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Quantifying the Impact of Large Percent Trucks Proportion on Rural Freeways

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QUANTIFYING THE IMPACT OF LARGE PERCENT TRUCKS PROPORTION ON RURAL FREEWAYS

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ABSTRACT

The trucking industry continues to contribute significantly to the economy of the United States. The surface transportation system has been a critical component for the movement of goods and services by the trucking industry across the country. Recent decades have seen substantial growth in freight miles traveled, due to globalization, trade growth, and improvements in logistics and supply chain management. Although these developments have led to economic growth, there has been a sharp increase in the proportion of freight/truck traffic traveling along key routes that has caused significant interactions between trucks and other vehicles. These interactions have raised safety and capacity concerns on the freeways.

Interstate 80 was identified for this research because of the high percentage of truck traffic (40% -70%) that it carries. This Interstate is a popular route for most freight transporting goods from the east (Chicago) to the west (California) and vice versa. Interstate 80 in the states of Wyoming and Nebraska was selected as a test case for this research, which seeks to develop a statistical modeling of the relationship between the high percent trucks and crash rates. Findings from this research are intended to aid transportation managers when deciding on actions to take on highway facilities carrying a large percentage of trucks.

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1. INTRODUCTION

1.1 Background and Problem Statement

The trucking industry continues to contribute significantly to the economy of the United States. The surface transportation system has been a critical component for the movement of goods and services by the trucking industry across the country. The tonnage transported by domestic freight is estimated to increase by 65% to 70% by the year 2020, of which trucks are expected to haul about three quarters of the total tonnage. (Mallet, Schmitt, & Sedor 2004). An increase in the number of trucks on the transportation system means more interaction between trucks and other vehicles.

Recent decades have seen substantial growth in freight miles traveled, due to globalization, trade growth, and improvements in logistics and supply chain management. Although leading to economic growth, these developments have led to a sharp increase in the proportion of freight traffic along key routes, many of which pass through rural areas. As one example, Interstate 80 forms a major corridor for transporting goods between the west coast and major cities to the east (including Chicago and the Northeast). In 2009, the Wyoming Department of Transportation reported a heavy vehicle proportion ranging from 40% (in urban areas) to 60% (in rural areas) on this facility. These increases in heavy truck traffic on the nation's highways have raised concerns about safety and capacity, particularly on the Interstate system.

Despite this growth, traditional measures of freeway performance (such as density or travel speed) report that these facilities continue to function well and fail to capture the impacts of such a large heavy vehicle proportion on traffic operations, safety, and public perceptions of comfort. Past research into the impact of heavy vehicles, mostly performed in the 1970s and 1980s, has typically been derived from data sets with little to no coverage of traffic streams with more than 20%-25% heavy vehicles (Huber 1982; Roess & Messer 1984).

This past research forms the basis of the *Highway Capacity Manual* procedures commonly used in engineering practice. For instance, the most recent version of the manual does not provide passenger-car equivalents for heavy vehicle proportions exceeding 25%, and recommends a default heavy vehicle proportion of 10% on rural freeways (HCM 2000). It is not at all clear whether these procedures are appropriate in locations with heavy vehicle volumes nearly double this upper limit, particularly on rural freeways where high heavy vehicle volume is juxtaposed with low total volumes and infrequent congestion.

From the standpoint of driver comfort and perceived quality of service, Washburn et al. (2004) report that four important factors are the ability to maintain a desired travel speed, the ability to change lanes freely, the ability to travel at least the speed limit, and smooth road conditions. They stated that the presence of heavy vehicles affects the first three of these factors directly. For instance, even if average travel speeds can remain high, frequent passing maneuvers (or situations where one heavy vehicle overtakes another) will affect these measures of comfort and perceived quality (Washburn, Ramlackhan, & McLeod 2004). Public perceptions of safety are also affected by the severity of incidents involving heavy vehicles, as discovered by Moore et al. (2005) through a combination of surveys and focus groups, even though it remains unclear whether such perceptions are accurate (Moore, et al. 2005).

The combination of high heavy vehicle volume, low total volume, and extensive ITS instrumentation on Interstate 80 makes this corridor an ideal test bed for evaluating existing methodologies and developing novel ones, although other rural corridors in diverse locations will also be considered in future studies. In particular, the overall research study will measure the impacts of very high heavy vehicle proportion, adopting a three-tiered approach to quantify the effects on operations, safety, and public perception. This study will focus on the relationship study between percent trucks and crash rates.

1.2 Research Objective

The overall objective of this research is to develop a methodology for quantifying the impacts of very high heavy vehicle proportion on rural freeways in three different areas:

- Traffic operations (developing new metrics to reflect the localized impact of heavy vehicles on such freeways, augmenting existing ones such as average density or speed)
- Traffic safety (including frequency of incidents and unsafe maneuvers occurring in the presence of heavy vehicles)
- Public perception of comfort and safety.

This report is part of the overall research objectives stated above, but will focus on the following objectives:

- Develop a statistical modeling of the relationship between percent trucks and crash rates.
- Analyze the impact of high percent trucks.

1.3 Research Approach

The research objectives will be accomplished through the following six tasks, focusing on rural locations with very high heavy vehicle proportion:

1. Conduct a comprehensive survey of past research on the impact of heavy vehicles, focusing on modeling assumptions, data sources, and relevance to rural freeways with high volume.
2. Identify test bed locations, and obtain operations and safety data needed for analysis.
3. Operations: Identify and develop a suite of metrics quantifying the operational effects of high heavy vehicle volume and low total volume.
4. Safety: Create a methodology to describe effects of heavy vehicles on incident frequency and unsafe driving behavior.
5. Comfort: Identify the impact of heavy vehicles on drivers’ perceptions by analyzing measures of comfort such as following distance, visibility, and lateral clearance.
6. Synthesis: Develop one or more practical methodologies for engineers, delivering an aggregate assessment based on the models developed for operations, safety, and comfort.

This research will address partially or fully some of the tasks stated above. The tasks that will be focused on by this research are:

- Review of traffic data to determine percent trucks and vehicle miles traveled for both all vehicles and trucks.
- Analyze crash information to obtain the crash frequency and crash rates.
- Determine the safety and economic impact of crashes.
- Examine the relation between high percent trucks and crash rates.

1.4 Report Outline

The first section provides a brief description of the problem statement and research objectives. Section 2 describes the findings of the literature review, including the assessment of prior published studies regarding the safety impacts of high percent trucks and driver perceptions in relation to car-truck interactions. Section 3 includes the description of the project location and the crash dataset used. Section 4 focuses on an in-depth analysis of the crash dataset in terms of truck volumes and crash rates. Section 5 analyzes the environmental factors that contributed to the crashes. Section 6 describes the statistical model used to examine the relationship between percent trucks and crash rates. Section 7 provides conclusions and recommendations for further study.

2. LITERATURE REVIEW

This literature review gives an overview of the previous research studies into the safety impact of high percentage of freight vehicles on rural freeways. The literature review focuses on the areas of safety and driver perception in relation to car–truck interactions. A summary of the literature review will be presented at the end of the section.

2.1 SAFETY

Because truck safety has significant implications for both truck drivers and other motorists with whom they share the road, safety is a major consideration for the trucking industry. Transportation safety is vital to the socio-economic development of nations. About 37,000 died as a result of highway crashes in 2008 on U.S. roadways. (NHTSA 2008). In a report by the National Highway Transportation Safety Administration, *Traffic Safety Facts 2008*, they reported that 74% of fatalities resulted from crashes involving large trucks were occupants of passenger cars, 10% were non-occupants, and only 16% were occupants of a large truck. One out of nine traffic fatalities in 2008 resulted from a collision involving a large truck. Large trucks accounted for 8% of all vehicles involved in fatal crashes, and 4% of all vehicles involved in injury and property damage only (PDO) crashes (NHTSA 2008). Thus, truck traffic had an influence on crashes. The causes of crashes are complex and have many variables and determining factors that come into play. There are a number of options looked at by numerous agencies and institutions for reducing crash rates, limiting their severity, and investigating behaviors that lead to those crashes. Truck travel has increased tremendously by 216% since 1970, as measured in vehicle-miles traveled (NTS 2000). Overall, vehicle-miles traveled (total VMT) also increased by 137% over the same period (NTS 2000).

Most of the fatal crashes involving large trucks occurred in rural areas (64%), during the daytime (67%), and on weekdays (80%) (NHTSA 2008). It is anticipated that the growth in the number of trucks will bring a commensurate increase in the number and severity of vehicle crashes, if all other factors are equal. Statistics indicate that total crash rates for large trucks are lower than for passenger vehicles, but fatal rates are higher. In 2006, large trucks were involved in 223,037 total crashes per million vehicle-miles traveled (MVMT) and 1.94 fatal crashes per 100 million vehicle-miles traveled, whereas passenger vehicles were involved in 2,771,684 total crashes per million vehicle miles traveled and 1.23 fatal crashes per 100 million vehicle-miles traveled (FMCSA 2006).

Roadway safety is dependent on many factors such as density, volume to capacity ratio, facility type (interstate, major/minor arterial), facility location (rural or urban) and vehicle mix. The primary issue of safety is of great concern to transportation professionals, but in-depth research into the possibility of an interaction between the percentages of large trucks vis-à-vis crash rates on the transportation facilities has not been extensively studied. This topic should be of particular concern to state department of transportation (DOT) engineers, especially in Wyoming and Nebraska, who operate facilities with large percentages of trucks on roads such as Interstate 80 (I-80).

Large truck crashes present both a public and an occupational safety problem. From the public safety perspective, given the substantial differences in vehicle mass, it is not surprising that the majority of persons who die in large-truck crashes are occupants of other vehicles or non-motorists (82% in 2005). However, it is important to note that more truck drivers die on the job than do workers in any other single occupation (Burks, Belzer, Kwan, Pratt, & Shackelford 2010).

Due to the safety concerns that trucks pose to smaller/passenger vehicles, most highway agencies have implemented various truck restriction strategies to improve safety and efficiency of highway travel. These types of restrictions include differential speed limits, truck-only lanes, and no-truck routes.

2.1.1 Speed Restrictions

The relationship between increased speed and crashes has been well documented by Stuster et al. in 1998, with the key correlation being speed and crash severity. Excessive speeding decreases a driver's response time in an event and may increase risk as a result of speed-related increases in crash exposure (Stuster, Coffman, & Warren 1998).

Similarly, a rigorous meta-analysis conducted by Elvik et al. (2004) included 97 different studies with a total of 460 estimates of the relationship between changes in speed and changes in the frequency of crashes or associated injuries and fatalities. Using the Power Model, this study assessed the relationship between speed and road safety. The study concluded there was a relationship between speed and the number of crashes and the severity of crashes. The data suggest that speed is likely to be the single most important determinant in the frequency of traffic fatalities; a 10% reduction in the mean speed of traffic is likely to reduce fatal traffic crashes by 34% and have a greater impact on traffic fatalities than a 10% increase in traffic volume. These data include all vehicles and are not specific to large trucks (Elvik 2004).

While traveling above the posted speed limit or driving too fast for conditions has been shown to increase crash exposure (i.e., risk), speed variance among vehicles sharing the same road has also been shown to be correlated with vehicular crash risk. Lower speed variance is associated with fewer crashes (Finch, Kompfner, Lockwook, & Maycock 1994); (Kallberg & Toivanen 1998).

The Insurance Institute for Highway Safety (IIHS) ("Institute Supports Speed Limiters . . ." 2007) concluded that truck speeds are increasing on rural Interstates (pp. 5, 7): "In New Mexico, where the speed limit for trucks is 75 mph, the proportion of large trucks exceeding 70 mph increased from 27% in 1996 to about 43% in 2006. The percentage exceeding 75 mph more than doubled, rising from 4% to 10%. Truck speeds also increased substantially in Nevada, which has 75 mph speed limits on rural interstates. The proportion of trucks traveling faster than 70 mph increased from 29% in 1996 to 41% in 2006. During the same decade, the proportion of trucks topping 75 mph jumped from 8 to 14%" (IIHS 2007).

The IIHS nationwide survey ("Institute Supports Speed Limiters . . ." 2007) indicated that 64% of drivers favor speed limit requirements for large trucks. More than three-quarters of respondents who favored speed limit requirements supported a maximum speed limit below 70 mph. More than 80% of drivers reported that speeding on Interstate highways and freeways was a safety problem, whereas 40% of drivers reported that speeding was a "big" safety problem (IIHS 2007).

The safety impact of lowering speed limits and creating differential speed limits for cars and trucks has been the subject of debate among researchers and policymakers. Research clearly finds that lower vehicle speeds reduce the severity of crashes and the incidence of fatalities (Bishop, Murray, McDonald, Hickman, & Bergoffen 2008). Lower speeds also improve truck-braking distances. On the other hand, differential speeds caused by lower speed limits can increase crash risk. Many researchers have argued that it is the speed differential between vehicles, not the absolute speed, that is most important for creating crash risk. Trucks traveling at speeds lower than the rest of the traffic interact with more vehicles, increasing risk. In addition to the car-truck differential, speed limits over 65 mph tend to increase speed differentials between trucks by dividing trucks into company drivers (who tend to have speed limited to lower levels) and owner-operators (who typically can travel at higher speeds). Overall, researchers and policymakers have not reached consensus on the impact of differential speeds. A study conducted by Mannering et al. showed that 12 states had implemented speed restrictions for trucks using certain routes. The speed limit for trucks of a specific size, weight, or axle configuration was set to either 5 mph or 10 mph below the speed limit for passenger cars (Mannering 1993).

According to Johnson and Pawar (2005), 11 states have adopted the Differential Speed Limits (DSL) for both automobiles and heavy trucks with speed differentials ranging between 2 mph to 15 mph. About eight of the states have differential speed limits of 5 mph, with one or two states having speed differentials of 10 mph and 15 mph, respectively (Johnson & Pawar 2005). They stated that although there have been a number of studies that have investigated the safety implications of speed differentials between automobiles and trucks, the results have been inconclusive (Johnson & Pawar 2005).

Naziru and Mussa (2002) argued in favor of restrictions for truck speeds because truck crashes, like truck traffic, tend to increase during off-peak time periods and reducing truck speed during off-peak time periods would mitigate trucks' involvement in crashes (Naziru & Mussa 2002). However, Stokes and McCasland also argued that speed reduction aimed at trucks only creates speed differential that might increase crash potential between trucks and passenger cars (Stokes & McCasland 1984).

Other research has revealed that the results from the DSL study are varied and conflicting or inconclusive. Johnson and Pawar cited some of the results as having negative as well as positive effects on safety. They pointed out that these are based on little empirical evidence and were mainly supported merely by different theories. Proponents of the DSL cited the fact that trucks require longer braking distances for any given speed and therefore traveling at lower speeds help equalize the stopping distance. This is offset by the fact that truck drivers have a higher seat position above the road, which allows a longer sight distance, reducing the effect of the differences in braking distance. The opponents suggested that the differential speeds increase the speed variance, thus having a negative impact on safety (Johnson & Pawar 2005). They stated it is possible that the two arguments are correct, and that the DSL has two effects:

- The positive effect that results from improved vehicle dynamics (braking and maneuvering) for trucks at lower speeds
- The negative effect of increasing speed variation and the number of interactions among vehicles

DSLs increase interactions among vehicles and increase the probability of rear-end, side-swipe, and on-ramp accidents (Johnson & Pawar 2005).

2.1.2 Truck-Lane Restriction

Truck Lane Restrictions (TLRS) are a means of managing truck traffic on highways by prohibiting trucks from using certain lanes to minimize interaction between trucks and other vehicles. TLRS are widely practiced in the United States, with some restrictions being site specific or statewide, and compliance is either mandatory or voluntary. Usually one or more lanes are restricted from use by heavy trucks. These restrictions have been implemented by most states, notably Virginia and Florida. From a national survey conducted in 1986 by the FHWA to evaluate the benefits of truck lane restrictions, it was found that 26 states had implemented TLRS at one or more locations in their area but most implemented them for different reasons (FHWA 1986). Fourteen states believed lane restrictions helped improve highway operations; eight states implemented them to reduce crashes; seven states used TLRS to address pavement wear and tear; and five states used TLRS for better safety in work zones (FHWA 1986). A potential means of reducing interaction between trucks and cars is restricting trucks from using certain lanes on multilane highways (FHWA 1986).

Prohibiting trucks from using certain lanes on multilane highways gives other vehicles the opportunity to occupy and attain higher travel speeds on these restricted lanes without any interference from heavy vehicles. This can possibly lead to improved traffic flow, thereby increasing the throughput (i.e., traffic flow) (Radhakrishnan & Wilmot 2009).

Gan and Jo (2003) developed operational performance models to study truck lane restriction policies for freeways. They developed a simulation model to represent maximum service flow rate and minimum speed values as close to Highway Capacity Manual values as possible using VISSIM for the Florida Department of Transportation. The model was then used to assess the impact of prohibiting trucks from using the left most lanes on freeway sections with three, four, or five lanes in one direction. The input to the model was different combinations of number of lanes, lane restrictions, free flow speed, traffic volume, truck percentage, interchange density, and ramp volume. Throughput on three-, four-, and five-lane roadways was found to increase under low truck percentages and increased truck lane restrictions, while the opposite was true under high truck percentages. It was found that when ramp volumes increased to 1,000 vehicles per hour (vph) or more, truck percentages were greater than 15%

and interchange density was greater than two per mile; truck lane restrictions reduced throughput. The study found that TLRS increased throughput only when the number of lanes restricted were limited and truck percentages were less than 25%. Restricting trucks from using the two left-most lanes was recommended for four-lane or five-lane highways. For three-lane highways, it was recommended that trucks be restricted from using one left-most lane only (Gan & Jo 2003).

Yang and Regan (2007) also studied the impact of left-lane truck prohibition on the I-710 corridor in Los Angeles County, California, which has the highest truck volumes using simulation models. In this study, a pair-wise comparison of average speed, frequency of lane changes, and total volume for different values of maximum service flow rate and truck percentages were estimated. The simulation was conducted on a hypothetical five-mile section having one on ramp and one off ramp and four through lanes in one direction. Between 5% and 20% truck percentages were considered for the study. Pair-wise comparison results indicated an increase in throughput due to truck lane prohibition, provided the flow rate is greater than 1,300 vehicles per hour per lane (vphpl) and where trucks make up to at least 10% of the total traffic stream. This simulation study used variable flow rates but a fixed ramp volume of 500 vehicles per hour (Yang & Regan 2007).

A study by S. Peeta et al. found that when truck percentages are relatively low (10% and 30%) and demand loads are not very high, the strategy restricting trucks to the right-most lane is a good strategy that lessens car-truck interactions without deteriorating the traffic performance. However, for high truck percentages (50% and 70%) with high to very high demand, the strategy makes the lane highly congested leading to significant deterioration (Peeta & Zhou 2004).

2.1.3 Truck-Only Lanes

Truck-only lanes are defined as lanes that are separated from the remaining roadway lanes by a physical barrier and equipped with their own access and exit ramps. These truck lanes are custom designed for longer and heavier trucks because trucks have very different accelerating, turning, and braking characteristics in comparison with cars. There are a number of important factors to be considered when the construction of the facility is contemplated, such as cost, demand, financing options, location, improved level of service for trucks and other vehicles, improved productivity and increased safety.

The only separated truck lane facility that currently exists is a 35-mile segment of the New Jersey Turnpike, where trucks are physically separated from non-commercial traffic with a barrier; with the inner roadway reserved for light vehicles or non-commercial vehicles only, while the outer roadway is open to all vehicles (Middleton 1992). Another study conducted by Janson et al. described a set of specific feasibility thresholds for the consideration of constructing dedicated truck lanes. The study found that the truck facilities were most cost-effective when they were constructed with barrier separation in the existing median. They concluded that barrier separated dedicated trucks lanes achieve optimum feasibility when truck volumes exceed 30% of the total vehicle mix, peak hour volumes exceed 1,800 vehicles per lane hour, and off-peak volumes exceed 1,200 vehicles per lane hour (Janson & Rathi 1990).

Researchers from the truck-only lanes study have argued that the benefits of truck-only lanes go beyond operational gains for trucking firms, which include traffic safety improvements, reduced conflicts, and lower maintenance costs on general-traffic lanes (Mannering 1993). Forkenbrock (2005) also observed that having truck-only lanes could improve the comfort and convenience of those traveling in passenger vehicles, which would have positive implications for the quality of life of these travelers (Forkenbrock; Hanley 2005).

The Federal Highway Administration (FHWA) and Forkenbrock and March estimated that truck vehicle miles traveled (TVMT) will increase by more than 70% by the year 2020 (Forkenbrock & March 2005).

A study conducted by the Southern California Association of Governments provided specific conditions to warrant the need for truck-only lanes as total truck volumes not exceeding 30% of the traffic mix and about 1,800 vehicles per lane-hour (vplh) and 1,200 vplh in each direction for peak and off-peak hours, respectively (Caltrans 2004). Poole and Samuel (2004) also proposed similar parameters in terms of 40,000 average daily traffic in each direction with 20% being truck volume as a warrant for a truck-only lane (Poole & Samuel 2004). These conditions, according to Forkenbrock and Hanley (2005), are not likely to be met on most rural Interstate highways, that truck-only lanes are likely to be cost-effective solutions for rural Interstate highways when traffic volumes are comparatively high, with a high percentage of heavy trucks (Forkenbrock; Hanley 2005).

Killough (2008), in his paper "*Value Analysis of Truck Toll Lanes in Southern California*," concluded that the economic benefits of providing truck-only lanes on freeways outweigh the investments. He cited the improvement in both travel time and reliability due to the reduction of congestion of vehicles using the facility (Killough 2008).

Forkenbrock & March (2005) advanced three different proposals for the construction of truck-only lanes in their research paper "*Issues in the Financing of Truck-Only Lanes*." For the first type, they proposed two additional lanes in each direction for heavy trucks only separated by barriers from passenger vehicles and light trucks under 25,000 pounds gross weight. The second type should have one additional lane in each direction limited to heavy trucks separated by a barrier from the main traffic stream, including a breakdown lane and additional passing lane every few miles for trucks. The third type should have one additional lane for a total of three lanes in each direction, with the right lane reserved exclusively for trucks, the left lane for non-truck vehicles and the middle lane used by all vehicles. Although it is expensive to construct truck-only lanes, the concept has a broader appeal in principle (Forkenbrock & March 2005).

Poole et al. estimated that it would cost approximately $2.5 million per single lane-mile and about $10 million per route-mile for two lanes in each direction to construct a truck-only facility alongside an existing rural Interstate (Poole & Samuel 2004). There are many benefits associated with truck-only lanes to both trucking firms and the traveling public. Some of the potential benefits for trucking firms are reduced crashes as the interaction between passenger cars and trucks are reduced, thereby improving safety. Increased throughput and efficiency for trucks as low traffic would occupy the lanes and reduce congestion, which will eventually increase travel time reliability. Finally, there would be stronger argument for greater use of the longer twin-trailer or three-trailer combination (LCVs) trucks as these LCVs improve the productivity of the trucking industry. The benefits for passenger vehicles are improved safety, increased quality traveling experience as passengers' cars do not feel intimated due to the separation of trucks and passenger vehicles, and improved traveling speeds of the passenger vehicles as trucks operate in the truck-only lanes (Forkenbrock & March 2005).

2.2 DRIVER FACTORS

A paper by Peeta, Zhang and Zhou, "*Behavior-Based Analysis of Freeway Car-Truck Interactions and Related Mitigation Strategies*," focused on modeling the behavior of non-truck drivers in the vicinity of trucks by quantifying a time-dependent "discomfort level" for every non-truck driver interacting with trucks in the ambient traffic stream. According to the researchers, trucks contribute to traffic congestion, infrastructure deterioration, and crashes due to their physical and operational characteristics such as size, weight, braking distance, blind spots, turning radii, and driver fatigue. They indicated that the influence of trucks on traffic safety and the deterioration of the pavement can be inferred from quantifiable measures, including truck operational characteristics such as acceleration, deceleration, and speed. They noted that traffic performance can be affected by the behavior of truck drivers and non-truck drivers; truck driver behavior is influenced by the presence of large blind spots and geometry constraints, and non-truck driver behavior is affected by the truck's physical and operational characteristics (Peeta, Zhang, & Zhou 2004). The study suggested that the non-truck drivers' discomfort level is a quantifiable measure that varies based on socioeconomic characteristics, past experience, and inherent behavioral tendencies of the drivers. They emphasized that the discomfort level is time-dependent and influenced by situational factors such as weather, time of day, and ambient traffic conditions. The study proposed a fuzzy logic-based modeling framework by introducing the notion of "discomfort" for non-truck drivers in the vicinity of trucks and using that to extend existing microscopic traffic flow modeling logic. The results from the study "indicate that the number of interactions involving trucks and non-trucks vehicles increases with truck percentage up to a certain point and reduces beyond that point, especially for low demand loadings (2,000 and 3,500 vehicle per hour) as well as higher demand loading scenarios" (Peeta, Zhang, & Zhou 2004). They explained that for lower congestion levels, there is a lower potential for car-truck interactions even with high truck percentages and fewer non-truck vehicles on the freeway. However, at higher congestion levels (5,000, 6,000 vehicles per hour) with higher density, the interactions will be reduced. Thus, medium level congestion and a high percentage of trucks could cause passenger car drivers the highest level of distress (Peeta, Zhang, & Zhou 2004).

A study by Johnson and Pawar stated that another driver factor associated with accidents is fatigue. They indicated that driver fatigue can be caused by both physical and mental stress, and inattention caused by boredom. This driver factor is prominent on most rural Interstates, as these drivers drive for very long periods, concentrating without any interruptions compared with driving in areas with traffic congestion such as urban freeways (Johnson & Pawar 2005). They concluded that driver fatigue causes several problems ranging from slower driver reaction and decision making to decreased tolerance for other road users, which will eventually cause accidents.

A study by the National Transportation Safety Board (1995) on fatal accidents in professional trucks drivers showed that the mean duration of sleep among drivers was less than six hours in the last 24 hours before the accident (NTSB 1995).

A study to investigate fatigue in local or short haul trucking by Hanowski et al. concluded that driver fatigue was found to influence a crash. They suggested that the off-duty behavior of drivers was likely a primary contributing factor in the level of fatigue during the workday. This was confirmed by the results of the analyses conducted, which indicated that the fatigue experienced by drivers was brought with them to the job rather than being caused by the job (Hanowski, Wierwille, & Dingus 2003).

A study by Dingus et al. to investigate safety and fatigue issues in long-haul trucking concluded that the frequency of critical incidents and fatigue-related critical incidents vary significantly by the hour of the day. They indicated that severe critical incidents were caused by extreme fatigue levels in single long-haul drivers (Dingus, Neale, Klauer, Petersen, & Carroll 2006).

Haworth (1998) examined the factors that contribute to the development of driver (both automobile and truck) fatigue in Australia. The five main factors that induced fatigue according to this report were (in no particular order): (a) intensity and length of manual and mental work; (b) psychic factors such as responsibilities, worries and conflicts; (c) features of the surroundings such as illumination, climate, and noise; (d) monotony; and (e) illness, pain, and eating habits (Haworth 1998).

A study by the University of Michigan Transportation Research Institute (UMTRI) into tractor-trailer drivers' behavior revealed that truck drivers frequently drive longer than the 10-hour maximum permitted under current law (Campbell & Belzer 2000).

Kostyniuk et al. concluded in their study that four driver factors contributing to car-truck crashes were fatigue or drowsiness, following improperly, improper lane changing, and driving with vision obscured by rain, snow, fog, smoke, sand, or dust. They indicated that the consequences of these driver actions were more severe for car drivers in the vicinity of trucks. Kostyniuk et al. pointed out that the majority of deaths were the occupants of the car instead of the trucks (Kostyniuk, Streff, & Zakrajsek 2002).

A report by Stuster to determine the risky behavior of motorists near trucks noted about 27 reasons for motorists' behavior that resulted in truck-car crashes. They indicate that the reasons for motorists' behavior include aggression, inattentiveness, incompetence, and ignorance (Stuster 1999).

A study conducted by Moore et al. investigated motorists' perceptions of trucks on the highway and the relationship between the established predictors of highway behavior and perceptions of trucks (Moore et al. 2005). To achieve the objective of the study, they conducted a telephone survey of 1,392 people. Based on the survey results, they concluded that the overall perception of truck behavior on highways is negative and that it is a safety hazard. The frequency of the perceptions as recorded from the survey indicated that about 53.3% of large trucks create dangerous conditions by trying to pass each other when they drive fast (56.2%). About 63.5% of passenger vehicle drivers become nervous when driving beside or near large trucks (Moore et al. 2005).

A study conducted by researchers in Finland investigated the contributing factors to truck fatal accidents and the driver factors for those accidents. They conducted a questionnaire survey of which 251 responded, all of whom were long-haul drivers. Results from the survey indicated that driver fatigue contributed slightly to truck accidents. To reduce the risk of accidents associated with fatigue, the researchers proposed a technological, in-car countermeasure to detect driver fatigue (Hakkanen & Summala 2001).

2.3 SUMMARY

This literature review was conducted to obtain an overview of previous/related research studies done by other researchers regarding the safety impacts of high percent trucks and driver perceptions in relation to car-truck interactions. Although several key findings were identified, the literature search revealed a scarcity of relevant published research on this topic.

3. PROJECT LOCATION

3.1 PROJECT LOCATION

Interstate 80 (I-80) was chosen for this research because of the high percentage of freight traffic that it carries. It stretches from east to west for approximately 3,000 miles through states such as Wyoming, Nebraska, Nevada, California, Utah, etc. It is a popular route for freight transportation from the east coast to the west coast and vice versa.

Originally, I-80 sections in three states, Wyoming, Nebraska and Utah, were identified for a preliminary study. Upon further checks in the three states, it became evident that the I-80 corridor in Utah intersects with two major interstates (I-15 and I-84) near Salt Lake City. Due to the huge amount of traffic that might divert to/from I-80 at that location, which might affect the total volume, the Utah section of I-80 was recommended for further studies.

The Wyoming and Nebraska sections of I-80 were selected for the analyses presented in this report. The length of I-80 in Wyoming is about 400 miles starting from Evanston near the Utah-Wyoming border to Pine Bluffs near the Wyoming–Nebraska border. The Nebraska section of I-80 runs west to east from Bushnell near the Wyoming–Nebraska border to Omaha near the Nebraska–Iowa borders, spanning a distance of about 455 miles. Figure 3.1 shows a map of the I-80 corridor from Wyoming to Nebraska.

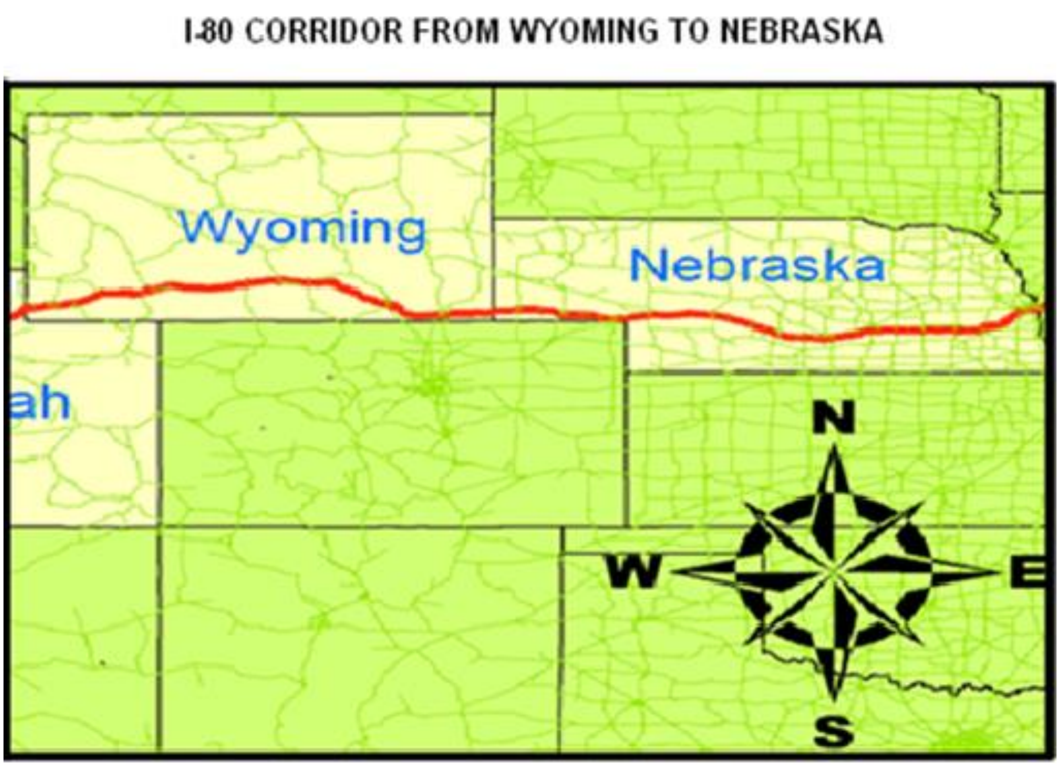

Figure 3.1 Corridor Map

The corridor passes through series of mountainous and low lying areas with extreme weather conditions. I-80 reaches its maximum elevation of 8,640 feet in Wyoming between Laramie and Cheyenne. The Interstate passes over the Continental Divide as well. With the exception of urban areas, such as Lincoln and Omaha in Nebraska and Cheyenne in Wyoming, the corridor traverses mainly through small rural towns in both states. The longest straight stretch of the I-80 system is about 72 miles in Nebraska from milepost 318 in Grand Island Area to milepost 390 near Lincoln, Nebraska. Figures 3.2 and 3.3 show the traffic stream on I-80 near Happy Jack, milepost 322 near Laramie, Wyoming.

Figure 3.2 Traffic Stream on I-80 near Happy Jack in Wyoming at Milepost 332.
(Source: Google Map 2009)

Figure 3.3 Trucks on I-80 in Wyoming. (Source: Google Map 2009)

3.2 DATA DESCRIPTION

The data for this research were obtained from the Wyoming Department of Transportation (WDOT) and the Nebraska Department of Roads (NDOR). The data include the average daily traffic volumes for all vehicles and trucks on I-80 in both states. Accident data for a 10-year period from 2000–2009 were also obtained.

3.2.1 Automatic Traffic Recorders

The WYDOT and the NDOR maintain multiple fixed and mobile automatic traffic counter stations on road facilities across each state. The automatic traffic counters record traffic data, which are reported annually in the *Automatic Traffic Recorder Report* issued by the WYDOT's Planning Office and the Planning and Project Development Division of NDOR. The data usually include the counter's location, the Average Daily Traffic (ADT) listed for all days of the month, and the percent of the average day and month for each of the 12 months and vehicle classification.

ADT is the average 24-hour volume at a given location over a defined time period less than one year. The common application is to measure an ADT for each month of the year. The Average Annual Daily Traffic (AADT) is the average 24-hour volume over a full 365-day year at a given location; that is, the number of vehicles passing a site in a year divided by 365 days.

3.2.2 Vehicle Miles Traveled (VMT) Data

The traffic count data or the AADT count is used to quantify the number of vehicles miles traveled along a section and is useful for various calculations, such as truck volumes, Level of Service (LOS), or crash rates.

The Vehicle Miles Traveled (VMT) data per section are estimated by multiplying the AADT by the length traveled within the network throughout the year. The VMT data are an important component in computing the percent trucks and crash rates for this research. I-80 was divided into 108 sections and 80 sections in Wyoming and Nebraska, respectively.

3.2.3 Crash Data

Crash data and crash information were obtained for the 10-year study period from 2000 to 2009 for all reported crashes on I-80 in both states. The crash information contains the following: crash date, crash identification number, time of crash, accident location or milepost, and pertinent crash-related information, such as first harmful event, manner of collision, road geometry, passenger data, vehicle type, road, light and weather conditions, posted and estimated speeds, etc. The information of interest for this study included the crash date, the milepost where the crash occurred, road, light, and weather conditions, and whether or not a truck was involved. The crash records supplied were used to determine the crash frequencies along the I-80 corridor for the study period. This information, together with the VMT data, is used to calculate the crash rates.

4. DATA ANALYSIS

4.1 ANALYSIS OF DATA

Roadway crashes cause economic loss to every country. It is, however, very important for transportation policy makers to find out the causes of these accidents and find ways of addressing them. This requires that the crash information needs to be investigated to identify sections on interstates that have high crash rates so that the necessary remediation measures can be undertaken. Interstate 80 carries a lot of freight traffic, mostly from the port city of Los Angeles in Southern California, which handles two-thirds of all container traffic entering the United States from the Pacific Rim countries to the eastern states of Nevada, Utah, Illinois, Iowa, etc. and freight traffic from the east to the west (Killough 2008).

Interstate 80 in Wyoming goes from Milepost (MP) 0 at the Wyoming-Utah border near Evanston to MP 402 at the Wyoming-Nebraska border near Pine Bluffs. The total number of crashes per milepost for the study period 2000–2009 for all vehicles and trucks in Wyoming is shown in Figure 4.1. MP 238 to 255 recorded the highest number of crashes for both All Vehicles and Trucks during the study period under investigation. It is important to note that this section of I-80 in Wyoming is the Elk Mountain corridor, which experiences severe weather conditions especially during the winter. It is most likely that the truck crashes within this section are due to the severe weather conditions.

Figure 4.2 shows the crash frequency for all vehicle and truck crashes on I-80 in Nebraska from 2000–2009. The I-80 corridor in Nebraska runs from west to east beginning with MP 0 from the Wyoming-Nebraska border near Bushnell to MP 455 on the Nebraska-Iowa border near Omaha. With regard to the crash frequency in Nebraska, truck crashes seems to be evenly distributed along most of the corridor with the highest crashes occurring between MP 409.77 at Waverly near Lincoln and MP 420.94 at Greenwood near Omaha. A higher all-vehicle crash rate occurs between MP 382.11 and MP 451.8 at Seward near Lincoln and Omaha. Frequency of crashes occurs mostly in the towns (densely populated areas) along the corridor compared with other areas. The crash frequency tables for both states can be found in Appendix A.

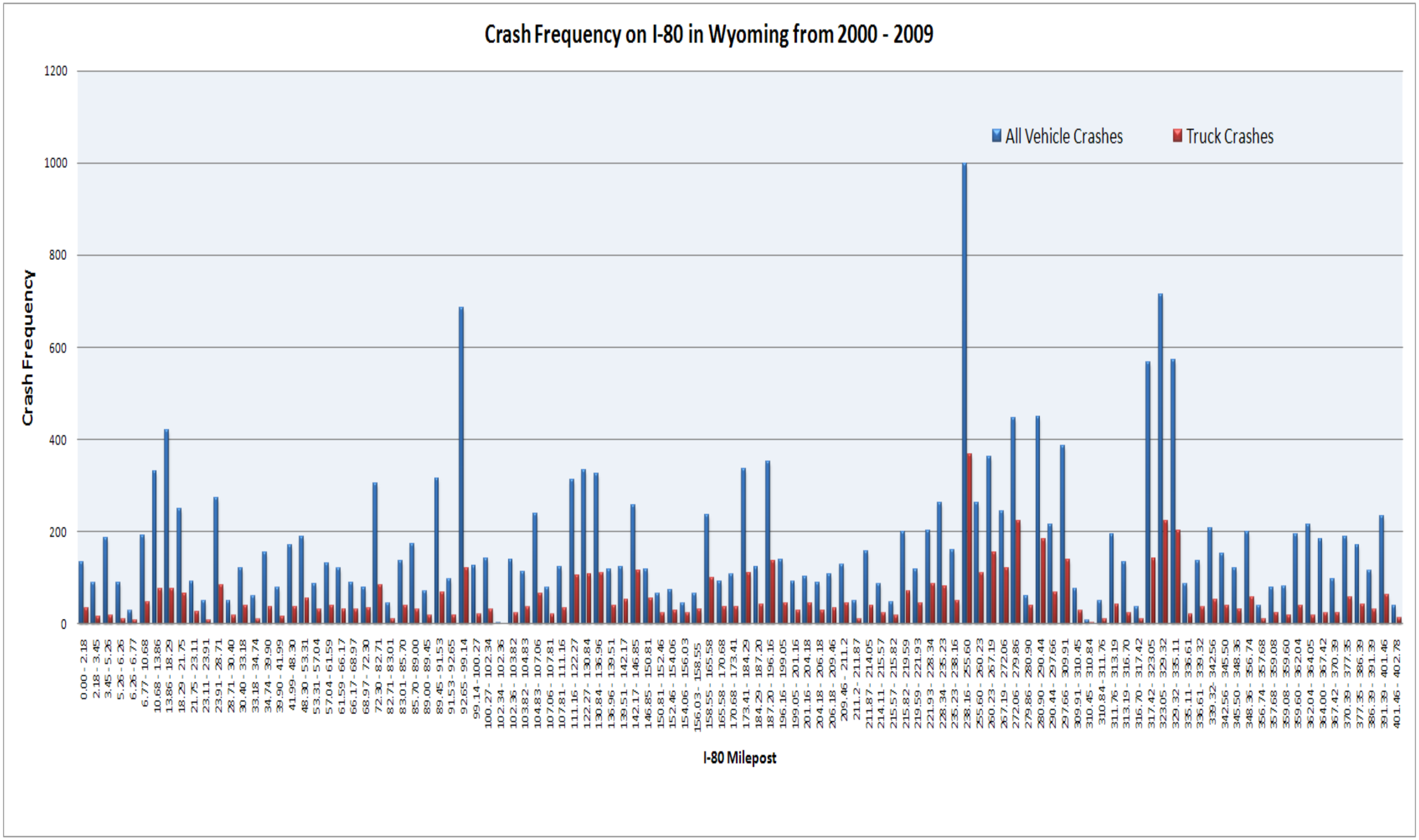

Figure 4.1 Crash Frequency on I-80 for Both All Vehicle and Truck Crashes in Wyoming from 2000–2009.

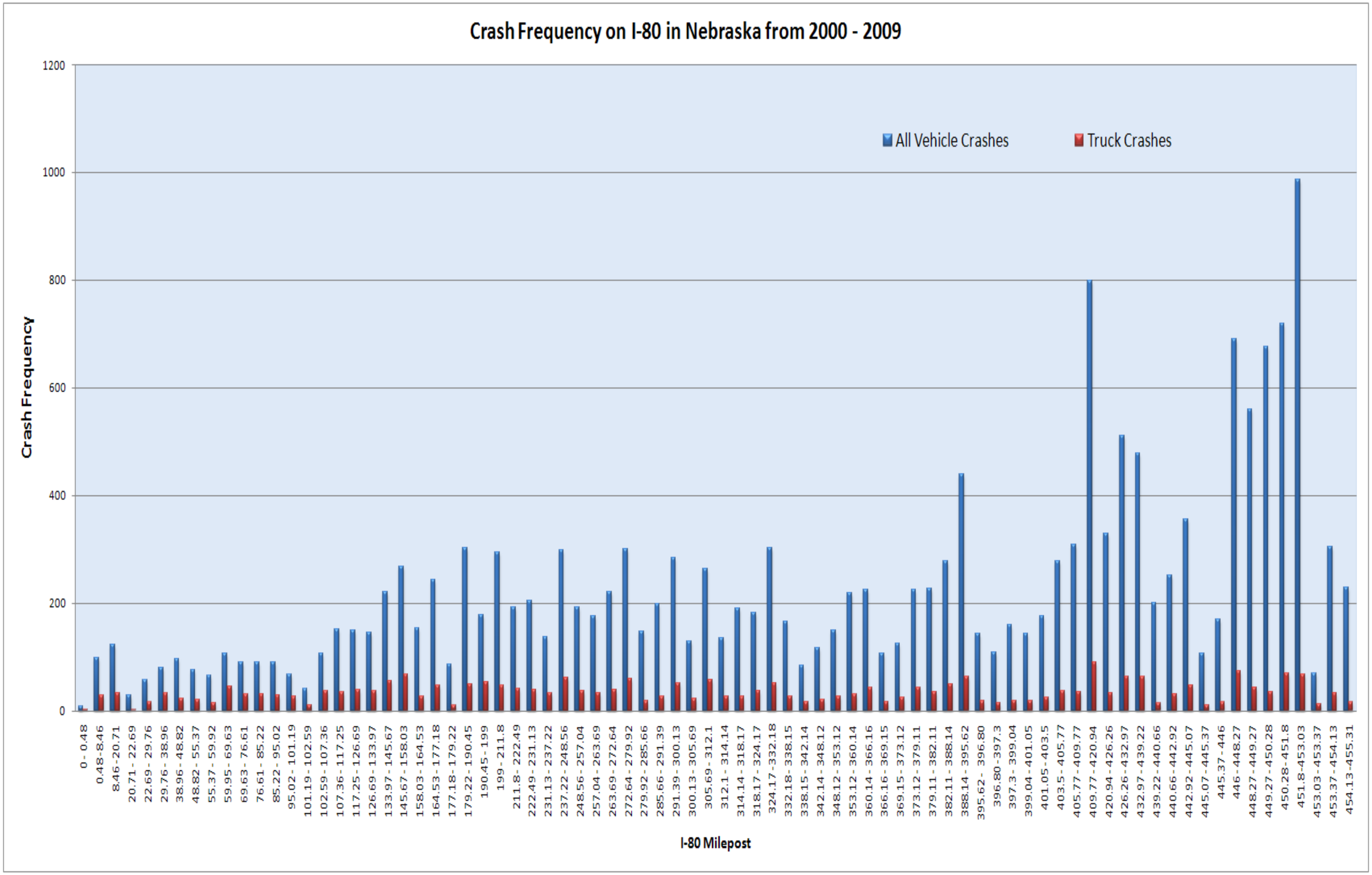

Figure 4.2 Crash Frequency on I-80 for Both All Vehicle and Truck Crashes in Nebraska from 2000–2009.

Figures 4.3 and 4.4 show the truck fatalities in Wyoming and Nebraska on I-80 from 2000–2009, respectively. These are fatality crashes involving at least one truck. The truck fatalities in both Wyoming and Nebraska were analyzed by year. It became evident that truck fatalities on I-80 in Wyoming were significantly higher fromr 2002 to 2004 than the rest of the study period. The highest number of truck fatalities in Nebraska was recorded in 2002. Compared to Wyoming truck fatalities, Nebraska has fairly distributed fatal crashes per year for the 10-year study period, with the exception of the low truck fatalities in 2006. Observations from both states indicate that Nebraska had more fatal truck crashes than Wyoming for most of the years.

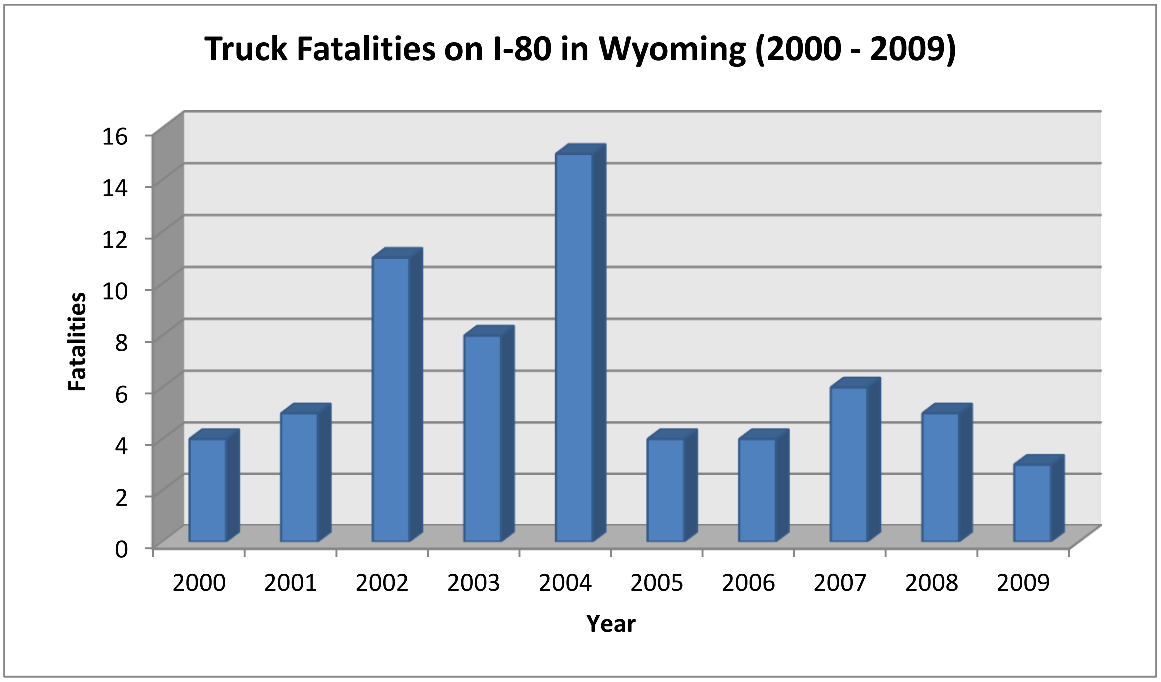

Figure 4.3 Truck Fatalities by Year on I-80 in Wyoming

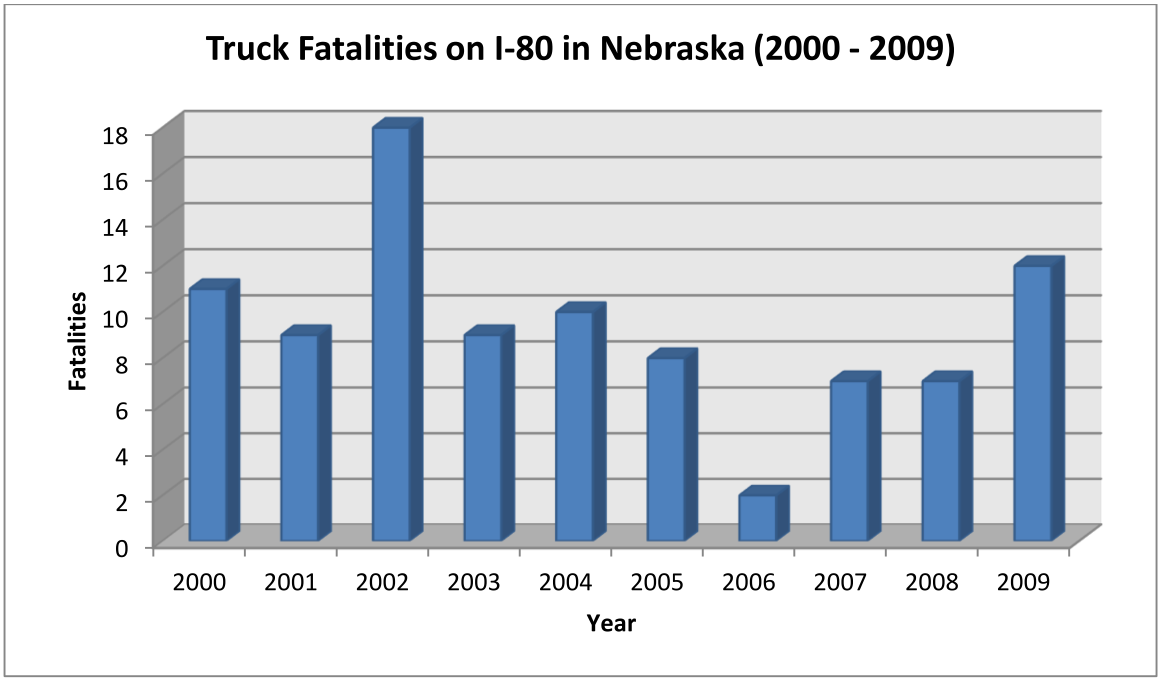

Figure 4.4 Truck Fatalities by Year on I-80 in Nebraska

Figures 4.5 and 4.6 show the average truck crashes by month on I-80 in Wyoming and Nebraska, respectively. These graphs show that higher truck crashes occur during the months of October through March. The reason for the high number of truck crashes might be due to the severe winter conditions, especially in Wyoming, coupled with the high wind conditions across the state.

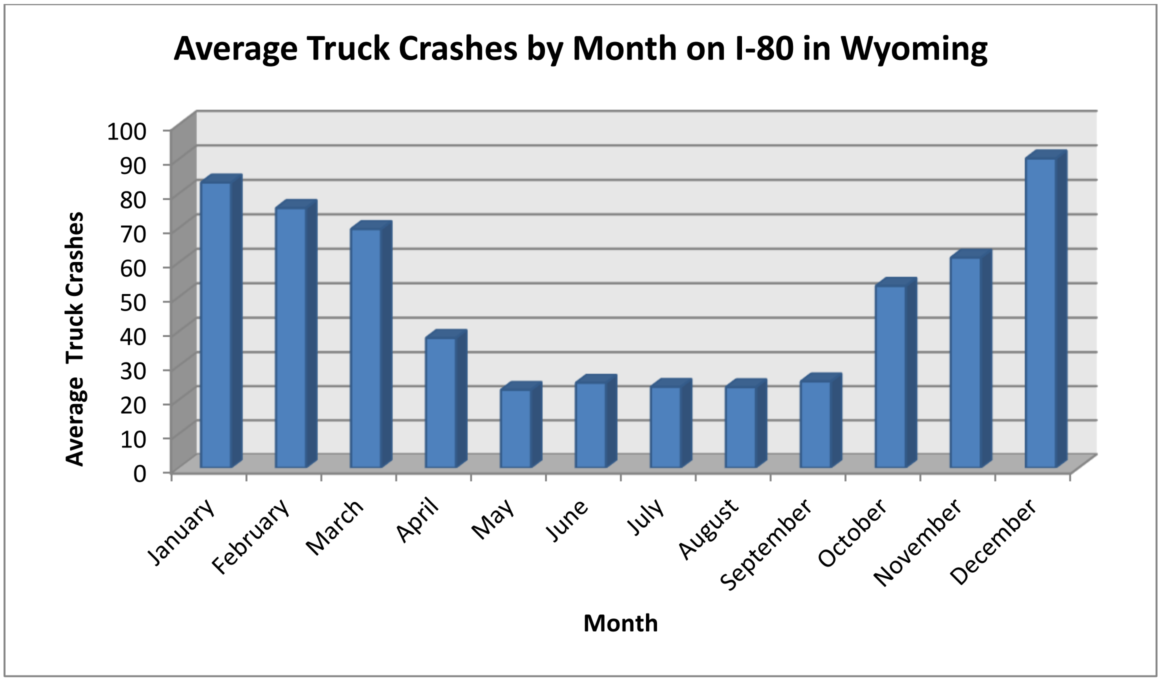

Figure 4.5 Average Truck Crashes by Month on I-80 in Wyoming

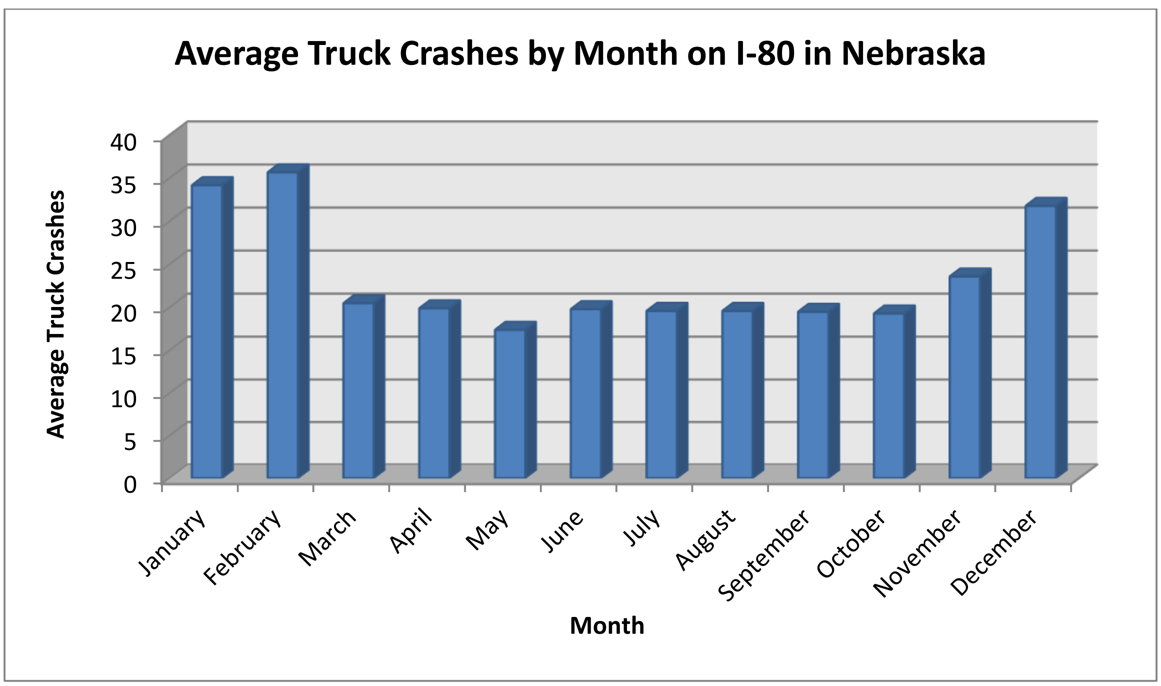

Figure 4.6 Average Truck Crashes by Month on I-80 in Nebraska

4.1.1 Truck Volume Analysis

Freight transportation is crucial to the economic success of any nation. Knowledge about truck volumes and movement on our freeways is important to transportation engineers, to ensure that the facility is operated effectively and to allow necessary maintenance decisions to be made. Traffic volume and vehicle mix is utilized for estimating the effects of current truck traffic on Level of Service (LOS) and safety.

The traffic volumes were obtained from the WYDOT and NDOR. The data were manually validated to check for inconsistencies and errors. The Vehicle VMT on I-80 in Wyoming and Nebraska for both All Vehicle and Trucks was calculated from the traffic volumes and can be found in Appendix A. After the validation, the percentage of trucks in the traffic stream was calculated using data from both the total all vehicle miles traveled (AVMT) and the total truck vehicle miles traveled (TVMT). The percent trucks on I-80 in Wyoming and Nebraska can be found in Appendix A. Figure 4.7 shows the percent trucks for both Wyoming and Nebraska. The graph shows a higher truck percentage in Wyoming than Nebraska throughout the 10-year study period.

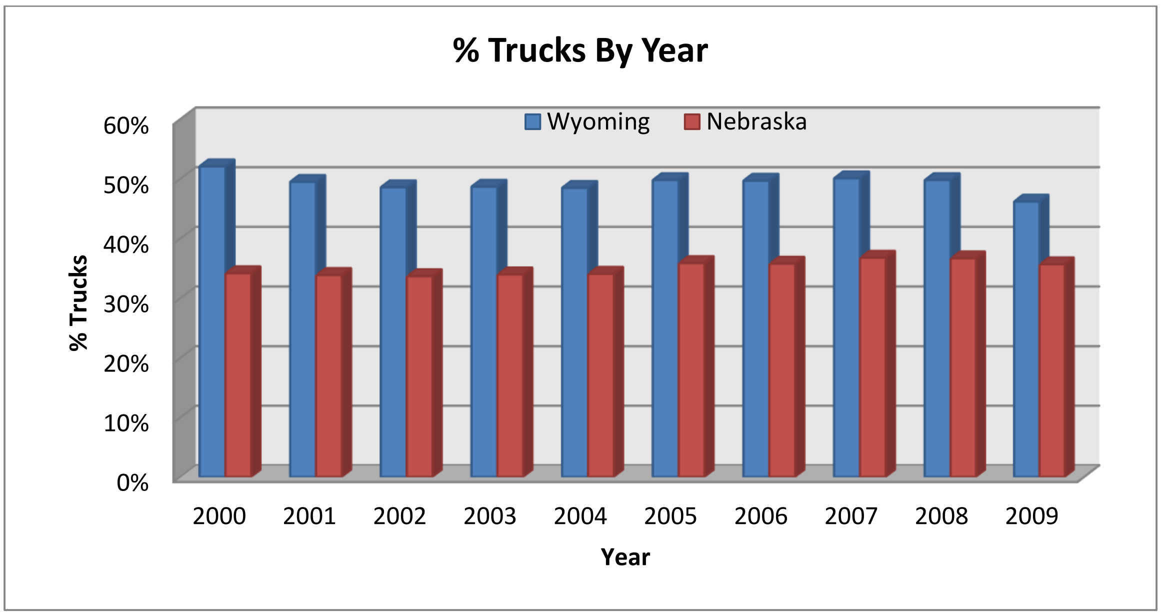

Figure 4.7 Truck Percentage by Year on I-80 in Both Wyoming and Nebraska

The truck volumes for the 10-year study period on I-80 in both Wyoming and Nebraska can be found in Figure 4.8. From the figure, it is clear that Nebraska had almost double the volume of truck traffic traveling on I-80 during the 10-year study period than in Wyoming. The year 2007 saw a higher truck volume on I-80 in both Nebraska and Wyoming than any other year. The high truck volumes in Nebraska could be attributed to more freight traffic using other routes such as Interstates 70 and 76 to link Interstate 80 in Nebraska instead of traveling through Wyoming. Although the truck volume in Nebraska is higher than Wyoming, the percent trucks are higher in Wyoming.

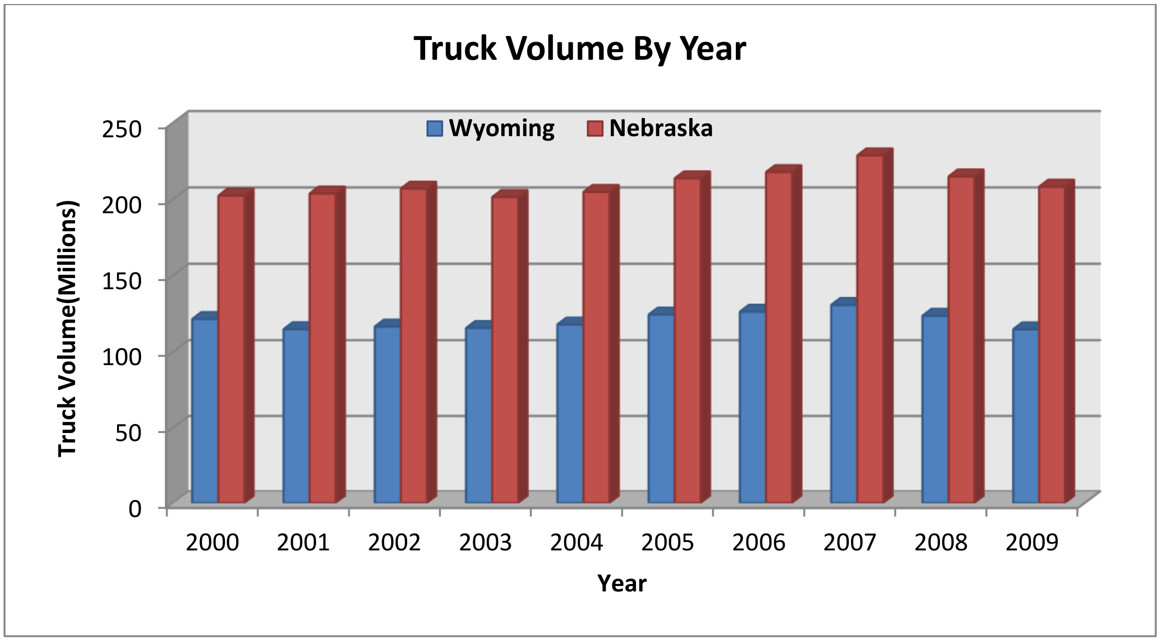

Figure 4.8 Truck Volume by Year on I-80 in Both Wyoming and Nebraska

4.1.2 Crash Rate Analysis

This section quantifies the crash rates on I-80 in both Wyoming and Nebraska. The crash rates for this research are expressed as the number of crashes per million vehicles miles traveled (MVMT). The crash rate measures the level of safety of a particular roadway section allowing for a comparison between sections of the roadway with varying traffic volumes. AADT is from permanent counts and represents a true average of volume counts over a year period. ADT is from temporary counters on a day considered to be average. AADTs are considered more accurate than ADTs.

VMT is calculated by multiplying the ADT by the length of road section by 365 days, thus the formula is:

VMT = ADT*Length*365

The crash rates are calculated by dividing the number of crashes (for all vehicles and trucks) by the VMT and then multiplied by one million. The formula for crash rate is:

$$Crash\ Rate = \frac{Number\ of\ Crashes * 1{,}000{,}000}{VMT}$$

Equation 4.1 Crash Rate Formula

The crash rate for all vehicles and trucks only were calculated for crashes in both Wyoming and Nebraska. VMT and crashes involving all vehicles were used in computing for the all vehicle crash rates. On the other hand, truck crash rates were computed using the truck only crashes and TVMT.

4.1.3 Crash Rate Comparison

WDOT divided I-80 into 108 sections for reporting the AADT and the NDOR also divided I-80 into 80 sections for reporting the AADT. The crash data for each individual section along I-80 were used to calculate the crash rate for each section per year. The crash rates were then averaged over the entire corridor for the year to obtain the average crash rate for each year. The crash rates were computed for Wyoming and Nebraska on the I-80 corridor from 2000 – 2009. Table 4.1 shows the single year crash rates in Wyoming on the I-80 corridor.

The average crash rates for the study period 2000–2009 along the I-80 corridor in Wyoming were 2.554 crashes per million VMT for all vehicles and 1.467 truck crashes per million TVMT.

The crash rates per sections of I-80 varied over the 10-year study period, where each year had different maximum and minimum rates. From Table 4.1, year 2002 has the highest maximum crash rates for both all vehicles and trucks. The average maximum crash rates for all vehicles and trucks only during the study period was 11.548 crashes per million VMT and 10.138 crashes per million TVMT, respectively. The average minimum crashes for both all vehicle and trucks only were zero crashes per million VMT and zero crashes per million TVMT, respectively. The zero crash rates indicate there were some sections that had no crashes for that year.

Table 4.1 Single Year Crash Rates in Wyoming on I-80 (Crashes per million VMT or TVMT)

All Vehicles	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Average	2.827	2.530	2.602	2.973	2.371	2.105	2.640	2.629	2.774	2.084
Max	15.095	14.507	22.831	9.858	8.557	10.073	7.353	10.698	7.518	8.987
Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trucks	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Average	1.630	1.520	1.335	1.644	1.147	1.018	1.537	1.810	1.758	1.273
Max	7.188	14.269	17.402	10.537	7.276	7.923	7.128	10.658	5.894	13.107
Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Table 4.2 shows the average, maximum, and minimum crash rates for Nebraska on I-80 for all vehicles and truck crash rates for the 10-year study period from 2000–2009. The 10-year average crash rates for all vehicles and trucks are 0.547 crashes per million VMT and 0.383 truck crashes per million TVMT. Maximum crash rates of 3.673 crashes per million VMT and 7.641 crashes per million TVMT occurred in 2002 and 2007 for all vehicles and trucks, respectively. The average minimum crash rates for all vehicles and trucks are 0.067 crashes per million VMT and 0.0 truck crashes per million VMT.

Table 4.2 Single Year Crash Rates in Nebraska on I-80 (Crashes per million VMT or TVMT)

All Vehicles	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Average	0.610	0.666	0.628	0.615	0.502	0.512	0.447	0.533	0.495	0.463
Max	1.733	2.748	3.673	2.529	1.368	1.320	1.579	1.347	1.736	1.786
Min	0.000	0.000	0.079	0.078	0.091	0.145	0.000	0.119	0.161	0.000
Trucks	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Average	0.376	0.448	0.359	0.425	0.352	0.402	0.289	0.376	0.419	0.382
Max	2.316	4.090	2.321	3.070	5.372	6.082	2.248	7.641	7.007	6.593
Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

From the analysis, it became evident that Wyoming has higher average crash rates than Nebraska. This could be due to certain factors such as the weather and road conditions, road geometry, etc. Apart from the yearly crash rate averages, the crash rates for multi-year periods were also analyzed. The three-year averages were used to smooth out any variations and remove the single year bias from the model. Table 4.3 shows the average, maximum, and minimum crash rates for Wyoming on I-80 for the three-year average for both all vehicles and trucks only. From the table, years 2001–2003 has the highest crash rates of 2.702 crashes per million VMT for All Vehicles and years 2007–2009 has the highest truck crash rates of 1.614 truck crashes per million TVMT.

Table 4.3 Multiple Year Average Crash Rates in Wyoming on I-80
(Crashes per million VMT or TVMT)

All Vehicles	2000 - 2009	2001 - 2003	2004 - 2006	2007 - 2009
Average	2.554	2.702	2.372	2.496
Maximum	11.548	22.831	10.073	10.698
Minimum	0.000	0.000	0.000	0.000
Trucks	**2000 - 2009**	**2001 - 2003**	**2004 - 2006**	**2007 - 2009**
Average	1.467	1.500	1.234	1.614
Maximum	10.138	17.402	7.923	13.107
Minimum	0.000	0.000	0.000	0.000

Table 4.4 shows the average, maximum, and minimum crash rates for Nebraska on I-80 for the three-year average for both all vehicles and trucks only. The years 2001–2003 had the highest crash rate of 0.636 crashes per million VMT for all vehicles. The truck crash rate for the years 2001–2003 is the highest with a value of 0.411 truck crashes per TVMT.

Table 4.4 Multiple Year Average Crash Rates in Nebraska on I-80
(Crashes per million VMT or TVMT)

All Vehicles	**2000 -2009**	**2001 -2003**	**2004 -2006**	**2007 - 2009**
Average	0.547	0.636	0.487	0.497
Maximum	1.982	3.673	1.579	1.786
Minimum	0.067	0.000	0.000	0.000
Trucks	**2000 -2009**	**2001 -2003**	**2004 -2006**	**2007 - 2009**
Average	0.383	0.411	0.348	0.392
Maximum	4.674	4.090	6.082	7.641
Minimum	0.000	0.000	0.000	0.000

Figure 4.9 shows the spatial map of the 10-year average crash rates for both all vehicles and trucks only in Wyoming. Most of the locations have all vehicle crash rates ranging from 1.51-3.00 crashes per million VMT. High truck crash rate frequencies occur between 0.00-1.51 crashes per million TVMT. The all vehicle crash rates show a relatively high crash rate between Laramie and Cheyenne. Between Evanston and Rock Springs, there were about 3.01-4.50 crashes per million VMT. Higher truck crash rates occur within the ranges of 3.01-4.50 crashes per million TVMT near Laramie.

The crash rate for all vehicles and trucks only were calculated for crashes in both Wyoming and Nebraska. VMT and crashes involving all vehicles were used in computing the all vehicle crash rates. On the other hand, truck crash rates were computed using the truck-only crashes and TVMT.

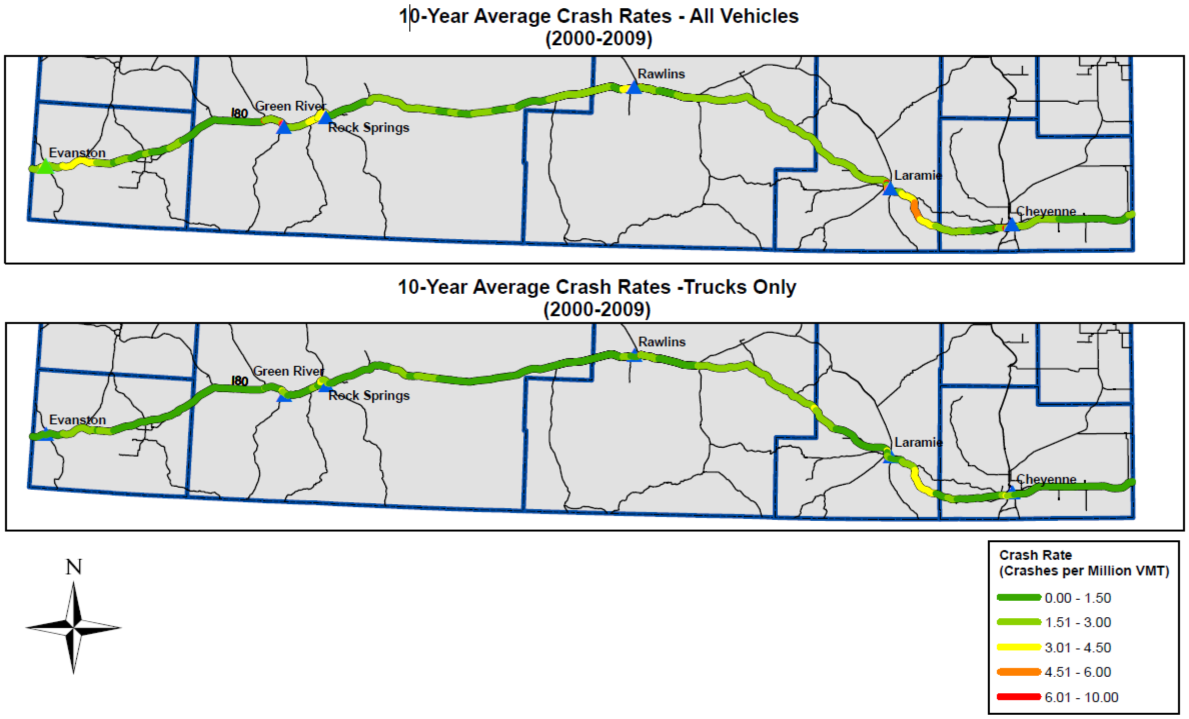

Figure 4.9 10-Year Average Crash Rates for All Vehicles and Trucks Only in Wyoming

Figure 4.10 shows the 10-year average crash rates for all vehicles and trucks only in Nebraska. The map shows that crash rates ranging from 0.0 - 0.5 crashes per million VMT have a higher frequency on most sections of I-80 for both all vehicles and trucks only. It is observed that higher crash rates for both all vehicles and trucks occur in towns, with the highest truck crash rates (>2.01 crashes per million TVMT) occurring near Omaha.

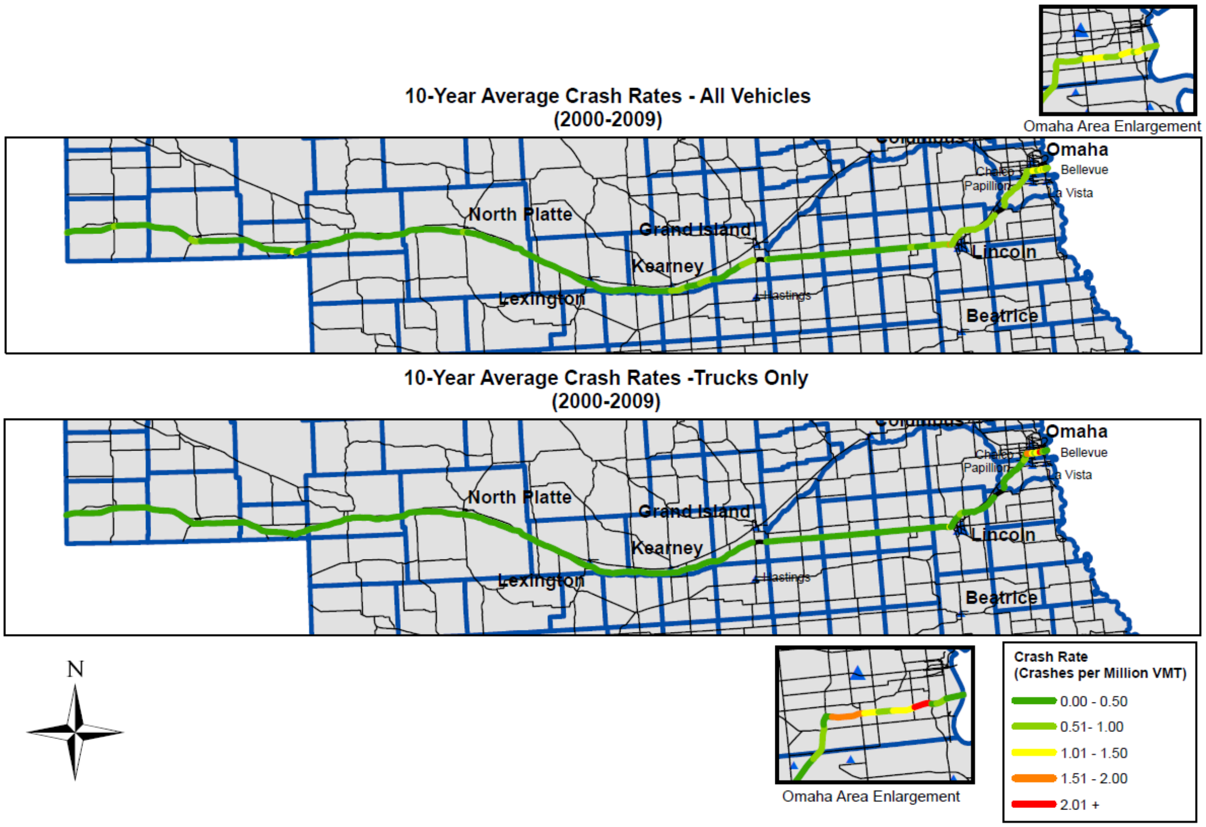

Figure 4.10 10-Year Average Crash Rates for All Vehicles and Trucks Only in Nebraska

4.1.4 Economic Impact of Vehicle Crashes

The impact of crashes on the economy of every nation cannot be over-emphasized. Crashes cause a reduction in productivity as the affected people often become hospitalized or are killed. According to the Economic Impact of Motor Vehicle Crashes by the National Highway Traffic Safety Administration, in 2000, motor vehicle crashes in the United States cost an estimated $231 billion, about $820 per person or 2% of the Gross Domestic Product (GDP). Figure 4.11 shows the share of the economic costs of motor vehicle crashes by type in 2000.

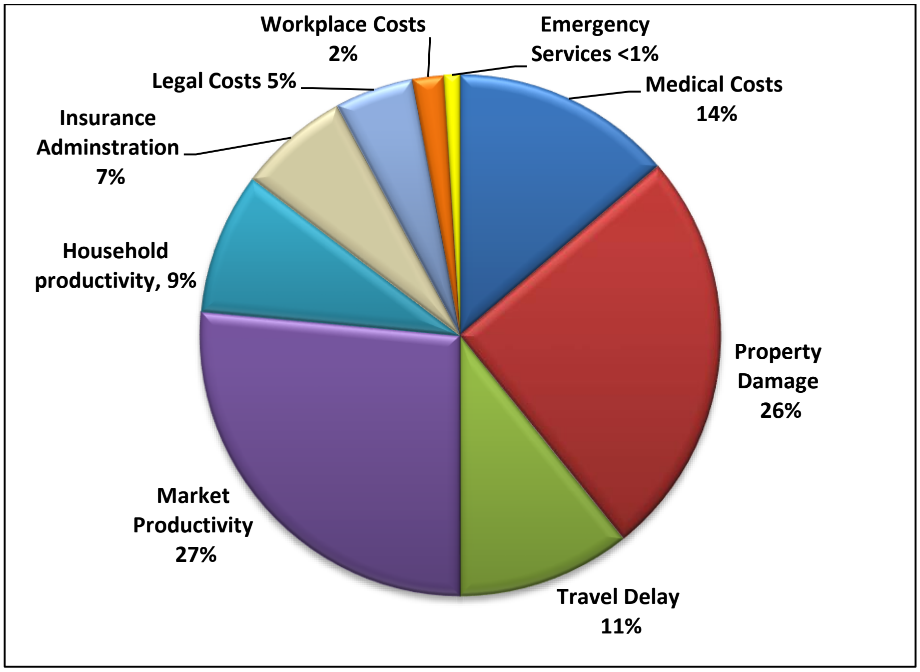

Figure 4.11 Economic Impact of Motor Vehicle Crashes in 2000
Source: USDOT, 2000

The largest component of the total cost (27%) is market productivity, which includes the cost of paid labor due to death and disability. The next to lowest component is the workplace costs, about 2% ,which is the disruption due to the loss or absence of an employee such that it requires training a new employee, overtime to accomplish the work of the injured employee, and the administrative costs to process personnel changes (USDOT, 2000).

4.1.5 Crash Monetization

The crash cost on I-80 in both Wyoming and Nebraska were primarily obtained from the Wyoming Department of Transportation (WYDOT) and Nebraska Department of Roads (NDOR). The figures obtained from WYDOT were derived from a USDOT report, *Treatment of Economic Value of a Statistical Life in Departmental Analyses*. Table 4.5 shows the crash cost used by WYDOT for each crash severity on I-80.

Table 4.5 Cost per Crash on I-80 in Wyoming

Crash Severity	Cost Per Crash
Fatal	5,800,000
Possible Injury	11,600
Property Damage Only (PDO)	5,800

There were a total of 19,526 all crashes on I-80 in Wyoming for the period 2000 to 2009. Out of which, 314 of the crashes resulted in fatalities, 9,325 in injuries and 9,887 in property damage only. These crashes resulted in huge economic losses especially in Wyoming. Economic loss due to fatal crashes amounted to $1.8 billion, and $108 million was the cost for injury crashes. For the property damage only (PDO) crashes, the economic loss amounted to about $57 million. Figure 4.12 and Table 4.6 show the economic cost of crashes due to different severities on I-80 in Wyoming from 2000–2009.

Table 4.6 Economic Cost by All Vehicle Crash Severity in Wyoming

Crash Severity	Economic Cost
Fatal	$1,821,200,000
Possible Injury	$108,170,000
Property Damage Only (PDO)	$57,344,600

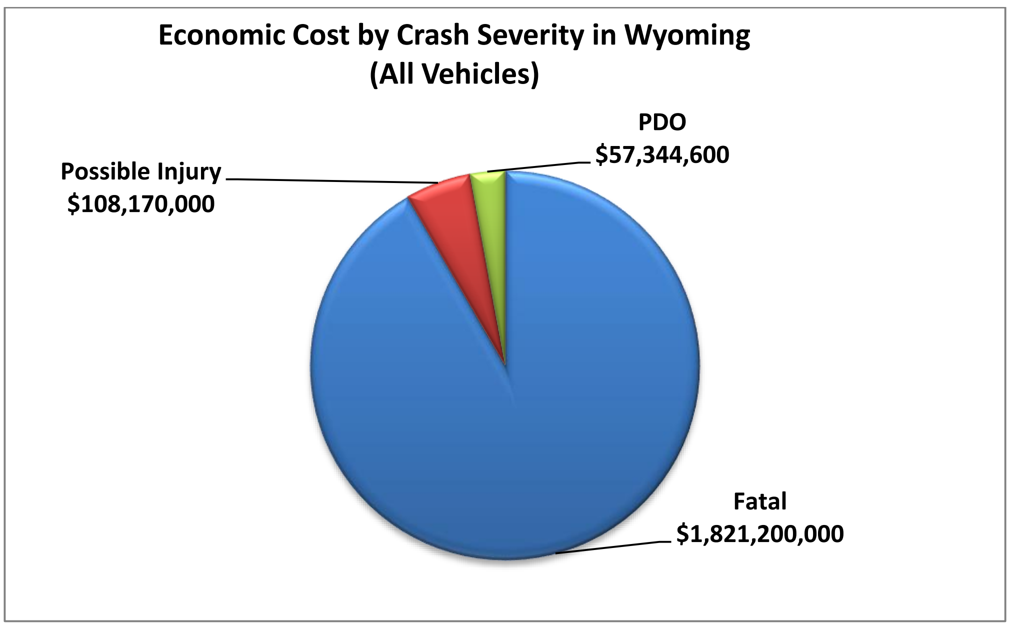

Figure 4.12 Economic Cost by All Vehicle Crash Severity on I-80 in Wyoming

NDOR derived its crash cost from several sources such as the Federal Highway Administration (FHWA, 1991) and U.S. Department of Commerce, Bureau of Economic Analysis (2010). These crash costs were adjusted to January 2010 costs using the Gross Domestic Product (GDP) Implicit Price Deflator. Table 4.7 is the cost per crash used by NDOR on I-80. The difference in crash costs for each state shows the different formula used in calculating the crash cost based on their respective local and economic conditions.

Table 4.7 Cost per Crash on I-80 in Nebraska

Crash Severity	Cost Per Crash
Fatal	$4,407,800
Injury	$40,800
Property Damage Only (PDO)	$7,300

The number of crashes that occurred on I-80 in Nebraska during the study period 2000–2009 was 19,059. Fatal crashes made up 244 of the total number and 6,951 of the crashes were injury crashes. The number of property damage only crashes for the 10-year study period was 12,224, making it the largest severity type crash for the period. The economic loss due to the total number of fatal crashes was $1.1 billion and the injury crash cost for the state of Nebraska for the 10-year period amounted to $269 million. The property damage only crashes cost an amount of $89 million. Table 4.8 and Figure 4.13 show the economic cost due to crash severity on I-80 in Nebraska.

Table 4.8 Economic Cost by All Vehicle Crash Severity in Nebraska

Crash Severity	Economic Cost
Fatal	$1,075,503,200
Possible Injury	$268,912,800
Property Damage Only (PDO)	$89,235,200

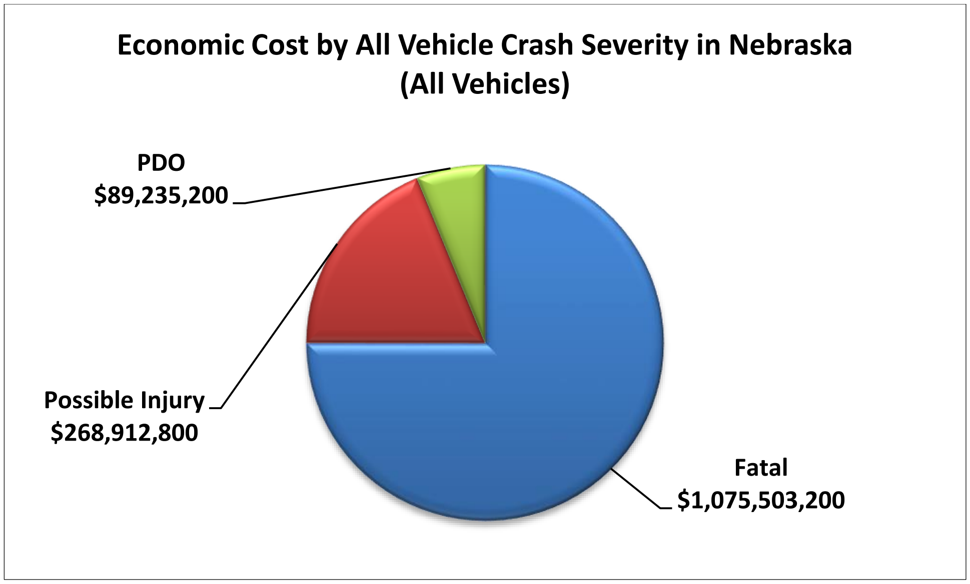

Figure 4.13 Economic Cost by All Vehicle Crash Severity on I-80 in Nebraska

The economic impact of truck accidents during the study period was significant compared with all vehicle crashes. There was a total of 5,924 truck crashes for the period, of which 65 were fatal crashes and 2,251 resulted in injury crashes and the remaining 3,608 were in property damage only crashes. Table 4.9 and Figure 4.14 show the economic cost of truck crashes of different severities in Wyoming from 2000–2009.

Table 4.9 Economic Cost by Truck Crash Severity in Wyoming

Crash Severity	Economic Cost
Fatal	377,000,000
Possible Injury	26,111,600
Property Damage Only (PDO)	20,926,400

Results show that fatal truck crashes in Wyoming led to $377 million in economic losses for the 10-year study period. These fatal truck crashes accounted to about 19% in overall economic loss to the state of Wyoming. This is significantly high compared with the total all vehicle crashes. The economic cost of the injury and property damage only truck crashes are $26 million and $21 million, respectively.

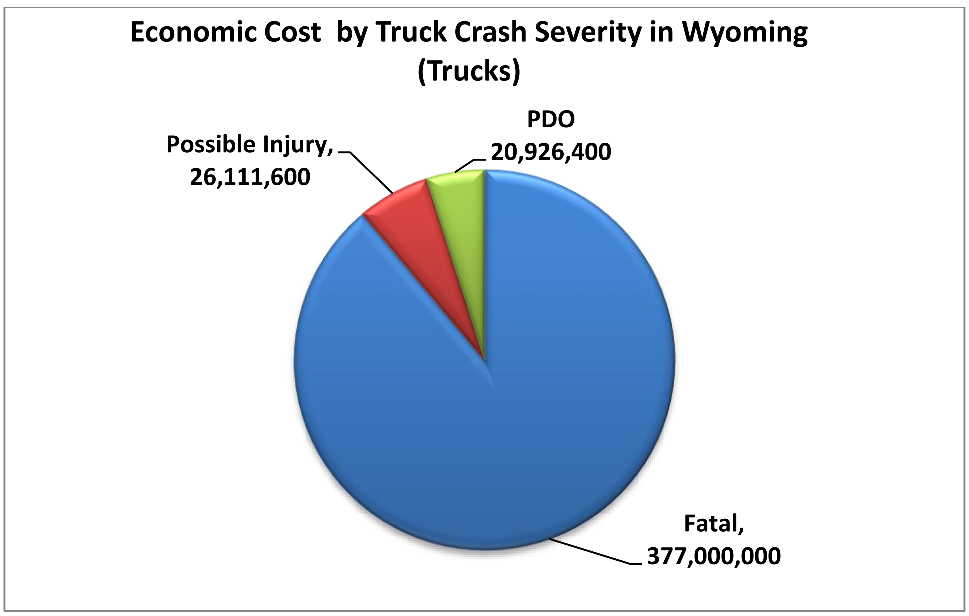

Figure 4.14 Economic Cost by Truck Crash Severity on I-80 in Wyoming

Nebraska registered a total of 2,809 truck crashes with different severities. Fatal truck crashes resulted in 93 crashes; 1,360 and 1,356 crashes resulted in injury and property damage only, respectively. These crashes resulted in economic losses to Nebraska; fatal truck crashes led to $410 million in economic losses. The economic losses due to injury and PDO truck crashes were $55 million and $10 million, respectively. Figure 4.15 and Table 4.10 show the economic cost by truck crash severity in Nebraska.

Table 4.10 Economic Cost by Truck Crash Severity in Nebraska

Crash Severity	Economic Cost
Fatal	$409,925,400
Possible Injury	$55,488,000
Property Damage Only (PDO)	$9,898,800

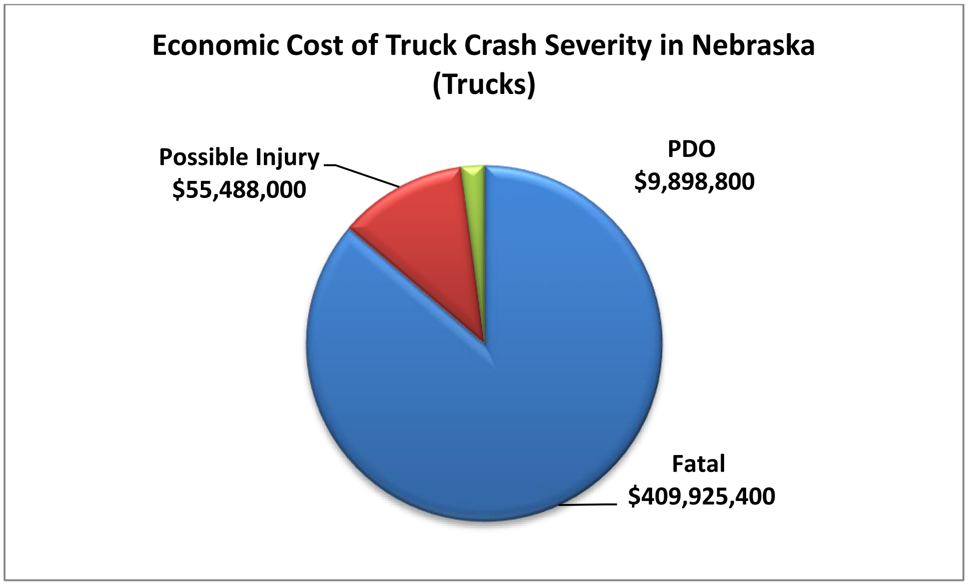

Figure 4.15 Economic Cost by Truck Crash Severity on I-80 in Nebraska

These fatal truck crashes accounted for about 29% in overall economic losses to the state of Nebraska, due to truck crashes.

5. ENVIRONMENTAL CONDITIONS

The crash data obtained from WYDOT contains, among other information the environmental conditions; weather, road, winter and light conditions at the time of the crash at the various locations. The environmental conditions play an important role in crashes. The possible types of light conditions recorded during an accident included: darkness lighted, darkness unlighted, dawn/dusk, daylight and unknown. The types of road conditions at the time of the crash included the following: dry, icy, muddy, slippery, slush, snowy, wet or unknown. Nine different types of weather factors contributed to crashes. These are clear, dust, fog, ground blizzard, rain, sleet/hail, snowing, strong wind and unknown.

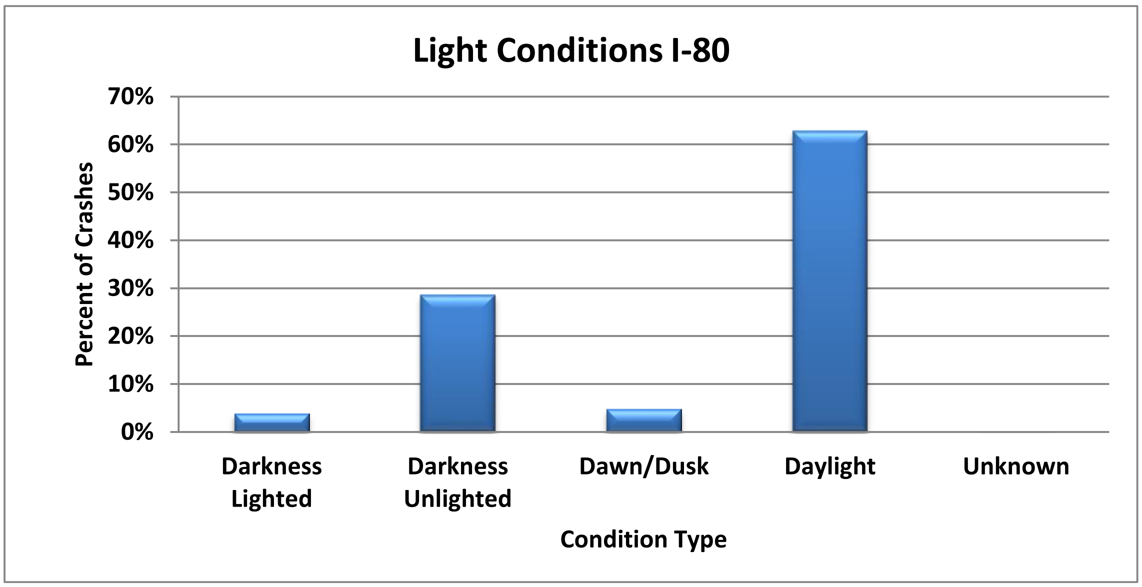

Figure 5.1 Crashes During Specific Light Condition on I-80 in Wyoming

Figure 5.1 shows the different types of light conditions during crashes on I-80 in Wyoming. Sixty-three percent of crashes occurred during daylight, whereas most of the remaining occurred when it was dark. Of the remaining, 28% occurred during unlighted darkness condition. This is because most sections of the Interstate are not lighted.

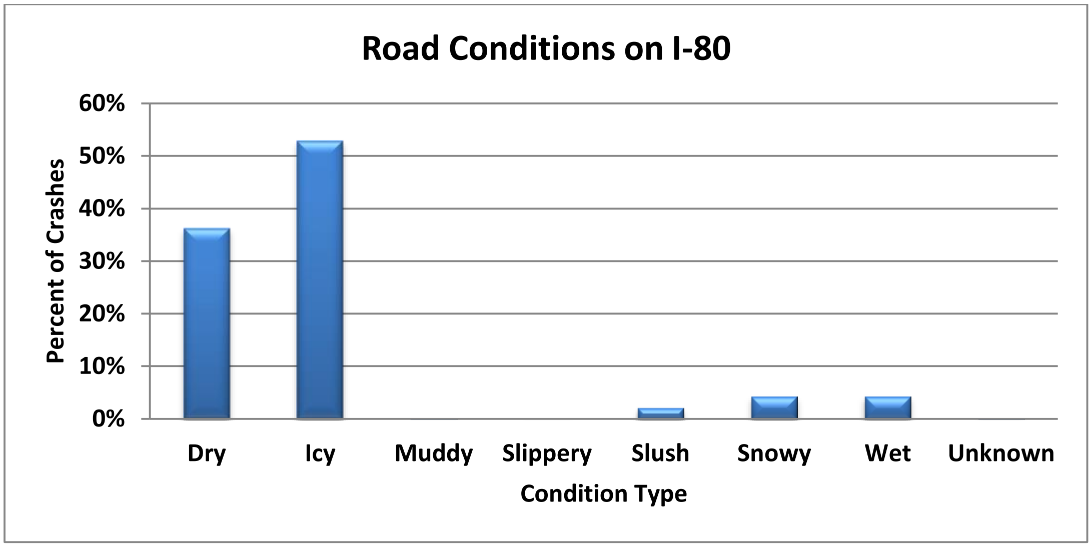

Figure 5.2 Crashes during Specific Road Conditions on I-80 in Wyoming

Figure 5.2 indicates that 53% of the crashes occurred during icy road conditions and 36% of crashes occurred during dry road conditions during the 10-year period. Snowy and wet road conditions both contributed to 4% of the crashes. The rest of the road conditions: muddy, slippery, slushy, and unknown, contributed to less than 1% of all crashes.

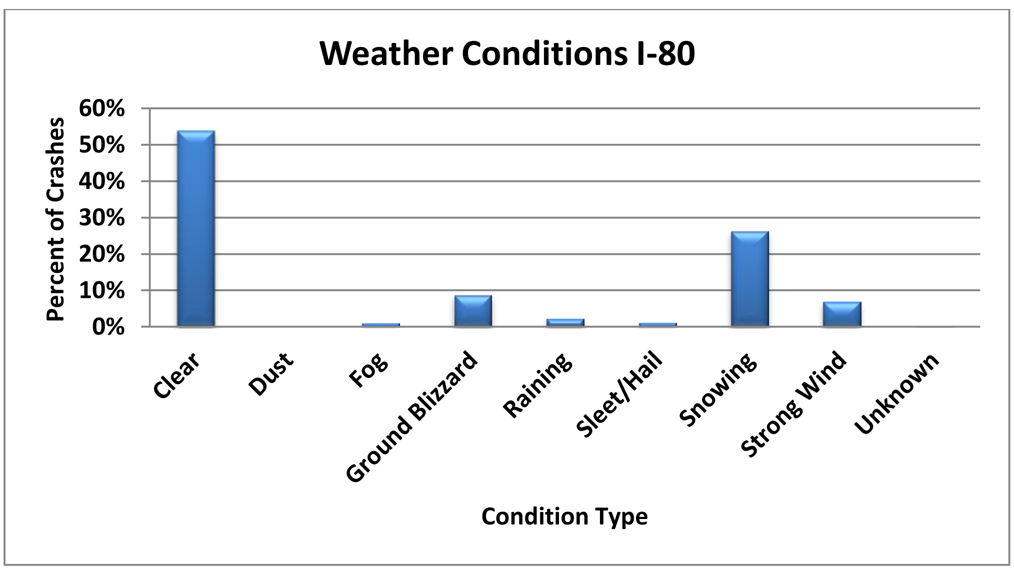

Figure 5.3 Crashes During Specific Weather Conditions on I-80 in Wyoming

Figure 5.3 shows number of crashes occurred during specific weather conditions. Most of the crashes occurred during clear weather conditions, about 54%. Snowy weather conditions contributed approximately 26% of crashes. About 9% and 7% of crashes occurred during ground blizzard and strong winds respectively. Fog, dust, sleet/hail and unknown road conditions accounted for the rest of crashes.

The light conditions in Nebraska during crashes is as shown in Figure 5.4. From the figure, it is evident that 66% of all accidents in Nebraska occurred during daylight conditions, and 33% occurred during dawn or dusk conditions. The rest (1%) of the crashes occurred during darkness lighted, darkness unlighted, and unknown light conditions.

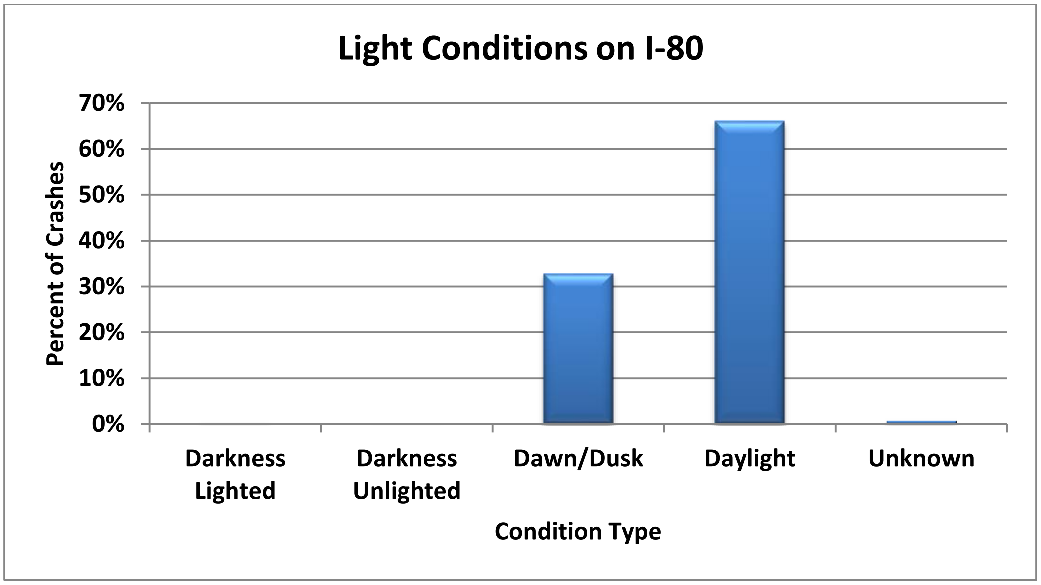

Figure 5.4 Crashes During Specific Light Conditions on I-80 in Nebraska

Figure 5.5 shows the specific road conditions during crashes in Nebraska. From the figure, most of the crashes (63.5%) occurred during snowy road conditions, and about 23.7% of crashes occurred during dry road conditions. Slippery, icy, muddy, slushy, and wet road conditions contributed 12.8% to the crashes on the corridor.

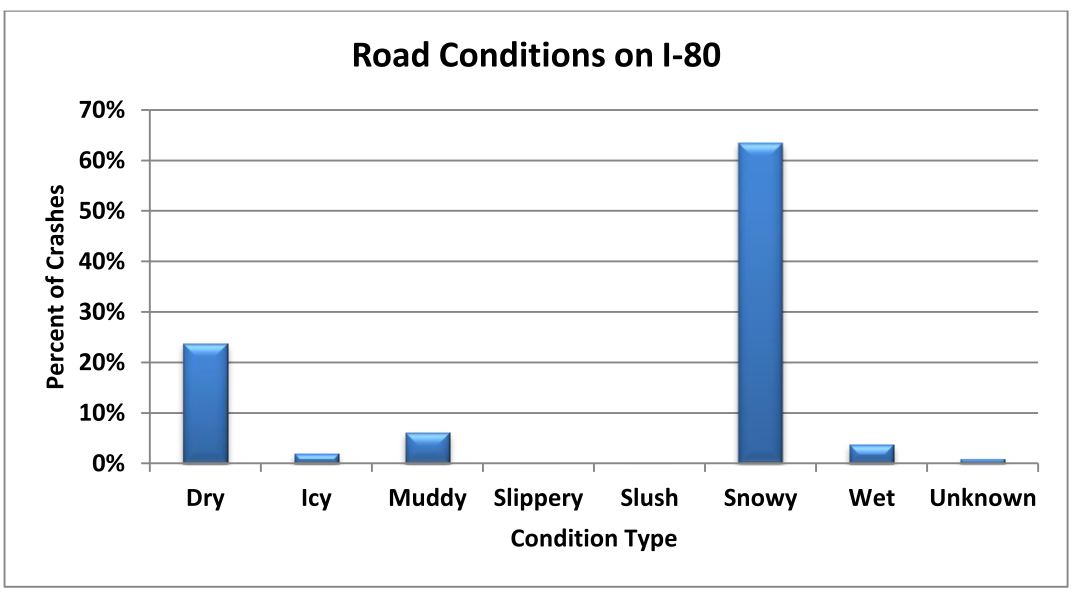

Figure 5.5 Crashes During Specific Road Conditions on I-80 in Nebraska

Weather conditions are considered significant to most crashes, especially in mountainous regions of the United States. Figure 5.6 shows the crashes during specific weather conditions on Interstate 80 in Nebraska. From the figure, it could be seen that most of the accidents occurred during clear weather conditions, about 46%. This means that most of the crashes occurred during adverse weather conditions. Snowy conditions resulted in 13% of crashes, and strong wind conditions in 1.1%.

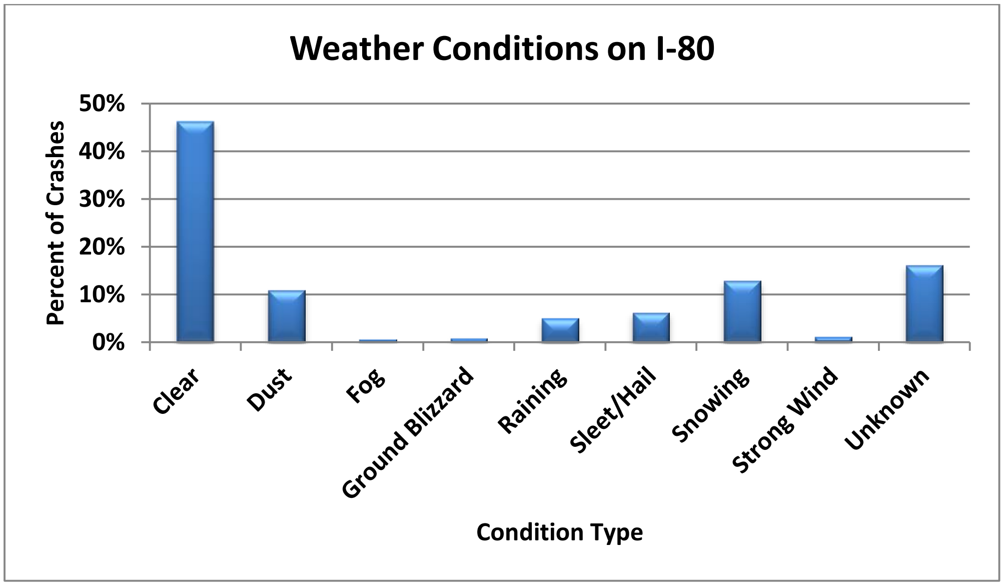

Figure 5.6 Crashes During Specific Weather Conditions on I-80 in Nebraska

The environmental conditions data in both states were combined. Figure 5.7 shows the light conditions in both states during which crashes occurred.

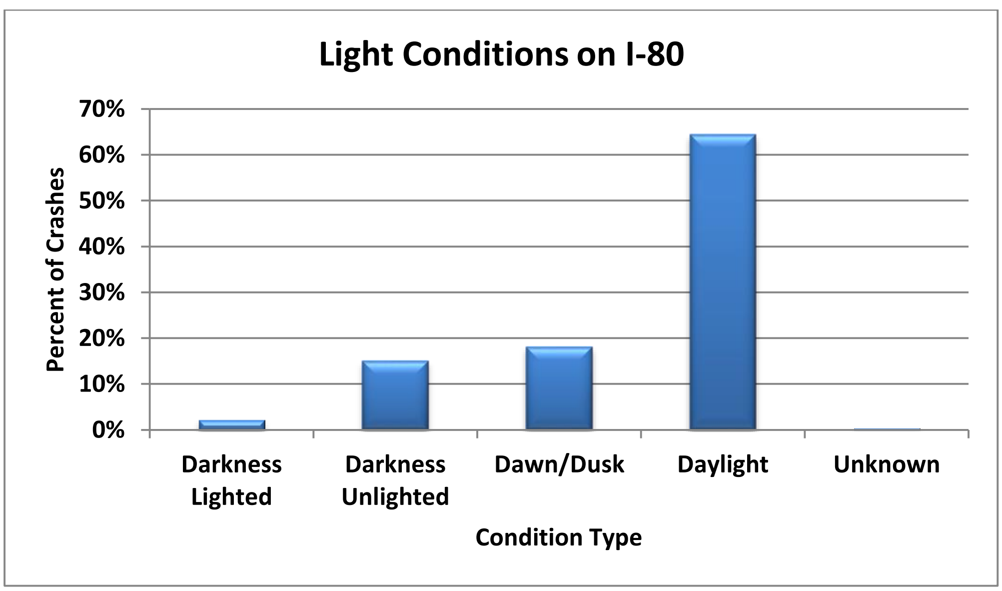

Figure 5.7 Crashes During Specific Light Conditions on I-80 in Both Wyoming and Nebraska

The combined light conditions in both Wyoming and Nebraska showed that most of the accidents (64%) occurred during daylight in both states. About 18% of accidents occurred during dawn or dusk conditions, with darkness unlighted conditions contributing about 15% of accidents. Comparing the individual state conditions to the combined, it became evident that most of the accidents occurred during daylight conditions.

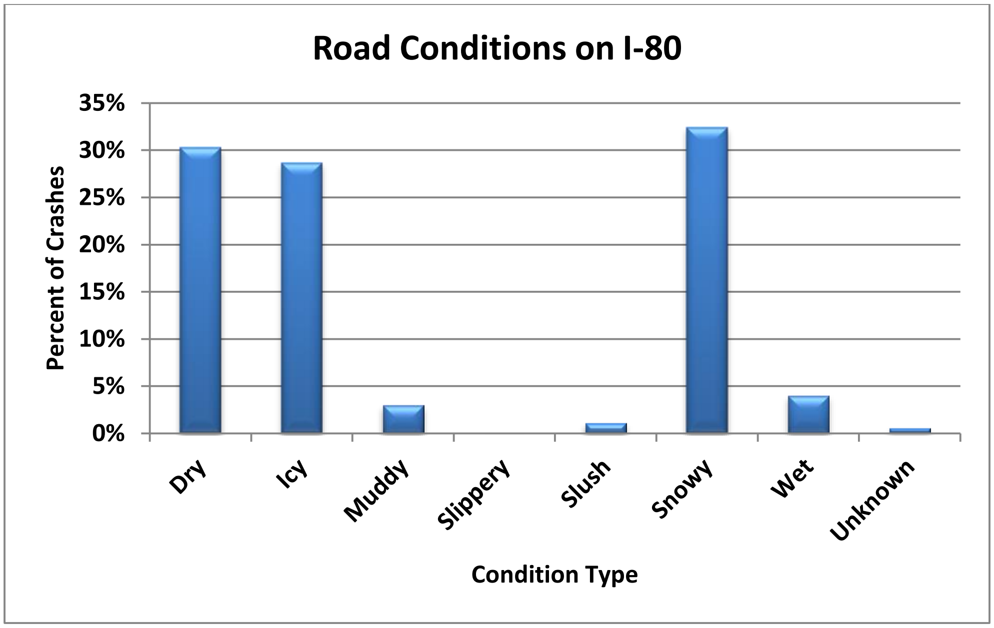

Figure 5.8 Crashes During Specific Road Conditions on I-80 in Both Wyoming and Nebraska

Figure 5.8 shows that 32.4% and 28.6% of the crashes occurred during snowy and icy road conditions, respectively, in both states. Dry road conditions contributed about 30.3% to the accidents. This result showed that snowy road conditions contributed to most of the accidents in both states.

Figure 5.9 shows that clear weather conditions contributed to 50% of the accidents in both states. Snowy weather conditions contributed to about 20% of the crashes with the remaining percentage of crashes due to strong winds, fog, rain, dust, and hail.

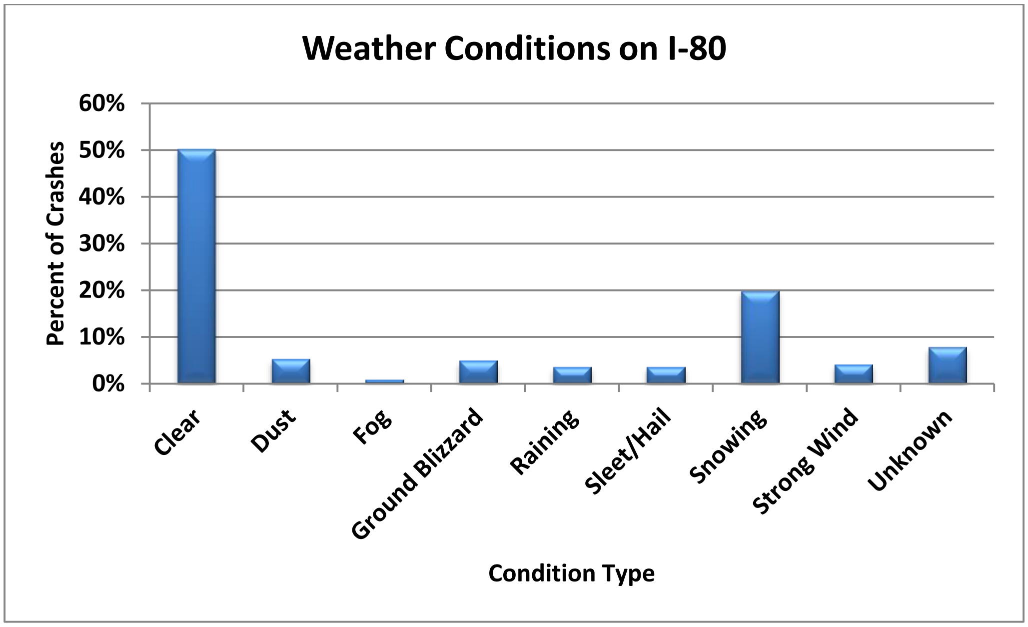

Figure 5.9 Crashes During Specific Weather Conditions on I-80 in Both Wyoming and Nebraska

6. PERCENT TRUCK AND CRASH RATE RELATIONSHIP STUDY

Crashes usually occur as a result of human, environmental factors such as weather and road conditions and roadway factors such as roadway geometry. The severity of crashes depends on the type of vehicle involved. Truck crashes tend to have more severe impact than passenger car crashes due to their different physical and operational characteristics. According to Peeta et al., passenger car drivers operate differently in the presence of large trucks than they do in the presence of other cars. They stated that passenger cars tend to change lanes frequently in order to avoid being in the presence of large trucks, thereby resulting in crashes (Peeta, Zhang, & Zhou 2004).

This chapter looks at modeling of the relationship between percent trucks and crash rates in both Wyoming and Nebraska. To establish the relation between percent trucks and crash rates, two analyses were looked at: general statistics and statistical regression model analyses. The general statistics looked at the scatter plot relationship between crash rate and percent trucks. The statistical regression analysis examined both the yearly and monthly models. The yearly model looked at the combined interactive effect of the percent trucks on crash rates in both states. The monthly model incorporated the environmental conditions to examine the effect of percent trucks on crash rates.

6.1 Methodology

A scatter plot between the calculated crash rates and percent trucks values for each state were used for the general statistics. The multiple linear regression models were used for the statistical analysis. The parameters used for the analysis included percent trucks, log crash rates, weather, road, light, and winter conditions for the 10-year study period. The dependent variable is the log crash rate and the predictor variables are the percent trucks, winter, weather, road, and light conditions. The log crash rate was used for the regression analysis to meet model assumptions. Two datasets were used for this research: yearly and monthly models.

The parameters for the yearly model included the crash year, log crash rate, percent truck and accident locations (sections). The Interstate was divided into 108 sections in Wyoming and 80 sections in Nebraska for reporting the Annual Average daily Traffic (AADT). Each section also corresponds to the accident location, percent trucks and crash rate. The locations (sections) were included in the model because the crash rates differ along the entire corridor. Yearly crash rates were calculated for both all vehicles and trucks only. The yearly model determines if there is a relationship between percent trucks, crash rate, and year. The yearly model was analyzed by combining data for both states.

The monthly model used monthly crash rates instead of the yearly crash rates. The weather, road, light, and winter condition variables were included in the monthly model. The monthly model examines the relationship between percent trucks, crash rates, weather, winter, road and light conditions in both states.

6.2 General Statistics

The VMT data, together with the crash data, were used to calculate the crash rate for each section on the Interstate in both states for all vehicles and truck only crashes for the 10-year study period. Data used for the general statistics were grouped into yearly for both Wyoming and Nebraska. A scatter plot of the crash rates and percent trucks were plotted to examine the relationship. Figure 6.1 shows the plot of percent trucks and crash rates for all vehicles in Wyoming.

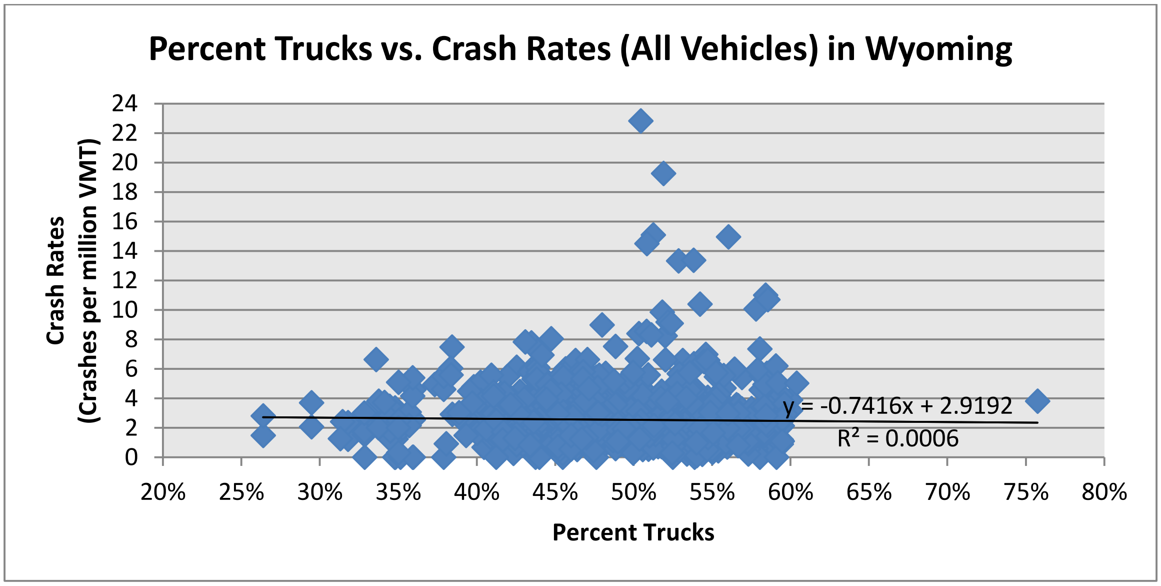

Figure 6.1 Percent Truck and Crash Rates for All Vehicles for All Years in Wyoming

The graph shows no correlation between percent truck and crash rates for all vehicles, since the coefficient of determination (R^2) is almost zero. It could be seen that most of the data are concentrated between the 40% and 60% trucks and between 0-8 crashes per million VMT, with several outliers. This graph shows that the data do not fit the model well because of the large presence of outliers and large amounts of variations within the data. The crash rates ranges from zero to 24 crashes per million VMT. Figure 6.2 shows the plot of percent trucks and the crash rates for trucks only for all years in Wyoming. This graph shows similarities with Figure 6.1 above except that all vehicle crash rates are slightly higher than that of the trucks only crash rates. This graph shows that most of the percent trucks range between 40% and 60%, with exceptions being the 25th percent and 75th percent. The crash rates ranges from zero to about 20 crashes per million TVMT. Most of the crash rate data lie within zero and six crashes per million TVMT.

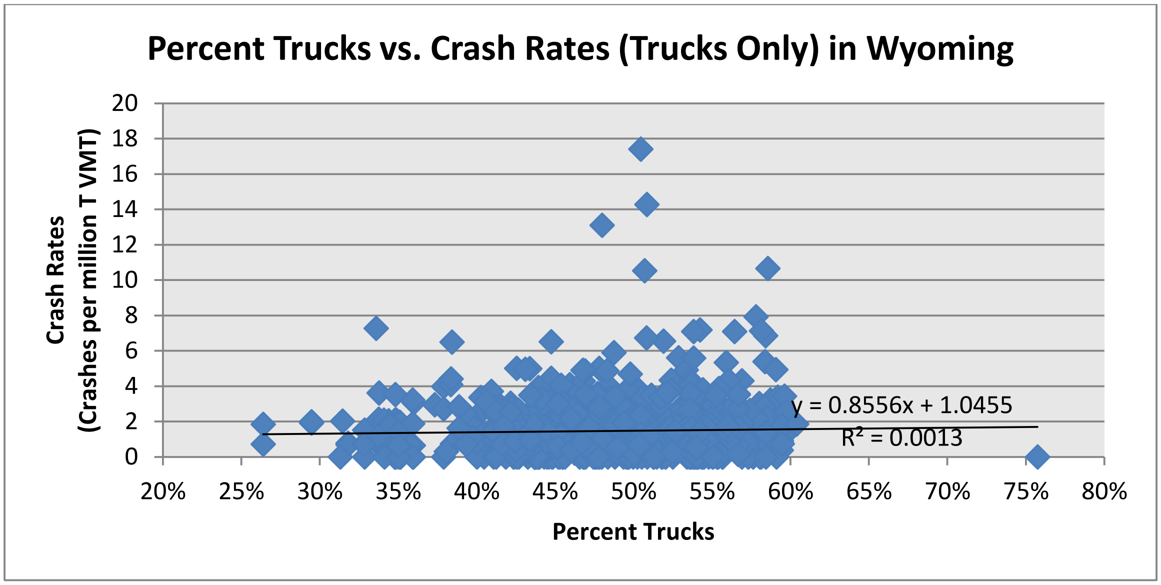

Figure 6.2 Percent Truck and Crash Rates for Truck Only for All Years in Wyoming

This graph gives little to no indication of a relationship between percent truck and crash rates, because of the presence of several outliers and the low coefficient of determination (R^2) value. Figure 6.3 shows the plot of percent truck and crash rates for all vehicles in Nebraska for all years. From the graph, it is evident that the data points of the percent truck are well distributed from the 5% to the 65%trucks. The crash rates ranges from zero to four crashes per million VMT with the higher crash rates within the range of zero and two crashes per million VMT. The coefficient of determination (R^2) is 0.16, which accounts for 16% of the variation that percent trucks have on crash rates. Several outliers can be seen in the plot with the extreme one occurring at the 3.5 crashes per million VMT.

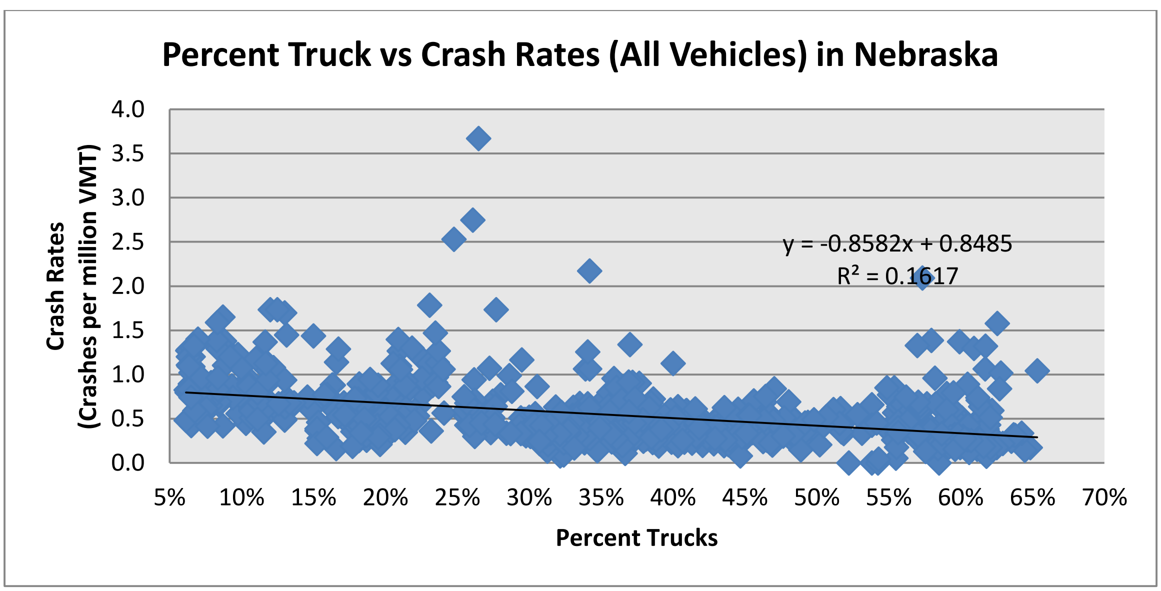

Figure 6.3 Percent Truck and Crash Rates for All Vehicles for All Years in Nebraska

Figure 6.4 shows the plot of percent truck and crash rates for truck only for all years in Nebraska. The percent trucks data shows a good distribution ranging from about 5% to 65% for all years. The crash rates ranges from below zero to about eight crashes per million TVMT, with most data concentrated between zero and three. Presence of outliers could be seen from four to eight crashes per million TVMT. The R–square value (0.15), accounts for 15% of the variations that percent trucks have on the crash rates.

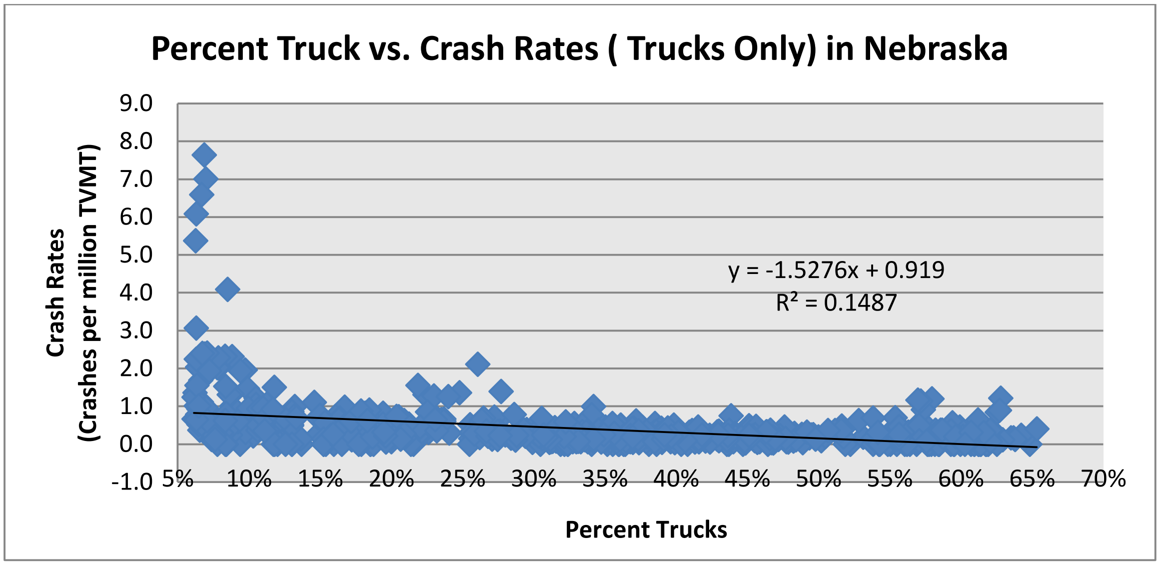

Figure 6.4 Percent Truck and Crash Rates for Truck Only for All Years in Nebraska

6.3 Statistical Regression Analysis

The data were assembled in Microsoft Excel and modeled using SAS Statistical Software Version 9.2. The Multiple Linear Regression was used for the analysis of both the yearly and monthly models in both Wyoming and Nebraska. The GLM procedure was used for the analysis, which uses the least squares to estimate parameters in the multiple linear regression models. It also handles models relating one or several continuous or categorical dependent variables. This analysis seeks to establish a relationship between the log crash rate dependent variable and predictor variables such as percent trucks, year, and locations, etc. for the yearly model. Equation 6.1 shows the general form of the multiple linear regression model used for this analysis.

$$Ln\{Yi\} = \beta o + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta p X p + \mathcal{E} i$$

Equation 6.1 Multiple Linear Regression Model

where:

Yi is the dependent variable (log crash rate);
$\beta_1, \ldots, \beta_p$ are the regression coefficients;
$X_1, \ldots, X_p$ represents the predictor variables in the model;
$\mathcal{E}i$ - Error term $N(0, \sigma^2)$.

The assumptions for the model are normality, equal variance, and independence. Two datasets were performed with the GLM procedure; the yearly and monthly models. The yearly data model included variables such as log crash rate, percent trucks, location, year, and state. The crash rate was transformed using the natural logarithm to meet the model assumptions. The log crash rate is the response variable, and the categorical factors are state, location, and year. The percent truck variable is a continuous covariate. The monthly data model has the same variables as the yearly model but has also included the environmental factors such as road, weather, light, and winter conditions.

The parameters with p-value less than 0.05 are deemed to be significant to the model and p-values greater than the 0.05 cutoff are not significant. For a good model fitting, a large R-square value is needed, and a small R-square value means the model does not have a good fitting. The R-square value ranges from zero to one, with values closer to one indicating a good model fit. The R-Square measures how well the regression line approximates the real data points.

6.4 Combined Yearly Data Model

The yearly data from both states were merged in Microsoft Excel and the merged data imported into SAS for modeling. The input variables for the modeling were log crash rate (response variable) percent trucks (continuous covariate); this is the continuous predictor variable that controls the model. The year, location, and state are the categorical factors; these factors show a finite number of levels. Binary values were assigned to the state variable, with Wyoming assigned a value of 0 and Nebraska a value of 1. The model was run for log crash rates for all vehicles and trucks only. Location and year were used as classification variables giving a total of 1,880 observations. The presence of outliers was evident in the residual plot. However, this did not change the results even after the removal of some of the outliers from the model. The SAS output for the combined yearly data model can be found in Appendix B.

Table 6.1 shows results for the combined model for all vehicles. The initial interaction model was significant with an R-Square value of 0.8392, which accounts for 83.92% ($p<0.0001$) of variations that the effect of percent trucks have on crash rates. The interaction between PTrucks and year in the initial model was removed since the p-value (0.2788) was greater than the cutoff of 0.05 levels. The model was re-run until all the p-values were less than 0.05 levels. The final model showed significance ($p=0.0002$) for the interaction between PTrucks and location (state), which means that the effect of percent trucks on the response log crash rate changes at different locations in both states. The state and year interaction also showed significance ($p<0.0001$), which indicates that the effect on the estimated log crash rate differs between the two states and varies from year to year. The final model has an R-Square value of 0.8380, which accounts for 83.8% ($p<0.0001$) of the variations that percent trucks have on crash rate.

Table 6.1 Results for Initial and Final Model for All Vehicles

Predictor Variable	Initial Model		Final Model	
	Type I P-value	Type III P-value	Type I P-value	Type III P-value
PTrucks	<.0001	0.1394	<.0001	0.1818
State	<.0001	0.0012	<.0001	0.0013
Location (State)	<.0001	<.0001	<.0001	<.0001
Year	<.0001	0.5849	<.0001	<.0001
PTrucks*Location(State)	<.0001	0.0003	<.0001	0.0002
PTrucks*Year	0.0009	0.2788	-	-
State*Year	<.0001	<.0001	<.0001	<.0001

Results for the initial and final model for the trucks only are shown in Table 6.2. The R-Square value for the initial interaction model is 0.5867, which accounts for 58.67% ($p<0.0001$) of the variation that percent trucks have on crash rate. The final model has an R-Square value of 0.5233 which means that 52.33% ($p<0.0001$) of the total variation accounts for a relationship between percent trucks and crash rate. Results from the initial model indicate that the interaction between PTrucks and year has the largest p-value (0.1802) greater than the 0.05 significant levels. This interaction variable was first removed and the model re-run. The final model indicates that the interaction between state and year showed significance ($p<0.0001$), which means that the effect on the response log crash rate changes from year to year and differs between the two states.

Table 6.2 Results for Initial and Final Model for Trucks Only

Predictor Variable	Initial Model		Final Model	
	Type I P-value	Type III P-value	Type I P-value	Type III P-value
PTrucks	<.0001	0.0367	<.0001	0.0376
State	<.0001	0.1834	<.0001	<.0001
Location(State)	<.0001	0.0412	<.0001	<.0001
Year	<.0001	0.5017	<.0001	<.0001
PTrucks*Year	<.0001	0.1802	-	-
PTrucks*Location(State)	0.0839	0.1001	-	-
State*Year	0.0727	0.0727	<.0001	<.0001

6.4.1 Yearly Regression Model Result Discussion

The all vehicles model showed a higher R-Square value (0.838), which accounts for about 84% ($p<0.0001$) of the variations in percent truck to crash rates. This means that the model fits the data well since the value is closer to one. Results for the interaction between PTrucks and location (state) showed that the effect of PTrucks on the response log crash rate changes at different locations. The state and year interaction also indicate that the effect on the log crash rate differs between the two states and varies from year to year.

The R-Square value for truck model falls within the range of 52.33% and 58.67%, which accounts for the variation that percent trucks have on crash rate. The interaction between state and year showed significance, which indicates that the effect on the log crash rate changes from year to year and differs from state to state. This means that the effect on log crash rate in Wyoming will be different from that of Nebraska from year to year.

6.5 Monthly Data Regression Model

The variables used for the model included log crash rate, percent trucks, and environmental factors such as light, road, winter, and weather conditions. The environmental factors showed conditions when an accident occurred on a particular day. The worst (non-ideal) conditions under each environmental factor was used for the modeling, with the worst conditions for the light and road variables being dark and wet conditions, respectively. The worst weather condition used was snow condition. The actual values of these worst (non-ideal) conditions were used. The months of October through March were termed as winter months and a value of 1 was assigned; and the months from April through September were termed as non-winter months (summer) and a value of 0 was assigned. These environmental factors were merged with the log crash rate, year, and percent truck to run the monthly model. The states of Wyoming and Nebraska were assigned a value of 0 and 1, respectively. When preliminary analyses were performed, it became evident that both states could not be combined for analysis due to the differences that exist in the environmental conditions in both states. Another reason for this is the difference between the monthly and yearly effects on the log crash rate. The results for the monthly model can be found in Appendix C.

6.5.1 Monthly Data Model - Wyoming

The all vehicles model for Wyoming included data such as the log crash rate, percent trucks, road, light, and winter for 2008. A graph of the log crash rate and year variable was plotted, and the results show that apart from 2008, which had the highest crash rate, the rest of the years had approximately the same crash rate levels. Due to that, 2008 was isolated from the crash years and used to represent the yearly variable. The road and light variables are continuous regressors, which means actual values were used. Winter variables have binary values, with the non-winter period assigned a value of 0 and otherwise a value of 1. Although few outliers were found to be present in the model, further checks reveal that the overall result will not be affected. For the truck model, the variables used were "lyear," winter, road, April, PTrucks, and log crash rate. These "lyear" and April variables explain the yearly and monthly effects on log crash rates. The "lyear" represents low crash rate years (2005 and 2009), which were assigned a value of 1 and otherwise a value of 0. The April variable represented the weather variables, because of their high crash rates.

Table 6.3 shows the results for the monthly all vehicles model in Wyoming. The initial model included all the parameters and their interactions with percent trucks. The p-values greater than the 0.05 significance levels were removed starting with the largest value and the model re-run until all the p-values were less than 0.05 level. The initial model has an R-Square value of 0.8493, which accounts for 84.93% ($p<0.0001$) of the variation that percent trucks have on the log crash rate. The winter and PTrucks interaction was first removed and the model re-run because of its large p-value (0.9504). The next predictor variable to be removed from the model was the year08 and PTrucks interaction. Filtering continues until all p-values greater than 0.05 were removed. The final model shows all the predictor variables with p-values less than the 0.05 cutoff. The final model has an R-Square value (0.8486), which indicates that the model accounts for 84.86% (p<0.0001) of the variation that percent trucks have on the log crash rate. The positive estimate (0.0162) of the road and PTrucks interaction shows that the effect of PTrucks on the response log crash rate changes with the road conditions. This means that there is a likelihood of the log crash rate increasing during wet road conditions.

Table 6.3 Results for Initial and Final Models for All Vehicles in Wyoming

Predictor Variable	**Initial Model**		**Final Model**	
	Estimate	**P-value**	**Estimate**	**P-value**
Intercept	-0.90052	0.0671	-0.62181	0.0033
road	0.718541	0.2212	0.683162	0.009
year08	1.01217	0.2688	1.263385	<.0001
light	-0.10488	0.9265	-0.8461	0.0051
winter	0.200265	0.5038	0.177913	0.0265
PTrucks	-0.01308	0.1822	-0.0185	0.0001
winter*PTrucks	-0.0003	0.9504	-	-
road*PTrucks	0.015135	0.1578	0.01622	0.0003
light*PTrucks	-0.0138	0.4988	-	-
year08*PTrucks	0.003149	0.7654	-	-

Results for the trucks only model can be found in Table 6.4. The initial model has an R-Square value of 0.6486, which accounts for 64.86% (p<0.0001) of the variation that percent trucks have on the log crash rate. The "lyear" and PTrucks interaction was first removed and the model re-run because of its large p-value (0.511) in the model. Filtering continues until all the p-values for the predictor variables are less than the 0.05 significant levels. Results from the final model has an R-Square value (0.6373) which accounts for 63.73% (p<0.0001) of the variation that percent trucks have on crash rate. The positive estimate (1.1379) for the road and PTrucks interaction indicates that the effect of PTrucks on the response log crash rate changes with the road conditions. This means that an increase in percent trucks will result in an increase in the estimated log crash rate during wet road condition. The positive estimate for the winter and PTrucks interaction shows that the effect of PTrucks on the response log crash rate changes with the winter conditions. This means that increasing PTrucks increases the estimated log crash rate during the winter season from October to March and decreases during non-winter months from April to September.

Table 6.4 Results for Initial and Final Models for Trucks Only in Wyoming

Predictor Variable	Initial Model		Final Model	
	Estimate	P -value	Estimate	P -value
Intercept	-1.1997925	<.0001	-1.28085	<.0001
road	-1.1626588	0.065	-0.31035	0.3866
lyear	-0.0794286	0.8835	-0.3749	<.0001
winter	0.0568533	0.8846	-0.38203	0.0904
april	0.20662767	0.2847	-	-
PTrucks	-0.0153097	0.001	-0.01464	0.0012
winter*PTrucks	-0.0080346	0.1968	0.017501	0.0046
road*PTrucks	0.02639907	0.0043	1.13795	0.0012
lyear*PTrucks	-0.0080366	0.511	-	-
road*lyear	0.23940068	0.4474	-	-
road*winter	1.44376441	0.0011	-	-

6.5.2 Monthly Data Model - Nebraska

The Nebraska all vehicles model includes parameters such as the log crash rate, percent trucks, road, light, winter (April), "hyear" (high crash years), "myear" (median crash years), and "lyear" (low crash years). A graph of crash rates and years was plotted which showed a cubic curve with years 2000–2002 having high crash years (hyear); years 2003–2005 represent the median crash years (myear) and years 2006–2009 represent the lowest crash years (lyear). These variables were included in the model to explain the yearly effects that have continuous covariates.

The truck model variables are "cmonth," "hyear," "lyear2," weather, road, PTrucks, and log crash rate. The "cmonth" variable represented the cold months from December to February when crashes occur. A value of 1 was assigned for the "cmonth" and a value of zero assigned for all other months. The "hyear" variable stands for high crash years (2000, 2008, and 2009) and "lyear2" represents the low crash years (2002, 2004, and 2005). A value of one was assigned for the high and low crash years (2000, 2002, 2004, 2005, 2008, 2009), and a value of zero for the other years. These variables explain the year and month effects on log crash rates in Nebraska.

Results for the monthly all vehicles model are shown in Table 6.5. Results from the initial model showed that the PTrucks and "hyear" interaction have the largest p-value (0.7842), and thus was first removed from the model and the model re-run. Filtering continues until all p-values greater than 0.05 levels are removed from the model. The R-Square value for the initial model is 0.6571, which accounts for about 66% of the variation that percent trucks have on log crash rates. The final model reveals that no interaction predictor variables remain in the model. The R-Square value for the final model was 0.6517, which accounts for about 65% of the variation that percent trucks have on the log crash rates. The positive estimate (0.00795) for the PTrucks predictor variable indicates that a 1% increase in PTrucks causes an increase in the estimated log crash rates by 2.2%.

Table 6.5 Results for Initial and Final Models for All Vehicles in Nebraska

Predictor Variable	Initial Model		Final Model	
	Estimate	P-value	Estimate	P-value
Intercept	-0.80217	0.0196	-1.01557	<.0001
PTrucks	-0.00386	0.8066	0.00795	<.0001
road	0.8649	0.0528	1.17524	0.0002
hyear	0.39769	0.0009	0.37649	<.0001
myear	0.24973	0.0464	0.17991	0.006
april	-0.11591	0.4659	-0.2118	0.0122
PTrucks*road	0.01750	0.3745	-	-
PTrucks*hyear	-0.00142	0.7842	-	-
PTrucks*myear	-0.00352	0.566	-	-
PTrucks*april	-0.00433	0.5339	-	-

Table 6.6 shows results for the truck only model. Results for the initial model showed an R-Square value (0.8262), which accounts for 82.62% ($p<0.0001$) of the variation that percent trucks have on log crash rates. The interaction between road and PTrucks with the largest p-value (0.9220) is first removed and the model re-run. Filtering continues until all the p-values are less than 0.05 significant levels. The final model shows predictor variables with p-values less than the cutoff of 0.05. The final model has an R-Square value (0.8188), which accounts for 81.88% ($p<0.0001$) of the variation that percent trucks have on log crash rates. The positive estimate for the interaction between PTrucks and “lyear2” (low years) indicates that the effect of PTrucks on the response log crash rate changes from 2002 to 2005. The weather and “cmonth” interaction indicates that the effect on the response log crash rate changes with the weather conditions and differs during the cold months from December to February. The positive estimate (0.0104) for the “lyear2” and weather interaction indicates that the effect on the response log crash rate changes with the weather conditions and differs with low crash years from 2002 to 2005.

Table 6.6 Results for Initial and Final Models for Trucks only in Nebraska

Predictor Variable	Initial Model		Final Model	
	Estimate	P-value	Estimate	P-value
Intercept	0.12130406	0.6929	0.093075	0.5844
hyear	1.08184981	0.032	0.416839	0.0003
lyear2	-1.1825037	<.0001	-1.2191	<.0001
weather	0.47009205	0.2733	0.379849	0.0031
road	-0.3039798	0.6203	0.226811	0.2787
cmonth	0.10372355	0.7445	-0.14275	0.4691
PTrucks	-0.0206434	0.0761	-0.02553	0.0002
hyear*PTrucks	-0.0678369	0.2297	-	-
lyear2*PTrucks	0.02300174	0.0081	0.025673	0.0003
weather*PTrucks	-0.0095551	0.4766	-	-
road*PTrucks	-0.0013954	0.922	-	-
cmonth*PTrucks	-0.0072988	0.4618	-	-
weather*road	0.7134637	0.3071	-	-
hyear*weather	-0.3778362	0.267	-	-
weather*cmonth	0.43605797	0.2313	0.74015	0.0092
lyear2*weather	0.935092	0.0128	0.736521	0.0104

6.5.3 Monthly Model Result Discussion

The results for the monthly all vehicle models in Wyoming show an R-Square value, which accounts for about 84% of variations that percent trucks have on log crash rates. The positive estimate (0.01622) of the road and PTrucks interaction indicates that the effect of PTrucks on the response log crash rate changes with the road conditions. This means that increasing PTrucks causes an increase in the log crash rate during wet road condition. The R-Square value accounts for about 63.73% ($p<0.0001$) in the truck only model, which indicates the variations that percent trucks have on log crash rates. The PTrucks and road interaction variable shows a positive estimate (1.13795), which indicates that the effect of PTrucks on the response log crash rate changes with the road conditions. This means that increasing PTrucks causes an increase in the log crash rate during wet road conditions. The PTrucks and winter interaction indicate that the effect of PTrucks on the response log crash rate changes with the winter conditions.

The monthly all vehicles model in Nebraska showed an R-Square value (0.65) which accounts for 65% of the variation that percent trucks have on log crash rates. The positive estimate (0.0079) for the PTrucks indicates that a 1% increase in PTrucks causes an increase in the estimated crash rate by 2.2%. The positive estimates of the road and year predictor variable indicates that the effect on the log crash rates change from year 2003 to year 2009 during wet road condition.

The R-Square value for the truck only model in Nebraska accounts for about 82% ($p<0.0001$) of variations that percent trucks have on log crash rates. The positive estimate (0.0256) for the interaction between PTrucks and “lyear2” (low years) indicates that the effect of PTrucks on the response log crash rate changes from year 2002 to year 2005. The weather and “cmonth” interaction indicates that the effect on the response log crash rate changes with the weather conditions and differs during the cold months from December to February. The positive estimate (0.0104) for the “lyear2” and weather interaction indicates that the effect on the response log crash rate changes with the weather conditions and differs with low crash years from 2002 to 2005.

7. CONCLUSIONS AND RECOMMENDATIONS

This section will summarize the results from the analysis of truck volume and crash rates, the economic impact of crashes, and the percent trucks and crash rates relationship study on Interstate 80 in the states of Wyoming and Nebraska. Recommendations for future studies of this research area will be presented.

7.1 CONCLUSIONS

7.1.1 Truck Volume and Crash Rate Analysis

The truck volume results indicate that truck traffic on I-80 section in Nebraska increased by 50% more than in Wyoming. This phenomenon could be explained by the fact that most freight traffic might use other routes such as Interstate 70 (I-70) and I-76 to link I-80 in Nebraska instead of traveling through Wyoming. The changing truck traffic from year to year in both states is confirmed by the interaction between state and year of the combined yearly model, which means that the effect of PTrucks on the log crash rate changes from year to year and differs between the two states. High truck volumes in Nebraska resulted in low percent trucks, which contributed to lower crash rates for both trucks and all vehicles. Low truck volumes resulted in high percent trucks and higher crash rates for both all vehicles and trucks only in Wyoming. This result is confirmed by the positive estimate of the PTrucks predictor variable in the monthly model, which means that the effect of increasing PTrucks results in an increase of the log crash rate.

7.1.2 Economic Impact of Crashes

The economic cost associated with the overall crash severity in Wyoming in terms of fatalities, injury, and property damage cost about $1.8 billion, $108 million, and $57 million, respectively for the 10-year study period. The fatal truck crashes accounted for about 19% in overall economic loss in the state of Wyoming. The economic cost of all accidents in the state of Nebraska during the 10-year study period amounted to $1.1 billion, $269 million, and $89 million in terms of fatalities, injury, and property damage, respectively. Fatal truck crashes contributed about 29% of the overall economic loss.

7.1.3 Environmental Conditions

Accidents are caused by many factors, including environmental factors such as light, road, winter, and weather conditions. Most of the accidents/crashes occur during daylight conditions than during dark conditions in both Nebraska and Wyoming. The probable reason could be that drivers tend to drive with caution to avoid potential hazards during dark conditions Snowy (“wet”) road conditions contributed to most of the accidents in both Wyoming and Nebraska compared with dry road conditions. This result is confirmed by the monthly model analysis for both Wyoming and Nebraska, which indicates that the effect of PTrucks on the log crash rate increases during “wet” road conditions. Wyoming experienced more truck crashes during winter than Nebraska. This result is confirmed by the monthly trucks only model for Wyoming. The positive estimate of the PTrucks and winter interaction indicates that the likelihood of truck crash rate increases with an increase in PTrucks during the winter months from October through March.

7.1.4 Percent Truck and Crash Rate Relationship Study

The high R-square value for the yearly all vehicle model indicates that the model fits the data well. The positive estimate of the interaction between PTrucks and location (state) indicates that the effect of PTrucks on the log crash rate changes at different locations in each state. This means that crash rates increase with an increasing PTrucks at various locations in each state. The remaining predictor variable, the interaction between state and year, indicates that the effect on the log crash rate changes from year to year and differs from the two states. The yearly truck only model has only one interaction predictor variable that remained in the final model: state and year interaction. The positive estimate of the interaction variable indicates that the effect on the log crash rate changes from year to year and differs from state to state. This means the effect on truck crash rates differs from state to state and changes from year to year.

The result for the all vehicle monthly model for Wyoming shows a positive estimate (0.0162) for the interaction between road and PTrucks, which indicates that the effect of PTrucks on the response log crash rate changes with the road conditions; this means that increasing PTrucks causes an increase in the log crash rate increases during wet road conditions in Wyoming. The positive estimate with a value of 1.1379 for the PTrucks and road interaction for the truck only model indicates that the effect of PTrucks on the log crash rate changes with the road conditions. This means that an increase in PTrucks causes an increase in log truck crash rates during wet road conditions. The positive estimate for the PTrucks and winter interaction indicates that the effect of PTrucks on the log crash rate changes with the winter conditions. This means that there is a likelihood of truck crash rates increasing as PTrucks increase during the winter months from October through March in Wyoming.

Results from the Nebraska monthly model for all vehicles show that five predictor variables remained in the final model: PTrucks, road, April, "myear," and "hyear" condition. The positive estimate of the PTrucks indicates that an increase in PTrucks results in an increase of all vehicle crash rates. The estimate of the road condition in the model has a positive value of 1.1752, which means that the chance of all vehicle crash rates is increased when the road condition is "wet." The positive estimate of the April predictor variable denotes the winter conditions, which indicates that the chance of increasing crash rates occurs during the month of April. The positive estimates of the "hyear" and "myear," indicates that the likelihood of an all vehicle crash rate increases from 2000 to 2005.

The monthly truck only model in Nebraska has three remaining interaction predictor variables in the final model: PTrucks and "hyear," weather and "cmonth," and weather and "lyear2" interactions. The positive estimate (0.0257) of the interaction between PTrucks and "hyear" indicates that the effect of PTrucks on the log crash rate changes from 2002 to 2005. This means that an increase in PTrucks results in increasing crash rates from 2002 to 2005. The positive value for the estimate of the interaction between weather and “cmonth” indicates that the effect on the log crash rate changes with the weather conditions and differs during the cold months from December to February. This means that during the cold months and weather conditions, the crash rate increases with an increasing PTrucks. The interaction between “lyear2” and weather conditions indicates that the effect on the log crash rate changes with the weather conditions, which differ from 2002 to 2005.

7.2 RECOMMENDATIONS AND FUTURE WORK

Further research should be performed using other advanced statistical models to include other variables such as road geometry. Driver surveys should be undertaken on I-80 in both Wyoming and Nebraska to collect information about driver perception on the level of service (LOS) and safety. This survey should be used to quantify the impact that high percent trucks have on the perception of safety of drivers of other vehicles within the traffic stream.

Extensive education of the traveling public is encouraged to create awareness about the dangers of unsafe driving and its consequences. It is recommended that transportation agencies examine the possibility of providing truck-lane restriction countermeasures at high crash locations on the freeway to improve safety and reduce crashes.

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APPENDIX A: CRASH DATA

- Crash Frequency Data (Wyoming)
- Crash Frequency Data (Nebraska)
- Vehicle Miles Traveled Data (Wyoming)
- Vehicle Miles Traveled Data (Nebraska)
- Crash Rate Data (Wyoming)
- Crash Rate Data (Nebraska)

Crash Frequency Data (Wyoming)

Beginning Milepost	End Milepost	Length	Number of All Vehicle Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	2.18	2.180	24	10	14	17	13	8	11	10	20	7
2.18	3.453	1.273	7	11	5	11	14	9	8	9	8	6
3.453	5.263	1.810	22	16	19	31	20	22	17	16	13	10
5.263	6.257	0.994	6	4	1	15	11	4	14	12	12	10
6.257	6.767	0.510	3	1	5	4	3	3	3	3	0	2
6.767	10.683	3.916	17	22	11	22	22	11	19	26	25	15
10.683	13.862	3.179	19	29	18	52	36	31	43	28	31	43
13.862	18.293	4.431	38	28	61	37	22	43	57	61	42	31
18.293	21.751	3.458	35	26	17	32	18	19	18	35	31	17
21.751	23.111	1.360	5	11	6	8	8	8	14	8	10	13
23.111	23.906	0.795	5	3	4	10	3	2	5	5	8	5
23.906	28.713	4.807	21	25	17	36	29	18	37	34	38	18
28.713	30.398	1.685	6	5	3	8	7	5	0	4	5	6
30.398	33.182	2.784	12	12	10	15	14	10	7	9	17	15
33.182	34.741	1.559	5	5	3	5	3	6	1	7	10	14
34.741	39.896	5.155	13	13	17	16	18	10	16	17	23	11
39.896	41.987	2.091	7	4	8	8	7	3	8	14	10	9
41.987	48.303	6.316	16	10	15	26	20	19	20	23	13	9
48.303	53.306	5.003	18	23	17	24	15	10	11	22	32	17
53.306	57.041	3.735	10	9	9	10	3	6	4	11	19	6
57.041	61.591	4.550	9	5	5	15	17	19	10	21	18	12
61.591	66.168	4.577	8	12	9	11	6	10	13	18	20	12
66.168	68.972	2.804	9	5	9	14	11	3	17	8	8	6
68.972	72.296	3.324	7	10	7	10	6	6	13	5	5	10
72.296	82.71	10.414	45	41	18	31	36	29	34	13	29	28
82.71	83.007	0.297	8	9	6	2	5	2	3	4	1	4
83.007	85.697	2.690	12	14	8	13	8	15	15	14	18	20
85.697	89.000	3.303	10	13	6	14	12	17	25	20	32	24
89.000	89.445	0.445	6	4	5	11	6	5	7	7	9	10
89.445	91.532	2.087	32	31	19	40	25	42	31	36	43	17
91.532	92.654	1.122	3	5	5	9	10	14	15	16	11	8
92.654	99.138	6.484	38	67	55	56	56	68	79	65	114	87
99.138	100.27	1.132	20	11	6	12	11	11	8	18	18	10
100.27	102.338	2.068	6	11	7	12	14	11	13	24	22	21
102.338	102.358	0.02	0	0	0	0	0	0	0	0	0	1
102.358	103.819	1.461	6	6	12	17	13	16	17	15	20	17
103.819	104.825	1.006	6	5	16	22	19	7	15	10	7	6
104.825	107.056	2.231	18	21	25	35	25	27	23	33	17	15
107.056	107.81	0.754	10	6	7	14	6	9	8	5	9	3
107.81	111.161	3.351	12	10	7	7	7	17	13	12	23	16
111.161	122.272	11.111	22	23	22	36	32	31	26	42	43	35
122.272	130.84	8.568	31	18	36	40	34	24	31	47	40	31
130.84	136.958	6.118	19	24	23	29	20	21	37	36	55	60
136.958	139.509	2.551	10	6	10	15	10	3	22	5	14	23

Beginning Milepost	End Milepost	Length	Number of All Vehicle Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
139.509	142.17	2.661	8	6	20	18	16	9	18	12	6	11
142.17	146.848	4.678	25	22	16	28	44	13	31	37	21	21
146.848	150.807	3.959	9	7	13	16	7	9	29	16	11	1
150.807	152.455	1.648	6	3	4	7	7	4	13	11	6	4
152.455	154.055	1.600	14	5	7	7	9	2	12	12	2	4
154.055	156.025	1.970	8	4	1	5	3	2	8	5	1	7
156.025	158.545	2.520	10	3	2	9	4	4	14	9	5	5
158.545	165.582	7.037	24	18	27	17	24	19	43	19	26	18
165.582	170.676	5.094	10	10	11	7	6	5	17	8	12	6
170.676	173.413	2.737	18	10	6	10	11	2	18	7	16	8
173.413	184.288	10.875	37	47	18	35	16	28	43	35	38	40
184.288	187.204	2.916	11	10	10	14	9	10	22	11	13	13
187.204	196.157	8.953	29	53	25	26	14	23	40	53	68	20
196.157	199.051	2.894	16	21	8	16	17	3	16	13	24	5
199.051	201.164	2.113	10	18	8	12	3	3	9	7	15	6
201.164	204.175	3.011	10	17	8	9	3	11	15	15	13	2
204.175	206.182	2.007	11	8	6	12	3	1	12	7	18	12
206.182	209.459	3.277	10	11	10	12	6	4	12	8	27	7
209.459	211.2	1.741	20	14	12	11	7	4	15	17	19	8
211.2	211.87	0.670	3	8	4	8	1	4	4	6	8	3
211.87	214.051	2.181	12	14	8	8	15	13	20	25	30	12
214.111	215.57	1.459	10	8	5	12	9	5	8	13	8	8
215.57	215.82	0.250	8	8	13	3	5	4	1	3	1	0
215.82	219.594	3.774	27	8	16	24	10	11	33	16	29	26
219.594	221.926	2.332	9	10	11	17	6	14	14	5	21	10
221.926	228.341	6.415	9	25	10	18	12	19	24	42	40	4
228.341	235.228	6.887	34	18	23	36	18	27	12	39	35	19
235.228	238.155	2.927	17	19	7	26	10	14	9	9	34	14
238.155	255.602	17.447	124	103	90	83	72	90	91	104	165	77
255.602	260.232	4.630	36	23	30	29	18	26	20	29	32	20
260.232	267.186	6.954	27	39	24	47	34	32	40	40	48	30
267.186	272.056	4.870	31	34	19	18	21	33	24	20	27	18
272.056	279.859	7.803	38	49	53	49	46	42	55	42	32	39
279.859	280.901	1.042	4	3	6	4	6	4	12	11	5	6
280.901	290.438	9.537	21	29	55	43	50	48	61	59	47	35
290.438	297.663	7.225	12	16	24	20	26	31	35	26	15	11
297.663	309.91	12.247	51	30	33	31	22	15	49	55	54	45
309.91	310.452	0.542	11	6	14	6	5	11	5	12	3	3
310.452	310.84	1.304	1	0	0	1	1	1	0	0	2	2
310.84	311.756	0.720	1	6	5	2	4	3	6	7	8	6
311.756	313.191	1.435	20	23	15	17	18	11	29	24	27	9
313.191	316.702	3.511	21	12	6	24	19	8	9	13	13	8
316.702	317.42	0.718	4	2	3	5	0	3	7	3	5	5
317.42	323.049	5.629	51	59	59	58	68	59	62	53	56	43
323.049	329.316	6.267	105	80	50	78	70	68	43	93	77	51

Beginning Milepost	End Milepost	Length	Number of All Vehicle Crashes									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
329.316	335.106	5.790	51	54	45	63	63	68	69	68	51	39
335.106	336.609	1.503	5	7	9	12	8	9	16	10	6	3
336.609	339.317	2.708	13	11	16	10	17	12	19	16	11	10
339.317	342.56	3.243	20	14	24	21	36	18	15	19	13	27
342.56	345.501	2.941	21	13	19	21	21	12	9	9	15	12
345.501	348.363	2.862	16	18	16	11	14	9	13	9	6	8
348.363	356.74	8.377	15	22	32	23	20	16	23	18	20	10
356.74	357.68	0.940	4	2	8	3	3	4	5	7	1	3
357.68	359.076	1.396	12	7	5	7	4	3	4	16	10	11
359.076	359.599	0.523	13	5	17	8	9	5	6	7	4	6
359.599	362.037	2.438	14	23	27	20	16	16	14	18	27	19
362.037	364.05	2.013	24	13	25	25	25	29	27	21	17	8
364	367.424	3.424	25	23	16	18	20	23	13	17	18	11
367.424	370.394	2.970	10	20	10	8	8	5	12	7	10	7
370.394	377.353	6.959	24	18	27	28	20	13	20	16	13	10
377.353	386.389	9.036	20	17	20	26	14	4	17	18	14	19
386.389	391.385	4.996	10	14	13	9	8	11	11	16	12	10
391.385	401.456	10.071	23	22	22	31	27	26	28	21	17	17
401.456	402.779	1.323	3	3	4	2	4	3	6	2	9	3

Beginning Milepost	End Milepost	Length	Number of Truck Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	2.18	2.180	9	2	1	3	1	3	5	2	4	3
2.18	3.453	1.273	2	4	0	1	1	0	2	2	2	2
3.453	5.263	1.810	0	2	2	3	2	2	3	0	2	2
5.263	6.257	0.994	1	2	0	0	2	1	1	2	2	0
6.257	6.767	0.510	0	1	1	2	0	2	1	1	0	0
6.767	10.683	3.916	7	8	2	7	4	1	4	9	2	3
10.683	13.862	3.179	8	4	0	10	8	8	7	7	10	13
13.862	18.293	4.431	12	4	9	3	1	7	16	13	7	3
18.293	21.751	3.458	7	8	6	3	1	6	7	15	10	3
21.751	23.111	1.360	0	5	1	3	1	2	3	3	5	3
23.111	23.906	0.795	2	0	0	2	0	1	0	1	2	0
23.906	28.713	4.807	9	4	4	10	8	3	9	15	17	4
28.713	30.398	1.685	2	3	0	3	2	2	0	2	1	2
30.398	33.182	2.784	4	1	3	5	4	2	2	4	8	7
33.182	34.741	1.559	1	2	0	0	1	1	0	1	1	2
34.741	39.896	5.155	2	3	4	4	4	1	3	7	5	3
39.896	41.987	2.091	2	2	1	2	0	2	0	6	1	0
41.987	48.303	6.316	3	1	3	4	6	2	4	7	4	3
48.303	53.306	5.003	6	7	1	10	4	4	2	10	4	6
53.306	57.041	3.735	3	1	4	4	1	1	2	3	9	2
57.041	61.591	4.550	3	1	1	2	6	7	0	11	6	2
61.591	66.168	4.577	4	1	2	4	2	3	4	5	4	3
66.168	68.972	2.804	4	1	4	3	3	1	9	3	1	1
68.972	72.296	3.324	3	5	4	5	2	2	6	1	2	4
72.296	82.71	10.414	12	8	5	1	11	10	13	5	10	8
82.71	83.007	0.297	3	2	1	0	0	0	2	1	1	0
83.007	85.697	2.690	4	6	1	2	2	6	4	2	4	9
85.697	89.000	3.303	1	3	2	0	4	3	2	4	7	4
89.000	89.445	0.445	1	1	0	0	1	2	1	3	2	7
89.445	91.532	2.087	11	6	3	9	4	9	6	4	9	6
91.532	92.654	1.122	1	0	1	5	1	3	3	1	3	1
92.654	99.138	6.484	9	17	5	6	7	15	21	8	18	15
99.138	100.27	1.132	5	1	1	1	2	0	0	5	4	1
100.27	102.338	2.068	3	2	2	5	3	1	3	3	6	2
102.338	102.358		0	0	0	0	0	0	0	0	0	0
102.358	103.819	1.461	1	0	2	5	1	3	2	2	5	2
103.819	104.825	1.006	1	2	6	6	7	2	3	4	0	4
104.825	107.056	2.231	6	3	5	9	6	6	8	9	7	5
107.056	107.81	0.754	3	0	2	3	1	2	0	2	5	2

Beginning Milepost	End Milepost	Length	Number of Truck Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
107.81	111.161	3.351	3	1	1	3	2	4	4	7	8	1
111.161	122.272	11.111	6	6	8	8	11	10	10	16	21	9
122.272	130.84	8.568	11	5	13	10	11	9	11	22	12	4
130.84	136.958	6.118	7	11	8	14	6	5	18	11	16	13
136.958	139.509	2.551	6	2	2	8	0	1	10	1	5	5
139.509	142.17	2.661	3	3	8	8	5	3	5	8	5	3
142.17	146.848	4.678	13	10	9	13	17	0	14	22	8	9
146.848	150.807	3.959	5	2	2	6	1	3	17	13	5	0
150.807	152.455	1.648	3	2	1	1	4	1	6	2	1	1
152.455	154.055	1.600	6	0	4	2	1	0	8	6	0	1
154.055	156.025	1.970	4	2	0	3	2	2	5	3	0	2
156.025	158.545	2.520	6	2	0	3	0	1	9	4	2	5
158.545	165.582	7.037	11	9	11	7	11	5	21	9	8	6
165.582	170.676	5.094	2	4	5	2	1	0	12	3	5	2
170.676	173.413	2.737	6	3	2	2	2	0	4	5	9	3
173.413	184.288	10.875	13	15	4	11	7	7	21	13	9	11
184.288	187.204	2.916	5	3	1	3	3	3	5	7	7	5
187.204	196.157	8.953	8	17	11	10	2	8	13	29	33	5
196.157	199.051	2.894	6	7	3	7	2	2	4	4	8	2
199.051	201.164	2.113	5	5	0	4	1	1	3	2	5	3
201.164	204.175	3.011	4	11	5	2	0	3	8	3	7	1
204.175	206.182	2.007	5	1	0	6	1	0	5	1	5	4
206.182	209.459	3.277	3	4	1	5	1	1	2	4	10	2
209.459	211.2	1.741	9	4	4	5	2	1	6	5	8	0
211.2	211.87	0.670	0	0	0	2	0	1	3	3	2	0
211.87	214.051	2.181	3	1	3	0	2	1	5	10	10	4
214.111	215.57	1.459	3	3	3	3	1	2	1	4	3	0
215.57	215.82	0.250	0	4	5	3	2	0	0	2	1	0
215.82	219.594	3.774	13	3	5	10	3	4	9	5	7	11
219.594	221.926	2.332	6	4	2	8	1	4	4	1	9	5
221.926	228.341	6.415	4	10	4	6	2	6	8	17	28	1
228.341	235.228	6.887	10	5	6	17	5	9	4	10	11	5
235.228	238.155	2.927	5	6	2	7	2	1	5	3	16	3
238.155	255.602	17.447	39	37	34	22	29	27	28	55	65	31
255.602	260.232	4.630	15	8	11	10	3	14	7	14	18	9
260.232	267.186	6.954	7	21	7	25	15	18	18	12	18	14
267.186	272.056	4.870	14	15	10	12	9	16	10	11	14	10
272.056	279.859	7.803	18	25	30	23	21	18	29	21	16	23
279.859	280.901	1.042	1	1	6	2	5	1	9	7	2	4

Beginning Milepost	End Milepost	Length	Number of Truck Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
280.901	290.438	9.537	8	9	26	13	19	16	23	34	19	17
290.438	297.663	7.225	3	7	7	7	7	10	13	7	6	1
297.663	309.91	12.247	15	9	4	8	9	5	19	33	19	18
309.91	310.452	0.542	4	4	4	1	1	5	0	7	0	1
310.452	310.84	1.304	1	0	0	1	0	0	0	0	0	1
310.84	311.756	0.720	0	1	3	0	0	1	2	1	2	0
311.756	313.191	1.435	5	8	0	1	5	4	6	5	7	1
313.191	316.702	3.511	3	2	0	6	5	0	2	0	3	1
316.702	317.42	0.718	2	1	1	1	0	0	2	1	1	2
317.42	323.049	5.629	20	10	10	13	14	9	20	23	12	9
323.049	329.316	6.267	38	25	6	21	16	27	12	32	33	12
329.316	335.106	5.790	24	18	12	22	14	19	23	32	22	15
335.106	336.609	1.503	1	4	4	4	0	2	4	0	1	0
336.609	339.317	2.708	6	2	4	3	5	3	3	6	2	1
339.317	342.56	3.243	8	6	4	1	9	3	3	7	2	8
342.56	345.501	2.941	6	7	5	4	3	1	1	4	2	5
345.501	348.363	2.862	3	5	6	2	4	0	2	6	2	2
348.363	356.74	8.377	2	6	5	11	7	5	5	6	8	3
356.74	357.68	0.940	1	1	2	1	0	0	0	3	0	2
357.68	359.076	1.396	4	2	0	1	2	1	0	5	4	5
359.076	359.599	0.523	2	1	3	2	3	0	1	3	3	1
359.599	362.037	2.438	3	5	5	6	2	3	2	4	5	5
362.037	364.05	2.013	3	1	2	1	2	1	4	2	1	0
364	367.424	3.424	1	5	3	4	3	4	1	0	0	2
367.424	370.394	2.970	2	11	2	1	1	0	2	2	1	2
370.394	377.353	6.959	11	5	9	7	3	2	7	5	4	5
377.353	386.389	9.036	8	2	4	6	3	0	6	2	7	4
386.389	391.385	4.996	4	2	4	2	2	4	1	3	5	3
391.385	401.456	10.071	6	6	7	8	5	5	12	6	3	4
401.456	402.779	1.323	0	0	1	1	3	2	3	1	2	0

Crash Frequency Data (Nebraska)

Beginning Milepost	End Milepost	Length	Number of All Vehicle Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	0.48	0.48	0	0	1	2	1	2	0	2	1	0
0.48	8.46	7.98	15	16	9	8	5	4	15	17	9	1
8.46	20.71	12.25	23	16	13	10	7	6	7	12	12	16
20.71	22.69	1.98	2	5	2	5	4	1	1	4	2	4
22.69	29.76	7.07	7	8	4	6	8	3	5	9	3	4
29.76	38.96	9.2	15	9	7	9	4	9	7	9	4	7
38.96	48.82	9.86	13	16	5	10	6	7	9	18	7	6
48.82	55.37	6.55	7	12	8	10	8	6	8	7	4	5
55.37	59.92	4.55	11	5	4	8	5	4	6	14	5	3
59.92	69.63	9.71	15	16	14	7	12	6	10	10	8	8
69.63	76.61	6.98	1	18	9	9	7	8	12	15	6	6
76.61	85.22	8.61	8	18	16	11	9	11	6	3	6	3
85.22	95.02	9.8	11	13	12	7	9	9	2	12	11	4
95.02	101.19	6.17	7	8	9	5	6	6	10	9	3	4
101.19	102.59	1.4	3	5	2	8	5	4	6	4	3	1
102.59	107.36	4.77	10	16	11	13	8	11	11	10	11	6
107.36	117.25	9.89	22	25	10	4	16	27	16	14	11	7
117.25	126.69	9.44	16	19	10	13	14	13	15	18	9	23
126.69	133.97	7.28	19	20	15	15	9	15	13	16	12	12
133.97	145.67	11.7	29	17	32	20	19	22	13	22	20	26
145.67	158.03	12.36	30	32	24	23	21	25	29	29	25	29
158.03	164.53	6.5	20	16	16	17	15	11	17	14	17	10
164.53	177.18	12.65	33	33	23	18	21	23	19	34	23	16
177.18	179.22	2.04	13	9	17	6	5	7	5	8	9	8
179.22	190.45	11.23	28	37	32	34	29	28	30	31	28	25
190.45	199	8.55	17	26	11	10	22	19	21	17	26	10
199	211.8	12.8	26	40	33	29	27	21	34	28	28	29
211.8	222.49	10.69	17	18	28	21	12	16	28	17	19	17
222.49	231.13	8.64	22	30	19	27	18	17	14	18	17	22
231.13	237.22	6.09	13	14	4	12	8	19	12	26	14	16
237.22	248.56	11.34	39	29	23	34	26	28	23	38	25	34
248.56	257.04	8.48	27	17	19	16	20	21	15	18	23	16
257.04	263.69	6.65	25	24	13	12	16	20	12	27	10	16
263.69	272.64	8.95	24	27	20	23	29	14	24	30	15	14
272.64	279.92	7.28	43	35	36	24	33	29	29	23	23	25
279.92	285.66	5.74	17	12	21	14	12	19	17	9	16	11
285.66	291.39	5.73	28	23	16	14	28	15	17	24	17	16
291.39	300.13	8.74	23	27	29	22	54	38	19	23	20	29
300.13	305.69	5.56	16	18	18	13	12	9	10	8	11	15
305.69	312.1	6.41	25	30	43	36	29	17	12	30	26	16
312.1	314.14	2.04	12	15	32	19	9	7	10	12	9	11
314.14	318.17	4.03	16	13	31	20	17	16	18	30	12	17
318.17	324.17	6	24	19	18	14	23	27	11	14	14	18
324.17	332.18	8.01	40	38	33	17	27	34	18	31	27	38
332.18	338.15	5.97	27	22	13	19	24	13	12	12	12	11
338.15	342.14	3.99	10	6	10	6	3	16	9	8	6	11
342.14	348.12	5.98	9	8	4	20	15	16	7	7	13	18

Beginning	End		Number of All Vehicle Crashes									
Milepost	Milepost	Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
348.12	353.12	5	17	20	18	15	18	21	9	11	13	7
353.12	360.14	7.02	27	19	17	29	26	19	22	21	18	20
360.14	366.16	6.02	25	26	19	24	24	20	17	19	21	30
366.16	369.15	2.99	10	13	7	15	12	11	13	10	8	8
369.15	373.12	3.97	8	16	15	12	8	13	12	10	16	15
373.12	379.11	5.99	18	27	28	23	21	27	25	23	21	13
379.11	382.11	3	23	21	33	18	20	31	13	19	25	24
382.11	388.14	6.03	21	27	46	39	20	33	22	22	21	28
388.14	395.62	7.48	54	35	50	58	37	40	46	46	39	35
395.62	396.8	1.18	8	14	13	15	8	16	11	16	23	19
396.8	397.3	0.5	9	15	20	15	8	6	10	6	7	12
397.3	399.04	1.74	18	23	11	32	15	17	14	13	11	5
399.04	401.05	2.01	22	13	11	16	12	15	14	14	12	14
401.05	403.5	2.45	14	19	11	16	19	17	17	19	16	28
403.5	405.77	2.27	33	36	32	33	25	29	17	24	32	17
405.77	409.77	4	47	33	48	37	22	32	20	24	24	22
409.77	420.94	11.17	117	95	103	90	69	77	50	79	68	51
420.94	426.26	5.32	42	36	39	36	38	38	20	23	30	27
426.26	432.97	6.71	59	64	65	63	38	61	55	55	20	30
432.97	439.22	6.25	49	78	59	84	47	46	19	41	28	28
439.22	440.66	1.44	15	28	19	38	21	22	12	18	19	9
440.66	442.92	2.26	28	55	39	21	13	18	11	26	26	14
442.92	445.07	2.15	30	29	37	35	31	32	36	44	48	33
445.07	445.37	0.3	6	10	8	13	11	14	10	12	11	12
445.37	446	0.63	11	19	22	11	18	19	21	18	19	12
446	448.27	2.27	53	71	74	91	63	66	57	76	65	75
448.27	449.27	1	45	56	70	58	58	43	52	60	51	66
449.27	450.28	1.01	69	86	77	65	65	72	54	85	49	54
450.28	451.8	1.52	73	67	73	70	72	77	47	86	85	70
451.8	453.03	1.23	98	98	119	96	96	91	85	102	104	98
453.03	453.37	0.34	6	7	5	10	5	6	7	4	10	9
453.37	454.13	0.76	37	33	39	21	30	23	29	26	39	27
454.13	455.31	1.18	28	21	23	28	17	15	30	22	22	23

Beginning Milepost	End Milepost	Length	Number of Truck Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	0.48	0.48	0	0	0	1	1	0	0	1	0	0
0.48	8.46	7.98	6	9	0	2	0	0	3	7	2	0
8.46	20.71	12.25	7	3	3	1	3	2	2	2	5	6
20.71	22.69	1.98	0	0	0	1	1	0	0	0	0	0
22.69	29.76	7.07	2	3	1	3	2	2	0	1	0	2
29.76	38.96	9.2	9	4	2	2	2	4	4	0	1	5
38.96	48.82	9.86	3	4	0	2	0	3	3	0	5	3
48.82	55.37	6.55	4	3	0	3	2	2	1	4	1	1
55.37	59.92	4.55	5	0	0	1	0	1	1	2	4	1
59.92	69.63	9.71	5	8	7	2	6	2	5	3	5	3
69.63	76.61	6.98	0	4	3	5	1	1	3	8	2	4
76.61	85.22	8.61	2	3	5	4	2	5	6	1	3	1
85.22	95.02	9.8	8	3	2	3	2	3	0	2	4	3
95.02	101.19	6.17	2	3	3	2	2	0	4	4	3	3
101.19	102.59	1.4	0	1	0	2	0	1	2	3	2	0
102.59	107.36	4.77	5	3	3	8	5	2	2	3	5	1
107.36	117.25	9.89	7	0	0	0	5	5	7	6	4	1
117.25	126.69	9.44	3	5	3	3	3	2	6	4	2	8
126.69	133.97	7.28	2	4	4	5	4	5	6	4	1	2
133.97	145.67	11.7	8	5	7	6	5	1	3	6	6	9
145.67	158.03	12.36	7	10	5	2	7	6	8	12	6	4
158.03	164.53	6.5	4	2	6	1	5	3	1	2	1	2
164.53	177.18	12.65	8	4	4	5	4	1	3	7	7	4
177.18	179.22	2.04	1	2	2	1	0	1	1	1	1	0
179.22	190.45	11.23	2	10	5	7	6	3	4	6	3	4
190.45	199	8.55	7	11	4	1	4	8	2	5	8	4
199	211.8	12.8	4	9	6	2	6	4	4	5	3	4
211.8	222.49	10.69	3	2	7	5	2	6	4	4	4	4
222.49	231.13	8.64	6	7	3	7	2	4	1	3	4	3
231.13	237.22	6.09	3	6	1	2	2	3	2	8	1	5
237.22	248.56	11.34	9	9	7	7	5	4	6	6	3	6
248.56	257.04	8.48	8	5	3	4	2	2	2	6	1	5
257.04	263.69	6.65	5	6	2	2	3	5	1	2	4	4
263.69	272.64	8.95	5	7	0	2	7	1	4	6	6	2
272.64	279.92	7.28	8	5	6	5	6	7	5	3	7	8
279.92	285.66	5.74	3	0	5	0	0	3	4	1	1	1
285.66	291.39	5.73	5	7	0	3	1	0	1	5	3	2
291.39	300.13	8.74	1	7	5	6	11	5	1	4	4	7
300.13	305.69	5.56	3	3	1	1	1	5	3	0	2	3
305.69	312.1	6.41	7	7	5	8	7	5	2	5	8	4
312.1	314.14	2.04	3	3	5	4	2	1	3	0	3	2
314.14	318.17	4.03	2	1	7	0	2	2	3	5	2	2
318.17	324.17	6	5	8	2	1	6	8	3	1	0	4
324.17	332.18	8.01	7	6	6	3	7	7	2	8	3	3
332.18	338.15	5.97	4	6	3	3	1	1	2	4	3	0
338.15	342.14	3.99	2	2	1	1	0	3	3	2	1	2
342.14	348.12	5.98	1	1	0	3	3	5	2	2	2	2
348.12	353.12	5	2	4	2	4	2	5	1	1	4	1
353.12	360.14	7.02	4	4	1	2	1	3	4	5	3	4

Beginning Milepost	End Milepost	Length	Number of Truck Crashes 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
360.14	366.16	6.02	4	3	7	3	3	4	5	2	2	10
366.16	369.15	2.99	0	2	1	5	0	1	3	3	1	1
369.15	373.12	3.97	2	4	3	2	2	1	5	1	3	2
373.12	379.11	5.99	3	5	7	6	3	4	3	1	7	4
379.11	382.11	3	2	5	6	2	3	7	2	1	6	2
382.11	388.14	6.03	4	6	7	11	3	6	3	4	2	4
388.14	395.62	7.48	6	6	11	7	6	3	5	3	8	8
395.62	396.8	1.18	1	2	2	3	0	1	1	0	6	2
396.8	397.3	0.5	2	3	1	2	1	1	1	1	2	1
397.3	399.04	1.74	1	6	1	3	0	3	0	3	2	0
399.04	401.05	2.01	2	2	2	0	1	1	3	0	3	4
401.05	403.5	2.45	1	2	1	2	4	3	3	0	3	6
403.5	405.77	2.27	8	2	3	4	5	3	2	6	2	2
405.77	409.77	4	7	3	6	3	2	4	1	2	5	3
409.77	420.94	11.17	5	11	14	13	7	9	7	9	9	6
420.94	426.26	5.32	3	6	4	7	1	6	2	1	2	2
426.26	432.97	6.71	12	6	4	6	1	8	13	8	1	4
432.97	439.22	6.25	9	13	8	10	2	3	2	3	7	6
439.22	440.66	1.44	1	2	3	3	0	1	0	0	1	3
440.66	442.92	2.26	4	7	5	4	0	1	0	4	5	2
442.92	445.07	2.15	2	5	8	1	3	8	7	4	5	5
445.07	445.37	0.3	1	1	0	1	3	2	1	0	0	2
445.37	446	0.63	2	0	4	2	0	3	1	1	2	1
446	448.27	2.27	8	6	8	7	7	8	3	9	9	9
448.27	449.27	1	2	6	7	6	4	4	4	2	3	6
449.27	450.28	1.01	5	2	3	4	5	2	4	3	4	4
450.28	451.8	1.52	6	8	5	6	9	9	6	5	10	5
451.8	453.03	1.23	4	7	4	4	7	8	3	11	10	9
453.03	453.37	0.34	0	3	0	3	1	2	1	2	0	1
453.37	454.13	0.76	3	1	4	4	2	6	4	3	3	4
454.13	455.31	1.18	2	0	3	2	2	2	2	0	3	0

Vehicle Miles Traveled Data (Wyoming)

Beginning	End		Vehicle Miles Traveled (All Vehicles)									
Milepost	Milepost	Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	2.18	2.18	6007535	5370975	5550008	5370975	5307319	5291405	5577857	5848395	5705169	5716309
2.18	3.453	1.273	3508070	3136354	3240899	3136354	3099182	3089889	3257161	3415141	3331505	3338010
3.453	5.263	1.81	4855778	4423052	4178611	3996933	3944081	3930868	4710435	4908630	4968088	5003102
5.263	6.257	0.994	2630373	2390918	2599534	2459852	2463480	2539670	2503389	2575951	2670282	2689148
6.257	6.767	0.51	1377510	1135515	1174607	1158784	1200668	1241621	1263959	1301189	1239759	1185776
6.767	10.683	3.916	10577116	8718974	9019135	8897642	8919082	9533698	9705219	9991087	9519404	9104896
10.683	13.862	3.179	7658211	7153465	7281102	7182474	7194077	7693021	7936691	8203568	7658211	7673295
13.862	18.293	4.431	10593413	9978834	10189085	10051613	10075872	10771318	10819837	11191820	10625760	10646785
18.293	21.751	3.458	7888563	7106017	7743413	7636129	7648750	8191483	7888563	8178862	7421560	7436706
21.751	23.111	1.369	3123031	2898173	3192987	3150514	3158009	3337896	2783245	2898173	2933151	2939147
23.12	23.906	0.786	1793063	1622363	1761505	1737119	1741422	1841834	1767242	1833227	1684044	1687487
23.906	28.713	4.807	10965969	9922009	10694013	10544876	10562421	11194061	10544876	10948423	10299238	10320293
28.713	30.398	1.685	3843906	3496417	3945385	3893108	3899259	4120668	3733202	3874658	3616347	3623727
30.398	33.182	2.784	6452616	5807354	6518666	6432293	6442454	6808272	6188414	6422131	5995344	6007538
33.182	34.741	1.559	3613372	3169525	3513791	3465423	3471113	3675966	3704418	3835296	3362997	3369825
34.741	39.896	5.155	10913135	9727743	10790833	10630899	10649715	11289450	10894319	11327082	9821822	9840637
39.896	41.987	2.091	4617451	3999247	4434279	4369406	4380854	4495336	4449543	4625083	4212947	4221342
41.987	48.303	6.316	13601506	11711127	12990591	12794637	12817690	13117385	13186545	13716773	12333569	12358928
48.303	53.306	5.003	11139180	9523085	10390481	10235262	10262654	10500046	10609612	11029614	10280915	10301002
53.306	57.041	3.735	8315978	7545727	7763851	7647973	7661606	7838831	7975159	8315978	7647973	7662969
57.041	61.591	4.55	10130575	8660811	9449668	9308504	9316808	9532705	9715388	10130575	9316808	9335076
61.591	66.168	4.577	10107160	8812441	9430565	9288564	9472330	9689509	9806451	10224103	9405506	9423883
66.168	68.972	2.804	7010701	6104939	6775305	6770188	6867417	6724132	8177445	8433310	7000466	7014795
68.972	72.296	3.324	8128842	7200698	7946853	7940787	8165240	7886190	8019649	8322964	7764864	7409379
72.296	82.71	10.414	26987881	23661910	25505448	25486443	26189648	25695504	27672081	28318270	25277382	25326796
82.71	83.007	0.297	769676	674821	727398	726856	746910	732818	762087	780516	691624	693900
83.007	85.697	2.69	7805708	6436027	6455664	6450755	6627488	6951498	7138050	7304964	7285327	7300055
85.697	89	3.303	9644760	8276410	8288466	8282438	8511501	8728508	9102242	9307193	8885235	8259531
89	89.445	0.445	1299400	1115048	1116672	1115860	1146720	1175957	1226309	1253921	1197072	1112774
89.445	91.532	2.087	4875232	4444840	4467693	4768586	4898085	5050436	5408461	5423696	6193068	6236488
91.532	92.654	1.122	3542435	4035918	4057418	4099395	4197683	4300065	5254270	5221508	5323890	5361157
92.654	99.138	6.484	20471609	23323434	23447684	23690267	24258265	24849930	30364248	30174915	30766580	30981946
99.138	100.27	1.132	3305440	3904551	3925210	3970660	4067757	4193777	4375576	4338390	3892156	4030984
100.27	102.338	2.068	3387200	4001130	4022300	4068874	4168373	4297510	4483806	4445700	3988428	4130690
102.338	102.358	0.908	2651360	3131919	3148490	3184946	3262830	3363913	3509738	3479910	3121976	3233334

Beginning	End		Vehicle Miles Traveled (All Vehicles)									
Milepost	Milepost	Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
102.358	103.819	1.461	3972824	4095475	4194129	4231458	4311448	4186130	4415434	4372773	4596744	4628740
103.819	104.825	1.006	2680487	2752089	2768613	2812675	2864082	2823691	2948536	2937520	3106427	3128092
104.825	107.056	2.231	5618773	5586201	5618773	5329692	5431481	5455910	5928213	5928213	6221367	6264525
107.056	107.81	0.754	1575340	1586246	1595941	1525656	1551104	1585034	1677131	1742568	1740145	1752263
107.81	111.161	3.351	8163773	8220291	8270530	7906300	8038176	8214011	8691278	9030388	9017829	8598336
111.161	122.272	11.111	25549745	26360848	26523068	25346969	25752520	26320292	25306414	26401403	27618057	27674834
122.272	130.84	8.568	19545750	20327580	20452673	19545750	19858482	20296307	19389384	19889755	20890498	20931153
130.84	136.958	6.118	12281885	14291648	14369805	13744546	13956688	14269317	13621727	13979018	13822703	13849500
136.958	139.509	2.551	5074577	5381845	5414434	5353911	5437712	5577379	5689113	5838091	5698424	5709597
139.509	142.17	2.661	5293394	5613912	5647906	5584774	5672188	5817877	5876153	6031556	5944142	5955797
142.17	146.848	4.678	9305712	9826490	10116760	9997237	10159447	10398492	10364343	10637538	10381418	10401907
146.848	150.807	3.959	7875441	8308951	8561832	8460680	8597958	8800263	8583508	8814713	8728011	8745352
150.807	152.455	1.648	3278284	3458740	3564006	3521900	3579044	3663257	3633181	3729424	3633181	3640399
152.455	154.055	1.6	3182800	3387200	3454360	3413480	3468960	3550720	3463120	3556560	3474800	3481808
154.055	156.025	1.97	3918823	4170490	4235205	4184871	4249586	4350253	4005109	4120157	4278348	4286976
156.025	158.545	2.52	5012910	5334840	5417622	5353236	5436018	5564790	5491206	5638374	5472810	5483848
158.545	165.582	7.037	13869927	14935857	15436715	15256920	15488085	15847676	15693566	16104526	15282605	15313427
165.582	170.676	5.094	10133240	10876964	10914150	10783998	10951336	11044301	11341791	11639281	11174453	11196765
170.676	173.413	2.737	5444577	5884139	5904120	5829194	5924100	5974050	6263761	6423602	6004020	6016008
173.413	184.288	10.875	21633094	23816250	23717016	23419313	23816250	24371963	24054413	24689513	24729206	24776839
184.288	187.204	2.916	5800653	6386040	6359431	6279606	6386040	6535048	6737272	6907567	6609551	6622323
187.204	196.157	8.953	17809755	19607070	19214929	18953501	19280286	19737784	20881530	21404385	20718137	20760619
196.157	199.051	2.894	5756889	6042093	6211103	6126598	6232229	6380112	6749821	6918830	6707568	6721301
199.051	201.164	2.113	4203285	4411521	4534921	4473221	4550346	4658320	4928256	5051655	4905118	4907432
201.164	204.175	3.011	5989632	6286366	6462208	6374287	6638051	7033696	6989735	7165578	7000726	7015013
204.175	206.182	2.007	3992425	4175563	4307423	4248819	4424632	4688352	4637073	4754282	4673701	4683224
206.182	209.459	3.277	6578578	6877604	6901526	6805837	7092903	7523500	7631150	7822527	7391929	7042666
209.459	211.2	1.741	3685697	3692052	3692052	3641214	3793726	4022493	4111459	4206778	4175005	4183266
211.2	211.87	0.67	1227860	1229977	1229977	1213041	1263849	1340061	1369699	1401454	1390869	1393621
211.78	214.051	2.271	4351804	4513442	4559032	4496864	4683370	4973490	5255321	5379658	5222164	5258637
214.111	215.57	1.459	2875689	3064739	3102016	3059414	3141957	3307042	3493430	3573310	3631889	3657450
215.57	215.82	0.25	529980	551442	569400	561516	584292	604440	652620	665760	659628	664271
215.81	219.594	3.784	8356018	8694402	8977540	8853236	9212337	9530004	10289642	10496816	10400135	10473336
219.594	221.926	2.332	4553813	4924076	5281572	5209222	5422017	5592253	5592253	5719930	5217733	5227948
221.926	228.341	6.415	12761039	13440067	14306412	14107387	14681048	15149343	14142509	14493730	14165924	14194021
228.341	235.228	6.887	13574277	14139872	15082530	14868861	15484731	15836657	14931705	15308768	15107668	15137833

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
235.228	238.155	2.927	5341775	5715699	6164408	6078940	6335345	6484915	5918687	6078940	5480661	5491345
238.155	255.602	17.447	31840775	34005948	36680573	36171120	37699478	38591019	35980076	36935299	32604954	32668635
255.602	260.232	4.63	8534248	9024333	9734112	9598916	10004504	10241097	9328524	9582017	8787740	8804640
260.232	267.186	6.954	12817960	13554041	14620090	14417033	15000821	15356170	14772382	15153114	13198692	13224074
267.186	272.056	4.87	8976628	9492117	10238688	10096484	10505321	10754178	10096484	10363117	9261036	9278811
272.056	279.859	7.803	14382880	14411361	15080663	14867056	15493637	15892370	16547432	16974646	14895537	14924018
279.859	280.901	1.042	1920667	1924470	2013847	1985323	2068995	2122241	2171684	2228734	1989126	1992929
280.901	290.438	9.537	17579075	17613885	18431921	18188251	18727807	19215148	19876539	20398689	18205656	18240466
290.438	297.663	7.225	13317481	13343853	13963577	13778978	14187733	14556930	14978870	15374439	13792164	13818535
297.663	309.91	12.247	22574283	22618984	23669471	23356560	24049434	24675256	24764659	25345779	23870628	22788850
309.91	310.452	0.542	999041	1001020	1047510	1033662	1064325	1092022	1095978	1121696	1056412	1008537
310.452	310.84	0.388	771829	798737	767580	757667	788823	808650	546653	560815	525410	529092
310.84	311.756	0.916	1822153	1885678	1812123	1788719	1862274	1909081	1979293	2029444	1982636	1996678
311.756	313.191	1.435	3325971	3755467	3155744	3113842	3242167	3315496	3944026	4043543	4467801	4499227
313.191	316.702	3.511	6663878	6920181	8868084	8752747	9111572	9329429	8816823	9034681	8714302	8775815
316.702	317.42	0.718	1520006	1561937	1552765	1531799	1596006	1640558	1803042	1847594	1803042	1815621
317.42	323.049	5.629	11916593	12245327	12173416	12009049	12512423	12861702	14135545	14484824	14135545	14234165
323.049	329.316	6.267	13038494	13324425	13404486	13358737	13907726	14296594	15600443	15989310	14433841	14463578
329.316	335.106	5.79	12046095	12310264	12415931	12373664	12891435	13250705	13673375	14011511	13292972	13320445
335.106	336.609	1.503	3126991	3195566	3222996	3212024	3346429	3439691	3554896	3642671	3461634	3468766
336.609	339.317	2.708	5633994	5757547	5806968	5787199	6029362	6197393	6404962	6563109	6236930	6249780
339.317	342.56	3.243	6806246	7013393	7102170	7078496	7362583	7563811	7765039	7954430	7540137	7555525
342.56	345.501	2.941	6172424	6360280	6548136	6526667	6698422	6880911	7160012	7331766	6934584	6948539
345.501	348.363	2.862	6058854	6215549	6372243	6351350	6528938	6706525	7040806	7218393	6779649	6793229
348.363	356.74	8.377	17581229	18101022	18636102	18574950	19324064	19843856	19568672	20394225	19018303	17997063
356.74	357.68	0.94	1972825	2031152	2091194	2084332	2168392	2226719	2195840	2288477	2134082	2019487
357.68	359.076	1.396	2929855	3016477	3105646	3095456	3220293	3306915	3261056	3556589	3678879	3704865
359.076	359.599	0.523	868572	878117	882889	880026	1202638	1111009	1256089	1288541	1277088	1286060
359.599	362.037	2.438	5472700	5748560	6037768	6153451	6451557	6531646	6869796	7038872	7804160	7858442
362.037	364.05	2.013	4188047	4489292	4713389	4702368	5224037	5290164	5466503	5598757	6223290	6266640
364	367.424	3.424	6186312	6736206	7073642	7054895	6986158	7073642	7386082	7573546	7323594	7374834
367.424	370.394	2.97	5095035	5637060	5918913	5902652	5506974	5561177	5745465	5886392	5355207	5393149
370.394	377.353	6.959	11557159	12065166	12281069	12242969	11938165	12014366	12573173	12903378	11912764	11996585
377.353	386.389	9.036	14346909	14577779	14858121	14825139	15187935	15270388	15204425	15897035	14676723	14297437
386.389	391.385	4.996	7932399	7996223	8151224	8132988	8023576	8023576	7713574	8698286	8151224	8167636

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
391.385	401.456	10.071	15806435	15990230	16302683	15843194	16174026	16063749	16541618	17350319	15659398	15685129
401.456	402.779	1.323	1979869	2004014	2028159	2028159	2071620	2061962	2032988	2139225	1791540	1794921

Vehicle Miles Traveled Data (Wyoming)

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	2.18	2.18	2983875	2263767	2426885	2188175	2212046	2482584	2538283	2657638	2275702	1970949
2.18	3.453	1.273	1742419	1321915	1417167	1277774	1291713	1449692	1482218	1551914	1328885	1150926
3.453	5.263	1.81	2411373	1846517	1823394	1737510	1777149	2001770	2140506	2239604	1942311	1687961
5.263	6.257	0.994	1306116	1003170	1135595	1079360	1106571	1266207	1135595	1171876	1055777	917184
6.257	6.767	0.51	660833	509120	513774	509120	519359	601265	575204	593819	545420	474310
6.767	10.683	3.916	5074157	3909245	3944978	3909245	3987859	4616768	4416661	4559595	4187966	3641958
10.683	13.862	3.179	3713072	3167715	3179318	3150310	3202525	3713072	3608642	3724675	3388178	2942610
13.862	18.293	4.431	5175408	4415270	4431443	4391010	4463789	5175408	4932811	5094542	4722560	4093424
18.293	21.751	3.458	3849619	3338440	3382616	3351061	3407859	3912727	3584563	3710780	3534076	3049403
21.751	23.111	1.369	1524039	1321667	1339156	1326664	1349150	1549024	1264203	1314172	1399118	1207239
23.12	23.906	0.786	875014	758824	770300	763127	774603	889359	803292	831981	803292	693126
23.906	28.713	4.807	5351393	4640798	4710980	4667116	4737299	5439121	4807481	4982936	4912754	4244269
28.713	30.398	1.685	1875826	1626741	1651342	1635967	1660568	1906578	1697469	1758972	1728220	1489591
30.398	33.182	2.784	3150096	2687743	2728390	2702986	2743632	3150096	2814763	2916379	2865571	2473333
33.182	34.741	1.559	1792460	1507943	1536395	1522169	1547775	1764009	1684344	1678653	1604679	1383893
34.741	39.896	5.155	5738804	4986174	4713345	4666306	4760385	4873279	4948542	4967358	5230779	4510135
39.896	41.987	2.091	2442288	2091209	1938566	1919486	1953830	1999623	2022520	2030152	2144634	1850033
41.987	48.303	6.316	7031287	5993884	6063044	6005411	6109151	6247471	5993884	6016937	6478005	5583533
48.303	53.306	5.003	5386980	4747847	4802630	4756977	4839152	4948717	4820891	4839152	5167849	4462976
53.306	57.041	3.735	4089825	3558148	3599046	3564964	3626312	3708108	3612679	3626312	3858068	3329118
57.041	61.591	4.55	4982250	4334558	4384380	4342861	4417595	4517240	4400988	4417595	4699923	4055552
61.591	66.168	4.577	4928285	4318514	4368632	4326867	4393691	4493927	4460515	4477221	4727812	4086300
66.168	68.972	2.804	3786802	3213664	3510468	3510468	3510468	3530937	4370174	4196186	3408122	3012043
68.972	72.296	3.324	4671051	4015891	4246410	4246410	4210012	4234277	4282808	4064421	3979493	4048649
72.296	82.71	10.414	14634274	12505652	13265874	13265874	13151841	13227863	14786318	14976373	12429630	12642492
82.71	83.007	0.297	417359	356652	378333	378333	375081	377249	406519	411939	340392	346679
83.007	85.697	2.69	3976493	3377564	3461021	3461021	3426657	3632845	3731030	3780123	3308835	3367746
85.697	89	3.303	4882660	4177387	4291918	4291918	4255750	4412478	4388366	4448646	4340142	3963996
89	89.445	0.445	657821	562803	578233	578233	573360	594475	591227	599348	584730	534053
89.445	91.532	2.087	2589967	2426190	2224325	2399528	2460469	2582349	2513792	2551879	2734700	2449042
91.532	92.654	1.122	1494785	1406736	1290020	1384211	1416974	1478403	1842885	1863362	1568500	1414107
92.654	99.138	6.484	8638309	8129477	7454979	7999311	8188644	8543643	10649970	10768303	9064308	8172077
99.138	100.27	1.132	1446130	1357296	1289122	1382087	1415141	1508107	1537030	1557689	1475053	1411010
100.27	102.338	2.068	1481900	1390869	1321008	1416273	1450145	1545410	1575048	1596218	1511538	1445911

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
102.338	102.358	0.908	1159970	1088715	1034030	1108600	1135114	1209683	1232882	1249453	1183169	1131799
102.358	103.819	1.461	1839764	1735778	1746443	1786438	1415819	1413152	1775772	1802436	1919754	1838164
103.819	104.825	1.006	1193368	1193368	1200711	1211727	962038	962038	1186024	1204383	1325556	1269743
104.825	107.056	2.231	2605808	2495875	2512162	2467374	1954356	2035788	2385943	2426659	2858246	2732027
107.056	107.81	0.754	848260	782823	787670	796153	809482	838566	899156	933086	848260	813118
107.81	111.161	3.351	4395878	4056767	4081886	4125845	4194923	4345639	4659630	4835465	4395878	4213763
111.161	122.272	11.111	13991527	12876260	12957370	12592374	12774872	13099313	13585975	14153747	14194303	13577864
122.272	130.84	8.568	10632888	9897968	9960514	9694692	9851058	10101244	10382702	10820527	10914347	10451503
130.84	136.958	6.118	7034170	6632218	6676879	6475903	6587556	6766202	7302139	7614769	7637099	7308838
136.958	139.509	2.551	2933012	2765412	2784034	2700233	2746789	2821278	3054057	3184413	3184413	3045677
139.509	142.17	2.661	3059485	2884657	2904082	2816669	2865232	2942933	3156611	3292588	3321726	3177979
142.17	146.848	4.678	5378531	5011424	5037037	4934588	5019962	5156559	5549278	5788323	5839547	5586842
146.848	150.807	3.959	4624112	4241178	4587986	4544635	4624112	4739715	4595211	4797516	4942020	4723819
150.807	152.455	1.648	1924864	1774484	1909826	1891780	1924864	1972986	1948925	2033138	2057198	1966970
152.455	154.055	1.6	1868800	1722800	1851280	1833760	1868800	1915520	1857120	1938880	1991440	1904424
154.055	156.025	1.97	2300960	2124793	2261412	2239841	2272198	2329722	2142769	2243436	2451961	2344103
156.025	158.545	2.52	2943360	2718009	2901969	2874375	2924964	2998548	2943360	3072132	3136518	2998548
158.545	165.582	7.037	8090791	7589932	8103633	8026578	8167846	8373326	8424696	8784287	8758602	8365621
165.582	170.676	5.094	5949792	5550040	5931199	5875420	5968385	6117130	6079944	6340247	6396026	6122708
170.676	173.413	2.737	3196816	2982030	3171841	3146866	3206806	3286726	3356657	3496518	3446567	3292720
173.413	184.288	10.875	12702000	12424144	12682153	12563072	12781388	13098938	12900469	13456181	14011894	13404579
184.288	187.204	2.916	3405888	3331384	3437818	3405888	3459105	3544252	3608113	3757120	3746477	3588954
187.204	196.157	8.953	10293712	10228355	10555139	10457104	10620496	10881924	11176030	11633528	11404779	10914602
196.157	199.051	2.894	3380192	3306250	3359066	3327376	3380192	3506949	3612580	3760464	3686522	3531244
199.051	201.164	2.113	2467984	2413997	2452559	2429422	2467984	2560533	2637658	2745632	2691645	2578272
201.164	204.175	3.011	3516848	3439917	3494868	3461897	3604769	3824572	3747641	3901503	3659720	3679502
204.175	206.182	2.007	2344176	2292897	2325862	2307548	2402780	2549291	2483361	2585919	2439408	2451129
206.182	209.459	3.277	3827536	3743809	3731848	3695964	3899302	4138523	4150484	4389705	3971069	3803614
209.459	211.2	1.741	2097034	2011247	2011247	1992183	2077971	2205064	2205064	2332157	2236837	2145330
211.2	211.87	0.67	698610	670031	670031	663680	692259	734599	734599	776939	745184	714699
211.78	214.051	2.271	2528191	2486745	2528191	2503323	2611082	2776865	2818311	2901202	2884624	2767747
214.111	215.57	1.459	1624232	1597605	1624232	1608256	1677485	1783992	1874523	1927777	1890499	1817542
215.57	215.82	0.25	271560	280320	287328	284700	296964	314484	349524	358284	286452	273838
215.81	219.594	3.784	4281596	4419712	4530205	4488770	4682132	4958364	5510828	5648944	4516393	4317506
219.594	221.926	2.332	2596099	2723776	2791870	2766335	2885500	3055736	3055736	3140854	2698241	2582480

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
221.926	228.341	6.415	7141499	7492720	7680038	7609794	7937600	8382481	7586379	7820527	7422476	7092328
228.341	235.228	6.887	7541265	7817778	8044016	7968603	8295392	8773005	8018878	8270254	7968603	7624219
235.228	238.155	2.927	3205065	3226432	3311900	3279850	3408052	3611040	3440103	3546939	3237116	3084341
238.155	255.602	17.447	19104465	19231828	19741281	19550236	20314414	21524364	20887548	21524364	19295510	18378495
255.602	260.232	4.63	5069850	5103649	5238845	5188147	5390941	5712031	5424740	5593735	5238845	5009012
260.232	267.186	6.954	7614630	7665394	7868451	7792305	8122272	8604532	8579150	8832971	7868451	7518178
267.186	272.056	4.87	5332650	5368201	5510405	5457079	5688160	6025895	5865915	6043670	5528181	5284656
272.056	279.859	7.803	8544285	8458842	8544285	8458842	8800614	9341752	9598080	9882890	8857575	8458842
279.859	280.901	1.042	1140990	1121974	1125777	1114367	1160007	1232269	1262696	1300729	1182826	1129580
280.901	290.438	9.537	10443015	10094915	10094915	10060104	10443015	11104406	11556937	11905037	10825926	10338585
290.438	297.663	7.225	7911375	7647663	7647663	7621291	7911375	8412429	8702513	8966225	8201459	7829624
297.663	309.91	12.247	13186957	12762293	12739942	12918748	13410465	14259794	14393899	14840915	13946884	12762293
309.91	310.452	0.542	583598	564805	563815	571729	593490	631078	637013	656796	617230	564805
310.452	310.84	0.388	417779	419195	413530	419195	439022	465930	317229	331391	397952	275876
310.84	311.756	0.916	986303	989646	976273	989646	1036454	1099979	1150130	1183564	1043141	953203
311.756	313.191	1.435	1518948	1597514	1697031	1720601	1807024	1906541	2288897	2341274	1712744	1573944
313.191	316.702	3.511	3267863	3460091	3588242	3639503	3844545	4100848	4100848	4229000	3677948	3339628
316.702	317.42	0.718	668279	701037	708899	719382	760003	812417	838624	864831	775727	705755
317.42	323.049	5.629	5239192	5496015	5557652	5639836	5958296	6369213	6574672	6780130	6081572	5532997
323.049	329.316	6.267	5833010	6118942	6187566	6279064	6633620	7091111	7251232	7479978	6747992	6137242
329.316	335.106	5.79	5389043	5653211	5716612	5801146	6128715	6551385	6361184	6572519	6234383	5682798
335.106	336.609	1.503	1398917	1467492	1483949	1505893	1590925	1700644	1651271	1706130	1618355	1475721
336.609	339.317	2.708	2520471	2644024	2673676	2688502	2866418	3064102	2975144	3073986	2915839	2657861
339.317	342.56	3.243	3018422	3184140	3201895	3219650	3397205	3633944	3610270	3728639	3491900	3185323
342.56	345.501	2.941	2737336	2887621	2903723	2919825	3080845	3295538	3327741	3435088	3177456	2898355
345.501	348.363	2.862	2663807	2810055	2825724	2841394	2998088	3207014	3269692	3374155	3102551	2828858
348.363	356.74	8.377	7796893	8224957	8255534	8301398	8744750	9356271	9111663	9417423	9019935	8279994
356.74	357.68	0.94	874905	922939	926370	921223	970973	1043024	1022438	1056748	1012145	929115
357.68	359.076	1.396	1299327	1370663	1375758	1368115	1441998	1549002	1518429	1589765	1696768	1673329
359.076	359.599	0.523	486782	513508	458148	461011	461966	502054	584139	641407	616591	606283
359.599	362.037	2.438	2313662	2411548	2580623	2593971	2598420	2776394	3061153	3328114	2687407	2470279
362.037	364.05	2.013	1836863	1928706	2057286	2060960	2079328	2218930	2432006	2652429	2138108	1961034
364	367.424	3.424	2936936	3211883	3249376	3255625	3286869	3524323	3286869	3661797	3199386	2899443
367.424	370.394	2.97	2493315	2726386	2764328	2412011	2482475	2493315	2558358	3208788	2558358	2288430
370.394	377.353	6.959	5588077	6121484	6350088	5461075	5638878	4978469	5588077	6350088	5867481	5207072

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
377.353	386.389	9.036	7420815	8080443	8245350	7091001	7321871	6464354	6794168	7948517	7354852	6718311
386.389	391.385	4.996	4102965	4267084	4358261	3838552	3957082	3628845	3993553	4412967	4157671	3813022
391.385	401.456	10.071	7903217	8234050	8417845	7517246	7756181	7682662	8601641	8969233	8381086	7682662
401.456	402.779	1.323	1062369	1108244	1098586	982691	1014079	999593	1052711	1101001	1081685	988486

Vehicle Miles Traveled Data (Nebraska)

Beginning	End		Vehicle Miles Traveled (All Vehicles)									
Milepost	Milepost	Length	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	0.48	0.48	1454160	1464672	1497960	1441896	1532124	1515480	1521612	1506720	1340280	1382328
0.48	8.46	7.98	24452117	24350172	25340490	24379299	24787077	25340490	24874458	24757950	22689933	23010330
8.46	20.71	12.25	37983269	37379650	39123438	37647925	39816481	39011656	38452750	38162119	34831038	35412300
20.71	22.69	1.98	5991183	5868324	5832189	5615379	5965889	5796054	5774373	5637060	5131170	5058900
22.69	29.76	7.07	20928261	21160510	21134705	20360540	21186316	20618595	21754037	20192804	18657377	18321905
29.76	38.96	9.2	27401280	27199800	27031900	26024500	27367700	26662520	26780050	26360300	22968720	23673900
38.96	48.82	9.86	30086804	28791200	29043123	27963453	29115101	28611255	28323343	28341338	25498207	25084333
48.82	55.37	6.55	20022531	18886925	18946694	18241423	19185769	18767388	18600035	18886925	17022140	16687435
55.37	59.92	4.55	12953850	12953850	12995369	13053495	13227874	12870813	12480536	13161444	12007223	11558820
59.92	69.63	9.71	26386197	26350755	26970982	27095027	27591208	27059585	26138106	28175993	25376114	25003978
69.63	76.61	6.98	18891196	18751072	19770152	19362520	19795629	19757414	19935753	20356123	18598210	18279748
76.61	85.22	8.61	22878492	22894205	24182692	23444169	24371251	24748369	24622663	25235480	23381316	22925632
85.22	95.02	9.8	25700745	25450355	26255180	26129985	26827500	27256740	26970580	27972140	25825940	25557665
95.02	101.19	6.17	16665170	16045856	16642650	16552568	17318265	17273224	16845334	17565990	16012076	15764350
101.19	102.59	1.4	3898930	3645985	3842720	3822280	3858050	3832500	3799285	3934700	3577000	3628100
102.59	107.36	4.77	22572713	23330070	24409521	24453047	24635858	24722910	23982964	24548805	23330070	23504175
107.36	117.25	9.89	49960324	51620855	51386215	50971082	52126234	51620855	50826688	50898885	47108543	46928050
117.25	126.69	9.44	46102128	48893064	48669100	47532052	48927520	49220396	47876612	48100576	43759120	43724664
126.69	133.97	7.28	37546236	40708304	40190150	40269866	41505464	41571894	40017432	40017432	36456784	36416926
133.97	145.67	11.7	61238970	64441845	64911600	65338650	64569960	64569960	64292377	62861760	57438225	57310110
145.67	158.03	12.36	65234844	67039404	67806342	69227433	68798850	66452922	64806261	64896489	59437695	59257239
158.03	164.53	6.5	36014550	39478400	38007450	38920863	38197250	36833063	36121313	35884063	33226863	33143825
164.53	177.18	12.65	71105650	77569800	76184625	76115366	75653641	72029100	71105650	70759356	65795813	65888158
177.18	179.22	2.04	11541300	12434820	12706599	12647031	11924769	11541300	11392380	11556192	10733409	10655226
179.22	190.45	11.23	63943620	68288507	70276498	69928087	66669422	64947863	63123830	64435494	59762691	58819932
190.45	199	8.55	47372985	51851261	52553430	52241355	49120605	49401473	49697944	49666736	46015459	44876385
199	211.8	12.8	70243520	77438400	78326080	77835520	71528320	73887680	74074560	75265920	69659520	67043200
211.8	222.49	10.69	61200517	64517090	64907275	64536599	60400638	61629721	61590702	63639174	58820389	55737927
222.49	231.13	8.64	50772960	52034400	52759728	52444368	49353840	49763808	49543056	52050168	48060864	45995256
231.13	237.22	6.09	36076856	36565883	37588394	37366109	35965713	35032116	35465572	37132709	34243004	33087122
237.22	248.56	11.34	66618815	67922631	70219832	69764531	69164361	69371316	68667669	69950790	64445787	63328230

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
248.56	257.04	8.48	50343428	50993420	52695780	52479116	52138644	51999360	51504128	52510068	48022028	47464892
257.04	263.69	6.65	42197741	43933225	45025487	44540037	42185605	42428330	42476875	43071551	39163679	40049625
263.69	272.64	8.95	57772474	59814192	59732524	58964837	58523826	59307846	59324180	60500210	54718062	55257076
272.64	279.92	7.28	47723312	48055462	49875644	48826050	48533758	48759620	48839336	49490350	46713576	47032440
279.92	285.66	5.74	38675546	38654595	40267822	40058312	41179191	40540185	41420127	39953557	37083270	38130820
285.66	291.39	5.73	38378107	38691825	40312699	40197669	40438186	40302241	41891743	40814647	37269639	37625185
291.39	300.13	8.74	57996018	59208256	62270752	62430257	63227782	61218019	65078040	63658446	57214444	56161711
300.13	305.69	5.56	36529200	37787428	39816828	40040062	40770646	38781834	40973586	41399760	36630670	36336407
305.69	312.1	6.41	40815194	43681266	44968073	45237133	47202439	44523540	46395260	47026965	42511441	42581630
312.1	314.14	2.04	13157082	14095278	14728188	15133995	15673830	15349929	15431835	16813068	14944122	15059535
314.14	318.17	4.03	25991687	27845084	29095391	29897059	31625425	31816649	30478084	32824249	29772028	29463129
318.17	324.17	6	43581000	44676000	46559400	46449900	47194500	47479200	47993850	48278550	44697900	45486300
324.17	332.18	8.01	59350095	60314899	62843857	62069089	63063130	63443205	62624583	63677097	60168717	60665737
332.18	338.15	5.97	45465878	45760050	48200586	47481499	48178795	48418491	49911140	48843406	45487669	48342224
338.15	342.14	3.99	30364898	31238708	32505732	31850375	32986328	33124681	34078590	33568868	30830930	32345534
342.14	348.12	5.98	48019400	47713822	50453111	49459982	50616813	50780516	52439368	51686336	46851656	49176231
348.12	353.12	5	40296000	40633625	42102750	41281500	43307250	43407625	43882125	44374875	39712000	41099000
353.12	360.14	7.02	60085935	61789864	63826893	62622612	66402004	66709480	65364273	66799161	60649641	61712995
360.14	366.16	6.02	52515470	53020849	54185418	53745958	56558502	57129800	57008949	56569489	52218835	52339686
366.16	369.15	2.99	26192400	26350646	27038196	26956345	27894906	27938560	27796684	27736660	26039611	26694421
369.15	373.12	3.97	34487390	35009048	35936440	36008893	36776889	36950775	36226250	36356665	34704748	35487235
373.12	379.11	5.99	52406810	52855011	54254275	54778999	55106952	55587949	54636887	54134026	52570786	53423462
379.11	382.11	3	29794950	30112500	30824250	31196550	31174650	31371750	29931825	29948250	28891575	29548575
382.11	388.14	6.03	61472533	63112241	64784963	65764386	66556728	65819410	65511277	65995486	63222289	64036640
388.14	395.62	7.48	80267880	82192671	84376831	85591770	86629246	85728280	89127379	89659768	86110508	96744637
395.62	396.8	1.18	14135574	14452139	14841922	15615029	16635788	17303373	17813752	18380123	17718998	17990339
396.8	397.3	0.5	5193038	5459488	5445800	5930338	6319063	6601938	6798125	6934088	6611063	6720563
397.3	399.04	1.74	19129212	20437518	21930003	22930286	24708566	25743779	26505899	28617606	27344231	26896485
399.04	401.05	2.01	18869478	19647147	20718276	21360220	25468660	25963873	26734206	30916011	29272635	26675514
401.05	403.5	2.45	26518984	29617560	31701162	30171995	35908609	36986180	38077165	40491640	38278371	38273900
403.5	405.77	2.27	27313151	28452407	29173245	29330670	31592611	32939005	33912551	36149636	33908409	33970550
405.77	409.77	4	42705000	42617400	42179400	45135900	45573900	49866300	51333600	54012700	50370000	51727800

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
409.77	420.94	11.17	134257257	134481494	140617455	146162243	147446513	161186172	165935935	164549738	160166909	166037861
420.94	426.26	5.32	64137654	63875511	66895010	69205752	68836810	76137978	78390466	79613800	74273850	71623293
426.26	432.97	6.71	81213814	84997751	89626644	92810539	96741425	98578288	101394810	101149895	95247444	95333164
432.97	439.22	6.25	83915781	87406094	91740469	94945625	97466406	98823750	116948281	115784844	110389688	97147031
439.22	440.66	1.44	23410224	24553404	25552044	26445564	27068400	28579500	31036680	30723948	29507184	26400888
440.66	442.92	2.26	41187257	42729820	44338375	45691211	46755332	49135168	49729096	49646606	47774083	48182409
442.92	445.07	2.15	47238026	48183650	49713912	51456057	55128687	67413949	70627500	74684657	70160574	66515410
445.07	445.37	0.3	8766023	8897970	9111495	10604528	10249200	11675985	13315200	14359830	13274138	12459458
445.37	446	0.63	24519569	24796658	25245061	26274087	27341055	27475576	31181220	31330688	30917927	28819634
446	448.27	2.27	95022257	93750433	100039127	100072269	101083100	101497375	134991509	124655348	120218462	126871719
448.27	449.27	1	51698600	50787925	54178775	53286350	53311900	53472500	62270825	58876325	59097150	60418450
449.27	450.28	1.01	52665339	52152915	55577674	54036717	55177689	55297500	65509105	63112880	60926785	64821573
450.28	451.8	1.52	84329600	87697236	90313118	88129980	85716600	85994000	97597642	92207760	88418476	94177300
451.8	453.03	1.23	71001442	72842137	74958937	74967916	75558285	75722152	76653723	75987032	74150827	74016142
453.03	453.37	0.34	9579900	10231425	10294716	10500101	9928000	9928000	11417200	11442020	10672600	11355150
453.37	454.13	0.76	21359800	22816150	22957624	23434752	21931244	21832767	24592897	24131026	22469400	23995100
454.13	455.31	1.18	28785835	31176220	31395877	32057001	30665840	30360043	32020392	34830709	32302500	34298795

Vehicle Miles Traveled Data (Nebraska)

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	0.48	0.48	759492	788400	863736	835704	876000	935568	890016	858480	753360	749856
0.48	8.46	7.98	12626555	13107150	14417865	13951833	14417865	15553818	14796516	14126595	12626555	12495483
8.46	20.71	12.25	19427581	20120625	22177400	21439644	22110331	23854119	22758663	21774988	19382869	19181663
20.71	22.69	1.98	3107610	3219629	3472574	3396690	3476187	3758040	3609887	3450893	3042567	3010046
22.69	29.76	7.07	11122171	11612475	12489862	12206002	12309224	13289833	12709209	12335029	10902824	10760894
29.76	38.96	9.2	14472980	15111000	16252720	15849760	15866550	17125800	16286300	16151980	14254710	14036440
38.96	48.82	9.86	15565243	16195050	17418676	16914830	16860847	18174445	17202742	17400682	15331314	15079391
48.82	55.37	6.55	10351948	10519300	11547323	11236525	11105034	11953750	11248479	11630999	10220456	10041150
55.37	59.92	4.55	7174440	7307300	7888563	7473375	7639450	8212409	7689273	8121068	7132921	6991758
59.92	69.63	9.71	14619619	15133521	15381611	14991755	16161324	17029641	16161324	17437218	15275287	14956313
69.63	76.61	6.98	10483786	10916895	11006064	10776771	11528343	12101575	11770374	12458253	11082495	10725817
76.61	85.22	8.61	12900578	13513395	13529108	13199130	14110499	14833308	14707602	15288992	13780520	13199130
85.22	95.02	9.8	14665700	15291675	14773010	14969745	15917650	16758245	16668820	17330565	15631490	15238020
95.02	101.19	6.17	9346008	9627514	9368528	9537432	10190526	10697238	10472033	10899922	9863979	9571213
101.19	102.59	1.4	2146200	2184525	2153865	2192190	2350600	2503900	2376150	2470685	2243290	2187080
102.59	107.36	4.77	10185143	10820626	10733573	10724868	11142720	12013245	11839140	12152529	11107899	10933794
107.36	117.25	9.89	21424460	22561563	22381070	22778154	23103040	24907965	24546980	25196753	23030843	22940597
117.25	126.69	9.44	20794196	21655596	21345492	22103524	22069068	23740184	23378396	23946920	21965700	22155208
126.69	133.97	7.28	16448068	17497662	17019366	17776668	17776668	19052124	18560542	19131840	17457804	17630522
133.97	145.67	11.7	26647920	27715545	27117675	28740465	28334768	30235140	30149730	31430880	28228005	28185300
145.67	158.03	12.36	28376706	28827846	27790224	30474507	29685012	31579800	32166282	33474588	30000810	29504556
158.03	164.53	6.5	15006063	15599188	14756950	16192313	15634775	16560050	16939650	17556500	15860163	15563600
164.53	177.18	12.65	29642745	30797058	29134848	31051006	30381505	32320750	33105683	34283081	31097179	30473850
177.18	179.22	2.04	4616520	4802670	4702149	4914360	4865961	5137740	5357397	5550993	5048388	4947867

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
179.22	190.45	11.23	25577448	26233280	25659427	26889112	26766144	28323745	29614914	30660146	27995829	27401481
190.45	199	8.55	19473480	19972800	19442273	20378498	20362894	21595590	22625438	23436833	21455156	20987044
199	211.8	12.8	29153280	29900800	28989760	30835200	30461440	32376960	34012160	35203520	32353600	31629440
211.8	222.49	10.69	24386563	24971840	24191470	25791229	25401044	27078839	28503014	29517495	27195895	26571599
222.49	231.13	8.64	19615392	20183040	19520784	21002976	20514168	21917520	23131656	23935824	22138272	21602160
231.13	237.22	6.09	13870584	14248469	13781670	14893095	14448525	15471036	16360176	16938117	15704435	15326551
237.22	248.56	11.34	25621029	26366067	25496856	29118569	26883455	29739434	30587949	31643420	29449697	28704659
248.56	257.04	8.48	19375952	19840232	19174764	21944968	20273560	22362820	23074716	23910420	21944968	21418784
257.04	263.69	6.65	16068395	16177621	15607217	16990750	16335392	17549017	17998059	18762642	17087840	16748025
263.69	272.64	8.95	21952560	21772889	21005203	22720246	22573243	23667604	24092281	25268311	23487933	22458906
272.64	279.92	7.28	17962672	17829812	17550806	18799690	18666830	19397560	19995430	20633158	19437418	18533970
279.92	285.66	5.74	14162876	14037170	14173352	14414288	14801882	15336132	15838956	16509388	15419936	14676176
285.66	291.39	5.73	14054544	13970886	14326432	14347347	14870209	15351243	15874105	16689771	15497644	14713351
291.39	300.13	8.74	21437472	21246066	22043591	21979789	22809215	23463186	24324513	25887662	23782196	22554007
300.13	305.69	5.56	13596980	13475216	14084036	14002860	14601533	14966825	15545204	16701962	15230647	14408740
305.69	312.1	6.41	15652259	15301311	16143585	16073396	16927368	17301712	18003607	18974562	17664358	16681705
312.1	314.14	2.04	4892022	4780332	5037219	5156355	5416965	5364843	5480256	6124335	5953077	5625453
314.14	318.17	4.03	9664142	9443499	9950977	10186329	10443745	10634969	10870321	12113273	11605796	10885030
318.17	324.17	6	14804400	14673000	14935800	14870100	15877500	15855600	16238850	18056550	17268150	15877500
324.17	332.18	8.01	19880820	19939293	20114712	19793111	21196463	21196463	21766574	24134731	22453632	20743297
332.18	338.15	5.97	15296931	14861121	15645579	15601998	15896170	16124970	16266608	17966267	16778685	15656474
338.15	342.14	3.99	10259986	9932307	10493002	10449311	10689609	10849808	10908062	11993042	11243022	10602228
342.14	348.12	5.98	15715440	14886014	16217461	16228375	16108326	16370250	16392077	17952708	16894098	16086499
348.12	353.12	5	13140000	12446500	13559750	13587125	13550625	13778750	13742250	14992375	14162000	13614500
353.12	360.14	7.02	19691275	18397314	19845013	19640029	19857825	20421531	19921882	21830796	20549646	19832202

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
360.14	366.16	6.02	16809345	15754641	16853291	16677507	17062035	17567414	17149927	18764942	17545441	16875264
366.16	369.15	2.99	8348827	7803152	8283346	8196038	8496160	8758084	8556184	9341956	8676232	8316087
369.15	373.12	3.97	11027271	10331727	10809913	10657763	11302590	11664853	11404024	12432849	11461986	10954818
373.12	379.11	5.99	16616260	15544949	16277376	16047809	17086325	17654776	17272165	18802610	17217506	16397625
379.11	382.11	3	8343900	8267250	8393175	8486250	8617650	8979000	9088500	9537450	8825700	8508150
382.11	388.14	6.03	16793248	16727220	16980329	17310472	17442529	18069799	18609032	19412379	18146833	17695638
388.14	395.62	7.48	21131748	21077144	21541278	21950808	22387640	23206700	23861948	24626404	22974633	22428593
395.62	396.8	1.18	3402530	3402530	3454214	3518819	3583424	3712634	3816002	3927984	3871993	3785853
396.8	397.3	0.5	1438100	1423500	1441750	1469125	1496500	1551250	1595050	1642500	1586838	1551250
397.3	399.04	1.74	5004588	4699740	4795005	4791830	4572720	4763250	4915674	5080800	4922025	4763250
399.04	401.05	2.01	5561067	5355645	5480365	5443683	5282280	5502375	5678451	5795835	5685787	5429010
401.05	403.5	2.45	6778415	6617450	6778415	6706875	6662162	6930437	7145057	7243425	6975150	6841012
403.5	405.77	2.27	6106413	5965560	6122984	6023558	6131270	6421262	6620114	6669827	6421262	6296980
405.77	409.77	4	9884200	9636000	9957200	9752800	9928000	10512000	10862400	11315000	11096000	10804000
409.77	420.94	11.17	27622014	26093120	26990071	26419284	27316235	29762465	30740957	33024105	31148662	30985580
420.94	426.26	5.32	13155695	12427520	12835298	12563446	12874134	14175140	14641172	15922760	14796516	14786807
426.26	432.97	6.71	16654220	15699052	16225619	15882738	17217525	18123710	18711506	20107522	18687015	18687015
432.97	439.22	6.25	15968750	15877500	16025781	15489688	16767188	17451563	19390625	20531250	20040781	18934375
439.22	440.66	1.44	3889440	4073400	4104936	3963024	4317804	4501764	4730400	5072040	5114088	4835520
440.66	442.92	2.26	6599200	7147758	7259120	7015774	7201377	7490092	7580831	8290245	8203630	7667445
442.92	445.07	2.15	7039207	7141225	7247166	7015665	7023512	7572837	7533600	7945594	7867119	7376650
445.07	445.37	0.3	1051200	1051200	1065983	1033680	1021088	1075838	1073100	1116900	1105950	1040250
445.37	446	0.63	2524851	2322495	2354688	2286853	2299500	2322495	2299500	2356988	2333993	2196023
446	448.27	2.27	9254904	9279760	9395757	7871225	7871225	7954080	8774345	8575493	8492638	8534065
448.27	449.27	1	4547900	4471250	4529650	3522250	3522250	3558750	3923750	3814250	3777750	3832500

Beginning Milepost	End Milepost	Length	Vehicle Miles Traveled (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
449.27	450.28	1.01	4633930	4538081	4597065	3575905	3575905	3612770	4018285	4331637	4294772	4092015
450.28	451.8	1.52	7417676	7545280	7600760	5464780	5464780	5520260	5991840	6435680	6380200	6102800
451.8	453.03	1.23	6249384	6191020	6235915	4713975	4713975	4758870	4828457	5207820	5162925	4938450
453.03	453.37	0.34	1149166	1352690	1338419	1102629	1141720	1154130	1213698	1321665	1259615	1259615
453.37	454.13	0.76	2563176	2995920	2984824	2460538	2552080	2568724	2704650	2947375	2801740	2801740
454.13	455.31	1.18	3454214	4266084	4134720	3363767	3917217	3940905	4156255	4533118	4307000	4307000

Crash Rate Data (Wyoming)

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	2.18	2.180	3.995	1.862	2.523	3.165	2.449	1.512	1.972	1.710	3.506	1.225
2.18	3.453	1.273	1.995	3.507	1.543	3.507	4.517	2.913	2.456	2.635	2.401	1.797
3.453	5.263	1.810	4.531	3.617	4.547	7.756	5.071	5.597	3.609	3.260	2.617	1.999
5.263	6.257	0.994	2.281	1.673	0.385	6.098	4.465	1.575	5.592	4.658	4.494	3.719
6.257	6.767	0.510	2.178	0.881	4.257	3.452	2.499	2.416	2.373	2.306	0.000	1.687
6.767	10.683	3.916	1.607	2.523	1.220	2.473	2.467	1.154	1.958	2.602	2.626	1.647
10.683	13.862	3.179	2.481	4.054	2.472	7.240	5.004	4.030	5.418	3.413	4.048	5.604
13.862	18.293	4.431	3.587	2.806	5.987	3.681	2.183	3.992	5.268	5.450	3.953	2.912
18.293	21.751	3.458	4.437	3.659	2.195	4.191	2.353	2.319	2.282	4.279	4.177	2.286
21.751	23.111	1.360	1.601	3.795	1.879	2.539	2.533	2.397	5.030	2.760	3.409	4.423
23.111	23.906	0.795	2.789	1.849	2.271	5.757	1.723	1.086	2.829	2.727	4.750	2.963
23.906	28.713	4.807	1.915	2.520	1.590	3.414	2.746	1.608	3.509	3.105	3.690	1.744
28.713	30.398	1.685	1.561	1.430	0.760	2.055	1.795	1.213	0.000	1.032	1.383	1.656
30.398	33.182	2.784	1.860	2.066	1.534	2.332	2.173	1.469	1.131	1.401	2.836	2.497
33.182	34.741	1.559	1.384	1.578	0.854	1.443	0.864	1.632	0.270	1.825	2.974	4.155
34.741	39.896	5.155	1.191	1.336	1.575	1.505	1.690	0.886	1.469	1.501	2.342	1.118
39.896	41.987	2.091	1.516	1.000	1.804	1.831	1.598	0.667	1.798	3.027	2.374	2.132
41.987	48.303	6.316	1.176	0.854	1.155	2.032	1.560	1.448	1.517	1.677	1.054	0.728
48.303	53.306	5.003	1.616	2.415	1.636	2.345	1.462	0.952	1.037	1.995	3.113	1.650
53.306	57.041	3.735	1.203	1.193	1.159	1.308	0.392	0.765	0.502	1.323	2.484	0.783
57.041	61.591	4.550	0.888	0.577	0.529	1.611	1.825	1.993	1.029	2.073	1.932	1.285
61.591	66.168	4.577	0.792	1.362	0.954	1.184	0.633	1.032	1.326	1.761	2.126	1.273
66.168	68.972	2.804	1.284	0.819	1.328	2.068	1.602	0.446	2.079	0.949	1.143	0.855
68.972	72.296	3.324	0.861	1.389	0.881	1.259	0.735	0.761	1.621	0.601	0.644	1.350
72.296	82.71	10.414	1.667	1.733	0.706	1.216	1.375	1.129	1.229	0.459	1.147	1.106
82.71	83.007	0.297	10.394	13.337	8.249	2.752	6.694	2.729	3.937	5.125	1.446	5.765
83.007	85.697	2.690	1.537	2.175	1.239	2.015	1.207	2.158	2.101	1.917	2.471	2.740
85.697	89.000	3.303	1.037	1.571	0.724	1.690	1.410	1.948	2.747	2.149	3.601	2.906
89.000	89.445	0.445	4.618	3.587	4.478	9.858	5.232	4.252	5.708	5.582	7.518	8.987
89.445	91.532	2.087	6.564	6.974	4.253	8.388	5.104	8.316	5.732	6.638	6.943	2.726
91.532	92.654	1.122	0.847	1.239	1.232	2.195	2.382	3.256	2.855	3.064	2.066	1.492
92.654	99.138	6.484	1.856	2.873	2.346	2.364	2.308	2.736	2.602	2.154	3.705	2.808
99.138	100.27	1.132	6.051	2.817	1.529	3.022	2.704	2.623	1.828	4.149	4.625	2.481

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
100.27	102.338	2.068	1.771	2.749	1.740	2.949	3.359	2.560	2.899	5.398	5.516	5.084
102.338	102.358	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.309
102.358	103.819	1.461	1.510	1.465	2.861	4.018	3.015	3.822	3.850	3.430	4.351	3.673
103.819	104.825	1.006	2.238	1.817	5.779	7.822	6.634	2.479	5.087	3.404	2.253	1.918
104.825	107.056	2.231	3.204	3.759	4.449	6.567	4.603	4.949	3.880	5.567	2.733	2.394
107.056	107.81	0.754	6.348	3.783	4.386	9.176	3.868	5.678	4.770	2.869	5.172	1.712
107.81	111.161	3.351	1.470	1.217	0.846	0.885	0.871	2.070	1.496	1.329	2.551	1.861
111.161	122.272	11.111	0.861	0.873	0.829	1.420	1.243	1.178	1.027	1.591	1.557	1.265
122.272	130.84	8.568	1.586	0.885	1.760	2.046	1.712	1.182	1.599	2.363	1.915	1.481
130.84	136.958	6.118	1.547	1.679	1.601	2.110	1.433	1.472	2.716	2.575	3.979	4.332
136.958	139.509	2.551	1.971	1.115	1.847	2.802	1.839	0.538	3.867	0.856	2.457	4.028
139.509	142.17	2.661	1.511	1.069	3.541	3.223	2.821	1.547	3.063	1.990	1.009	1.847
142.17	146.848	4.678	2.687	2.239	1.582	2.801	4.331	1.250	2.991	3.478	2.023	2.019
146.848	150.807	3.959	1.143	0.842	1.518	1.891	0.814	1.023	3.379	1.815	1.260	0.114
150.807	152.455	1.648	1.830	0.867	1.122	1.988	1.956	1.092	3.578	2.950	1.651	1.099
152.455	154.055	1.600	4.399	1.476	2.026	2.051	2.594	0.563	3.465	3.374	0.576	1.149
154.055	156.025	1.970	2.041	0.959	0.236	1.195	0.706	0.460	1.997	1.214	0.234	1.633
156.025	158.545	2.520	1.995	0.562	0.369	1.681	0.736	0.719	2.550	1.596	0.914	0.912
158.545	165.582	7.037	1.730	1.205	1.749	1.114	1.550	1.199	2.740	1.180	1.701	1.175
165.582	170.676	5.094	0.987	0.919	1.008	0.649	0.548	0.453	1.499	0.687	1.074	0.536
170.676	173.413	2.737	3.306	1.699	1.016	1.716	1.857	0.335	2.874	1.090	2.665	1.330
173.413	184.288	10.875	1.710	1.973	0.759	1.494	0.672	1.149	1.788	1.418	1.537	1.614
184.288	187.204	2.916	1.896	1.566	1.572	2.229	1.409	1.530	3.265	1.592	1.967	1.963
187.204	196.157	8.953	1.628	2.703	1.301	1.372	0.726	1.165	1.916	2.476	3.282	0.963
196.157	199.051	2.894	2.779	3.476	1.288	2.612	2.728	0.470	2.370	1.879	3.578	0.744
199.051	201.164	2.113	2.379	4.080	1.764	2.683	0.659	0.644	1.826	1.386	3.058	1.223
201.164	204.175	3.011	1.670	2.704	1.238	1.412	0.452	1.564	2.146	2.093	1.857	0.285
204.175	206.182	2.007	2.755	1.916	1.393	2.824	0.678	0.213	2.588	1.472	3.851	2.562
206.182	209.459	3.277	1.520	1.599	1.449	1.763	0.846	0.532	1.573	1.023	3.653	0.994
209.459	211.2	1.741	5.426	3.792	3.250	3.021	1.845	0.994	3.648	4.041	4.551	1.912
211.2	211.87	0.670	2.443	6.504	3.252	6.595	0.791	2.985	2.920	4.281	5.752	2.153
211.87	214.051	2.181	2.757	3.102	1.755	1.779	3.203	2.614	3.806	4.647	5.745	2.282
214.111	215.57	1.459	3.477	2.610	1.612	3.922	2.864	1.512	2.290	3.638	2.203	2.187
215.57	215.82	0.250	15.095	14.507	22.831	5.343	8.557	6.618	1.532	4.506	1.516	0.000

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
215.82	219.594	3.774	3.231	0.920	1.782	2.711	1.086	1.154	3.207	1.524	2.788	2.482
219.594	221.926	2.332	1.976	2.031	2.083	3.263	1.107	2.503	2.503	0.874	4.025	1.913
221.926	228.341	6.415	0.705	1.860	0.699	1.276	0.817	1.254	1.697	2.898	2.824	0.282
228.341	235.228	6.887	2.505	1.273	1.525	2.421	1.162	1.705	0.804	2.548	2.317	1.255
235.228	238.155	2.927	3.182	3.324	1.136	4.277	1.578	2.159	1.521	1.481	6.204	2.549
238.155	255.602	17.447	3.894	3.029	2.454	2.295	1.910	2.332	2.529	2.816	5.061	2.357
255.602	260.232	4.630	4.218	2.549	3.082	3.021	1.799	2.539	2.144	3.027	3.641	2.272
260.232	267.186	6.954	2.106	2.877	1.642	3.260	2.267	2.084	2.708	2.640	3.637	2.269
267.186	272.056	4.870	3.453	3.582	1.856	1.783	1.999	3.069	2.377	1.930	2.915	1.940
272.056	279.859	7.803	2.642	3.400	3.514	3.296	2.969	2.643	3.324	2.474	2.148	2.613
279.859	280.901	1.042	2.083	1.559	2.979	2.015	2.900	1.885	5.526	4.936	2.514	3.011
280.901	290.438	9.537	1.195	1.646	2.984	2.364	2.670	2.498	3.069	2.892	2.582	1.919
290.438	297.663	7.225	0.901	1.199	1.719	1.451	1.833	2.130	2.337	1.691	1.088	0.796
297.663	309.91	12.247	2.259	1.326	1.394	1.327	0.915	0.608	1.979	2.170	2.262	1.975
309.91	310.452	0.542	11.011	5.994	13.365	5.805	4.698	10.073	4.562	10.698	2.840	2.975
310.452	310.84	1.304	1.296	0.000	0.000	1.320	1.268	1.237	0.000	0.000	3.807	3.780
310.84	311.756	0.720	0.549	3.182	2.759	1.118	2.148	1.571	3.031	3.449	4.035	3.005
311.756	313.191	1.435	6.013	6.124	4.753	5.459	5.552	3.318	7.353	5.935	6.043	2.000
313.191	316.702	3.511	3.151	1.734	0.677	2.742	2.085	0.858	1.021	1.439	1.492	0.912
316.702	317.42	0.718	2.632	1.280	1.932	3.264	0.000	1.829	3.882	1.624	2.773	2.754
317.42	323.049	5.629	4.280	4.818	4.847	4.830	5.435	4.587	4.386	3.659	3.962	3.021
323.049	329.316	6.267	8.053	6.004	3.730	5.839	5.033	4.756	2.756	5.816	5.335	3.526
329.316	335.106	5.790	4.234	4.387	3.624	5.091	4.887	5.132	5.046	4.853	3.837	2.928
335.106	336.609	1.503	1.599	2.191	2.792	3.736	2.391	2.617	4.501	2.745	1.733	0.865
336.609	339.317	2.708	2.307	1.911	2.755	1.728	2.820	1.936	2.966	2.438	1.764	1.600
339.317	342.56	3.243	2.938	1.996	3.379	2.967	4.890	2.380	1.932	2.389	1.724	3.574
342.56	345.501	2.941	3.402	2.044	2.902	3.218	3.135	1.744	1.257	1.228	2.163	1.727
345.501	348.363	2.862	2.641	2.896	2.511	1.732	2.144	1.342	1.846	1.247	0.885	1.178
348.363	356.74	8.377	0.853	1.215	1.717	1.238	1.035	0.806	1.175	0.883	1.052	0.556
356.74	357.68	0.940	2.028	0.985	3.826	1.439	1.384	1.796	2.277	3.059	0.469	1.486
357.68	359.076	1.396	4.096	2.321	1.610	2.261	1.242	0.907	1.227	4.499	2.718	2.969
359.076	359.599	0.523	14.967	5.694	19.255	9.091	7.484	4.500	4.777	5.432	3.132	4.665
359.599	362.037	2.438	2.558	4.001	4.472	3.250	2.480	2.450	2.038	2.557	3.460	2.418

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
362.037	364.05	2.013	5.731	2.896	5.304	5.316	4.786	5.482	4.939	3.751	2.732	1.277
364	367.424	3.424	4.041	3.414	2.262	2.551	2.863	3.252	1.760	2.245	2.458	1.492
367.424	370.394	2.970	1.963	3.548	1.689	1.355	1.453	0.899	2.089	1.189	1.867	1.298
370.394	377.353	6.959	2.077	1.492	2.199	2.287	1.675	1.082	1.591	1.240	1.091	0.834
377.353	386.389	9.036	1.394	1.166	1.346	1.754	0.922	0.262	1.118	1.132	0.954	1.329
386.389	391.385	4.996	1.261	1.751	1.595	1.107	0.997	1.371	1.426	1.839	1.472	1.224
391.385	401.456	10.071	1.455	1.376	1.349	1.957	1.669	1.619	1.693	1.210	1.086	1.084
401.456	402.779	1.323	1.515	1.497	1.972	0.986	1.931	1.455	2.951	0.935	5.024	1.671

Crash Rate Data (Wyoming)

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	2.18	2.180	3.016	0.883	0.412	1.371	0.452	1.208	1.970	0.753	1.758	1.522
2.18	3.453	1.273	1.148	3.026	0.000	0.783	0.774	0.000	1.349	1.289	1.505	1.738
3.453	5.263	1.810	0.000	1.083	1.097	1.727	1.125	0.999	1.402	0.000	1.030	1.185
5.263	6.257	0.994	0.766	1.994	0.000	0.000	1.807	0.790	0.881	1.707	1.894	0.000
6.257	6.767	0.510	0.000	1.964	1.946	3.928	0.000	3.326	1.739	1.684	0.000	0.000
6.767	10.683	3.916	1.380	2.046	0.507	1.791	1.003	0.217	0.906	1.974	0.478	0.824
10.683	13.862	3.179	2.155	1.263	0.000	3.174	2.498	2.155	1.940	1.879	2.951	4.418
13.862	18.293	4.431	2.319	0.906	2.031	0.683	0.224	1.353	3.244	2.552	1.482	0.733
18.293	21.751	3.458	1.818	2.396	1.774	0.895	0.293	1.533	1.953	4.042	2.830	0.984
21.751	23.111	1.360	0.000	3.783	0.747	2.261	0.741	1.291	2.373	2.283	3.574	2.485
23.111	23.906	0.795	2.286	0.000	0.000	2.621	0.000	1.124	0.000	1.202	2.490	0.000
23.906	28.713	4.807	1.682	0.862	0.849	2.143	1.689	0.552	1.872	3.010	3.460	0.942
28.713	30.398	1.685	1.066	1.844	0.000	1.834	1.204	1.049	0.000	1.137	0.579	1.343
30.398	33.182	2.784	1.270	0.372	1.100	1.850	1.458	0.635	0.711	1.372	2.792	2.830
33.182	34.741	1.559	0.558	1.326	0.000	0.000	0.646	0.567	0.000	0.596	0.623	1.445
34.741	39.896	5.155	0.349	0.602	0.849	0.857	0.840	0.205	0.606	1.409	0.956	0.665
39.896	41.987	2.091	0.819	0.956	0.516	1.042	0.000	1.000	0.000	2.955	0.466	0.000
41.987	48.303	6.316	0.427	0.167	0.495	0.666	0.982	0.320	0.667	1.163	0.617	0.537
48.303	53.306	5.003	1.114	1.474	0.208	2.102	0.827	0.808	0.415	2.066	0.774	1.344
53.306	57.041	3.735	0.734	0.281	1.111	1.122	0.276	0.270	0.554	0.827	2.333	0.601
57.041	61.591	4.550	0.602	0.231	0.228	0.461	1.358	1.550	0.000	2.490	1.277	0.493
61.591	66.168	4.577	0.812	0.232	0.458	0.924	0.455	0.668	0.897	1.117	0.846	0.734
66.168	68.972	2.804	1.056	0.311	1.139	0.855	0.855	0.283	2.059	0.715	0.293	0.332
68.972	72.296	3.324	0.642	1.245	0.942	1.177	0.475	0.472	1.401	0.246	0.503	0.988
72.296	82.71	10.414	0.820	0.640	0.377	0.075	0.836	0.756	0.879	0.334	0.805	0.633
82.71	83.007	0.297	7.188	5.608	2.643	0.000	0.000	0.000	4.920	2.428	2.938	0.000
83.007	85.697	2.690	1.006	1.776	0.289	0.578	0.584	1.652	1.072	0.529	1.209	2.672
85.697	89.000	3.303	0.205	0.718	0.466	0.000	0.940	0.680	0.456	0.899	1.613	1.009
89.000	89.445	0.445	1.520	1.777	0.000	0.000	1.744	3.364	1.691	5.005	3.420	13.107
89.445	91.532	2.087	4.247	2.473	1.349	3.751	1.626	3.485	2.387	1.567	3.291	2.450
91.532	92.654	1.122	0.669	0.000	0.775	3.612	0.706	2.029	1.628	0.537	1.913	0.707
92.654	99.138	6.484	1.042	2.091	0.671	0.750	0.855	1.756	1.972	0.743	1.986	1.836
99.138	100.27	1.132	3.458	0.737	0.776	0.724	1.413	0.000	0.000	3.210	2.712	0.709

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
100.27	102.338	2.068	2.024	1.438	1.514	3.530	2.069	0.647	1.905	1.879	3.969	1.383
102.338	102.358	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102.358	103.819	1.461	0.544	0.000	1.145	2.799	0.706	2.123	1.126	1.110	2.605	1.088
103.819	104.825	1.006	0.838	1.676	4.997	4.952	7.276	2.079	2.529	3.321	0.000	3.150
104.825	107.056	2.231	2.303	1.202	1.990	3.648	3.070	2.947	3.353	3.709	2.449	1.830
107.056	107.81	0.754	3.537	0.000	2.539	3.768	1.235	2.385	0.000	2.143	5.894	2.460
107.81	111.161	3.351	0.682	0.247	0.245	0.727	0.477	0.920	0.858	1.448	1.820	0.237
111.161	122.272	11.111	0.429	0.466	0.617	0.635	0.861	0.763	0.736	1.130	1.479	0.663
122.272	130.84	8.568	1.035	0.505	1.305	1.031	1.117	0.891	1.059	2.033	1.099	0.383
130.84	136.958	6.118	0.995	1.659	1.198	2.162	0.911	0.739	2.465	1.445	2.095	1.779
136.958	139.509	2.551	2.046	0.723	0.718	2.963	0.000	0.354	3.274	0.314	1.570	1.642
139.509	142.17	2.661	0.981	1.040	2.755	2.840	1.745	1.019	1.584	2.430	1.505	0.944
142.17	146.848	4.678	2.417	1.995	1.787	2.634	3.386	0.000	2.523	3.801	1.370	1.611
146.848	150.807	3.959	1.081	0.472	0.436	1.320	0.216	0.633	3.700	2.710	1.012	0.000
150.807	152.455	1.648	1.559	1.127	0.524	0.529	2.078	0.507	3.079	0.984	0.486	0.508
152.455	154.055	1.600	3.211	0.000	2.161	1.091	0.535	0.000	4.308	3.095	0.000	0.525
154.055	156.025	1.970	1.738	0.941	0.000	1.339	0.880	0.858	2.333	1.337	0.000	0.853
156.025	158.545	2.520	2.038	0.736	0.000	1.044	0.000	0.333	3.058	1.302	0.638	1.667
158.545	165.582	7.037	1.360	1.186	1.357	0.872	1.347	0.597	2.493	1.025	0.913	0.717
165.582	170.676	5.094	0.336	0.721	0.843	0.340	0.168	0.000	1.974	0.473	0.782	0.327
170.676	173.413	2.737	1.877	1.006	0.631	0.636	0.624	0.000	1.192	1.430	2.611	0.911
173.413	184.288	10.875	1.023	1.207	0.315	0.876	0.548	0.534	1.628	0.966	0.642	0.821
184.288	187.204	2.916	1.468	0.901	0.291	0.881	0.867	0.846	1.386	1.863	1.868	1.393
187.204	196.157	8.953	0.777	1.662	1.042	0.956	0.188	0.735	1.163	2.493	2.894	0.458
196.157	199.051	2.894	1.775	2.117	0.893	2.104	0.592	0.570	1.107	1.064	2.170	0.566
199.051	201.164	2.113	2.026	2.071	0.000	1.646	0.405	0.391	1.137	0.728	1.858	1.164
201.164	204.175	3.011	1.137	3.198	1.431	0.578	0.000	0.784	2.135	0.769	1.913	0.272
204.175	206.182	2.007	2.133	0.436	0.000	2.600	0.416	0.000	2.013	0.387	2.050	1.632
206.182	209.459	3.277	0.784	1.068	0.268	1.353	0.256	0.242	0.482	0.911	2.518	0.526
209.459	211.2	1.741	4.292	1.989	1.989	2.510	0.962	0.454	2.721	2.144	3.576	0.000
211.2	211.87	0.670	0.000	0.000	0.000	3.014	0.000	1.361	4.084	3.861	2.684	0.000
211.87	214.051	2.181	1.187	0.402	1.187	0.000	0.766	0.360	1.774	3.447	3.467	1.445
214.111	215.57	1.459	1.847	1.878	1.847	1.865	0.596	1.121	0.533	2.075	1.587	0.000
215.57	215.82	0.250	0.000	14.269	17.402	10.537	6.735	0.000	0.000	5.582	3.491	0.000

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
215.82	219.594	3.774	3.036	0.679	1.104	2.228	0.641	0.807	1.633	0.885	1.550	2.548
219.594	221.926	2.332	2.311	1.469	0.716	2.892	0.347	1.309	1.309	0.318	3.336	1.936
221.926	228.341	6.415	0.560	1.335	0.521	0.788	0.252	0.716	1.055	2.174	3.772	0.141
228.341	235.228	6.887	1.326	0.640	0.746	2.133	0.603	1.026	0.499	1.209	1.380	0.656
235.228	238.155	2.927	1.560	1.860	0.604	2.134	0.587	0.277	1.453	0.846	4.943	0.973
238.155	255.602	17.447	2.041	1.924	1.722	1.125	1.428	1.254	1.341	2.555	3.369	1.687
255.602	260.232	4.630	2.959	1.568	2.100	1.927	0.556	2.451	1.290	2.503	3.436	1.797
260.232	267.186	6.954	0.919	2.740	0.890	3.208	1.847	2.092	2.098	1.359	2.288	1.862
267.186	272.056	4.870	2.625	2.794	1.815	2.199	1.582	2.655	1.705	1.820	2.532	1.892
272.056	279.859	7.803	2.107	2.955	3.511	2.719	2.386	1.927	3.021	2.125	1.806	2.719
279.859	280.901	1.042	0.876	0.891	5.330	1.795	4.310	0.812	7.128	5.382	1.691	3.541
280.901	290.438	9.537	0.766	0.892	2.576	1.292	1.819	1.441	1.990	2.856	1.755	1.644
290.438	297.663	7.225	0.379	0.915	0.915	0.918	0.885	1.189	1.494	0.781	0.732	0.128
297.663	309.91	12.247	1.137	0.705	0.314	0.619	0.671	0.351	1.320	2.224	1.362	1.410
309.91	310.452	0.542	6.854	7.082	7.095	1.749	1.685	7.923	0.000	10.658	0.000	1.771
310.452	310.84	1.304	2.394	0.000	0.000	2.386	0.000	0.000	0.000	0.000	0.000	3.625
310.84	311.756	0.720	0.000	1.010	3.073	0.000	0.000	0.909	1.739	0.845	1.917	0.000
311.756	313.191	1.435	3.292	5.008	0.000	0.581	2.767	2.098	2.621	2.136	4.087	0.635
313.191	316.702	3.511	0.918	0.578	0.000	1.649	1.301	0.000	0.488	0.000	0.816	0.299
316.702	317.42	0.718	2.993	1.426	1.411	1.390	0.000	0.000	2.385	1.156	1.289	2.834
317.42	323.049	5.629	3.817	1.820	1.799	2.305	2.350	1.413	3.042	3.392	1.973	1.627
323.049	329.316	6.267	6.515	4.086	0.970	3.344	2.412	3.808	1.655	4.278	4.890	1.955
329.316	335.106	5.790	4.453	3.184	2.099	3.792	2.284	2.900	3.616	4.869	3.529	2.640
335.106	336.609	1.503	0.715	2.726	2.696	2.656	0.000	1.176	2.422	0.000	0.618	0.000
336.609	339.317	2.708	2.381	0.756	1.496	1.116	1.744	0.979	1.008	1.952	0.686	0.376
339.317	342.56	3.243	2.650	1.884	1.249	0.311	2.649	0.826	0.831	1.877	0.573	2.512
342.56	345.501	2.941	2.192	2.424	1.722	1.370	0.974	0.303	0.301	1.164	0.629	1.725
345.501	348.363	2.862	1.126	1.779	2.123	0.704	1.334	0.000	0.612	1.778	0.645	0.707
348.363	356.74	8.377	0.257	0.729	0.606	1.325	0.800	0.534	0.549	0.637	0.887	0.362
356.74	357.68	0.940	1.143	1.083	2.159	1.086	0.000	0.000	0.000	2.839	0.000	2.153
357.68	359.076	1.396	3.079	1.459	0.000	0.731	1.387	0.646	0.000	3.145	2.357	2.988
359.076	359.599	0.523	4.109	1.947	6.548	4.338	6.494	0.000	1.712	4.677	4.865	1.649
359.599	362.037	2.438	1.297	2.073	1.938	2.313	0.770	1.081	0.653	1.202	1.861	2.024

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
362.037	364.05	2.013	1.633	0.518	0.972	0.485	0.962	0.451	1.645	0.754	0.468	0.000
364	367.424	3.424	0.340	1.557	0.923	1.229	0.913	1.135	0.304	0.000	0.000	0.690
367.424	370.394	2.970	0.802	4.035	0.724	0.415	0.403	0.000	0.782	0.623	0.391	0.874
370.394	377.353	6.959	1.968	0.817	1.417	1.282	0.532	0.402	1.253	0.787	0.682	0.960
377.353	386.389	9.036	1.078	0.248	0.485	0.846	0.410	0.000	0.883	0.252	0.952	0.595
386.389	391.385	4.996	0.975	0.469	0.918	0.521	0.505	1.102	0.250	0.680	1.203	0.787
391.385	401.456	10.071	0.759	0.729	0.832	1.064	0.645	0.651	1.395	0.669	0.358	0.521
401.456	402.779	1.323	0.000	0.000	0.910	1.018	2.958	2.001	2.850	0.908	1.849	0.000

Crash Rate Data (Nebraska)

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	0.48	0.48	0.000	0.000	0.668	1.387	0.653	1.320	0.000	1.327	0.746	0.000
0.48	8.46	7.98	0.613	0.657	0.355	0.328	0.202	0.158	0.603	0.687	0.397	0.043
8.46	20.71	12.25	0.606	0.428	0.332	0.266	0.176	0.154	0.182	0.314	0.345	0.452
20.71	22.69	1.98	0.334	0.852	0.343	0.890	0.670	0.173	0.173	0.710	0.390	0.791
22.69	29.76	7.07	0.334	0.378	0.189	0.295	0.378	0.145	0.230	0.446	0.161	0.218
29.76	38.96	9.2	0.547	0.331	0.259	0.346	0.146	0.338	0.261	0.341	0.174	0.296
38.96	48.82	9.86	0.432	0.556	0.172	0.358	0.206	0.245	0.318	0.635	0.275	0.239
48.82	55.37	6.55	0.350	0.635	0.422	0.548	0.417	0.320	0.430	0.371	0.235	0.300
55.37	59.92	4.55	0.849	0.386	0.308	0.613	0.378	0.311	0.481	1.064	0.416	0.260
59.92	69.63	9.71	0.568	0.607	0.519	0.258	0.435	0.222	0.383	0.355	0.315	0.320
69.63	76.61	6.98	0.053	0.960	0.455	0.465	0.354	0.405	0.602	0.737	0.323	0.328
76.61	85.22	8.61	0.350	0.786	0.662	0.469	0.369	0.444	0.244	0.119	0.257	0.131
85.22	95.02	9.8	0.428	0.511	0.457	0.268	0.335	0.330	0.074	0.429	0.426	0.157
95.02	101.19	6.17	0.420	0.499	0.541	0.302	0.346	0.347	0.594	0.512	0.187	0.254
101.19	102.59	1.4	0.769	1.371	0.520	2.093	1.296	1.044	1.579	1.017	0.839	0.276
102.59	107.36	4.77	0.443	0.686	0.451	0.532	0.325	0.445	0.459	0.407	0.471	0.255
107.36	117.25	9.89	0.440	0.484	0.195	0.078	0.307	0.523	0.315	0.275	0.234	0.149
117.25	126.69	9.44	0.347	0.389	0.205	0.273	0.286	0.264	0.313	0.374	0.206	0.526
126.69	133.97	7.28	0.506	0.491	0.373	0.372	0.217	0.361	0.325	0.400	0.329	0.330
133.97	145.67	11.7	0.474	0.264	0.493	0.306	0.294	0.341	0.202	0.350	0.348	0.454
145.67	158.03	12.36	0.460	0.477	0.354	0.332	0.305	0.376	0.447	0.447	0.421	0.489
158.03	164.53	6.5	0.555	0.405	0.421	0.437	0.393	0.299	0.471	0.390	0.512	0.302
164.53	177.18	12.65	0.464	0.425	0.302	0.236	0.278	0.319	0.267	0.481	0.350	0.243
177.18	179.22	2.04	1.126	0.724	1.338	0.474	0.419	0.607	0.439	0.692	0.839	0.751
179.22	190.45	11.23	0.438	0.542	0.455	0.486	0.435	0.431	0.475	0.481	0.469	0.425
190.45	199	8.55	0.359	0.501	0.209	0.191	0.448	0.385	0.423	0.342	0.565	0.223

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
199	211.8	12.8	0.370	0.517	0.421	0.373	0.377	0.284	0.459	0.372	0.402	0.433
211.8	222.49	10.69	0.278	0.279	0.431	0.325	0.199	0.260	0.455	0.267	0.323	0.305
222.49	231.13	8.64	0.433	0.577	0.360	0.515	0.365	0.342	0.283	0.346	0.354	0.478
231.13	237.22	6.09	0.360	0.383	0.106	0.321	0.222	0.542	0.338	0.700	0.409	0.484
237.22	248.56	11.34	0.585	0.427	0.328	0.487	0.376	0.404	0.335	0.543	0.388	0.537
248.56	257.04	8.48	0.536	0.333	0.361	0.305	0.384	0.404	0.291	0.343	0.479	0.337
257.04	263.69	6.65	0.592	0.546	0.289	0.269	0.379	0.471	0.283	0.627	0.255	0.400
263.69	272.64	8.95	0.415	0.451	0.335	0.390	0.496	0.236	0.405	0.496	0.274	0.253
272.64	279.92	7.28	0.901	0.728	0.722	0.492	0.680	0.595	0.594	0.465	0.492	0.532
279.92	285.66	5.74	0.440	0.310	0.522	0.349	0.291	0.469	0.410	0.225	0.431	0.288
285.66	291.39	5.73	0.730	0.594	0.397	0.348	0.692	0.372	0.406	0.588	0.456	0.425
291.39	300.13	8.74	0.397	0.456	0.466	0.352	0.854	0.621	0.292	0.361	0.350	0.516
300.13	305.69	5.56	0.438	0.476	0.452	0.325	0.294	0.232	0.244	0.193	0.300	0.413
305.69	312.1	6.41	0.613	0.687	0.956	0.796	0.614	0.382	0.259	0.638	0.612	0.376
312.1	314.14	2.04	0.912	1.064	2.173	1.255	0.574	0.456	0.648	0.714	0.602	0.730
314.14	318.17	4.03	0.616	0.467	1.065	0.669	0.538	0.503	0.591	0.914	0.403	0.577
318.17	324.17	6	0.551	0.425	0.387	0.301	0.487	0.569	0.229	0.290	0.313	0.396
324.17	332.18	8.01	0.674	0.630	0.525	0.274	0.428	0.536	0.287	0.487	0.449	0.626
332.18	338.15	5.97	0.594	0.481	0.270	0.400	0.498	0.268	0.240	0.246	0.264	0.228
338.15	342.14	3.99	0.329	0.192	0.308	0.188	0.091	0.483	0.264	0.238	0.195	0.340
342.14	348.12	5.98	0.187	0.168	0.079	0.404	0.296	0.315	0.133	0.135	0.277	0.366
348.12	353.12	5	0.422	0.492	0.428	0.363	0.416	0.484	0.205	0.248	0.327	0.170
353.12	360.14	7.02	0.449	0.307	0.266	0.463	0.392	0.285	0.337	0.314	0.297	0.324
360.14	366.16	6.02	0.476	0.490	0.351	0.447	0.424	0.350	0.298	0.336	0.402	0.573
366.16	369.15	2.99	0.382	0.493	0.259	0.556	0.430	0.394	0.468	0.361	0.307	0.300
369.15	373.12	3.97	0.232	0.457	0.417	0.333	0.218	0.352	0.331	0.275	0.461	0.423
373.12	379.11	5.99	0.343	0.511	0.516	0.420	0.381	0.486	0.458	0.425	0.399	0.243

Beginning Milepost	End Milepost	Length	Crash Rates (All Vehicles)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
379.11	382.11	3	0.772	0.697	1.071	0.577	0.642	0.988	0.434	0.634	0.865	0.812
382.11	388.14	6.03	0.342	0.428	0.710	0.593	0.300	0.501	0.336	0.333	0.332	0.437
388.14	395.62	7.48	0.673	0.426	0.593	0.678	0.427	0.467	0.516	0.513	0.453	0.362
395.62	396.8	1.18	0.566	0.969	0.876	0.961	0.481	0.925	0.618	0.871	1.298	1.056
396.8	397.3	0.5	1.733	2.748	3.673	2.529	1.266	0.909	1.471	0.865	1.059	1.786
397.3	399.04	1.74	0.941	1.125	0.502	1.396	0.607	0.660	0.528	0.454	0.402	0.186
399.04	401.05	2.01	1.166	0.662	0.531	0.749	0.471	0.578	0.524	0.453	0.410	0.525
401.05	403.5	2.45	0.528	0.642	0.347	0.530	0.529	0.460	0.446	0.469	0.418	0.732
403.5	405.77	2.27	1.208	1.265	1.097	1.125	0.791	0.880	0.501	0.664	0.944	0.500
405.77	409.77	4	1.101	0.774	1.138	0.820	0.483	0.642	0.390	0.444	0.476	0.425
409.77	420.94	11.17	0.871	0.706	0.732	0.616	0.468	0.478	0.301	0.480	0.425	0.307
420.94	426.26	5.32	0.655	0.564	0.583	0.520	0.552	0.499	0.255	0.289	0.404	0.377
426.26	432.97	6.71	0.726	0.753	0.725	0.679	0.393	0.619	0.542	0.544	0.210	0.315
432.97	439.22	6.25	0.584	0.892	0.643	0.885	0.482	0.465	0.162	0.354	0.254	0.288
439.22	440.66	1.44	0.641	1.140	0.744	1.437	0.776	0.770	0.387	0.586	0.644	0.341
440.66	442.92	2.26	0.680	1.287	0.880	0.460	0.278	0.366	0.221	0.524	0.544	0.291
442.92	445.07	2.15	0.635	0.602	0.744	0.680	0.562	0.475	0.510	0.589	0.684	0.496
445.07	445.37	0.3	0.684	1.124	0.878	1.226	1.073	1.199	0.751	0.836	0.829	0.963
445.37	446	0.63	0.449	0.766	0.871	0.419	0.658	0.692	0.673	0.575	0.615	0.416
446	448.27	2.27	0.558	0.757	0.740	0.909	0.623	0.650	0.422	0.610	0.541	0.591
448.27	449.27	1	0.870	1.103	1.292	1.088	1.088	0.804	0.835	1.019	0.863	1.092
449.27	450.28	1.01	1.310	1.649	1.385	1.203	1.178	1.302	0.824	1.347	0.804	0.833
450.28	451.8	1.52	0.866	0.764	0.808	0.794	0.840	0.895	0.482	0.933	0.961	0.743
451.8	453.03	1.23	1.380	1.345	1.588	1.281	1.271	1.202	1.109	1.342	1.403	1.324
453.03	453.37	0.34	0.626	0.684	0.486	0.952	0.504	0.604	0.613	0.350	0.937	0.793
453.37	454.13	0.76	1.732	1.446	1.699	0.896	1.368	1.053	1.179	1.077	1.736	1.125
454.13	455.31	1.18	0.973	0.674	0.733	0.873	0.554	0.494	0.937	0.632	0.681	0.671

Crash Rate Data (Nebraska)

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only) 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0	0.48	0.48	0.000	0.000	0.000	1.197	1.142	0.000	0.000	1.165	0.000	0.000
0.48	8.46	7.98	0.475	0.687	0.000	0.143	0.000	0.000	0.203	0.496	0.158	0.000
8.46	20.71	12.25	0.360	0.149	0.135	0.047	0.136	0.084	0.088	0.092	0.258	0.313
20.71	22.69	1.98	0.000	0.000	0.000	0.294	0.288	0.000	0.000	0.000	0.000	0.000
22.69	29.76	7.07	0.180	0.258	0.080	0.246	0.162	0.150	0.000	0.081	0.000	0.186
29.76	38.96	9.2	0.622	0.265	0.123	0.126	0.126	0.234	0.246	0.000	0.070	0.356
38.96	48.82	9.86	0.193	0.247	0.000	0.118	0.000	0.165	0.174	0.000	0.326	0.199
48.82	55.37	6.55	0.386	0.285	0.000	0.267	0.180	0.167	0.089	0.344	0.098	0.100
55.37	59.92	4.55	0.697	0.000	0.000	0.134	0.000	0.122	0.130	0.246	0.561	0.143
59.92	69.63	9.71	0.342	0.529	0.455	0.133	0.371	0.117	0.309	0.172	0.327	0.201
69.63	76.61	6.98	0.000	0.366	0.273	0.464	0.087	0.083	0.255	0.642	0.180	0.373
76.61	85.22	8.61	0.155	0.222	0.370	0.303	0.142	0.337	0.408	0.065	0.218	0.076
85.22	95.02	9.8	0.545	0.196	0.135	0.200	0.126	0.179	0.000	0.115	0.256	0.197
95.02	101.19	6.17	0.214	0.312	0.320	0.210	0.196	0.000	0.382	0.367	0.304	0.313
101.19	102.59	1.4	0.000	0.458	0.000	0.912	0.000	0.399	0.842	1.214	0.892	0.000
102.59	107.36	4.77	0.491	0.277	0.279	0.746	0.449	0.166	0.169	0.247	0.450	0.091
107.36	117.25	9.89	0.327	0.000	0.000	0.000	0.216	0.201	0.285	0.238	0.174	0.044
117.25	126.69	9.44	0.144	0.231	0.141	0.136	0.136	0.084	0.257	0.167	0.091	0.361
126.69	133.97	7.28	0.122	0.229	0.235	0.281	0.225	0.262	0.323	0.209	0.057	0.113
133.97	145.67	11.7	0.300	0.180	0.258	0.209	0.176	0.033	0.100	0.191	0.213	0.319
145.67	158.03	12.36	0.247	0.347	0.180	0.066	0.236	0.190	0.249	0.358	0.200	0.136
158.03	164.53	6.5	0.267	0.128	0.407	0.062	0.320	0.181	0.059	0.114	0.063	0.129
164.53	177.18	12.65	0.270	0.130	0.137	0.161	0.132	0.031	0.091	0.204	0.225	0.131
177.18	179.22	2.04	0.217	0.416	0.425	0.203	0.000	0.195	0.187	0.180	0.198	0.000
179.22	190.45	11.23	0.078	0.381	0.195	0.260	0.224	0.106	0.135	0.196	0.107	0.146
190.45	199	8.55	0.359	0.551	0.206	0.049	0.196	0.370	0.088	0.213	0.373	0.191
199	211.8	12.8	0.137	0.301	0.207	0.065	0.197	0.124	0.118	0.142	0.093	0.126
211.8	222.49	10.69	0.123	0.080	0.289	0.194	0.079	0.222	0.140	0.136	0.147	0.151
222.49	231.13	8.64	0.306	0.347	0.154	0.333	0.097	0.183	0.043	0.125	0.181	0.139
231.13	237.22	6.09	0.216	0.421	0.073	0.134	0.138	0.194	0.122	0.472	0.064	0.326
237.22	248.56	11.34	0.351	0.341	0.275	0.240	0.186	0.135	0.196	0.190	0.102	0.209
248.56	257.04	8.48	0.413	0.252	0.156	0.182	0.099	0.089	0.087	0.251	0.046	0.233
257.04	263.69	6.65	0.311	0.371	0.128	0.118	0.184	0.285	0.056	0.107	0.234	0.239

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
263.69	272.64	8.95	0.228	0.322	0.000	0.088	0.310	0.042	0.166	0.237	0.255	0.089
272.64	279.92	7.28	0.445	0.280	0.342	0.266	0.321	0.361	0.250	0.145	0.360	0.432
279.92	285.66	5.74	0.212	0.000	0.353	0.000	0.000	0.196	0.253	0.061	0.065	0.068
285.66	291.39	5.73	0.356	0.501	0.000	0.209	0.067	0.000	0.063	0.300	0.194	0.136
291.39	300.13	8.74	0.047	0.329	0.227	0.273	0.482	0.213	0.041	0.155	0.168	0.310
300.13	305.69	5.56	0.221	0.223	0.071	0.071	0.068	0.334	0.193	0.000	0.131	0.208
305.69	312.1	6.41	0.447	0.457	0.310	0.498	0.414	0.289	0.111	0.264	0.453	0.240
312.1	314.14	2.04	0.613	0.628	0.993	0.776	0.369	0.186	0.547	0.000	0.504	0.356
314.14	318.17	4.03	0.207	0.106	0.703	0.000	0.192	0.188	0.276	0.413	0.172	0.184
318.17	324.17	6	0.338	0.545	0.134	0.067	0.378	0.505	0.185	0.055	0.000	0.252
324.17	332.18	8.01	0.352	0.301	0.298	0.152	0.330	0.330	0.092	0.331	0.134	0.145
332.18	338.15	5.97	0.261	0.404	0.192	0.192	0.063	0.062	0.123	0.223	0.179	0.000
338.15	342.14	3.99	0.195	0.201	0.095	0.096	0.000	0.277	0.275	0.167	0.089	0.189
342.14	348.12	5.98	0.064	0.067	0.000	0.185	0.186	0.305	0.122	0.111	0.118	0.124
348.12	353.12	5	0.152	0.321	0.147	0.294	0.148	0.363	0.073	0.067	0.282	0.073
353.12	360.14	7.02	0.203	0.217	0.050	0.102	0.050	0.147	0.201	0.229	0.146	0.202
360.14	366.16	6.02	0.238	0.190	0.415	0.180	0.176	0.228	0.292	0.107	0.114	0.593
366.16	369.15	2.99	0.000	0.256	0.121	0.610	0.000	0.114	0.351	0.321	0.115	0.120
369.15	373.12	3.97	0.181	0.387	0.278	0.188	0.177	0.086	0.438	0.080	0.262	0.183
373.12	379.11	5.99	0.181	0.322	0.430	0.374	0.176	0.227	0.174	0.053	0.407	0.244
379.11	382.11	3	0.240	0.605	0.715	0.236	0.348	0.780	0.220	0.105	0.680	0.235
382.11	388.14	6.03	0.238	0.359	0.412	0.635	0.172	0.332	0.161	0.206	0.110	0.226
388.14	395.62	7.48	0.284	0.285	0.511	0.319	0.268	0.129	0.210	0.122	0.348	0.357
395.62	396.8	1.18	0.294	0.588	0.579	0.853	0.000	0.269	0.262	0.000	1.550	0.528
396.8	397.3	0.5	1.391	2.107	0.694	1.361	0.668	0.645	0.627	0.609	1.260	0.645
397.3	399.04	1.74	0.200	1.277	0.209	0.626	0.000	0.630	0.000	0.590	0.406	0.000
399.04	401.05	2.01	0.360	0.373	0.365	0.000	0.189	0.182	0.528	0.000	0.528	0.737
401.05	403.5	2.45	0.148	0.302	0.148	0.298	0.600	0.433	0.420	0.000	0.430	0.877
403.5	405.77	2.27	1.310	0.335	0.490	0.664	0.815	0.467	0.302	0.900	0.311	0.318
405.77	409.77	4	0.708	0.311	0.603	0.308	0.201	0.381	0.092	0.177	0.451	0.278
409.77	420.94	11.17	0.181	0.422	0.519	0.492	0.256	0.302	0.228	0.273	0.289	0.194
420.94	426.26	5.32	0.228	0.483	0.312	0.557	0.078	0.423	0.137	0.063	0.135	0.135
426.26	432.97	6.71	0.721	0.382	0.247	0.378	0.058	0.441	0.695	0.398	0.054	0.214
432.97	439.22	6.25	0.564	0.819	0.499	0.646	0.119	0.172	0.103	0.146	0.349	0.317

Beginning Milepost	End Milepost	Length	Crash Rates (Trucks Only)									
			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
439.22	440.66	1.44	0.257	0.491	0.731	0.757	0.000	0.222	0.000	0.000	0.196	0.620
440.66	442.92	2.26	0.606	0.979	0.689	0.570	0.000	0.134	0.000	0.482	0.609	0.261
442.92	445.07	2.15	0.284	0.700	1.104	0.143	0.427	1.056	0.929	0.503	0.636	0.678
445.07	445.37	0.3	0.307	0.307	0.000	0.312	0.948	0.600	0.301	0.000	0.000	0.620
445.37	446	0.63	0.220	0.000	0.471	0.243	0.000	0.358	0.121	0.118	0.238	0.126
446	448.27	2.27	1.962	1.468	1.933	2.019	2.019	2.283	0.776	2.382	2.406	2.394
448.27	449.27	1	0.435	1.329	1.530	1.687	1.124	1.113	1.009	0.519	0.786	1.550
449.27	450.28	1.01	0.717	0.293	0.434	0.743	0.929	0.368	0.661	0.460	0.619	0.650
450.28	451.8	1.52	1.000	1.310	0.813	1.357	2.035	2.015	1.237	0.960	1.937	1.012
451.8	453.03	1.23	2.316	4.090	2.321	3.070	5.372	6.082	2.248	7.641	7.007	6.593
453.03	453.37	0.34	0.000	0.992	0.000	1.217	0.392	0.775	0.369	0.677	0.000	0.355
453.37	454.13	0.76	0.754	0.215	0.863	1.047	0.505	1.504	0.953	0.656	0.690	0.920
454.13	455.31	1.18	0.584	0.000	0.732	0.600	0.515	0.512	0.485	0.000	0.702	0.000

APPENDIX B: YEARLY MODEL

- Combined Yearly Model SAS Output

COMBINED YEARLY MODEL ALL VEHICLE

INITIAL MODEL (ALL VEHICLES)

The GLM Procedure

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	402	1258.480047	3.130547	19.18	<.0001
Error	1477	241.106562	0.163241		
Corrected Total	1879	1499.586609			

Number of Observations Read	1880
Number of Observations Used	1880

Dependent Variable: TCrate

R-Square	Coeff Var	Root MSE	TCrate Mean
0.839218	202.7022	0.404031	0.199322

Source	DF	Type I SS	Mean Square	F Value	Pr > F
PTrucks	1	94.3732842	94.3732842	578.12	<.0001
State	1	706.5001708	706.5001708	4327.96	<.0001
Location(State)	186	387.5566970	2.0836382	12.76	<.0001
Year	9	14.0917289	1.5657477	9.59	<.0001
PTruck*Locati(State)	187	45.2454893	0.2419545	1.48	<.0001
PTrucks*Year	9	4.6292772	0.5143641	3.15	0.0009
State*Year	9	6.0833998	0.6759333	4.14	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
PTrucks	1	0.35706974	0.35706974	2.19	0.1394
State	1	1.71565492	1.71565492	10.51	0.0012
Location(State)	186	46.23950698	0.24859950	1.52	<.0001
Year	9	1.22505400	0.13611711	0.83	0.5849
PTruck*Locati(State)	187	43.69707886	0.23367422	1.43	0.0003
PTrucks*Year	9	1.79074245	0.19897138	1.22	0.2788
State*Year	9	6.08339980	0.67593331	4.14	<.0001

FINAL MODEL (ALL VEHICLES)

The GLM Procedure

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	393	1256.689305	3.197683	19.56	<.0001
Error	1486	242.897304	0.163457		
Corrected Total	1879	1499.586609			

Number of Observations Read	1880
Number of Observations Used	1880

Dependent Variable: TCrate

R-Square	Coeff Var	Root MSE	TCrate Mean
0.838024	202.8365	0.404298	0.199322

Source	DF	Type I SS	Mean Square	F Value	Pr > F
PTrucks	1	94.3732842	94.3732842	577.36	<.0001
State	1	706.5001708	706.5001708	4322.24	<.0001
Location(State)	186	387.5566970	2.0836382	12.75	<.0001
Year	9	14.0917289	1.5657477	9.58	<.0001
PTruck*Locati(State)	187	45.2454893	0.2419545	1.48	<.0001
State*Year	9	8.9219346	0.9913261	6.06	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
PTrucks	1	0.29171309	0.29171309	1.78	0.1818
State	1	1.69868251	1.69868251	10.39	0.0013
Location(State)	186	46.73797878	0.25127946	1.54	<.0001
Year	9	11.63110547	1.29234505	7.91	<.0001
PTruck*Locati(State)	187	43.93196121	0.23493027	1.44	0.0002
State*Year	9	8.92193458	0.99132606	6.06	<.0001

COMBINED YEARLY MODEL ALL VEHICLE
INITIAL MODEL (TRUCKS ONLY)
The GLM Procedure

Dependent Variable: TCrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	402	1261.676525	3.138499	5.22	<.0001
Error	1477	888.743818	0.601722		
Corrected Total	1879	2150.420343			

Number of Observations Read	1880
Number of Observations Used	1880

R-Square	Coeff Var	Root MSE	TCrate Mean
0.586712	-178.5714	0.775708	-0.434396

Source	DF	Type I SS	Mean Square	F Value	Pr > F
PTrucks	1	30.9466971	30.9466971	51.43	<.0001
State	1	572.8260229	572.8260229	951.98	<.0001
Location(State)	186	455.7260990	2.4501403	4.07	<.0001
Year	9	41.8940017	4.6548891	7.74	<.0001
PTrucks*Year	9	20.6311865	2.2923541	3.81	<.0001
PTruck*Locati(State)	187	130.1595628	0.6960404	1.16	0.0839
State*Year	9	9.4929546	1.0547727	1.75	0.0727

Source	DF	Type III SS	Mean Square	F Value	Pr > F
PTrucks	1	2.6309112	2.6309112	4.37	0.0367
State	1	1.0658891	1.0658891	1.77	0.1834
Location(State)	186	134.4893924	0.7230612	1.20	0.0412
Year	9	5.0118392	0.5568710	0.93	0.5017
PTrucks*Year	9	7.6122886	0.8458098	1.41	0.1802
PTruck*Locati(State)	187	128.8122762	0.6888357	1.14	0.1001
State*Year	9	9.4929546	1.0547727	1.75	0.0727

FINAL MODEL (TRUCKS ONLY)

The GLM Procedure

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	206	1125.377962	5.463000	8.92	<.0001
Error	1673	1025.042380	0.612697		
Corrected Total	1879	2150.420343			

Number of Observations Read	1880
Number of Observations Used	1880

Dependent Variable: TCrate

R-Square	Coeff Var	Root MSE	TCrate Mean
0.523329	-180.1926	0.782750	-0.434396

Source	DF	Type I SS	Mean Square	F Value	Pr > F
PTrucks	1	30.9466971	30.9466971	50.51	<.0001
State	1	572.8260229	572.8260229	934.93	<.0001
Location(State)	186	455.7260990	2.4501403	4.00	<.0001
Year	9	41.8940017	4.6548891	7.60	<.0001
State*Year	9	23.9851415	2.6650157	4.35	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
PTrucks	1	2.6517856	2.6517856	4.33	0.0376
State	1	75.3196594	75.3196594	122.93	<.0001
Location(State)	186	453.9474271	2.4405776	3.98	<.0001
Year	9	34.9315342	3.8812816	6.33	<.0001
State*Year	9	23.9851415	2.6650157	4.35	<.0001

APPENDIX C: MONTHLY MODEL

- Monthly Model Output (Wyoming)
- Monthly Model Output (Nebraska)

WYOMING MONTHLY MODEL – ALL VEHICLES
INITIAL MODEL

The GLM Procedure

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	36.39429564	4.04381063	68.91	<.0001
Error	110	6.45483578	0.05868033		
Corrected Total	119	42.84913143			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.849359	-26.74225	0.242240	-0.905833

Source	DF	Type I SS	Mean Square	F Value	Pr > F
road	1	28.03208049	28.03208049	477.71	<.0001
year08	1	6.35078220	6.35078220	108.23	<.0001
light	1	0.61072725	0.61072725	10.41	0.0017
winter	1	0.33027674	0.33027674	5.63	0.0194
PTrucks	1	0.24840069	0.24840069	4.23	0.0420
winter*PTrucks	1	0.41560044	0.41560044	7.08	0.0089
road*PTrucks	1	0.37919920	0.37919920	6.46	0.0124
light*PTrucks	1	0.02197681	0.02197681	0.37	0.5418
year08*PTrucks	1	0.00525184	0.00525184	0.09	0.7654

Source	DF	Type III SS	Mean Square	F Value	Pr > F
road	1	0.08880716	0.08880716	1.51	0.2212
year08	1	0.07249199	0.07249199	1.24	0.2688
light	1	0.00050127	0.00050127	0.01	0.9265
winter	1	0.02639682	0.02639682	0.45	0.5038
PTrucks	1	0.10577730	0.10577730	1.80	0.1822
winter*PTrucks	1	0.00022796	0.00022796	0.00	0.9504
road*PTrucks	1	0.11867955	0.11867955	2.02	0.1578
light*PTrucks	1	0.02702017	0.02702017	0.46	0.4988
year08*PTrucks	1	0.00525184	0.00525184	0.09	0.7654

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-0.900523778	0.48699901	-1.85	0.0671
road	0.718540658	0.58408173	1.23	0.2212
year08	1.012169587	0.91065636	1.11	0.2688
light	-0.104881371	1.13476705	-0.09	0.9265
winter	0.200265455	0.29859085	0.67	0.5038
PTrucks	-0.013078271	0.00974093	-1.34	0.1822
winter*PTrucks	-0.000303490	0.00486921	-0.06	0.9504
road*PTrucks	0.015134590	0.01064214	1.42	0.1578
light*PTrucks	-0.013795454	0.02033004	-0.68	0.4988
year08*PTrucks	0.003148504	0.01052434	0.30	0.7654

FINAL MODEL

The GLM Procedure

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	36.36058678	6.06009780	105.54	<.0001
Error	113	6.48854465	0.05742075		
Corrected Total	119	42.84913143			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.848572	-26.45368	0.239626	-0.905833

Source	DF	Type I SS	Mean Square	F Value	Pr > F
road	1	28.03208049	28.03208049	488.19	<.0001
year08	1	6.35078220	6.35078220	110.60	<.0001
light	1	0.61072725	0.61072725	10.64	0.0015
winter	1	0.33027674	0.33027674	5.75	0.0181
PTrucks	1	0.24840069	0.24840069	4.33	0.0398
road*PTrucks	1	0.78831941	0.78831941	13.73	0.0003

Source	DF	Type III SS	Mean Square	F Value	Pr > F
road	1	0.40587940	0.40587940	7.07	0.0090
year08	1	2.68994044	2.68994044	46.85	<.0001
light	1	0.46877568	0.46877568	8.16	0.0051
winter	1	0.29035999	0.29035999	5.06	0.0265
PTrucks	1	0.92062253	0.92062253	16.03	0.0001
road*PTrucks	1	0.78831941	0.78831941	13.73	0.0003

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-0.621814029	0.20739050	-3.00	0.0033
road	0.683162152	0.25695657	2.66	0.0090
year08	1.263385107	0.18458604	6.84	<.0001
light	-0.846096474	0.29612275	-2.86	0.0051
winter	0.177912941	0.07911769	2.25	0.0265
PTrucks	-0.018501810	0.00462070	-4.00	0.0001
road*PTrucks	0.016220228	0.00437764	3.71	0.0003

WYOMING MONTHLY MODEL – TRUCKS ONLY
INITIAL MODEL

The GLM Procedure

Class Level Information		
Class	**Levels**	**Values**
year	10	2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
month	12	1 2 3 4 5 6 7 8 9 10 11 12

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	24.72691264	2.47269126	20.12	<.0001
Error	109	13.39672780	0.12290576		
Corrected Total	119	38.12364044			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.648598	-22.30160	0.350579	-1.571991

Source	DF	Type I SS	Mean Square	F Value	Pr > F
road	1	17.70193880	17.70193880	144.03	<.0001
lyear	1	2.43903243	2.43903243	19.84	<.0001
winter	1	0.74479668	0.74479668	6.06	0.0154
april	1	0.32343166	0.32343166	2.63	0.1076
PTrucks	1	0.37147900	0.37147900	3.02	0.0849
winter*PTrucks	1	0.58567200	0.58567200	4.77	0.0312
road*PTrucks	1	0.95051247	0.95051247	7.73	0.0064
lyear*PTrucks	1	0.05031231	0.05031231	0.41	0.5236
road*lyear	1	0.18166362	0.18166362	1.48	0.2267
road*winter	1	1.37807366	1.37807366	11.21	0.0011

Source	DF	Type III SS	Mean Square	F Value	Pr > F
road	1	0.42719383	0.42719383	3.48	0.0650
lyear	1	0.00265028	0.00265028	0.02	0.8835
winter	1	0.00259918	0.00259918	0.02	0.8846
april	1	0.14206773	0.14206773	1.16	0.2847
PTrucks	1	1.39543704	1.39543704	11.35	0.0010
winter*PTrucks	1	0.20724917	0.20724917	1.69	0.1968
road*PTrucks	1	1.04334559	1.04334559	8.49	0.0043
lyear*PTrucks	1	0.05344368	0.05344368	0.43	0.5110
road*lyear	1	0.07147435	0.07147435	0.58	0.4474
road*winter	1	1.37807366	1.37807366	11.21	0.0011

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-1.199792549	0.22730149	-5.28	<.0001
road	-1.162658771	0.62362842	-1.86	0.0650

lyear	-0.079428602	0.54090041	-0.15	0.8835
winter	0.056853298	0.39095198	0.15	0.8846
april	0.206627667	0.19218826	1.08	0.2847
PTrucks	-0.015309665	0.00454356	-3.37	0.0010
winter*PTrucks	-0.008034638	0.00618737	-1.30	0.1968
road*PTrucks	0.026399071	0.00906068	2.91	0.0043
lyear*PTrucks	-0.008036550	0.01218730	-0.66	0.5110
road*lyear	0.239400678	0.31393258	0.76	0.4474
road*winter	1.443764405	0.43116771	3.35	0.0011

FINAL MODEL

The GLM Procedure

Class Level Information		
Class	Levels	Values
year	10	2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
month	12	1 2 3 4 5 6 7 8 9 10 11 12

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	24.29465210	4.04910868	33.09	<.0001
Error	113	13.82898834	0.12238043		
Corrected Total	119	38.12364044			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.637260	-22.25389	0.349829	-1.571991

Source	DF	Type I SS	Mean Square	F Value	Pr > F
road	1	17.70193880	17.70193880	144.65	<.0001
lyear	1	2.43903243	2.43903243	19.93	<.0001
winter	1	0.74479668	0.74479668	6.09	0.0151
PTrucks	1	0.39203506	0.39203506	3.20	0.0762
road*PTrucks	1	1.67544635	1.67544635	13.69	0.0003
road*winter	1	1.34140278	1.34140278	10.96	0.0012

Source	DF	Type III SS	Mean Square	F Value	Pr > F
road	1	0.09246992	0.09246992	0.76	0.3866
lyear	1	2.64354268	2.64354268	21.60	<.0001
winter	1	0.35692492	0.35692492	2.92	0.0904
PTrucks	1	1.36100788	1.36100788	11.12	0.0012
road*PTrucks	1	1.02475440	1.02475440	8.37	0.0046
road*winter	1	1.34140278	1.34140278	10.96	0.0012

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-1.280846463	0.21157002	-6.05	<.0001
road	-0.310348527	0.35703059	-0.87	0.3866
lyear	-0.374897395	0.08066316	-4.65	<.0001
winter	-0.382026703	0.22369757	-1.71	0.0904
PTrucks	-0.014640214	0.00439009	-3.33	0.0012
road*PTrucks	0.017500500	0.00604779	2.89	0.0046
road*winter	1.137950158	0.34371590	3.31	0.0012

NEBRASKA MONTHLY MODEL – ALL VEHICLES
INITIAL MODEL

The GLM Procedure

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	13.39242958	1.48804773	23.43	<.0001
Error	110	6.98733812	0.06352126		
Corrected Total	119	20.37976771			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.657143	129.2066	0.252034	0.195063

Source	DF	Type I SS	Mean Square	F Value	Pr > F
PTrucks	1	9.85005946	9.85005946	155.07	<.0001
road	1	1.55269047	1.55269047	24.44	<.0001
hyear	1	1.01984042	1.01984042	16.06	0.0001
myear	1	0.45570525	0.45570525	7.17	0.0085
april	1	0.40347821	0.40347821	6.35	0.0132
PTrucks*road	1	0.06117198	0.06117198	0.96	0.3286
PTrucks*hyear	1	0.00505286	0.00505286	0.08	0.7784
PTrucks*myear	1	0.01969763	0.01969763	0.31	0.5788
PTrucks*april	1	0.02473330	0.02473330	0.39	0.5339

Source	DF	Type III SS	Mean Square	F Value	Pr > F
PTrucks	1	0.00382363	0.00382363	0.06	0.8066
road	1	0.24339728	0.24339728	3.83	0.0528
hyear	1	0.73662241	0.73662241	11.60	0.0009
myear	1	0.25778594	0.25778594	4.06	0.0464
april	1	0.03401271	0.03401271	0.54	0.4659
PTrucks*road	1	0.05051745	0.05051745	0.80	0.3745
PTrucks*hyear	1	0.00478651	0.00478651	0.08	0.7842
PTrucks*myear	1	0.02105437	0.02105437	0.33	0.5660
PTrucks*april	1	0.02473330	0.02473330	0.39	0.5339

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-.8021735672	0.33867885	-2.37	0.0196
PTrucks	-.0038631017	0.01574554	-0.25	0.8066
road	0.8648999573	0.44184257	1.96	0.0528
hyear	0.3976939423	0.11678473	3.41	0.0009
myear	0.2497340072	0.12396743	2.01	0.0464
april	-.1159054544	0.15839549	-0.73	0.4659
PTrucks*road	0.0174945504	0.01961741	0.89	0.3745
PTrucks*hyear	-.0014177233	0.00516466	-0.27	0.7842
PTrucks*myear	-.0035190297	0.00611239	-0.58	0.5660
PTrucks*april	-.0043298900	0.00693898	-0.62	0.5339

FINAL MODEL

The GLM Procedure

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	13.28177381	2.65635476	42.66	<.0001
Error	114	7.09799389	0.06226310		
Corrected Total	119	20.37976771			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.651714	127.9206	0.249526	0.195063

Source	DF	Type I SS	Mean Square	F Value	Pr > F
PTrucks	1	9.85005946	9.85005946	158.20	<.0001
road	1	1.55269047	1.55269047	24.94	<.0001
hyear	1	1.01984042	1.01984042	16.38	<.0001
myear	1	0.45570525	0.45570525	7.32	0.0079
april	1	0.40347821	0.40347821	6.48	0.0122

Source	DF	Type III SS	Mean Square	F Value	Pr > F
PTrucks	1	1.55791619	1.55791619	25.02	<.0001
road	1	0.91091908	0.91091908	14.63	0.0002
hyear	1	1.56630540	1.56630540	25.16	<.0001
myear	1	0.48898525	0.48898525	7.85	0.0060
april	1	0.40347821	0.40347821	6.48	0.0122

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-1.015567614	0.23377479	-4.34	<.0001
PTrucks	0.007945647	0.00158845	5.00	<.0001
road	1.175238758	0.30725686	3.82	0.0002
hyear	0.376484969	0.07506281	5.02	<.0001
myear	0.179911764	0.06419882	2.80	0.0060
april	-0.211803582	0.08320293	-2.55	0.0122

NEBRASKA MONTHLY MODEL – TRUCKS ONLY
INITIAL MODEL

The GLM Procedure

Class Level Information		
Class	**Levels**	**Values**
year	10	2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
month	12	1 2 3 4 5 6 7 8 9 10 11 12

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	15	47.36108799	3.15740587	32.96	<.0001
Error	104	9.96327349	0.09580071		
Corrected Total	119	57.32436148			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.826195	385.6712	0.309517	0.080254

Source	DF	Type I SS	Mean Square	F Value	Pr > F
hyear	1	24.94610184	24.94610184	260.40	<.0001
lyear2	1	5.90461287	5.90461287	61.63	<.0001
weather	1	6.15176813	6.15176813	64.21	<.0001
road	1	4.56392090	4.56392090	47.64	<.0001
cmonth	1	2.28082284	2.28082284	23.81	<.0001
PTrucks	1	0.22311508	0.22311508	2.33	0.1300
hyear*PTrucks	1	0.12098038	0.12098038	1.26	0.2637
lyear2*PTrucks	1	1.30653943	1.30653943	13.64	0.0004
weather*PTrucks	1	0.11349810	0.11349810	1.18	0.2789
road*PTrucks	1	0.04270508	0.04270508	0.45	0.5058
cmonth*PTrucks	1	0.06268984	0.06268984	0.65	0.4204
weather*road	1	0.45865087	0.45865087	4.79	0.0309
hyear*weather	1	0.08638947	0.08638947	0.90	0.3445
weather*cmonth	1	0.48452877	0.48452877	5.06	0.0266
lyear2*weather	1	0.61476439	0.61476439	6.42	0.0128

Source	DF	Type III SS	Mean Square	F Value	Pr > F
hyear	1	0.45237993	0.45237993	4.72	0.0320
lyear2	1	2.05593920	2.05593920	21.46	<.0001
weather	1	0.11620772	0.11620772	1.21	0.2733
road	1	0.02365742	0.02365742	0.25	0.6203
cmonth	1	0.01022961	0.01022961	0.11	0.7445
PTrucks	1	0.30759329	0.30759329	3.21	0.0761
hyear*PTrucks	1	0.13984495	0.13984495	1.46	0.2297

lyear2*PTrucks	1	0.69932320	0.69932320	7.30	0.0081
weather*PTrucks	1	0.04889809	0.04889809	0.51	0.4766
road*PTrucks	1	0.00092409	0.00092409	0.01	0.9220
cmonth*PTrucks	1	0.05225534	0.05225534	0.55	0.4618
weather*road	1	0.10091169	0.10091169	1.05	0.3071
hyear*weather	1	0.11930357	0.11930357	1.25	0.2670
weather*cmonth	1	0.13887102	0.13887102	1.45	0.2313
lyear2*weather	1	0.61476439	0.61476439	6.42	0.0128

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.121304061	0.30629065	0.40	0.6929
hyear	1.081849806	0.49785132	2.17	0.0320
lyear2	-1.182503709	0.25525939	-4.63	<.0001
weather	0.470092054	0.42682493	1.10	0.2733
road	-0.303979783	0.61170965	-0.50	0.6203
cmonth	0.103723553	0.31741846	0.33	0.7445
PTrucks	-0.020643386	0.01152065	-1.79	0.0761
hyear*PTrucks	-0.067836865	0.05614702	-1.21	0.2297
lyear2*PTrucks	0.023001736	0.00851346	2.70	0.0081
weather*PTrucks	-0.009555131	0.01337442	-0.71	0.4766
road*PTrucks	-0.001395412	0.01420788	-0.10	0.9220
cmonth*PTrucks	-0.007298761	0.00988253	-0.74	0.4618
weather*road	0.713463704	0.69516118	1.03	0.3071
hyear*weather	-0.377836194	0.33857992	-1.12	0.2670
weather*cmonth	0.436057966	0.36217859	1.20	0.2313
lyear2*weather	0.935092000	0.36913425	2.53	0.0128

NEBRASKA MONTHLY MODEL – TRUCKS ONLY
FINAL MODEL

The GLM Procedure

Class Level Information		
Class	Levels	Values
year	10	2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
month	12	1 2 3 4 5 6 7 8 9 10 11 12

Number of Observations Read	120
Number of Observations Used	120

Dependent Variable: tcrate

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	9	46.93965623	5.21551736	55.25	<.0001
Error	110	10.38470525	0.09440641		
Corrected Total	119	57.32436148			

R-Square	Coeff Var	Root MSE	tcrate Mean
0.818843	382.8543	0.307256	0.080254

Source	DF	Type I SS	Mean Square	F Value	Pr > F
hyear	1	24.94610184	24.94610184	264.24	<.0001
lyear2	1	5.90461287	5.90461287	62.54	<.0001
weather	1	6.15176813	6.15176813	65.16	<.0001
road	1	4.56392090	4.56392090	48.34	<.0001
cmonth	1	2.28082284	2.28082284	24.16	<.0001
PTrucks	1	0.22311508	0.22311508	2.36	0.1271
lyear2*PTrucks	1	1.37286007	1.37286007	14.54	0.0002
weather*cmonth	1	0.85427204	0.85427204	9.05	0.0033
lyear2*weather	1	0.64218246	0.64218246	6.80	0.0104

Source	DF	Type III SS	Mean Square	F Value	Pr > F
hyear	1	1.32500476	1.32500476	14.04	0.0003
lyear2	1	2.31792242	2.31792242	24.55	<.0001
weather	1	0.86629324	0.86629324	9.18	0.0031
road	1	0.11188611	0.11188611	1.19	0.2787
cmonth	1	0.04981310	0.04981310	0.53	0.4691
PTrucks	1	1.39973820	1.39973820	14.83	0.0002
lyear2*PTrucks	1	1.28904318	1.28904318	13.65	0.0003
weather*cmonth	1	0.66338831	0.66338831	7.03	0.0092
lyear2*weather	1	0.64218246	0.64218246	6.80	0.0104

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	0.093075010	0.16965674	0.55	0.5844
hyear	0.416839159	0.11126550	3.75	0.0003
lyear2	-1.219104180	0.24603229	-4.96	<.0001
weather	0.379849154	0.12539478	3.03	0.0031

road	0.226811117	0.20834208	1.09	0.2787
cmonth	-0.142748110	0.19651664	-0.73	0.4691
PTrucks	-0.025525010	0.00662893	-3.85	0.0002
lyear2*PTrucks	0.025673077	0.00694776	3.70	0.0003
weather*cmonth	0.740149638	0.27921347	2.65	0.0092
lyear2*weather	0.736521384	0.28239492	2.61	0.0104