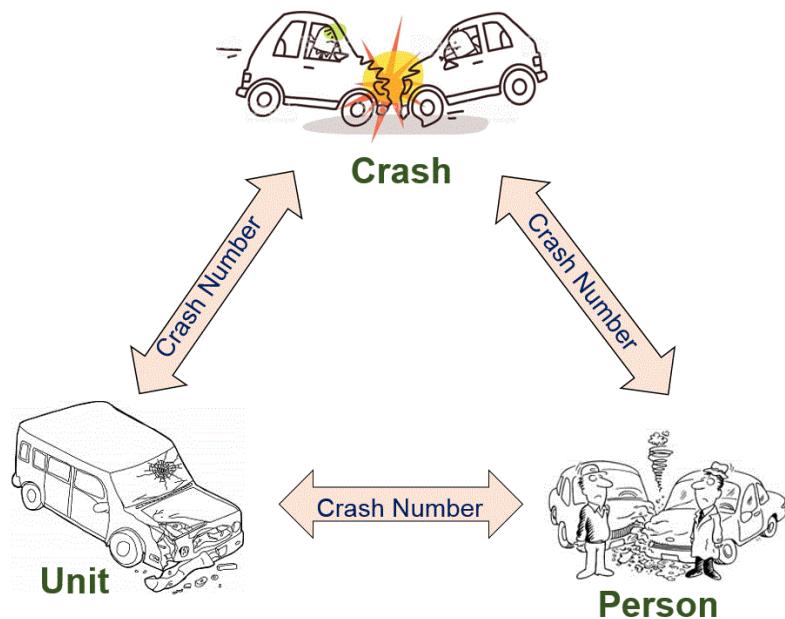


Figure 1. Common State Crash Database Configuration

The crash table summarizes the crash specific information that is independent of vehicle or user data. A crash is also assigned a severity designation represented by the KABCO scale where each letter represents the level of injury (K = fatal crash, A = incapacitating injury, B = injury, C = possible injury, and O = property damage only). If a crash includes multiple injuries, the crash will be designated by the most severe injury. As an example, a crash could have four persons

involved. If two are not injured, one has an incapacitating injury, and one person is killed, the crash would be designated as a fatal crash.

In addition to the CRIS database, TxDOT also maintains a database that includes a variety of roadway characteristics. This database, known as the Roadway Highway Inventory Network Offload (RHiNO), can be used to supplement information from the crash database.

Both of these databases provide a rich resource of information that can be used to evaluate crash conditions in Texas, but they do have some limitations. Often the location information in the crash database is approximate and the subjective reporting variables can dramatically differ between jurisdictions where law enforcement interprets some reporting information in a way that is different from that in other regions. If a variable is not applicable, for example, the field is typically left blank in the database. This will result in gaps in information that could impact how the data is used for evaluation purposes.

For the purposes of this study, the TTI researchers used five years of Texas crash data that extended from 2011 to 2015. Based on the target rural freeways and rural two-lane facilities, the research team evaluated crashes based on total crashes as well as severe (K+A) crashes (see Table 1).

Table 1. Summary of Texas Crash, Vehicle, and Primary Person Information

Roadway Type	Total Crashes	Severe (K+A) Crashes
Crash Data		
Rural Two-Lane (Others)	156,746	14,057
Rural Two-Lane (Local)	36,370	2,234
Rural Two-Lane	193,116	16,291
Rural Freeway	42,315	2,566
Vehicle Data		
Rural Two-Lane (Others)	224,043	20,936
Rural Two-Lane (Local)	44,456	2,593
Rural Two-Lane	268,499	23,529
Rural Freeway	64,279	4,038
Primary Person Data		
Rural Two-Lane (Others)	224,043	20,936
Rural Two-Lane (Local)	44,456	2,593
Rural Two-Lane	268,499	23,529
Rural Freeway	64,279	4,038

Source: TX CRIS Data (2011-2015)

Washington Crash Information and Data

Though the primary analysis focused on the comprehensive Texas crash and road characteristic database, the TTI researchers also acquired a supplemental database that included information related to crashes and companion roads in the State of Washington. This database, known as the Roadway Information Database (RID), includes sample data from several states that participated in a national naturalistic driving study.

Driver Exposure and Data

In addition to information unique to a crash condition and the site characteristics where the crash occurred, there is a need to be able to assess the magnitude of traffic conditions and volume (commonly referred to as exposure). For this benchmarking activity, three potential data sources can individually and collectively help to provide information about the vehicle miles traveled and their associated drivers. These three sources are the United States Census data (2014 update), the 2009 National Household Travel Survey (NHTS), and the 2015 TxDOT RHiNO file (previously referenced in the Texas summary). These three data sets are briefly reviewed in the following sections.

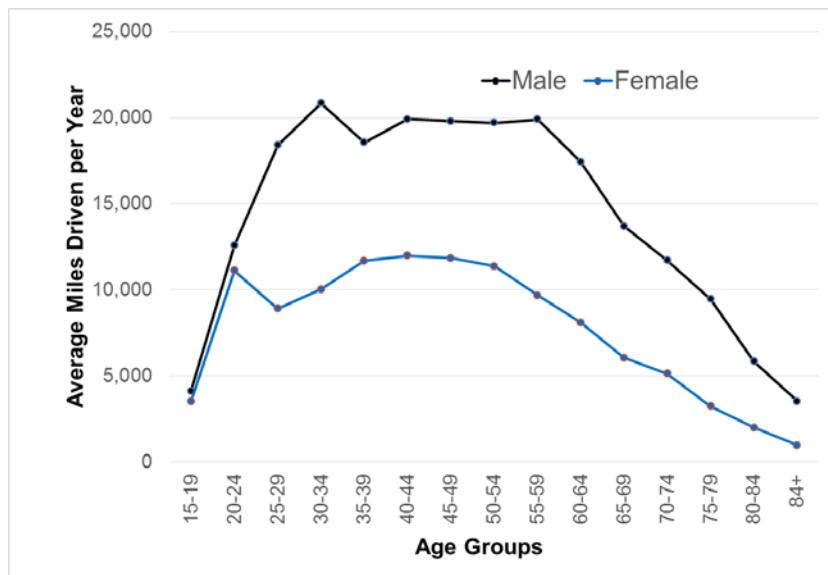
United States Census

As part of the United States census, a subset of participants are selected to complete a long form that requests information associated with general characteristics including gender, age, and population information. Though only a small portion of the population completes this long form, it is randomly selected in a manner so that the resulting information generally represents the larger population characteristics. This type of information can then be used to determine common population trends at a variety of defined geographic regions. For this study, the census data helped to supplement information related to the age and gender of drivers.

2009 NHTS

The United States Department of Transportation infrequently performs a National Household Travel Survey to determine trip patterns throughout the country. The most recently available NHTS data is from the year 2009. This database provides a rich source for assessing travel patterns and, similar to the census, is a random sample that is representative of the larger population. The data summarizes trips that occurred within a 24 hour period and includes information such as purpose of trip, means of transportation, travel time, time of day, day of week, and vehicle and driver characteristics (when applicable).

For this study, the NHTS data provided information about trip choice and distance of trips for participants. This information enabled an assessment of age and gender related to the specific type of trip. During the time period of the 2009 NHTS, the economy was in a recession and consequently the number of trips and the number of crashes were reduced. As the economy began to improve, the number of crashes (and presumably the number of trips) has increased. When considering information from the 2009 NHTS, therefore, the user should consider potential economic implications associated with the timing of the NHTS study. The NHTS also did not document the specific corridors where trips occurred and so this data cannot be extrapolated to apply to road types. Figure 2 shows the type of data that can be extracted from the NHTS data. Note that gender, age, and miles driven are key elements available in this data set. Table 8 in Appendix A contains the companion summary statistics.



Source: NHTS (2009)

Figure 2. Age, Gender, and Miles Driven for Texas Rural Roads

TxDOT RHiNO

The TxDOT RHiNO database primarily provides road characteristic information for every known road in Texas. As part of this information, the estimated traffic volume and corridor length is available. This data can be used to compute the estimated vehicle miles traveled for a variety of road types and regions. For this study, the TTI researchers developed the annual vehicle miles traveled (AVMT) for the road type classifications for the year 2015. This information is summarized in Table 2.

Table 2. Texas 2015 AVMT -- Based on Region and Functional Classification

FC Code	Functional Classification	Exposure (estimated AVMT)
1	Rural Interstate	17,046,232,374
2	Rural Other Freeway and Expressway	6,614,382
3	Rural Other Principal Arterial	21,976,176,632
4	Rural Other Minor Arterial	11,357,449,526
5	Rural Other Major Collector	12,189,208,769
6	Rural Other Minor Collector	1,835,064,999
7	Rural Local	4,478,692,780
Total Rural Values:		68,889,438,780 (say 68.9 billion)
Total Urban Values:		189,232,779,778 (say 189.2 billion)
Total Rural + Urban Values:		258,122,218,559 (say 258.1 billion)

Source: 2015 RHiNO

Many of the rural roads shown in Table 2 may have more than two lanes, and so the TTI team extended the exposure estimate to determine an approximate AVMT for rural two-lane roads in Texas. For the year 2015, there were **194,607.4 miles of rural two-lane roads in Texas**. This equates to an exposure of 33,597,489,925 (say 33.6 billion vehicle miles traveled).

Summary of Report Content

This introductory chapter provided information about the project scope and available data sources used to explore the benchmarking activity. In the three subsequent chapters, this report reviews information related to driver characteristics, vehicle characteristics, and road environment characteristics. The body of the report ends with a conclusions chapter that provides a high level review of the findings from this analysis and suggests potential future research to supplement this work. This report also includes a list of references and two appendices.

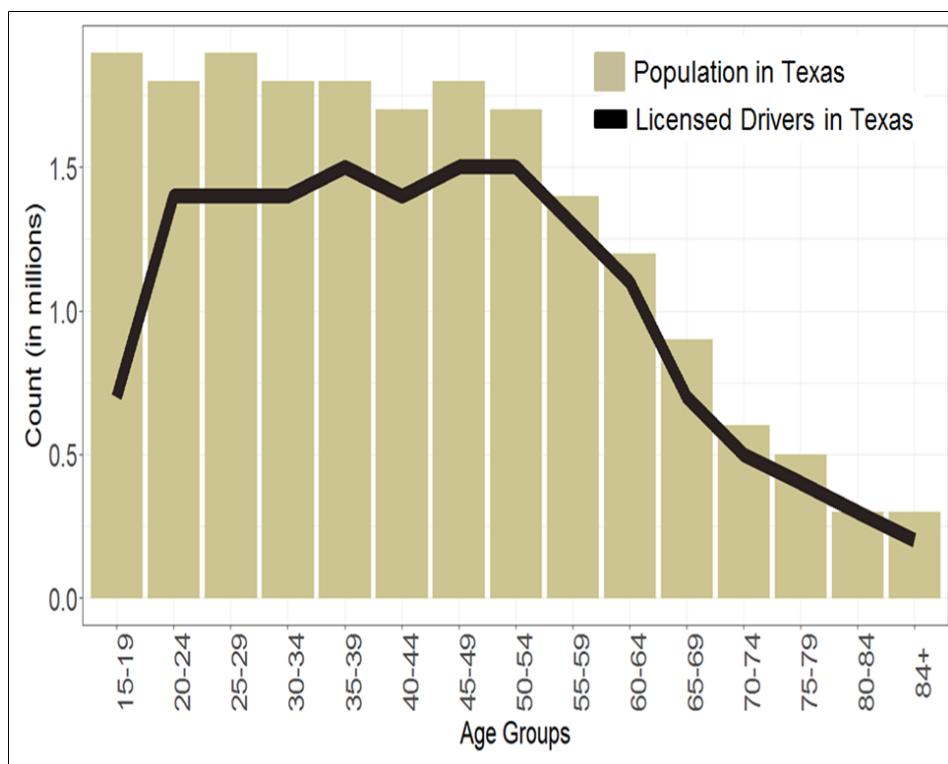
Appendix A provides supplemental data for the Texas statistics used throughout this report. Similarly, Appendix B provides information related to the Washington statistics.

DRIVER CHARACTERISTICS

Driver characteristics can include information related to a driver's age, gender, or actions associated with a crash. Ideally, an evaluation of the crash condition should particularly focus on the at-fault driver; however, often this information is not clearly documented in a crash report. In Texas, as an example, the reporting officer acquires information related to each driver and will usually list the at-fault driver as the first driver; however, this practice varies within the state. For this reason, the driver characteristic analysis assessed the overall driving population, reviewed licensed drivers and their characteristics, summarized driver information based on crashes in Texas, and then further assessed the drowsy driver characteristics. For contributing factor and driver condition information, this section further contrasts Texas driver characteristics to those for drivers in the State of Washington.

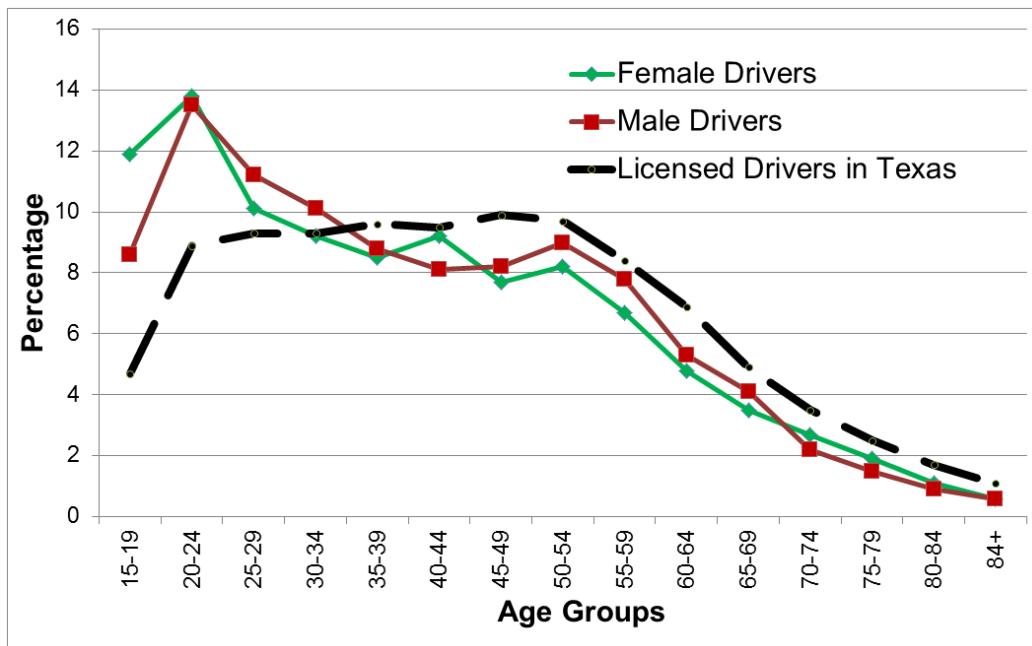
Texas Drivers and Crashes

Figure 3 contrasts the population in Texas (for ages 15 and older) to the number of licensed drivers in Texas. Appendix A contains companion summary statistics (see Table 9 and Table 10). As shown, the number of licensed drivers is closely associated with the size of the general population for age groups 20 and above. For rural conditions, Figure 4 further depicts how the age and gender of Texas drivers compare to the licensed drivers involved in severe crashes.



Source: USDOT (2010), U.S. Census (2014)

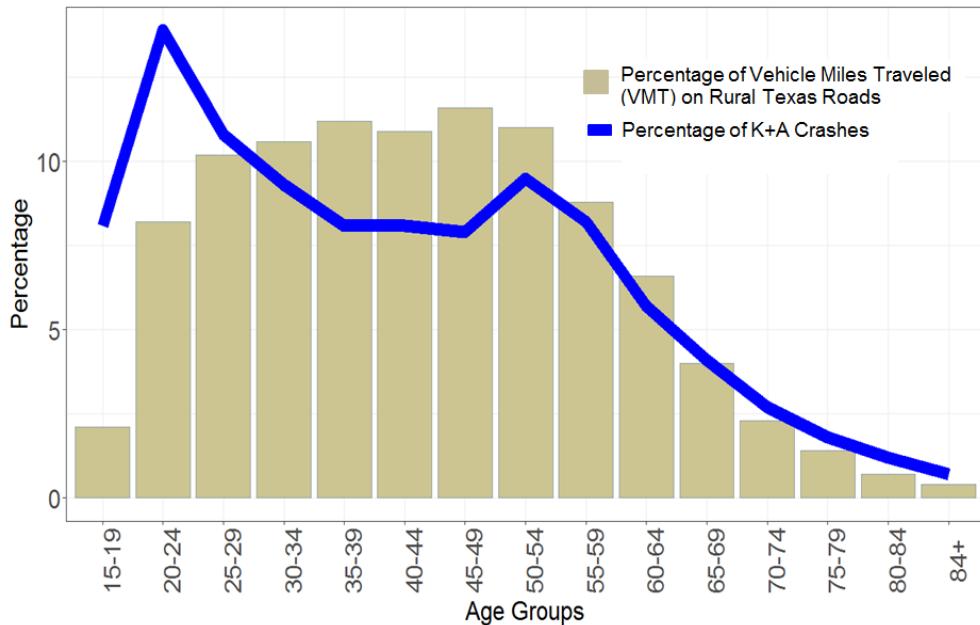
Figure 3. Population in Texas Contrasted to Licensed Drivers in Texas



Source: TX CRIS Data (2011-2015), USDOT (2010)

Figure 4. Comparison of Rural Severe (K+A) Crashes to Licensed Drivers in Texas

When comparing the rural percent of VMTs and driver age, it becomes clear that the percentage of severe crashes is disproportional for younger drivers (see Figure 5). Table 9 and Table 10 in Appendix A provide companion data. Drivers under the age of approximately 25 years tend to drive fewer miles but are also involved in a larger number of severe crashes.

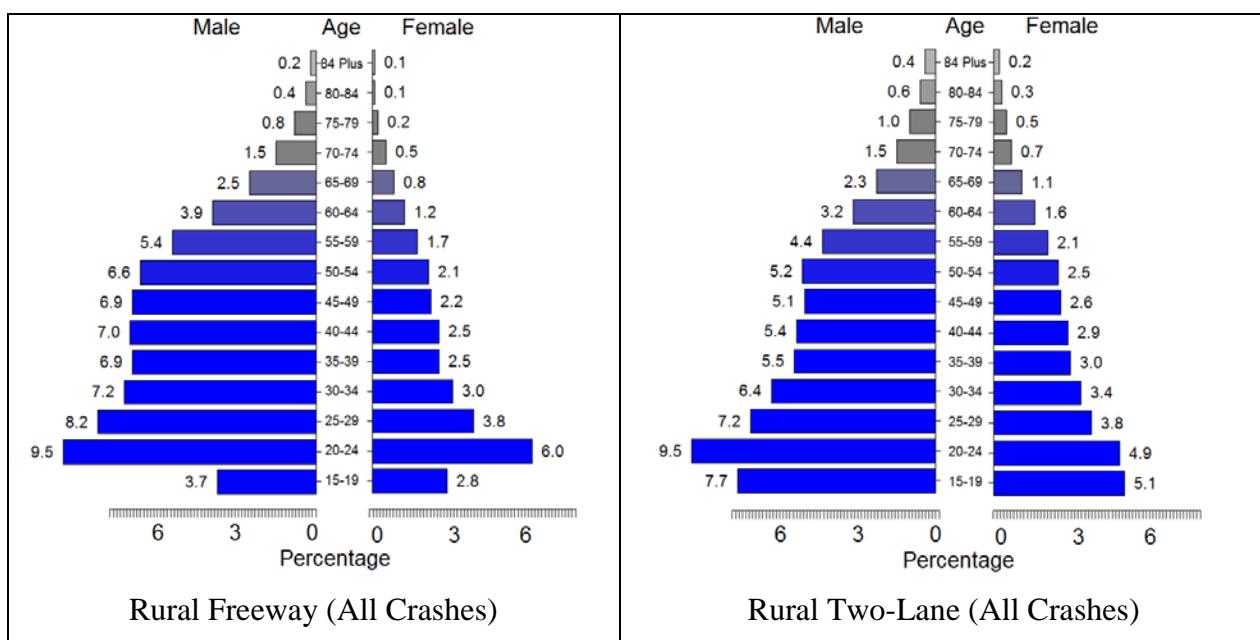


Source: TX CRIS Data (2011-2015), NHTS (2009)

Figure 5. Comparing Rural Severe (K+A) Crashes to Rural Travel in Texas

Age Groups and Gender

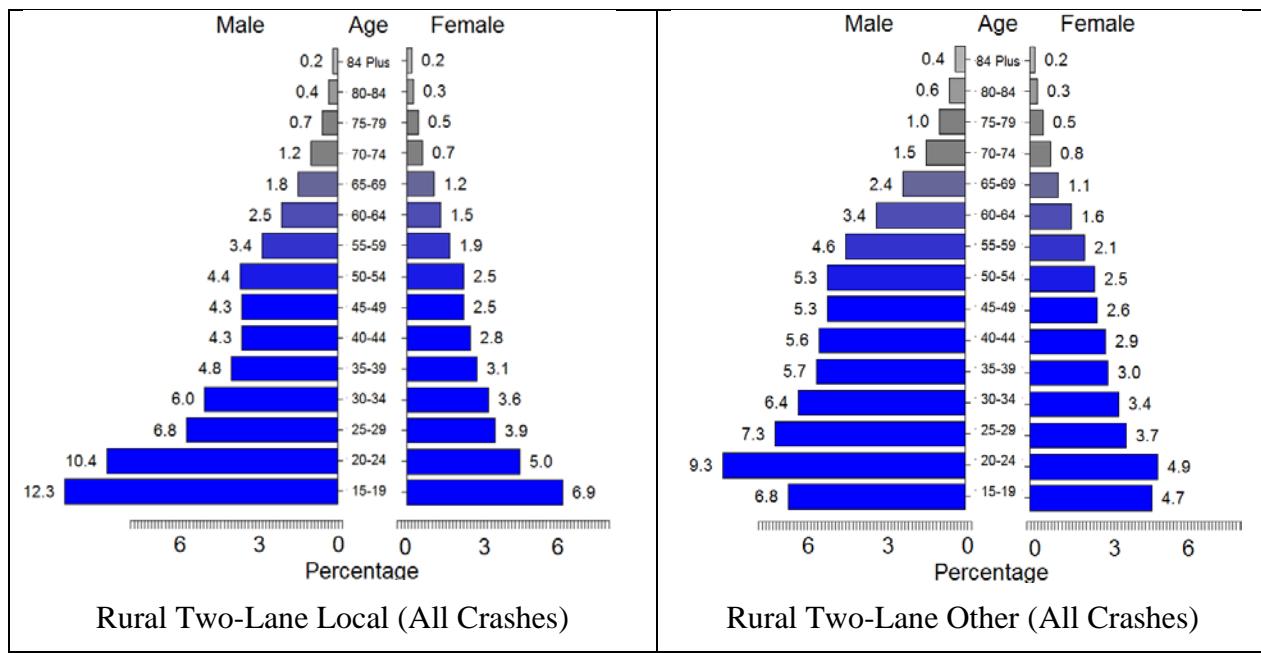
The age and gender of drivers involved in rural freeway and rural two-lane crashes in Texas is graphically depicted in Figure 6. Table 11 and Table 12 in Appendix A include the companion summary statistics for this figure. Though this graphic represents all involved drivers, the distribution is similar to the age and gender of the Driver 1 characteristics previously discussed. It is notable that drivers between the ages of 30 and 54 who are involved in a rural freeway or a rural two-lane highway have similar distributions with male drivers involved more than twice as often as their female counterparts. Drivers between the ages of 20 and 24 are involved more frequently in these rural crashes. This is particularly notable since they tend to drive fewer miles on these facilities (see Figure 5).



Source: TX CRIS Data (2011-2015)

Figure 6. Age and Gender of Texas Drivers Involved in Rural Freeway and Two-Lane Crashes

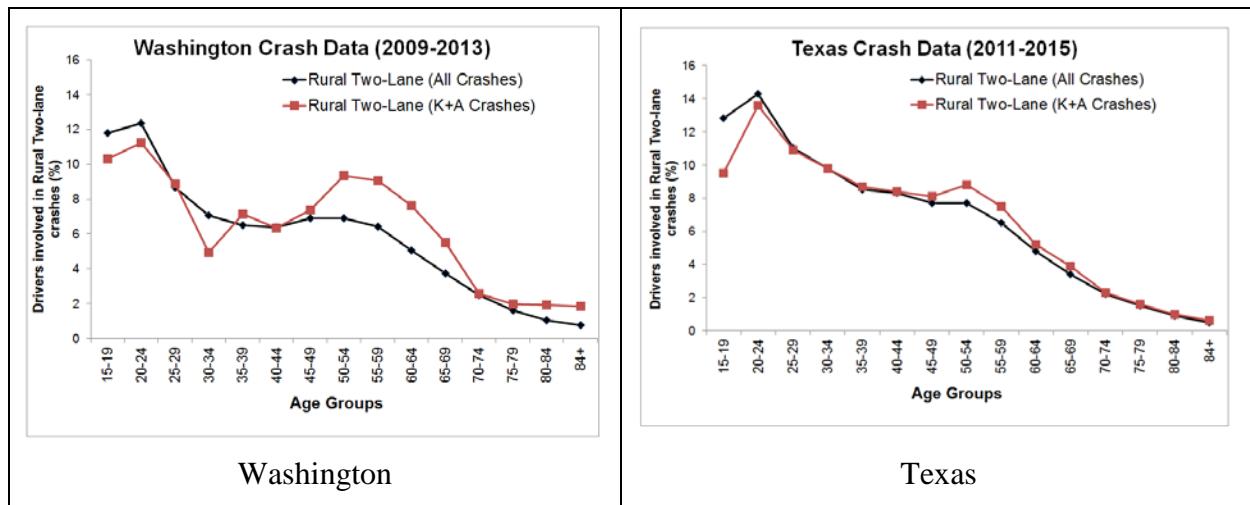
The rural two-lane road type can be further divided into rural local roads and other rural two-lane facilities. Figure 7 depicts the age and gender distribution for these two-lane road configurations. An alarming observation is the number of drivers between the ages of 15 and 19 who are involved in crashes on the local rural two-lane roads. Approximately 19 percent of these local road crashes involve drivers in this inexperienced age group with roughly 12 percent male and seven percent female involvement.



Source: TX CRIS Data (2011-2015)

Figure 7. Age and Gender of Texas Drivers Involved in Rural Two-Lane Crashes (Local and Others)

Figure 8 depicts the age distribution of drivers in Washington and Texas who were involved in rural two-lane crashes. The elevated involvement of younger drivers also occurred in Washington; however, Washington also experienced a greater increase in drivers between the ages of 50 and 59 than was observed for Texas.



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 8. Age of Drivers involved in Rural Two-Lane Highway Crashes (WA versus TX)

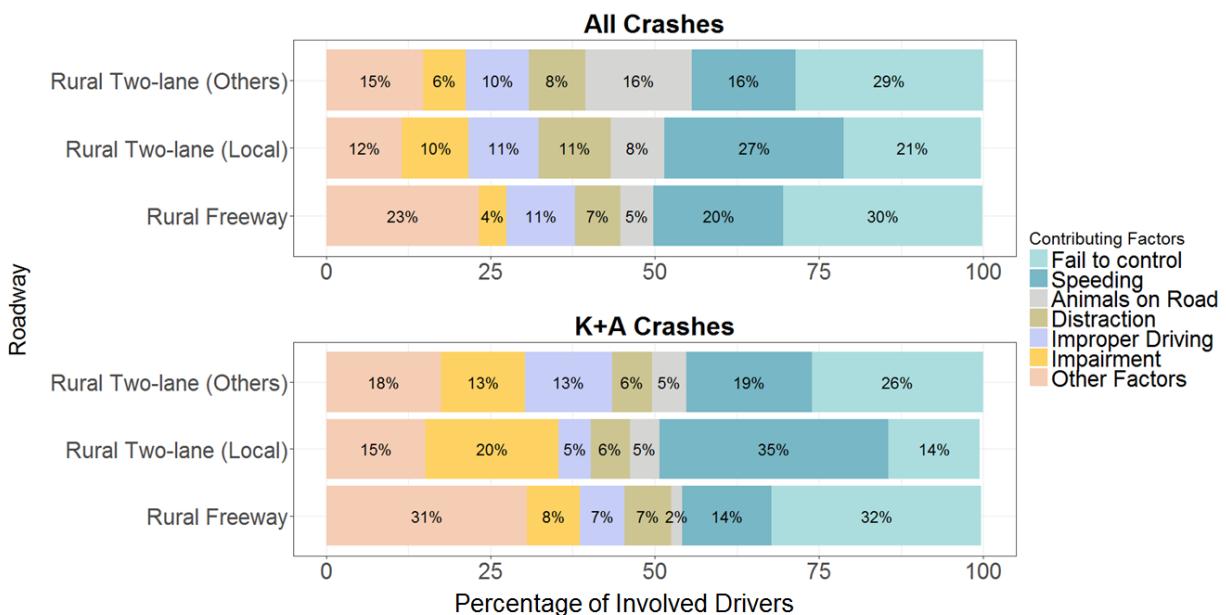
Contributing Factors

An assessment of contributing factors can help to further clarify possible driver-related actions that may have helped contribute to the crash condition. In an effort to assess regional differences, the TTI researchers evaluated contributing factors for Texas and then contrasted this information to Washington crashes.

Texas Only

Due to the disproportionate number of young drivers involved in the rural two-lane local roads, the Texas contributing factors are depicted for rural two-lane (others), rural two-lane local, and rural freeway (see Figure 9). Supporting tables for contributing factors are available in Appendix A for Texas crashes (see Table 13, Table 14, Table 15, and Table 16).

The *Fail to Control* and the *Speeding* factors collectively represent 45 to 50 percent of all crashes and 45 to 49 percent of all severe crashes. Impairment for rural two-lane local roads is 20 percent for severe crashes. This value can be contrasted to 13 percent for other rural two-lane roads and eight percent for rural freeways.



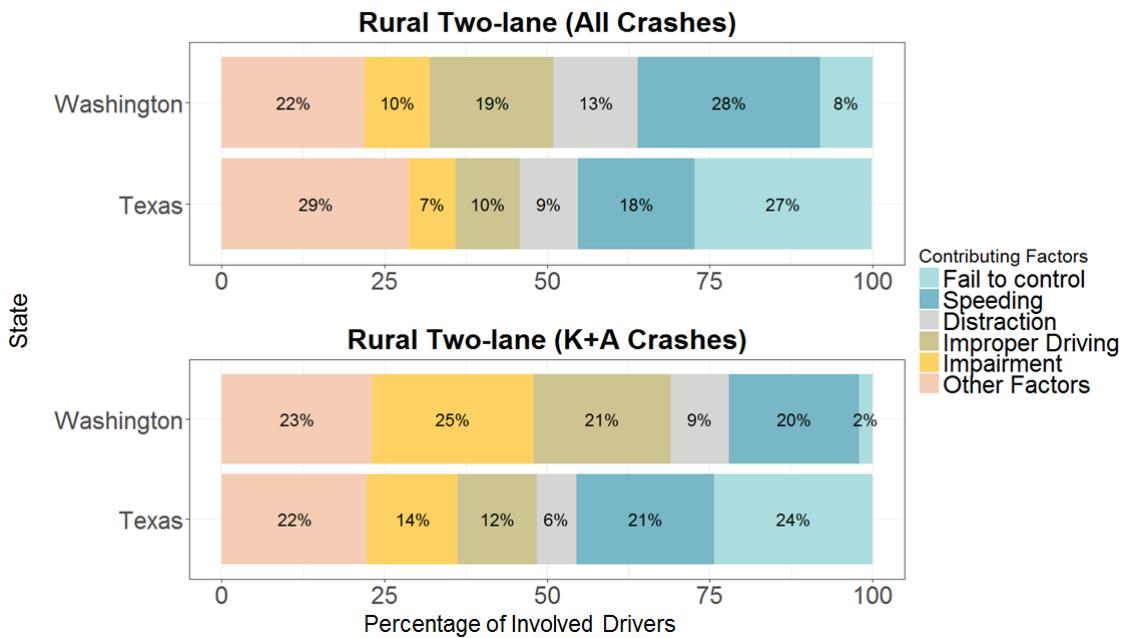
Source: TX CRIS Data (2011-2015)

Figure 9. Contributing Factors (All Drivers) for Texas Crashes at Rural Two-Lane and Freeway

Texas Contrasted to Washington

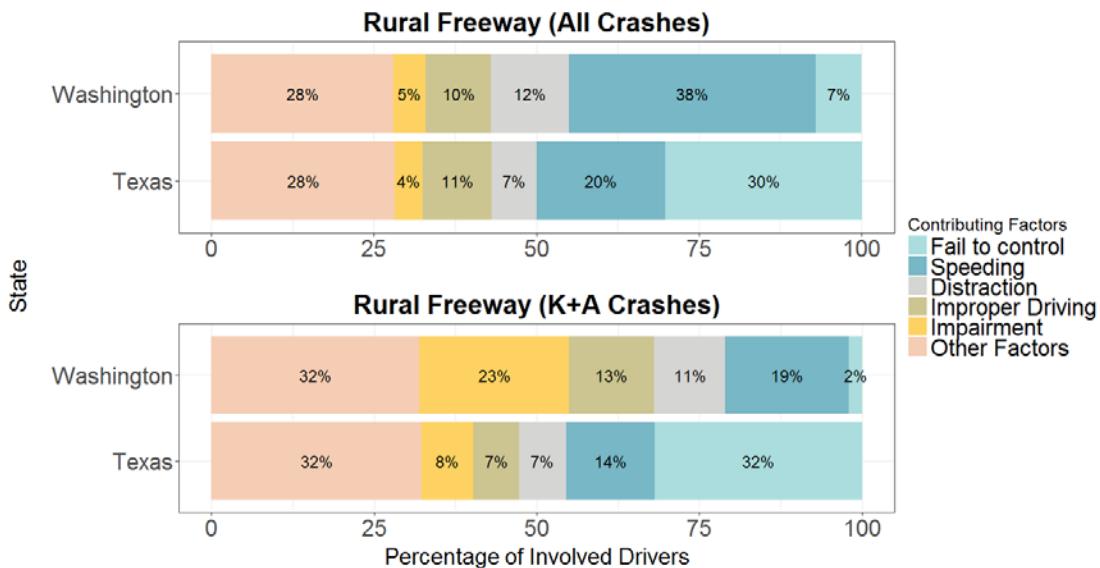
The Washington database does not provide sufficient information to subdivide the rural two-lane roads, but the Texas rural two-lane total crashes and the Texas rural freeway crashes can be compared to similar roadway facility crash conditions in Washington (see Figure 10 and Figure 11). The supporting table for the additional Washington data is included in Appendix B (see Table 45). The most notable difference between the contributing factors for the two

States is the elevated level of reported impairment for the Washington severe crashes on rural two-lane roads and rural freeways at 25 and 23 percent, respectively.



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 10. Contributing Factors for All Drivers Involved in Rural Two-Lane Highway Crashes (WA versus TX)



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

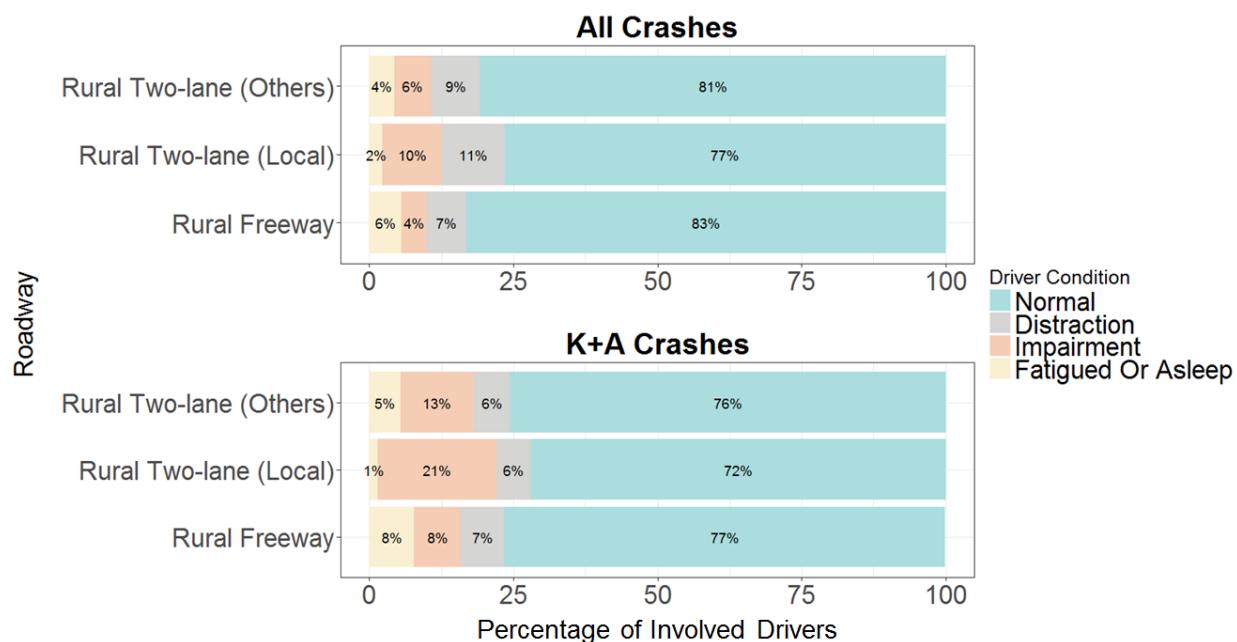
Figure 11. Contributing Factors for All Drivers Involved in Freeway Crashes (WA versus TX)

Driver Conditions

An assessment of driver conditions can also provide insights into possible actions that may have contributed to the crash condition. This information is presented first as the Texas-specific observations and then contrasted to similar crash data driver conditions for the State of Washington.

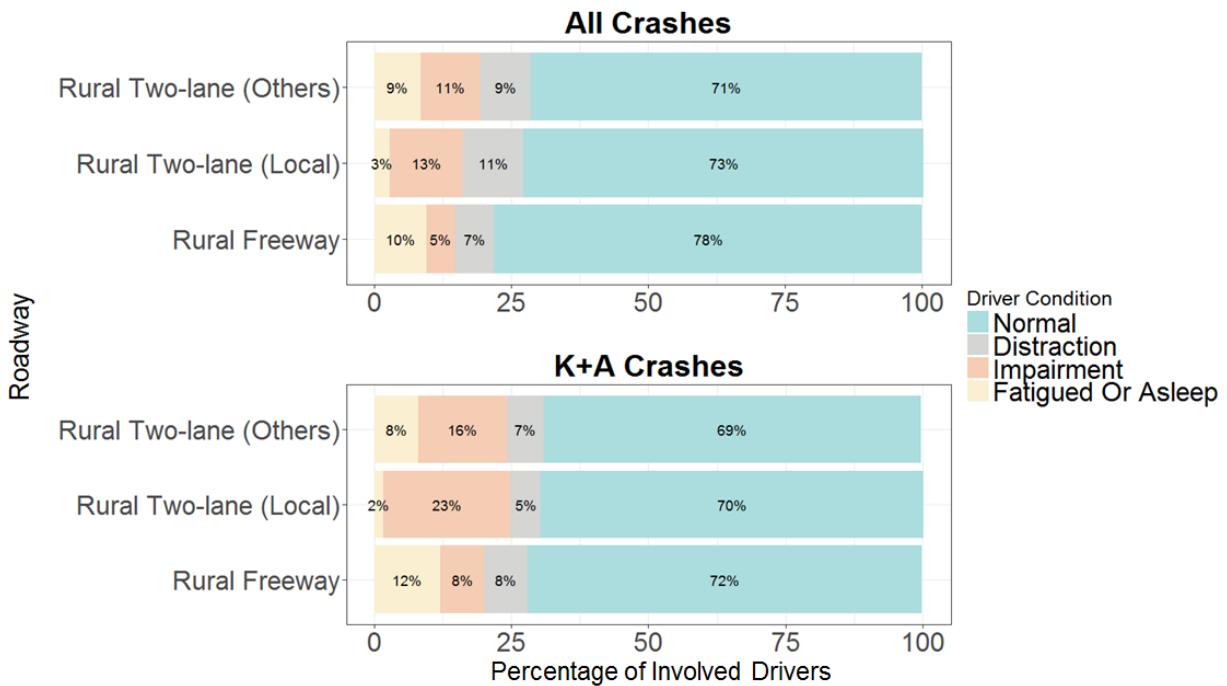
Texas Only

For the Texas driver condition categories, the TTI researchers grouped the data into categories defined as normal, distraction, impairment, and fatigued or asleep. The individual driver condition factors included in each of these categories are summarized in detail in the supporting tables located in Appendix A (see Table 17, Table 18, Table 19, and Table 20). As can be observed in the supporting tables, a large number of the driver condition fields were not populated in the crash data (noted in the tables as “Undetermined Driver Condition”). For the known driver conditions characteristics, however, approximately 70 to 80 percent of the crashes occurred during “Normal” driver conditions. The heightened proportion of impaired drivers for severe crashes at rural two-lane local roads was again noted as disproportionate with 21 percent of the crashes associated with this characteristic (see Figure 12). As shown in Figure 13, an examination of single vehicle only crashes shows that 10 to 12 percent of the at-fault driver in these single vehicle crashes were fatigued or asleep. The drowsy driver condition is further reviewed later in this chapter (see page 22).



Source: TX CRIS Data (2011-2015)

Figure 12. Driver Condition (All Drivers) for Texas Crashes at Rural Two-Lane and Freeway

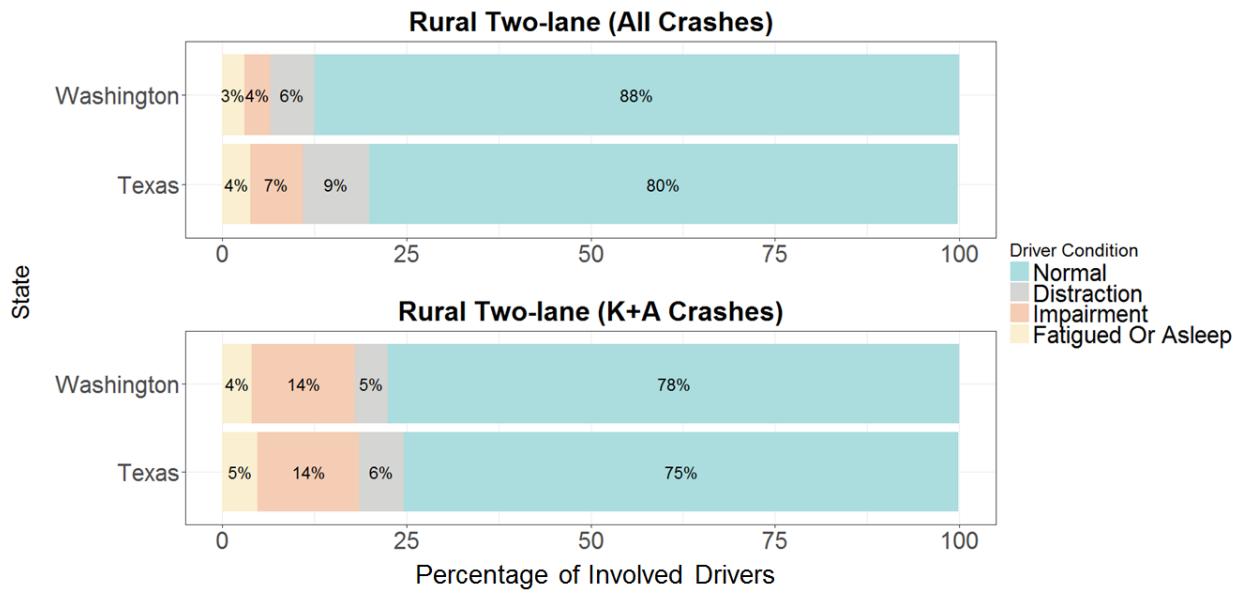


Source: TX CRIS Data (2011-2015)

Figure 13. Driver Condition (All Drivers) for Single Vehicle Texas Crashes at Rural Two-Lane and Freeway

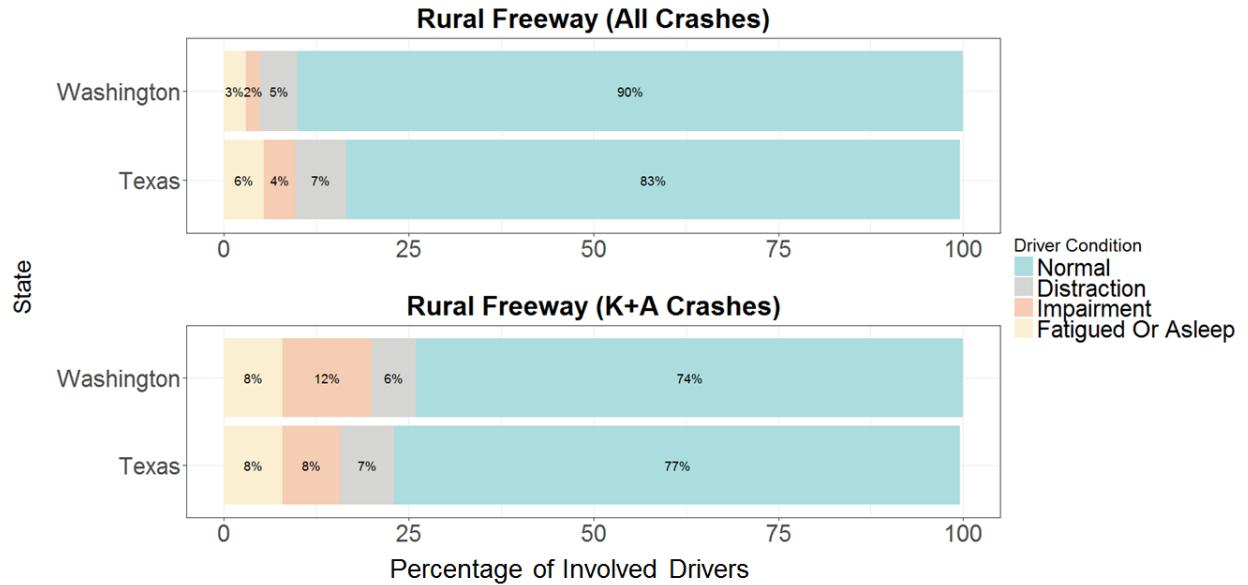
Texas Contrasted to Washington

Graphic representations of the driver conditions for crashes in the State of Washington and contrasted to crashes for similar Texas facility types is shown in Figure 14 (rural two-lane roads) and Figure 15 (rural freeways). The comparison of driver conditions for severe crashes provides very similar results. For total crash comparisons, the “Normal” driver conditions were reported more frequently for Washington than for Texas. The supporting table for the additional Washington data is included in Appendix B (see Table 46).



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 14. Condition for All Drivers Involved in Two-Lane Highway Crashes (WA versus TX)



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 15. Condition for All Drivers Involved in Freeway Crashes (WA versus TX)

Other Driver Factors – Texas Only

Crash data from the State of Texas includes an *Other Driver Factors* variable that indicates if the driver's attention was diverted from the driving task, or if the driver lost control or skidded. In addition, an *Other Factors* category includes a variety of driver maneuvers. For detailed information regarding these Texas *Other Factors*, refer to Appendix A (see Table 21, Table 22, Table 23, and Table 24). An assessment of driver conditions can also provide insights into possible actions that may have contributed to the crash condition. This information is only presented as the Texas-specific observations because Washington crash categories do not align with this Texas category. Based on an initial inspection of Figure 16, it is apparent that drivers who lost control or skidded combined with drivers whose attention may have been diverted from driving made up approximately 18 percent of the total number of crashes on the two-lane facilities. Similarly, 14 to 19 percent of the severe crashes on rural two-lane roads occurred due to a driver's diverted attention and/or a location where the driver simply lost control. For rural freeways, approximately 26 to 27 percent of the total and the severe crashes occurred due to diverted attention and/or loss of control.

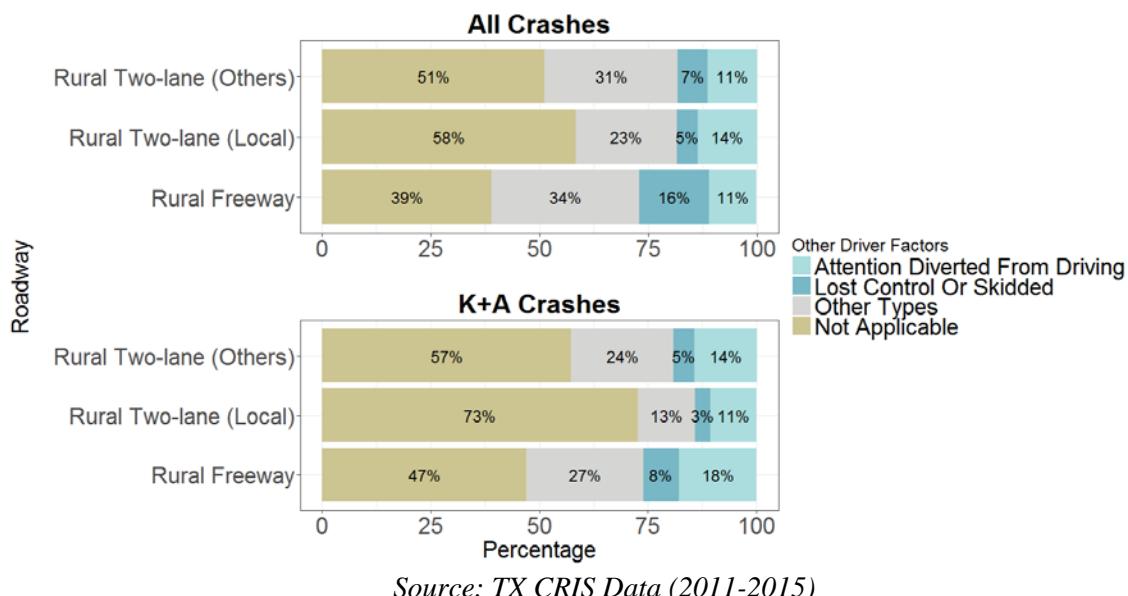


Figure 16. Other Driver Factors for Texas Crashes at Rural Two-Lane and Freeway

Drowsy Driver Characteristics

At the request of MOBIS researchers, the TTI team further explored characteristics directly related to the drowsy driver. The Texas crash database does not clearly define the at-fault driver (generally assumed to be Driver 1), so an evaluation of crashes that involved only one vehicle can help specifically evaluate the at-fault driver for these single vehicle collisions. For the purposes of this analysis, a drowsy driver is defined by one of the following driver factors: Driver inattention, distraction in vehicle, fatigues or asleep. For crashes that were noted as having a driver who was drowsy or not alert, several common characteristics also occurred

including other driver factors (Figure 17), driver age (Figure 18), and posted speed limit trends (Figure 19).

Other Driver Factors	All Crashes				K+A Crashes			
	Rural Two-lane (Others)	Rural Two-lane (Local)	Rural Two-lane	Rural Freeway	Rural Two-lane (Others)	Rural Two-lane (Local)	Rural Two-lane	Rural Freeway
Attention Diverted From Driving	62.1	62.8	62.2	58.0	62.4	59.2	62.0	63.0
Not Applicable	28.0	26.2	27.6	24.8	29.0	33.8	29.6	24.9
Construction - Within Posted Road Construction Zone	2.2	0.2	1.7	5.2	2.3	--	2.0	3.6
Lost Control Or Skidded	1.6	1.3	1.6	5.0	0.5	0.9	0.5	1.7
Swerved Or Veered-Reason Not Specified	1.2	0.9	1.1	1.2	2.2	0.5	1.9	1.4
Swerved Or Veered - Avoid Vehicle Stopped Or Moving Slowly	1.1	0.1	0.9	1.5	0.7	--	0.6	2.0
Other Types	3.8	8.6	4.9	4.2	3.1	5.6	3.4	3.4

(In percentage)

Note: Other Driver Factors (CRIS Code: OTHR_FACTR_ID) is a variable of Crash Table.

Source: TX CRIS Data (2011-2015)

Figure 17. Drowsy Drivers and Other Common Driver Factors for Single Vehicle Crashes in Texas

As shown in Figure 17, the most common driver factor that occurred when a single vehicle crash driver was designated as drowsy was the *Attention Diverted From Driving* variable with this attention issue linked to approximately 58 to 63 percent of the drowsy driving crashes. Another notable common characteristic is driver age (see Figure 18) with the drivers aged 20-24 followed by the younger 15 to 19 age group as the most common age categories that occurred for single vehicle drowsy drivers.

Driver Age	All				K+A			
	Rural Two-lane (Others)	Rural Two-lane (Local)	Rural Two-lane	Rural Freeway	Rural Two-lane (Others)	Rural Two-lane (Local)	Rural Two-lane	Rural Freeway
15-19	17.7	20.4	18.3	11.1	14.3	18.5	14.9	10.4
20-24	20.9	18.4	20.3	22.1	18.7	12.2	17.9	16.9
25-29	11.8	10.6	11.6	13.1	11	11.7	11.1	9
30-34	9.2	9	9.1	9.5	8.1	13.7	8.8	7.9
35-39	6.5	7.9	6.8	7.7	6.5	7.8	6.7	9.3
40-44	6.2	5.8	6.1	7	7	7.3	7	9
45-49	5.8	6.1	5.9	7	6.1	5.4	6.1	10.4
50-54	5.8	6	5.9	6.7	7.6	10.2	7.9	7.6
55-59	5.1	5	5	5.1	6.4	4.9	6.2	7.3
60-64	3.7	3.8	3.8	3.7	5.2	1.5	4.8	4.5
65-69	2.5	2.7	2.6	3	3.5	3.4	3.5	3.1
70-74	1.9	1.7	1.8	1.9	2.4	1.5	2.3	3.4
75-79	1.3	1.3	1.3	1.1	1.7	1.5	1.7	1.1
80-84	0.9	0.8	0.9	0.8	0.9	0	0.8	0
85+	0.5	0.6	0.5	0.1	0.3	0.5	0.4	0

(In percentage)

Source: TX CRIS Data (2011-2015)

Figure 18. Drowsy Driver and Age for Single Vehicle Crashes in Texas

Posted Speed	All Crashes				K+A Crashes			
	Rural Two-lane (Others)	Rural Two-lane (Local)	Rural Two-lane	Rural Freeway	Rural Two-lane (Others)	Rural Two-lane (Local)	Rural Two-lane	Rural Freeway
0-30 mph	3.5	37.3	11.0	0.4	1.3	23.4	4.2	0.3
30-40 mph	3.7	29.6	9.5	0.1	2.5	31.6	6.2	0.0
40-50 mph	6.6	12.9	8.0	0.3	5.7	16.3	7.1	0.0
50-60 mph	36.7	19.5	32.9	2.0	32.8	27.3	32.1	2.3
> 60 mph	49.4	0.7	38.6	97.2	57.7	1.4	50.5	97.4

(In percentage)

Source: TX CRIS Data (2011-2015)

Figure 19. Drowsy Driver and the Posted Speed Limit for Single Vehicle Crashes in Texas

Finally, the linkage between the posted speed limit and the drowsy driver condition provides insights into single vehicle crashes. For rural two-lane (other) and rural freeway locations, drowsy drivers involved in single vehicle crashes generally use facilities with posted speed limits of 50 mph or greater, while the rural local crashes tend to occur on the lower speed corridors. This trend may simply be indicative of the available posted speed limits, but does suggest that the higher number of rural two-lane local crashes are occurring on these lower speed limit facilities.

Chapter Summary

This chapter evaluated driver characteristics and how they relate to crashes on rural two-lane and rural freeway facilities in the States of Texas and Washington. An inspection of the driver characteristics indicated that younger drivers are over represented in severe as well as total crashes. In Texas, new drivers (ages 19 or younger) are involved in more rural two-lane local crashes than they are in crashes at other rural two-lane or rural freeway locations. Drivers in the age group of 20 to 24 drive fewer miles on rural roads and so their heightened involvement in crashes on these facilities is notable. In general, male drivers were involved in approximately twice as many crashes as female drivers for Texas rural facilities.

Speeding and Failed to Control represent approximately 50 percent of the contributing factors for crashes at rural two-lane and freeway locations. For single vehicle crashes, approximately 10 to 12 percent of the at-fault drivers were fatigued or asleep.

Crash conditions linked to drowsy drivers include attention diverted from driving, driver age, and posted speed limit facilities. Most notable is that the younger drivers tend to be over represented in the drowsy driving category.

MOTOR VEHICLE CHARACTERISTICS

In addition to the driver characteristics, the number and type of vehicles can potentially contribute to the frequency and severity of crashes. This chapter first summarizes the distribution of registered vehicles in the State of Texas and then reviews the relationship between the vehicle type and the crash condition.

Texas Vehicle Types and Crashes

In 2015, there were approximately 23 million registered motor vehicles in the State of Texas. Of this value, 94 percent of the vehicles were either cars, pickups, sport utility vehicles (SUVs), or vans. As shown in Table 3, the number of pickups, SUVs, and vans represented 36 percent of all registered vehicles. This information can be used in concert with the number of crashes that involve this vehicle population to determine if the vehicle type has any unique issues related to crashes in Texas.

Table 3. Registered Vehicles in Texas (as of 2015)

Vehicle Types	Registered Vehicles	Percentage (%)
Car	13,288,425	58
Pickup/SUV/Van	8,290,273	36
Motorcycle	375,853	2
Bus/Truck/Trailer	217,209	1
Other types	862,397	4

Source: Texas Department of Motor Vehicles (Number of Registered Vehicles). Available at http://www.txdmv.gov/reports-and-data/cat_view/13-publications/25-reports-data/65-vehicle-titles-registration/229-number-of-vehicles-registered. Accessed on March 1, 2017.

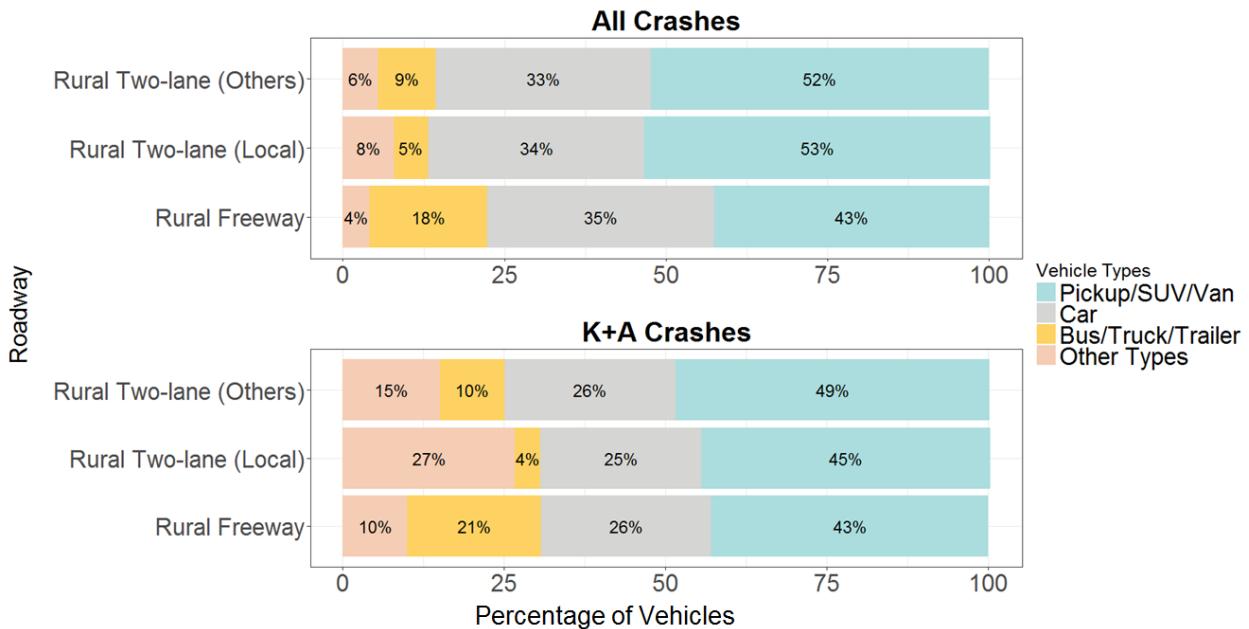
Vehicle Types

The involvement of unique vehicle types in crashes can have a direct impact on the crash type and level of severity. This information is presented first as the Texas-specific observations and then contrasted to similar vehicle type characteristics for the State of Washington.

Texas Only

The Texas vehicle type categories and their relationship to total crashes or severe crashes are depicted in Figure 20. The individual vehicle types are further documented for Texas-specific crashes in Appendix A (see Table 25, Table 26, Table 27, and Table 28). As previously observed in Table 3, 58 percent of the registered vehicles in Texas are passenger cars while 36 percent of the registered vehicles belong to the pickup, SUV, and van category. By contrast, almost 43 to 53 percent of all crashes at rural two-lane and rural freeway locations involved pickups, SUVs, and vans. For severe crashes, this vehicle type accounts for 43 to 49 percent of the involved vehicles. An additional observation worth note is the larger percentage of buses, trucks, or trailers that occur at rural freeway locations. This equates to 18 percent of the

vehicles for all crashes and 21 percent of the vehicles for severe crashes at these rural freeway locations.

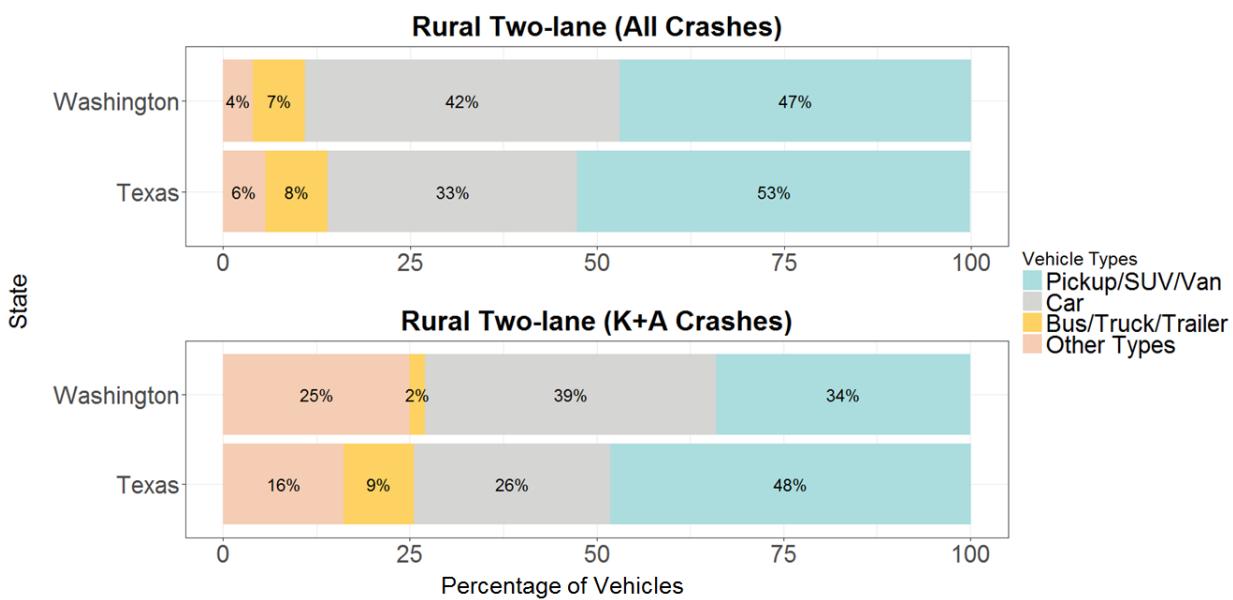


Source: TX CRIS Data (2011-2015)

Figure 20. Vehicle Types for Texas Crashes at Rural Two-Lane and Freeway

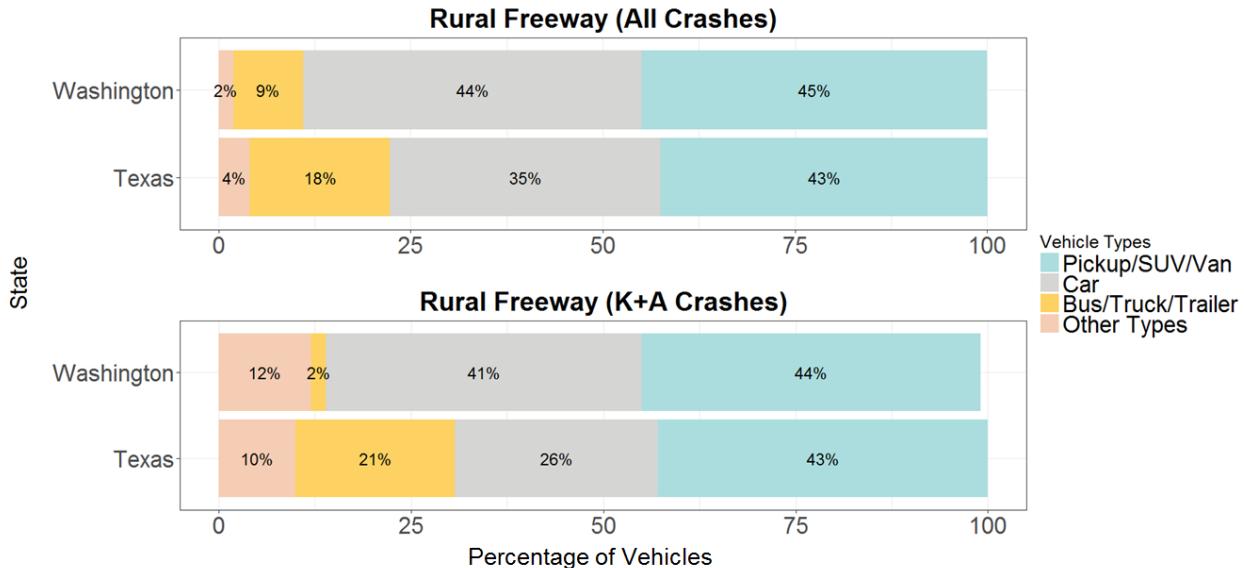
Texas Contrasted to Washington

Figure 21 and Figure 22 graphically depict the vehicle type for rural two-lane and rural freeway locations, respectively, for the State of Washington contrasted to Texas crash conditions. The supporting tables for the additional Washington data are included in Appendix B (see Table 47 and Table 48). The overrepresentation of pickups, SUVs, and vans in Washington is not as significant as observed in Texas. In Washington the percent of passenger cars involved in crashes is approximately equivalent to the percent of crashes involving pickups, SUVs, or vans. For rural freeway locations, the percent of buses, trucks, and trailers are substantially larger for Texas locations than their Washington counterparts. As an example, the percentage of buses, trucks, and trailers involved in severe crashes was two percent in Washington and 21 percent in Texas at rural freeway locations (see Figure 22).



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 21. Vehicle Types for Rural Two-Lane Highway Crashes (WA versus TX)



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 22. Vehicle Types for Rural Freeway Crashes (WA versus TX)

Chapter Summary

This chapter evaluated vehicle type characteristics and how they relate to crashes on rural two-lane and rural freeway facilities in the States of Texas and Washington. In general, the percentage of passenger cars make up approximately 58 percent of the registered vehicles in Texas, yet the number of crashes associated with passenger cars is less than the number of crashes associated with pickups, SUVs, and vans. In addition, the number of heavy vehicles (i.e.

buses, trucks, and trailers) are much greater at rural freeway locations in Texas than in Washington.

ROAD ENVIRONMENT CHARACTERISTICS

The roadway network includes a variety of design elements that individually or collectively may influence safety performance. For this study, MOBIS researchers selected rural freeways and rural two-lane highways as target roadways to evaluate. Within these facilities, many potential roadway characteristics or environmental factors can influence how a driver or vehicle may perform due to an unexpected event that results in a crash. The goal of this chapter, therefore, is to assess the influence of the road environment on the crash condition. This content includes general characteristics of the target facilities, and then further evaluates factors such as the collision types, roadside obstructions, roadway shoulders, roadway surface, and weather conditions,

Texas Road Environment and Crashes

Prior to reviewing unique crash condition elements and how they relate to crashes in Texas and Washington, it is beneficial to first review the roadway networks related to these roads and evaluate the appropriate analysis level. As shown in Figure 23, the rural Texas freeway network and the rural two-lane roadway network include a large number of Texas roadway facilities where crashes could occur. For this figure, the red dots represent a fatal or injury crash that occurred during the study period (2011 to 2015). Similarly, Figure 24 depicts these severe rural freeway and rural two-lane severe crash conditions for the State of Washington.

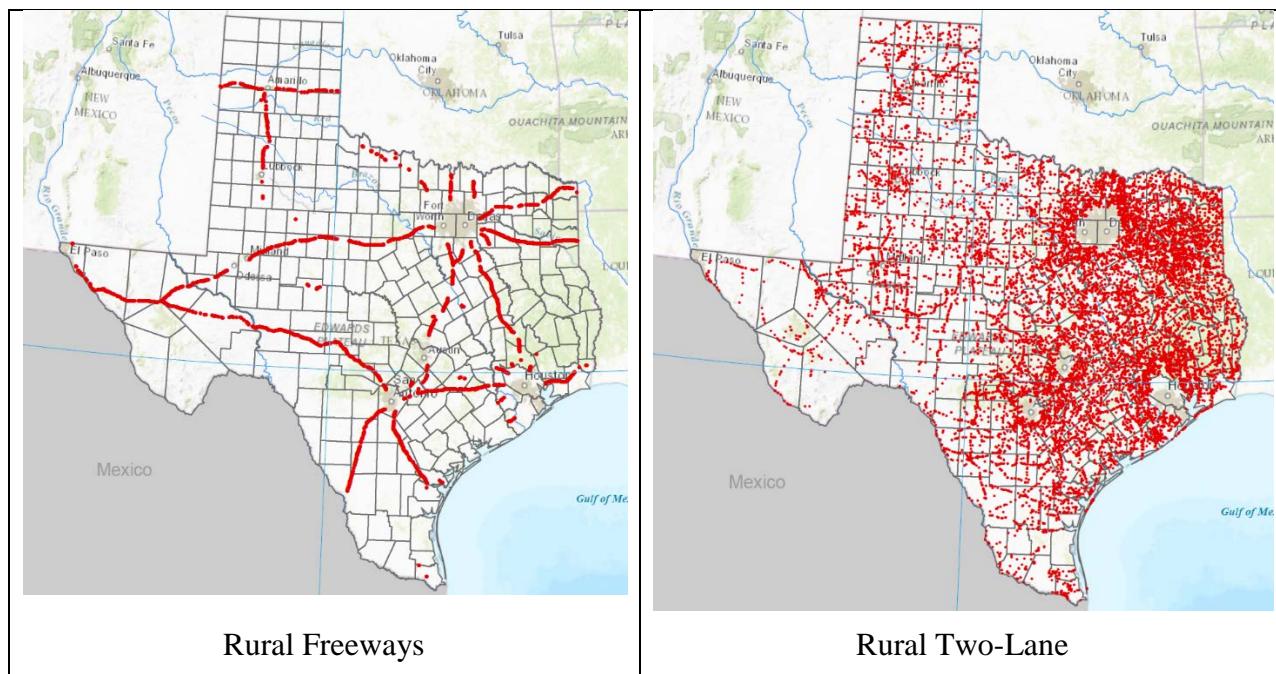


Figure 23. Texas Locations of Severe (K+A) Crashes

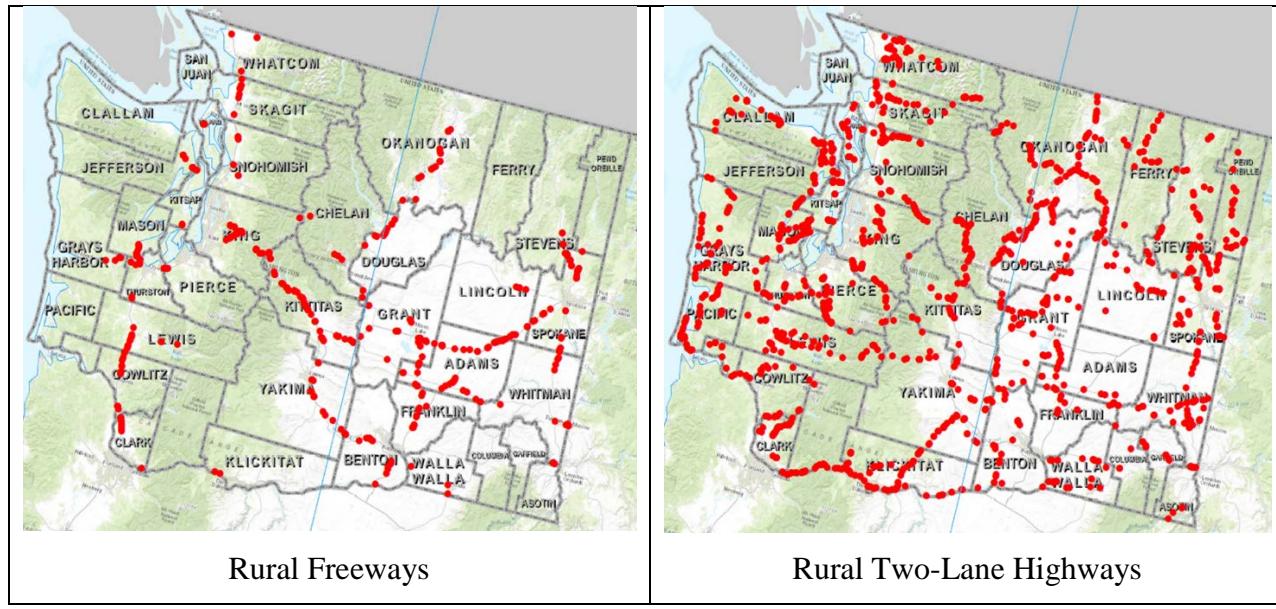


Figure 24. Washington Locations of Severe (K+A) Crashes

The identification of rural freeways in Texas and in Washington is relatively straightforward since this road category is reported directly in the crash database. For the rural two-lane facilities, however, Washington data does not provide sufficient information to enable any subdivision of these facilities. For Texas rural two-lane roads, however, crash data can be used to determine if the rural two-lane road is a local road or some other type of road. This distinction appears to be important since the local roads are often over represented by crashes involving run-off-road activities or crashes associated with very young drivers. Due to these two observations, team members further subdivided the Texas rural two-lane highways into these two categories. Figure 25 depicts these rural two-lane local roads in Texas. The darker lines represent facilities that are owned and maintained by the Texas Department of Transportation. The lighter lines indicate local road facilities that are maintained by a town or a county since they are not part of the state roadway system. Figure 26 shows an example state-maintained rural two-lane roadway compared to a locally-maintained rural two-lane highway. The shoulder treatment for these two roads is one obvious difference.

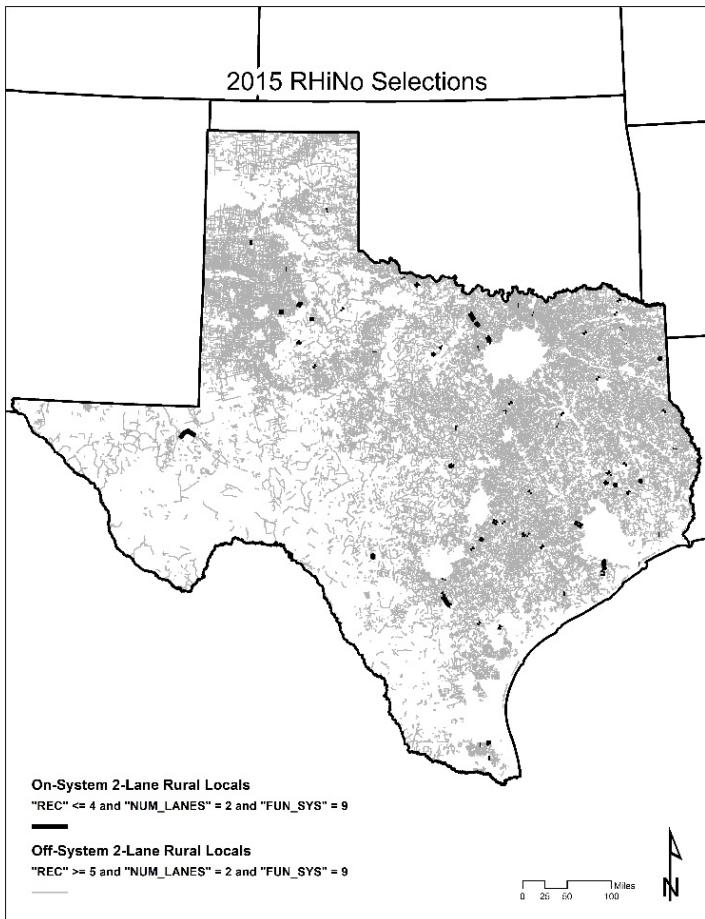


Figure 25. Texas Rural Two-Lane Local Roads



Figure 26. Example Rural Two-Lane Road Configurations

Collision Types

The relationship of collision types to crashes can help determine common road environment features that may introduce challenges for the traveling public. The following section presents this information for specific Texas conditions. This information is presented first as Texas-specific observations for rural two-lane roads and rural freeways. This Texas information is then contrasted to Washington collision type information, when available, so that regional differences can be assessed.

Texas Only

The Texas collision types can be broadly classified as *One Motor Vehicle, Same Direction*, and *Other Types*. Figure 27 graphically depicts these three general collision type categories. Additional detailed collision type information for Texas crashes is located in Appendix A (see Table 29, Table 30, Table 31, and Table 32). The percent of single vehicle crashes is equivalent to 61 to 67 percent of total and severe crashes at rural two-lane (other) locations as a rural freeway locations. This high percentage of crashes involving only one vehicle represents a substantial concern for these rural crash locations. Of greater concern, however, is the percent of these single vehicle crashes at rural local two-lane roads where 75 percent of all crashes involve only one motor vehicle and 87 percent of the severe crashes are single vehicle crashes.

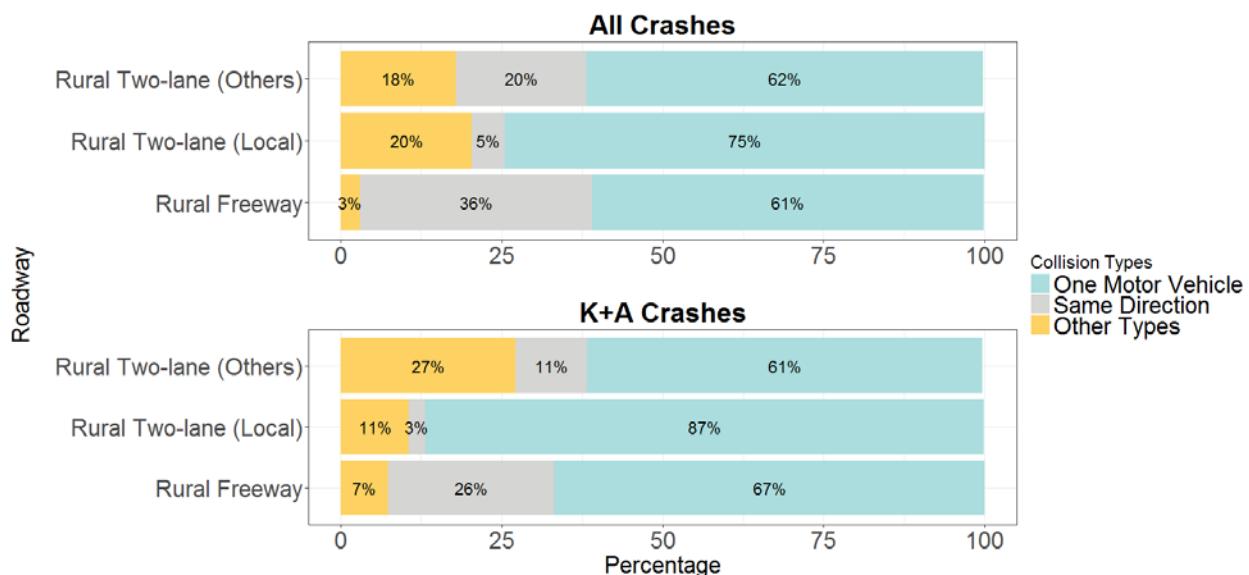
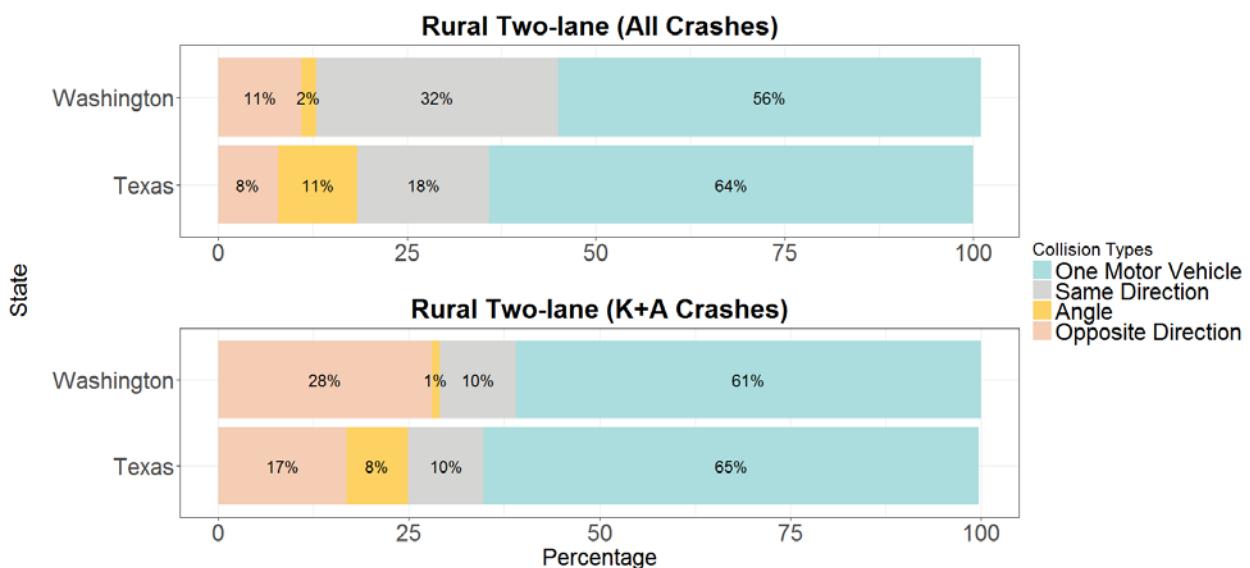


Figure 27. Collision Types for Texas Crashes at Rural Two-Lane and Freeway

Texas Contrasted to Washington

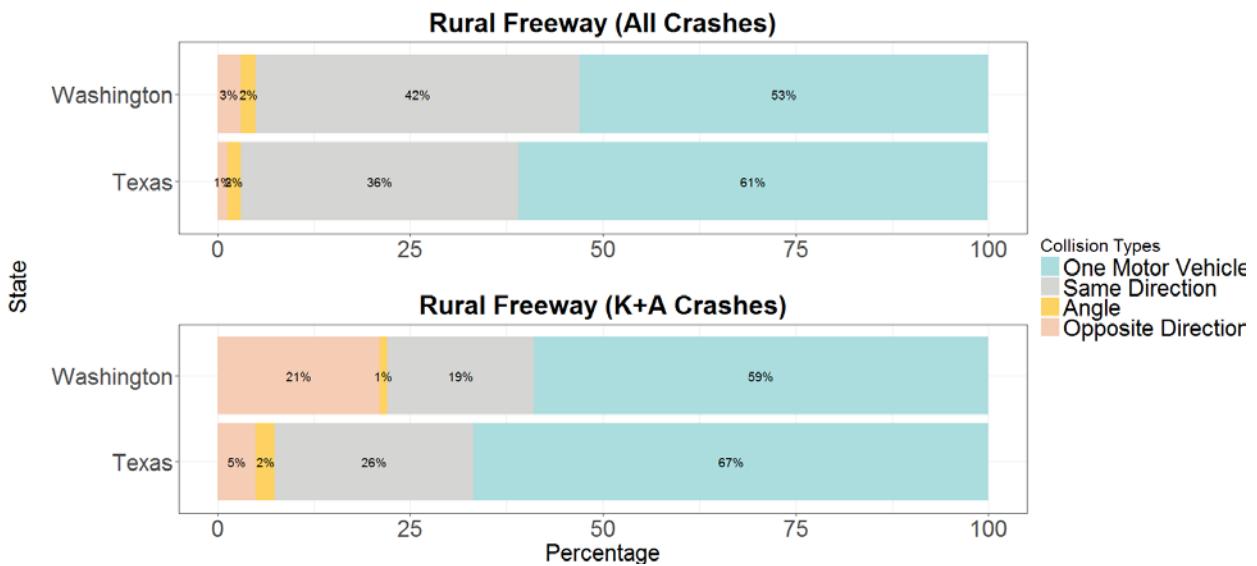
As noted previously, the Washington data format does not permit an assessment of two-lane local roads, and so the comparison of Washington collision types to Texas collision types does not include an assessment of the two-lane local conditions noted in the previous section. As shown in Figure 28 and Figure 29, the percent of single vehicle crashes at rural two-lane highways and rural freeways is slightly larger for the overall values observed for Texas. In addition, the collision types are represented as four categories: one motor vehicle, same direction crashes, angle crashes, and opposite direction crashes. For additional detailed Washington information supporting these two figures, refer to Appendix B (see Table 49 and Table 50).

As a general trend, the Texas collision types for one motor vehicle and angle crashes tend to be slightly elevated when compared to Washington rural two-lane and rural freeway crashes. In contrast, Washington opposite direction crashes occurred more often than their Texas counterparts. Finally, the percent of same direction crashes varies for the Washington facilities when compared to the Texas rural two-lane roadways and rural freeways.



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 28. Collision Types for Rural Two-Lane Highway Crashes (WA versus TX)

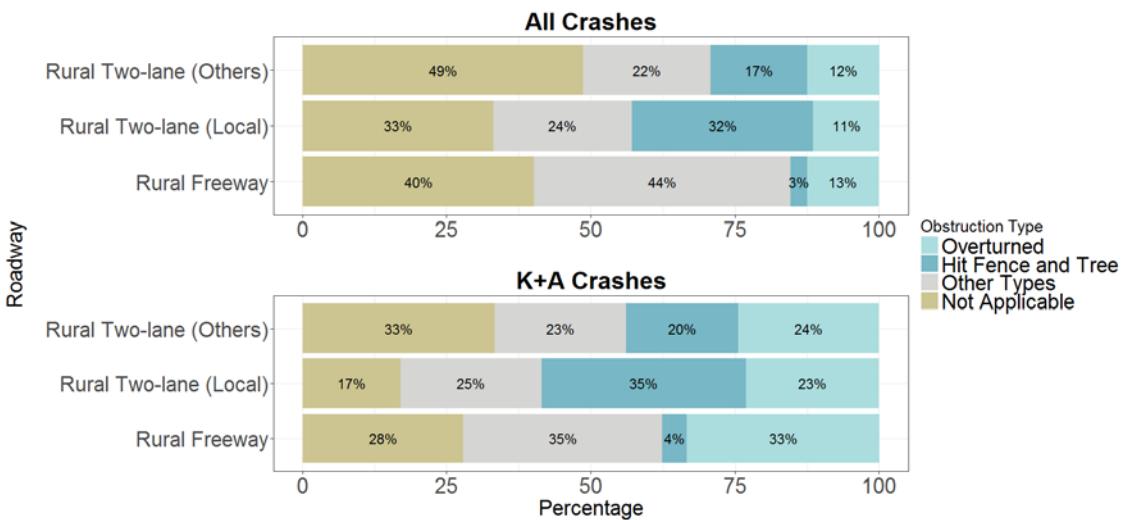


Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 29. Collision Types for Rural Freeway Crashes (WA versus TX)

Obstruction Type (Texas Only)

The Washington data was not in a format that allowed a direct comparison between Washington and Texas crashes and the obstruction types associated with the crash. As a result, Figure 30 depicts obstructions types associated with Texas rural two-lane and rural freeway facilities. Supporting information for this figure is included in Appendix A (see Table 33, Table 34, Table 35, and Table 36). As noted in Figure 30, the studied crashes generally included impacting some type of obstruction for 51 to 67 percent of the rural two-lane crash locations. Similarly, severe crashes included an impact of obstructions for 67 to 83 percent of the K+A crashes.



Source: TX CRIS Data (2011-2015)

Figure 30. Obstruction Type for Texas Crashes at Rural Two-Lane and Freeway

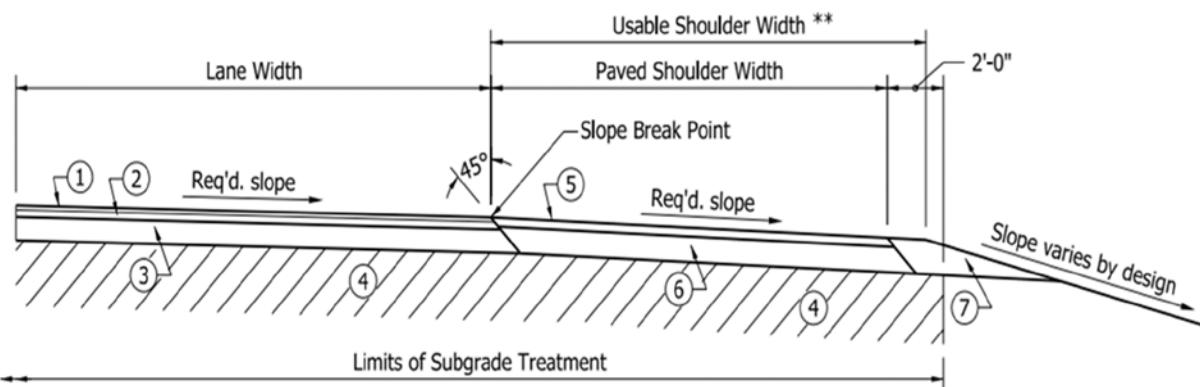
Rural Two-Lane Highway Shoulders (Texas Only)

Paved roadway shoulders for rural freeway locations generally conform to requirements that enable a distressed vehicle to safely exit the freeway and park the vehicle out of the path of traffic. The application of highway shoulders for rural two-lane facilities, however, can vary dramatically. In Texas, many of the roads are designed and maintained by TxDOT. These facilities generally conform to the set of design standards shown in Table 4. A much larger proportion of the rural two-lane roads are owned and maintained by regional jurisdictions such as towns or counties. Though these agencies often try to provide wide shoulders, they often do not have sufficient financial resources to maintain the roads in a format with suitable shoulder widths consistent with the TxDOT recommendations. These off-system roads are depicted in Figure 25. Consequently, the TTI researchers explored how well the roads in Texas (both on system and off system) generally adhered to the recommended shoulder widths. Figure 31 further depicts the concept of a usable shoulder. In some cases the entire shoulder may not be paved but could still be a usable graded width. This type of information is hard to determine from road characteristic or crash database information.

Table 4. Texas Shoulder Width Recommendations for Rural Two-Lane Highways

Road Functional Classification	Speed	AADT (vpd)			
		< 400	400-1500	1500-2000	> 2000
Arterial	All	4	4 or 8	8	8-10
Collector	All	2	4	8	8-10
Local	All	2	4	4	8

Source: TxDOT Roadway Design Manual, 2014 (pp. 3-27)



Source: <http://www.in.gov/dot/div/contracts/standards/dm-Archived/10English/Part5/ECh52MEPDG/figures/EFig52-13E.pdf>

Figure 31. Schematic of Usable Shoulder Width

As shown in Table 4, the recommended TxDOT shoulder widths are primarily based on the roadway functional classification (arterial, collector, or local road) and the traffic volume,

expressed as vehicles per day, along the specific corridor. Using these key criteria, it is possible to determine if a roadway location meets or exceeds these recommendations. Table 5, Table 6, and Table 7 show the section length (in miles) for each of the rural two-lane functional classification categories in Texas. In each table, the shaded area represents the width threshold that most closely represents the proposed design standards. Table content shown above the shaded area represents roadway segment lengths that do not adhere to the recommended standards. Similarly, values shown below the shaded regions represent locations that meet or exceed the TxDOT shoulder requirements. Presumably, shoulder widths less than those recommended by the design standards are more likely to be associated with crashes. Of particular interest is the two-lane local roadway where the run-off-road crashes tend to be over represented. As shown in Table 7, less than one percent of the shoulder widths for these two-lane local roads in Texas adhere to the recommended widths. The absence of shoulders is likely one of the reasons that these local roads tend to be over represented by single vehicle run off of the road crashes.

Table 5. Rural Two-Lane Arterial Crashes and Companion Shoulder

Existing Average Shoulder Width (ft)	< 400	400-1500	1500-2000	> 2000	Grand Total
No Shoulder	206,203	21,815	2,393	10,834	241,333
0-2	5,268	4,903	831	1,825	12,826
2.1-4	7,010	5,553	883	2,577	16,023
4.1-8	1,840	4,464	1,254	5,878	13,436
8.1-10	195	1,360	919	5,035	7,509
> 10	27	97	32	362	518
Grand Total	220,542	38,193	6,310	26,511	291,646

Table 6. Rural Two-Lane Collector Crashes and Companion Shoulder

Existing Average Shoulder Width (ft)	< 400	400-1500	1500-2000	> 2000	Grand Total
No Shoulder	14,062	7,168	6,889	1,591	29,710
< 2	5,139	4,683	1,317	739	11,879
2.1-4	6,894	5,317	1,562	751	14,524
4.1-8	1,660	2,548	1,798	559	6,566
8.1-10	113	488	668	212	1,480
> 10	27	48	82	15	172
Grand Total	27,895	20,253	12,316	3,867	64,331

Table 7. Rural Two-Lane Local Crashes and Companion Shoulder

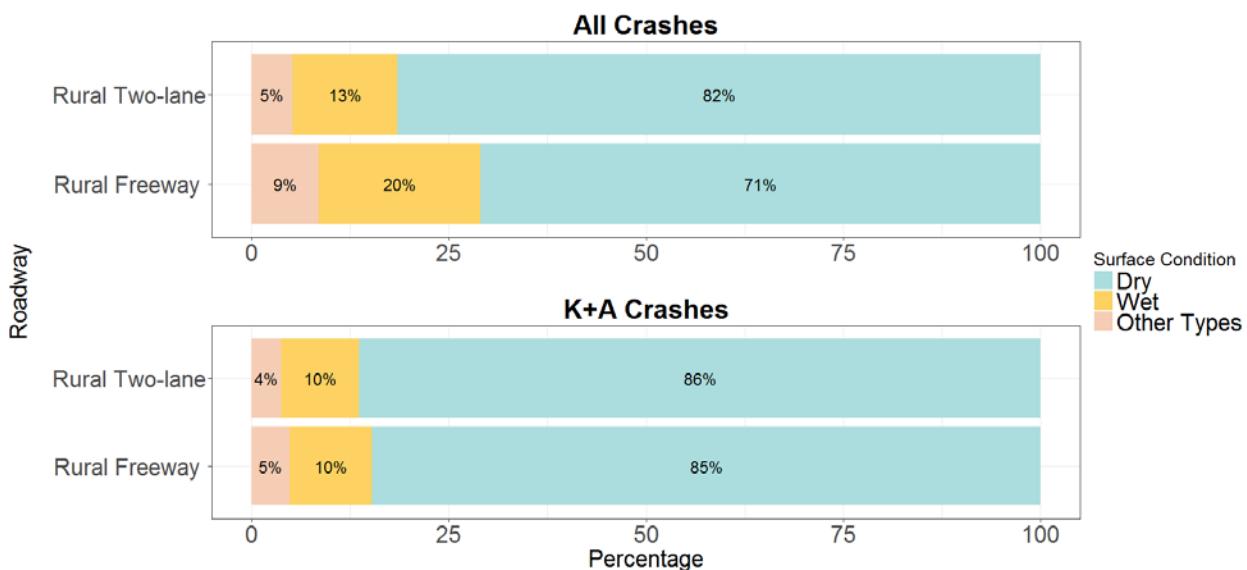
Existing Average Shoulder Width (ft)	< 400	400-1500	1500-2000	> 2000	Grand Total
No Shoulder	191,954	1,439	634	14,317	208,433
< 2	46	2	9	9	66
2.1-4	43	13	0	13	69
4.1-8	16	2	1	7	27
> 8	2	2	0	1	4
Grand Total	192,061	1,458	644	14,347	208,598

Road Surface Due to Weather

The friction on the surface of a road can be compromised during inclement weather and may continue to be compromised for a period of time following the weather event. Consequently, an assessment of the road surface condition and weather conditions can help provide insights into crashes associated with weather events. The following section reviews the road surface for Texas and Washington roadway facilities.

Texas Only

As shown in Figure 32, the surface condition associated with a crash at the rural two-lane and rural freeway crash locations in Texas was often a dry pavement condition. By inspection, it is apparent that 72 to 85 percent of the crashes occurring when the pavement surface was dry. In contrast to the previous Texas graphics that include a local two-lane road, this figure combines all two-lane roads into a single group because the rural two-lane (others) and the rural two-lane (local) values were equivalent. The three surface conditions evaluated include dry, wet, and other types. For this analysis, the other types of surface conditions referred to elements that included ice, sand, mud, dirt, snow, slush, other, or unknown conditions. Table 37, Table 38, Table 39, and Table 40 (located in Appendix A) provide additional details about the individual surface condition crashes. In Texas, only ten to 20 percent of the crashes occurred during wet pavement conditions.

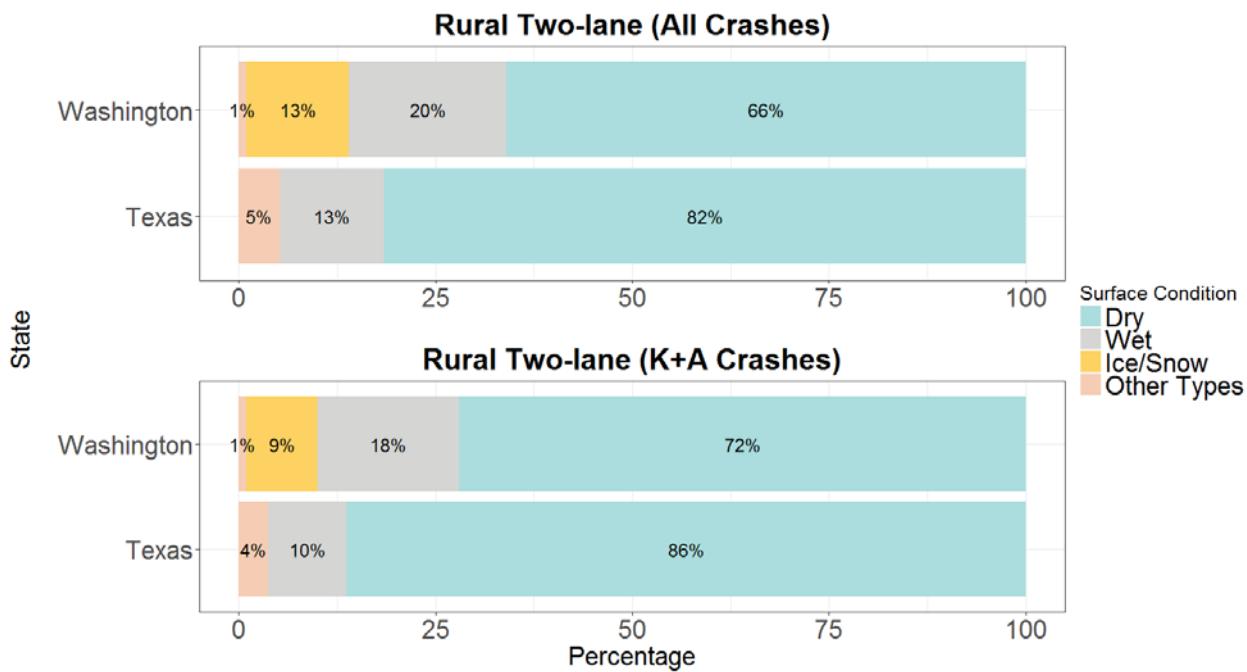


Source: TX CRIS Data (2011-2015)

Figure 32. Surface Condition for Texas Crashes at Rural Two-Lane and Freeway

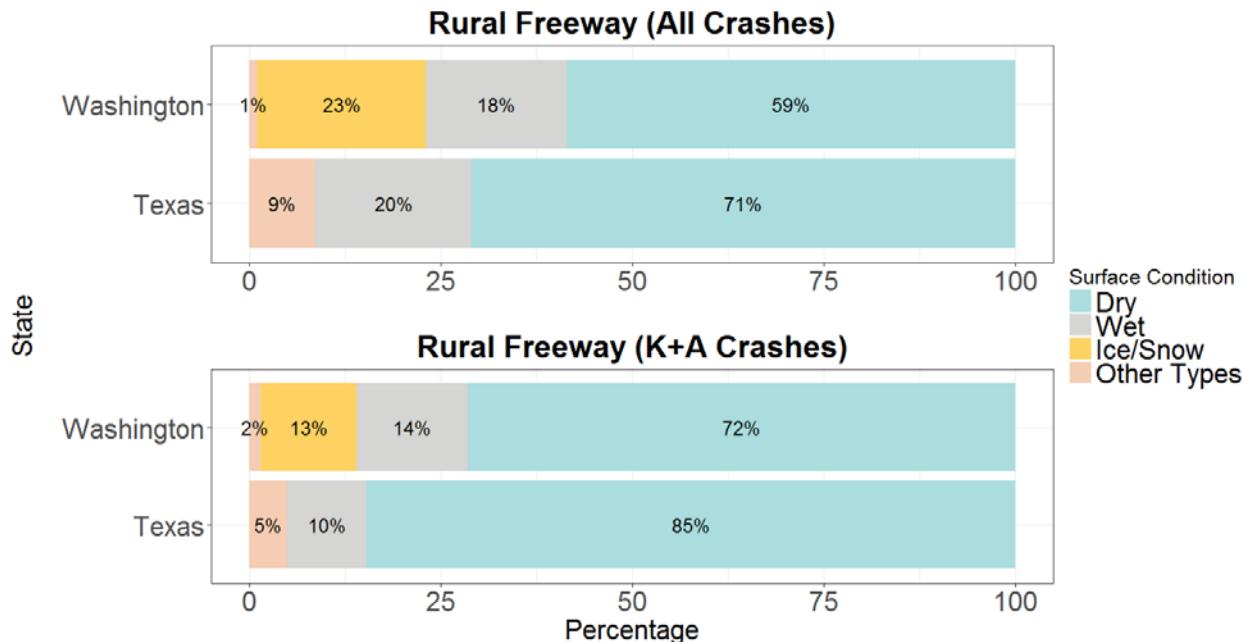
Texas Contrasted to Washington

The inclusion of the Washington data in this analysis enabled the TTI researchers to study a substantially different climate than Texas and determine how the Pacific Northwest region, known for extreme rain fall, compared to the surface conditions for rural Texas crashes. In the winter, Washington is also more likely to experience icy conditions (a rare event for most of Texas). Figure 33 shows a comparison of Washington and Texas Crashes, based on surface condition, for rural two-lane roads. Similarly, Figure 34 depicts the same comparison for rural freeway locations. Both of these consider total crashes as well as severe crashes only. Additional data related to surface condition for Washington crashes is located in Appendix A (see Table 51 and Table 52). It is no surprise that the Washington region generally experienced more crashes associated with snow and ice as well as wet conditions; however, this observation could simply be due to the common weather pattern typical of the region.



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 33. Surface Condition for Rural Two-Lane Highway Crashes (WA versus TX)



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 34. Surface Condition for Rural Freeway Crashes (WA versus TX)

Weather Type

In addition to the surface condition evaluation, the reported weather can also be assessed to determine if it provides generally consistent results to the surface condition values.

Texas Only

The percentage of weather-related crashes that occurred on Texas rural two-lane roadways and rural freeways is depicted in Figure 35. As expected, the weather trends are generally similar to those observed based on the surface condition evaluation. For all crashes, the percent of crashes that occurred during clear and/or cloudy conditions ranged from 75 percent up to 87 percent. For the severe (K+A) crashes, the clear and/or cloudy conditions were associated with 86 percent up to 91 percent of these severe crashes. These observations suggest that weather is usually not a significant issue associated with the crash conditions in Texas. For additional details about the supporting values, refer to Appendix A (see Table 41, Table 42, Table 43, and Table 44).



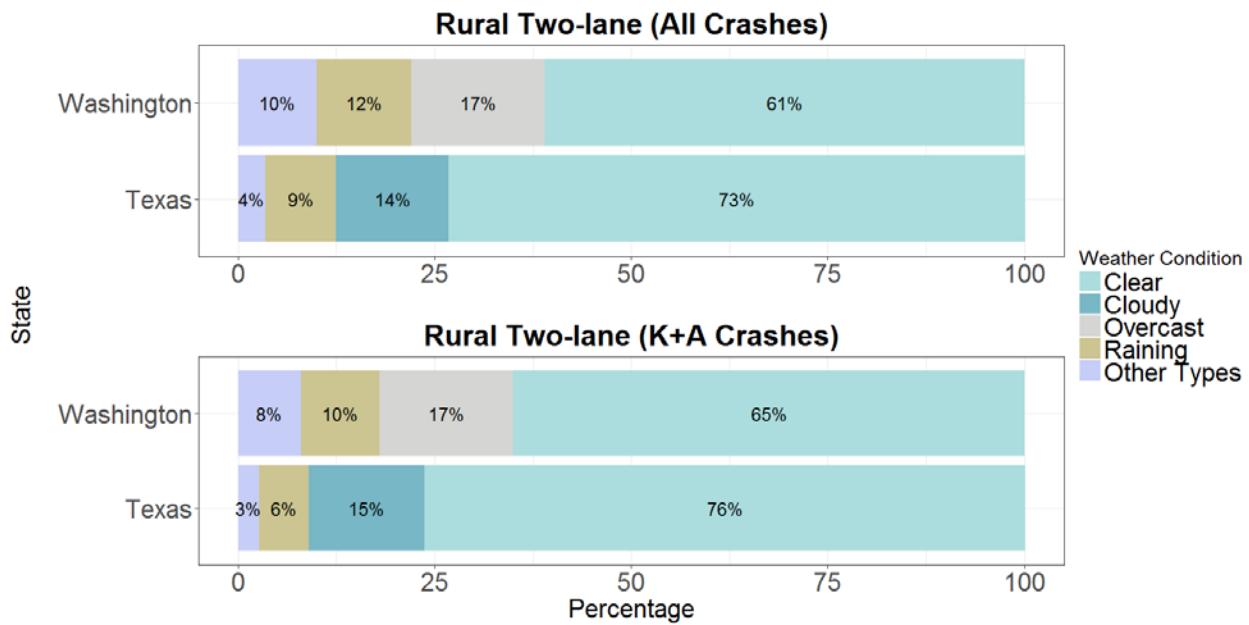
Source: TX CRIS Data (2011-2015)

Figure 35. Weather Types for Texas Crashes at Rural Two-Lane and Freeway

Texas Contrasted to Washington

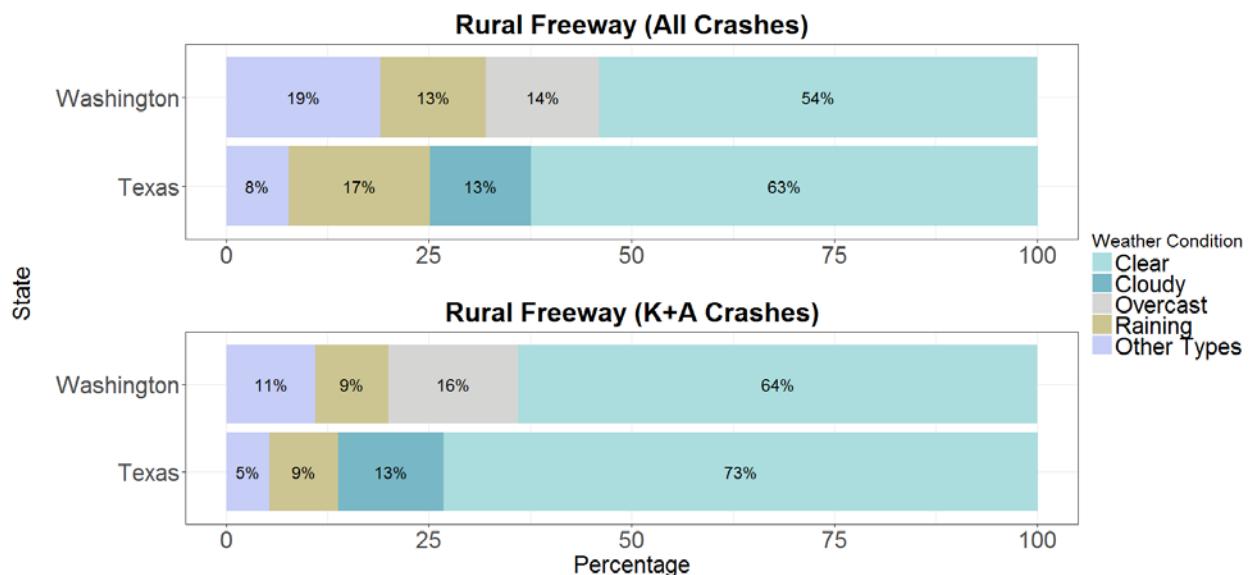
Figure 36 and Figure 37 compare the percentage of crashes associated with weather conditions in Washington to those associated with Texas weather. In general the percent of crashes associated with rain are comparable between the two states, but the *Other Types* category (that includes items such as snow or freezing rain) is greater for Washington than for Texas; however, this value only applies to eight to ten percent of the Washington crashes.

More detailed information related to the Washington weather-related crashes is included in Appendix B (see Table 53 and Table 54).



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 36. Weather Condition for Rural Two-Lane Highway Crashes (WA versus TX)



Source: TX CRIS Data (2011-2015), WA RID DATA (2009-2013)

Figure 37. Weather Condition for Rural Freeway Crashes (WA versus TX)

Chapter Summary

This chapter assessed how the road environment and prevailing weather conditions commonly influence the crash condition. Upon inspection of collision type it is evident that single vehicle crashes are a substantial problem on rural two-lane roads and rural freeways. These collision types are 60 to 70 percent of the total and severe crashes for these facilities. Of particular concern is the rural two-lane local road where 87 percent of the observed Texas severe crashes were designated as single vehicle crashes. Similar values can be attributed to roadside obstructions impacted during the crash. This indicates that the single vehicle crashes tend to be run-off-the-road collisions that ultimately impact some sort of roadside obstacle.

The shoulder widths for rural two-lane roads varied significantly in Texas; however, rural two-lane local roads adhered to state shoulder requirements at less than one percent of the roadway locations with the majority of these locations not having any shoulders.

Finally, an evaluation of the surface condition and weather indicated that the majority of crashes (72 percent and greater) occur when the pavement surface is dry.

CONCLUSIONS

This research effort provided initial steps towards ultimately developing benchmark information that will help to establish the level of safety that the average competent and experienced driver regularly achieves. This analysis explored crash information as it related to the driver, the vehicle, and the crash environment to help identify unique issues and common crash trends. This chapter, therefore, provides a brief summary of these observations followed by a recommendation for future research activities.

Summary of Unique Observations

Based on the findings presented in the previous chapters related to the safety performance associated with rural two-lane roadways and rural freeways, the following observations are noteworthy:

- Driver Characteristics
 - Drivers under the age of 25 tend to drive fewer miles on these rural corridors but are involved in more crashes than older drivers.
 - Drivers age 15 to 19 are involved in almost 19 percent of crashes that occur on rural local two-lane roads.
 - Male drivers are involved in crashes approximately twice as many times as females. This trend tends to be constant for drivers between the ages of 30 and 54.
 - The contributing factors referred to as *Fail to Control* and *Speeding* collectively represent 45 to 50 percent of all rural two-lane and rural freeway crashes.
 - Approximately 20 percent of all severe (K+A) crashes on rural two-lane local roads in Texas are associated with driver impairment.
 - Approximately 14 to 26 percent of Texas severe crashes on rural two-lane roads and rural freeways are due to either the driver diverting attention or the driver losing control of the vehicle.
 - Drowsy driving often is correlated with other driver factors, driver age, and posted speed limit.
- Vehicle Characteristics
 - In Texas, 58 percent of the registered vehicles are cars. Similarly, 36 percent of the vehicles are pickups, SUVs, or vans. By comparison, 43 to 53 percent of all rural two-lane and rural freeway crashes involve pickups, SUVs, or vans. Severe crashes involve 43 to 49 percent pickups, SUVs, or vans.

- Crash Characteristics
 - In Texas, 61 to 67 percent of total and severe rural two-lane (other) and rural freeway crashes involve a single vehicle. In Washington, this value ranges from 64 to 65 percent.
 - In Texas, 75 percent of all rural two-lane local crashes and 87 percent of severe crashes involve a single vehicle.
 - In Texas, paved shoulders for rural two-lane local roads rarely adhere to the TxDOT design guidance requirements. In fact, less than one percent of these facilities meet the TxDOT values.
 - Most crashes occur during conditions when the pavement surface is dry and there is no inclement weather.

Recommended Future Research Activities

The research included in this report serves as an initial step towards determining what characteristics typically apply to drivers involved in crashes. This information can then help identify characteristics of drivers who have a better safety performance. In the future, several potential analyses would benefit this activity. This section provides a brief synopsis of some potential future research activities that can help to further clarify this benchmarking effort.

Expand Rural Analysis

The analysis summarized in this report focused only on the rural two-lane and rural freeway road type. Additional analysis may be appropriate for other road types. In addition, the content of this report focused on locations **where** crashes occurred. This analysis could be further refined to focus on **when** crashes occurred such as time of day, lighting conditions, and similar.

Urban Road Types

As previously noted, this analysis focused on two road types (rural two-lane and rural freeway). The crash type and crash frequency can be expected to vary dramatically from urban crash conditions where the predominant crash types tend to occur at intersection locations and where pedestrian and bicycle activity is more prominent. Consequently, a similar effort for these urban facilities would be advisable.

Focused Case Studies

The use of large crash and road characteristic databases allows a high-level inspection of unique site characteristics; however, often crash databases do not fully capture key information included in the crash reports. In particular, the reporting officer will develop include a narrative section for the crash report that may include sketches and information related to the sequence of events. An evaluation of this type of information can provide more detailed data related to specific sites of interest. In some cases, this could be a comprehensive safety assessment of a corridor.

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APPENDIX A – TEXAS STATISTICS

Driver Information

Table 8. Average Miles Driven per Year by Age Groups and Genders on TX Rural Roads

Age Groups	TX Rural Roads	
	Male	Female
15-19	4,106	3,493
20-24	12,564	11,100
25-29	18,391	8,901
30-34	20,848	10,028
35-39	18,549	11,681
40-44	19,918	11,974
45-49	19,805	11,830
50-54	19,688	11,363
55-59	19,899	9,662
60-64	17,438	8,098
65-69	13,682	6,037
70-74	11,689	5,127
75-79	9,452	3,231
80-84	5,832	1,984
84+	3,528	952
Grand Total	215,388	115,460

Note: This table includes data used to develop Figure 2.

Source: NHTS (2009)

Table 9. Number of Licensed Drivers by Age Groups

Age Groups	No. of Licensed Drivers (TX)
15-19	713,345
20-24	1,351,199
25-29	1,412,464
30-34	1,412,465
35-39	1,456,426
40-44	1,434,245
45-49	1,505,030
50-54	1,467,250
55-59	1,269,222
60-64	1,050,538
65-69	747,331
70-74	524,071
75-79	384,675
80-84	257,100
84+	172,289
Grand Total	15,157,650

Note: This table includes data used to develop Figure 3.

Source: USDOT (2010)

Table 10. Percent of Licensed Drivers by Age Groups

Age Groups	Percent of Licensed Drivers (TX)
15-19	4.7
20-24	8.9
25-29	9.3
30-34	9.3
35-39	9.6
40-44	9.5
45-49	9.9
50-54	9.7
55-59	8.4
60-64	6.9
65-69	4.9
70-74	3.5
75-79	2.5
80-84	1.7
84+	1.1
Grand Total	100.0

Note: This table includes percent data for the Texas licensed driver information shown in Figure 3.

Source: USDOT (2010)

Table 11. Number of Drivers by Age Groups (TX Rural Two-Lane vs. Freeway)

Age Groups	All Crashes				K+A Crashes			
	Rural Two-lane		Rural Freeway		Rural Two-lane		Rural Freeway	
	Male	Female	Male	Female	Male	Female	Male	Female
15-19	19,993	13,132	2,311	1,719	1,447	752	117	85
20-24	24,523	12,664	5,850	3,696	2,274	871	337	173
25-29	18,780	9,774	5,032	2,328	1,882	634	290	127
30-34	16,525	8,850	4,423	1,865	1,695	577	267	119
35-39	14,399	7,720	4,251	1,562	1,479	537	290	107
40-44	13,944	7,547	4,312	1,530	1,364	580	322	89
45-49	13,225	6,800	4,269	1,351	1,379	487	303	90
50-54	13,406	6,580	4,078	1,275	1,513	518	280	69
55-59	11,503	5,417	3,334	1,021	1,309	423	253	62
60-64	8,390	4,093	2,403	771	899	302	187	39
65-69	5,874	2,964	1,530	509	689	223	102	44
70-74	3,810	1,936	908	315	372	170	80	20
75-79	2,501	1,369	471	145	259	121	39	12
80-84	1,512	851	237	63	159	70	23	4
85+	912	491	116	35	107	40	18	0
Individual Total	169,297	90,188	43,525	18,185	16,827	6,305	2,908	1,040
Grand Total per Facility	259,485		61,710		23,132		3,948	

Note: This table includes data used to develop Figure 6.

Source: TX CRIS Data (2011-2015)

Table 12. Percent Drivers by Age Groups (TX Rural Two-Lane vs. Freeway)

Age Groups	All Crashes				K+A Crashes			
	Rural Two-lane		Rural Freeway		Rural Two-lane		Rural Freeway	
	Male	Female	Male	Female	Male	Female	Male	Female
15-19	7.7	5.1	3.7	2.8	6.3	3.3	3.0	2.1
20-24	9.5	4.9	9.5	6.0	9.8	3.8	8.5	4.4
25-29	7.2	3.8	8.2	3.8	8.1	2.7	7.3	3.2
30-34	6.4	3.4	7.2	3.0	7.3	2.5	6.8	3.0
35-39	5.5	3.0	6.9	2.5	6.4	2.3	7.3	2.7
40-44	5.4	2.9	7.0	2.5	5.9	2.5	8.2	2.3
45-49	5.1	2.6	6.9	2.2	6.0	2.1	7.7	2.3
50-54	5.2	2.5	6.6	2.1	6.5	2.2	7.1	1.7
55-59	4.4	2.1	5.4	1.7	5.7	1.8	6.4	1.6
60-64	3.2	1.6	3.9	1.2	3.9	1.3	4.7	1.0
65-69	2.3	1.1	2.5	0.8	3.0	1.0	2.6	1.1
70-74	1.5	0.7	1.5	0.5	1.6	0.7	2.0	0.5
75-79	1.0	0.5	0.8	0.2	1.1	0.5	1.0	0.3
80-84	0.6	0.3	0.4	0.1	0.7	0.3	0.6	0.1
84+	0.4	0.2	0.2	0.1	0.5	0.2	0.5	0.0
Grand Total	100.0		100.0		100.0		100.0	

Note: This table includes data used to develop Figure 6.

Source: TX CRIS Data (2011-2015)

Table 13. Number of Drivers by Contributing Factors (TX Rural Two-Lane Roads)

Contributing Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Fail to Control						
Failed To Control Speed	19,925	2,320	22,245	1,166	101	1,267
Failed To Yield Row - Stop Sign	6,515	841	7,356	538	36	574
Failed To Drive In Single Lane	6,100	550	6,650	961	37	998
Failed To Yield Row - Turning Left	3,840	220	4,060	436	9	445
Failed To Pass To Left Safely	1,944	214	2,158	133	5	138
Failed To Yield Row - Private Drive	1,921	474	2,395	125	19	144
Failed To Yield Row - Open Intersection	715	481	1,196	27	16	43
Failed To Pass To Right Safely	440	37	477	12	1	13
Failed To Give Half Of Roadway	326	1,359	1,685	36	46	82
Failed To Signal Or Gave Wrong Signal	254	26	280	9	1	10
Failed To Yield Row - Yield Sign	212	328	540	8	7	15
Failed To Stop At Proper Place	154	37	191	10	4	14
Failed To Heed Warning Sign	137	32	169	25	2	27
Failed To Yield Right-of-Way - Turn On Red	78	5	83	2	--	2
Failed To Yield Right-of-Way - Emergency Vehicle	48	5	53	7	1	8
Failed To Stop For Train	44	76	120	10	17	27
Failed To Yield Right-of-Way - To Pedestrian	18	17	35	6	--	6
Failed To Stop For School Bus	11	2	13	1	1	2
Subtotal (Fail to Control)	42,682	7,024	49,706	3,512	303	3,815
Speeding						
Unsafe Speed	23,193	8,919	32,112	2,432	697	3,129
Speeding - (Over Limit)	434	218	652	152	44	196
Subtotal (Speeding)	23,627	9,137	32,764	2,584	741	3,325
Animal On Road						
Animal On Road- Wild	16,368	1,744	18,112	482	60	542
Animal On Road- Domestic	7,715	1,020	8,735	220	37	257
Subtotal (Animals on Road)	24,083	2,764	26,847	702	97	799

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Table 13. Number of Drivers by Contributing Factors (TX Rural Two-Lane Roads) (cont.)

Contributing Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Distraction						
Driver Inattention	9,917	2,750	12,667	623	90	713
Distraction In Vehicle	2,368	767	3,135	168	27	195
Cell/Mobile Phone Use	496	151	647	43	9	52
Subtotal (Distraction)	12,781	3,668	16,449	834	126	960
Improper Driving						
Turned When Unsafe	3,668	260	3,928	305	4	309
Wrong Side - Not Passing	3,001	223	3,224	902	19	921
Disregard Stop Sign Or Light	2,591	665	3,256	318	47	365
Followed Too Closely	1,438	108	1,546	52	7	59
Backed Without Safety	1,134	1,709	2,843	26	6	32
Changed Lane When Unsafe	709	29	738	24	1	25
Turned Improperly - Cut Corner On Left	345	202	547	11	4	15
Turned Improperly - Wide Right	324	167	491	6	1	7
Disregard Stop And Go Signal	322	34	356	26	4	30
Turned Improperly - Wrong Lane	250	15	265	12	2	14
Overtake And Pass Insufficient Clearance	213	13	226	45	--	45
Improper Start From Parked Position	166	58	224	12	3	15
Road Rage	125	47	172	8	4	12
Wrong Side - Approach Or Intersection	82	12	94	9	--	9
Drove Without Headlights	67	23	90	12	5	17
Disregard Warning Sign At Construction	59	9	68	9	--	9
Disregard Turn Marks At Intersection	32	4	36	3	--	3
Parked And Failed To Set Brakes	25	11	36	1	--	1
Wrong Way - One Way Road	18	2	20	5	--	5
Subtotal (Improper Driving)	14,569	3,591	18,160	1,786	107	1,893
Impairment						
Under Influence - Alcohol	6,901	2,425	9,326	1,326	347	1,673
Under Influence - Drug	980	227	1,207	166	23	189
Had Been Drinking	888	424	1,312	169	51	220
Impaired Visibility	818	319	1,137	73	11	84
Taking Medication	52	12	64	6	--	6
Subtotal (Impairment)	9,639	3,407	13,046	1,740	432	2,172

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Table 13. Number of Drivers by Contributing Factors (TX Rural Two-Lane Roads) (cont.)

Contributing Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Factors						
Faulty Evasive Action	4,146	869	5,015	446	55	501
Fatigued Or Asleep	6,482	671	7,153	763	29	792
Ill	1,253	313	1,566	183	31	214
Passed In No Passing Lane	1,198	57	1,255	142	3	145
Load Not Secured	571	29	600	16	3	19
Passed On Right Shoulder	375	6	381	18	--	18
Pedestrian Failed to Yield Right-of-Way To Vehicle	309	67	376	186	33	219
Oversized Vehicle Or Load	276	39	315	9	--	9
Fleeing Or Evading Police	272	196	468	53	18	71
Fire In Vehicle	229	43	272	2	--	2
Parked In Traffic Lane	162	57	219	10	8	18
Disabled In Traffic Lane	123	11	134	17	--	17
Handicapped Driver	21	15	36	2	1	3
Opened Door Into Traffic Lane	13	8	21	2	1	3
Parked Without Lights	12	5	17	3	--	3
Other	6,610	1,495	8,105	535	142	677
Subtotal (Other Factors)	22,052	3,881	25,933	2,387	324	2,711
Grand Total -- Defined	149,433	33,472	182,905	13,545	2,130	15,675
Undetermined Contributing Factors	74,610	10,984	85,594	7,391	463	7,854
Grand Total (Defined + Undetermined)	224,043	44,456	268,499	20,936	2,593	23,529

Note: This table includes data used to develop Figure 9.

Source: TX CRIS Data (2011-2015)

Table 14. Percent Drivers by Contributing Factors (TX Rural Two-Lane Roads)

Contributing Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Fail to Control						
Failed To Control Speed	13.3	6.9	12.2	8.6	4.7	8.1
Failed To Yield Right-of-Way - Stop Sign	4.4	2.5	4.0	4.0	1.7	3.7
Failed To Drive In Single Lane	4.1	1.6	3.6	7.1	1.7	6.4
Failed To Yield Right-of-Way - Turning Left	2.6	0.7	2.2	3.2	0.4	2.8
Failed To Pass To Left Safely	1.3	0.6	1.2	1.0	0.2	0.9
Failed To Yield Right-of-Way - Private Drive	1.3	1.4	1.3	0.9	0.9	0.9
Failed To Yield Right-of-Way - Open Intersection	0.5	1.4	0.7	0.2	0.8	0.3
Failed To Pass To Right Safely	0.3	0.1	0.3	0.1	< 0.1	0.1
Failed To Give Half Of Roadway	0.2	4.1	0.9	0.3	2.2	0.5
Failed To Signal Or Gave Wrong Signal	0.2	0.1	0.2	0.1	< 0.1	0.1
Failed To Yield Right-of-Way - Yield Sign	0.1	1.0	0.3	0.1	0.3	0.1
Failed To Stop At Proper Place	0.1	0.1	0.1	0.1	0.2	0.1
Failed To Heed Warning Sign	0.1	0.1	0.1	0.2	0.1	0.2
Failed To Yield Right-of-Way - Turn On Red	0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Failed To Yield Right-of-Way - Emergency Vehicle	< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.1
Failed To Stop For Train	< 0.1	0.2	0.1	0.1	0.8	0.2
Failed To Yield Right-of-Way - To Pedestrian	< 0.1	0.1	< 0.1	< 0.1	--	< 0.1
Failed To Stop For School Bus	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Subtotal (Fail to Control)	28.6	20.9	27.2	26.1	14.0	24.3
Speeding						
Unsafe Speed	15.5	26.6	17.6	18.0	32.7	20.0
Speeding - (Over Limit)	0.3	0.7	0.4	1.1	2.1	1.3
Subtotal (Speeding)	15.8	27.3	17.9	19.1	34.8	21.2
Animal On Road						
Animal On Road- Wild	11.0	5.2	9.9	3.6	2.8	3.5
Animal On Road- Domestic	5.2	3.0	4.8	1.6	1.7	1.6
Subtotal (Animals on Road)	16.2	8.2	14.7	5.2	4.5	5.1

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Table 14. Percent Drivers by Contributing Factors (TX Rural Two-Lane Roads) (cont.)

Contributing Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Distraction						
Driver Inattention	6.6	8.2	6.9	4.6	4.2	4.5
Distraction In Vehicle	1.6	2.3	1.7	1.2	1.3	1.2
Cell/Mobile Phone Use	0.3	0.5	0.4	0.3	0.4	0.3
Subtotal (Distraction)	8.4	11.0	9.0	6.1	5.9	6.1
Improper Driving						
Turned When Unsafe	2.5	0.8	2.1	2.3	0.2	2.0
Wrong Side - Not Passing	2.0	0.7	1.8	6.7	0.9	5.9
Disregard Stop Sign Or Light	1.7	2.0	1.8	2.3	2.2	2.3
Followed Too Closely	1.0	0.3	0.8	0.4	0.3	0.4
Backed Without Safety	0.8	5.1	1.6	0.2	0.3	0.2
Changed Lane When Unsafe	0.5	0.1	0.4	0.2	< 0.1	0.2
Turned Improperly - Cut Corner On Left	0.2	0.6	0.3	0.1	0.2	0.1
Turned Improperly - Wide Right	0.2	0.5	0.3	< 0.1	< 0.1	< 0.1
Disregard Stop And Go Signal	0.2	0.1	0.2	0.2	0.2	0.2
Turned Improperly - Wrong Lane	0.2	< 0.1	0.1	0.1	0.1	0.1
Overtake and Pass Insufficient Clearance	0.1	< 0.1	0.1	0.3	--	0.3
Improper Start From Parked Position	0.1	0.2	0.1	0.1	0.1	0.1
Road Rage	0.1	0.1	0.1	0.1	0.2	0.1
Wrong Side - Approach Or Intersection	0.1	< 0.1	0.1	0.1	--	0.1
Drove Without Headlights	< 0.1	0.1	< 0.1	0.1	0.2	0.1
Disregard Warning Sign At Construction	< 0.1	< 0.1	< 0.1	0.1	--	0.1
Disregard Turn Marks At Intersection	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Parked And Failed To Set Brakes	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Wrong Way - One Way Road	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Subtotal (Improper Driving)	9.7	10.6	9.9	13.3	4.9	12.1
Impairment						
Under Influence - Alcohol	4.6	7.2	5.1	9.8	16.3	10.7
Under Influence - Drug	0.7	0.7	0.7	1.2	1.1	1.2
Had Been Drinking	0.6	1.3	0.7	1.2	2.4	1.4
Impaired Visibility	0.5	1.0	0.6	0.5	0.5	0.5
Taking Medication	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Subtotal (Impairment)	6.4	10.2	7.1	12.7	20.3	13.9

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Table 14. Percent Drivers by Contributing Factors (TX Rural Two-Lane Roads) (cont.)

Contributing Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Factors						
Faulty Evasive Action	2.8	2.6	2.7	3.3	2.6	3.2
Fatigued Or Asleep	4.3	2.0	3.9	5.6	1.4	5.1
Ill	0.8	0.9	0.9	1.4	1.5	1.4
Passed In No Passing Lane	0.8	0.2	0.7	1.0	0.1	0.9
Load Not Secured	0.4	0.1	0.3	0.1	0.1	0.1
Passed On Right Shoulder	0.3	< 0.1	0.2	0.1	--	0.1
Pedestrian Failed to Yield Right-of-Way To Vehicle	0.2	0.2	0.2	1.4	1.5	1.4
Oversized Vehicle Or Load	0.2	0.1	0.2	0.1	--	0.1
Fleeing Or Evading Police	0.2	0.6	0.3	0.4	0.8	0.5
Fire In Vehicle	0.2	0.1	0.1	< 0.1	--	< 0.1
Parked In Traffic Lane	0.1	0.2	0.1	0.1	0.4	0.1
Disabled In Traffic Lane	0.1	< 0.1	0.1	0.1	--	0.1
Handicapped Driver	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Opened Door Into Traffic Lane	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Parked Without Lights	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Other	4.4	4.5	4.4	3.9	6.7	4.3
Subtotal (Other Factors)	14.8	11.5	14.2	17.5	15.1	17.3
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 9.

Source: TX CRIS Data (2011-2015)

Table 15. Number of Drivers by Contributing Factors (TX Rural Two-Lane vs. Freeway)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Fail to Control				
Failed To Control Speed	22,245	8,005	1,267	405
Failed To Yield Right-of-Way - Stop Sign	7,356	285	574	19
Failed To Drive In Single Lane	6,650	3,035	998	307
Failed To Yield Right-of-Way - Turning Left	4,060	86	445	4
Failed To Pass To Left Safely	2,158	94	138	6
Failed To Yield Right-of-Way - Private Drive	2,395	26	144	1
Failed To Yield Right-of-Way - Open Intersection	1,196	41	43	3
Failed To Pass To Right Safely	477	20	13	1
Failed To Give Half Of Roadway	1,685	2	82	--
Failed To Signal Or Gave Wrong Signal	280	5	10	--
Failed To Yield Right-of-Way - Yield Sign	540	66	15	3
Failed To Stop At Proper Place	191	6	14	--
Failed To Heed Warning Sign	169	25	27	4
Failed To Yield Right-of-Way - Turn On Red	83	5	2	--
Failed To Yield Right-of-Way - Emergency Vehicle	53	5	8	1
Failed To Stop For Train	120	--	27	--
Failed To Yield Right-of-Way - To Pedestrian	35	--	6	--
Failed To Stop For School Bus	13	--	2	--
Subtotal (Fail to Control)	49,706	11,706	3,815	754
Speeding				
Unsafe Speed	32,112	7,565	3,129	304
Speeding - (Over Limit)	652	78	196	16
Subtotal (Speeding)	32,764	7,643	3,325	320
Animal On Road				
Animal On Road- Wild	18,112	1,582	542	27
Animal On Road- Domestic	8,735	353	257	13
Subtotal (Animals on Road)	26,847	1,935	799	40

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Table 15. Number of Drivers by Contributing Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Distraction				
Driver Inattention	12,667	2,125	713	126
Distraction In Vehicle	3,135	460	195	34
Cell/Mobile Phone Use	647	89	52	9
Subtotal (Distraction)	16,449	2,674	960	169
Improper Driving				
Turned When Unsafe	3,928	83	309	5
Wrong Side - Not Passing	3,224	7	921	1
Disregard Stop Sign Or Light	3,256	88	365	7
Followed Too Closely	1,546	749	59	18
Backed Without Safety	2,843	83	32	1
Changed Lane When Unsafe	738	2,727	25	77
Turned Improperly - Cut Corner On Left	547	17	15	--
Turned Improperly - Wide Right	491	5	7	--
Disregard Stop And Go Signal	356	28	30	3
Turned Improperly - Wrong Lane	265	31	14	1
Overtake and Pass Insufficient Clearance	226	29	45	--
Improper Start From Parked Position	224	33	15	2
Road Rage	172	82	12	3
Wrong Side - Approach Or Intersection	94	2	9	--
Drove Without Headlights	90	4	17	--
Disregard Warning Sign At Construction	68	29	9	1
Disregard Turn Marks At Intersection	36	2	3	--
Parked And Failed To Set Brakes	36	4	1	--
Wrong Way - One Way Road	20	95	5	46
Subtotal (Improper Driving)	18,160	4,098	1,893	165
Impairment				
Under Influence - Alcohol	9,326	1,016	1,673	123
Under Influence - Drug	1,207	230	189	33
Had Been Drinking	1,312	144	220	14
Impaired Visibility	1,137	249	84	18
Taking Medication	64	15	6	--
Subtotal (Impairment)	13,046	1,654	2,172	188

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Table 15. Number of Drivers by Contributing Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Other Factors				
Faulty Evasive Action	5,015	2,237	501	192
Fatigued Or Asleep	7,153	2,229	792	199
Ill	1,566	273	214	39
Passed In No Passing Lane	1,255	9	145	--
Load Not Secured	600	216	19	--
Passed On Right Shoulder	381	35	18	6
Pedestrian Failed to Yield Right-of-Way To Vehicle	376	69	219	55
Oversized Vehicle Or Load	315	87	9	2
Fleeing Or Evading Police	468	46	71	16
Fire In Vehicle	272	139	2	--
Parked In Traffic Lane	219	58	18	12
Disabled In Traffic Lane	134	131	17	24
Handicapped Driver	36	3	3	--
Opened Door Into Traffic Lane	21	2	3	--
Parked Without Lights	17	2	3	1
Other	8,105	3,382	677	178
Subtotal (Other Factors)	25,933	8,918	2,711	724
Grand Total -- Defined	182,905	38,628	15,675	2,360
Undetermined Contributing Factors	85,594	25,651	7,854	1,678
Grand Total (Defined + Undetermined)	268,499	64,279	23,529	4,038

Note: This table includes data used to develop Figure 10 and Figure 11.

Source: TX CRIS Data (2011-2015)

Table 16. Percent Drivers by Contributing Factors (TX Rural Two-Lane vs. Freeway)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Fail to Control				
Failed To Control Speed	12.2	20.7	8.1	17.2
Failed To Yield Right-of-Way - Stop Sign	4.0	0.7	3.7	0.8
Failed To Drive In Single Lane	3.6	7.9	6.4	13.0
Failed To Yield Right-of-Way - Turning Left	2.2	0.2	2.8	0.2
Failed To Pass To Left Safely	1.2	0.2	0.9	0.3
Failed To Yield Right-of-Way - Private Drive	1.3	0.1	0.9	< 0.1
Failed To Yield Right-of-Way - Open Intersection	0.7	0.1	0.3	0.1
Failed To Pass To Right Safely	0.3	0.1	0.1	< 0.1
Failed To Give Half Of Roadway	0.9	< 0.1	0.5	--
Failed To Signal or Gave Wrong Signal	0.2	< 0.1	0.1	--
Failed To Yield Right-of-Way - Yield Sign	0.3	0.2	0.1	0.1
Failed To Stop At Proper Place	0.1	< 0.1	0.1	--
Failed To Heed Warning Sign	0.1	0.1	0.2	0.2
Failed To Yield Right-of-Way - Turn On Red	< 0.1	< 0.1	< 0.1	--
Failed To Yield Right-of-Way - Emergency Vehicle	< 0.1	< 0.1	0.1	< 0.1
Failed To Stop For Train	0.1	--	0.2	--
Failed To Yield Right-of-Way - To Pedestrian	< 0.1	--	< 0.1	--
Failed To Stop For School Bus	< 0.1	--	< 0.1	--
Subtotal (Fail to Control)	27.2	30.3	24.3	31.9
Speeding				
Unsafe Speed	17.6	19.6	20.0	12.9
Speeding - (Over Limit)	0.4	0.2	1.3	0.7
Subtotal (Speeding)	17.9	19.8	21.2	13.6
Animal On Road				
Animal On Road- Wild	9.9	4.1	3.5	1.1
Animal On Road- Domestic	4.8	0.9	1.6	0.6
Subtotal (Animals on Road)	14.7	5.0	5.1	1.7

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Table 16. Percent Drivers by Contributing Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Distraction				
Driver Inattention	6.9	5.5	4.5	5.3
Distraction In Vehicle	1.7	1.2	1.2	1.4
Cell/Mobile Phone Use	0.4	0.2	0.3	0.4
Subtotal (Distraction)	9.0	6.9	6.1	7.1
Improper Driving				
Turned When Unsafe	2.1	0.2	2.0	0.2
Wrong Side - Not Passing	1.8	< 0.1	5.9	< 0.1
Disregard Stop Sign Or Light	1.8	0.2	2.3	0.3
Followed Too Closely	0.8	1.9	0.4	0.8
Backed Without Safety	1.6	0.2	0.2	< 0.1
Changed Lane When Unsafe	0.4	7.1	0.2	3.3
Turned Improperly - Cut Corner On Left	0.3	< 0.1	0.1	--
Turned Improperly - Wide Right	0.3	< 0.1	< 0.1	--
Disregard Stop And Go Signal	0.2	0.1	0.2	0.1
Turned Improperly - Wrong Lane	0.1	0.1	0.1	< 0.1
Overtake and Pass Insufficient Clearance	0.1	0.1	0.3	--
Improper Start From Parked Position	0.1	0.1	0.1	0.1
Road Rage	0.1	0.2	0.1	0.1
Wrong Side - Approach Or Intersection	0.1	< 0.1	0.1	--
Drove Without Headlights	< 0.1	< 0.1	0.1	--
Disregard Warning Sign At Construction	< 0.1	0.1	0.1	< 0.1
Disregard Turn Marks At Intersection	< 0.1	< 0.1	< 0.1	--
Parked And Failed To Set Brakes	< 0.1	< 0.1	< 0.1	--
Wrong Way - One Way Road	< 0.1	0.2	< 0.1	1.9
Subtotal (Improper Driving)	9.9	10.5	12.1	6.8
Impairment				
Under Influence - Alcohol	5.1	2.6	10.7	5.2
Under Influence - Drug	0.7	0.6	1.2	1.4
Had Been Drinking	0.7	0.4	1.4	0.6
Impaired Visibility	0.6	0.6	0.5	0.8
Taking Medication	< 0.1	< 0.1	< 0.1	--
Subtotal (Impairment)	7.1	4.2	13.9	8.0

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Table 16. Percent Drivers by Contributing Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Other Factors				
Faulty Evasive Action	2.7	5.8	3.2	8.1
Fatigued Or Asleep	3.9	5.8	5.1	8.4
Ill	0.9	0.7	1.4	1.7
Passed In No Passing Lane	0.7	< 0.1	0.9	--
Load Not Secured	0.3	0.6	0.1	--
Passed On Right Shoulder	0.2	0.1	0.1	0.3
Pedestrian Failed to Yield Right-of-Way To Vehicle	0.2	0.2	1.4	2.3
Oversized Vehicle Or Load	0.2	0.2	0.1	0.1
Fleeing Or Evading Police	0.3	0.1	0.5	0.7
Fire In Vehicle	0.1	0.4	< 0.1	--
Parked In Traffic Lane	0.1	0.2	0.1	0.5
Disabled In Traffic Lane	0.1	0.3	0.1	1.0
Handicapped Driver	< 0.1	< 0.1	< 0.1	--
Opened Door Into Traffic Lane	< 0.1	< 0.1	< 0.1	--
Parked Without Lights	< 0.1	< 0.1	< 0.1	< 0.1
Other	4.4	8.8	4.3	7.5
Subtotal (Other Factors)	14.2	23.2	17.3	30.6
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 10 and Figure 11.

Source: TX CRIS Data (2011-2015)

Driver Conditions

Table 17. Number of Drivers by Driver Condition (TX Rural Two-Lane Roads)

Driver Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Normal						
Unsafe Speed	23,193	8,919	32,112	2,432	697	3,129
Failed to Control Speed	19,925	2,320	22,245	1,166	101	1,267
Animal on Road- Wild	16,368	1,744	18,112	482	60	542
Animal on Road- Domestic	7,715	1,020	8,735	220	37	257
Other	6,610	1,495	8,105	535	142	677
Failed to Yield Right-of-way - Stop Sign	6,515	841	7,356	538	36	574
Failed to Drive in Single Lane	6,100	550	6,650	961	37	998
Faulty Evasive Action	4,146	869	5,015	446	55	501
Failed to Yield Right-of-way - Turning Left	3,840	220	4,060	436	9	445
Turned when Unsafe	3,668	260	3,928	305	4	309
Wrong Side - Not Passing	3,001	223	3,224	902	19	921
Disregard Stop Sign or Light	2,591	665	3,256	318	47	365
Failed to Pass to Left Safely	1,944	214	2,158	133	5	138
Failed to Yield Right-of-way - Private Drive	1,921	474	2,395	125	19	144
Followed Too Closely	1,438	108	1,546	52	7	59
Ill	1,253	313	1,566	183	31	214
Passed in No Passing Lane	1,198	57	1,255	142	3	145
Backed Without Safety	1,134	1,709	2,843	26	6	32
Failed to Yield Right-of-way - Open Intersection	715	481	1,196	27	16	43
Changed Lane when Unsafe	709	29	738	24	1	25
Load Not Secured	571	29	600	16	3	19
Failed to Pass to Right Safely	440	37	477	12	1	13
Speeding - (Over limit)	434	218	652	152	44	196
Passed on Right Shoulder	375	6	381	18	--	18
Turned Improperly - Cut Corner on Left	345	202	547	11	4	15
Failed to Give Half of Roadway	326	1,359	1,685	36	46	82
Turned Improperly - Wide Right	324	167	491	6	1	7
Disregard Stop and Go Signal	322	34	356	26	4	30
Pedestrian Failed to Yield Right-of-way to Vehicle	309	67	376	186	33	219
Oversized Vehicle or Load	276	39	315	9	--	9
Fleeing or Evading Police	272	196	468	53	18	71
Failed To Signal Or Gave Wrong Signal	254	26	280	9	1	10
Turned Improperly - Wrong Lane	250	15	265	12	2	14

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Table 17. Number of Drivers by Driver Condition (TX Rural Two-Lane Roads) (cont.)

Driver Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Normal (cont.)						
Fire In Vehicle	229	43	272	2	--	2
Overtake and Pass Insufficient Clearance	213	13	226	45	--	45
Failed to Yield Right-of-way - Yield Sign	212	328	540	8	7	15
Improper Start from Parked Position	166	58	224	12	3	15
Parked in Traffic Lane	162	57	219	10	8	18
Failed to Stop at Proper Place	154	37	191	10	4	14
Failed to Heed Warning Sign	137	32	169	25	2	27
Road Rage	125	47	172	8	4	12
Disabled in Traffic Lane	123	11	134	17	--	17
Wrong Side - Approach or Intersection	82	12	94	9	--	9
Failed to Yield Row - Turn on Red	78	5	83	2	--	2
Drove Without Headlights	67	23	90	12	5	17
Disregard Warning Sign at Construction	59	9	68	9	--	9
Failed to Yield Right-of-way - Emergency Vehicle	48	5	53	7	1	8
Failed to Stop for Train	44	76	120	10	17	27
Disregard Turn Marks at Intersection	32	4	36	3	--	3
Parked and Failed to Set Brakes	25	11	36	1	--	1
Handicapped Driver	21	15	36	2	1	3
Failed to Yield Right-of-way - To Pedestrian	18	17	35	6	--	6
Wrong Way - One Way Road	18	2	20	5	--	5
Opened Door into Traffic Lane	13	8	21	2	1	3
Parked Without Lights	12	5	17	3	--	3
Failed to Stop for School Bus	11	2	13	1	1	2
Subtotal (Normal)	120,531	25,726	146,257	10,208	1,543	11,751
Distraction						
Driver Inattention	9,917	2,750	12,667	623	90	713
Distraction in Vehicle	2,368	767	3,135	168	27	195
Cell/Mobile Phone Use	496	151	647	43	9	52
Subtotal (Distraction)	12,781	3,668	16,449	834	126	960

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Table 17. Number of Drivers by Driver Condition (TX Rural Two-Lane Roads) (cont.)

Driver Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Impairment						
Under Influence - Alcohol	6,901	2,425	9,326	1,326	347	1,673
Under Influence - Drug	980	227	1,207	166	23	189
Had Been Drinking	888	424	1,312	169	51	220
Impaired Visibility	818	319	1,137	73	11	84
Taking Medication	52	12	64	6	--	6
Subtotal (Impairment)	9,639	3,407	13,046	1,740	432	2,172
Fatigued or Asleep	6,482	671	7,153	763	29	792
Subtotal (Fatigued or Asleep)	6,482	671	7,153	763	29	792
Grand Total -- Defined	149,433	33,472	182,905	13,545	2,130	15,675
Undetermined Driver Condition	74,610	10,984	85,594	7,391	463	7,854
Grand Total (Defined + Undetermined)	224,043	44,456	268,499	20,936	2,593	23,529

Note: This table includes data used to develop Figure 12.

Source: TX CRIS Data (2011-2015)

Table 18. Percent Drivers by Driver Condition (TX Rural Two-Lane Roads)

Driver Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Normal						
Unsafe Speed	15.5	26.6	17.6	18.0	32.7	20.0
Failed to Control Speed	13.3	6.9	12.2	8.6	4.7	8.1
Animal on Road- Wild	11.0	5.2	9.9	3.6	2.8	3.5
Animal on Road- Domestic	5.2	3.0	4.8	1.6	1.7	1.6
Other	4.4	4.5	4.4	3.9	6.7	4.3
Failed to Yield Right-of-way - Stop Sign	4.4	2.5	4.0	4.0	1.7	3.7
Failed to Drive in Single Lane	4.1	1.6	3.6	7.1	1.7	6.4
Faulty Evasive Action	2.8	2.6	2.7	3.3	2.6	3.2
Failed to Yield Right-of-way - Turning Left	2.6	0.7	2.2	3.2	0.4	2.8
Turned when Unsafe	2.5	0.8	2.1	2.3	0.2	2.0
Wrong Side - Not Passing	2.0	0.7	1.8	6.7	0.9	5.9
Disregard Stop Sign or Light	1.7	2.0	1.8	2.3	2.2	2.3
Failed to Pass to Left Safely	1.3	0.6	1.2	1.0	0.2	0.9
Failed to Yield Right-of-way - Private Drive	1.3	1.4	1.3	0.9	0.9	0.9
Followed Too Closely	1.0	0.3	0.8	0.4	0.3	0.4
Ill	0.8	0.9	0.9	1.4	1.5	1.4
Passed in No Passing Lane	0.8	0.2	0.7	1.0	0.1	0.9
Backed Without Safety	0.8	5.1	1.6	0.2	0.3	0.2
Failed to Yield Right-of-way - Open Intersection	0.5	1.4	0.7	0.2	0.8	0.3
Changed Lane when Unsafe	0.5	0.1	0.4	0.2	< 0.1	0.2
Load Not Secured	0.4	0.1	0.3	0.1	0.1	0.1
Failed to Pass to Right Safely	0.3	0.1	0.3	0.1	< 0.1	0.1
Speeding - (Over limit)	0.3	0.7	0.4	1.1	2.1	1.3
Passed on Right Shoulder	0.3	< 0.1	0.2	0.1	--	0.1
Turned Improperly - Cut Corner on Left	0.2	0.6	0.3	0.1	0.2	0.1
Failed to Give Half of Roadway	0.2	4.1	0.9	0.3	2.2	0.5
Turned Improperly - Wide Right	0.2	0.5	0.3	< 0.1	< 0.1	< 0.1
Disregard Stop and Go Signal	0.2	0.1	0.2	0.2	0.2	0.2
Pedestrian Failed to Yield Right-of-way to Vehicle	0.2	0.2	0.2	1.4	1.5	1.4
Oversized Vehicle or Load	0.2	0.1	0.2	0.1	--	0.1
Fleeing or Evading Police	0.2	0.6	0.3	0.4	0.8	0.5
Failed To Signal Or Gave Wrong Signal	0.2	0.1	0.2	0.1	< 0.1	0.1
Turned Improperly - Wrong Lane	0.2	< 0.1	0.1	0.1	0.1	0.1

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Table 18. Percent Drivers by Driver Condition (TX Rural Two-Lane Roads) (cont.)

Driver Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Normal (cont.)						
Fire In Vehicle	0.2	0.1	0.1	< 0.1	--	< 0.1
Overtake and Pass Insufficient Clearance	0.1	< 0.1	0.1	0.3	--	0.3
Failed to Yield Right-of-way - Yield Sign	0.1	1.0	0.3	0.1	0.3	0.1
Improper Start from Parked Position	0.1	0.2	0.1	0.1	0.1	0.1
Parked in Traffic Lane	0.1	0.2	0.1	0.1	0.4	0.1
Failed to Stop at Proper Place	0.1	0.1	0.1	0.1	0.2	0.1
Failed to Heed Warning Sign	0.1	0.1	0.1	0.2	0.1	0.2
Road Rage	0.1	0.1	0.1	0.1	0.2	0.1
Disabled in Traffic Lane	0.1	< 0.1	0.1	0.1	--	0.1
Wrong Side - Approach or Intersection	0.1	< 0.1	0.1	0.1	--	0.1
Failed to Yield Row - Turn on Red	0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Drove Without Headlights	< 0.1	0.1	< 0.1	0.1	0.2	0.1
Disregard Warning Sign at Construction	< 0.1	< 0.1	< 0.1	0.1	--	0.1
Failed to Yield Right-of-way - Emergency Vehicle	< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.1
Failed to Stop for Train	< 0.1	0.2	0.1	0.1	0.8	0.2
Disregard Turn Marks at Intersection	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Parked and Failed to Set Brakes	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Handicapped Driver	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Failed to Yield Right-of-way - To Pedestrian	< 0.1	0.1	< 0.1	< 0.1	--	< 0.1
Wrong Way - One Way Road	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Opened Door into Traffic Lane	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Parked Without Lights	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Failed to Stop for School Bus	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Subtotal (Normal)	80.8	76.5	79.9	75.6	71.9	75.3
Distraction						
Driver Inattention	6.6	8.2	6.9	4.6	4.2	4.5
Distraction in Vehicle	1.6	2.3	1.7	1.2	1.3	1.2
Cell/Mobile Phone Use	0.3	0.5	0.4	0.3	0.4	0.3
Subtotal (Distraction)	8.5	11.0	9.0	6.1	5.9	6.0

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Table 18. Percent Drivers by Driver Condition (TX Rural Two-Lane Roads) (cont.)

Driver Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Impairment						
Under Influence - Alcohol	4.6	7.2	5.1	9.8	16.3	10.7
Under Influence - Drug	0.7	0.7	0.7	1.2	1.1	1.2
Had Been Drinking	0.6	1.3	0.7	1.2	2.4	1.4
Impaired Visibility	0.5	1.0	0.6	0.5	0.5	0.5
Taking Medication	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Subtotal (Impairment)	6.4	10.2	7.1	12.7	20.6	13.8
Fatigued or Asleep	4.3	2.3	3.8	5.3	1.3	4.8
Subtotal (Fatigued or Asleep)	4.3	2.3	3.8	5.3	1.3	4.8
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 12.

Source: TX CRIS Data (2011-2015)

Table 19. Number of Drivers by Driver Condition (TX Rural Two-Lane vs. Freeway)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Normal				
Unsafe Speed	32,112	7,565	3,129	304
Failed to Control Speed	22,245	8,005	1,267	405
Animal on Road- Wild	18,112	1,582	542	27
Animal on Road- Domestic	8,735	353	257	13
Other	8,105	3,382	677	178
Failed to Yield Right-of-way - Stop Sign	7,356	285	574	19
Failed to Drive in Single Lane	6,650	3,035	998	307
Faulty Evasive Action	5,015	2,237	501	192
Failed to Yield Right-of-way - Turning Left	4,060	86	445	4
Turned when Unsafe	3,928	83	309	5
Wrong Side - Not Passing	3,224	7	921	1
Disregard Stop Sign or Light	3,256	88	365	7
Failed to Pass to Left Safely	2,158	94	138	6
Failed to Yield Right-of-way - Private Drive	2,395	26	144	1
Followed Too Closely	1,546	749	59	18
Ill	1,566	273	214	39
Passed in No Passing Lane	1,255	9	145	--
Backed Without Safety	2,843	83	32	1
Failed to Yield Right-of-way - Open Intersection	1,196	41	43	3
Changed Lane when Unsafe	738	2,727	25	77
Load Not Secured	600	216	19	--
Failed to Pass to Right Safely	477	20	13	1
Speeding - (Over limit)	652	78	196	16
Passed on Right Shoulder	381	35	18	6
Turned Improperly - Cut Corner on Left	547	17	15	--
Failed to Give Half of Roadway	1,685	2	82	--
Turned Improperly - Wide Right	491	5	7	--
Disregard Stop and Go Signal	356	28	30	3
Pedestrian Failed to Yield Right-of-way to Vehicle	376	69	219	55
Oversized Vehicle or Load	315	87	9	2
Fleeing or Evading Police	468	46	71	16
Failed To Signal Or Gave Wrong Signal	280	5	10	--
Turned Improperly - Wrong Lane	265	31	14	1

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Table 19. Number of Drivers by Driver Condition (TX Rural Two-Lane vs. Freeway) (cont.)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Normal (cont.)				
Fire In Vehicle	272	139	2	--
Overtake and Pass Insufficient Clearance	226	29	45	--
Failed to Yield Right-of-way - Yield Sign	540	66	15	3
Improper Start from Parked Position	224	33	15	2
Parked in Traffic Lane	219	58	18	12
Failed to Stop at Proper Place	191	6	14	--
Failed to Heed Warning Sign	169	25	27	4
Road Rage	172	82	12	3
Disabled in Traffic Lane	134	131	17	24
Wrong Side - Approach or Intersection	94	2	9	--
Failed to Yield Row - Turn on Red	83	5	2	--
Drove Without Headlights	90	4	17	--
Disregard Warning Sign at Construction	68	29	9	1
Failed to Yield Right-of-way - Emergency Vehicle	53	5	8	1
Failed to Stop for Train	120	--	27	--
Disregard Turn Marks at Intersection	36	2	3	--
Parked and Failed to Set Brakes	36	4	1	--
Handicapped Driver	36	3	3	--
Failed to Yield Right-of-way - To Pedestrian	35	--	6	--
Wrong Way - One Way Road	20	95	5	46
Opened Door into Traffic Lane	21	2	3	--
Parked Without Lights	17	2	3	1
Failed to Stop for School Bus	13	--	2	--
Subtotal (Normal)	146,257	32,071	11,751	1,804
Distraction				
Driver Inattention	12,667	2,125	713	126
Distraction in Vehicle	3,135	460	195	34
Cell/Mobile Phone Use	647	89	52	9
Subtotal (Distraction)	16,449	2,674	960	169

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Table 19. Number of Drivers by Driver Condition (TX Rural Two-Lane vs. Freeway) (cont.)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Impairment				
Under Influence - Alcohol	9,326	1,016	1,673	123
Under Influence - Drug	1,207	230	189	33
Had Been Drinking	1,312	144	220	14
Impaired Visibility	1,137	249	84	18
Taking Medication	64	15	6	--
Subtotal (Impairment)	13,046	1,654	2,172	188
Fatigued or Asleep				
	7,153	2,229	792	199
Subtotal (Fatigued or Asleep)	7,153	2,229	792	199
Grand Total -- Defined	182,905	38,628	15,675	2,360
Undetermined Driver Condition	85,594	25,651	7,854	1,678
Grand Total (Defined + Undetermined)	268,499	64,279	23,529	4,038

Note: This table includes data used to develop Figure 14 and Figure 15.

Source: TX CRIS Data (2011-2015)

Table 20. Percent Drivers by Driver Condition (TX Rural Two-Lane vs. Freeway)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Normal				
Unsafe Speed	17.6	19.6	20.0	12.9
Failed to Control Speed	12.2	20.7	8.1	17.2
Animal on Road- Wild	9.9	4.1	3.5	1.1
Animal on Road- Domestic	4.8	0.9	1.6	0.6
Other	4.4	8.8	4.3	7.5
Failed to Yield Right-of-way - Stop Sign	4.0	0.7	3.7	0.8
Failed to Drive in Single Lane	3.6	7.9	6.4	13.0
Faulty Evasive Action	2.7	5.8	3.2	8.1
Failed to Yield Right-of-way - Turning Left	2.2	0.2	2.8	0.2
Turned when Unsafe	2.1	0.2	2.0	0.2
Wrong Side - Not Passing	1.8	< 0.1	5.9	< 0.1
Disregard Stop Sign or Light	1.8	0.2	2.3	0.3
Failed to Pass to Left Safely	1.2	0.2	0.9	0.3
Failed to Yield Right-of-way - Private Drive	1.3	0.1	0.9	< 0.1
Followed Too Closely	0.8	1.9	0.4	0.8
III	0.9	0.7	1.4	1.7
Passed in No Passing Lane	0.7	< 0.1	0.9	--
Backed Without Safety	1.6	0.2	0.2	< 0.1
Failed to Yield Right-of-way - Open Intersection	0.7	0.1	0.3	0.1
Changed Lane when Unsafe	0.4	7.1	0.2	3.3
Load Not Secured	0.3	0.6	0.1	--
Failed to Pass to Right Safely	0.3	0.1	0.1	< 0.1
Speeding - (Over limit)	0.4	0.2	1.3	0.7
Passed on Right Shoulder	0.2	0.1	0.1	0.3
Turned Improperly - Cut Corner on Left	0.3	< 0.1	0.1	--
Failed to Give Half of Roadway	0.9	< 0.1	0.5	--
Turned Improperly - Wide Right	0.3	< 0.1	< 0.1	--
Disregard Stop and Go Signal	0.2	0.1	0.2	0.1
Pedestrian Failed to Yield Right-of-way to Vehicle	0.2	0.2	1.4	2.3
Oversized Vehicle or Load	0.2	0.2	0.1	0.1
Fleeing or Evading Police	0.3	0.1	0.5	0.7
Failed To Signal or Gave Wrong Signal	0.2	< 0.1	0.1	--
Turned Improperly - Wrong Lane	0.1	0.1	0.1	< 0.1

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Table 20. Percent Drivers by Driver Condition (TX Rural Two-Lane vs. Freeway) (cont.)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Normal (cont.)				
Fire In Vehicle	0.1	0.4	< 0.1	--
Overtake and Pass Insufficient Clearance	0.1	0.1	0.3	--
Failed to Yield Right-of-way - Yield Sign	0.3	0.2	0.1	0.1
Improper Start from Parked Position	0.1	0.1	0.1	0.1
Parked in Traffic Lane	0.1	0.2	0.1	0.5
Failed to Stop at Proper Place	0.1	< 0.1	0.1	--
Failed to Heed Warning Sign	0.1	0.1	0.2	0.2
Road Rage	0.1	0.2	0.1	0.1
Disabled in Traffic Lane	0.1	0.3	0.1	1.0
Wrong Side - Approach or Intersection	0.1	< 0.1	0.1	--
Failed to Yield Row - Turn on Red	< 0.1	< 0.1	< 0.1	--
Drove Without Headlights	< 0.1	< 0.1	0.1	--
Disregard Warning Sign at Construction	< 0.1	0.1	0.1	< 0.1
Failed to Yield Right-of-way - Emergency Vehicle	< 0.1	< 0.1	0.1	< 0.1
Failed to Stop for Train	0.1	--	0.2	--
Disregard Turn Marks at Intersection	< 0.1	< 0.1	< 0.1	--
Parked and Failed to Set Brakes	< 0.1	< 0.1	< 0.1	--
Handicapped Driver	< 0.1	< 0.1	< 0.1	--
Failed to Yield Right-of-way - To Pedestrian	< 0.1	--	< 0.1	--
Wrong Way - One Way Road	< 0.1	0.2	< 0.1	1.9
Opened Door into Traffic Lane	< 0.1	< 0.1	< 0.1	--
Parked Without Lights	< 0.1	< 0.1	< 0.1	< 0.1
Failed to Stop for School Bus	< 0.1	--	< 0.1	--
Subtotal (Normal)	79.9	83.0	75.3	76.5
Distraction				
Driver Inattention	6.9	5.5	4.5	5.4
Distraction in Vehicle	1.7	1.2	1.2	1.4
Cell/Mobile Phone Use	0.4	0.2	0.3	0.5
Subtotal (Distraction)	9.0	6.9	6.0	7.3

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Table 20. Percent Drivers by Driver Condition (TX Rural Two-Lane vs. Freeway) (cont.)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Impairment				
Under Influence - Alcohol	5.1	2.6	10.7	5.2
Under Influence - Drug	0.7	0.6	1.2	1.4
Had Been Drinking	0.7	0.4	1.4	0.6
Impaired Visibility	0.6	0.6	0.5	0.8
Taking Medication	< 0.1	< 0.1	< 0.1	--
Subtotal (Impairment)	7.1	4.2	13.8	8.0
Fatigued or Asleep	3.8	5.5	4.8	7.8
Subtotal (Fatigued or Asleep)	3.8	5.5	4.8	7.8
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 14 and Figure 15.

Source: TX CRIS Data (2011-2015)

Table 21. Number of Crashes by Other Driver Factors (TX Rural Two-Lane Roads)

Other Driver Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Attention Diverted from Driving	17,833	4,961	22,794	2,034	239	2,273
Lost Control or Skidded (Icy or Slick Road, Etc.)	10,657	1,728	12,385	658	76	734
Other Factors						
Swerved or Veered-Avoiding Animal in Road	5,869	2,087	7,956	358	83	441
Slowing/Stopping-To Make Left Turn	5,200	127	5,327	393	2	395
Slowing/Stopping-For Traffic	4,683	107	4,790	97	5	102
One Vehicle Entering Driveway	4,594	527	5,121	337	14	351
Construction - Within Posted Road Construction Zone (Not Related to Crash)	4,020	123	4,143	384	6	390
Slowing/Stopping - For Officer, Flagman, or Traffic Control	3,609	481	4,090	66	4	70
One Vehicle Leaving Driveway	3,277	1,817	5,094	178	35	213
Vehicle Passing or Attempting to Pass on Left	3,011	253	3,264	311	14	325
Swerved or Veered-Avoiding Vehicle from Opposite Direction in Wrong Lane	1,710	593	2,303	129	15	144
Swerved or Veered-Reason Not Specified	1,481	440	1,921	288	39	327
Slowing/Stopping-To Make Right Turn	1,296	76	1,372	55	2	57
Construction-Within Posted Road Construction Zone (Related to Crash)	1,026	61	1,087	85	--	85
Swerved or Veered - Avoid Vehicle Stopped or Moving Slowly in Traffic Lane	971	35	1,006	94	1	95
School Bus Related Crash	790	255	1,045	61	6	67
Vehicle Changing Lanes	726	42	768	35	2	37
Swerved or Veered-Avoiding Vehicle Entering Road	693	107	800	41	5	46
Vehicle Passing or Attempting to Pass on Right	670	42	712	31	--	31
Vision Obstructed by Other Visual Obstructions	642	263	905	70	22	92
Swerved or Veered-Avoiding Vehicle Passing, Changing Lanes	546	59	605	30	2	32

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Table 21. Number of Crashes by Other Driver Factors (TX Rural Two-Lane Roads) (cont.)

Other Driver Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Factors (cont.)						
Vision Obstructed by Headlight or Sun Glare	521	177	698	66	7	73
Slowing/Stopping-Reason not Specified	446	81	527	21	3	24
Swerved or Veered-Avoiding Object in Road	298	56	354	30	1	31
Slowing/Stopping-For Animal in Road	228	40	268	9	1	10
Gusty Winds	210	20	230	13	2	15
One Vehicle Parked Improper Location	194	52	246	30	3	33
One Vehicle Forward from Parking	145	36	181	9	1	10
One Vehicle Backward from Parking	144	162	306	1	1	2
Slowing/Stopping-To Avoid Previous Accident	137	1	138	8	--	8
Construction-In Other Construction Maintenance Area (Related to Crash)	115	17	132	12	3	15
Open Door or Object Projecting from Vehicle	115	35	150	10	4	14
Vision Obstructed by Moving Vehicle	88	2	90	6	--	6
Swerved or Veered-For Surface or Visibility	77	83	160	7	6	13
Slowing/Stopping-For Vehicle Entering Road	71	6	77	2	--	2
Passenger Interfered with Driver	65	21	86	12	2	14
Vision Obstructed by Standing or Parked Vehicle	59	16	75	5	--	5
Slowing/Stopping-For Pedestrian, Pedalcyclist, Etc. in Road	51	7	58	1	--	1
Foot Slipped Off Brake or Clutch	50	21	71	2	1	3
Vision Obstructed by Hillcrest	48	8	56	10	--	10
Slowing/Stopping-For Object in Road	45	2	47	2	--	2
Slowing/Stopping-For Surface or Visibility	45	12	57	4	1	5

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Table 21. Number of Crashes by Other Driver Factors (TX Rural Two-Lane Roads) (cont.)

Other Driver Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Factors (cont.)						
Slowing/Stopping-for Vehicle from Opposite Direction in Wrong Lane	33	5	38	4	--	4
Swerved or Veered-Avoiding Pedestrian, Pedalcyclist, Etc. in Road	30	11	41	2	--	2
Vision Obstructed by Trees, Shrubs, Weeds, Etc.	26	91	117	3	4	7
Swerved or Veered-Avoiding Previous Accident	22	2	24	1	--	1
Construction - In Other Const. Main. Area (Not Related to Crash)	16	1	17	1	--	1
Crash Occurred on a Beach	11	4	15	1	--	1
Swerved or Veered - For Officer, Flagman, Or Traffic Control Device	4	--	4	--	--	--
Vision Obstructed by Commercial Sign	2	--	2	1	--	1
Vision Obstructed by Highway Sign	1	--	1	1	--	1
Subtotal (Other Factors)	48,111	8,464	56,575	3,317	297	3,614
Not Applicable	80,145	21,216	101,361	8,048	1,622	9,670
Grand Total -- Defined	156,746	36,369	193,115	14,057	2,234	16,291
Undetermined Driver Condition	0	1	1	0	0	0
Grand Total (Defined + Undetermined)	156,746	36,370	193,116	14,057	2,234	16,291

Note: This table includes data used to develop Figure 16.

Source: TX CRIS Data (2011-2015)

Table 22. Percent Crashes by Other Driver Factors (TX Rural Two-Lane Roads)

Other Driver Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Attention Diverted from Driving	11.4	13.6	11.8	14.4	10.7	14.0
Lost Control or Skidded (Icy or Slick Road, Etc.)	6.8	4.8	6.4	4.7	3.4	4.5
Other Factors						
Swerved or Veered-Avoiding Animal in Road	3.7	5.7	4.1	2.6	3.7	2.7
Slowing/Stopping-To Make Left Turn	3.3	0.4	2.8	2.8	0.1	2.4
Slowing/Stopping-For Traffic	3.0	0.3	2.5	0.7	0.2	0.6
One Vehicle Entering Driveway	2.9	1.5	2.7	2.4	0.6	2.2
Construction - Within Posted Road Construction Zone (Not Related to Crash)	2.6	0.3	2.2	2.7	0.3	2.4
Slowing/Stopping - For Officer, Flagman, or Traffic Control	2.3	1.3	2.1	0.5	0.2	0.4
One Vehicle Leaving Driveway	2.1	5.0	2.6	1.3	1.6	1.3
Vehicle Passing or Attempting to Pass on Left	1.9	0.7	1.7	2.2	0.6	2.0
Swerved or Veered-Avoiding Vehicle from Opposite Direction in Wrong Lane	1.1	1.6	1.2	0.9	0.7	0.9
Swerved or Veered-Reason Not Specified	0.9	1.2	1.0	2.1	1.8	2.0
Slowing/Stopping-To Make Right Turn	0.8	0.2	0.7	0.4	0.1	0.4
Construction-Within Posted Road Construction Zone (Related to Crash)	0.7	0.2	0.6	0.6	--	0.5
Swerved or Veered - Avoid Vehicle Stopped or Moving Slowly in Traffic Lane	0.6	0.1	0.5	0.7	< 0.1	0.6
School Bus Related Crash	0.5	0.7	0.5	0.4	0.3	0.4
Vehicle Changing Lanes	0.5	0.1	0.4	0.3	0.1	0.2
Swerved or Veered-Avoiding Vehicle Entering Road	0.4	0.3	0.4	0.3	0.2	0.3
Vehicle Passing or Attempting to Pass on Right	0.4	0.1	0.4	0.2	--	0.2
Vision Obstructed by Other Visual Obstructions	0.4	0.7	0.5	0.5	1.0	0.6
Swerved or Veered-Avoiding Vehicle Passing, Changing Lanes	0.4	0.2	0.3	0.2	0.1	0.2

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Table 22. Percent Crashes by Other Driver Factors (TX Rural Two-Lane Roads) (cont.)

Other Driver Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Factors (cont.)						
Vision Obstructed by Headlight or Sun Glare	0.3	0.5	0.4	0.5	0.3	0.5
Slowing/Stopping-Reason not Specified	0.3	0.2	0.3	0.2	0.1	0.2
Swerved or Veered-Avoiding Object in Road	0.2	0.2	0.2	0.2	< 0.1	0.2
Slowing/Stopping-For Animal in Road	0.2	0.1	0.1	0.1	< 0.1	0.1
Gusty Winds	0.1	0.1	0.1	0.1	0.1	0.1
One Vehicle Parked Improper Location	0.1	0.1	0.1	0.2	0.1	0.2
One Vehicle Forward from Parking	0.1	0.1	0.1	0.1	< 0.1	0.1
One Vehicle Backward from Parking	0.1	0.5	0.2	< 0.1	< 0.1	< 0.1
Slowing/Stopping-To Avoid Previous Accident	0.1	< 0.1	0.1	0.1	--	0.1
Construction-In Other Construction Maintenance Area (Related to Crash)	0.1	0.1	0.1	0.1	0.1	0.1
Open Door or Object Projecting from Vehicle	0.1	0.1	0.1	0.1	0.2	0.1
Vision Obstructed by Moving Vehicle	0.1	< 0.1	0.1	< 0.1	--	< 0.1
Swerved or Veered-For Surface or Visibility	0.1	0.2	0.1	0.1	0.3	0.1
Slowing/Stopping-For Vehicle Entering Road	0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Passenger Interfered with Driver	< 0.1	0.1	< 0.1	0.1	0.1	0.1
Vision Obstructed by Standing or Parked Vehicle	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Slowing/Stopping-For Pedestrian, Pedalcyclist, Etc. in Road	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Foot Slipped Off Brake or Clutch	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Vision Obstructed by Hillcrest	< 0.1	< 0.1	< 0.1	0.1	--	0.1
Slowing/Stopping-For Object in Road	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Slowing/Stopping-For Surface or Visibility	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

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Table 22. Percent Crashes by Other Driver Factors (TX Rural Two-Lane Roads) (cont.)

Other Driver Factors	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Factors (cont.)						
Slowing/Stopping-for Vehicle from Opposite Direction in Wrong Lane	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Swerved or Veered-Avoiding Pedestrian, Pedalcyclist, Etc. in Road	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Vision Obstructed by Trees, Shrubs, Weeds, Etc.	< 0.1	0.3	0.1	< 0.1	0.2	< 0.1
Swerved or Veered-Avoiding Previous Accident	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Construction - In Other Const. Main. Area (Not Related to Crash)	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Crash Occurred on a Beach	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Swerved or Veered - For Officer, Flagman, Or Traffic Control Device	< 0.1	--	< 0.1	--	--	--
Vision Obstructed by Commercial Sign	< 0.1	--	< 0.1	< 0.1	--	< 0.1
Vision Obstructed by Highway Sign	< 0.1	--	< 0.1	< 0.1	--	< 0.1
Subtotal (Other Factors)	30.7	23.3	29.3	23.6	13.3	22.2
Not Applicable	51.1	58.3	52.5	57.3	72.6	59.4
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 16.

Source: TX CRIS Data (2011-2015)

Table 23. Number of Crashes by Other Driver Factors (TX Rural Two-Lane vs. Freeway)

Other Driver Factors	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Attention Diverted from Driving	22,794	4,620	2,273	457
Lost Control or Skidded (Icy or Slick Road, Etc.)	12,385	6,783	734	213
Other Factors				
Swerved or Veered-Avoiding Animal in Road	7,956	310	441	21
Slowing/Stopping-To Make Left Turn	5,327	49	395	2
Slowing/Stopping-For Traffic	4,790	2,162	102	80
One Vehicle Entering Driveway	5,121	34	351	1
Construction - Within Posted Road	4,143	3,716	390	125
Construction Zone (Not Related to Crash)				
Slowing/Stopping - For Officer, Flagman, or Traffic Control	4,090	162	70	5
One Vehicle Leaving Driveway	5,094	46	213	4
Vehicle Passing or Attempting to Pass on Left	3,264	434	325	23
Swerved or Veered-Avoiding Vehicle from Opposite Direction in Wrong Lane	2,303	27	144	2
Swerved or Veered-Reason Not Specified	1,921	503	327	57
Slowing/Stopping-To Make Right Turn	1,372	32	57	--
Construction-Within Posted Road	1,087	490	85	44
Construction Zone (Related to Crash)				
Swerved or Veered - Avoid Vehicle Stopped or Moving Slowly in Traffic Lane	1,006	518	95	26
School Bus Related Crash	1,045	28	67	1
Vehicle Changing Lanes	768	2,618	37	87
Swerved or Veered-Avoiding Vehicle Entering Road	800	51	46	1
Vehicle Passing or Attempting to Pass on Right	712	97	31	6
Vision Obstructed by Other Visual Obstructions	905	165	92	16
Swerved Or Veered-Avoiding Vehicle Passing, Changing Lanes	605	1,172	32	53

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Table 23. Number of Crashes by Other Driver Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Other Driver Factors	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Other Factors (cont.)				
Vision Obstructed by Headlight or Sun Glare	698	41	73	2
Slowing/Stopping-Reason not Specified	527	127	24	14
Swerved or Veered-Avoiding Object in Road	354	327	31	16
Slowing/Stopping-For Animal in Road	268	17	10	--
Gusty Winds	230	314	15	18
One Vehicle Parked Improper Location	246	112	33	22
One Vehicle Forward from Parking	181	39	10	1
One Vehicle Backward from Parking	306	6	2	--
Slowing/Stopping-To Avoid Previous Accident	138	439	8	36
Construction-In Other Construction Maintenance Area (Related to Crash)	132	137	15	11
Open Door or Object Projecting from Vehicle	150	22	14	1
Vision Obstructed by Moving Vehicle	90	4	6	1
Swerved or Veered-For Surface or Visibility	160	12	13	--
Slowing/Stopping-For Vehicle Entering Road	77	4	2	1
Passenger Interfered with Driver	86	18	14	4
Vision Obstructed by Standing or Parked Vehicle	75	2	5	--
Slowing/Stopping-For Pedestrian, Pedalcyclist, Etc. in Road	58	3	1	--
Foot Slipped Off Brake or Clutch	71	5	3	--
Vision Obstructed by Hillcrest	56	10	10	2
Slowing/Stopping-For Object in Road	47	58	2	2
Slowing/Stopping-For Surface or Visibility	57	27	5	--

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Table 23. Number of Crashes by Other Driver Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Other Driver Factors	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Other Factors (cont.)				
Slowing/Stopping-for Vehicle from Opposite Direction in Wrong Lane	38	2	4	--
Swerved or Veered-Avoiding Pedestrian, Pedalcyclist, Etc. in Road	41	9	2	--
Vision Obstructed by Trees, Shrubs, Weeds, Etc.	117	3	7	--
Swerved or Veered-Avoiding Previous Accident	24	38	1	4
Construction - In Other Const. Main. Area (Not Related to Crash)	17	10	1	1
Crash Occurred on a Beach	15	--	1	--
Swerved or Veered - For Officer, Flagman, Or Traffic Control Device	4	--	--	--
Vision Obstructed by Commercial Sign	2	--	1	--
Vision Obstructed by Highway Sign	1	--	1	--
Subtotal (Other Factors)	56,575	14,400	3,614	690
Not Applicable	101,361	16,511	9,670	1,206
Grand Total -- Defined	193,115	42,314	16,291	2,566
Undetermined Driver Condition	1	1	0	0
Grand Total (Defined + Undetermined)	193,116	42,315	16,291	2,566

Note: This table includes data used to develop Figure 16.

Source: TX CRIS Data (2011-2015)

Table 24. Percent Crashes by Other Driver Factors (TX Rural Two-Lane vs. Freeway)

Other Driver Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Attention Diverted from Driving	11.8	10.9	14.0	17.8
Lost Control or Skidded (Icy or Slick Road, Etc.)	6.4	16.0	4.5	8.3
Other Factors				
Swerved or Veered-Avoiding Animal in Road	4.1	0.7	2.7	0.8
Slowing/Stopping-To Make Left Turn	2.8	0.1	2.4	0.1
Slowing/Stopping-For Traffic	2.5	5.1	0.6	3.1
One Vehicle Entering Driveway	2.7	0.1	2.2	< 0.1
Construction - Within Posted Road	2.2	8.8	2.4	4.9
Construction Zone (Not Related to Crash)				
Slowing/Stopping - For Officer, Flagman, or Traffic Control	2.1	0.4	0.4	0.2
One Vehicle Leaving Driveway	2.6	0.1	1.3	0.2
Vehicle Passing or Attempting to Pass on Left	1.7	1.0	2.0	0.9
Swerved or Veered-Avoiding Vehicle from Opposite Direction in Wrong Lane	1.2	0.1	0.9	0.1
Swerved or Veered-Reason Not Specified	1.0	1.2	2.0	2.2
Slowing/Stopping-To Make Right Turn	0.7	0.1	0.4	--
Construction-Within Posted Road	0.6	1.2	0.5	1.7
Construction Zone (Related to Crash)				
Swerved or Veered - Avoid Vehicle Stopped or Moving Slowly in Traffic Lane	0.5	1.2	0.6	1.0
School Bus Related Crash	0.5	0.1	0.4	< 0.1
Vehicle Changing Lanes	0.4	6.2	0.2	3.4
Swerved or Veered-Avoiding Vehicle Entering Road	0.4	0.1	0.3	< 0.1
Vehicle Passing or Attempting to Pass on Right	0.4	0.2	0.2	0.2
Vision Obstructed by Other Visual Obstructions	0.5	0.4	0.6	0.6
Swerved or Veered-Avoiding Vehicle Passing, Changing Lanes	0.3	2.8	0.2	2.1

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Table 24. Percent Crashes by Other Driver Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Other Driver Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Other Factors (cont.)				
Vision Obstructed by Headlight or Sun Glare	0.4	0.1	0.5	0.1
Slowing/Stopping-Reason not Specified	0.3	0.3	0.2	0.6
Swerved or Veered-Avoiding Object in Road	0.2	0.8	0.2	0.6
Slowing/Stopping-For Animal in Road	0.1	< 0.1	0.1	--
Gusty Winds	0.1	0.7	0.1	0.7
One Vehicle Parked Improper Location	0.1	0.3	0.2	0.9
One Vehicle Forward from Parking	0.1	0.1	0.1	< 0.1
One Vehicle Backward from Parking	0.2	< 0.1	< 0.1	--
Slowing/Stopping-To Avoid Previous Accident	0.1	1.0	0.1	1.4
Construction-In Other Construction Maintenance Area (Related to Crash)	0.1	0.3	0.1	0.4
Open Door or Object Projecting from Vehicle	0.1	0.1	0.1	< 0.1
Vision Obstructed by Moving Vehicle	0.1	< 0.1	< 0.1	< 0.1
Swerved or Veered-For Surface or Visibility	0.1	< 0.1	0.1	--
Slowing/Stopping-For Vehicle Entering Road	< 0.1	< 0.1	< 0.1	< 0.1
Passenger Interfered with Driver	< 0.1	< 0.1	0.1	0.2
Vision Obstructed by Standing or Parked Vehicle	< 0.1	< 0.1	< 0.1	--
Slowing/Stopping-For Pedestrian, Pedalcyclist, Etc. in Road	< 0.1	< 0.1	< 0.1	--
Foot Slipped Off Brake or Clutch	< 0.1	< 0.1	< 0.1	--
Vision Obstructed by Hillcrest	< 0.1	< 0.1	0.1	0.1
Slowing/Stopping-For Object in Road	< 0.1	0.1	< 0.1	0.1
Slowing/Stopping-For Surface or Visibility	< 0.1	0.1	< 0.1	--

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Table 24. Percent Crashes by Other Driver Factors (TX Rural Two-Lane vs. Freeway) (cont.)

Other Driver Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Other Factors (cont.)				
Slowing/Stopping-for Vehicle from Opposite Direction in Wrong Lane	< 0.1	< 0.1	< 0.1	--
Swerved or Veered-Avoiding Pedestrian, Pedalcyclist, Etc. in Road	< 0.1	< 0.1	< 0.1	--
Vision Obstructed by Trees, Shrubs, Weeds, Etc.	0.1	< 0.1	< 0.1	--
Swerved or Veered-Avoiding Previous Accident	< 0.1	0.1	< 0.1	0.2
Construction - In Other Const. Main. Area (Not Related to Crash)	< 0.1	< 0.1	< 0.1	< 0.1
Crash Occurred on a Beach	< 0.1	--	< 0.1	--
Swerved or Veered - For Officer, Flagman, or Traffic Control Device	< 0.1	--	--	--
Vision Obstructed by Commercial Sign	< 0.1	--	< 0.1	--
Vision Obstructed by Highway Sign	< 0.1	--	< 0.1	--
Subtotal (Other Factors)	29.3	34.0	22.2	26.9
Not Applicable	52.5	39.0	59.4	47.0
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 16.

Source: TX CRIS Data (2011-2015)

Vehicle Information

Table 25. Number of Vehicles by Vehicle Types (TX Rural Two-Lane Roads)

Vehicle Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Pickup/SUV/Van						
Pickup	74,605	15,242	89,847	6,486	742	7,228
Sport Utility Vehicle	36,110	7,400	43,510	3,165	378	3,543
Van	6,526	1,095	7,621	546	38	584
Subtotal (Pickup/SUV/Van)	117,241	23,737	140,978	10,197	1,158	11,355
Car						
Passenger Car, 4-Door	61,390	12,061	73,451	4,473	487	4,960
Passenger Car, 2-Door	13,122	2,856	15,978	1,041	161	1,202
Subtotal (Car)	74,512	14,917	89,429	5,514	648	6,162
Bus/Truck/Trailer						
Truck Tractor	14,239	1,096	15,335	1,606	59	1,665
Truck	5,172	932	6,104	436	30	466
Yellow School Bus	318	158	476	32	4	36
Bus	238	77	315	21	2	23
Fire Truck	88	30	118	7	2	9
Subtotal (Bus/Truck/Trailer)	20,055	2,293	22,348	2,102	97	2,199
Other Types						
Motorcycle	5,428	1,000	6,428	2,223	322	2,545
Police Car/Truck	735	166	901	32	4	36
Farm Equipment	421	70	491	45	11	56
Ambulance	96	13	109	9	--	9
Trailer, Semi-Trailer, or Pole Trailer	27	6	33	4	--	4
Police Motorcycle	1	1	2	--	--	--
Other	810	597	1,407	136	181	317
Unknown	3,047	1,064	4,111	115	22	137
Not applicable	1,670	592	2,262	559	150	709
Subtotal (Other Types)	12,235	3,509	15,744	3,123	690	3,813
Grand Total	224,043	44,456	268,499	20,936	2,593	23,529

Note: This table includes data used to develop Figure 20 and Figure 21.

Source: TX CRIS Data (2011-2015)

Table 26. Percent Vehicles by Vehicle Types (TX Rural Two-Lane Roads)

Vehicle Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Pickup/SUV/Van						
Pickup	33.3	34.3	33.5	31.0	28.6	30.7
Sport Utility Vehicle	16.1	16.7	16.2	15.1	14.6	15.1
Van	2.9	2.5	2.8	2.6	1.5	2.5
Subtotal (Pickup/SUV/Van)	52.3	53.4	52.5	48.7	44.7	48.3
Car						
Passenger Car, 4-Door	27.4	27.1	27.4	21.4	18.8	21.1
Passenger Car, 2-Door	5.9	6.4	6.0	5.0	6.2	5.1
Subtotal (Car)	33.3	33.5	33.3	26.4	25.0	26.2
Bus/Truck/Trailer						
Truck Tractor	6.4	2.5	5.7	7.7	2.3	7.1
Truck	2.3	2.1	2.3	2.1	1.2	2.0
Yellow School Bus	0.1	0.4	0.2	0.2	0.2	0.2
Bus	0.1	0.2	0.1	0.1	0.1	0.1
Fire Truck	< 0.1	0.1	< 0.1	< 0.1	0.1	< 0.1
Subtotal (Bus/Truck/Trailer)	8.9	5.3	8.3	10.1	3.9	9.3
Other Types						
Motorcycle	2.4	2.3	2.4	10.6	12.4	10.8
Police Car/Truck	0.3	0.4	0.3	0.2	0.2	0.2
Farm Equipment	0.2	0.2	0.2	0.2	0.4	0.2
Ambulance	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Trailer, Semi-Trailer, or Pole Trailer	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Police Motorcycle	< 0.1	< 0.1	< 0.1	--	--	< 0.1
Other	0.4	1.3	0.5	0.7	7.0	1.3
Unknown	1.4	2.4	1.5	0.6	0.9	0.6
Not applicable	0.8	1.3	0.8	2.7	5.8	3.0
Subtotal (Other Types)	5.5	7.9	5.9	15.0	26.7	16.2
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 20 and Figure 21.

Source: TX CRIS Data (2011-2015)

Table 27. Number of Vehicles by Vehicle Types (TX Rural Two-Lane vs. Freeway)

Vehicle Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Pickup/SUV/Van				
Pickup	89,847	14,562	7,228	819
Sport Utility Vehicle	43,510	10,714	3,543	771
Van	7,621	2,054	584	142
Subtotal (Pickup/SUV/Van)	140,978	27,330	11,355	1,732
Car				
Passenger Car, 4-Door	73,451	18,864	4,960	902
Passenger Car, 2-Door	15,978	3,732	1,202	166
Subtotal (Car)	89,429	22,596	6,162	1,068
Bus/Truck/Trailer				
Truck Tractor	15,335	10,143	1,665	720
Truck	6,104	1,440	466	106
Yellow School Bus	476	13	36	--
Bus	315	119	23	10
Fire Truck	118	14	9	--
Subtotal (Bus/Truck/Trailer)	22,348	11,729	2,199	836
Other Types				
Motorcycle	6,428	460	2,545	176
Police Car/Truck	901	122	36	6
Farm Equipment	491	8	56	1
Ambulance	109	34	9	1
Trailer, Semi-Trailer, or Pole Trailer	33	14	4	1
Police Motorcycle	2	--	--	--
Other	1,407	266	317	23
Unknown	4,111	1,334	137	55
Not applicable	2,262	386	709	139
Subtotal (Other Types)	15,744	2,624	3,813	402
Grand Total	268,499	64,279	23,529	4,038

Note: This table includes data used to develop Figure 20 and Figure 22.

Source: TX CRIS Data (2011-2015)

Table 28. Percent Vehicles by Vehicle Types (TX Rural Two-Lane vs. Freeway)

Vehicle Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Pickup/SUV/Van				
Pickup	33.5	22.7	30.7	20.3
Sport Utility Vehicle	16.2	16.7	15.1	19.1
Van	2.8	3.2	2.5	3.5
Subtotal (Pickup/SUV/Van)	52.5	42.6	48.3	42.9
Car				
Passenger Car, 4-Door	27.4	29.4	21.1	22.3
Passenger Car, 2-Door	6.0	5.8	5.1	4.1
Subtotal (Car)	33.3	35.2	26.2	26.4
Bus/Truck/Trailer				
Truck Tractor	5.7	15.8	7.1	17.8
Truck	2.3	2.2	2.0	2.6
Yellow School Bus	0.2	< 0.1	0.2	--
Bus	0.1	0.2	0.1	0.3
Fire Truck	< 0.1	< 0.1	< 0.1	--
Subtotal (Bus/Truck/Trailer)	8.3	18.2	9.3	20.7
Other Types				
Motorcycle	2.4	0.7	10.8	4.4
Police Car/Truck	0.3	0.2	0.2	0.2
Farm Equipment	0.2	< 0.1	0.2	< 0.1
Ambulance	< 0.1	0.1	< 0.1	< 0.1
Trailer, Semi-Trailer, or Pole Trailer	< 0.1	< 0.1	< 0.1	< 0.1
Police Motorcycle	< 0.1	--	< 0.1	--
Other	0.5	0.4	1.3	0.6
Unknown	1.5	2.1	0.6	1.4
Not applicable	0.8	0.6	3.0	3.4
Subtotal (Other Types)	5.9	4.1	16.2	10.0
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 20 and Figure 22.

Source: TX CRIS Data (2011-2015)

Road Environment Characteristics

Table 29. Number of Crashes by Collision Types (TX Rural Two-Lane Roads)

Collision Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
One Motor Vehicle (OMV)						
OMV Vehicle Going Straight	93,773	24,447	118,220	8,482	1,840	10,322
OMV Vehicle Turning Left	1,289	792	2,081	84	44	128
OMV Vehicle Turning Right	1,222	725	1,947	58	40	98
OMV Vehicle Backing	296	955	1,251	8	14	22
OMV Other	55	135	190	3	1	4
Subtotal (OMV)	96,635	27,054	123,689	8,635	1,939	10,574
Same Direction (SD)						
SD One Straight-One Stopped	10,758	578	11,336	496	16	512
SD Both Going Straight-Rear End	10,180	493	10,673	504	20	524
SD One Straight-One Left Turn	6,123	407	6,530	404	11	415
SD Both Going Straight-Sideswipe	2,484	208	2,692	112	3	115
SD One Straight-One Right Turn	1,944	155	2,099	60	6	66
SD Both Right Turn	174	16	190	2	--	2
SD Both Left Turn	85	15	100	1	--	1
SD One Right Turn-One Stopped	18	2	20	--	--	--
SD One Left Turn-One Stopped	14	--	14	1	--	1
SD One Right Turn-One Left Turn	6	3	9	--	--	--
Subtotal (SD)	31,786	1,877	33,663	1,580	56	1,636
Other Types						
Angle - Both Going Straight	9,127	2,688	11,815	780	103	883
Opposite Direction (OD) Both Going Straight	7,251	1,693	8,944	2,045	79	2,124
OD One Straight-One Left Turn	4,727	277	5,004	581	16	597
Angle - One Straight-One Left Turn	3,914	642	4,556	312	19	331
Angle - One Straight-One Right Turn	901	358	1,259	44	6	50

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Table 29. Number of Crashes by Collision Types (TX Rural Two-Lane Roads) (cont.)

Collision Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Types (continued)						
Angle - One Straight-One Backing	530	714	1,244	22	3	25
Angle - One Left Turn-One Stopped	372	179	551	5	1	6
OD One Backing-One Stopped	330	226	556	1	--	1
OD One Straight-One Backing	262	312	574	3	2	5
Angle - One Right Turn-One Stopped	247	102	349	5	--	5
Angle - One Straight-One Stopped	200	22	222	23	3	26
OD One Straight-One Stopped	130	46	176	16	6	22
Angle - Both Left Turn	79	11	90	--	--	--
OD One Right Turn-One Left Turn	63	5	68	1	--	1
Angle - One Right Turn-One Left Turn	55	53	108	1	1	2
OD Both Left Turns	33	3	36	--	--	--
OD One Straight-One Right Turn	22	6	28	1	--	1
OD Both Backing	12	29	41	--	--	--
OD One Left Turn-One Stopped	8	2	10	--	--	--
OD One Straight-One Enter Or Leave Parking Space	6	2	8	--	--	--
Angle - Both Right Turn	2	2	4	--	--	--
OD One Right Turn-One Stopped	1	--	1	--	--	--
OD One Enter Or Leave Parking Space-One Stopped	1	1	2	--	--	--
OD One Left Turn-One Enter Or Leave Parking Space	1	--	1	--	--	--
OD One Right Turn-One Enter Or Leave Parking Space	1	--	1	--	--	--
Subtotal (Other)	28,275	7,373	35,648	3,840	239	4,079
Grand Total -- Defined	156,696	36,304	193,000	14,055	2,234	16,289
Undetermined Collision Types	50	66	116	2	0	2
Grand Total (Defined + Undetermined)	156,746	36,370	193,116	14,057	2,234	16,291

Note: This table includes data used to develop Figure 27 and Figure 28.

Source: TX CRIS Data (2011-2015)

Table 30. Percent Crashes by Collision Types (TX Rural Two-Lane Roads)

Collision Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
One Motor Vehicle (OMV)						
OMV Vehicle Going Straight	59.8	67.3	61.3	60.3	82.4	63.4
OMV Vehicle Turning Left	0.8	2.2	1.1	0.6	2.0	0.8
OMV Vehicle Turning Right	0.8	2.0	1.0	0.4	1.8	0.6
OMV Vehicle Backing	0.2	2.6	0.6	0.1	0.6	0.1
OMV Other	< 0.1	0.4	0.1	< 0.1	< 0.1	< 0.1
Subtotal (OMV)	61.6	74.5	64.1	61.4	86.8	64.9
Same Direction (SD)						
SD One Straight-One Stopped	6.9	1.6	5.9	3.5	0.7	3.1
SD Both Going Straight-Rear End	6.5	1.4	5.5	3.6	0.9	3.2
SD One Straight-One Left Turn	3.9	1.1	3.4	2.9	0.5	2.5
SD Both Going Straight-Sideswipe	1.6	0.6	1.4	0.8	0.1	0.7
SD One Straight-One Right Turn	1.2	0.4	1.1	0.4	0.3	0.4
SD Both Right Turn	0.1	< 0.1	0.1	< 0.1	--	< 0.1
SD Both Left Turn	0.1	< 0.1	0.1	< 0.1	--	< 0.1
SD One Right Turn-One Stopped	< 0.1	< 0.1	< 0.1	--	--	--
SD One Left Turn-One Stopped	< 0.1	--	< 0.1	< 0.1	--	< 0.1
SD One Right Turn-One Left Turn	< 0.1	< 0.1	< 0.1	--	--	--
Subtotal (SD)	20.3	5.1	17.4	11.2	2.5	10.0
Other Types						
Angle - Both Going Straight	5.8	7.4	6.1	5.5	4.6	5.4
Opposite Direction (OD) Both Going Straight	2.5	1.8	4.6	2.2	0.9	13.0
OD One Straight-One Left Turn	0.6	1.0	2.6	0.3	0.3	3.7
Angle - One Straight-One Left Turn	0.3	2.0	2.4	0.2	0.1	2.0
Angle - One Straight-One Right Turn	0.2	0.5	0.7	< 0.1	< 0.1	0.3

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Table 30. Percent Crashes by Collision Types (TX Rural Two-Lane Roads) (cont.)

Collision Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Types (continued)						
Angle - One Straight-One Backing	0.2	0.3	0.6	< 0.1	--	0.2
Angle - One Left Turn-One Stopped	0.1	0.1	0.3	0.2	0.1	< 0.1
OD One Backing-One Stopped	0.1	< 0.1	0.3	--	--	< 0.1
OD One Straight-One Backing	< 0.1	0.1	0.3	< 0.1	< 0.1	< 0.1
Angle - One Right Turn-One Stopped	< 0.1	< 0.1	0.2	--	--	< 0.1
Angle - One Straight-One Stopped	4.6	4.7	0.1	14.5	3.5	0.2
OD One Straight-One Stopped	3.0	0.8	0.1	4.1	0.7	0.1
Angle - Both Left Turn	0.2	0.6	< 0.1	< 0.1	--	--
OD One Right Turn-One Left Turn	0.2	0.9	< 0.1	< 0.1	0.1	< 0.1
Angle - One Right Turn-One Left Turn	0.1	0.1	0.1	0.1	0.3	< 0.1
OD Both Left Turns	< 0.1	< 0.1	< 0.1	< 0.1	--	--
OD One Straight-One Right Turn	< 0.1	< 0.1	< 0.1	--	--	< 0.1
OD Both Backing	< 0.1	< 0.1	< 0.1	< 0.1	--	--
OD One Left Turn-One Stopped	< 0.1	0.1	< 0.1	--	--	--
OD One Straight-One Enter Or Leave Parking Space	< 0.1	< 0.1	< 0.1	--	--	--
Angle - Both Right Turn	< 0.1	< 0.1	< 0.1	--	--	--
OD One Right Turn-One Stopped	< 0.1	--	< 0.1	--	--	--
OD One Enter Or Leave Parking Space-One Stopped	< 0.1	< 0.1	< 0.1	--	--	--
OD One Left Turn-One Enter Or Leave Parking Space	< 0.1	--	< 0.1	--	--	--
OD One Right Turn-One Enter Or Leave Parking Space	< 0.1	--	< 0.1	--	--	--
Subtotal (Other)	17.9	20.4	18.5	27.1	10.6	25.0
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 27 and Figure 28.

Source: TX CRIS Data (2011-2015)

Table 31. Number of Crashes by Collision Types (TX Rural Two-Lane vs. Freeway)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
One Motor Vehicle (OMV)				
OMV Vehicle Going Straight	118,220	25,624	10,322	1,706
OMV Vehicle Turning Left	2,081	47	128	3
OMV Vehicle Turning Right	1,947	55	98	4
OMV Vehicle Backing	1,251	38	22	1
OMV Other	190	4	4	--
Subtotal (OMV)	123,689	25,768	10,574	1,714
Same Direction (SD)				
SD One Straight-One Stopped	11,336	1,842	512	130
SD Both Going Straight-Rear End	10,673	7,409	524	366
SD One Straight-One Left Turn	6,530	83	415	3
SD Both Going Straight-Sideswipe	2,692	5,824	115	162
SD One Straight-One Right Turn	2,099	41	66	--
SD Both Right Turn	190	9	2	--
SD Both Left Turn	100	8	1	--
SD One Right Turn-One Stopped	20	--	--	--
SD One Left Turn-One Stopped	14	1	1	--
SD One Right Turn-One Left Turn	9	--	--	--
Subtotal (SD)	33,663	15,217	1,636	661
Other Types				
Angle - Both Going Straight	11,815	494	883	38
Opposite Direction (OD) Both Going Straight	8,944	343	2,124	116
OD One Straight-One Left Turn	5,004	137	597	9
Angle - One Straight-One Left Turn	4,556	98	331	5
Angle - One Straight-One Right Turn	1,259	76	50	5

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Table 31. Number of Crashes by Collision Types (TX Rural Two-Lane vs. Freeway) (cont.)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Other Types (continued)				
Angle - One Straight-One Backing	1,244	8	25	--
Angle - One Left Turn-One Stopped	551	14	6	--
OD One Backing-One Stopped	556	33	1	--
OD One Straight-One Backing	574	33	5	1
Angle - One Right Turn-One Stopped	349	4	5	--
Angle - One Straight-One Stopped	222	58	26	14
OD One Straight-One Stopped	176	16	22	3
Angle - Both Left Turn	90	3	--	--
OD One Right Turn-One Left Turn	68	3	1	--
Angle - One Right Turn-One Left Turn	108	--	2	--
OD Both Left Turns	36	2	--	--
OD One Straight-One Right Turn	28	--	1	--
OD Both Backing	41	--	--	--
OD One Left Turn-One Stopped	10	1	--	--
OD One Straight-One Enter Or Leave Parking Space	8	--	--	--
Angle - Both Right Turn	4	--	--	--
OD One Right Turn-One Stopped	1	--	--	--
OD One Enter Or Leave Parking Space-One Stopped	2	--	--	--
OD One Left Turn-One Enter Or Leave Parking Space	1	--	--	--
OD One Right Turn-One Enter Or Leave Parking Space	1	--	--	--
Subtotal (Other)	35,648	1,323	4,079	191
Grand Total -- Defined	193,000	42,308	16,289	2,566
Undetermined Collision Types	116	7	2	0
Grand Total (Defined + Undetermined)	193,116	42,315	16,291	2,566

Note: This table includes data used to develop Figure 27 and Figure 29.

Source: TX CRIS Data (2011-2015)

Table 32. Percent Crashes by Collision Types (TX Rural Two-Lane vs. Freeway)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
One Motor Vehicle (OMV)				
OMV Vehicle Going Straight	61.3	60.6	63.4	66.5
OMV Vehicle Turning Left	1.1	0.1	0.8	0.1
OMV Vehicle Turning Right	1.0	0.1	0.6	0.2
OMV Vehicle Backing	0.6	0.1	0.1	< 0.1
OMV Other	0.1	< 0.1	< 0.1	--
Subtotal (OMV)	64.1	60.9	64.9	66.8
Same Direction (SD)				
SD One Straight-One Stopped	5.9	4.4	3.1	5.1
SD Both Going Straight-Rear End	5.5	17.5	3.2	14.3
SD One Straight-One Left Turn	3.4	0.2	2.5	0.1
SD Both Going Straight-Sideswipe	1.4	13.8	0.7	6.3
SD One Straight-One Right Turn	1.1	0.1	0.4	--
SD Both Right Turn	0.1	< 0.1	< 0.1	--
SD Both Left Turn	0.1	< 0.1	< 0.1	--
SD One Right Turn-One Stopped	< 0.1	--	--	--
SD One Left Turn-One Stopped	< 0.1	< 0.1	< 0.1	--
SD One Right Turn-One Left Turn	< 0.1	--	--	--
Subtotal (SD)	17.4	36.0	10.0	25.8
Other Types				
Angle - Both Going Straight	6.1	1.2	5.4	1.5
Opposite Direction (OD) Both Going Straight	4.6	0.2	13.0	0.2
OD One Straight-One Left Turn	2.6	0.2	3.7	0.2
Angle - One Straight-One Left Turn	2.4	< 0.1	2.0	--
Angle - One Straight-One Right Turn	0.7	< 0.1	0.3	--

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Table 32. Percent Crashes by Collision Types (TX Rural Two-Lane vs. Freeway) (cont.)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Other Types (continued)				
Angle - One Straight-One Backing	0.6	< 0.1	0.2	--
Angle - One Left Turn-One Stopped	0.3	0.1	< 0.1	0.5
OD One Backing-One Stopped	0.3	< 0.1	< 0.1	--
OD One Straight-One Backing	0.3	--	< 0.1	--
Angle - One Right Turn-One Stopped	0.2	--	< 0.1	--
Angle - One Straight-One Stopped	0.1	0.8	0.2	4.5
OD One Straight-One Stopped	0.1	0.3	0.1	0.4
Angle - Both Left Turn	< 0.1	0.1	--	--
OD One Right Turn-One Left Turn	< 0.1	0.1	< 0.1	< 0.1
Angle - One Right Turn-One Left Turn	0.1	< 0.1	< 0.1	0.1
OD Both Left Turns	< 0.1	< 0.1	--	--
OD One Straight-One Right Turn	< 0.1	< 0.1	< 0.1	--
OD Both Backing	< 0.1	--	--	--
OD One Left Turn-One Stopped	< 0.1	--	--	--
OD One Straight-One Enter Or Leave Parking Space	< 0.1	< 0.1	--	--
Angle - Both Right Turn	< 0.1	--	--	--
OD One Right Turn-One Stopped	< 0.1	--	--	--
OD One Enter Or Leave Parking Space-One Stopped	< 0.1	--	--	--
OD One Left Turn-One Enter Or Leave Parking Space	< 0.1	--	--	--
OD One Right Turn-One Enter Or Leave Parking Space	< 0.1	--	--	--
Subtotal (Other)	18.5	3.0	25.0	7.4
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 27 and Figure 29.

Source: TX CRIS Data (2011-2015)

Table 33. Number of Crashes by Obstruction Types (TX Rural Two-Lane Roads)

Obstruction Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Overturned	19,531	4,169	23,700	3,409	513	3,922
Hit Fence	16,000	6,416	22,416	1,462	331	1,793
Hit Tree, Shrub, Landscaping	10,316	5,046	15,362	1,279	460	1,739
Other Types						
Hit Highway Sign	4,966	509	5,475	393	20	413
Hit Guardrail	4,505	275	4,780	384	10	394
Hit Culvert-Headwall	4,419	903	5,322	682	65	747
Ditch	3,998	1,296	5,294	299	85	384
Hit Utility Pole	2,370	1,333	3,703	211	62	273
Hit Mailbox	2,361	1,075	3,436	172	51	223
Hit Other Fixed Object	2,295	987	3,282	219	53	272
Embankment	2,037	714	2,751	267	62	329
Jack-Knifed	1,317	27	1,344	90	3	93
Hit Side of Bridge (Bridge Rail)	1,107	192	1,299	98	10	108
Hit Fallen Trees or Debris on Road	600	103	703	20	6	26
Hit Median Barrier	380	14	394	21	--	21
Hit Delineator or Marker Post	352	32	384	46	1	47
Hit Overhead Signal Light, Wires, Signs, Etc.	326	166	492	--	1	1
Hit Luminaire Pole	283	89	372	17	1	18
Hit House, Bldg. or Bldg. Fixture	251	145	396	17	7	24
Hit Object from Another Vehicle in Road	241	2	243	9	--	9
Hit Concrete Traffic Barrier	230	20	250	20	--	20
Person Fell or Jumped From Vehicle	182	123	305	99	56	155
Hit Curb	167	60	227	10	7	17
Hit Work Zone Barricade, Cones, Signs or Material	147	10	157	6	1	7
Hit Previously Wrecked Vehicle	136	2	138	18	--	18
Hit Hole in Road	110	75	185	18	7	25
Hit Railroad Crossing Gates	90	15	105	3	--	3
Hit Commercial Sign	86	20	106	2	--	2
Hit Train Moving Forward	86	137	223	15	27	42
Hit Top of Underpass or Tunnel	58	8	66	--	1	1

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Table 33. Number of Crashes by Obstruction Types (TX Rural Two-Lane Roads) (cont.)

Obstruction Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Other Types (cont.)						
Hit Traffic Signal Pole Or Post	58	4	62	6	--	6
Hit Retaining Wall	56	13	69	7	--	7
Fire Hydrant	55	71	126	2	1	3
Hit Pier Or Support At Underpass, Tunnel Or Overhead Sign Bridge	41	13	54	10	--	10
Hit Work Zone Machinery Or Stockpiled Materials	38	17	55	4	2	6
Hit Attenuation Device	34	2	36	1	--	1
Hit End Of Bridge (Abutment Or Rail End)	32	16	48	7	1	8
Hit By Fallen/Blowing Rocks From A Truck	26	2	28	--	--	0
Hit Railroad Signal Pole Or Post	19	9	28	--	--	0
Hit Other Machinery	12	7	19	1	--	1
Not Reported	3	1	4	--	--	0
Hit Train Standing Still	2	--	2	1	--	1
Hit Toll Booth	1	--	1	--	--	0
Hit Train Backing	1	1	2	--	--	0
Hit Train On Tracks Parallel To Road - No Crossing	1	--	1	--	--	0
Other	1,050	212	1,262	53	11	64
Subtotal (Other Types)	34,529	8,700	43,229	3,228	551	3,779
Not Applicable	76,370	12,039	88,409	4,679	379	5,058
Grand Total	156,746	36,370	193,116	14,057	2,234	16,291

Note: This table includes data used to develop Figure 30.

Source: TX CRIS Data (2011-2015)

Table 34. Percent Crashes by Obstruction Types (TX Rural Two-Lane Roads)

Obstruction Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Overturned	12.4	11.4	12.3	24.3	23.0	24.1
Hit Fence	10.2	17.6	11.6	10.4	14.8	11.0
Hit Tree, Shrub, Landscaping	6.6	13.9	8.0	9.1	20.6	10.7
Other Types						
Hit Highway Sign	3.2	1.4	2.8	2.8	0.9	2.5
Hit Guardrail	2.9	0.8	2.5	2.7	0.5	2.4
Hit Culvert-Headwall	2.8	2.5	2.8	4.9	2.9	4.6
Ditch	2.6	3.6	2.7	2.1	3.8	2.4
Hit Utility Pole	1.5	3.7	1.9	1.5	2.8	1.7
Hit Mailbox	1.5	3.0	1.8	1.2	2.3	1.4
Hit Other Fixed Object	1.5	2.7	1.7	1.6	2.4	1.7
Embankment	1.3	2.0	1.4	1.9	2.8	2.0
Jack-Knifed	0.8	0.1	0.7	0.6	0.1	0.6
Hit Side of Bridge (Bridge Rail)	0.7	0.5	0.7	0.7	0.5	0.7
Hit Fallen Trees or Debris on Road	0.4	0.3	0.4	0.1	0.3	0.2
Hit Median Barrier	0.2	< 0.1	0.2	0.2	--	0.1
Hit Delineator or Marker Post	0.2	0.1	0.2	0.3	< 0.1	0.3
Hit Overhead Signal Light, Wires, Signs, Etc.	0.2	0.5	0.3	--	< 0.1	< 0.1
Hit Luminaire Pole	0.2	0.2	0.2	0.1	< 0.1	0.1
Hit House, Bldg. or Bldg. Fixture	0.2	0.4	0.2	0.1	0.3	0.2
Hit Object from Another Vehicle in Road	0.2	< 0.1	0.1	0.1	--	0.1
Hit Concrete Traffic Barrier	0.2	0.1	0.1	0.1	--	0.1
Person Fell or Jumped From Vehicle	0.1	0.3	0.2	0.7	2.5	1.0
Hit Curb	0.1	0.2	0.1	0.1	0.3	0.1
Hit Work Zone Barricade, Cones, Signs or Material	0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1
Hit Previously Wrecked Vehicle	0.1	< 0.1	0.1	0.1	--	0.1
Hit Hole in Road	0.1	0.2	0.1	0.1	0.3	0.2
Hit Railroad Crossing Gates	0.1	< 0.1	0.1	< 0.1	--	< 0.1
Hit Commercial Sign	0.1	0.1	0.1	< 0.1	--	< 0.1
Hit Train Moving Forward	0.1	0.4	0.1	0.1	1.2	0.3
Hit Top of Underpass or Tunnel	< 0.1	< 0.1	< 0.1	--	< 0.1	< 0.1

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Table 34. Percent Crashes by Obstruction Types (TX Rural Two-Lane Roads) (cont.)

Obstruction Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Other Types (cont.)						
Hit Traffic Signal Pole Or Post	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Hit Retaining Wall	< 0.1	< 0.1	< 0.1	0.1	--	< 0.1
Fire Hydrant	< 0.1	0.2	0.1	< 0.1	< 0.1	< 0.1
Hit Pier Or Support At Underpass, Tunnel Or Overhead Sign Bridge	< 0.1	< 0.1	< 0.1	0.1	--	0.1
Hit Work Zone Machinery Or Stockpiled Materials	< 0.1	0.1	< 0.1	< 0.1	0.1	< 0.1
Hit Attenuation Device	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Hit End Of Bridge (Abutment Or Rail End)	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Hit By Fallen/Blowing Rocks From A Truck	< 0.1	< 0.1	< 0.1	--	--	< 0.1
Hit Railroad Signal Pole Or Post	< 0.1	< 0.1	< 0.1	--	--	< 0.1
Hit Other Machinery	< 0.1	< 0.1	< 0.1	< 0.1	--	< 0.1
Not Reported	< 0.1	< 0.1	< 0.1	--	--	< 0.1
Hit Train Standing Still	< 0.1	--	< 0.1	< 0.1	--	< 0.1
Hit Toll Booth	< 0.1	--	< 0.1	--	--	< 0.1
Hit Train Backing	< 0.1	< 0.1	< 0.1	--	--	< 0.1
Hit Train On Tracks Parallel To Road - No Crossing	< 0.1	--	< 0.1	--	--	< 0.1
Other	0.7	0.6	0.7	0.4	0.5	0.4
Subtotal (Other Types)	22.1	24.0	22.4	22.8	24.5	23.2
Not Applicable	48.7	33.1	45.8	33.3	17.0	31.0
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 30.

Source: TX CRIS Data (2011-2015)

Table 35. Number of Crashes by Obstruction Types (TX Rural Two-Lane vs. Freeway)

Obstruction Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Overturned	23,700	5,274	3,922	857
Hit Fence	22,416	428	1,793	34
Hit Tree, Shrub, Landscaping	15,362	798	1,739	76
Other Types				
Hit Highway Sign	5,475	950	413	42
Hit Guardrail	4,780	2,785	394	155
Hit Culvert-Headwall	5,322	175	747	23
Ditch	5,294	482	384	22
Hit Utility Pole	3,703	55	273	8
Hit Mailbox	3,436	9	223	2
Hit Other Fixed Object	3,282	542	272	41
Embankment	2,751	346	329	37
Jack-Knifed	1,344	941	93	30
Hit Side of Bridge (Bridge Rail)	1,299	611	108	45
Hit Fallen Trees or Debris on Road	703	39	26	1
Hit Median Barrier	394	8,056	21	292
Hit Delineator or Marker Post	384	105	47	19
Hit Overhead Signal Light, Wires, Signs, Etc.	492	17	1	--
Hit Luminaire Pole	372	203	18	14
Hit House, Bldg. or Bldg. Fixture	396	6	24	--
Hit Object from Another Vehicle in Road	243	177	9	2
Hit Concrete Traffic Barrier	250	1,446	20	42
Person Fell or Jumped From Vehicle	305	21	155	12
Hit Curb	227	45	17	7
Hit Work Zone Barricade, Cones, Signs or Material	157	114	7	7
Hit Previously Wrecked Vehicle	138	146	18	27
Hit Hole in Road	185	23	25	1
Hit Railroad Crossing Gates	105	--	3	--
Hit Commercial Sign	106	5	2	--
Hit Train Moving Forward	223	3	42	--
Hit Top of Underpass or Tunnel	66	83	1	--

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Table 35. Number of Crashes by Obstruction Types (TX Rural Two-Lane vs. Freeway) (cont.)

Obstruction Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Other Types (cont.)				
Hit Traffic Signal Pole Or Post	62	6	6	1
Hit Retaining Wall	69	232	7	15
Fire Hydrant	126	--	3	--
Hit Pier Or Support At Underpass, Tunnel Or Overhead Sign Bridge	54	56	10	15
Hit Work Zone Machinery Or Stockpiled Materials	55	14	6	1
Hit Attenuation Device	36	39	1	3
Hit End Of Bridge (Abutment Or Rail End)	48	9	8	2
Hit By Fallen/Blowing Rocks From A Truck	28	5	--	--
Hit Railroad Signal Pole Or Post	28	--	--	--
Hit Other Machinery	19	1	1	--
Not Reported	4	--	0	--
Hit Train Standing Still	2	--	1	--
Hit Toll Booth	1	--	--	--
Hit Train Backing	2	--	--	--
Hit Train On Tracks Parallel To Road - No Crossing	1	--	--	--
Other	1,262	1,064	64	18
Subtotal (Other Types)	43,229	18,811	3,779	884
Not Applicable	88,409	17,004	5,058	715
Grand Total	193,116	42,315	16,291	2,566

Note: This table includes data used to develop Figure 30.

Source: TX CRIS Data (2011-2015)

Table 36. Percent Crashes by Obstruction Types (TX Rural Two-Lane vs. Freeway)

Obstruction Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Overturned	12.3	12.5	24.1	33.4
Hit Fence	11.6	1.0	11.0	1.3
Hit Tree, Shrub, Landscaping	8.0	1.9	10.7	3.0
Other Types				
Hit Highway Sign	2.8	2.3	2.5	1.6
Hit Guardrail	2.5	6.6	2.4	6.0
Hit Culvert-Headwall	2.8	0.4	4.6	0.9
Ditch	2.7	1.1	2.4	0.9
Hit Utility Pole	1.9	0.1	1.7	0.3
Hit Mailbox	1.8	< 0.1	1.4	0.1
Hit Other Fixed Object	1.7	1.3	1.7	1.6
Embankment	1.4	0.8	2.0	1.4
Jack-Knifed	0.7	2.2	0.6	1.2
Hit Side of Bridge (Bridge Rail)	0.7	1.4	0.7	1.8
Hit Fallen Trees or Debris on Road	0.4	0.1	0.2	< 0.1
Hit Median Barrier	0.2	19.0	0.1	11.4
Hit Delineator or Marker Post	0.2	0.3	0.3	0.7
Hit Overhead Signal Light, Wires, Signs, Etc.	0.3	< 0.1	< 0.1	--
Hit Luminaire Pole	0.2	0.5	0.1	0.6
Hit House, Bldg. or Bldg. Fixture	0.2	< 0.1	0.1	--
Hit Object from Another Vehicle in Road	0.1	0.4	0.1	0.1
Hit Concrete Traffic Barrier	0.1	3.4	0.1	1.6
Person Fell or Jumped From Vehicle	0.2	0.1	1.0	0.5
Hit Curb	0.1	0.1	0.1	0.3
Hit Work Zone Barricade, Cones, Signs or Material	0.1	0.3	< 0.1	0.3
Hit Previously Wrecked Vehicle	0.1	0.4	0.1	1.1
Hit Hole in Road	0.1	0.1	0.2	< 0.1
Hit Railroad Crossing Gates	0.1	--	< 0.1	--
Hit Commercial Sign	0.1	< 0.1	< 0.1	--
Hit Train Moving Forward	0.1	< 0.1	0.3	--
Hit Top of Underpass or Tunnel	< 0.1	0.2	< 0.1	--

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Table 36. Percent Crashes by Obstruction Types (TX Rural Two-Lane vs. Freeway) (cont.)

Obstruction Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Other Types (cont.)				
Hit Traffic Signal Pole or Post	< 0.1	< 0.1	< 0.1	< 0.1
Hit Retaining Wall	< 0.1	0.6	< 0.1	0.6
Fire Hydrant	0.1	--	< 0.1	--
Hit Pier or Support at Underpass, Tunnel or Overhead Sign Bridge	< 0.1	0.1	0.1	0.6
Hit Work Zone Machinery or Stockpiled Materials	< 0.1	< 0.1	< 0.1	< 0.1
Hit Attenuation Device	< 0.1	0.1	< 0.1	0.1
Hit End of Bridge (Abutment or Rail End)	< 0.1	< 0.1	< 0.1	0.1
Hit by Fallen/Blowing Rocks from a Truck	< 0.1	< 0.1	< 0.1	--
Hit Railroad Signal Pole or Post	< 0.1	--	< 0.1	--
Hit Other Machinery	< 0.1	< 0.1	< 0.1	--
Not Reported	< 0.1	--	< 0.1	--
Hit Train Standing Still	< 0.1	--	< 0.1	--
Hit Toll Booth	< 0.1	--	< 0.1	--
Hit Train Backing	< 0.1	--	< 0.1	--
Hit Train on Tracks Parallel to Road - No Crossing	< 0.1	--	< 0.1	--
Other	0.7	2.5	0.4	0.7
Subtotal (Other Types)	22.4	44.4	23.2	34.5
Not Applicable	45.8	40.2	31.0	27.9
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 30.

Source: TX CRIS Data (2011-2015)

Table 37. Number of Crashes by Surface Condition (TX Rural Two-Lane Roads)

Surface Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Dry	129,556	27,738	157,294	12,298	1,758	14,056
Wet						
Wet	20,665	3,833	24,498	1,407	133	1,540
Standing Water	1,127	129	1,256	65	3	68
Subtotal (Wet)	21,792	3,962	25,754	1,472	136	1,608
Other Types						
Ice	3,214	248	3,462	133	7	140
Sand, Mud, Dirt	636	3,780	4,416	49	292	341
Snow	572	75	647	26	2	28
Slush	419	33	452	17	1	18
Other	392	417	809	48	37	85
Unknown	165	117	282	14	1	15
Subtotal (Other Types)	5,398	4,670	10,068	287	340	627
Grand Total	156,746	36,370	193,116	14,057	2,234	16,291

Note: This table includes data used to develop Figure 32 and Figure 33.

Source: TX CRIS Data (2011-2015)

Table 38. Percent Crashes by Surface Condition (TX Rural Two-Lane Roads)

Surface Condition	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Dry	82.7	76.3	81.5	87.5	78.7	86.3
Wet						
Wet	13.2	10.5	12.7	10.0	6.0	9.5
Standing Water	0.7	0.4	0.7	0.5	0.1	0.4
Subtotal (Wet)	13.9	10.9	13.3	10.5	6.1	9.9
Other Types						
Ice	2.1	0.7	1.8	1.0	0.3	0.9
Sand, Mud, Dirt	0.4	10.4	2.3	0.4	13.1	2.1
Snow	0.4	0.2	0.3	0.2	0.1	0.2
Slush	0.3	0.1	0.2	0.1	< 0.1	0.1
Other	0.3	1.2	0.4	0.3	1.7	0.5
Unknown	0.1	0.3	0.2	0.1	0.0	0.1
Subtotal (Other Types)	3.5	12.8	5.2	2.0	15.2	3.8
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 32 and Figure 33.

Source: TX CRIS Data (2011-2015)

Table 39. Number of Crashes by Surface Condition (TX Rural Two-Lane vs. Freeway)

Surface Condition	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Dry	157,294	30,041	14,056	2,173
Wet				
Wet	24,498	7,602	1,540	237
Standing Water	1,256	1,010	68	30
Subtotal (Wet)	25,754	8,612	1,608	267
Other Types				
Ice	3,462	3,022	140	110
Sand, Mud, Dirt	4,416	18	341	1
Snow	647	352	28	6
Slush	452	204	18	5
Other	809	47	85	2
Unknown	282	19	15	2
Subtotal (Other Types)	10,068	3,662	627	126
Grand Total	193,116	42,315	16,291	2,566

Note: This table includes data used to develop Figure 32 and Figure 34.

Source: TX CRIS Data (2011-2015)

Table 40. Percent Crashes by Surface Condition (TX Rural Two-Lane vs. Freeway)

Surface Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Dry	81.5	71.0	86.3	84.7
Wet				
Wet	12.7	18.0	9.5	9.2
Standing Water	0.7	2.4	0.4	1.2
Subtotal (Wet)	13.3	20.4	9.9	10.4
Other Types				
Ice	1.8	7.1	0.9	4.3
Sand, Mud, Dirt	2.3	< 0.1	2.1	< 0.1
Snow	0.3	0.8	0.2	0.2
Slush	0.2	0.5	0.1	0.2
Other	0.4	0.1	0.5	0.1
Unknown	0.2	< 0.1	< 0.1	0.1
Subtotal (Other Types)	5.2	8.6	3.8	4.9
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 32 and Figure 34.

Source: TX CRIS Data (2011-2015)

Table 41. Number of Crashes by Weather Type (TX Rural Two-Lane Roads)

Weather Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local	Local	Total	Others -- Not Local	Local	Total
Clear	113,704	27,744	141,448	10,639	1,799	12,438
Cloudy	22,488	5,152	27,640	2,082	310	2,392
Other Types						
Rain	14,839	2,498	17,337	948	82	1,030
Fog	2,454	528	2,982	214	30	244
Sleet/Hail	1,281	80	1,361	65	3	68
Snow	1,199	116	1,315	45	2	47
Severe Crosswinds	247	41	288	28	3	31
Blowing Sand/Snow	175	25	200	10	2	12
Other	168	27	195	12	2	14
Unknown	191	159	350	14	1	15
Subtotal (Other Types)	20,554	3,474	24,028	1,336	125	1,461
Grand Total	156,746	36,370	193,116	14,057	2,234	16,291

Note: This table includes data used to develop Figure 35 and Figure 36.

Source: TX CRIS Data (2011-2015)

Table 42. Percent Crashes by Weather Type (TX Rural Two-Lane Roads)

Weather Types	Rural Two-lane Crashes			Rural Two-lane K+A Crashes		
	Others -- Not Local (%)	Local (%)	Total (%)	Others -- Not Local (%)	Local (%)	Total (%)
Clear	72.5	76.3	73.3	75.7	80.5	76.4
Cloudy	14.4	14.2	14.3	14.8	13.9	14.7
Other Types						
Rain	9.5	6.9	9.0	6.7	3.7	6.3
Fog	1.6	1.5	1.5	1.5	1.3	1.5
Sleet/Hail	0.8	0.2	0.7	0.5	0.1	0.4
Snow	0.8	0.3	0.7	0.3	0.1	0.3
Severe Crosswinds	0.2	0.1	0.2	0.2	0.1	0.2
Blowing Sand/Snow	0.1	0.1	0.1	0.1	0.1	0.1
Other	0.1	0.1	0.1	0.1	0.1	0.1
Unknown	0.1	0.4	0.2	0.1	< 0.1	0.1
Subtotal (Other Types)	13.2	9.6	12.5	9.5	5.5	9.0
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 35 and Figure 36.

Source: TX CRIS Data (2011-2015)

Table 43. Number of Crashes by Weather Types (TX Rural Two-Lane vs. Freeway)

Weather Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Clear	141,448	26,448	12,438	1,882
Cloudy	27,640	5,286	2,392	333
Other Types				
Rain	17,337	7,378	1,030	218
Fog	2,982	446	244	28
Sleet/Hail	1,361	1,248	68	45
Snow	1,315	1,030	47	19
Severe Crosswinds	288	246	31	17
Blowing Sand/Snow	200	116	12	13
Other	195	95	14	7
Unknown	350	22	15	4
Subtotal (Other Types)	24,028	10,581	1,461	351
Grand Total	193,116	42,315	16,291	2,566

Note: This table includes data used to develop Figure 35 and Figure 37.

Source: TX CRIS Data (2011-2015)

Table 44. Percent Crashes by Weather Types (TX Rural Two-Lane vs. Freeway)

Weather Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Clear	73.3	62.5	76.4	73.3
Cloudy	14.3	12.4	14.7	13.0
Other Types				
Rain	9.0	17.4	6.3	8.5
Fog	1.5	1.1	1.5	1.1
Sleet/Hail	0.7	3.0	0.4	1.8
Snow	0.7	2.4	0.3	0.7
Severe Crosswinds	0.2	0.6	0.2	0.7
Blowing Sand/Snow	0.1	0.3	0.1	0.5
Other	0.1	0.2	0.1	0.3
Unknown	0.2	0.1	0.1	0.2
Subtotal (Other Types)	12.5	25.1	9.0	13.8
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 35 and Figure 37.

Source: TX CRIS Data (2011-2015)

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APPENDIX B – WASHINGTON STATISTICS

Driver Information

Table 45. Percent Drivers by Contributing Factors (WA Rural Two-Lane vs. Freeway)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Fail to Control				
Follow Too Closely	7.9	7.3	1.9	2.1
Fail to Yield Right to Pedestrian	0.2	< 0.1	< 0.1	< 0.1
Failing to Signal	0.1	< 0.1	0.2	< 0.1
Failure to Use Xwalk	< 0.1	< 0.1	0.3	0.3
Subtotal (Fail to Control)	8.2	7.3	2.4	2.4
Speeding				
Exceeding Safe Speed	26.6	36.6	18.1	17.1
Exceeding Stated Speed Limit	1.0	1.1	2.2	1.6
Subtotal (Speeding)	27.6	37.7	20.3	18.7
Distraction				
Inattention	8.3	7.9	6.4	8.6
Driver Distractions Outside Vehicle	1.4	1.2	0.4	0.3
Driver Interacting with Passengers, Animals	0.9	0.7	0.5	0.5
Unknown Driver Distraction	0.7	0.6	0.2	1.1
Other Driver Distractions Inside Vehicle	0.7	0.5	0.1	< 0.1
Driver Adjusting Audio or Entertainment	0.4	0.2	0.3	< 0.1
Driver Eating or Drinking	0.4	0.3	0.2	0.3
Driver Operating Handheld Telecommunication	0.3	0.2	0.4	< 0.1
Driver Operating Other Electronic Device	0.1	0.1	0.2	< 0.1
Driver Smoking	0.1	0.1	< 0.1	< 0.1
Driver Reading or Writing	< 0.1	< 0.1	< 0.1	< 0.1
Driver Operating Hands-free Wireless Tel	< 0.1	< 0.1	0.1	0.3
Driver Grooming	< 0.1	< 0.1	< 0.1	< 0.1
Subtotal (Distraction)	13.3	11.8	8.8	11.1

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Table 45. Percent Drivers by Contributing Factors (WA Rural Two-Lane vs. Freeway) (cont.)

Contributing Factors	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Improper Driving				
Did Not Grant Right of Way to Vehicle	9.6	7.0	6.5	5.1
Over Center Line	4.0	0.9	10.2	5.1
Improper Passing	2.5	0.8	2.5	1.9
Improper Turn	1.6	0.4	0.8	< 0.1
Improper U-Turn	0.8	0.4	1.1	0.8
Improper Backing	0.6	0.3	0.1	< 0.1
Improper Signal	0.1	< 0.1	< 0.1	< 0.1
Improper Parking Location	< 0.1	0.1	< 0.1	< 0.1
On Wrong Side Of Road	< 0.1	< 0.1	< 0.1	< 0.1
Subtotal (Improper Driving)	19.2	9.9	21.2	12.9
Impairment				
Under Influence of Alcohol	8.7	4.6	22.1	18.4
Under Influence of Drugs	1.0	0.9	2.3	4.3
Had Taken Medication	0.1	< 0.1	0.1	< 0.1
Subtotal (Impairment)	9.8	5.5	24.5	22.7
Other Types				
Apparently Asleep	5.0	5.8	5.4	11.5
Operating Defective Equipment	3.3	7.1	2.0	3.2
Disregard Stop Sign - Flashing Red	1.4	0.5	2.2	0.3
Driver Not Distracted	1.0	0.7	0.4	0.3
Apparently Fatigued	1.4	1.3	2.5	2.4
Disregard Stop and Go Light	0.3	0.3	0.1	0.3
Disregard Yield Sign - Flashing Yellow	0.1	< 0.1	0.2	< 0.1
Headlight Violation	< 0.1	< 0.1	0.3	< 0.1
Disregard Flagger - Officer	< 0.1	< 0.1	< 0.1	< 0.1
Hitchhiking	< 0.1	< 0.1	0.1	< 0.1
Other	9.4	12.1	9.8	14.4
Subtotal (Other Types)	21.9	27.8	23.0	32.4
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 10 and Figure 11.

Source: WA RID (2009-2013)

Driver Condition

Table 46. Percent Drivers by Driver Condition (WA Rural Two-Lane vs. Freeway)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Normal				
Exceeding Safe Speed	10.9	14.5	10.1	9.1
Did Not Grant RW to Vehicle	3.9	2.8	3.6	2.7
Other	3.8	4.8	5.5	7.7
Follow Too Closely	3.2	2.9	1.0	1.1
Over Center Line	1.6	0.3	5.7	2.7
Operating Defective Equipment	1.4	2.8	1.1	1.7
Improper Passing	1.0	0.3	1.4	1.0
Improper Turn	0.7	0.2	0.5	< 0.1
Disregard Stop Sign - Flashing Red	0.6	0.2	1.2	0.1
Exceeding Stated Speed Limit	0.4	0.5	1.2	0.9
Driver Not Distracted	0.4	0.3	0.3	0.1
Improper U-Turn	0.3	0.2	0.6	0.4
Improper Backing	0.2	0.1	0.1	< 0.1
Disregard Stop and Go Light	0.1	0.1	0.1	0.1
Fail to Yield Row to Pedestrian	0.1	< 0.1	< 0.1	< 0.1
Failing to Signal	0.1	< 0.1	0.1	< 0.1
Improper Signal	< 0.1	< 0.1	< 0.1	< 0.1
Disregard Yield Sign - Flashing Yellow	< 0.1	< 0.1	0.1	< 0.1
Headlight Violation	< 0.1	< 0.1	0.2	< 0.1
Failure to Use Xwalk	< 0.1	< 0.1	0.2	0.1
Disregard Flagger - Officer	< 0.1	< 0.1	< 0.1	< 0.1
Improper Parking Location	< 0.1	< 0.1	< 0.1	< 0.1
On Wrong Side Of Road	< 0.1	< 0.1	< 0.1	< 0.1
Hitchhiking	< 0.1	< 0.1	0.1	< 0.1
Not Applicable	59.1	60.4	44.4	46.7
Subtotal (Normal)	87.8	90.4	77.5	74.4

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Table 46. Percent Drivers by Driver Condition (WA Rural Two-Lane vs. Freeway) (cont.)

Driver Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Distraction				
Inattention	3.4	3.1	3.6	4.6
Driver Distractions Outside Vehicle	0.6	0.5	0.3	0.1
Driver Interacting with Passengers, Animals	0.4	0.3	0.3	0.3
Unknown Driver Distraction	0.3	0.2	0.1	0.6
Other Driver Distractions Inside Vehicle	0.3	0.2	0.1	< 0.1
Driver Adjusting Audio or Entertainment	0.2	0.1	0.2	< 0.1
Driver Eating or Drinking	0.2	0.1	0.1	0.1
Driver Operating Handheld Telecommunication	0.1	0.1	0.2	< 0.1
Driver Operating Other Electronic Device	0.1	< 0.1	0.1	< 0.1
Driver Smoking	< 0.1	< 0.1	< 0.1	< 0.1
Driver Reading or Writing	< 0.1	< 0.1	< 0.1	< 0.1
Driver Operating Hands-free Wireless Telephone	< 0.1	< 0.1	< 0.1	0.1
Driver Grooming	< 0.1	< 0.1	< 0.1	< 0.1
Subtotal (Distraction)	5.6	4.6	5.0	5.8
Impairment				
Under Influence of Alcohol	3.6	1.8	12.3	9.8
Under Influence of Drugs	0.4	0.4	1.3	2.3
Had Taken Medication	< 0.1	< 0.1	0.1	< 0.1
Subtotal (Impairment)	4.0	2.2	13.7	12.1
Fatigued or Asleep				
Apparently Asleep	2.0	2.3	3.0	6.1
Apparently Fatigued	0.6	0.5	0.8	1.6
Subtotal (Fatigued or Asleep)	2.6	2.8	3.8	7.7
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 14 and Figure 15.

Source: WA RID (2009-2013)

Vehicle Information

Table 47. Number of Crashes by Vehicle Types (WA Rural Two-Lane vs. Freeway)

Vehicle Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Pickup, Panel Truck under 10,000 lb	30,048	16,306	680	310
Passenger Car	26,713	15,717	793	289
Bus/Truck/Trailer				
Truck Tractor & Semi-Trailer	1,383	1,836	23	5
Truck	845	409	10	3
School Bus	639	127	--	--
Bus or Motor Stage	563	303	--	2
Truck & Trailer	347	220	7	5
Truck - Double Trailer Combinations	285	277	2	1
Truck Tractor	40	34	--	--
Subtotal (Bus/Truck/Trailer)	12,070	14,593	474	339
Other Types				
Motorcycle	1,484	278	383	49
Farm Tractor and/or Farm equipment	24	2	1	--
Scooter Bike	14	--	3	--
Moped	3	--	1	--
Railway Vehicle	2	--	--	--
Other	350	253	9	6
Not Stated	592	294	108	32
Subtotal (Other Types)	2,469	827	505	87
Grand Total	63,332	36,056	2,020	702

Note: This table includes data used to develop Figure 21 and Figure 22.

Source: WA RID (2009-2013)

Table 48. Percent Crashes by Vehicle Types (WA Rural Two-Lane vs. Freeway)

Vehicle Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Pickup, Panel Truck under 10,000 lb	47.5	45.2	33.7	44.2
Passenger Car	42.2	43.5	39.3	41.2
Bus/Truck/Trailer				
Truck Tractor & Semi-Trailer	2.2	5.1	1.1	0.7
Truck	1.3	1.1	0.5	0.4
School Bus	1.0	0.4	--	--
Bus or Motor Stage	0.9	0.8	--	0.3
Truck & Trailer	0.6	0.6	0.4	0.7
Truck - Double Trailer Combinations	0.5	0.8	0.1	0.1
Truck Tractor	0.1	0.1	--	--
Subtotal (Bus/Truck/Trailer)	6.5	8.9	2.1	2.3
Other Types				
Motorcycle	2.3	0.8	19.0	7.0
Farm Tractor and/or Farm equipment	< 0.1	0.1	0.1	--
Scooter Bike	< 0.1	--	0.2	--
Moped	< 0.1	--	0.1	--
Railway Vehicle	< 0.1	--	--	--
Other	0.6	0.7	0.5	0.9
Not Stated	0.9	0.9	5.4	4.6
Subtotal (Other Types)	3.9	2.4	25.0	12.4
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 21 and Figure 22.

Source: WA RID (2009-2013)

Road Environment Characteristics

Table 49. Number of Crashes by Collision Types (WA Rural Two-Lane vs. Freeway)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
One Motor Vehicle (OMV)				
Fixed object	15,291	9,504	639	185
Entering at angle	7,921	1,479	186	40
Vehicle Strikes Deer	5,352	2,994	43	5
Vehicle overturned	3,511	2,954	225	154
Other object	695	543	9	4
Vehicle Strikes Elk	613	171	4	--
Domestic animal (horse, cow, sheep)	310	47	8	3
Vehicle Strikes All Other Non-Domestic Animal	302	225	4	2
Vehicle going straight hits pedestrian	263	81	64	15
Fire started in vehicle	257	459		
Vehicle - Pedalcyclist	256	22	35	1
All other non-collision	252	390	12	2
Breakage of any part of the vehicle resulting in injury or in further property damage	106	144	1	--
Domestic animal other (cat, dog, etc)	90	59	--	--
Vehicle turning left hits pedestrian	20	--	3	--
Vehicle turning right hits pedestrian	14	--	2	--
Vehicle backing hits pedestrian	11	7	--	1
Vehicle Struck by State Road or Construction Machinery	10	2	--	--
Vehicle Hits State Road or Construction Machinery	9	12	--	--
Vehicle hits Pedestrian - All Other Actions	4	7	--	1
Vehicle Struck by City Road or Construction Machinery	3		--	--
Subtotal (OMV)	35,290	19,100	1,235	413

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Table 49. Number of Crashes by Collision Types (WA Rural Two-Lane vs. Freeway) (cont.)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Same Direction (SD)				
From SD - both going straight - one stopped - rear-end	9,455	2,897	70	24
From SD - both going straight - both moving - rear-end	5,231	5,391	54	50
From SD - one left turn - one straight	2,065	215	27	--
From SD - all others	1,616	2,465	24	34
From SD - both going straight - both moving - sideswipe	1,015	3,731	9	20
From SD - one right turn - one straight	506	60	6	1
From SD - both going straight - one stopped - sideswipe	221	122	5	3
SD -- both turning right -- one stopped - - rear end	74	15	--	--
SD -- both turning left -- both moving -- sideswipe	56	66	1	--
SD -- both turning right -- both moving -- rear end	48	25	--	--
SD -- both turning right -- both moving -- sideswipe	36	2	--	--
Person fell, jumped or was pushed from vehicle	24	7	2	1
SD -- both turning left -- both moving -- rear end	20	2	--	--
SD -- both turning left -- one stopped -- rear end	6	10	--	--
SD -- both turning right -- one stopped - - sideswipe	4	--	--	--
Subtotal (SD)	20,377	15,008	198	133

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Table 49. Number of Crashes by Collision Types (WA Rural Two-Lane vs. Freeway) (cont.)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Angle				
One parked--one moving	753	665	9	7
One car leaving parked position	170	58	2	--
One car entering parked position	29	8	2	1
Subtotal (Angle)	952	731	13	8
Opposite Direction (OD)				
From OD - one left turn - one straight	2,027	304	71	13
From OD - all others	1,903	494	128	34
From OD - both going straight - sideswipe	1,587	182	56	12
From OD - both moving - head-on	1,055	201	319	89
From OD - both going straight - one stopped - sideswipe	72	4	--	--
From OD - one left turn - one right turn	47	2	--	--
From OD - one stopped - head-on	18	22	--	--
Subtotal (OD)	6,709	1,209	574	148
Grand Total	63,328	36,048	2,020	702

Note: This table includes data used to develop Figure 28 and Figure 29.

Source: WA RID (2009-2013)

Table 50. Percent Crashes by Collision Types (WA Rural Two-Lane vs. Freeway)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
One Motor Vehicle (OMV)				
Fixed object	24.1	26.4	31.6	26.4
Entering at angle	12.5	4.1	9.2	5.7
Vehicle Strikes Deer	8.5	8.3	2.1	0.7
Vehicle overturned	5.5	8.2	11.1	21.9
Other object	1.1	1.5	0.5	0.6
Vehicle Strikes Elk	1.0	0.5	0.2	< 0.1
Domestic animal (horse, cow, sheep)	0.5	0.1	0.4	0.4
Vehicle Strikes All Other Non-Domestic Animal	0.5	0.6	0.2	0.3
Vehicle going straight hits pedestrian	0.4	0.2	3.2	2.1
Fire started in vehicle	0.4	1.3	--	--
Vehicle - Pedalcyclist	0.4	0.1	1.7	0.1
All other non-collision	0.4	1.1	0.6	0.3
Breakage of any part of the vehicle resulting in injury or in further property damage	0.2	0.4	0.1	< 0.1
Domestic animal other (cat, dog, etc.)	0.1	0.2	--	--
Vehicle turning left hits pedestrian	< 0.1	--	0.2	--
Vehicle turning right hits pedestrian	< 0.1	--	0.1	--
Vehicle backing hits pedestrian	< 0.1	< 0.1	--	0.1
Vehicle Struck by State Road or Construction Machinery	< 0.1	< 0.1	--	--
Vehicle Hits State Road or Construction Machinery	< 0.1	< 0.1	--	--
Vehicle hits Pedestrian - All Other Actions	< 0.1	< 0.1	--	0.1
Vehicle Struck by City Road or Construction Machinery	< 0.1	< 0.1	--	--
Subtotal (OMV)	55.6	53.0	61.2	58.7

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Table 50. Percent Crashes by Collision Types (WA Rural Two-Lane vs. Freeway) (cont.)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Same Direction (SD)				
From SD - both going straight - one stopped - rear-end	14.9	8.0	3.5	3.4
From SD - both going straight - both moving - rear-end	8.3	15.0	2.7	7.1
From SD - one left turn - one straight	3.3	0.6	1.3	< 0.1
From SD - all others	2.6	6.8	1.2	4.9
From SD - both going straight - both moving - sideswipe	1.6	10.4	0.5	2.9
From SD - one right turn - one straight	0.8	0.2	0.3	0.1
From SD - both going straight - one stopped - sideswipe	0.4	0.3	0.3	0.5
SD -- both turning right -- one stopped - - rear end	0.1	< 0.1	--	--
SD -- both turning left -- both moving -- sideswipe	0.1	0.2	0.1	< 0.1
SD -- both turning right -- both moving -- rear end	0.1	0.1	--	--
SD -- both turning right -- both moving -- sideswipe	0.1	< 0.1	--	--
Person fell, jumped or was pushed from vehicle	< 0.1	< 0.1	< 0.1	0.1
SD -- both turning left -- both moving -- rear end	< 0.1	< 0.1	--	--
SD -- both turning left -- one stopped -- rear end	< 0.1	< 0.1	--	--
SD -- both turning right -- one stopped - - sideswipe	< 0.1	--	--	--
Subtotal (SD)	32.3	41.6	9.9	19.0

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Table 50. Percent Crashes by Collision Types (WA Rural Two-Lane vs. Freeway) (cont.)

Collision Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Angle				
One parked--one moving	1.2	1.8	0.5	1.0
One car leaving parked position	0.3	0.2	< 0.1	--
One car entering parked position	0.1	< 0.1	< 0.1	0.1
Subtotal (Angle)	1.6	2.0	0.5	1.1
OD				
From OD - one left turn - one straight	3.2	0.8	3.5	1.9
From OD - all others	3.0	1.4	6.3	4.8
From OD - both going straight - sideswipe	2.5	0.5	2.8	1.7
From OD - both moving - head-on	1.7	0.6	15.8	12.8
From OD - both going straight - one stopped - sideswipe	< 0.1	< 0.1	--	--
From OD - one left turn - one right turn	0.1	< 0.1	--	--
From OD - one stopped - head-on	< 0.1	0.1	--	--
Subtotal (OD)	10.5	3.4	28.4	21.2
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 28 and Figure 29.

Source: WA RID (2009-2013)

Table 51. Number of Crashes by Surface Condition (WA Rural Two-Lane vs. Freeway)

Surface Condition	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Dry	41,877	21,119	1,461	504
Wet				
Standing Water	12,472	5,885	359	89
Wet	113	446	8	6
Subtotal (Wet)	12,585	6,331	367	95
Ice/Snow				
Snow/Slush	4,901	5,601	84	44
Ice	3,504	2,757	84	45
Subtotal (Ice/Snow)	8,405	8,358	168	89
Other				
Sand/Mud/Dirt	53	23	2	8
Oil	10	6		
Other	226	178	14	5
Unknown	375	87	0	0
Subtotal (Other)	664	294	16	13
Grand Total	63,531	36,102	2,012	701

Note: This table includes data used to develop Figure 33 and Figure 34.

Source: WA RID (2009-2013)

Table 52. Percent Crashes by Surface Condition (WA Rural Two-Lane vs. Freeway)

Surface Condition	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Dry	66.1	58.6	72.3	71.8
Wet				
Standing Water	19.7	16.3	17.8	12.7
Wet	0.2	1.2	0.4	0.9
Subtotal (Wet)	19.9	17.5	18.2	13.6
Ice/Snow				
Snow/Slush	7.7	15.5	4.2	6.3
Ice	5.5	7.7	4.3	6.4
Subtotal (Ice/Snow)	13.2	23.2	8.5	12.7
Other				
Sand/Mud/Dirt	< 0.1	0.1	0.2	1.1
Oil	< 0.1	< 0.1	< 0.1	< 0.1
Other	0.3	0.5	0.7	0.7
Unknown	0.5	0.1	0.1	0.1
Subtotal (Other)	0.8	0.7	1.0	1.9
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 33 and Figure 34.

Source: WA RID (2009-2013)

Table 53. Number of Crashes by Weather Types (WA Rural Two-Lane vs. Freeway)

Weather Types	All Crashes		K+A Crashes	
	Rural Two-lane	Rural Freeway	Rural Two-lane	Rural Freeway
Clear or Partly Cloudy	38,607	19,604	1,319	447
Overcast	10,521	5,035	341	114
Raining	7,689	4,551	198	65
Other Types				
Snowing	4,075	5,072	69	44
Fog or Smog or Smoke	1,089	644	55	11
Sleet or Hail or Freezing Rain	410	616	12	5
Blowing Sand or Dirt or Snow	406	265	3	8
Severe Crosswind	94	96	5	3
Other	222	119	8	3
Unknown	219	54	10	2
Subtotal (Other Types)	6,515	6,866	162	76
Grand Total	63,332	36,056	2,020	702

Note: This table includes data used to develop Figure 36 and Figure 37.

Source: WA RID (2009-2013)

Table 54. Percent Crashes by Weather Types (WA Rural Two-Lane vs. Freeway)

Weather Types	All Crashes		K+A Crashes	
	Rural Two-lane (%)	Rural Freeway (%)	Rural Two-lane (%)	Rural Freeway (%)
Clear or Partly Cloudy	61.0	54.4	65.3	63.7
Overcast	16.6	14.0	16.9	16.2
Raining	12.1	12.6	9.8	9.3
Other Types				
Snowing	6.4	14.1	3.4	6.3
Fog or Smog or Smoke	1.7	1.8	2.7	1.6
Sleet or Hail or Freezing Rain	0.7	1.7	0.6	0.7
Blowing Sand or Dirt or Snow	0.6	0.7	0.2	1.1
Severe Crosswind	0.1	0.2	0.2	0.4
Other	0.4	0.3	0.4	0.4
Unknown	0.4	0.2	0.5	0.3
Subtotal (Other Types)	10.3	19.0	8.0	10.8
Grand Total	100.0	100.0	100.0	100.0

Note: This table includes data used to develop Figure 36 and Figure 37.

Source: WA RID (2009-2013)