FHWA-ID-EIS-12-01-D

Safety Technical Report

Draft Environmental Impact Statement

US-95 Thorncreek Road to Moscow

Project No. DHP-NH-4110(156);Key No 09294

US-95 THORNCREEK ROAD TO MOSCOW
AASHTO HIGHWAY SAFETY MANUAL ANALYSIS
ON ALTERNATIVES CARRIED FORWARD

DHP-NH-4110 (156)
KEY # 09294

PREPARED BY
DISTRICT 2 PROJECT DEVELOPMENT ENGINEER

Curtis J. Arnzen

Curtis J. Arnzen, P.E.

7/31/12

Date

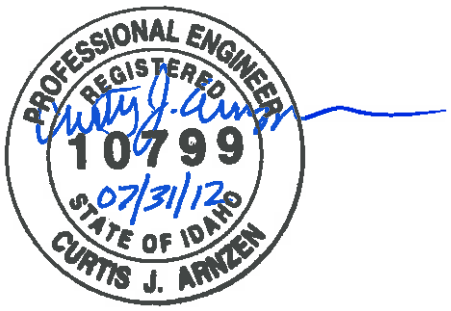


Table of Contents

Introduction

This Safety Analysis is a supporting document of the Environmental Impact Statement for US-95, Thorncreek to Moscow. The Purpose and Need Statement in the Environmental Impact Statement is the following:

- Purpose – The purpose of this project is to improve public safety and increase highway capacity on US 95 between Thorncreek Road and Moscow.
- Need – Within the project limits, US95 does not meet current American Association of State Highway and Transportation Officials (AASHTO) Standards (widths, clear-zones, grades, and sight distance). Additional concerns include high accident locations and insufficient highway capacity.

This report will analyze the safety of the existing alignment and make an alternative recommendation based on safety. It will also quantify the safety benefit of the No Action Alternative and Alternatives E2, C3, and W4.

This report uses the First Edition (2010) of the AASHTO Highway Safety Manual (HSM) to analyze and quantify the safety benefits of each alternative. This report replaces a report shown in Appendix D called Thorncreek Road to Moscow Environmental Matrix Safety Analysis Alignments Carried Forward that was published on February 15, 2011 prior to the date the Idaho Transportation Department (ITD) District 2 received its first copies of the HSM. The HSM provides the most current and accepted knowledge and practices relating to safety management according to AASHTO and Transportation Research Board (TRB) Task forces.

The results of the calculation methods in the HSM show that Alternatives E2, C3, and W4 will be much safer than the No Action Alternative. The results of the calculation method show that Alternative E2 is the safest proposed alternative for total crashes, as well as total injury related crashes and fatalities. This result is consistent with the previous safety report shown in Appendix D. Table 1 shown below summarizes the findings of this safety analysis for 2017. At this time, 2017 is the first year a safety benefit would be anticipated after completion of the project.

Table 1: Predicted Crash Rate For Proposed Alternatives Based on HSM Calculations for 2017.		
Alternative	Total Crashes Per Year	Fatal and Injury Crashes Per Year
No Action	24.8	10.5
E2	7.7	3.8
C3	10.9	4.7
W4	9.3	4.5

Safety Analysis of the Existing Alignment

Ten years of crash data on the existing alignment between MP 337.668 (Thorncreek Rd.) and MP 344.004 (Moscow) was analyzed in order to compare the safety of the existing alignment to the proposed alternatives. The crashes are shown in Appendix A.1 of this report. From January 1, 2002 through December 31, 2011, 220 crashes occurred or an average of 22.0 crashes per year. The number of crashes is higher than predicted for similar 2-way, 2-lane rural NHS Routes with similar average annual daily traffic (AADT). Using ITD's Safety Analysis base rate, approximately 14.0 crashes per year would be predicted on the existing alignment. ITD's Safety Analysis estimates that crashes occur at a base rate of 1.22 crashes per million vehicle miles for similar highways, while the actual crash rate is 1.85 crashes per million vehicle miles.

In addition to having a higher than predicted number of total crashes, the District's top three Official High Crash Locations are located within this section of highway. Statewide, the three High Crash Locations in this section of roadway are ranked within the top 13 non-interstate High Crash Locations. Appendix A.2 shows the list of High Crash Locations.

The crashes that have occurred on the existing alignment over the past 10 years appear to be random in nature and include head-on crashes, sideswipes, rear end turning, overturning, run off the road to the ditch and embankment, among other crash types. In the past 10 years, 6 fatalities have occurred in 5 crashes and 138 injuries have occurred in 220 crashes on US-95 between Thorncreek and Moscow. Two of the fatal crashes were head on collisions, one fatal crash was a sideswipe, one fatal crash was due to a motorist driving left of center into another car, and one was a pedestrian crash. The head-on crashes and sideswipe crashes are generally associated with passing maneuvers. The frequency of head-on, sideswipe, and driving left of center crash types is predicted to greatly decrease by replacing the 2-Lane roadway with a new 4-Lane roadway with a divided median. The US-95 project recently built between the top of the

Lewiston Hill and Thorncreek Road has eliminated head-on crashes and sideswipes from cars traveling in the opposite direction since its completion in October 2007.

Approximately 40% of the existing crashes are from vehicles negotiating a curve and in the past 10 years, 14 crashes occurred with a motorist running off the road to the ditch, 19 crashes occurred with a motorist running of the road in an embankment area, and 76 crashes occurred with a motorist overturning a vehicle. The existing alignment does not meet AASHTO Standards for shoulder width, curve radius, sight distance, clear zone, and grade. Any action alternative will be designed to full AASHTO standards. The number of run off the road and overturning crashes is predicted to decrease if any action alternative is selected. The severity of the accidents is also predicted to decrease because the roadside clear zone will become more forgiving.

There are currently 66 at-grade intersections and approaches (public, commercial, residential, and field) in this 6.34 mile segment of US-95. Between 2002 and 2011, there were 22 crashes directly associated with private approaches, or intersections. The north end of the project is the most densely populated area. It has the highest number of access points and the highest number of intersection related crashes. The southern end of the project with its closely spaced approaches onto US-95, have also resulted in a high number of intersection related crashes. Currently, many approaches do not meet the ITD access control policy and contribute to intersection related conflicts. Eighteen rear-ending crashes occurred on the existing alignment in the past 10 years. Rear ending accidents are generally associated with turning traffic to and from public roads and approaches to residencies, businesses, and industry. Any of the three proposed action alignments greatly reduce at grade intersections and approaches to US-95 and future approaches would not easily be granted because Type IV Right of Way would be purchased.

Currently, 57% of the crashes on US-95 between Thorncreek Road and Moscow occur during inclement weather where the police report lists snow, rain, or fog as the weather condition and has a road surface condition of wet, snow, ice, or slush. The number of crashes occurring during inclement weather is observed to be the greatest along curves with substandard radiuses. All existing alternatives will flatten curves to the AASHTO standard for radius and super-elevation, reducing the potential for weather related crashes.

There have been 31 wild animal crashes between Thorncreek Road and Moscow in the ten year period between January 2002 and December 2011. This is 14% of the total crashes; however, the severity of the crashes was very low, with 27 crashes being property damage only crashes and 4 being Type C Accidents (Possible Injury). The Idaho Department of Fish and Game have designated a portion of Thorncreek Road to Moscow as a wildlife crossing area.

The cost estimate for preventing a fatality is calculated every year by the FHWA. In 2010, the cost used by the Federal Highways Administration (FHWA) was $6,053,567 per fatality. The ITD Office of Highway Safety uses the cost the FHWA establishes for preventing a fatality as a basis for determining the cost of the other crash types. The National Highway Traffic Safety (NHTS) also did a study on the costs of crashes and determined who pays for the cost of crashes. The most significant point of this study is that society at large picks up nearly 75% of all crash costs incurred by individual motor vehicle crash victims. These costs are passed on to the general public through insurance premiums, taxes, direct out-of-pocket payments for goods and services, and increased charges for medical care. Economic values can be calculated for accidents between Thorncreek Road and Moscow. The results of these values are summarized in Table 2 Below:

Table 2: Economic Cost of All Crashes Between Thorncreek Road and Moscow Between 01/02 and 12/11.

Crash Type	Total Crashes	Cost Per Crash (2010 Values)	Total Cost per Crash Type
Fatality	5	$6,053,567	$30,267,835
Type A Accident (Serious)	18	$301,473	$5,426,514
Type B Accident (Visible)	33	$84,441	$2,786,553
Type C Accident (Possible)	36	$55,972	$2,014,992
Property Damage Only	128	$6,480	$829,440
		Total:	**$41,325,334**

From October 1, 2007, or the date the four lane divided highway from the Top of Lewiston Hill to Thorncreek Road (MP 323.36 to MP 337.668) was completed, to December 31, 1012, 31

injury crashes and no fatal crashes occurred on this new section of US-95, or 2.17 accidents per centerline mile. During the same time period on US-95 between Thorncreek Road and Moscow (MP 337.668 to MP 344.004), 65 injury and 3 fatal accidents occurred, or 10.7 injury crashes or fatal crashes per centerline mile.

All crash data supports the need for the construction of an action alternative and reconstruction of US-95 between Thorncreek Road and Moscow with a four lane divided highway. The No Action Alternative is not acceptable because of the observed crash history of the existing alignment and the high economic cost of all crashes between Thorncreek Road and Moscow.

Calculation Methodology for Action Alternatives

Standard Predictive Calculations

In order to calculate predicted number of crashes per year for proposed alternatives, Chapter 11-Predictive Method for Rural Multilane Highways and Chapter 12-Predictive Method for Urban and Suburban Arterials of the AASHTO Highway Safety Manual were followed. The Empirical Bayes method is not applicable since all three action alternatives are new and will be a different highway type than the existing facility.

Each of the three action alternatives has two different and distinct segments. One segment has characteristics of a rural multilane highway and the other segment has characteristics of a suburban arterial. Each segment within each alternative was modeled separately. Segments of highway that have a proposed 34 foot divided median (42' between the northbound and southbound travel lanes) and 65 mph speed limit were modeled as a rural divided multilane highway and segments of highway with five total lanes including a two-way left turn lane and a 45 mph speed limit were modeled as a suburban arterial. Typical sections for each proposed alternative are shown in Appendices C.1, C.2, and C.3. All public road intersections were also modeled within each proposed alternative. ADT projections used in the predictive calculations are for 2017, or the first year after the anticipated construction is complete. 2017 would be the first year that a safety benefit would be realized.

Spreadsheets developed by Karen Dixon, PhD Civil Engineering, from Oregon State University were used for calculations and are show in the appendix of this report. Dr. Dixon was one of the authors of the AASHTO Highway Safety Manual.

Wild Animal Crashes

The Highway Safety Manual Analysis Technique predicts some wild animal crashes within the base formulas; however, the wild animal crashes are not quantified within the formulas. The predicted crashes for each alternative generated using the HSM Manual within this report include wild animal crashes.

To satisfy concerns about wild animal crashes, the wild animal crash rate was investigated between Thorncreek Road and Moscow and wild animal crash rates within ungulate crossing areas in Latah County identified by the Idaho Department of Fish and Game in Appendix B.1. Table 3, shown below, is a list of wild animal crashes within ungulate crossing areas that have been identified by the Idaho Department of Fish and Game.

Table 3: Wild Animal Crashes at Ungulate Crossing Areas on US-95 in Latah County From 1/1/02 to 12/31/11.

Ungulate Crossing Area	Total Wild Animal Crashes	Wild Animal Crashes Per Year
Marsh Hill (MP 367.1-370.1)	34	3.4
Crooks Hill (MP 356.0 – 359.0)	14	1.4
Steakhouse Hill (MP 349.7 – 352.7)	48	4.8
Thorncreek to Moscow (MP 340.3 – 343.3)	17	1.7

Currently, 1.7 of the 3.1 wild animal crashes on the existing alignment are between Thorncreek and Moscow occur within the identified ungulate crossing area.

Approximately 1.98 miles of Alternative E2 will be through an ungulate impact area within an identified ungulate crossing area between Thorncreek Road and Moscow. The remainder of Alternative E2 and the entire C3 and W4 Alternatives are not within the ungulate impact areas. Appendix B.2 shows the ungulate impact area in relationship to the alternatives.
Alternative E2 has potential to have more wild animal crashes than Alternatives C3 and W4 because of the 1.98 mile long length of Alternative E2 within the ungulate impact area; however, a wildlife crash countermeasure that clears the roadside of trees and brush will be

constructed. The crash countermeasure is predicted to reduce the total number of wild animal crashes to a rate that is similar to the number of wild animal crashes predicted by the base rate of the Highway Safety Manual. A report included in Appendix B.3 and titled "Methods to Reduce Traffic Crashes Involving Deer: What Works and What Does Not", shows a 50% reduction in animal crashes for railway clearing. This 50% reduction was achieved with the clearing of a 40 to 60 meter strip for railway cars to avoid moose collisions. This report also acknowledges that roadside clearing may be effective, but there is limited information supporting the extent of the reduction, which is why there is no crash modification factor (CMF) available for roadside clearing.

In July 2010, ITD District 6 completed a project to widen the roadside clear width from 30 feet to 60 feet from the roadway along US-20 between MP 369 and 375.5. For the ten years prior to the clearing project 37 wild animal crashes occurred or 3.7 crashes per year. Since the project only 1 wild animal crash has occurred, or about 0.6 crashes per year. This is about an 85% reduction in wild animal crashes so far. The data for this ITD project is shown in Appendix B.4. It should be noted that only 1 year and 8 months have passed since the completion of this project; however, the roadside clearing used on this project has substantially reduced wild animal crashes in the short time period.

For the proposed Thorncreek Road to Moscow Project, a minimum of 240' of Right-of-Way is estimated; however, in most areas the topography of the land will require a larger purchase of land that is estimated to be up to about 600' wide. The proposed Right-of-Way will be cleared of trees and brush providing a clear area that ranges from a minimum of 75' to maximum of about 330' from the edge of traveled way to the nearest possible brush or trees. The wide clear area is predicted to reduce the wild animal crash potential on all proposed alternatives.

The severity of wild animal crashes is observed to be lower than other crash types. Because the severity of wild animal crashes is low, the current State Highway Safety Plan does not devote an emphasis area for wild animal crashes. Table 4, shown below, shows that the total economic cost of wild animal crashes within the existing Thorncreek to Moscow Alignment from 1/1/02 to 12/31/11 is $398,848. This value is less than 1% of the total economic costs on the existing alignment between Thorncreek Road and Moscow during the same time period.

Table 4: Economic Costs of Wild Animal Crashes Within the Existing Thorncreek to Moscow Alignment From 1/1/02 to 12/31/11.				
Crash Types	Number	Percentage of Total	Cost of Crash Type	Total Cost
Fatalities	0	0%	$6,053,567	$0
Type A Accidents	0	0%	$301,473	$0
Type B Accidents	0	0%	$84,441	$0
Type C Accidents	4	12.9%	$55,972	$223,888
Property Damage Only	27	87.1%	$6,480	$174,960
Total	31	100%		**$398,848**

Existing animal crash data is used to estimate the percentage of the predicted wild animal crashes that will result in fatalities or injury related crashes. In the past 10 years, 428 wild animal crashes have occurred on US-95 in District 2. The crash data is shown in Appendix B.5. Of the 428 wild animal crashes in District 2, no fatalities were observed, 3 Type A Accidents (Serious) were observed, and 7 Type B Accidents (Visible) were observed. The results of the wild animal crashes are summarized in Table 5 below. The conclusion shown in Table 5 is that wild animal crashes usually do not cause severe crashes or fatalities. Less than 1 percent of the total wild animal crashes along US-95 in District 2 during the past 10 years have resulted in a fatality or serious injury. About 91% of the wild animal crashes along US-95 in District 2 during the past 10 years were crashes involving property damage only.

Table 5: Wild Animal Crashes Along US-95 in District 2 From 1/2002 Through 12/2011 From 1/1/02 to 12/31/11 and Their Related Economic Costs.				
Crash Types	Total Number	Percentage of Total	Cost of Crash Type	Total Cost
Fatalities	0	0%	$6,053,567	$0
Type A Accidents	3	0.7%	$301,473	$904,419
Type B Accidents	7	1.6%	$84,441	$591,087
Type C Accidents	30	7.0%	$55,972	$1,679,160
Property Damage Only	388	90.6%	$6,480	$2,514,240
Total	428	100%		**$5,688,906**

All data used for prediction of wild animal crashes is based on crashes that have been reported to the Idaho State Police. Many wild animal crashes are not reported to the police because the result of the collision is not significant and does not include an injury or significant property damage. Unreported wild animal crashes are not a primary ITD safety concern, since they do not increase the number crashes with injury and the property damage is generally not significant.

In conclusion, wild animal crashes should not be a dominant factor in selecting an alternative. Wild animal crashes have been observed to have low severity and low economic costs relative to the total amount of economic costs due to crashes and because it is predicted that the total number of wild animal crashes is not significantly greater for any of the alternatives. Alternative E2 may have more wild animal crash potential than Alternatives C3 and W4 because it is within an ungulate impact area; however, roadside clearing will reduce the wild animal crash potential. Wild animal crash rates are predicted to be similar to the wild animal crash rates that the base formulas of the HSM predict.

Crashes Relating to Unfavorable Weather Conditions

Approximately 57% percent of crashes during the past 10 years occur during inclement weather where the police report lists snow, rain, or fog as the weather condition and has a road surface condition of wet, snow, ice, or slush. Therefore, the ITD commissioned Dr. Russell Qualls, Idaho State Climatologist and a Registered Professional Engineer, to study the weather patterns in the study area and make recommendations on proposed alternatives based on weather conditions. His original report titled "Final Report for Weather Analysis of Proposed Realignments of U.S. Highway 95, Thorncreek Road to Moscow" stated that there were three distinct climate types in the project study area. The report indicated that Alternative W4 would have colder temperatures and be more susceptible to frost; however, Alternative E2 and C3 would have greater precipitation than W4. Dr. Qualls suggested that due to insignificant differences between weather in the corridors, that weather should not be a dominant factor in selecting one alternative over the other. For this report, all three alternatives are treated equally and no crash modification factors or calibration factors are applied to any of the alternatives for weather related crashes.

Crash Prediction Results for Proposed Alternatives

No Action Alternative

The existing alignment had 220 total crashes and 92 fatal and injury related crashes for the 10 year period from January 1, 2002 through December 31, 2011.

As AADTs between Thorncreek Road and Moscow grow and the two lane highway approaches its capacity, passing opportunities will decrease and crashes on US-95 are expected to increase. The frequency of crashes is predicted to increase at the same rate as the growth rate, or at 2% per year. By 2017, the frequency of crashes on the No Action Alternative is predicted to be 24.8 total crashes and 10.5 fatal and injury related crashes per year if no improvements are made. Increasing actual crash data for the existing alignment with a growth rate is a reasonable projection of crashes for the No Action Alternative.

Alternative E2

Alternative E2 is predicted to have the fewest crashes of the three action alternatives and the No Action Alternative. Alternative E2 is the shortest alternative, has the fewest county road intersections, and has the fewest commercial and residential approaches. These factors all reduce the predicted crash rate. A grade separation is assumed at Eid Road due to the topography of the land and the turning movements in and out of the trailer park.

Alternative E2 may have more wild animal crash potential than the Alternatives C3 and W4 because 1.98 miles of E2 are within an ungulate impact area; however, the roadside clearing crash countermeasure will reduce the wild animal crash potential and wild animal crash severity is generally low with less than 1% of wild animal crashes resulting in a fatality or serious injury.

Calculations for predicted crashes were done using spreadsheets developed by Dr. Karen Dixon, one of the authors of the HSM. All supporting spreadsheets and typical sections for crash prediction are shown in Appendix C.1. Table 6, shown below, summarizes the predicted crashes for Alternative E2.

Table 6: HSM Crash Results for Alternative E2.

	Total Crashes Per Year	Fatal and Injury Crashes Per Year
Rural Divided Multilane Segment	6.1	3.3
Suburban Segment	0.9	0.3
South Old US-95 Intersection	0.3	0.1
North Old US-95 Intersection	0.4	0.1
Total	**7.7**	**3.8**

Alternative C3

Alternative C3 is predicted to be the least safe action alternative. It has the longest five lane suburban section with a two-way left turning lane of the three action alternatives. Crashes are predicted at a rate of 3.4 crashes per centerline mile for the file lane suburban section while the rural four lane divided section has a predicted rate of 1.1 crashes per mile. Alternative C3 also has the most residential and commercial approaches of the three alternatives. The numerous residential and commercial approaches result in greater numbers of predicted crashes due to vehicles turning on and off of US-95. Five at-grade intersections at Eid Road, Clyde Road, Cameron Road, North Old US-95, and South Old US-95 must be constructed to accommodate local traffic and crashes associated with the additional county road intersections are predicted.

A grade separation is currently assumed at Zeitler Road. If it is later decided that a grade separation is not warranted at this location, the total crashes and fatal and injury crashes will increase slightly. All supporting spreadsheets and typical sections for crash prediction are shown in Appendix C.2. Table 7, shown below, summarizes the predicted crashes for Alternative C3.

Table 7: HSM Crash Results for Alternative C3.

	Total Crashes Per Year	Fatal and Injury Crashes Per Year
Rural Divided Multilane Segment	4.9	2.7
Suburban Segment	4.8	1.5
South Old US-95 Intersection	0.3	0.1
Eid Road Intersection	0.3	0.1
Clyde Road Intersection	0.2	0.1
Cameron Road Intersection	0.2	0.1
North Old US-95 Intersection	0.2	0.1
Total	**10.9**	**4.7**

Alternative W4

Alternative W4 is predicted to have more crashes than Alternative E2, but is predicted to have fewer crashes than Alternative C3. Alternative W4 is the longest proposed action alternative, and has four proposed county road intersections. A grade separation at Snow Road is assumed due to the topography of the land in relation to Snow Road.

All supporting spreadsheets and typical sections for crash prediction are shown in Appendix C.3. Table 8, shown below, summarizes the predicted crashes for Alternative W4.

Table 8: HSM Crash Results for Alternative W4.

	Total Crashes Per Year	Fatal and Injury Crashes Per Year
Rural Multilane Segment	6.9	3.8
Suburban Segment	1.1	0.3
South Old US-95 Intersection	0.3	0.1
Eid Road Intersection	0.3	0.1
Jacksha Intersection	0.3	0.1
North Old US-95 Intersection	0.4	0.1
Total	**9.3**	**4.5**

Summary

The First Edition of the AASHTO Highway Safety Manual (2010) was used to calculate predicted crash rates for the three different alternatives carried forward on the Thorncreek to Moscow project. AASHTO and TRB Task forces recognize that that the Highway Safety Manual is the most accepted and current document that provides knowledge and practices relating to safety evaluation and management. The manual was developed as a tool for crash analysis and estimation. The following table summarizes the calculations based on the First Edition of the AASHTO Highway Safety Manual:

Table 9: Predicted Crash Rate For Proposed Alternatives Based on HSM Calculations.

Alternative	Total Crashes Per Year	Fatal and Injury Crashes Per Year
No Action	24.8	10.5
E2	7.7	3.8
C3	10.9	4.7
W4	9.3	4.5

Calculations from the AASHTO Highway Safety Manual show that all alternatives are predicted to be safer than the No Action Alternative and eliminate three High Crash Locations. In fact, Alternative E2 is predicted to have about 69% fewer crashes than the No Action Alternative. Constructing any action alternative is predicted to significantly reduce fatalities and the different crash types.

Calculations show that Alternative E2 is predicted to be safer than both Alternatives C3 and W4, both in total crashes, and fatal and high severity crashes. The following are the reasons that Alternative E2 is predicted to be the safest proposed alternative:

- It is the shortest alternative.
- It has the fewest public road intersections.
- It has the fewest residential and commercial approaches.

Alternative E2 may have more wild animal crash potential than Alternatives C3 and W4; however, wild animal crash potential should not be a dominant factor in selecting an alternative based on safety because wild animal crash severity is generally low with less than 1% of wild animal crashes resulting in a fatality or serious injury and very low economic costs associated with the wild animal crashes compared to the total economic costs of all crashes.

Also, roadside clearing is predicted to reduce the wild animal crash potential. Wild animal crash potential does not outweigh the other safety benefits of Alternative E2.

Alternative C3 is calculated to be the least safe alternative in total crashes as well as fatal and injury crashes. Alternative C3 has five public road intersections, the most residential and commercial approaches, and the longest suburban section. The characteristics of Alternative C3 create turning traffic across US-95, leading to an increase in the predicted number of crashes.

Alternative W4 is predicted to have more crashes than Alternative E2 because it is the longest alternative, and it has four public road intersections verses Alternative E2's 2 public road intersections.

In conclusion, the Purpose and Need Statement in the Environmental Impact Statement is the following:

- Purpose – The purpose of this project is to improve public safety and increase highway capacity on US 95 between Thorncreek Road and Moscow.
- Need – Within the project limits, US95 does not meet current American Association of State Highway and Transportation Officials (AASHTO) Standards (widths, clear-zones, grades, and sight distance). Additional concerns include high accident locations and insufficient highway capacity.

Alternative E2 is predicted to be the safest alternative and it is predicted to be safer than the No Action Alternative by about 69%. From a safety perspective, Alternative E2 satisfies the Purpose and Need Statement to a greater extent than Alternatives C3 and W4 and is the recommended alternative because it has the lowest predicted crash rate. The reason it has the lowest predicted crash rate is because it is the shortest alternative, has the fewest public road intersections, and has the fewest approaches.

Appendix A.1

Crash Data

Thorncreek Road to Moscow Crash Data
From 1/02 through 12/11

Lewiston Hill to Thorncreek Road Crash Data
From 10/07 through 12/11

All Accidents on US-95 between 337.668 to 344.004 from 01/01/02 and 12/31/11

Total Crashes: 220 **Total Units: 220** **Total People: 220** **Fatalities: 6** **Injuries: 138**

#	MP	Vehicle Type	Driver Action	Lane Direction		Event 1	Junction	Event Relation To Road	Contributing Circumstance 1	Contributing Circumstance 2	Road Condition	Weather	Surface	Light	Fatal	Injury	Day	AccidentDate	Severity
1	337.689	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Right Shoulder	Other	None	None	Snow	Slush	Day	0	0	Wednesday	11/30/2005	Property Dmg Report
2	337.700	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	Roadside or Sidewalk	None	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	Friday	3/28/2008	Property Dmg Report
3	337.800	Car	Going Straight	Ascending	N	Ditch	Nonjunction	Roadside or Sidewalk	Tire Defect	Inattention	None	Fog	Wet	Day	0	2	Tuesday	1/30/2007	A Injury Accident
4	337.800	Car	Going Straight	Ascending	N	Fence	Nonjunction	Roadside or Sidewalk	None	Inattention	None	Clear	Dry	Day	0	0	Saturday	9/27/2008	Property Dmg Report
5	337.897	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Rear-End	Driveway/Alley/Parking Lot Related	On Roadway	Inattention	Following Too Close					0	0		9/4/2008	C Injury Accident
5	337.897	Car	Slowing in Traffic	Descending	S	Rear-End	Driveway/Alley/Parking Lot Related		None	None	None	Clear	Dry	Day	0	1	Thursday	9/4/2008	C Injury Accident
6	337.900	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	Roadside or Sidewalk	Asleep, Drowsy, Fatigued	Overcorrected	None	Cloudy	Wet	Day	0	1	Wednesday	12/1/2010	B Injury Accident
7	337.973	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Friday	4/16/2010	Property Dmg Report
7	337.973	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None					0	0		4/16/2010	Property Dmg Report
8	338.012	Car	Going Straight	Descending	N	Angle	Nonjunction	On Roadway	Drove Left of Center	Drug Impaired	None	Snow	Snow	Dark, No Street Lights	1	4	Friday	1/7/2011	Fatal Accident
8	338.012	Car	Going Straight	Descending	S	Angle	Nonjunction		None	None					0	0		1/7/2011	Fatal Accident
9	338.038	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dark, No Street Lights	0	1	Tuesday	4/6/2010	C Injury Accident
10	338.056	Car	Negotiating Curve	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Monday	9/15/2008	Property Dmg Report
11	338.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Rear-End	Nonjunction		None	None	None	Cloudy	Ice	Day	0	0	Sunday	12/4/2005	Property Dmg Report
11	338.100	Car	Going Straight	Ascending	N	Rear-End	Nonjunction	On Roadway	Inattention	Following Too Close					0	0		12/4/2005	Property Dmg Report
12	338.100	Car	Going Straight	Descending	S	Side Swipe Opposite	Nonjunction		None	None	None	Cloudy	Snow	Dark, No Street Lights	0	2	Thursday	2/22/2007	B Injury Accident
12	338.100	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Side Swipe Opposite	Nonjunction	Outside Right-Of-Way	None	None					0	0		2/22/2007	B Injury Accident
13	338.100	Car	Negotiating Curve	Ascending	S	Overturn	Nonjunction	Left Shoulder	None	Speed Too Fast For Conditions	None	Clear	Dry	Dark, No Street Lights	0	1	Tuesday	8/19/2003	B Injury Accident
14	338.100	Car	Going Straight	Descending	S	Overturn	Nonjunction	Right Shoulder	Inattention	None	None	Cloudy	Dry	Day	0	0	Monday	11/22/2004	Property Dmg Report
15	338.100	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Animal - Domestic	Nonjunction	On Roadway	None	None	None	Cloudy	Wet	Dark, No Street Lights	0	0	Thursday	10/16/2008	Property Dmg Report
16	338.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Snow	Ice	Day	0	0	Saturday	12/12/2009	Property Dmg Report
17	338.100	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Head-On	Nonjunction	On Roadway	Inattention	Asleep, Drowsy, Fatigued	None	Clear	Dry	Day	0	3	Monday	3/1/2010	A Injury Accident
17	338.100	Car	Negotiating Curve	Descending	S	Side Swipe Opposite	Nonjunction		None	None					0	0		3/1/2010	A Injury Accident
17	338.100	Car	Negotiating Curve	Descending	S	Head-On	Nonjunction		None	None					0	0		3/1/2010	A Injury Accident

18	338.100	Car	Negotiating Curve	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	1	Monday	10/25/2010	C Injury Accident
19	338.130	Car	Negotiating Curve	Descending	S	Overturn	Nonjunction	Roadside or Sidewalk	Inattention	None	None	Clear	Dry	Dark, No Street Lights	0	1	Wednesday	10/1/2003	B Injury Accident
20	338.200	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Overturn	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	Following Too Close		Clear	Ice	Day	0	1	Monday	11/27/2006	A Injury Accident
21	338.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Ditch	Nonjunction	Roadside or Sidewalk	None	None	None	Snow	Ice	Dark, No Street Lights	0	0	Friday	2/23/2007	Property Dmg Report
22	338.200	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	2	Thursday	10/25/2007	C Injury Accident
23	338.200	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Overturn	Nonjunction	On Roadway	Asleep, Drowsy, Fatigued	Drove Left of Center	None	Clear	Dry	Day	0	2	Monday	4/27/2009	C Injury Accident
23	338.200	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Side Swipe Opposite	Nonjunction		None	None					0	0		4/27/2009	C Injury Accident
24	338.200	Car	Negotiating Curve	Descending	S	Embankment	Nonjunction	Roadside or Sidewalk	Asleep, Drowsy, Fatigued	None	None	Clear	Dry	Day	0	1	Sunday	4/17/2011	C Injury Accident
25	338.300	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Head-On	Nonjunction		None	None					0	0		12/22/2007	A Injury Accident
25	338.300	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Head-On	Nonjunction	On Roadway	None	None	None	Snow	Snow	Dark, No Street Lights	0	3	Saturday	12/22/2007	A Injury Accident
26	338.300	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Ditch	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Snow	Day	0	0	Tuesday	1/21/2003	Property Dmg Report
27	338.300	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Outside Right-Of-Way	None	None	Other	Snow	Snow	Dark, No Street Lights	0	0	Saturday	1/10/2009	Property Dmg Report
28	338.300	Car	Going Straight	Ascending	S	Overturn	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	Drove Left of Center	None	Snow	Slush	Day	0	0	Saturday	3/19/2011	Property Dmg Report
29	338.400	Car	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Alcohol Impaired	Inattention	None	Clear	Dry	Dark, No Street Lights	0	1	Friday	5/12/2006	B Injury Accident
30	338.400	SUV/Crossover	Going Straight	Descending	N	Overturn	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Dawn or Dusk	0	0	Saturday	2/5/2011	Property Dmg Report
31	338.500	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Overturn	Nonjunction	Right Shoulder	None	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	Sunday	3/23/2003	Property Dmg Report
32	338.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	On Roadway	Distracted IN or ON Vehicle	Overcorrected	None	Cloudy	Dry	Day	0	1	Saturday	9/14/2002	A Injury Accident
33	338.500	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Guardrail Face	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Snow	Snow	Day	0	0	Saturday	12/12/2009	Property Dmg Report
34	338.500	Pickup	Going Straight	Descending	N	Overturn	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Dawn or Dusk	0	0	Thursday	4/7/2011	Property Dmg Report
35	338.700	Pickup/Van/Panel/SUV	Merging	Descending	S	Side Swipe Same	Nonjunction		None	None	None	Clear	Dry	Day	0	0	Thursday	8/14/2008	Property Dmg Report
35	338.700	Car	Merging	Descending	S	Side Swipe Same	Nonjunction	On Roadway	Inattention	Other					0	0		8/14/2008	Property Dmg Report
36	338.700	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Overturn	Nonjunction	Right Shoulder	Alcohol Impaired	None	None	Cloudy	Dry	Day	0	1	Saturday	10/24/2009	B Injury Accident
37	338.700	Car	Going Straight	Descending	S	Side Swipe Opposite	Nonjunction		None	None	None	Clear	Ice	Dawn or Dusk	0	2	Monday	2/1/2010	A Injury Accident
37	338.700	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Side Swipe Opposite	Nonjunction	Left Shoulder	Inattention	None					0	0		2/1/2010	A Injury Accident
38	338.700	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Guardrail End	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Snow	Dark, Street Lights On	0	1	Saturday	12/11/2010	C Injury Accident
39	338.800	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	Monday	10/15/2007	Property Dmg Report
40	338.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	On Roadway	None	None	None	Clear	Ice	Dark, No Street Lights	0	2	Monday	3/24/2008	C Injury Accident

41	338.800	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Traffic Sign Support	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Clear	Ice	Day	0	0	Thursday	1/28/2010	Property Dmg Report
42	338.800	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	0	Friday	7/16/2010	Property Dmg Report
43	338.818	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Guardrail Face	Nonjunction	Right Shoulder	Inattention	None	None	Clear	Dry	Day	0	0	Saturday	5/31/2008	Property Dmg Report
44	338.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Day	0	0	Tuesday	1/15/2008	Property Dmg Report
45	338.900	Pickup/Van/Panel/SUV	Passing	Ascending	S	Ditch	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	Other	None	Snow	Snow	Dark, No Street Lights	0	0	Wednesday	3/3/2004	Property Dmg Report
46	338.928	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Inattention	Overcorrected	None	Clear	Dry	Day	0	1	Tuesday	8/28/2007	C Injury Accident
47	338.972	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Overturn	Nonjunction	Outside Right-Of-Way	Speed Too Fast For Conditions	None	None	Clear	Ice	Dark, No Street Lights	0	1	Monday	12/10/2007	B Injury Accident
48	338.981	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Overturn	Nonjunction	Left Shoulder	None	None	None	Clear	Ice	Dawn or Dusk	0	0	Sunday	1/1/2006	Property Dmg Report
49	338.981	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	Wednesday	3/19/2008	Property Dmg Report
50	338.981	Car	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	Other	None	Clear	Dry	Dark, No Street Lights	0	0	Thursday	5/8/2008	Property Dmg Report
51	338.990	Car	Negotiating Curve	Descending	N	Embankment	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Snow	Ice	Dark, No Street Lights	0	0	Sunday	11/21/2010	Property Dmg Report
52	338.991	Car	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	Sunday	10/9/2011	Property Dmg Report
53	339.020	Car	Negotiating Curve	Ascending	N	Other Fixed Object	Nonjunction	Left Shoulder	None	None	None	Cloudy	Wet	Dark, No Street Lights	0	0	Friday	2/4/2005	Property Dmg Report
54	339.020	Truck - 2 Axle/6 Tires	Negotiating Curve	Descending	S	Guardrail End	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Day	0	0	Monday	12/29/2008	Property Dmg Report
55	339.094	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Embankment	Nonjunction	Right Shoulder	None	Speed Too Fast For Conditions	None	Rain	Snow	Day	0	0	Sunday	12/2/2007	Property Dmg Report
56	339.100	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	0	Thursday	7/5/2007	Property Dmg Report
57	339.100	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Embankment	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Snow	Ice	Dark, No Street Lights	0	0	Sunday	12/9/2007	Property Dmg Report
58	339.100	Car	Negotiating Curve	Descending	S	Tree	Nonjunction	Right Shoulder	None	Speed Too Fast For Conditions	None	Snow	Snow	Dark, No Street Lights	0	1	Tuesday	12/25/2007	A Injury Accident
59	339.100	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Guardrail Face	Nonjunction	Right Shoulder	None	Speed Too Fast For Conditions	None	Snow	Snow	Day	0	0	Saturday	12/22/2007	Property Dmg Report
60	339.100	Car	Going Straight	Descending	N	Guardrail Face	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	Drove Left of Canter	None	Severe Cross Winds	Slush	Day	0	2	Wednesday	2/6/2008	C Injury Accident
61	339.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Embankment	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Dawn or Dusk	0	0	Saturday	2/22/2003	Property Dmg Report
62	339.100	Motorcycle	Negotiating Curve	Descending	S	Guardrail Face	Nonjunction	Right Shoulder	Other	Inattention	None	Cloudy	Dry	Day	0	1	Thursday	4/24/2003	A Injury Accident
63	339.120	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Snow	Snow	Dark, No Street Lights	0	0	Wednesday	12/10/2003	Property Dmg Report
64	339.200	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Off Roadway-Location Unknown	Other	None	None	Clear	Snow	Day	0	1	Saturday	2/2/2002	C Injury Accident
65	339.200	Car	Negotiating Curve	Descending	N	Overturn	Nonjunction	Left Shoulder	None	None	None	Clear	Ice	Day	0	0	Saturday	11/18/2006	Property Dmg Report
66	339.200	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Side Swipe Opposite	Nonjunction		None	None					0	0		3/26/2007	Property Dmg Report

66	339.200	Car	Negotiating Curve	Descending	N	Side Swipe Opposite	Nonjunction	On Roadway	Drove Left of Center	Speed Too Fast For Conditions	None	Cloudy	Ice	Dark, No Street Lights	0	0	Monday	3/26/2007	Property Dmg Report
67	339.200	Car	Negotiating Curve	Descending	S	Ditch	Nonjunction	Outside Right-Of-Way	Alcohol Impaired	Overcorrected	None	Clear	Dry	Dark, No Street Lights	0	0	Friday	4/13/2007	Property Dmg Report
68	339.200	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Right Shoulder	None	Speed Too Fast For Conditions	None	Cloudy	Ice	Dark, No Street Lights	0	2	Saturday	12/1/2007	B Injury Accident
69	339.200	Car	Negotiating Curve	Descending	N	Guardrail Face	Nonjunction	Left Shoulder	None	Drove Left of Center	None	Clear	Dry	Day	0	0	Sunday	2/2/2003	Property Dmg Report
70	339.200	Tractor - 1 Trailer	Negotiating Curve	Descending	N	Side Swipe Opposite	Nonjunction	On Roadway	None	Speed Too Fast For Conditions	None	Snow	Snow	Day	0	0	Tuesday	1/6/2004	Property Dmg Report
70	339.200	Tractor - 1 Trailer	Negotiating Curve	Descending	S	Side Swipe Opposite	Nonjunction		None	None					0	0		1/6/2004	Property Dmg Report
71	339.200	Truck - 2 Axle/6 Tires	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	Inattention	Poor Pavement Markings	Snow	Ice	Day	0	2	Wednesday	1/7/2004	B Injury Accident
72	339.200	Car	Negotiating Curve	Descending	N	Overturn	Nonjunction	Left Shoulder	None	Overcorrected	None	Clear	Dry	Dark, No Street Lights	0	1	Sunday	12/26/2004	B Injury Accident
73	339.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Guardrail Face	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Snow	Snow	Dark, No Street Lights	0	0	Saturday	1/10/2009	Property Dmg Report
74	339.200	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Guardrail Face	Nonjunction	Right Shoulder	Other	None	None	Sleet/Hail	Ice	Dawn or Dusk	0	0	Saturday	1/9/2010	Property Dmg Report
75	339.200	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Right Shoulder	Alcohol Impaired	Speed Too Fast For Conditions		Snow	Snow	Dark, No Street Lights	0	1	Sunday	11/21/2010	B Injury Accident
76	339.200	Car	Negotiating Curve	Descending	N	Concrete Traffic Barrier	Nonjunction	Left Shoulder	None	Drove Left of Center	None	Clear	Ice	Day	0	0	Saturday	12/4/2010	Property Dmg Report
77	339.250	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Inattention	None	None	Cloudy	Dry	Dark, No Street Lights	0	1	Thursday	3/24/2005	C Injury Accident
78	339.300	Car	Negotiating Curve	Ascending	S	Ditch	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Snow	Ice	Day	0	0	Wednesday	12/31/2008	Property Dmg Report
79	339.300	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Outside Right-Of-Way	None	None	None	Clear	Ice	Dawn or Dusk	0	0	Sunday	11/8/2009	Property Dmg Report
80	339.400	Car	Negotiating Curve	Descending	N	Overturn	Nonjunction	Left Shoulder	Drove Left of Center	Other Vehicle Defect	None	Cloudy	Wet	Day	0	0	Tuesday	5/10/2005	Property Dmg Report
81	339.400	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Ditch	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Cloudy	Wet	Day	0	1	Saturday	10/16/2004	B Injury Accident
82	339.500	Car	Negotiating Curve	Ascending	S	Overturn	Nonjunction	Left Shoulder	None	None	Loose Gravel/Seal Coat	Clear	Dry	Dawn or Dusk	0	1	Thursday	8/4/2005	C Injury Accident
83	339.500	Car	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Saturday	11/19/2005	Property Dmg Report
84	339.500	Car	Negotiating Curve	Ascending	S	Embankment	Nonjunction	Roadside or Sidewalk	None	Speed Too Fast For Conditions	None	Snow	Snow	Dark, No Street Lights	0	0	Monday	1/14/2008	Property Dmg Report
85	339.500	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Overturn	Nonjunction	Roadside or Sidewalk	None	None	None	Snow	Snow	Dark, No Street Lights	0	0	Sunday	12/21/2008	Property Dmg Report
86	339.500	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Animal - Wild	Nonjunction	On Roadway	Other	None	None	Cloudy	Dry	Dark, Street Lights Off	0	0	Saturday	8/15/2009	Property Dmg Report
87	339.500	Pickup	Going Straight	Descending	S	Overturn	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Day	0	0	Saturday	1/8/2011	Property Dmg Report
88	339.600	Pickup	Passing	Ascending	N	Same Direction Turning	Nonjunction	Roadside or Sidewalk	Improper Overtaking	None					0	0		10/27/2011	Property Dmg Report
88	339.600	SUV/Crossover	Turning Left	Ascending	N	Same Direction Turning	Nonjunction		Failed to Signal	None	None	Clear	Dry	Day	0	0	Thursday	10/27/2011	Property Dmg Report

89	339.620	Pickup/Van/Panel/SUV	Passing	Descending	S	Overturn	In Intersection	On Roadway	Inattention	None	None	Clear	Dry	Day	0	1	Thursday	5/31/2007	C Injury Accident
89	339.620	Pickup/Van/Panel/SUV	Turning Left	Descending	S	Same Direction Turning	In Intersection		None	None					0	0		5/31/2007	C Injury Accident
90	339.620	Car	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	None	None	None	Clear	Ice	Day	0	1	Thursday	12/13/2007	C Injury Accident
91	339.620	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Embankment	Nonjunction	Roadside or Sidewalk	None	None	None	Clear	Ice	Day	0	2	Wednesday	1/30/2008	A Injury Accident
92	339.620	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Rear-End	Intersection Related	On Roadway	Inattention	None	None	Cloudy	Dry	Day	0	0	Tuesday	2/2/2010	Property Dmg Report
92	339.620	Pickup/Van/Panel/SUV	Slowing in Traffic	Ascending	N	Rear-End	Intersection Related		None	None					0	0		2/2/2010	Property Dmg Report
92	339.620	Car	Turning Right	Ascending	N	Rear-End Turning	Intersection Related		None	None					0	0		2/2/2010	Property Dmg Report
93	339.700	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Traffic Sign Support	Nonjunction	Right Shoulder	None	None	Other	Rain	Wet	Day	0	0	Sunday	6/5/2005	Property Dmg Report
94	339.731	Pickup/Van/Panel/SUV	Turning Left	Ascending	S	Embankment	Nonjunction	Left Shoulder	None	None	None	Clear	Ice	Day	0	0	Sunday	12/12/2004	Property Dmg Report
95	339.800	Car	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	Other	None	Cloudy	Wet	Dark, No Street Lights	0	1	Saturday	10/1/2005	C Injury Accident
96	339.850	Pickup	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Saturday	4/9/2011	Property Dmg Report
97	339.900	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Overturn	Nonjunction	Off Roadway-Location Unknown	Other	None	None	Rain	Wet	Dark, No Street Lights	0	2	Wednesday	11/12/2008	B Injury Accident
98	340.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Other Object Not Fixed	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Day	0	0	Friday	3/26/2004	Property Dmg Report
99	340.027	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Other	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	0	Tuesday	5/26/2009	Property Dmg Report
100	340.100	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Overturn	Nonjunction	Roadside or Sidewalk	Drove Left of Center	Inattention	None	Cloudy	Ice	Dawn or Dusk	0	1	Friday	12/14/2007	C Injury Accident
101	340.250	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Head-On	Nonjunction		None	None					0	0		1/24/2007	B Injury Accident
101	340.250	Car	Negotiating Curve	Ascending	S	Head-On	Nonjunction	On Roadway	Distracted IN or ON Vehicle	Drove Left of Center	None	Clear	Dry	Day	0	2	Wednesday	1/24/2007	B Injury Accident
102	340.300	Car	Going Straight	Ascending	N	Rear-End	Nonjunction	On Roadway	None	None	None	Cloudy	Wet	Day	0	0	Monday	10/31/2005	Property Dmg Report
102	340.300	Pickup/Van/Panel/SUV	Stopped in Traffic	Ascending	N	Rear-End	Nonjunction		None	None					0	0		10/31/2005	Property Dmg Report
103	340.300	Car	Turning Left	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	Monday	3/25/2002	Property Dmg Report
104	340.300	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Friday	3/12/2004	Property Dmg Report
105	340.350	Car	Negotiating Curve	Descending	S	Rear-End Turning	In Intersection	On Roadway	Inattention	None	None	Clear	Dry	Day	0	1	Monday	9/15/2003	C Injury Accident
105	340.350	Car	Turning Right	Descending	S	Rear-End Turning	In Intersection		None	None					0	0		9/15/2003	C Injury Accident
106	340.400	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Animal - Wild	In Intersection	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Wednesday	2/18/2009	Property Dmg Report
107	340.425	Car	Negotiating Curve	Ascending	S	Side Swipe Opposite	Nonjunction	On Roadway	None	None	None	Snow	Snow	Day	0	0	Friday	12/12/2003	Property Dmg Report
107	340.425	Car	Negotiating Curve	Ascending	N	Side Swipe Opposite	Nonjunction		None	None					0	0		12/12/2003	Property Dmg Report
108	340.438	Car	Going Straight	Ascending	S	Overturn	Nonjunction	Left Shoulder	None	Distracted IN or ON Vehicle	None	Cloudy	Dry	Day	0	0	Friday	2/18/2005	Property Dmg Report
109	340.500	Car	Negotiating Curve	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Wet	Day	0	0	Tuesday	7/8/2003	Property Dmg Report

110	340.500	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Thursday	1/29/2009	Property Dmg Report
111	340.500	Car	Negotiating Curve	Descending	S	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	Loose Gravel/Seal Coat	Snow	Wet	Day	0	0	Thursday	3/5/2009	Property Dmg Report
112	340.500	Pickup/Van/Panel/SUV	Avoiding Vehicle, Pedestrian, Pedalcycle	Descending	S	Head-On	Nonjunction		None	None					0	0		6/27/2010	Fatal Accident
112	340.500	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Head-On	Nonjunction	On Roadway	Asleep, Drowsy, Fatigued	Drove Left of Center	None	Clear	Dry	Day	1	4	Sunday	6/27/2010	Fatal Accident
113	340.520	Car	Negotiating Curve	Ascending	S	Head-On	Nonjunction	On Roadway	Drove Left of Center	Asleep, Drowsy, Fatigued	None	Clear	Dry	Dark, No Street Lights	0	2	Sunday	7/14/2002	A Injury Accident
113	340.520	Car	Negotiating Curve	Ascending	N	Head-On	Nonjunction		None	None					0	0		7/14/2002	A Injury Accident
114	340.600	Car	Negotiating Curve	Descending	S	Overturn	Nonjunction	Right Shoulder	Overcorrected	Overcorrected	None	Cloudy	Dry	Day	0	0	Tuesday	2/28/2006	Property Dmg Report
115	340.600	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Side Swipe Same	Nonjunction	On Roadway	None	None	None	Cloudy	Slush	Day	0	1	Friday	3/7/2003	C Injury Accident
115	340.600	Car	Negotiating Curve	Descending	S	Side Swipe Same	Nonjunction		None	None					0	0		3/7/2003	C Injury Accident
116	340.600	Car	Negotiating Curve	Descending	N	Side Swipe Opposite	Nonjunction		Speed Too Fast For Conditions	Alcohol Impaired	None	Cloudy	Slush	Day	2	1	Friday	3/7/2003	Fatal Accident
116	340.600	Car	Negotiating Curve	Descending	S	Side Swipe Opposite	Nonjunction	On Roadway	None	None					0	0		3/7/2003	Fatal Accident
117	340.700	Car	Negotiating Curve	Descending	S	Tree	Nonjunction	Roadside or Sidewalk	Inattention	Speed Too Fast For Conditions	None	Snow	Ice	Day	0	1	Saturday	12/22/2007	B Injury Accident
118	340.800	Car	Negotiating Curve	Descending	S	Delineator Post	Nonjunction	Roadside or Sidewalk	None	None	None	Clear	Dry	Day	0	0	Saturday	3/1/2003	Property Dmg Report
119	340.800	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	S	Overturn	Nonjunction	Roadside or Sidewalk	None	Alcohol Impaired	None	Cloudy	Dry	Dark, No Street Lights	0	1	Thursday	2/28/2008	A Injury Accident
120	340.800	Car	Negotiating Curve	Descending	S	Embankment	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Dawn or Dusk	0	0	Wednesday	1/28/2009	Property Dmg Report
121	340.800	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	Overcorrected	High/Low Shoulder	Cloudy	Ice	Day	0	3	Saturday	11/14/2009	C Injury Accident
122	340.800	Car	Negotiating Curve	Descending	N	Other Fixed Object	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Dark, No Street Lights	0	0	Saturday	1/22/2011	Property Dmg Report
123	340.813	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Tree	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Cloudy	Slush	Day	0	0	Tuesday	11/25/2003	Property Dmg Report
124	340.900	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	S	Overturn	Nonjunction	Left Shoulder	Overcorrected	Drove Left of Center	Loose Gravel/Seal Coat	Fog	Ice	Day	0	0	Sunday	12/4/2005	Property Dmg Report
125	340.900	Car	Negotiating Curve	Ascending	S	Embankment	Nonjunction	Left Shoulder	None	None	None	Fog	Ice	Day	0	0	Thursday	12/13/2007	Property Dmg Report
126	340.900	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Day	0	0	Monday	4/14/2008	Property Dmg Report
127	340.900	Tractor - 1 Trailer	Going Straight	Descending	S	Overturn	Nonjunction	Right Shoulder	Other	Inattention	None	Cloudy	Dry	Dark, No Street Lights	0	1	Monday	11/10/2008	C Injury Accident
128	340.914	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Ditch	Nonjunction	Roadside or Sidewalk	Too Slow for Traffic	None	None	Snow	Snow	Day	0	0	Thursday	3/7/2002	Property Dmg Report
129	340.955	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Embankment	Nonjunction	Left Shoulder	Overcorrected	Drove Left of Center	None	Cloudy	Ice	Day	0	2	Tuesday	11/25/2003	B Injury Accident
130	340.976	Car	Negotiating Curve	Ascending	S	Tree	Nonjunction	Left Shoulder	Exceeded Posted Speed	Alcohol Impaired	None	Cloudy	Dry	Dawn or Dusk	0	1	Wednesday	5/28/2008	A Injury Accident
131	340.981	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Overturn	Nonjunction	Outside Right-Of-Way	None	None	None	Snow	Slush	Dark, No Street Lights	0	0	Monday	2/3/2003	Property Dmg Report
132	340.981	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Day	0	0	Friday	3/28/2008	Property Dmg Report

133	340.994	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	0	Monday	7/17/2006	Property Dmg Report
134	340.996	Car	Negotiating Curve	Ascending	N	Ditch	Nonjunction	Off Roadway-Location Unknown	Other	None	None	Rain	Wet	Day	0	0	Sunday	5/16/2004	Property Dmg Report
135	341.000	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Ditch	Nonjunction	Right Shoulder	None	None	None	Snow	Ice	Dark, No Street Lights	0	0	Wednesday	1/30/2002	Property Dmg Report
136	341.009	Car	Going Straight	Descending	S	Rear-End	Intersection Related	On Roadway	None	Following Too Close	None	Clear	Dry	Day	0	2	Monday	5/14/2007	A Injury Accident
136	341.009	Pickup/Van/Panel/SUV	Turning Left	Descending	S	Rear-End	In Intersection		None	None					0	0		5/14/2007	A Injury Accident
137	341.009	Car	Going Straight	Descending	S	Rear-End	Intersection Related	On Roadway	Vision Obstruction	None					0	0		3/2/2003	C Injury Accident
137	341.009	Pickup/Van/Panel/SUV	Turning Left	Descending	S	Rear-End	Intersection Related		None	None	None	Cloudy	Wet	Dark, No Street Lights	0	1	Sunday	3/2/2003	C Injury Accident
138	341.009	Car	Negotiating Curve	Descending	S	Parked Car	Intersection Related	On Roadway	None	None					0	0		12/13/2008	Property Dmg Report
138	341.009	Pickup/Van/Panel/SUV	Parked Vehicle	Descending	NE	Parked Car	Intersection Related		Drove Left of Center	None	None	Snow	Snow	Dark, No Street Lights	0	0	Saturday	12/13/2008	Property Dmg Report
139	341.009	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Snow	Ice	Dark, No Street Lights	0	0	Saturday	1/24/2009	Property Dmg Report
140	341.023	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Embankment	Nonjunction	Roadside or Sidewalk	Distracted IN or ON Vehicle	Inattention	None	Clear	Dry	Day	0	1	Friday	9/11/2009	B Injury Accident
141	341.046	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Intersection Related	Right Shoulder	Following Too Close	None	None	Cloudy	Dry	Day	0	0	Friday	3/16/2007	Property Dmg Report
142	341.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Overturn	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Sleet/Hail	Ice	Dark, Street Lights Off	0	0	Thursday	12/21/2006	Property Dmg Report
143	341.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Embankment	Nonjunction	Roadside or Sidewalk	None	Inattention	None	Clear	Ice	Dawn or Dusk	0	1	Wednesday	1/30/2008	C Injury Accident
144	341.100	Car	Negotiating Curve	Ascending	N	Embankment	Nonjunction	Right Shoulder	None	None	None	Cloudy	Ice	Dark, Street Lights Off	0	1	Friday	4/4/2003	C Injury Accident
145	341.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Tree	Nonjunction	Left Shoulder	None	Speed Too Fast For Conditions	Other	Snow	Ice	Dark, No Street Lights	0	0	Saturday	1/24/2009	Property Dmg Report
146	341.100	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Tree	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None		Cloudy	Ice	Dawn or Dusk	0	1	Sunday	1/3/2010	B Injury Accident
147	341.100	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Head-On	Nonjunction	On Roadway	Speed Too Fast For Conditions	Drove Left of Center	None	Snow	Snow	Dark, No Street Lights	0	3	Sunday	11/21/2010	B Injury Accident
147	341.100	Car	Going Straight	Descending	S	Head-On	Nonjunction		None	None					0	0		11/21/2010	B Injury Accident
148	341.112	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Outside Right-Of-Way	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dark, No Street Lights	0	1	Monday	11/27/2006	A Injury Accident
149	341.200	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	0	Wednesday	6/30/2010	Property Dmg Report
150	341.200	Pickup	Going Straight	Descending	S	Pedestrian	Nonjunction	On Roadway	None	None					1	0	Friday	9/30/2011	Fatal Accident
150	341.200	Pedestrian	Walk/Ride with Traffic NO Bike Lane	Descending	W	Pedestrian	Nonjunction		None	None					0	0		9/30/2011	Fatal Accident
151	341.300	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Traffic Sign Support	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Snow	Ice	Day	0	0	Saturday	11/27/2010	Property Dmg Report
152	341.317	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Utility Pole	Intersection Related	Right Shoulder	None	None	None	Clear	Dry	Dark, No Street Lights	0	1	Saturday	10/22/2005	B Injury Accident
153	341.317	Car	Going Straight	Ascending	N	Angle	In Intersection		None	None	None	Clear	Dry	Dark, No Street Lights	0	3	Thursday	10/4/2007	C Injury Accident
153	341.317	Car	Going Straight	Ascending	N	Angle	In Intersection		None	None					0	0		10/4/2007	C Injury Accident
153	341.317	Pickup/Van/Panel/SUV	Turning Right	Ascending	E	Angle	In Intersection	On Roadway	Drove Left of Center	None					0	0		10/4/2007	C Injury Accident

154	341.317	Car	Passing	Ascending	N	Rear-End	In Intersection	On Roadway	None	None	None	Clear	Dry	Day	0	1	Tuesday	7/8/2003	C Injury Accident
154	341.317	Truck - 3+ Axle	Slowing In Traffic	Ascending	N	Rear-End	In Intersection		None	None					0	0		7/8/2003	C Injury Accident
155	341.332	Car	Going Straight	Descending	N	Side Swipe Opposite	Nonjunction		Vision Obstruction	Following Too Close	None	Cloudy	Ice	Dark, No Street Lights	0	2	Monday	11/22/2010	B Injury Accident
155	341.332	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Side Swipe Opposite	Nonjunction	On Roadway	None	None					0	0		11/22/2010	B Injury Accident
155	341.332	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Rear-End	Nonjunction	On Roadway	Following Too Close	None					0	0		11/22/2010	B Injury Accident
156	341.335	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Wet	Dark, No Street Lights	0	0	Friday	1/23/2009	Property Dmg Report
156	341.335	Car	Going Straight	Descending	N	Animal - Wild	Nonjunction	On Roadway	None	None					0	0		1/23/2009	Property Dmg Report
157	341.400	Car	Going Straight	Ascending	S	Ditch	Nonjunction	Left Shoulder	Speed Too Fast For Conditions	None	None	Clear	Dry	Dawn or Dusk	0	0	Thursday	7/7/2005	Property Dmg Report
158	341.481	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Head-On Turning	Nonjunction		None	None					0	0		3/10/2009	Property Dmg Report
158	341.481	Car	Turning Left	Descending	N	Head-On Turning	Nonjunction	On Roadway	Inattention	None	None	Clear	Slush	Day	0	0	Tuesday	3/10/2009	Property Dmg Report
159	341.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Other Object Not Fixed	Nonjunction	On Roadway	None	None	None	Severe Cross Winds	Dry	Day	0	0	Thursday	3/18/2004	Property Dmg Report
159	341.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Other Object Not Fixed	Nonjunction	On Roadway	Other	None					0	0		3/18/2004	Property Dmg Report
160	341.517	Car	Going Straight	Descending	S	Embankment	Nonjunction	Outside Right-Of-Way	Overcorrected	None	Flooded	Rain	Wet	Dark, No Street Lights	0	1	Friday	1/25/2002	B Injury Accident
161	341.700	Car	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Outside Right-Of-Way	Inattention	Speed Too Fast For Conditions	None	Cloudy	Wet	Day	0	1	Saturday	10/30/2004	B Injury Accident
162	341.800	Car	Going Straight	Descending	N	Overturn	Nonjunction	Left Shoulder	Asleep, Drowsy, Fatigued	None	None	Clear	Dry	Day	0	1	Wednesday	5/2/2007	B Injury Accident
163	341.800	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	Tuesday	6/10/2003	Property Dmg Report
164	341.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Overturn	Nonjunction	Left Shoulder	Alcohol Impaired	None	None	Clear	Dry	Dark, No Street Lights	0	0	Saturday	10/4/2003	Property Dmg Report
165	341.800	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	Right Shoulder	None	None	None	Clear	Dry	Dark, No Street Lights	0	1	Friday	4/18/2008	B Injury Accident
166	341.847	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Side Swipe Opposite	Nonjunction		None	None	None	Clear	Dry	Dark, No Street Lights	0	1	Saturday	9/11/2010	C Injury Accident
166	341.847	Car	Negotiating Curve	Descending	N	Side Swipe Opposite	Nonjunction	On Roadway	Alcohol Impaired	Inattention					0	0		9/11/2010	C Injury Accident
167	341.899	Car	Negotiating Curve	Descending	N	Head-On	Nonjunction	On Roadway	Asleep, Drowsy, Fatigued	Drove Left of Center	None	Clear	Dry	Day	1	5	Tuesday	8/1/2006	Fatal Accident
167	341.899	Car	Negotiating Curve	Descending	S	Head-On	Nonjunction		None	None					0	0		8/1/2006	Fatal Accident
168	341.900	Car	Going Straight	Ascending	S	Overturn	Nonjunction	Left Shoulder	Asleep, Drowsy, Fatigued	None	None	Clear	Dry	Dark, No Street Lights	0	1	Saturday	4/2/2005	B Injury Accident
169	341.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Monday	8/15/2005	Property Dmg Report
170	341.900	Car	Going Straight	Descending	N	Tree	Nonjunction	Off Roadway-Location Unknown	Asleep, Drowsy, Fatigued	None	None	Clear	Dry	Dark, No Street Lights	0	1	Saturday	6/24/2006	A Injury Accident
171	341.900	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Overturn	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Dawn or Dusk	0	0	Friday	4/4/2003	Property Dmg Report
172	341.900	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Embankment	Nonjunction	Roadside or Sidewalk	None	None	None	Rain	Wet	Day	0	0	Sunday	5/4/2003	Property Dmg Report

173	341.900	Car	Negotiating Curve	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Wednesday	3/11/2009	Property Dmg Report
174	341.950	Car	Going Straight	Descending	S	Side Swipe Opposite	Nonjunction		None	None					0	0		1/19/2002	Property Dmg Report
174	341.950	Car	Passing	Descending	N	Side Swipe Opposite	Nonjunction	On Roadway	Alcohol Impaired	Failed to Yield	None	Snow	Snow	Dark, No Street Lights	0	0	Saturday	1/19/2002	Property Dmg Report
175	341.981	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Wet	Dark, No Street Lights	0	0	Tuesday	10/29/2002	Property Dmg Report
176	342.000	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Rear-End Turning	Nonjunction	On Roadway	None	None					0	0		9/17/2004	C Injury Accident
176	342.000	Car	Turning Left	Descending	S	Rear-End Turning	At Driveway/Alley/Parking Lot		Failed to Signal	None	None	Rain	Wet	Day	0	1	Friday	9/17/2004	C Injury Accident
177	342.000	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Thursday	3/12/2009	Property Dmg Report
178	342.030	Car	Going Straight	Descending	S	Rear-End Turning	Driveway/Alley/Parking Lot Related	On Roadway	Inattention	None	None	Cloudy	Dry	Day	0	4	Sunday	10/16/2005	C Injury Accident
178	342.030	Pickup/Van/Panel/SUV	Stopped in Traffic	Descending	S	Rear-End Turning	Driveway/Alley/Parking Lot Related		None	None					0	0		10/16/2005	C Injury Accident
179	342.100	Pickup/Van/Panel/SUV	Going Straight	Descending	N	Overturn	Nonjunction	Left Shoulder	None	None	None	Cloudy	Ice	Dark, No Street Lights	0	3	Friday	1/18/2002	B Injury Accident
180	342.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Head-On	Driveway/Alley/Parking Lot Related	On Roadway	None	Inattention					0	0		5/13/2005	A Injury Accident
180	342.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Driveway/Alley/Parking Lot Related		None	None					0	0		5/13/2005	A Injury Accident
180	342.100	Pickup/Van/Panel/SUV	Stopped in Traffic	Ascending	S	Rear-End	Driveway/Alley/Parking Lot Related	On Roadway	None	None	None	Clear	Dry	Day	0	3	Friday	5/13/2005	A Injury Accident
181	342.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Other	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	0	Saturday	4/28/2007	Property Dmg Report
181	342.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Cargo Loss/Shift	Nonjunction	On Roadway	Other	None					0	0		4/28/2007	Property Dmg Report
182	342.200	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Rear-End Turning	At Driveway/Alley/Parking Lot	Right Shoulder	None	Following Too Close					0	0		2/20/2007	Property Dmg Report
182	342.200	Pickup/Van/Panel/SUV	Turning Right	Descending	S	Rear-End Turning	At Driveway/Alley/Parking Lot		None	None	None	Cloudy	Wet	Dark, No Street Lights	0	0	Tuesday	2/20/2007	Property Dmg Report
183	342.200	Car	Going Straight	Descending	S	Overturn	Nonjunction	Off Roadway-Location Unknown	Distracted IN or ON Vehicle	Overcorrected	None	Clear	Dry	Day	0	2	Monday	7/2/2007	C Injury Accident
184	342.200	Car	Going Straight	Descending	N	Overturn	Nonjunction	Roadside or Sidewalk	Overcorrected	Drove Left of Center	None	Clear	Dry	Day	0	1	Saturday	10/19/2002	A Injury Accident
185	342.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Ditch	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	Drove Left of Center	None	Cloudy	Snow	Dark, No Street Lights	0	0	Friday	1/2/2004	Property Dmg Report
186	342.300	Motorcycle	Going Straight	Ascending	N	Overturn	Nonjunction	Off Roadway-Location Unknown	None	None	None	Severe Cross Winds	Dry	Day	0	1	Wednesday	9/1/2004	A Injury Accident
187	342.317	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	N	Overturn	Nonjunction	Outside Right-Of-Way	Overcorrected	None	None	Cloudy	Ice	Dawn or Dusk	0	0	Tuesday	11/23/2010	Property Dmg Report
188	342.400	Pickup/Van/Panel/SUV	Starting In Traffic	Ascending	N	Rear-End	Nonjunction	On Roadway	Following Too Close	Inattention	None	Rain	Wet	Day	0	3	Sunday	3/24/2002	C Injury Accident

188	342.400	Car	Stopped In Traffic	Ascending	N	Rear-End	Nonjunction		None	None					0	0		3/24/2002	C Injury Accident
189	342.400	Pickup/Van/Panel/SUV	Going Straight	Ascending	N	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dawn or Dusk	0	1	Monday	11/22/2010	C Injury Accident
190	342.500	Car	Going Straight	Ascending	S	Embankment	Nonjunction	Roadside or Sidewalk	Overcorrected	Fatigued	None	Clear	Dry	Day	0	0	Friday	3/2/2007	Property Dmg Report
191	342.500	Pickup/Van/Panel/SUV	Avoiding Obstacle	Ascending	S	Side Swipe Opposite	Nonjunction	On Roadway	Speed Too Fast For Conditions	None					0	0		12/2/2007	Property Dmg Report
191	342.500	Car	Going Straight	Ascending	N	Side Swipe Opposite	Nonjunction		Vision Obstruction	None	None	Rain	Snow	Day	0	0	Sunday	12/2/2007	Property Dmg Report
192	342.500	SUV/Crossover	Negotiating Curve	Ascending	S	Overturn	Nonjunction	Outside Right-Of-Way	Speed Too Fast For Conditions	None	None	Clear	Ice	Dark, No Street Lights	0	0	Saturday	2/5/2011	Property Dmg Report
193	342.600	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	Distracted IN or ON Vehicle	None	Clear	Ice	Dark, No Street Lights	0	1	Monday	12/22/2003	B Injury Accident
194	342.700	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	N	Overturn	Nonjunction	Left Shoulder	Overcorrected	Speed Too Fast For Conditions	None	Cloudy	Ice	Dark, No Street Lights	0	2	Saturday	2/10/2007	B Injury Accident
195	342.700	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Wednesday	9/1/2004	Property Dmg Report
196	342.800	Car	Going Straight	Descending	S	Embankment	Nonjunction	Roadside or Sidewalk	Other	None	None	Snow	Snow	Dawn or Dusk	0	0	Saturday	12/22/2007	Property Dmg Report
197	342.800	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	Right Shoulder	Tire Defect	Speed Too Fast For Conditions	None	Snow	Snow	Dark, No Street Lights	0	0	Thursday	1/6/2005	Property Dmg Report
198	342.801	Car	Going Straight	Ascending	N	Rear-End	Nonjunction		None	None	None	Clear	Dry	Dark, No Street Lights	0	1	Tuesday	10/17/2006	C Injury Accident
198	342.801	Car	Going Straight	Ascending	N	Rear-End	Nonjunction	On Roadway	Inattention	Other Vehicle Defect					0	0		10/17/2006	C Injury Accident
199	342.857	Car	Going Straight	Descending	S	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Wednesday	7/13/2005	Property Dmg Report
200	342.905	SUV/Crossover	Merging	Descending	S	Side Swipe Same	Nonjunction	On Roadway	Inattention	Failed to Yield	None	Rain	Wet	Day	0	0	Monday	4/11/2011	Property Dmg Report
200	342.905	Truck With Trailer	Merging	Descending	S	Side Swipe Same	Nonjunction		None	None					0	0		4/11/2011	Property Dmg Report
201	342.968	Car	Going Straight	Descending	S	Overturn	Nonjunction	Outside Right-Of-Way	Alcohol Impaired	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	Saturday	3/27/2004	Property Dmg Report
202	342.981	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	S	Ditch	Nonjunction	Right Shoulder	None	None	None	Clear	Ice	Day	0	0	Wednesday	12/25/2002	Property Dmg Report
203	342.996	Pickup/Van/Panel/SUV	Going Straight	Ascending	S	Embankment	Nonjunction	Left Shoulder	None	None	None	Clear	Dry	Day	0	1	Tuesday	2/10/2009	B Injury Accident
204	343.000	Car	Going Straight	Descending	S	Angle Turning	Intersection Related		None	None	None	Snow	Ice	Dark, No Street Lights	0	0	Monday	11/22/2010	Property Dmg Report
204	343.000	Pickup/Van/Panel/SUV	Turning Left	Descending	E	Angle Turning	Intersection Related	On Roadway	Failed to Yield	None					0	0		11/22/2010	Property Dmg Report
205	343.007	Tractor - 1 Trailer	Going Straight	Descending	N	Side Swipe Opposite	Nonjunction	On Roadway	Inattention	None					0	0		12/6/2011	Property Dmg Report
205	343.007	Van - 1 to 8 seats	Stopped in Traffic	Descending	S	Side Swipe Opposite	Nonjunction		None	None	None	Clear	Dry	Dark, No Street Lights	0	0	Tuesday	12/6/2011	Property Dmg Report
205	343.007	Car	Stopped in Traffic	Descending	S	Backed Into	Nonjunction		None	None					0	0		12/6/2011	Property Dmg Report
206	343.095	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Ditch	Nonjunction	Outside Right-Of-Way	None	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	Thursday	2/16/2006	Property Dmg Report
207	343.100	Car	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Rain	Wet	Dark, No Street Lights	0	0	Thursday	1/30/2003	Property Dmg Report
208	343.100	Car	Going Straight	Ascending	N	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Day	0	1	Sunday	7/25/2004	C Injury Accident

209	343.100	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Side Swipe Same	Driveway/Alley/Parking Lot Related	On Roadway	Inattention	Failed to Yield	None	Cloudy	Wet	Day	0	0	Tuesday	4/27/2010	Property Dmg Report
209	343.100	Car	Turning Left	Descending	S	Side Swipe Same	Driveway/Alley/Parking Lot Related		None	None					0	0		4/27/2010	Property Dmg Report
210	343.200	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Same Direction Turning	Nonjunction		None	None					0	0		5/31/2008	Property Dmg Report
210	343.200	Car	U-Turn	Descending	S	Same Direction Turning	Nonjunction	On Roadway	Failed to Yield	Inattention	None	Clear	Dry	Day	0	0	Saturday	5/31/2008	Property Dmg Report
211	343.300	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Rear-End	At Driveway/Alley/Parking Lot	On Roadway	None	Following Too Close					0	0		5/10/2006	Property Dmg Report
211	343.300	Pickup/Van/Panel/SUV	Turning Left	Descending	S	Rear-End	At Driveway/Alley/Parking Lot		None	None	None	Clear	Dry	Day	0	0	Wednesday	5/10/2006	Property Dmg Report
212	343.300	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	On Roadway	Alcohol Impaired	Drug Impaired	None	Snow	Wet	Dawn or Dusk	0	1	Wednesday	3/20/2002	B Injury Accident
213	343.400	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	On Roadway	Other	None	None	Cloudy	Dry	Day	0	1	Sunday	10/30/2005	B Injury Accident
214	343.481	Car	Going Straight	Descending	S	Utility Pole	Nonjunction	Roadside or Sidewalk	Inattention	Overcorrected	None	Cloudy	Snow	Day	0	1	Sunday	2/15/2004	C Injury Accident
215	343.500	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Rear-End	At Driveway/Alley/Parking Lot	On Roadway	None	Inattention					0	0		2/26/2003	Property Dmg Report
215	343.500	Pickup/Van/Panel/SUV	Turning Left	Descending	S	Rear-End	Driveway/Alley/Parking Lot Related		None	None	None	Clear	Dry	Day	0	0	Wednesday	2/26/2003	Property Dmg Report
216	343.500	Car	Going Straight	Descending	S	Side Swipe Same	Nonjunction		Speed Too Fast For Conditions	None	None	Sleet/Hail	Ice	Day	0	1	Saturday	1/9/2010	C Injury Accident
216	343.500	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Side Swipe Same	Nonjunction	On Roadway	Improper Overtaking	Improper Lane Change					0	0		1/9/2010	C Injury Accident
217	343.616	Car	Going Straight	Descending	S	Overturn	Nonjunction	Outside Right-Of-Way	Inattention	None	None	Clear	Dry	Day	0	1	Sunday	9/10/2006	B Injury Accident
218	343.800	Tractor - 1 Trailer	Going Straight	Ascending	N	Side Swipe Same	Driveway/Alley/Parking Lot Related	On Roadway	Inattention	None	None	Cloudy	Wet	Day	0	0	Friday	5/28/2004	Property Dmg Report
218	343.800	Pickup/Van/Panel/SUV	Stopped in Traffic	Ascending	N	Side Swipe Same	Driveway/Alley/Parking Lot Related		None	None					0	0		5/28/2004	Property Dmg Report
218	343.800	Car	Stopped in Traffic	Ascending		Side Swipe Same	Driveway/Alley/Parking Lot Related		None	None					0	0		5/28/2004	Property Dmg Report
219	343.981	Pickup/Van/Panel/SUV	Going Straight	Descending	S	Overturn	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Clear	Ice	Day	0	0	Sunday	1/11/2004	Property Dmg Report
220	344.004	Car	Turning Left	Ascending	N	Side Swipe Same	Intersection Related		Inattention	None					0	0		8/24/2005	Property Dmg Report
220	344.004	Truck With Trailer	Turning Right	Ascending	N	Side Swipe Same	Intersection Related	On Roadway	Drove Left of Center	Inattention	None	Clear	Dry	Day	0	0	Wednesday	8/24/2005	Property Dmg Report

Total Crashes: 220 **Fatal:** 6

All Accidents on US-95 Between MP 323.36 to 337.668 from 10/1/07 to 12/31/11

#	Milepost	Vehicle Type	Driver Action	Lane Direction	Event 1	Event Relation to Junction	Event Relation To Road	1	2	Road Condition	Weather	Surface	Light	Fatalities	Injuries	AccidentDate	Severity
1	323.600	Pickup/Van/Panel/SUV	Going Straight	Descending	Overturn	Nonjunction	Median	None	Alcohol Impaired	None	Cloudy	Dry	Day	0	1	2/16/2009	B Injury Accident
2	323.900	Car	Going Straight	Descending	Rear-End	Nonjunction		Too Slow for Traffic	None		Snow	Snow	Day	0	0	12/29/2010	Property Dmg Report
	323.900	Tractor - 1 Trailer	Going Straight	Descending	Rear-End	Nonjunction	On Roadway	Speed Too Fast For Conditions	None					0	0	12/29/2010	Property Dmg Report
3	324.010	Car	Avolding Obstacle	Ascending	Ditch	Nonjunction	Left Shoulder	Distracted IN or ON Vehicle	Overcorrected	None	Cloudy	Dry	Day	0	1	10/11/2010	C Injury Accident
4	324.100	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	10/25/2009	Property Dmg Report
5	324.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	Overturn	Nonjunction	Median	Speed Too Fast For Conditions	None	Pavement Markings	Snow	Ice	Dark, No Street Lights	0	0	12/13/2008	Property Dmg Report
6	324.200	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	7/2/2010	Property Dmg Report
7	324.500	SUV/Crossover	Negotiating Curve	Descending	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Clear	Ice	Dark, No Street Lights	0	0	2/16/2011	Property Dmg Report
8	324.523	Car	Going Straight	Ascending	Overturn	Nonjunction	Right Shoulder	Asleep, Drowsy, Fatigued	Inattention	None	Cloudy	Dry	Day	0	1	9/2/2009	A Injury Accident
9	324.700	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Overturn	Nonjunction	Median	None	None	None	Cloudy	Ice	Day	0	1	12/19/2008	B Injury Accident
10	324.800	Car	Passing	Ascending	Embankment	Nonjunction	Median	Speed Too Fast For Conditions	None	None	Cloudy	Snow	Day	0	0	1/8/2008	Property Dmg Report
11	324.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	7/15/2010	Property Dmg Report
12	324.900	Car	Negotiating Curve	Ascending	Overturn	Nonjunction	Roadside or Sidewalk	Asleep, Drowsy, Fatigued	Inattention	None	Cloudy	Dry	Dark, No Street Lights	0	1	10/3/2010	C Injury Accident
13	324.995	Pickup	Negotiating Curve	Ascending	Fence	Nonjunction	Private Property	Distracted IN or ON Vehicle	None	None	Cloudy	Dry	Dawn or Dusk	0	0	11/13/2011	Property Dmg Report
14	325.800	Car	Negotiating Curve	Descending	Overturn	Nonjunction	Roadside or Sidewalk	Alcohol Impaired	None	None	Cloudy	Wet	Day	0	1	9/18/2011	B Injury Accident
15	326.000	Car	Going Straight	Descending	Embankment	Nonjunction	Right Shoulder	Inattention	None	High/Low Shoulder	Clear	Dry	Dark, No Street Lights	0	0	8/30/2008	Property Dmg Report
16	326.016	Car	Negotiating Curve	Descending	Overturn	Nonjunction	Roadside or Sidewalk	Inattention	Overcorrected	None	Cloudy	Wet	Dark, No Street Lights	0	0	1/29/2011	Property Dmg Report
17	326.100	Pickup/Van/Panel/SUV	Turning Left	Ascending	Overturn	Intersection Related		Inattention	Failed to Yield	None	Cloudy	Wet	Day	0	5	11/18/2007	A Injury Accident
	326.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	Rear-End	Intersection Related	On Roadway	None	None					0	0	11/18/2007	A Injury Accident
18	326.300	Pickup/Van/Panel/SUV	Going Straight	Descending	Rear-End	Intersection Related	On Roadway	None	Inattention	None	Clear	Dry	Dark, No Street Lights	0	0	8/19/2009	Property Dmg Report

	326.300	Truck With Trailer	Going Straight	Descending	Rear-End	Intersection Related		None	None					0	0	8/19/2009	Property Dmg Report
19	326.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Overturn	Nonjunction	Right Shoulder	None	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	1/15/2008	Property Dmg Report
20	327.012	Car	Passing	Ascending	Embankment	In Intersection	Median	Inattention	Improper Overtaking	None	Clear	Dry	Dark, No Street Lights	0	0	8/15/2011	Property Dmg Report
21	327.300	Car	Turning Left	Ascending	Rear-End	Nonjunction		None	None	None	Snow	Snow	Day	0	0	1/31/2008	Property Dmg Report
	327.300	Car	Going Straight	Ascending	Rear-End	Intersection Related	On Roadway	None	None					0	0	1/31/2008	Property Dmg Report
22	327.400	Pickup/Van/Panel/SUV	Merging	Ascending	Overturn	Nonjunction	Roadside or Sidewalk	Too Slow for Traffic	Failed to Yield	None	Cloudy	Ice	Day	0	0	1/15/2008	Property Dmg Report
	327.400	Car	Going Straight	Ascending	Rear-End	Nonjunction	On Roadway	Speed Too Fast For Conditions	None					0	0	1/15/2008	Property Dmg Report
23	327.600	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Domestic	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Dark, No Street Lights	0	0	10/30/2009	Property Dmg Report
24	327.600	Pickup	Going Straight	Ascending	Overturn	Nonjunction	Median	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	3/19/2011	Property Dmg Report
25	328.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, Street Lights On	0	1	8/7/2010	B Injury Accident
26	328.800	Tractor - 1 Trailer	Turning Right	Ascending	Side Swipe Same	Driveway/Alley/Parking Lot		Failed to Maintain Lane	Improper Turn	None	Clear	Dry	Day	0	1	8/29/2011	C Injury Accident
	328.800	Cargo Van	Going Straight	Ascending	Side Swipe Same	y/Parking Lot Related	Other	Inattention	None					0	0	8/29/2011	C Injury Accident
27	329.400	Pickup/Van/Panel/SUV	Going Straight	Ascending	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	1/2/2009	Property Dmg Report
28	329.500	Car	Negotiating Curve	Descending	Overturn	Nonjunction	Left Shoulder	Asleep, Drowsy, Fatigued	None	None	Clear	Dry	Dark, No Street Lights	0	1	6/18/2010	B Injury Accident
29	330.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Overturn	Nonjunction	Right Shoulder	None	None	None	Snow	Ice	Dark, No Street Lights	0	0	3/28/2008	Property Dmg Report
30	330.953	Tractor - 1 Trailer	Going Straight	Ascending	Ditch	Nonjunction	Roadside or Sidewalk	Inattention	IN or ON Vehicle	None	Cloudy	Dry	Day	0	0	4/2/2011	Property Dmg Report
31	331.064	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Overturn	Nonjunction	Right Shoulder	None	None	None	Snow	Ice	Dark, No Street Lights	0	1	3/7/2009	B Injury Accident
32	331.100	Car	Going Straight	Descending	Ditch	Nonjunction	Roadside or Sidewalk	Inattention	None	None	Snow	Ice	Dark, No Street Lights	0	0	12/22/2007	Property Dmg Report
33	331.392	Pickup/Van/Panel/SUV	Going Straight	Ascending	Traffic Sign Support	In Intersection	Right Shoulder	None	Fast For Conditions	None	Snow	Snow	Dark, No Street Lights	0	0	11/19/2007	Property Dmg Report
34	331.400	Car	Negotiating Curve	Ascending	Overturn	Nonjunction	Right Shoulder	None	None	None	Clear	Ice	Day	0	0	12/29/2008	Property Dmg Report
35	331.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Delineator Post	Nonjunction	Right Shoulder	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dawn or Dusk	0	0	12/24/2010	Property Dmg Report
36	331.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Overturn	Nonjunction	Roadside or Sidewalk	Inattention	Fast For Conditions	None	Clear	Snow	Dark, No Street Lights	0	1	3/27/2008	C Injury Accident

37	331.800	Car	Going Straight	Ascending	Overturn	Nonjunction	Right Shoulder	None	None	None	Clear	Dry	Day	0	0	7/5/2008	Property Dmg Report
38	331.800	Pickup	Going Straight	Ascending	Embankment	Nonjunction	Outside Right-Of-Way	Speed Too Fast For Conditions	None	None	Cloudy	Ice	Dark, No Street Lights	0	0	11/16/2011	Property Dmg Report
39	331.901	Pickup	Going Straight	Ascending	Overturn	Nonjunction	Median	Overcorrected	None	None	Cross Winds	Wet	Day	0	1	3/10/2011	C Injury Accident
40	332.088	Pickup/Van/Panel/SUV	Going Straight	Ascending	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Clear	Ice	Day	0	1	1/28/2009	A Injury Accident
41	332.200	Pickup/Van/Panel/SUV	Changing Lanes	Ascending	Overturn	Nonjunction	Location Unknown	None	None	None	Cloudy	Ice	Day	0	1	3/7/2009	B Injury Accident
42	332.900	Pickup/Van/Panel/SUV	Going Straight	Descending	Overturn	Nonjunction	Left Shoulder	None	None	None	Clear	Ice	Day	0	2	12/31/2007	C Injury Accident
43	333.200	Pickup	Going Straight	Descending	Side Swipe Same	Nonjunction	On Roadway	Drove Left of Center	None	None	Cloudy	Snow	Day	0	0	2/15/2011	Property Dmg Report
	333.200	Pickup	Going Straight	Descending	Side Swipe Same	Nonjunction		None	None					0	0	2/15/2011	Property Dmg Report
44	333.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Overturn	Nonjunction	Roadside or Sidewalk	Other	None	None	Cloudy	Ice	Day	0	1	12/30/2010	C Injury Accident
45	334.003	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Vision Obstruction	None	None	Cloudy	Dry	Dawn or Dusk	0	0	9/30/2009	Property Dmg Report
46	334.017	Pickup/Van/Panel/SUV	Going Straight	Descending	Overturn	Nonjunction	Median	Speed Too Fast For Conditions	None	None	Snow	Ice	Dark, No Street Lights	0	0	3/21/2008	Property Dmg Report
47	334.160	Car	Turning Left	Descending	Side Swipe Same	In Intersection	On Roadway	Inattention	Improper Turn	None	Cloudy	Snow	Day	0	0	12/5/2009	Property Dmg Report
	334.160	Pickup/Van/Panel/SUV	Passing	Descending	Side Swipe Same	In Intersection		None	None					0	0	12/5/2009	Property Dmg Report
48	334.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	8/7/2010	Property Dmg Report
49	334.500	Pickup	Going Straight	Descending	Overturn	Nonjunction	Outside Right-Of-Way	Speed Too Fast For Conditions	None	None	Snow	Ice	Dark, No Street Lights	0	2	2/28/2011	C Injury Accident
50	334.621	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Overturn	In Intersection	Left Shoulder	Inattention	Overcorrected	None	Cloudy	Dry	Day	0	1	10/1/2007	B Injury Accident
51	334.732	Car	Going Straight	Ascending	Overturn	Nonjunction	Outside Right-Of-Way	Inattention	None	None	Cloudy	Wet	Dark, No Street Lights	0	1	1/4/2010	C Injury Accident
52	334.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Overturn	Nonjunction	Roadside or Sidewalk	Speed Too Fast For Conditions	None	None	Snow	Ice	Dark, No Street Lights	0	3	12/9/2007	C Injury Accident
53	335.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Cloudy	Dry	Day	0	0	3/3/2009	Property Dmg Report
54	336.600	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	None	None	None	Clear	Dry	Dark, No Street Lights	0	0	1/9/2009	Property Dmg Report
55	336.981	Car	Going Straight	Descending	Direction Turning	In Intersection		None	None	None	Clear	Dry	Day	0	0	10/21/2008	Property Dmg Report
	336.981	Car	Going Straight	Descending	Direction Turning	In Intersection	On Roadway	None	Inattention					0	0	10/21/2008	Property Dmg Report

56	337.180	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	In Intersection	On Roadway	None	None	None	Cloudy	Wet	Dark, No Street Lights	0	2	1/7/2009	C Injury Accident
57	337.180	Motorcycle	Negotiating Curve	Descending	Overturn	In Intersection	Roadside or Sidewalk	None	None	None	Cloudy	Dry	Day	0	1	7/16/2011	B Injury Accident
	337.180	Car	Turning Left	Descending	Non-Contact Unit	In Intersection	On Roadway	Inattention	Failed to Yield					0	0	7/16/2011	B Injury Accident

Appendix A.2

Official High Crash Location List for District 2

Idaho Transportation Department
Office of Highway Safety

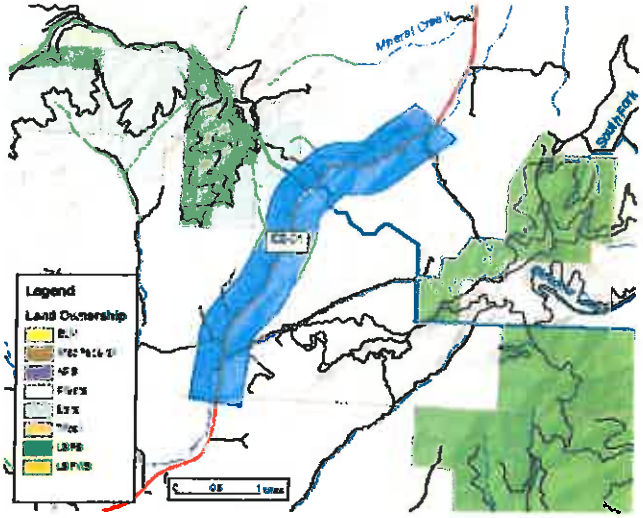
Cluster Summary Non-Interstate District Report

District	Rank	Route	Segment Code	& Milepost Range	Length	County	City	y Rank	Severity Rank	Rate Multiplie Rank
2										
	4	95	001540	340.620 - 341.120	0.500	Latah		31	7	23
	6	95	001540	337.668 - 338.168	0.500	Latah		38.5	12	33
	13	95	001540	338.668 - 339.620	0.952	Latah		36	42	25
	17	95	001540	344.568 - 344.760	0.192	Latah	Moscow	19.5	58	48.5
	27	12	001910	123.508 - 127.008	1.500	Idaho		142	28	20
	40	3	001800	15.050 - 15.550	0.500	Latah		116	62	19
	43.5	6	001840	100.550 - 101.050	0.500	Latah		116	77	4
	46	95	001540	282.601 - 283.101	0.500	Lewis		116	37	89.5
	51	12	001910	33.325 - 33.825	0.500	Nez Perce		88.5	66	71
	53	8	001870	17.980 - 18.480	0.500	Latah		88.5	97	11
	57	95	001547	.186 - .347	0.161	Latah	Moscow	17	134	24
	66	12	001910	36.818 - 37.818	1.000	Nez Perce		88.5	87	77
	71	95	001540	294.656 - 295.156	0.500	Nez Perce		116	32	163
	89	95	001540	349.863 - 351.863	2.000	Latah		74	88	129
	92	95	001540	318.327 - 318.662	0.335	Nez Perce		35	125	103
	96	12	001910	54.489 - 54.989	0.500	Lewis		142	94	60
	128	95	001540	303.581 - 304.081	0.500	Nez Perce		47.5	164	101
	140	8	001870	9.312 - 10.312	1.000	Latah		131.5	110	161
	147	95	001540	367.736 - 369.236	1.500	Latah		154	127	130
	160	95	001540	311.920 - 312.420	0.500	Nez Perce	Lewiston	177.5	179	35
	161	12	001910	38.318 - 38.818	0.500	Clearwater		116	168	119
	162.5	3	001800	16.550 - 17.050	0.500	Latah		177.5	158	78.5
	191	95	001540	369.736 - 371.236	1.500	Latah		177.5	165	149.5
	207	95	001540	233.090 - 234.090	1.000	Idaho		203.5	189	144.5
	211	3	001800	7.500 - 8.000	0.500	Latah	Juliaetta	177.5	201	174

Appendix B.1

Wildlife Crossing Areas on US-95 in Latah County Identified by Idaho Fish and Game

ID2-01



ITD2_ID: ID2-01

AOI_NAME: Marsh Hill

PRIORITY: Moderate

SPECIES: mule deer/ elk/ moose/ black bear/ small mammals

MIG_POP:

LOC_POP: Yes

SCALE:

HWY_MORT:

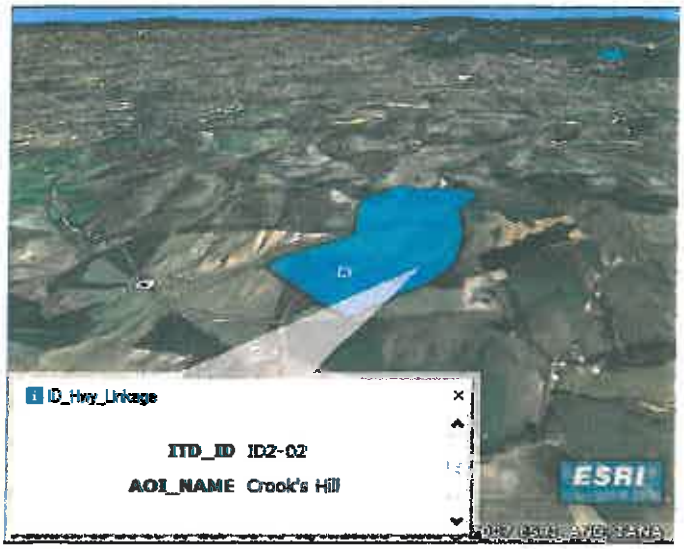
SEASON: Spring, Summer, Fall, Winter

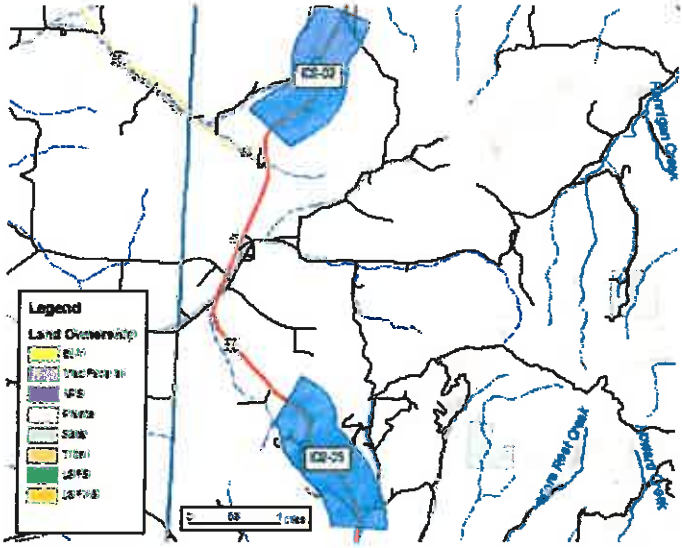
ATTRACT:

AGENCIES:

ADDITIONAL COMMENTS:
Not a high kill area.Herd of elk by rest area.

ID2-02





ITD2_ID: ID2-02

AOI_NAME: Crook's Hill

PRIORITY: Low

SPECIES: mule deer/ elk/ moose/ small mammals

MIG_POP:

LOC_POP:

SCALE:

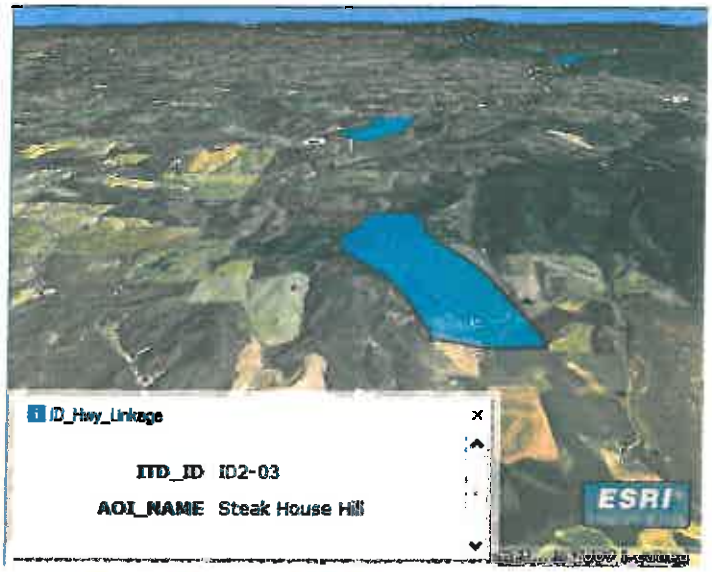
HWY_MORT:

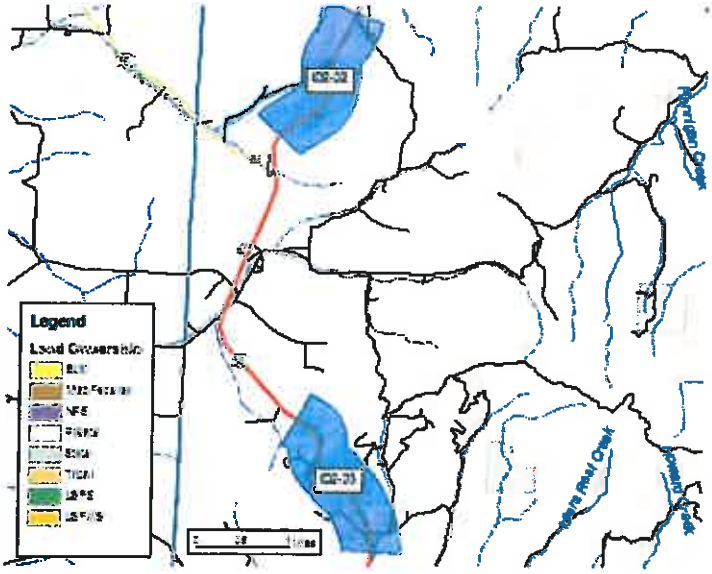
SEASON:

ATTRACT:

AGENCIES:

ID2-03





ITD2_ID: ID2-03

AOI_NAME: Steak House Hill

PRIORITY: Moderate

SPECIES: mule deer/ elk/ moose/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

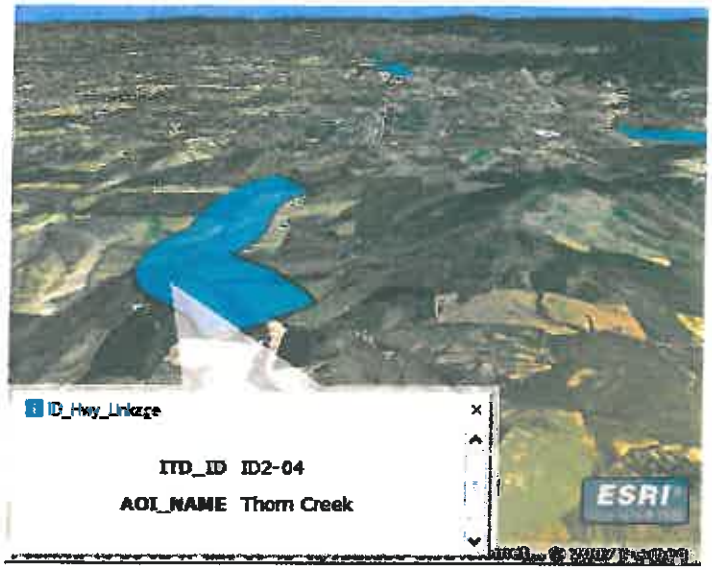
ATTRACT:

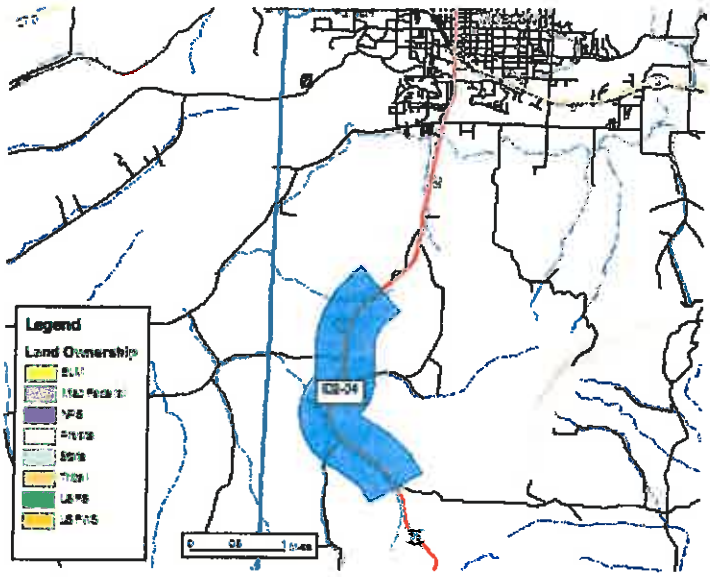
AGENCIES:

ADDITIONAL COMMENTS:

High kill area. Potential highway safety issue.

ID2-04





ITD2_ID: ID2-04

AOI_NAME: Thorn Creek

PRIORITY: Low

SPECIES: mule deer/ elk/ moose/ short-eared owls/ small mammals

MIG_POP:

LOC_POP:

SCALE:

HWY_MORT:

SEASON:

ATTRACT: water/riparian

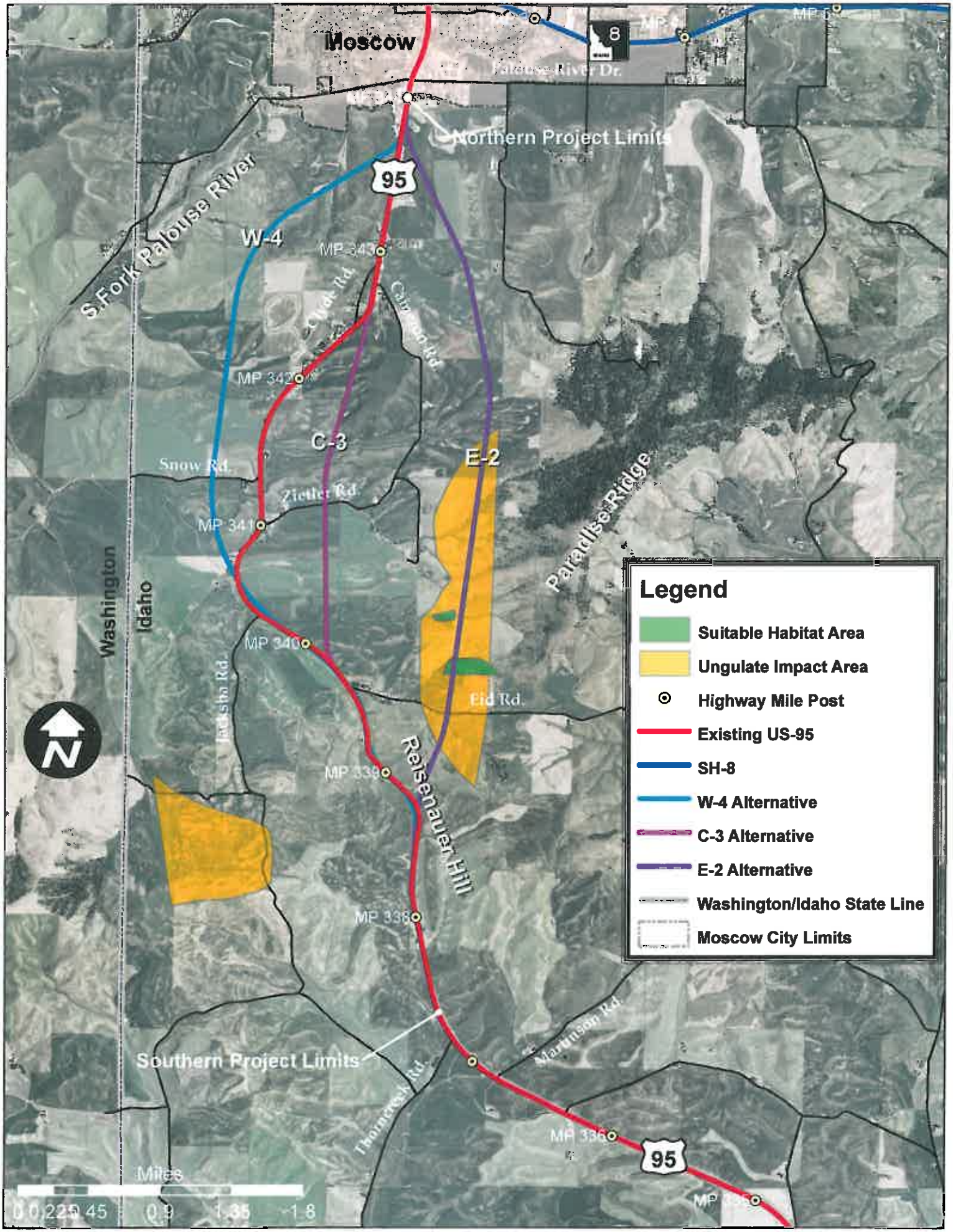
AGENCIES:

ADDITIONAL COMMENTS:

Moose population increasing in this area.Private ponds act as an attractant.Plans to make hwy wider and relocate.

Appendix B.2

Ungulate Impact Area


Moscow
8
Palouse River Dr.
Northern Project Limits
95
S.Fork Palouse River
W-4
MP 343
Cavanaugh Rd
MP 342
C-3
E-2
Snow Rd.
Zeigler Rd.
MP 341
Paradise Ridge
Washington
Idaho
MP 340
Eid Rd.
Reisenauer Hill
MP 339
MP 338
Southern Project Limits
Marmuson Rd.
Thorncrest Rd.
MP 336
95
Miles
0 0.225 0.45 0.9 1.35 1.8
Legend
Suitable Habitat Area
Ungulate Impact Area
Highway Mile Post
Existing US-95
SH-8
W-4 Alternative
C-3 Alternative
E-2 Alternative
Washington/Idaho State Line
Moscow City Limits

Appendix B.3

Methods to Reduce Traffic Crashes Involving Deer: What Works and What Does Not

Methods to Reduce Traffic Crashes Involving Deer: What Works and What Does Not

James H. Hedlund*
Paul D. Curtis**
Gwen Curtis**
Allan F. Williams

October 2003

*Highway Safety North, Ithaca, NY
**Cornell University, Ithaca, NY

INSURANCE INSTITUTE
FOR HIGHWAY SAFETY
1005 NORTH GLEBE ROAD ARLINGTON, VA 22201
PHONE 703/247-1500 FAX 703/247-1678
http://www.highwaysafety.org

ABSTRACT

More than 1.5 million traffic crashes involving deer are estimated to occur each year in the United States. These crashes produce at least $1.1 billion in vehicle damage and about 150 fatalities annually. Deer-related crashes are increasing as both deer populations and vehicular travel increase. Many methods have been used in attempts to reduce deer crashes, often with little scientific foundation and limited evaluation. This paper summarizes the methods and reviews the evidence of their effectiveness and the situations in which each may be useful. The only widely accepted method with solid evidence of effectiveness is well-designed and maintained fencing, combined with underpasses or overpasses as appropriate. Herd reduction is controversial but can be effective. Deer whistles appear useless. Roadside reflectors appear to have little long-term effect, although additional well-designed evaluations are needed before firm conclusions can be drawn. Both temporary passive signs and active signs appear promising in specific situations, but considerable research is required to evaluate long-term driver response and to improve and test deer detection technology for active signs. Other methods using advanced technology require substantial additional research and evaluation.

INTRODUCTION

Deer and motor vehicles do not share the nation's highways gracefully or safely. Although precise data are not available, the best estimates suggest that more than 1.5 million deer-vehicle crashes (DVCs) in the United States in 2002 produced at least $1.1 billion in vehicle damage, about 150 human fatalities, and at least 1.5 million dead deer (Conover et al., 1995; DeerCrash, 2003; Williams, 2003a). These numbers are rising every year as both the number of deer and the amount of motor vehicle travel continue to increase.

Many methods have been proposed and implemented in attempts to reduce DVCs. Few have been documented or evaluated well. This summary reviews the methods and evidence of their effectiveness. For the methods with solid evidence we discuss conditions most appropriate for their use. For promising methods we suggest additional research. Finally, we provide data collection and reporting recommendations that, if implemented, will help to understand the DVC problem more clearly and evaluate DVC control methods more accurately.

Deer Population and Crash Trends

Deer inhabit all of the United States, including Hawaii, where they have escaped from captivity. White-tailed deer are common east of the Rocky Mountains, especially in northeastern, southeastern, and midwestern states; mule deer are found from the Rocky Mountains west, with smaller populations of black-tailed deer in some locations. In southern areas, white-tailed deer usually occupy fixed range areas year-round. In northern areas with deep snow, white-tailed deer may travel many miles between summer

ranges and winter deer yards. These movements depend somewhat on winter severity and spring green-up. Mule deer have regular migratory routes between summer and winter ranges.

Deer population totals are difficult to estimate, but there is abundant evidence that deer populations have increased over the past century. McCabe and McCabe (1997) estimated a North American white-tailed population of 24-33 million in 1500, before European settlement began, which dropped below 2 million by 1900 and then rose to 16-17 million by 1997. Other estimates placed the total U.S. deer population at 25-30 million by the end of the twentieth century; for example, Knapp (2001) estimated more than 27 million deer. Knox (1997) estimated that Virginia's deer population increased from about 25,000 in 1923 to about 900,000 in 1994.

Nationwide DVC counts also are difficult to estimate, but there is strong evidence that they are increasing. Most state crash data files record crashes with animals but do not distinguish deer from other animals such as moose, elk, horses, and cattle. The National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System, a census of all fatal traffic crashes, shows an average of 154 fatal crashes involving animals in the four years 1998-2001, compared with an average of 111 in the four years 1992-95, an increase of 39 percent. NHTSA's General Estimates System estimates about 274,000 total police-reported crashes with animals annually in 2000-01 compared with 222,000 in 1992-93, an increase of 24 percent (Williams, 2003a). Data from states that distinguish deer from other animals suggest that most animal crashes involve deer: 99.7 percent in Michigan (Highway Safety Information System (HSIS), 1995), more than 90 percent in Minnesota (HSIS, 1995), and 93 percent in Pennsylvania (Williams, 2003a).

DVCs increased by 54 percent in Pennsylvania from 1994 to 2000 (Williams, 2003a), by 51 percent in Iowa from 1990 to 1997 (Hubbard et al., 2000), and by 69 percent in five states combined (Illinois, Maine, Michigan, Minnesota, and Utah) from 1985 to 1991 (HSIS, 1995). In 1999, 16 percent of all reported traffic crashes in Wisconsin were DVCs, up from 5 percent in 1978 (DVCR Working Group, 2000). The number of DVC claims at a major automobile insurance company rose 21 percent from 1998 to 2001 (Williams, 2003b).

Many DVCs are not reported to police. In a small telephone survey in New York, Decker et al. (1990) found that police were notified of about half, and insurance companies of less than half, of the DVCs. Taking the police underreporting into account, Conover et al. (1995) estimated that about 1.5 million DVCs occurred annually in the mid-1990s. The reported crashes alone produced more than $1.1 billion in vehicle damage (in 1993 dollars); the unreported crashes added additional vehicle damage costs. More recently, an estimated 131,500 DVCs occurred in 2000 in the five upper midwest states of Illinois, Iowa, Michigan, Minnesota, and Wisconsin, producing 23 deaths, 4,650 injuries, and $222 million in vehicle damage (DeerCrash, 2003).

DVCs are seasonal. White-tailed deer DVCs peak in October and November during the breeding season, with a secondary peak in May and June as yearling deer disperse from their birth ranges (Allen and McCullough, 1976 (Michigan data); Decker et al., 1990 (New York data); Puglisi et al., 1974 (Pennsylvania data); HSIS, 1995 (data for five states combined)). Mule deer DVCs are most frequent during the spring and fall migrations (Messmer et al., 2000). DVCs occur predominantly in darkness, on high-speed, two-lane, rural roads (HSIS, 1995; Williams, 2003a), especially when forest cover is close to the roadway (Finder et al., 1999).

Study Approach

We reviewed both published studies and other information obtained from highway safety, motor vehicle insurance, and natural resources sources. Three review studies were especially useful: Danielson and Hubbard (1998), DeerCrash (2003), and Putman (1997). The DeerCrash website (deercrash.com) contains an extensive bibliography and periodically updates summaries of information on specific methods. Studies involving animals other than deer were not reviewed systematically but were included when appropriate.

Three general strategies to reduce DVCs are to modify driver behavior, modify deer behavior, or reduce the number of deer. Each can be attempted in several ways. We summarize the theoretical basis and supporting evidence for each method and assess the available evaluation studies. We did not conduct a formal meta-analysis with specific criteria to define high-quality studies. Rather, we give more weight to methods with evidence from studies with sound designs, controls for potentially confounding influences, adequate sample sizes, and consideration of how the method's effectiveness may change over time.

METHODS TO AFFECT DRIVER BEHAVIOR

Three methods to affect driver behavior are to increase driver awareness of deer and the possibility of DVCs, improve the visibility of deer on or approaching roadways, and reduce driving speeds so drivers have more time to avoid crashes.

General Education

General education consists of efforts to provide information about DVC dangers so drivers will watch more carefully for deer and drive more slowly. Typical methods include news stories and public awareness campaigns in peak DVC seasons. About half the states use some form of general education (Romin and Bissonette, 1993; Sullivan and Messmer, 2003).

None of the general education campaigns has been evaluated. In other traffic safety areas such as impaired driving and occupant protection, stand-alone general education campaigns have not been effective in modifying driver behavior (O'Neill, 2001; Williams, 1994). Campaigns can be effective

when they present new information that directly affects drivers and that is reinforced by something drivers can observe. For example, publicity announcing increased enforcement of a safety belt use law can be effective when the publicity is followed with extensive law enforcement presence. It is unlikely that DVC general education is useful unless it provides information on very specific and time-sensitive situations, such as the beginning of mule deer migration across a short road segment. In these situations, either temporary passive or active signs may be more effective than general campaigns.

Signs

Roadside signs attempt to warn drivers of specific locations and even times when deer may be present. Passive signs have a fixed message at all times, though they may use lights or animation to attract attention. Active signs are lighted when deer are detected on or near the roadway.

Passive signs: Roadway signs warning drivers of deer-crossing locations are used in almost all states (Romin and Bissonette, 1993; Sullivan and Messmer, 2003). Most are passive: fixed signs in fixed locations, with the same message in words or pictures at all times and in all seasons, usually a standard yellow diamond sign with the figure of a deer, as specified in the *Manual of Uniform Traffic Control Devices*.

No studies have evaluated the effectiveness of standard deer warning signs in increasing driver awareness of deer, in reducing driving speeds, or in reducing DVCs. Because passive signs are used so frequently at locations where deer are present only occasionally, drivers probably ignore them (Putman 1997, Sullivan and Messmer, 2003).

Lighted and animated signs: Three methods have been used to attempt to increase the effect of deer warning signs. The first is to make the signs more visible with lights, flags, or even a lighted and animated figure of a deer. In a small study of lighted and animated signs, Pojar et al. (1975) found a slight effect on vehicle speeds but no effect on DVCs.

Temporary passive signs: The second method, used on roads crossed by mule deer migration corridors, installs or uncovers passive signs only during migration periods. Messmer et al. (2000) used large warning signs with battery-powered flashing amber lights at the ends of a two-mile and a four-mile roadway section, together with smaller flashing signs at each milepost within the two sections. Travel speeds during three migration periods when the signs were displayed and activated dropped about 8 mph from pre-migration levels, and DVCs dropped by 50 percent in the spring and 70 percent in the fall migration compared with three previous years. In a more extensive study of the same technique, using a more powerful research design, Sullivan et al. (preprint) placed similar temporary lighted signs on five roadway sections in three states with an adjacent section, separated by a buffer section, as a control. DVCs were about 50 percent lower in signed than in control sections across all sites. Vehicle speeds also were lower in signed sections.

Active signs: The final method uses signs that are activated only when deer are detected near the roadway. Detection methods include infrared light (in Minnesota), radar (Wyoming), laser (Washington), radio frequency beams parallel to the roadway (Indiana), and heat detection cameras (British Columbia). In Washington, radio collars have been attached to 8 elk in a herd of 80 near a segment of Highway 101. Flashing "elk warning" signs are activated when any of the collared elk come within one-quarter mile of the roadway (DeerCrash, 2003).

The only evaluation of these methods to date is a small study of a segment of U.S. 30 in Nugget Canyon, Wyoming (Gordon et al., 2001). An eight-foot fence was erected along both sides of the roadway, with a 300-foot gap through which migrating deer could cross. Two deer detection systems were used: infrared heat sensors, and geophones that detect ground vibrations combined with infrared light beams that detect motion across the beam. Both systems detected almost all deer (very few false negatives). The heat sensor system also was activated by birds and snow (more than 50 percent false positives), while the combined geophone and infrared system had no false positives. Vehicle speeds dropped by about 4 mph when the "deer on road when lights are flashing" sign was lighted, regardless of whether the sign was triggered by a deer, a false positive, or remotely by a researcher. DVC data were not collected, and it is unclear whether the observed speed reduction would be large enough to affect DVCs.

In summary, standard passive signs, although low-cost and low-maintenance, are unlikely to have any effect, though no evaluations substantiate this conclusion. The one study of lighted signs showed no effect on DVCs. Initial results are encouraging for temporary passive signs used in defined mule deer migratory corridors during migratory periods, which can vary from year to year. More testing is needed before the potential of active signs can be evaluated accurately. The two main issues are to refine detection technology to minimize false positives and false negatives and to determine the effects of these signs on driver behavior and DVCs.

Deer Visibility

The sooner a driver sees a deer on or approaching a roadway, the better the chance of avoiding a crash. Deer visibility can be improved through roadway lighting, roadside clearing, or methods to enhance drivers' nighttime vision.

Roadway lighting: Roadway lighting is commonly used to improve driver vision in urban areas, freeway interchanges, and other potentially dangerous locations. Because most DVCs occur at night, roadway lighting is an obvious potential countermeasure. In the only study of the effect of roadway lighting on DVCs, Reed and Woodard (1981) studied a single three-quarter-mile section in Colorado using a one week on/one week off design. The lighting did not affect overall deer crossings or driving speeds, and the study was too small to detect an effect on DVCs.

Roadway lighting is expensive. Only two states reported using lighting to control DVCs (Romin and Bissonette, 1996). It is unlikely to be useful except in very specialized situations.

Roadside clearing: A broad clear roadside area allows drivers to see deer that may enter the road and reduces forage that may attract deer close to the roadway. Finder et al. (1999) found that the most important landscape or topographical feature predicting high DVC sites in Illinois was the distance between the roadway and forest cover. In a study in Norway, Jaren et al. (1991) found that a clear 20-30 meter strip reduced crashes between railway trains and moose by more than 50 percent. Putman (1997) and Bruinderink and Hazebroek (1996) recommend reducing forage near the roadside. Roadside clearing raises many issues beyond DVC control, such as the costs of acquiring roadside right-of-way and of maintaining a clear area, the potential safety benefits if trees adjacent to the roadway are removed, and the aesthetics of cleared areas along secondary roads.

Infrared detection from vehicles: A potential long-term strategy to improve drivers' night vision is to equip vehicles with infrared technology that can detect deer and other heat-emitting objects and transmit information to drivers on heads-up displays. These systems have been introduced recently in Cadillacs (General Motors, 2000) and as aftermarket equipment for heavy trucks (Bendix, 2002), but their effects on DVCs have not been evaluated. Any strategy involving vehicle modifications requires many years to implement in the majority of the vehicle fleet.

Speed Limits

An approach often suggested to reduce traffic crashes in many situations is to attempt to reduce travel speeds through lower speed limits. Unfortunately, lower speed limits do not necessarily produce lower travel speeds (Transportation Research Board, 1998). The only study to evaluate the effects of speed limit changes on wildlife crashes involved short road segments in the highly regulated environment of Jasper National Park. Bertwistle (1999) compared sheep and elk crashes for eight years before and eight years after the speed limit was reduced from 90 to 70 km/h on three highway segments of 2.5 km, 4 km, and 9 km. He found that sheep crashes *increased* on these segments and decreased on adjoining segments where the speed limit remained at 90 km/h. Elk crashes increased on the speed-limit-reduction segments and increased more on the unchanged segments. No travel speed data were collected to measure the direct effect of the speed limit change. Bertwistle notes that differences in sheep and elk behavior likely explain the crash result differences.

Speed limit reductions together with deer warning signs may be useful in very specific locations with high deer populations or migration routes. However, unless speed limits are actively enforced, they are unlikely to affect travel speeds significantly, and perhaps not even then. Although seven states reported reducing speed limits in an attempt to control DVCs (Romin and Bissonette, 1996), the effects of these speed limit reductions have not been evaluated.

METHODS TO AFFECT DEER BEHAVIOR

Deer behavior management strategies attempt to either physically block deer from the roadway or make the roadway less attractive to deer by appealing to their senses of sight, sound, or smell.

Physical Control

Fencing: Fencing provides a physical barrier that attempts to prevent deer from entering the roadway. Every review of DVC control methods during the past 20 years has concluded that properly designed and maintained fencing, used together with appropriate underpasses, overpasses, and one-way deer gates, is the most effective method for reducing DVCs both in the United States (Danielson and Hubbard, 1998; Reed et al., 1979) and in Europe (Bruinderink and Hazebroek, 1996; Putman, 1997; Staines et al., 2001). State wildlife administrators agree, while state highway administrators rank fencing second to reducing deer herd size (Sullivan and Messmer, 2003). In 1992, 11 states had erected fencing to reduce DVCs (Romin and Bissonette, 1996). Crashes with moose were reduced by 80 percent after about 1,300 km of main roads in Sweden were fenced (Lavsund and Sandegren, 1991).

Aside from herd reduction, fencing is the only DVC method that unquestionably is effective if applied properly. Fencing that is sufficiently high, strong, long, and well-anchored with no gaps or tunnels will prevent deer from crossing a fenced road section. The issues with fencing involve the details and side effects.

- *Physical characteristics:* Fencing must be sufficiently high and long. Several studies have found 2.4 m (7.8 ft) fencing effective (Ward, 1982 (in Wyoming); Reed et al., 1982 (in Colorado); Ludwig and Bremicker, 1983 (in Minnesota)). White-tailed deer will jump a 2.2 m (7.4 ft) fence in search of food (Bellis and Graves, 1978). Fencing must extend far enough along a roadway to discourage deer from detouring around the ends of the fenced section. The necessary length depends on deer movement patterns. After one year's experience, Ward (1982) extended a fenced section from 6.7 to 7.8 miles and reduced end runs substantially. Electric fencing, currently being studied in Michigan, may provide an effective alternative to chain-link fencing (DVCR Working Group, 2000). Curtis et al. (1994) summarized the characteristics and effectiveness of various fencing types used to prevent deer from damaging crops.
- *Maintenance:* Regular checks are required to repair tunnels and breaks caused by erosion, animals, falling trees, and people. Deer regularly test a fence and are quick to pass through any breaks or gaps (Ward, 1982). Deer can crawl though openings less than 10 inches high under a fence (Bellis and Graves, 1978; Falk et al., 1978).
- *Effect on deer movements:* Fencing design should consider deer movement patterns and provide safe passage routes, as appropriate, through underpasses or other methods.

- *Escape routes:* Deer that manage to enter a fenced roadway need some way to escape. One-way gates have been found generally successful (Reed et al., 1974; Ward, 1982; Ludwig and Bremicker, 1983).
- *Costs:* Effective fencing is costly to construct and maintain. Iowa recently estimated construction costs for 8 ft chain-link fence on one side of a roadway at $42,000 per mile (Danielson and Hubbard, 1998).
- *Other effects:* Roadway fencing or more substantial physical barriers may have other benefits such as reducing noise in adjacent properties or preventing pedestrian access to high-speed roads. Fencing and barriers may have positive or negative aesthetic implications.

Underpasses and overpasses: Deer underpasses, and more rarely used overpasses, allow deer to cross a roadway without encountering vehicles. Deer sometimes use underpasses or overpasses created when highways cross rivers or tunnel through ridges. Seven states report using underpasses specifically to allow deer crossings (Romin and Bissonette, 1996). Olbrich (1984) noted 824 under- and overpasses for animals on 823 km of federal highway in West Germany. To be effective, fencing or other barriers are required to channel deer to underpasses and overpasses.

Ward (1982) describes how a system of fencing and six underpasses was used along 7.8 miles of interstate highway crossing a mule deer migration route. The system did not disrupt deer movement and virtually eliminated DVCs. Other studies consider whether and how underpasses and overpasses are used rather than how they affect DVCs. Deer can be reluctant to use them, even when highly motivated to move along a migration route or to forage (Reed et al., 1975). Deer can remain wary or frightened even after several years of experience with the same underpass (Reed, 1981). Ward (1982) placed forage in underpasses to attract deer.

Factors affecting the use of underpasses and overpasses include their locations in relation to natural deer paths, size (wide openings and short lengths), design (earth floors), visual appearance (exit clearly visible from entrance, light walls and ceiling), and woody cover at the entrances (Danielson and Hubbard, 1998; Hartmann, 2003; Putman, 1997). In particular, some studies propose a minimum acceptable underpass "openness factor" of entrance area divided by underpass length (Putman, 1997).

Fencing and underpasses have been used to assist various species. Hartmann (2003) summarizes several case studies of underpass and overpass use by elk, bear, panther, mountain goats, and even salamanders. Singer and Doherty (1985) describe an underpass construction for mountain goats that directed almost all goats under rather than across the highway. Foster and Humphrey (1995) review other useful studies.

Underpasses and overpasses are expensive when included in original highway construction. Adding them to an existing highway is even more expensive.

At-grade crosswalks: Crosswalks may provide a middle ground between a fully separated underpass or overpass and uncontrolled crossings marked only with signs. In the only study to date, Lehnert and Bissonette (1997) installed nine crosswalks on about 13 miles of two-lane and 4 miles of divided four-lane highways in Utah, with similar adjacent roads used as controls. At each crosswalk, fencing and landscaping directed deer to the crosswalk area. Because fencing was not permitted on the highway shoulder, the deer were channeled to the highway on a dirt path bordered by cobblestones. A similar path bordered by cobblestones crossed the divided highway's median strip. White painted cattleguard lines bounded the path across the highway surface. One-way gates in the fencing near the crosswalks allowed deer that moved beyond the crosswalk area to leave the roadway. Passive signs warned drivers to expect deer in the crosswalk areas.

The crosswalks appeared to decrease DVCs by about 40 percent, although the small sample size precluded any definitive conclusions. The crosswalk design of cobblestones and cattleguard stripes directed many, but not all, deer across the road as intended. Although drivers may have been more alert for deer at crosswalk areas, fewer than 5 percent responded to crosswalk signs by slowing down or turning on their high-beam headlights.

Crosswalks may be worth additional study to determine if design improvements can contain deer more effectively and if active signs that detect deer in the crosswalk area can improve driver awareness and actions.

Crosswalks, underpasses, and overpasses are more likely to be effective for western mule deer than eastern white-tails. Mule deer have defined migratory routes across highways, so DVCs are confined to relatively few locations where these expensive control methods can be justified. In contrast, white-tailed deer crashes occur throughout substantial lengths of two-lane, rural roads (Maine Department of Transportation, 2002). Further, DVCs occur most frequently in the fall breeding season, when antlered males are chasing females. At these times, crosswalks or other methods short of the complete physical control provided by substantial fences are unlikely to keep deer off the highway.

Sensory Control

Reflectors: Reflectors, used in Europe and some areas of the United States for more than 30 years, are the most contentious DVC control method. They have strong advocates, strong opponents, and conflicting results from more than 10 studies. The most commonly used and most frequently evaluated system, manufactured by Swareflex, consists of reflectors installed on posts at regular intervals along the roadway. Light from vehicle headlights is reflected to form a continuous "visual fence" of red, blue-green, or white light that deer are expected not to cross. Red reflectors form a visual barrier that humans cannot detect, so that it does not distract drivers. In 1992, 22 states reported using reflectors (Romin and Bissonette, 1997).

The basic behavioral questions about reflectors are whether deer can see light in the wavelengths used, whether deer are reluctant to cross such light beams, and whether deer become habituated to light beams over time. Zacks (1986) studied the effect of red and white light from Swareflex reflectors on penned white-tailed deer. He found no evidence that a beam of red or white light produced by reflectors from a static source, as opposed to a moving vehicle, affected deer behavior. Ujvari et al. (1998) exposed fallow deer in a large forested area to light from WEGU reflectors (a design similar to Swareflex) during a period of 15 nights. They found the proportion of deer that did not react to the reflected light increased over time: on the first night, 99 percent of the deer fled from low-intensity reflected light, while on the final three nights about 40 percent were completely indifferent to higher intensity light.

DeerCrash (2003) describes and summarizes 10 studies that attempt to evaluate the effect of roadside reflectors on DVCs using different study designs. The overall results are at best ambiguous.

- Four studies used designs that alternately cover and uncover the reflectors along a roadway segment. One found reflectors effective and three did not.
- Four studies used before/after designs. One found reflectors effective, one did not, and two had inconclusive results.
- Two studies used treatment/control designs. One found that reflectors were effective at some sites but not at others and the other study found no effect.

The best study in terms of its design, size, and power is Reeve and Anderson (1993), who used a cover/uncover design with control segments for three years on a 24.1 km segment of U.S. 30 in Wyoming that crosses a major mule deer migration route. They recorded 126 DVCs when the reflectors were uncovered, 64 when covered, and 147 on control segments. They concluded that the reflectors had no effect on DVCs.

Schafer and Penland (1985) provide the most positive site-specific evidence of effectiveness. They studied four roadway sections totaling 3.68 km in Washington during three years, in an area populated largely by white-tailed deer. They also used a cover/uncover design but with no control segments. They recorded 52 DVCs when reflectors were covered and only 6 when uncovered, concluding that the reflectors were highly effective.

Pafko and Kovach (1996) summarize results from a larger but less controlled application in Minnesota. Reflectors were installed at 16 road segments totaling 16.35 miles, four segments each in coniferous forest, prairie farmland, central hardwood, and metropolitan hardwood habitats. Average annual DVC counts on these segments for several years before and seven years after installation show 79 to 90 percent reductions in DVCs in the three rural habitats from pre-installation DVC averages of 98 to 214. In the metropolitan habitat, DVCs increased by 87 percent from a pre-installation average of 11.8.

These three examples illustrate the difficulties of drawing definitive conclusions from even the best studies. The very substantial reductions from high DVC totals found by Pafko and Kovach (1996)

suggest significant effects even though their simple before/after design does not control for other factors that may influence DVCs and their DVC counts may not be completely accurate. However, the authors note that estimated statewide deer populations were increasing during the study, DVCs did not decrease substantially on other roads, and the reductions appeared stable for several years. The increase in metropolitan areas may be due to small sample sizes, traffic volume increases, or reflector ineffectiveness on heavily traveled roads. Reeve and Anderson (1993) and Schafer and Penland (1985) reach very different conclusions from similar studies. Schafer and Penland had a considerably smaller study, with no control area, in an area populated largely by whitetails, while Reeve and Penland's study was on a mule deer migratory route.

If reflectors are effective, they offer obvious advantages. They are cheaper to install and maintain than physical barriers created with fencing and underpasses, though their cost is not insignificant — an estimated $8,000 to $10,000 per mile for installation (Danielson and Hubbard, 1998) plus annual maintenance to repair or replace damaged reflectors. Reflectors form a barrier only when vehicle headlights are present, so they allow deer to cross roads freely during daylight hours. However, the evaluations to date leave many questions unanswered. There appears to be no solid behavioral evidence that deer are reluctant to cross a light beam produced by reflectors. Do deer cross a beam at will, as suggested by Zacks (1986)? Do deer become habituated to such a beam, as found by Ujvari et al. (1998)? Are reflectors effective on high-volume roadways where there are few breaks in traffic to permit deer to cross? Are they effective on migratory routes or low-volume roads through established range areas where deer move freely?

Simple metal mirrors to reflect vehicle headlights as white light flashes also have been installed in a manner similar to reflectors. It appears that deer rapidly become accustomed to them, and they corrode quickly (Gilbert, 1982; Putman, 1997). Lavsund and Sandegren (1991) concluded from a large experiment that mirrors had no effect whatsoever on moose crashes in Sweden.

Flagging: An early attempt to influence deer behavior through sight was based on the observation that white-tailed deer raise their tails as a warning sign to other deer. Graves and Bellis (1978) placed rear-view silhouette models of deer with raised tails along a highway. These deer flag models did not affect deer movements (see also DeerCrash, 2003).

Whistles: Deer warning whistles have been available to the public for more than 20 years. A typical whistle is attached to a vehicle and produces ultrasonic noise in the range of 16-20 kHz when vehicle speed exceeds about 30 mph (DeerCrash, 2003). Whistles are based on the presumption that deer can hear and will be warned away from noise in this range. Twenty states reported using whistles in 1992 (Romin and Bissonette, 1997), although state wildlife agency and transportation department administrators ranked whistle effectiveness lowest of all common methods (Sullivan and Messmer, 2003).

Romin and Dalton (1992) conducted the only high-quality study of whistle effects. They drove past 150 groups of deer at distances up to 100 meters and a speed of 65 km/h, observing deer behavioral responses. Two common brands of whistles had no effect on deer behavior, even when deer were within 10 meters of the road. Romin and Dalton were unaware of any research demonstrating that deer are frightened by sound in the range produced by whistles. In a review of the effects of sound on animals and birds of many species, Bomford and O'Brien (1990) concluded that sounds of the type produced by whistles (steady noise rather than specific alarm or distress signals) may influence movements in the short term but that mammals and birds become accustomed to these sounds after long or frequent exposure.

Several less scientific reports and considerable anecdotal evidence either support or deny the effectiveness of whistles. For example, Cline (1989) reported on a one-year test of whistles attached to 42 Michigan State Police vehicles in five locations; 43 vehicles in five other locations served as controls. There were 14 DVCs involving police vehicles in the test locations and 5 in the control locations during the prior year; during the experimental year, there were 5 DVCs in each location. Based on these results, Cline concluded that the whistles were effective.

Roadside whistles, as opposed to vehicle-mounted whistles, are being tested in Saskatchewan (Beaupré, 2002). A series of noisemaking devices together with vehicle detection sensors was mounted along a 5 km section of highway. When the sensors detect a vehicle, the device warns deer with either sound or light signals.

In summary, there is no firm evidence that whistles are effective and considerable evidence that they are not. In the only high-quality study (Romin and Dalton, 1992), deer were not affected by whistles. It is unclear whether deer can hear whistles, whether whistle noise is covered by traffic noise, or whether deer become accustomed to whistle noise over time. In the absence of any solid studies that whistles are effective, they cannot be recommended.

Repellents: Chemical and biological substances attempt to repel deer in two ways. Contact repellents with unpleasant tastes applied to a food source seek to reduce or eliminate feeding. Area repellants with unpleasant smells, such as predator urine, seek to prevent deer from entering or crossing an area.

Several studies, summarized in El Hani and Conover (1995) and DeerCrash (2003), evaluated the effectiveness of various repellents on the feeding patterns of white-tailed and mule deer. Some repellents reduced feeding, but none completely stopped deer from feeding or entering an area.. The studies also showed that deer habituate to repellents and will not be deterred by them if sufficiently hungry. No study in the United States has evaluated the effects of repellents in reducing DVCs, and repellents are not used systematically in any state to control DVCs (Romin and Bissonette, 1996). Putman (1997) reported that repellent "scent fences" have been studied in Germany, with mixed results. Early results from a repellent "odor fence" installed along 53 km of roadway in British Columbia, using posts and boxes every 0.25 km,

reportedly showed a 36 percent DVC reduction from the prior 10 years, and a test of four different repellents along 16 km of roadway on Vancouver Island began in 1999 (DVCR Working Group, 2000).

Repellents are most likely to hinder deer movements when applied in conjunction with fences or other physical barriers (Curtis et al., 1994). Jordan and Richmond (1992) demonstrated that an electric fence treated with repellents was more effective in deterring deer from feeding on apples than an electric fence alone, although repellent effectiveness decreased significantly after several weeks. The combination of repellents and fences has proved useful for home gardens and agricultural fields (Curtis et al., 1994) but would be expensive to install and maintain along highways.

Intercept feeding: In certain locations, deer regularly cross roadways to feed. Wood and Wolfe (1988) studied three such road sections in Utah for two years. On the treatment portion of each section, they established and maintained feeding stations more than 1,200 feet away from the roadway. They found lower DVCs in some, but not all, treatment areas. They noted that a feeding program has continuing costs, may make deer dependent on the food provided, and may attract more deer to the roadside. They concluded that intercept feeding may be useful only temporarily in specific situations.

Salt alternatives: Some authors suggest that deer may be attracted to roadways by salt applied to melt ice in the winter and that other deicing substances should be used instead (Feldhamer et al., 1986; DeerCrash, 2003). However, no studies have investigated the issue.

METHODS TO AFFECT DEER POPULATIONS

If there were no deer, or no deer near highways, there would be no DVCs. Deer herd reduction has long been considered an appropriate strategy for reducing DVCs as well as crop and garden losses caused by deer (DeNicola et al., 2000). State transportation department administrators rated herd management as potentially the most effective DVC control strategy, while state wildlife administrators rated it second only to fencing (Sullivan and Messmer, 2003).

The only herd reduction strategy that would completely eliminate DVCs would be to eliminate all deer, which the general public would not accept. Indeed, even in a high DVC area, only a minority of the public wished to reduce the deer population (Stout et al., 1993). In a survey of 10 randomly selected large metropolitan areas, 63 percent of respondents wanted no change in the number of deer in their neighborhoods, 27 percent wanted more deer, and only 10 percent wanted fewer deer (Conover, 1997).

Two reports document how local deer herd management policies can affect DVCs. In 1972, Princeton, New Jersey, passed a no-firearms-discharge ordinance. DVCs then increased by 436 percent in 10 years, from 33 in 1972 to 144 in 1982, compared with no statistically significant change in two adjoining townships where firearms hunting continued to be allowed (Kuser, 1995). Princeton then tried to reduce DVCs and other deer-related problems with deer whistles, reflectors, and increased bowhunting, but DVCs continued to rise, to 167 in 1991 and 227 in 1992.

Irondequoit, New York, began a selective deer culling and bowhunting program in 1993. About 125 deer were removed in each of the next eight years. DVCs dropped from 227 in 1992 to about 100 annually in the late 1990s (Eckler, 2001).

Although herd reduction can be controversial, common sense and expert opinion agree that substantial and continued herd reductions will reduce DVCs (Danielson and Hubbard 1998; DVCR Working Group, 2000). But many questions remain, including the effectiveness of herd reductions over a large area on DVCs, the amount of herd reduction necessary to reduce DVCs substantially, how deer range and migration patterns influence the effect of herd reductions on DVCs, and how to design cost-effective herd reduction programs (Brown et al., 2000). Wisconsin and other states are pursuing aggressive deer herd reduction programs (DVCR Working Group, 2000). Data from these programs may help address these questions.

SUMMARY AND CONCLUSIONS

Effective Methods with Solid Scientific Evidence

Fencing, combined with underpasses and overpasses as appropriate, is the only broadly accepted method that is theoretically sound and proven to be effective. Fencing is expensive to construct and maintain, and even the best fencing will not prevent all deer from entering a roadway.

Promising Methods Where More Information Is Needed

Herd reduction is unquestionably effective in reducing DVCs if the deer population in a specific area is reduced by a substantial amount. More research is needed on the minimum area needed for herd reduction to have a substantial effect and on the expected impact of a given amount of herd reduction on DVCs. A herd reduction strategy should be part of an overall wildlife management program that balances the costs and benefits of maintaining wildlife populations.

Roadside clearing may be effective, although there is very limited information supporting it. Roadside clearing must be part of a broader strategy of roadway design and maintenance.

Both temporary passive signs and active signs appear promising in specific situations, but considerable research is required to evaluate long-term driver response and to improve and test deer detection technology for active signs.

At-grade crossings for deer, perhaps combined with active signs, offer a long-shot chance at providing greater safety than uncontrolled crossings marked only with passive signs. At-grade crossings are most promising for highways crossing mule deer migration routes in western states.

Infrared driver vision technology in vehicles may be effective in the future. Its development and implementation will depend on its usefulness in improving driver night vision overall, not on its effect on DVCs.

Methods With Limited Demonstrated Effectiveness

Although reflectors have been studied fairly often, most studies were not designed or conducted well. The balance of the available evidence is that reflectors have little long-term effect, especially for white-tailed deer in suburban areas. Additional high-quality studies would be useful to investigate deer response and habituation to light beams and the effectiveness of reflectors when implemented.

Roadside lighting and intercept feeding may have limited effectiveness in specialized situations. Both methods are costly and have side effects that must be considered carefully.

Deer repellents can have limited effectiveness in modifying deer feeding and movement patterns. It is unlikely that repellents will be useful in roadway applications.

Methods that Appear Ineffective Based on Available Evidence

General education, passive signs, and lower speed limits appear ineffective in influencing driver behavior and reducing DVCs. The lack of good studies proving their ineffectiveness probably results from the unwillingness of funding organizations to allocate resources to study methods that are so unpromising.

Ineffective Methods with Evidence from Controlled or Experimental Situations

Deer whistles and deer flagging signs are not effective.

DISCUSSION AND RECOMMENDATIONS

Previous reviews of DVC control methods (Reed et al., 1979; Bruinderink and Hazebroek, 1996; Putman, 1997; Danielson and Hubbard, 1998; Staines et al., 2001) reached conclusions similar to ours, as did a review of moose-vehicle crashes in Sweden (Lavsund and Sandegren, 1991). There is no quick, cheap method to reduce DVCs. Fencing and herd reduction programs can be effective if they are designed and maintained well, but they are neither cheap nor quick.

DVC control must be part of an overall environmental strategy that balances the competing needs of humans and wildlife. For example, there is a trend in suburban areas to preserve or create green space and wildlife corridors (Houck, 1990). These areas must be carefully planned and coordinated by transportation, natural resource, and urban planning agencies to avoid attracting more deer and increasing DVCs.

Data Collection and Reporting

States should identify crashes involving deer on their state crash report forms and crash data files rather than aggregating crashes involving all animals. Without this, it is difficult to track DVC totals, trends, and patterns. States also should record precise DVC locations, as Maine does (Maine Department of Transportation, 2002), using GIS or other methods, to identify areas with high DVC frequencies. This

information is critical in deciding where fencing, herd reduction, active signs, or other DVC control methods are needed.

Research

Research is needed in the following areas.

- *Herd reduction:* minimum geographic area needed to be effective, effect of different amounts of herd reduction on DVCs in various settings
- *Active signs:* improved deer detection technology, long-term driver response
- *Temporary passive signs and at-grade crossings:* additional field trials under varying circumstances
- *Reflectors:* deer response and habituation, effect of reflector systems as implemented
- *Intensive general education:* effects of intensive driver awareness programs for DVCs in targeted communities
- *Integrated DVC program:* effects of coordinated program including signs, roadside clearing, and general education in specific high DVC locations
- *Data:* multi-state survey of DVC reporting to police, insurance companies, and wildlife agencies

ACKNOWLEDGMENTS

This study was supported by the Insurance Institute for Highway Safety. The opinions, findings, and conclusions are those of the authors and do not necessarily reflect the views of the Insurance Institute for Highway Safety.

REFERENCES

Allen, R.E. and McCullough, D.R. 1976. Deer-car accidents in southern Michigan. *Journal of Wildlife Management* 40:317-25.

Beaupré, V.G. 2002. Pilot project to deter wildlife-vehicle collisions. Press release. Regina, Saskatchewan: Saskatchewan Department of Highways and Transportation. Available: http://www.gov.sk.ca/newsrel/releases/2002/05/09-326.html.

Bellis, E.D. and Graves, H.B. 1978. Highway fences as deterrents to vehicle-deer collisions. *Transportation Research Record* 674:53-58. Washington, DC: Transportation Research Board.

Bendix. 2002. Bendix begins sale of XVision™ infrared nighttime vision system. Press release. Elyria, OH. Available: http://www.bendix.com/products/XVisionPR.shtml.

Bertwistle, J. 1999. The effects of reduced speed zones on reducing bighorn sheep and elk collisions with vehicles on the Yellowhead Highway in Jasper National Park. *Proceedings of the 1999 International Conference on Wildlife Ecology and Transportation.* Tallahassee, FL: Florida Department of Transportation.

Bomford, M. and O'Brien, P.H. 1990. Sonic deterrents in animal damage control: a review of device tests and effectiveness. *Wildlife Society Bulletin* 18:411-22.

Brown, T.L.; Decker, D.J.; Riley, S.J.; Enck, J.W.; Lauber, T.B.; Curtis, P.C. and Mattfeld, G.F. 2000. The future of hunting as a mechanism to control white-tailed deer populations. *Wildlife Society Bulletin* 28:797-807.

Bruinderink, G.W.T.A. and Hazebroek, E. 1996. Ungulate traffic collisions in Europe. *Conservation Biology* 10:1059-67.

Cline, B.C. 1989. The State of Michigan's Car-Deer Whistle Research Project. Lansing, MI: Michigan Department of Management and Budget.

Conover, M.R. 1997. Wildlife management by metropolitan residents in the United States: practices, perceptions, costs, and values. *Wildlife Society Bulletin* 25:306-11.

Conover, M.R.; Pitt, W.C.; Kessler, K.K.; DuBow, T.J. and Sanborn, W.A. 1995. Review of human injuries, illnesses, and economic losses caused by wildlife in the United States. *Wildlife Society Bulletin* 23:407-14.

Curtis, P.D.; Fargione, M.J. and Richmond, M.E. 1994. Preventing deer damage with barrier, electrical, and behavioral fencing systems. *Proceedings of the 16th Vertebrate Pest Conference* (eds. W.S. Halverson and A.C. Crabb), 16:223-227. Davis, CA: University of California, Davis

Danielson, B.J. and Hubbard, M.W. 1998. A literature review for assessing the status of current methods of reducing deer-vehicle collisions. Ames, IA: Iowa Department of Transportation and Iowa Department of Natural Resources.

Decker, D.J.; Loconti Lee, K.M. and Connelly, N.A. 1990. Deer-related vehicular accidents in Tompkins County, New York: incidence, costs, and implications for deer management *Transactions of the Northeast Section of the Wildlife Society* 47:21-26.

DeerCrash. 2003. Countermeasures toolbox. Madison, WI: University of Wisconsin, Madison, Deer-Vehicle Crash Information Clearinghouse. Available: http://www.deercrash.com/toolbox/index.htm.

DeNicola, A.J.; VerCauteren, K.C.; Curtis, P.D. and Hyngstrom, S.C. 2000. *Managing White-Tailed Deer in Suburban Environments: A Technical Guide.* Ithaca, NY: Cornell Cooperative Extension.

DVCR Working Group. 2000. Final Report: Deer Vehicle Collision Reduction Working Group Conference. Madison, WI: Sand County Foundation.

Eckler, J. 2001. Irondequoit Live Deer Spotliight Survey, Fall 2000. Albany NY: New York State Department of Environmental Conservation.

El Hani, A. and Conover, M.R. 1995. Comparative analysis of deer repellents. *Repellents in Wildlife Management Symposium Proceedings*. Fort Collins, CO: National Wildlife Research Center, Animal and Plant Health Inspection Service.

Falk, N.W.; Graves, H.B. and Bellis, E.D. 1978. Highway right-of-way fences as deer deterrents. *Journal of Wildlife Management* 42:646-50.

Feldhamer, G.A.; Gates, J.E.; Harman, D.M.; Loranger, A.J. and Dison, K.R. 1986. Effects of interstate highway fencing on white-tailed deer activity. *Journal of Wildlife Management* 50:497-503.

Finder, R.A.; Roseberry, J.L. and Woolf, A. 1999. Site and landscape conditions at white-tailed deer/vehicle collision locations in Illinois. *Landscape and Urban Planning* 44:77-85.

Foster, M.L. and Humphrey, S.R. 1995. Use of highway underpasses by Florida panthers and other wildlife. *Wildlife Society Bulletin* 23:95-100.

General Motors. 2000. DeVille becomes first car to offer safety benefits of night vision. Detroit, MI. Available: http://www.gm.com/company/gmability/safety/crash_avoidance/newfeatures/night_vision.html.

Gilbert, J.R. 1982. Evaluation of deer mirrors for reducing deer-vehicle collisions. Report no. FHWA-RD-82-061. Washington, DC: Federal Highway Administration.

Gordon, K.M.; Anderson, S.H.; Gribble, B. and Johnson, M. 2001. Evaluation of the FLASH (Flashing Light Animal Sensing Host) system in Nugget Canyon, Wyoming. Report no. FHWA-WY-01/03F. Laramie, WY: University of Wyoming.

Graves, H.B. and Bellis, D.E. 1978. The effectiveness of deer flagging models as deterrents to deer entering highway rights-of-way. Report no. FHWA-PA-78-12. Washington, DC: Federal Highway Administration.

Hartmann, M. 2003. Evaluation of wildlife crossing structures: their use and effectiveness. Missoula, MT: Wildlands Center for Preventing Roads. Available: http://www.wildlandscpr.org/resourcelibrary/reports/EvaluationByMaureenHartmann.htm.

Houck, M.C. 1990. Metropolitan wildlife refuge system: a strategy for regional natural resource planning. *Wildlife Conservation in Metropolitan Environments* (eds. L.W. Adams and D.L. Leedy), 225-29. Columbia, MD: National Institute for Urban Wildlife.

Highway Safety Information System. 1995. Investigation of crashes with animals. Report no FHWA-RD-94-156. Washington, DC: Federal Highway Administration.

Hubbard, M.W.; Danielson, B.J. and Schmitz, R.A. 2000. Factors influencing the location of deer-vehicle accidents in Iowa. *Journal of Wildlife Management* 64:707-13.

Jaren, V.; Andersen, R.; Ulleberg, M.; Pedersen, P.H. and Wiseth, B. 1991. Moose-train collisions: the effects of vegetation removal with a cost-benefit analysis. *Alces* 27:93-99.

Jordan, D.M. Jr. and Richmond, M.E. 1992. Effectiveness of a vertical 3-wire electrical fence modified with attractants or repellents as a deer exclosure. *Proceedings of the Fifth Eastern Wildlife Damage Control Conference*, 44-47.

Knapp, K. 2001. Midwest deer-vehicle crash facts. Madison, WI: University of Wisconsin, Madison, Deer-Vehicle Crash Information Clearinghouse.

Knox, W.M. 1997. Historical changes in the abundance and distribution of deer in Virginia. *The Science of Overabundance* (eds. W.J. McShea, H.B. Underwood, and J.H. Rappole). Washington, DC: Smithsonian Institution Press.

Kuser, J. 1995. Deer and people in Princeton, New Jersey, 1971-1993. *Urban Deer: A Manageable Resource? Proceedings of the 1993 Symposium of the North Central Section, the Wildlife Society* (ed. J.B. McAninch), 47-50.

Lavsund, S. and Sandegren, F. 1991. Moose-vehicle relations in Sweden: a review. *Alces* 27:118-26.

Lehnert, M.E. and Bissonette, J.A. 1997. Effectiveness of highway crosswalk structures at reducing deer-vehicle collisions. *Wildlife Society Bulletin* 25:809-18.

Ludwig, J. and Bremicker, T. 1983. Evaluation of 2.4m fences and one-way gates for reducing deer-vehicle collisions in Minnesota. *Transportation Research Record* 913:19-22. Washington, DC: Transportation Research Board.

Maine Department of Transportation. 2002. Maine deer crashes, 1999-2001. Augusta ME: Maine Department of Transportation.

McCabe. T.R. and McCabe, R.D. 1997. Recounting whitetails past. *The Science of Overabundance* (eds. W.J. McShea, H.B. Underwood, and J.H. Rappole). Washington, DC: Smithsonian Institution Press.

Messmer, T.A.; Hendricks, C.W. and Klimack, P.W. 2000. Modifying human behavior to reduce wildlife-vehicle collisions using temporary signage. *Wildlife and Highways: Seeking Solutions to an Ecological and Socio-Economic Dilemma* – Seventh Annual Meeting of the Wildlife Society, 134-47.

Olbrich, P. 1984. Untersuchung der Wirksamkeit von Woldwarnreflektoren und der Eignung von Wilddurchlassen. *Zeitschrift für Jagdwissenschaft* 30:101-16.

O'Neill, B. 2001. Seat belt use: where we've been, where we are, and what's next. *2001 Seat Belt Summit: Policy Options for Increasing Seat Belt Use in the United States in 2001 and Beyond*, Appendix A. Arlington, VA: Automotive Coalition for Traffic Safety.

Pafko, F. and Kovach, B. 1996. Minnesota experience with deer reflectors. *Proceedings of Transportation and Wildlife: Reducing Wildlife Mortality and Improving Wildlife Passageways Across Transportation Corridors*, 116-124. Tallahassee, FL: Florida Department of Transportation.

Pojar, T.M.; Reed, D.F.; Reseigh, T.C. and Woodard, T.N. 1975. Effectiveness of a lighted, animated deer crossing sign. *Journal of Wildlife Management* 39:87-91.

Puglisi, M.J.; Lindzey, J.S. and Bellis, E.D. 1974. Factors associated with highway mortality of white-tailed deer. *Journal of Wildlife Management* 38:799-807.

Putman, R.J. 1997. Deer and road traffic accidents: options for management. *Journal of Environmental Management* 51:43-57.

Reed, D.F. 1981. Mule deer behavior at a highway underpass exit. *Journal of Wildlife Management* 45:542-43.

Reed, D.F.; Beck, T.D. and Woodard, T.N. 1982. Methods of reducing deer-vehicle accidents: benefit-cost analysis. *Wildlife Society Bulletin* 10:349-54.

Reed, D.F.; Pojar, T.M. and Woodard, T.N. 1974. Use of one-way gates by mule deer. *Journal of Wildlife Management* 38:9-15.

Reed, D.F. and Woodard, T.N. 1981. Effectiveness of highway lighting in reducing deer-vehicle collisions. *Journal of Wildlife Management* 45:721-26.

Reed, D.F.; Woodard, T.N. and Beck, T.D.I. 1979. Regional deer-vehicle accident research. Report no. FHWA-CO-RD-79-11. Denver, CO: Colorado Division of Wildlife.

Reed, D.F.; Woodard, T.N. and Pojar, T.M. 1975. Behavioral response of mule deer to a highway underpass. *Journal of Wildlife Management* 39:361-67.

Reeve, A.F. and Anderson, S.H. 1993. Ineffectiveness of Swareflex reflectors at reducing deer-vehicle collisions. *Wildlife Society Bulletin* 21:127-32.

Romin, L.A. and Bissonette, J.A. 1997. Deer-vehicle collisions: status of state monitoring activities and mitigation efforts. *Wildlife Society Bulletin* 24:276-83.

Romin, L.A. and Dalton, L.B. 1992. Lack of response by mule deer to wildlife warning whistles. *Wildlife Society Bulletin* 20:382-84.

Schafer, J.A. and Penland, S.T. 1985. Effectiveness of Swareflex reflectors in reducing deer-vehicle accidents. *Journal of Wildlife Management* 49:774-76.

Singer, F.J. and Doherty, J.L. 1985. Managing mountain goats at a highway crossing. *Wildlife Society Bulletin* 13:469-77.

Staines, B.; Langbein, J. and Putman, R. 2001. Road traffic accidents and deer in Scotland. Aberdeen, UK: University of Aberdeen.

Stout, R.J.; Stedman, R.C.; Decker, D.J. and Knuth, A.B. 1993. Perception of risk from deer-related vehicle accidents: implications for public preferences for deer herd size. *Wildlife Society Bulletin* 21: 237-49.

Sullivan, T.L. and Messmer, T.A. 2003. Perceptions of deer-vehicle collision management by state wildlife agency and department of transportation administrators. *Wildlife Society Bulletin* 31:163-73.

Sullivan, T.L.; Williams, A.F.; Messmer, T.A.; Nelson, L.A. and Kyrychenko, S.Y. 2003. Effectiveness of temporary warning signs in reducing deer-vehicle collisions during mule deer migrations (preprint). Arlington, VA: Insurance Institute for Highway Safety.

Transportation Research Board. 1998. Managing speed: review of current practice for setting and enforcing speed limits. Special Report 254. Washington, DC: Transportation Research Board.

Ujvari, M.; Baagoe, H.J. and Madsen, A.B. 1998. Effectiveness of wildlife warning reflectors in reducing deer-vehicle collisions: a behavioral study. *Journal of Wildlife Management* 62:1094-99.

Ward, A.L. 1982. Mule deer behavior in relation to fencing and underpasses on Interstate 80 in Wyoming. *Transportation Research Record* 859:8-13. Washington, DC: Transportation Research Board.

Williams, A.F. 1994. The contribution of education and public information to reducing alcohol-impaired driving. *Alcohol, Drugs, and Driving* 10:197-205.

Williams, A.F. 2003a. Motor vehicle/animal collisions. Internal memorandum. Arlington, VA: Insurance Institute for Highway Safety.

Williams, A.F. 2003b. Personal communication.

Wood, P. and Wolfe, M.L. 1988. Intercept feeding as a means of reducing deer-vehicle collisions. *Wildlife Society Bulletin* 16:376-80.

Zacks, J.L. 1986. Do white-tailed deer avoid red? An evaluation of the premise underlying the design of Swareflex wildlife reflectors. *Transportation Research Record* 1075:35-43. Washington, DC: Transportation Research Board.

Appendix B.4

Wild Animal Crash Data on US-20 From MP 369 to 375.5 Between 7/1/2000 and 3/9/2012

Photographs of US-20 Before, During, and After the Tree Clearing Project During July 2010

Wild Animal Related Crashes on US-20 from MP 369 to 375.5 from 7/1/2000 to 3/8/2012

#	MP	Vehicle Type	Driver Action	Lane Direction	Event 1	Intersection	Roadway	Weather	Surface	Light	AccidentDate	Severity
2	369.047	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	7/14/2000	C Injury Accident
8	370.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	9/3/2000	Property Dmg Report
28	374.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	10/25/2000	Property Dmg Report
1	369.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	7/20/2001	Property Dmg Report
27	373.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	8/20/2001	C Injury Accident
32	374.037	Motor Home	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	8/29/2001	Property Dmg Report
23	372.563	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	9/5/2001	Property Dmg Report
18	372.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	7/3/2002	C Injury Accident
30	374.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	8/7/2002	B Injury Accident
22	372.400	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	8/31/2002	Property Dmg Report
26	373.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	10/16/2002	Property Dmg Report
24	372.988	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Cloudy	Ice	Dark, No Street Lights	11/18/2002	Property Dmg Report
5	370.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	5/9/2003	Property Dmg Report
35	375.000	Tractor - 1 Trailer	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	6/16/2003	Property Dmg Report
13	371.063	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dawn or Dusk	6/29/2003	B Injury Accident
14	371.063	Tractor - 1 Trailer	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dawn or Dusk	6/29/2003	Property Dmg Report
7	370.300	Motorcycle	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	8/30/2003	A Injury Accident
9	370.500	Tractor - 1 Trailer	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Snow	Snow	Dark, No Street Lights	11/21/2003	Property Dmg Report
16	371.170	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Rain	Wet	Day	6/10/2004	Property Dmg Report
21	372.275	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	7/12/2004	Property Dmg Report
38	375.011	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	9/7/2004	Property Dmg Report
36	375.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Rain	Wet	Dark, No Street Lights	10/10/2004	Property Dmg Report
37	375.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Wet	Dark, No Street Lights	10/22/2004	Property Dmg Report
34	375.000	Motor Home	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	8/14/2005	Property Dmg Report
12	371.000	Tractor - 1 Trailer	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	8/23/2005	Property Dmg Report
3	369.300	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	10/30/2005	Property Dmg Report
29	374.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Snow	Ice	Dark, No Street Lights	12/30/2005	Property Dmg Report
25	373.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	6/19/2006	Property Dmg Report
6	370.063	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	5/25/2007	Property Dmg Report
10	370.500	Tractor - 1 Trailer	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Cloudy	Dry	Dawn or Dusk	5/18/2008	Property Dmg Report
11	370.998	Car	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	6/15/2008	Property Dmg Report
33	374.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Cloudy	Dry	Dark, No Street Lights	9/1/2008	Property Dmg Report
4	369.900	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Cloudy	Dry	Dark, No Street Lights	9/25/2008	Property Dmg Report
31	374.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Cloudy	Dry		6/8/2009	B Injury Accident
15	371.132	Car	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	8/15/2009	Property Dmg Report
20	372.005	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Dark, No Street Lights	8/18/2009	Property Dmg Report
17	371.924	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	On Roadway	Clear	Dry	Day	10/8/2009	Property Dmg Report
19	372.001	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	On Roadway	Snow	Ice	Dark, No Street Lights	11/13/2010	Property Dmg Report

Logging 2010

2007

2011

Appendix B.5

Wild Animal Crashes on US-95 in District 2

Between January 1, 2002 and December 31, 2011

Summary of Wild Animal Crashes on US-95 in District 2

The following list of wild animal crashes represents 10 years worth of data on US-95 from January 1, 2002 through December 31, 2011. The following table is a summary of the findings:

Wild Animal Crashes along US-95 in District 2 between January 2002 and January 2012.		
	Total Number	Percentage of Total
Total Wild Animal Crashes	428	100%
Fatalities	0	0%
Type A Accidents	3	0.7%
Type B Accidents	7	1.6%
Type C Accidents	30	7.0%
Property Damage Only	388	90.6%

Using this data, we assume that about 2% of the wild animal related accidents will involve Type A Accident, Type B Accident, or Fatality and that 10% of wild animal related accidents will involve a fatality or injury.

Segment Code Milepost Listing Report - Wild Life Accidents in D2 Along US-95 from 1/1/02 through 12/31/11

	Segment	Milepost	Vehicle Type	Driver Action	Lane Direction	Event 1	Junction	Weather	Surface	AccidentDate	Severity
1-1	001540	182.700	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	2/16/2009	Property Dmg Report
1-2	001540	183.601	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	2/10/2008	Property Dmg Report
1-3	001540	183.935	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	5/22/2002	Property Dmg Report
1-4	001540	185.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	2/18/2008	Property Dmg Report
1-5	001540	185.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	3/15/2002	Property Dmg Report
1-6	001540	185.600	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	12/23/2007	Property Dmg Report
1-7	001540	186.900	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	2/18/2002	Property Dmg Report
1-8	001540	187.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Ice	12/23/2008	Property Dmg Report
1-9	001540	187.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/26/2002	Property Dmg Report
1-11	001540	188.300	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/4/2002	Property Dmg Report
1-12	001540	188.426	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Wet	11/28/2010	Property Dmg Report
1-13	001540	189.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/22/2002	Property Dmg Report
1-14	001540	189.300	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	12/29/2006	Property Dmg Report
1-15	001540	190.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	12/24/2010	Property Dmg Report
1-16	001540	190.800	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/23/2002	Property Dmg Report
1-17	001540	191.000	Tractor - 1 Trailer	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	11/16/2005	Property Dmg Report
1-18	001540	192.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/21/2008	Property Dmg Report
1-19	001540	192.018	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/24/2010	Property Dmg Report
1-20	001540	192.200	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/14/2004	Property Dmg Report
1-21	001540	193.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	4/26/2009	Property Dmg Report
1-22	001540	194.129	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	In Intersection	Cloudy	Dry	2/1/2010	Property Dmg Report
1-23	001540	195.003	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/26/2005	Property Dmg Report
1-25	001540	196.868	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/31/2002	Property Dmg Report
1-26	001540	202.300	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/20/2008	Property Dmg Report
1-27	001540	204.500	SUV/Crossover	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	1/17/2011	Property Dmg Report
1-28	001540	204.800	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/26/2003	Property Dmg Report
1-29	001540	204.800	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	9/21/2008	Property Dmg Report
1-30	001540	208.600	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	3/13/2004	Property Dmg Report
1-32	001540	209.600	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/25/2011	Property Dmg Report
1-33	001540	209.990	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/26/2002	Property Dmg Report
1-34	001540	210.700	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/3/2002	Property Dmg Report
1-35	001540	213.200	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/8/2004	Property Dmg Report
1-36	001540	213.727	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	1/5/2002	Property Dmg Report

1-37	001540	214.009	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/2/2007	Property Dmg Report
1-38	001540	215.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	9/2/2004	Property Dmg Report
1-39	001540	215.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/3/2002	Property Dmg Report
1-40	001540	215.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	2/3/2003	Property Dmg Report
1-41	001540	216.700	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	5/1/2003	Property Dmg Report
1-42	001540	217.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/12/2007	Property Dmg Report
1-43	001540	218.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	9/16/2005	Property Dmg Report
1-44	001540	218.590	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/30/2003	Property Dmg Report
1-45	001540	219.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/26/2003	Property Dmg Report
1-47	001540	219.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	6/2/2005	Property Dmg Report
1-48	001540	219.600	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/21/2010	Property Dmg Report
1-49	001540	221.005	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/16/2008	Property Dmg Report
1-50	001540	221.400	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	12/23/2010	Property Dmg Report
1-51	001540	221.717	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	12/1/2002	Property Dmg Report
1-52	001540	221.900	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/8/2009	Property Dmg Report
1-53	001540	221.924	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	6/1/2009	Property Dmg Report
1-54	001540	223.100	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Wet	5/1/2010	Property Dmg Report
1-55	001540	224.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/24/2004	Property Dmg Report
1-56	001540	224.800	SUV/Crossover	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/23/2011	Property Dmg Report
1-57	001540	225.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/14/2008	Property Dmg Report
1-58	001540	232.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/12/2005	Property Dmg Report
1-59	001540	234.000	Tractor - 1 Trailer	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	7/18/2004	Property Dmg Report
1-60	001540	234.438	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/14/2008	Property Dmg Report
1-61	001540	234.700	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/27/2007	Property Dmg Report
1-62	001540	236.082	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/31/2010	Property Dmg Report
	001540	236.082	Car	Going Straight	Ascending	Animal - Wild	Nonjunction			10/31/2010	Property Dmg Report
1-63	001540	236.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	9/6/2004	Property Dmg Report
1-64	001540	237.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/3/2007	Property Dmg Report
1-65	001540	238.943	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/20/2010	Property Dmg Report
1-66	001540	239.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/22/2007	Property Dmg Report
1-67	001540	239.250	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/10/2003	Property Dmg Report
1-68	001540	239.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	9/16/2004	Property Dmg Report
1-69	001540	240.262	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/7/2007	Property Dmg Report
1-70	001540	240.700	SUV/Crossover	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	7/16/2011	Property Dmg Report
1-71	001540	248.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/18/2007	Property Dmg Report
1-72	001540	254.400	SUV/Crossover	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/12/2011	Property Dmg Report

1-73	001540	256.300	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/27/2005	Property Dmg Report
1-74	001540	256.600	Pickup	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/15/2011	Property Dmg Report
1-75	001540	257.912	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/9/2010	Property Dmg Report
1-76	001540	259.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/2/2009	Property Dmg Report
1-77	001540	260.040	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/8/2003	Property Dmg Report
1-78	001540	260.180	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/3/2005	Property Dmg Report
2-1	008605	266.400	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	4/30/2004	Property Dmg Report
2-3	008605	268.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/9/2009	Property Dmg Report
2-4	008605	269.700	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/18/2008	Property Dmg Report
2-5	008605	269.732	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	3/24/2007	Property Dmg Report
2-6	008605	269.732	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	4/19/2007	Property Dmg Report
2-7	008605	269.758	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/12/2007	Property Dmg Report
2-8	008605	270.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	9/18/2004	Property Dmg Report
2-9	008605	271.000	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/12/2006	Property Dmg Report
2-10	008605	272.000	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	7/13/2009	Property Dmg Report
3-1	001540	274.100	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/25/2005	Property Dmg Report
3-2	001540	274.572	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Wet	5/25/2003	Property Dmg Report
3-4	001540	275.766	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/19/2010	Property Dmg Report
3-5	001540	276.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/17/2009	Property Dmg Report
3-6	001540	277.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/27/2006	Property Dmg Report
3-8	001540	278.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/31/2005	Property Dmg Report
3-10	001540	278.700	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/8/2003	Property Dmg Report
3-11	001540	278.990	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	10/14/2008	Property Dmg Report
3-12	001540	279.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/5/2004	Property Dmg Report
3-13	001540	279.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	11/17/2010	Property Dmg Report
3-16	001540	283.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/16/2006	Property Dmg Report
3-17	001540	283.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	11/9/2002	Property Dmg Report
3-18	001540	285.200	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/6/2008	Property Dmg Report
3-19	001540	285.500	Tractor - 1 Trailer	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/6/2004	Property Dmg Report
3-20	001540	287.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Wet	11/28/2002	Property Dmg Report
3-21	001540	287.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	9/17/2004	Property Dmg Report
3-22	001540	288.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/10/2008	Property Dmg Report
3-23	001540	288.400	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/19/2003	Property Dmg Report
3-24	001540	288.981	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	6/15/2007	Property Dmg Report
3-25	001540	289.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/30/2005	Property Dmg Report
3-26	001540	289.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/30/2005	Property Dmg Report

3-27	001540	289.600	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/7/2005	Property Dmg Report
3-28	001540	290.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/19/2011	Property Dmg Report
3-29	001540	291.400	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/13/2002	Property Dmg Report
3-30	001540	291.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/17/2006	Property Dmg Report
3-31	001540	291.500	Pickup	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	4/25/2011	Property Dmg Report
3-32	001540	291.900	Pickup/Van/Panel/SUV	Avoiding Obstacle	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/5/2003	Property Dmg Report
3-33	001540	291.914	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	9/10/2003	Property Dmg Report
3-34	001540	292.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	3/15/2004	Property Dmg Report
3-35	001540	292.156	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/25/2010	Property Dmg Report
3-36	001540	292.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Fog	Wet	10/31/2008	Property Dmg Report
3-37	001540	293.150	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	12/6/2003	Property Dmg Report
3-38	001540	293.300	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	12/4/2002	Property Dmg Report
3-39	001540	293.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	12/7/2002	Property Dmg Report
3-40	001540	293.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	4/19/2005	Property Dmg Report
3-41	001540	293.600	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/24/2006	Property Dmg Report
3-42	001540	293.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/4/2008	Property Dmg Report
3-43	001540	294.100	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/9/2003	Property Dmg Report
3-44	001540	294.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/1/2002	Property Dmg Report
3-45	001540	294.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/27/2004	Property Dmg Report
3-46	001540	294.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	1/24/2005	Property Dmg Report
3-47	001540	294.700	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	2/22/2008	Property Dmg Report
3-48	001540	294.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/21/2008	Property Dmg Report
3-49	001540	295.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	3/14/2007	Property Dmg Report
3-50	001540	295.600	Pickup	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	6/12/2011	Property Dmg Report
3-51	001540	295.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/14/2008	Property Dmg Report
3-52	001540	296.100	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/12/2005	Property Dmg Report
3-53	001540	296.743	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/10/2003	Property Dmg Report
3-54	001540	298.039	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/16/2010	Property Dmg Report
3-55	001540	298.600	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/12/2005	Property Dmg Report
3-56	001540	301.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/12/2006	Property Dmg Report
3-57	001540	302.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	6/20/2003	Property Dmg Report
3-58	001540	302.700	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	12/29/2008	Property Dmg Report
3-59	001540	302.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	5/8/2008	Property Dmg Report
3-61	001540	303.000	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/7/2005	Property Dmg Report
3-62	001540	303.100	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/14/2004	Property Dmg Report
3-63	001540	303.500	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/24/2007	Property Dmg Report

3-65	001540	303.700	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/28/2010	Property Dmg Report
3-66	001540	303.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/6/2002	Property Dmg Report
3-67	001540	303.900	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/8/2005	Property Dmg Report
3-68	001540	304.900	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/5/2004	Property Dmg Report
3-69	001540	304.900	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/1/2011	Property Dmg Report
3-70	001540	305.800	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Snow	12/23/2008	Property Dmg Report
3-71	001540	305.800	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Snow	12/23/2008	Property Dmg Report
3-72	001540	305.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/22/2010	Property Dmg Report
3-73	001540	306.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/11/2003	Property Dmg Report
3-74	001540	306.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/2/2004	Property Dmg Report
3-75	001540	306.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	4/21/2003	Property Dmg Report
3-76	001540	306.700	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Wet	3/6/2006	Property Dmg Report
3-77	001540	306.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/11/2010	Property Dmg Report
3-78	001540	307.100	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/5/2008	Property Dmg Report
3-79	001540	307.300	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/11/2009	Property Dmg Report
3-80	001540	307.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/13/2006	Property Dmg Report
3-81	001540	308.400	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/13/2003	Property Dmg Report
3-82	001540	308.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/29/2008	Property Dmg Report
3-83	001540	308.600	Motorcycle	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/10/2006	Property Dmg Report
3-84	001540	308.600	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/27/2010	Property Dmg Report
3-85	001540	308.680	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/18/2010	Property Dmg Report
3-86	001540	308.700	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/12/2008	Property Dmg Report
3-87	001540	308.700	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	2/14/2009	Property Dmg Report
3-88	001540	308.800	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/16/2008	Property Dmg Report
3-90	001540	308.976	Motorcycle	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/5/2011	Property Dmg Report
3-91	001540	308.999	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	2/7/2010	Property Dmg Report
3-93	001540	309.100	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/19/2006	Property Dmg Report
3-94	001540	309.400	SUV/Crossover	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/4/2011	Property Dmg Report
3-95	001540	309.433	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	In Intersection	Cloudy	Dry	6/10/2007	Property Dmg Report
3-96	001540	309.500	Pickup Camper	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/3/2002	Property Dmg Report
3-97	001540	309.700	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/6/2005	Property Dmg Report
3-98	001540	309.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/12/2003	Property Dmg Report
3-100	001540	310.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/28/2010	Property Dmg Report
3-101	001540	310.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/3/2011	Property Dmg Report
3-102	001540	310.962	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/2/2004	Property Dmg Report
3-103	001540	311.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	3/30/2008	Property Dmg Report

3-104	001540	311.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	12/7/2010	Property Dmg Report
3-105	001540	311.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	6/5/2007	Property Dmg Report
3-106	001540	312.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Wet	4/14/2002	Property Dmg Report
3-107	001540	312.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/10/2002	Property Dmg Report
3-108	001540	312.800	SUV/Crossover	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/10/2011	Property Dmg Report
3-109	001540	313.018	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/20/2008	Property Dmg Report
3-110	001540	313.100	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/12/2006	Property Dmg Report
3-111	001540	313.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	9/10/2005	Property Dmg Report
3-112	001540	313.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	11/8/2007	Property Dmg Report
3-113	001540	314.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	12/5/2003	Property Dmg Report
3-114	001540	314.100	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/18/2005	Property Dmg Report
3-115	001540	314.160	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	12/2/2007	Property Dmg Report
3-116	001540	314.500	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	4/12/2003	Property Dmg Report
3-117	001540	314.800	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/14/2003	Property Dmg Report
3-118	001540	314.800	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/29/2004	Property Dmg Report
3-119	001540	315.000	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/14/2005	Property Dmg Report
3-120	001540	315.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/27/2003	Property Dmg Report
3-123	001540	317.400	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	1/26/2005	Property Dmg Report
3-124	001540	317.458	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/29/2006	Property Dmg Report
3-125	001540	317.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/13/2007	Property Dmg Report
3-126	001540	318.000	Bus - 16 or more seats	Going Straight	Ascending	Animal - Wild	On Ramp	Clear	Dry	9/10/2005	Property Dmg Report
3-127	001540	318.100	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cross	Dry	10/17/2009	Property Dmg Report
3-128	001540	318.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/6/2005	Property Dmg Report
3-129	001540	318.400	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/18/2010	Property Dmg Report
3-131	001540	318.500	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	11/14/2010	Property Dmg Report
3-132	001540	318.600	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	6/7/2008	Property Dmg Report
3-133	001540	318.600	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/10/2009	Property Dmg Report
3-134	001540	318.976	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/19/2002	Property Dmg Report
3-135	001540	319.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/4/2005	Property Dmg Report
3-136	001540	319.018	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/18/2009	Property Dmg Report
3-137	001540	319.500	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	6/1/2010	Property Dmg Report
3-138	001540	319.500	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/5/2010	Property Dmg Report
3-140	001540	320.300	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/9/2011	Property Dmg Report
3-141	001540	320.900	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Dry	10/4/2011	Property Dmg Report
4-1	001539	323.971	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/4/2006	Property Dmg Report
4-2	001539	324.100	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/25/2009	Property Dmg Report

4-3	001539	324.200	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/2/2010	Property Dmg Report
4-4	001539	324.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/15/2010	Property Dmg Report
4-6	001539	334.003	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	9/30/2009	Property Dmg Report
4-7	001539	334.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/7/2010	Property Dmg Report
4-8	001539	335.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	3/3/2009	Property Dmg Report
4-9	001539	336.600	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	1/9/2009	Property Dmg Report
4-11	001539	337.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/7/2006	Property Dmg Report
5-1	001540	337.973	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	4/16/2010	Property Dmg Report
	001540	337.973	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction			4/16/2010	Property Dmg Report
5-2	001540	338.056	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/15/2008	Property Dmg Report
5-5	001540	338.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/15/2007	Property Dmg Report
5-6	001540	338.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/16/2010	Property Dmg Report
5-7	001540	338.981	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/8/2008	Property Dmg Report
5-8	001540	338.991	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/9/2011	Property Dmg Report
5-9	001540	339.100	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/5/2007	Property Dmg Report
5-10	001540	339.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/19/2005	Property Dmg Report
5-11	001540	339.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	8/15/2009	Property Dmg Report
5-13	001540	339.850	Pickup	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	4/9/2011	Property Dmg Report
5-14	001540	340.300	Car	Turning Left	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	3/25/2002	Property Dmg Report
5-15	001540	340.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	3/12/2004	Property Dmg Report
5-16	001540	340.400	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	In Intersection	Clear	Dry	2/18/2009	Property Dmg Report
5-17	001540	340.500	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	7/8/2003	Property Dmg Report
5-18	001540	340.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	1/29/2009	Property Dmg Report
5-19	001540	340.900	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	4/14/2008	Property Dmg Report
5-20	001540	340.994	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/17/2006	Property Dmg Report
5-21	001540	341.200	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/30/2010	Property Dmg Report
5-22	001540	341.335	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	1/23/2009	Property Dmg Report
	001540	341.335	Car	Going Straight	Descending	Animal - Wild	Nonjunction			1/23/2009	Property Dmg Report
5-23	001540	341.800	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	6/10/2003	Property Dmg Report
5-24	001540	341.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/15/2005	Property Dmg Report
5-25	001540	341.900	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	3/11/2009	Property Dmg Report
5-26	001540	341.981	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	10/29/2002	Property Dmg Report
5-27	001540	342.000	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	3/12/2009	Property Dmg Report
5-28	001540	342.700	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/1/2004	Property Dmg Report
5-29	001540	342.857	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/13/2005	Property Dmg Report
5-30	001540	343.100	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	1/30/2003	Property Dmg Report

6-1	001540	346.687	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/25/2007	Property Dmg Report
6-2	001540	347.990	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/29/2010	Property Dmg Report
6-3	001540	348.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/19/2004	Property Dmg Report
6-4	001540	348.100	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/9/2010	Property Dmg Report
6-5	001540	348.514	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/11/2005	Property Dmg Report
6-6	001540	348.700	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	10/7/2008	Property Dmg Report
6-7	001540	349.018	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	4/28/2003	Property Dmg Report
6-8	001540	349.101	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/28/2005	Property Dmg Report
6-9	001540	349.101	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/28/2005	Property Dmg Report
6-10	001540	349.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/23/2006	Property Dmg Report
6-11	001540	349.200	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/27/2003	Property Dmg Report
6-12	001540	349.700	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/18/2006	Property Dmg Report
6-13	001540	349.700	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Ice	1/21/2007	Property Dmg Report
6-14	001540	349.700	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/9/2007	Property Dmg Report
6-15	001540	349.700	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/20/2010	Property Dmg Report
6-16	001540	349.800	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	1/24/2005	Property Dmg Report
6-17	001540	350.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/27/2002	Property Dmg Report
6-18	001540	350.030	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	5/10/2003	Property Dmg Report
6-19	001540	350.100	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/18/2005	Property Dmg Report
6-20	001540	350.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/23/2006	Property Dmg Report
6-21	001540	350.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/17/2005	Property Dmg Report
6-23	001540	350.400	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	4/12/2007	Property Dmg Report
6-24	001540	350.400	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	7/1/2004	Property Dmg Report
6-25	001540	350.400	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/11/2008	Property Dmg Report
6-26	001540	350.500	Car	Going Straight	Descending	Animal - Wild	Related	Fog	Wet	11/24/2005	Property Dmg Report
6-27	001540	350.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/20/2006	Property Dmg Report
6-28	001540	350.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/22/2007	Property Dmg Report
6-29	001540	350.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	2/7/2009	Property Dmg Report
6-30	001540	350.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/23/2009	Property Dmg Report
6-32	001540	350.600	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/17/2004	Property Dmg Report
6-33	001540	350.600	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/25/2008	Property Dmg Report
6-34	001540	350.650	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Fog	Wet	11/22/2005	Property Dmg Report
6-36	001540	350.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	2/15/2011	Property Dmg Report
6-37	001540	350.900	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/27/2002	Property Dmg Report
6-38	001540	350.964	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/4/2007	Property Dmg Report
6-39	001540	350.981	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Wet	4/12/2010	Property Dmg Report

6-40	001540	351.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/11/2005	Property Dmg Report
6-41	001540	351.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/4/2002	Property Dmg Report
6-42	001540	351.000	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/1/2003	Property Dmg Report
6-43	001540	351.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	12/5/2008	Property Dmg Report
6-44	001540	351.070	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/16/2009	Property Dmg Report
6-45	001540	351.100	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	12/15/2002	Property Dmg Report
6-46	001540	351.200	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/4/2009	Property Dmg Report
6-47	001540	351.300	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	2/6/2009	Property Dmg Report
6-48	001540	351.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/29/2005	Property Dmg Report
6-49	001540	351.400	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/29/2011	Property Dmg Report
6-50	001540	351.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	12/1/2009	Property Dmg Report
6-51	001540	351.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	12/1/2009	Property Dmg Report
6-52	001540	351.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/24/2010	Property Dmg Report
6-53	001540	351.965	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	7/5/2009	Property Dmg Report
6-54	001540	352.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/12/2002	Property Dmg Report
6-55	001540	352.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction			8/26/2008	Property Dmg Report
6-56	001540	352.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/6/2007	Property Dmg Report
6-57	001540	352.300	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/26/2006	Property Dmg Report
6-58	001540	352.300	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	12/28/2003	Property Dmg Report
6-59	001540	352.400	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/15/2011	Property Dmg Report
6-60	001540	352.800	Car	Negotiating Curve	Ascending	Animal - Wild	Related	Cloudy	Dry	7/1/2010	Property Dmg Report
6-62	001540	353.636	Pickup/Van/Panel/SUV	Turning Left	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	6/12/2003	Property Dmg Report
6-63	001540	354.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/26/2005	Property Dmg Report
6-65	001540	354.705	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/3/2003	Property Dmg Report
6-66	001540	355.100	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/26/2005	Property Dmg Report
6-67	001540	355.430	SUV/Crossover	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/25/2011	Property Dmg Report
6-68	001540	355.500	SUV/Crossover	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	3/23/2011	Property Dmg Report
6-69	001540	356.005	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/28/2010	Property Dmg Report
6-71	001540	356.018	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/22/2009	Property Dmg Report
6-74	001540	356.700	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/14/2003	Property Dmg Report
6-75	001540	357.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/11/2005	Property Dmg Report
6-76	001540	357.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/24/2009	Property Dmg Report
6-78	001540	358.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	5/29/2002	Property Dmg Report
6-79	001540	358.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Wet	12/19/2003	Property Dmg Report
6-80	001540	358.197	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/22/2003	Property Dmg Report
6-81	001540	358.724	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/9/2008	Property Dmg Report

6-82	001540	358.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/25/2004	Property Dmg Report
6-83	001540	358.900	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/26/2009	Property Dmg Report
6-84	001540	358.976	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	5/14/2008	Property Dmg Report
6-85	001540	358.981	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/22/2008	Property Dmg Report
6-86	001540	359.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/10/2009	Property Dmg Report
6-87	001540	359.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	10/12/2007	Property Dmg Report
6-88	001540	359.500	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/9/2004	Property Dmg Report
6-89	001540	359.700	Pickup	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/31/2011	Property Dmg Report
6-90	001540	359.770	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/31/2009	Property Dmg Report
6-91	001540	360.001	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Snow	Snow	11/25/2006	Property Dmg Report
6-92	001540	360.020	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/25/2010	Property Dmg Report
6-93	001540	360.300	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	9/17/2005	Property Dmg Report
6-94	001540	360.611	Pickup	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/21/2011	Property Dmg Report
6-95	001540	360.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/15/2005	Property Dmg Report
6-96	001540	360.981	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	3/6/2010	Property Dmg Report
6-97	001540	360.994	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/1/2004	Property Dmg Report
6-98	001540	361.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	1/12/2009	Property Dmg Report
6-99	001540	361.200	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/14/2003	Property Dmg Report
6-100	001540	361.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Wet	10/29/2009	Property Dmg Report
6-101	001540	361.480	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/24/2006	Property Dmg Report
6-102	001540	361.724	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/30/2007	Property Dmg Report
6-103	001540	362.000	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Snow	Wet	12/11/2003	Property Dmg Report
6-104	001540	362.100	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	12/20/2009	Property Dmg Report
6-105	001540	362.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/20/2004	Property Dmg Report
6-106	001540	362.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	1/31/2009	Property Dmg Report
6-107	001540	362.600	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	4/2/2004	Property Dmg Report
6-108	001540	363.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	11/12/2007	Property Dmg Report
6-109	001540	363.687	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/7/2003	Property Dmg Report
6-110	001540	363.780	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	10/1/2011	Property Dmg Report
6-111	001540	363.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	5/6/2011	Property Dmg Report
6-112	001540	365.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction		Dry	8/28/2005	Property Dmg Report
6-114	001540	365.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	3/15/2007	Property Dmg Report
6-115	001540	365.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/19/2007	Property Dmg Report
6-116	001540	365.500	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	11/15/2008	Property Dmg Report
6-117	001540	365.650	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	4/12/2004	Property Dmg Report
6-118	001540	365.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/3/2007	Property Dmg Report

6-119	001540	365.900	Tractor - 2 Trailers	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/30/2007	Property Dmg Report
6-120	001540	366.800	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	12/1/2008	Property Dmg Report
6-121	001540	367.100	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	9/18/2003	Property Dmg Report
6-122	001540	367.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	11/19/2006	Property Dmg Report
6-123	001540	367.300	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/16/2002	Property Dmg Report
6-124	001540	367.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	1/12/2002	Property Dmg Report
6-125	001540	367.500	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	2/21/2009	Property Dmg Report
6-126	001540	367.900	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	10/28/2010	Property Dmg Report
6-127	001540	368.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	5/10/2005	Property Dmg Report
6-128	001540	368.000	Truck With Trailer	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/22/2007	Property Dmg Report
6-129	001540	368.000	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	1/10/2009	Property Dmg Report
6-130	001540	368.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	4/19/2009	Property Dmg Report
6-132	001540	368.100	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Rain	Wet	4/30/2010	Property Dmg Report
6-134	001540	368.300	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	3/27/2003	Property Dmg Report
6-135	001540	368.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Rain	Wet	2/22/2009	Property Dmg Report
6-136	001540	368.700	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Snow	Ice	12/30/2007	Property Dmg Report
6-137	001540	368.700	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/17/2008	Property Dmg Report
6-138	001540	368.800	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/30/2011	Property Dmg Report
6-139	001540	368.900	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	12/5/2004	Property Dmg Report
6-140	001540	369.050	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/6/2010	Property Dmg Report
6-141	001540	369.100	SUV/Crossover	Going Straight	Descending	Animal - Wild	Nonjunction	Rain	Wet	4/16/2011	Property Dmg Report
6-142	001540	369.300	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	3/4/2007	Property Dmg Report
6-144	001540	369.568	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/6/2006	Property Dmg Report
6-145	001540	369.600	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	9/21/2008	Property Dmg Report
6-146	001540	369.700	Pickup/Van/Panel/SUV	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/8/2010	Property Dmg Report
6-147	001540	369.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/5/2008	Property Dmg Report
6-148	001540	370.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	3/16/2002	Property Dmg Report
6-149	001540	370.028	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Wet	10/13/2007	Property Dmg Report
6-152	001540	371.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	11/16/2002	Property Dmg Report
6-153	001540	371.000	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	1/4/2010	Property Dmg Report
6-154	001540	371.050	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/26/2011	Property Dmg Report
6-155	001540	371.100	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/28/2010	Property Dmg Report
6-156	001540	371.200	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	9/9/2010	Property Dmg Report
6-157	001540	371.400	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/24/2009	Property Dmg Report
1-10	001540	188.000	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	1/23/2006	C Injury Accident
1-24	001540	195.184	Motorcycle	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/18/2002	C Injury Accident

1-31	001540	208.900	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/15/2006	C Injury Accident
1-46	001540	219.200	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	6/28/2002	C Injury Accident
2-2	008605	268.100	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	12/25/2009	C Injury Accident
3-3	001540	275.100	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/19/2007	C Injury Accident
3-7	001540	277.500	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Wet	5/30/2004	C Injury Accident
3-9	001540	278.520	SUV/Crossover	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/23/2011	C Injury Accident
3-14	001540	281.400	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/1/2009	C Injury Accident
3-60	001540	302.995	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/29/2003	C Injury Accident
3-64	001540	303.700	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	1/23/2008	C Injury Accident
3-89	001540	308.800	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	11/4/2008	C Injury Accident
3-99	001540	310.300	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/12/2006	C Injury Accident
3-122	001540	315.024	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/24/2007	C Injury Accident
4-10	001539	337.180	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	In Intersection	Cloudy	Wet	1/7/2009	C Injury Accident
5-3	001540	338.100	Car	Negotiating Curve	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	10/25/2010	C Injury Accident
5-4	001540	338.200	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/25/2007	C Injury Accident
5-12	001540	339.800	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	10/1/2005	C Injury Accident
5-31	001540	343.100	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	7/25/2004	C Injury Accident
6-22	001540	350.346	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	12/14/2010	C Injury Accident
6-31	001540	350.600	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	2/17/2008	C Injury Accident
6-35	001540	350.700	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	10/20/2006	C Injury Accident
6-61	001540	353.617	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	6/14/2002	C Injury Accident
6-70	001540	356.013	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/18/2002	C Injury Accident
6-72	001540	356.100	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Wet	4/5/2010	C Injury Accident
6-73	001540	356.100	SUV/Crossover	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/27/2011	C Injury Accident
6-77	001540	357.800	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	8/23/2007	C Injury Accident
6-133	001540	368.100	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	12/15/2010	C Injury Accident
6-143	001540	369.400	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Cloudy	Dry	7/13/2002	C Injury Accident
6-151	001540	370.300	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	9/10/2010	C Injury Accident
3-15	001540	283.004	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/10/2008	B Injury Accident
3-92	001540	309.000	Pickup/Van/Panel/SUV	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	10/3/2004	B Injury Accident
3-121	001540	315.000	Pickup/Van/Panel/SUV	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	5/15/2008	B Injury Accident
3-130	001540	318.500	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Cloudy	Dry	11/17/2008	B Injury Accident
3-139	001540	319.600	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	6/18/2004	B Injury Accident
4-5	001539	328.400	Pickup/Van/Panel/SUV	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	8/7/2010	B Injury Accident
6-131	001540	368.003	Car	Negotiating Curve	Descending	Animal - Wild	Nonjunction	Clear	Dry	7/8/2007	B Injury Accident
6-64	001540	354.596	Car	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	11/11/2002	A Injury Accident

6-113	001540	365.200	Car	Going Straight	Descending	Animal - Wild	Nonjunction	Clear	Dry	9/11/2008	A Injury Accident
6-150	001540	370.300	Motorcycle	Going Straight	Ascending	Animal - Wild	Nonjunction	Clear	Dry	5/23/2005	A Injury Accident

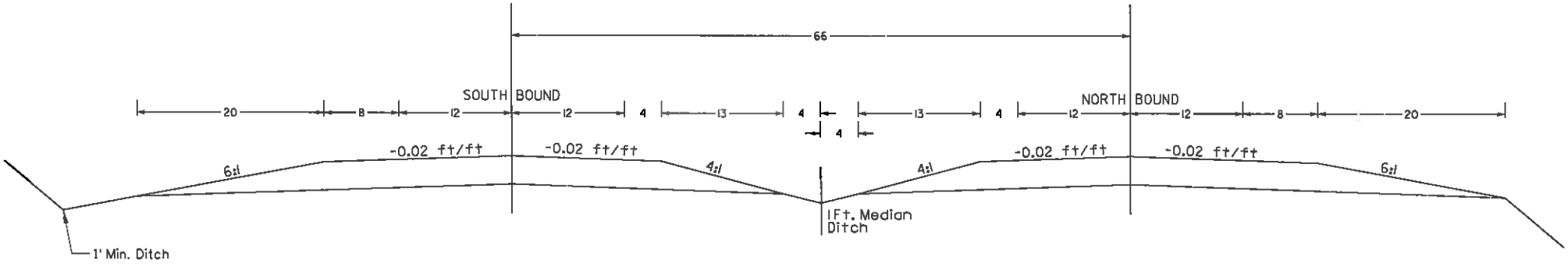
Appendix C.1

Typical Sections, AASHTO HSM Calculations, and Results For Alignment E2

E-2 TYPICAL SECTIONS

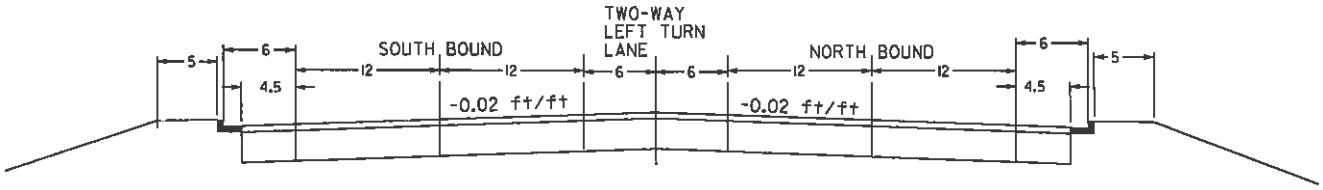
RURAL SECTION

Milepost 337.668 to Milepost 343.282



URBAN SECTION

Milepost 343.282 to Milepost 343.518



Worksheet 1A -- General Information and Input Data for Rural Multilane Roadway Segments

General Information		Location Information	
Analyst	Curtis J. Arnzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD D2	Roadway Section	E2 Rural - Divided
Date Performed	03/10/12	Jurisdiction	Latah Co, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (divided / undivided)		Undivided	Divided
Length of segment, L (mi)		--	5.61
AADT (veh/day)	$AADT_{MAX}$ = 89,300 (veh/day)	--	5,920
Lane width (ft)		12	12
Shoulder width (ft) - right shoulder width for divided [if differ for directions of travel, use average width]		8	8
Shoulder type - right shoulder type for divided		Paved	Paved
Median width (ft) - for divided only		30	40
Side Slopes - for undivided only		1:7 or flatter	Not Applicable
Lighting (present/not present)		Not Present	Not Present
Auto speed enforcement (present/not present)		Not Present	Not Present
Calibration Factor, Cr		1.00	1.00

Worksheet 1B (a) -- Crash Modification Factors for Rural Multilane Divided Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for Lane Width	CMF for Right Shoulder Width	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1rd	*CMF 2rd*	*CMF 3rd*	*CMF 4rd*	*CMF 5rd*	*CMF comb*
from Equation 11-16	from Table 11-17	from Table 11-18	from Equation 11-17	from Section 11.7.2	(1)*(2)*(3)*(4)*(5)
1.00	1.00	0.99	1.00	1.00	0.99

Worksheet 1C (a) -- Roadway Segment Crashes for Rural Multilane Divided Roadway Segments

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-5			N spf rd	Overdispersion Parameter, k	Combined CMFs (6) from Worksheet 1B (a)	Calibration Factor, Cr	Predicted average crash frequency, $N_{predicted\ rs(d)}$
	a	b	c	from Equation 11-9	from Equation 11-10			(3)*(5)*(6)
Total	-9.025	1.049	1.549	6.118	0.038	0.99	1.00	6.057
Fatal and Injury (FI)	-8.837	0.958	1.687	3.350	0.033	0.99	1.00	3.316
Fatal and Injury[a] (FI[a])	-8.505	0.874	1.740	2.251	0.031	0.99	1.00	2.228
Property Damage Only (PDO)	--	--	--	--	--	--	--	$(7)_{TOTAL} - (7)_{FI}$ 2.741

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1D (a) -- Crashes by Severity Level and Collision Type for Rural Multilane Divided Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	Proportion of Collision $Type_{(TOTAL)}$	$N_{predicted\ rs(d)\ (TOTAL)}$ (crashes/year)	Proportion of Collision Type(FI)	$N_{predicted\ rs(d)\ (FI)}$ (crashes/year)	Proportion of Collision Type (FI^a)	N *predicted rs* (FI^a) (crashes/year)	Proportion of Collision Type (PDO)	$N_{predicted\ rs(d)\ (PDO)}$ (crashes/year)
	from Table 11-6	$(7)_{TOTAL}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{FI}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{FI^a}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{PDO}$ from Worksheet 1C (a)
Total	1.000	6.057	1.000	3.316	1.000	2.228	1.000	2.741
		$(2)*(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)*(7)_{FI^a}$		$(8)*(9)_{PDO}$
Head-on collision	0.006	0.036	0.013	0.043	0.018	0.040	0.002	0.005
Sideswipe collision	0.043	0.260	0.027	0.090	0.022	0.049	0.053	0.145
Rear-end collision	0.116	0.703	0.163	0.541	0.114	0.254	0.088	0.241
Angle collision	0.043	0.260	0.048	0.159	0.045	0.100	0.041	0.112
Single-vehicle collision	0.768	4.652	0.727	2.411	0.778	1.733	0.792	2.171
Other collision	0.024	0.145	0.022	0.073	0.023	0.051	0.024	0.066

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1E -- Summary Results for Rural Multilane Roadway Segments

(1)	(2)	(3)	(4)
Crash severity level	Predicted average crash frequency (crashes/year) (7) from Worksheet 1C (a) or (b)	Roadway segment length (mi)	Crash rate (crashes/mi/year) (2)/(3)
Total	6.1	5.6	1.1
Fatal and Injury (FI)	3.3	5.6	0.6
Fatal and Injury[a] (FI[a])	2.2	5.6	0.4
Property Damage Only (PDO)	2.7	5.6	0.5

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1A – General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Roadway Section	E2, Suburban
Date Performed	03/10/12	Jurisdiction	Latah County, Idaho
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		–	ST
Length of segment, L (mi)		–	9.24
AADT (veh/day)	$AADT_{MAX}$ = 63,300 (veh/day)	–	7,485
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		–	0
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		–	2
Minor commercial driveways (number)		–	3
Major industrial / institutional driveways (number)		–	0
Minor industrial / institutional driveways (number)		–	0
Major residential driveways (number)		–	0
Minor residential driveways (number)		–	2
Other driveways (number)		–	0
Speed Category		–	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	0
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.00

Worksheet 1B – Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	0.94	1.00	0.94

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{bmmv}**	**Proportion of Total Crashes**	**Adjusted N_{bmmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{bmmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-9.70	1.17	0.81	0.500	1.000	0.500	0.94	1.00	0.470
Fatal and Injury (FI)	-10.47	1.12	0.62	0.148	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.280	0.140	0.94	1.00	0.132
Property Damage Only (PDO)	-9.97	1.17	0.88	0.382	$(5)_{TOTAL}-(5)_{FI}$ 0.720	0.360	0.94	1.00	0.339

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bmmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bmmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bmmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.132	1.000	0.339	0.470
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Rear-end collision	0.846	0.111	0.651	0.220	0.332
Head-on collision	0.021	0.003	0.004	0.001	0.004
Angle collision	0.050	0.007	0.059	0.020	0.027
Sideswipe, same direction	0.061	0.008	0.248	0.084	0.092
Sideswipe, opposite direction	0.004	0.001	0.009	0.003	0.004
Other multiple-vehicle collision	0.018	0.002	0.029	0.010	0.012

Worksheet 1E – Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-4.82	0.54	0.52	0.239	1.000	0.239	0.94	1.00	0.225
Fatal and Injury (FI)	-4.43	0.35	0.36	0.065	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.285	0.068	0.94	1.00	0.064
Property Damage Only (PDO)	-5.83	0.61	0.55	0.162	$(5)_{TOTAL}-(5)_{FI}$ 0.715	0.171	0.94	1.00	0.161

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.064	1.000	0.161	0.225

		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.016	0.001	0.049	0.008	0.009
Collision with fixed object	0.398	0.026	0.768	0.123	0.149
Collision with other object	0.005	0.000	0.061	0.010	0.010
Other single-vehicle collision	0.581	0.037	0.122	0.020	0.057

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	2	0.165	1.172	0.146	
Minor commercial	3	0.053	1.172	0.070	
Major industrial/institutional	0	0.181	1.172	0.000	
Minor industrial/institutional	0	0.024	1.172	0.000	
Major residential	0	0.087	1.172	0.000	
Minor residential	2	0.016	1.172	0.014	
Other	0	0.027	1.172	0.000	
Total	--	--	--	0.230	0.10

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL} * (3)$	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.230	1.000	0.230	0.94	1.00	0.216
Fatal and injury (FI)	--	0.269	0.062	0.94	1.00	0.058
Property damage only (PDO)	--	0.731	0.168	0.94	1.00	0.158

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.470	0.225	0.216	0.911	0.023	1.00	0.021
Fatal and injury (FI)	--	--	--	--	--	1.00	0.021

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{bikel}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.470	0.225	0.216	0.911	0.012	1.00	0.011
Fatal and injury (FI)	--	--	--	--	--	1.00	0.011

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.111	0.220	0.332
Head-on collisions (from Worksheet 1D)	0.003	0.001	0.004
Angle collisions (from Worksheet 1D)	0.007	0.020	0.027
Sideswipe, same direction (from Worksheet 1D)	0.008	0.084	0.092
Sideswipe, opposite direction (from Worksheet 1D)	0.001	0.003	0.004
Driveway-related collisions (from Worksheet 1H)	0.058	0.158	0.216
Other multiple-vehicle collision (from Worksheet 1D)	0.002	0.010	0.012
Subtotal	0.190	0.497	0.686
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.001	0.008	0.009
Collision with fixed object (from Worksheet 1F)	0.026	0.123	0.149
Collision with other object (from Worksheet 1F)	0.000	0.010	0.010
Other single-vehicle collision (from Worksheet 1F)	0.037	0.020	0.057
Collision with pedestrian (from Worksheet 1I)	0.021	0.000	0.021
Collision with bicycle (from Worksheet 1J)	0.011	0.000	0.011
Subtotal	0.096	0.161	0.257
Total	0.286	0.657	0.943

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	0.9	0.24	3.9
Fatal and injury (FI)	0.3	0.24	1.2
Property damage only (PDO)	0.7	0.24	2.7

Worksheet 2A – General Information and Input Data for Rural Multilane Highway Intersections

General Information		Location Information	
Analyst	Curtis J. Arnzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD District 2	Intersection	E2, Old US-95 South
Date Performed	03/10/12	Jurisdiction	Latah Co., ID
		Analysis Year	2017

Input Data				Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)				–	3ST
$AADT_{major}$ (veh/day)	$AADT_{Maj}$ =	78 300	(veh/day)	–	4,000
$AADT_{minor}$ (veh/day)	$AADT_{Min}$ =	23,000	(veh/day)	–	500
Intersection skew angle (degrees)				0	0
Number of non-STOP-controlled approaches with left-turn lanes (0, 1, 2)				0	1
Number of non-STOP-controlled approaches with right-turn lanes (0, 1, 2, 3, or 4)				0	1
Intersection lighting (present/not present)				Not Present	Not Present
Calibration Factor, C_i				1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Crash Severity Level	CMF for Intersection Skew Angle (CMF_{1i}) from Equations 11-18 or 11-20 and 11-19 or 11-21	CMF for Left-Turn Lanes (CMF_{2i}) from Table 11-22	CMF for Right-Turn Lanes (CMF_{3i}) from Table 11-23	CMF for Lighting (CMF_{4i}) from Equation 11-22	Combined CMF (CMF_{COMB}) (2)*(3)*(4)*(5)
Total	1.00	0.56	0.86	1.00	0.48
Fatal and Injury (FI)	1.00	0.45	0.77	1.00	0.35

Note: The 4-leg Signalized Intersection (4SG) models do not have base conditions and so can only be used for estimation purposes. As a result, there are not CMFs provided for the 4SG condition.

Worksheet 2C – Intersection Crashes for Rural Multilane Highway Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs from (6) of Worksheet 2B	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$ (3)*(5)*(6)
	a	b	c or d (4SG)	from Equation 11-11 or 11-12	from Table 11-7 or 11-8			
Total	-12.526	1.204	0.236	0.548	0.460	0.48	1.00	0.264
Fatal and Injury (FI)	-12.664	1.107	0.272	0.257	0.569	0.35	1.00	0.069
Fatal and Injury[a] (FI[a])	-11.989	1.013	0.228	0.170	0.566	0.35	1.00	0.059
Property Damage Only (PDO)	–	–	–	–	–	–	–	$(7)_{TOTAL} - (7)_{FI}$ 0.175

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	Proportion of Collision $Type_{TOTAL}$	$N_{predicted\ int\ (TOTAL)}$ (crashes/year)	Proportion of Collision $Type_{FI}$	$N_{predicted\ int\ (FI)}$ (crashes/year)	Proportion of Collision Type (FI^a)	$N_{predicted\ int}$ (FI^a) (crashes/year)	Proportion of Collision Type (PDO)	$N_{predicted\ int\ (PDO)}$ (crashes/year)
	from Table 11-9	$(7)_{TOTAL}$ from Worksheet 2C	from Table 11-9	$(7)_{FI}$ from Worksheet 2C	from Table 11-9	$(7)_{FI}{}^a$ from Worksheet 2C	from Table 11-9	$(7)_{PDO}$ from Worksheet 2C
Total	1.000	0.264 (2)*(3)$_{TOTAL}$	1.000	0.089 (4)x(5)$_{FI}$	1.000	0.059 (6)*(7)$_{FI}{}^a$	1.000	0.175 (8)*(9)$_{PDO}$
Head-on collision	0.029	0.008	0.043	0.004	0.052	0.003	0.020	0.003
Sideswipe collision	0.133	0.035	0.058	0.005	0.057	0.003	0.179	0.031
Rear-end collision	0.289	0.076	0.247	0.022	0.142	0.008	0.315	0.055
Angle collision	0.263	0.069	0.369	0.033	0.381	0.022	0.198	0.035
Single-vehicle collision	0.234	0.062	0.219	0.020	0.284	0.017	0.244	0.043
Other collision	0.052	0.014	0.064	0.006	0.084	0.005	0.044	0.008

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2E – Summary Results for Rural Multilane Highway Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency (crashes / year) (7) from Worksheet 2C
Total	0.3
Fatal and Injury (FI)	0.1
Fatal and Injury[a] (FI[a])	0.1
Property Damage Only (PDO)	0.2

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Curtis J. Arnzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Intersection	E2 - Old US-95 North
Date Performed	03/10/12	Jurisdiction	Latah County, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 15,700 (veh/day)	--	6,920
AADT $_{minor}$ (veh/day)	$AADT_{MIN}$ = 9,300 (veh/day)	--	1,450
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	1
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	0
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.67	1.00	0.86	1.00	0.91	1.00	0.52

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.60	0.480	1.000	0.480	0.52	1.00	0.252
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.174	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.376	0.181	0.52	1.00	0.095
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.288	$(5)_{TOTAL}-(5)_{FI}$ = 0.624	0.299	0.52	1.00	0.157

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.095	1.000	0.157	0.252
		(2)*$(3)_{FI}$		(4)*$(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.040	0.440	0.069	0.109
Head-on collision	0.045	0.004	0.023	0.004	0.008
Angle collision	0.343	0.032	0.262	0.041	0.074
Sideswipe	0.126	0.012	0.040	0.006	0.018
Other multiple-vehicle collision	0.065	0.006	0.235	0.037	0.043

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.181	1.000	0.181	0.52	1.00	0.095
Fatal and Injury (FI)	--	--	--	--	0.056	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.333	0.060	0.52	1.00	0.032
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.112	$(5)_{TOTAL}-(5)_{FI}$ = 0.667	0.121	0.52	1.00	0.063

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)

Collision Type	Proportion of Collision Type$_{(FI)}$	Predicted N $_{bfav\ (FI)}$ (crashes/year)	Proportion of Collision Type $_{(PDO)}$	Predicted N $_{bfav\ (PDO)}$ (crashes/year)	Predicted N $_{bfav\ (TOTAL)}$ (crashes/year)
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.032	1.000	0.063	0.095
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.001	0.001
Collision with fixed object	0.762	0.024	0.834	0.053	0.077
Collision with other object	0.090	0.003	0.092	0.006	0.009
Other single-vehicle collision	0.039	0.001	0.023	0.001	0.003
Single-vehicle noncollision	0.105	0.003	0.030	0.002	0.005

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{pedi}	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.252	0.095	0.347	0.021	1.00	0.007
Fatal and injury (FI)	--	--	--	--	1.00	0.007

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 12-14					Overdispersion Parameter, k	$N_{pedbase}$ from Equation 12-29	Combined CMF (4) from Worksheet 2H	Calibration factor, C_i	Predicted N_{predi} (4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{bikai}	Calibration factor, C_i	Predicted N_{bikai}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.252	0.095	0.347	0.016	1.00	0.006
Fatal and injury (FI)	--	--	--	--	1.00	0.006

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	Fatal and Injury (FI)	Property damage only (PDO)	Total
	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.040	0.069	0.109
Head-on collisions (from Worksheet 2D)	0.004	0.004	0.008
Angle collisions (from Worksheet 2D)	0.032	0.041	0.074
Sideswipe (from Worksheet 2D)	0.012	0.006	0.018
Other multiple-vehicle collision (from Worksheet 2D)	0.006	0.037	0.043
Subtotal	0.095	0.157	0.252
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.024	0.053	0.077
Collision with other object (from Worksheet 2F)	0.003	0.006	0.009
Other single-vehicle collision (from Worksheet 2F)	0.001	0.001	0.003
Single-vehicle noncollision (from Worksheet 2F)	0.003	0.002	0.005
Collision with pedestrian (from Worksheet 2G or 2I)	0.007	0.000	0.007
Collision with bicycle (from Worksheet 2J)	0.006	0.000	0.006
Subtotal	0.044	0.063	0.108
Total	0.139	0.220	0.359

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.4
Fatal and injury (FI)	0.1
Property damage only (PDO)	0.2

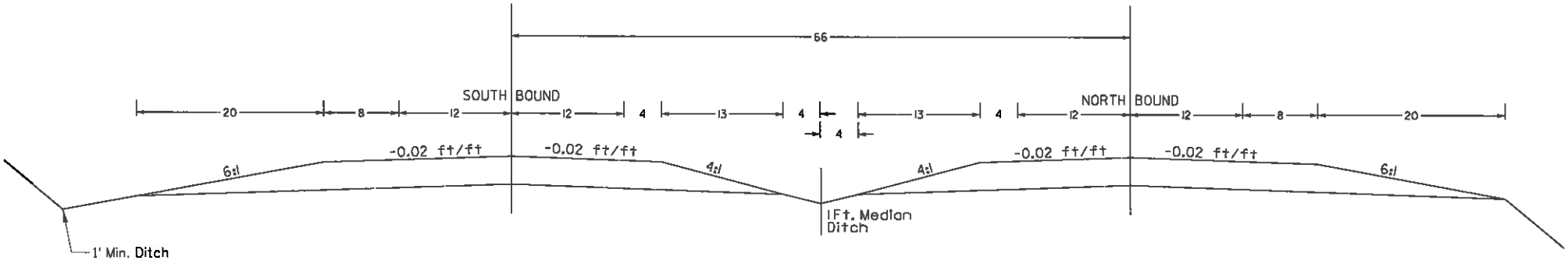
Appendix C.2

Typical Sections, AASHTO HSM Calculations, and Results For Alignment C3

C-3 TYPICAL SECTIONS

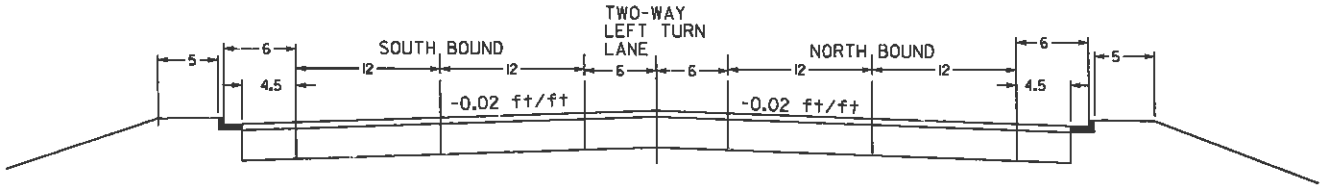
RURAL SECTION

Milepost 337.668 to Milepost 342.187



URBAN SECTION

Milepost 342.187 to Milepost 343.608



Worksheet 1A – General Information and Input Data for Rural Multilane Roadway Segments

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD D2	Roadway Section	C3 Rural - Divided
Date Performed	03/30/12	Jurisdiction	Latah Co, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (divided / undivided)		Undivided	Divided
Length of segment, L (mi)		--	4.52
AADT (veh/day)	$AADT_{MAY}$ = 89,300 (veh/day)	--	5,920
Lane width (ft)		12	12
Shoulder width (ft) - right shoulder width for divided [if differ for directions of travel, use average width]		8	8
Shoulder type - right shoulder type for divided		Paved	Paved
Median width (ft) - for divided only		30	40
Side Slopes - for undivided only		1:7 or flatter	Not Applicable
Lighting (present/not present)		Not Present	Not Present
Auto speed enforcement (present/not present)		Not Present	Not Present
Calibration Factor, Cr		1.00	1.00

Worksheet 1B (a) – Crash Modification Factors for Rural Multilane Divided Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for Lane Width	CMF for Right Shoulder Width	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1rd	*CMF 2rd*	*CMF 3rd*	*CMF 4rd*	*CMF 5rd*	*CMF comb*
from Equation 11-16	from Table 11-17	from Table 11-18	from Equation 11-17	from Section 11.7.2	(1)*(2)*(3)*(4)*(5)
1.00	1.00	0.99	1.00	1.00	0.99

Worksheet 1C (a) – Roadway Segment Crashes for Rural Multilane Divided Roadway Segments

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients** from Table 11-5			**N spf rd**	**Overdispersion Parameter, k**	**Combined CMFs** (6) from Worksheet 1B (a)	**Calibration Factor, Cr**	**Predicted average crash frequency, $N_{predicted\ rs(d)}$** (3)*(5)*(6)
	a	b	c	from Equation 11-9	from Equation 11-10			
Total	-9.025	1.049	1.549	4.929	0.047	0.99	1.00	4.880
Fatal and Injury (FI)	-8.837	0.958	1.687	2.699	0.041	0.99	1.00	2.672
Fatal and Injury[a] (FI[a])	-8.505	0.874	1.740	1.813	0.039	0.99	1.00	1.795
Property Damage Only (PDO)	--	--	--	--	--	--	--	$(7)_{TOTAL} - (7)_{FI}$ 2.208

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1D (a) – Crashes by Severity Level and Collision Type for Rural Multilane Divided Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	**Proportion of Collision Type$_{(TOTAL)}$**	**N $_{predicted\ rs(d)\ (TOTAL)}$ (crashes/year)**	**Proportion of Collision Type(FI)**	**N $_{predicted\ rs(d)\ (FI)}$ (crashes/year)**	**Proportion of Collision Type (FI[a])**	**N *predicted rs* (FI[a]) (crashes/year)**	**Proportion of Collision Type (PDO)**	**N $_{predicted\ rs(d)\ (PDO)}$ (crashes/year)**
	from Table 11-6	$(7)_{TOTAL}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{FI}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{FI}$[a] from Worksheet 1C (a)	from Table 11-6	$(7)_{PDO}$ from Worksheet 1C (a)
Total	1.000	4.880	1.000	2.672	1.000	1.795	1.000	2.208
		$(2)*(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)*(7)_{FI}$[a]		$(8)*(9)_{PDO}$
Head-on collision	0.006	0.029	0.013	0.035	0.018	0.032	0.002	0.004
Sideswipe collision	0.043	0.210	0.027	0.072	0.022	0.039	0.053	0.117
Rear-end collision	0.116	0.566	0.163	0.435	0.114	0.205	0.088	0.194
Angle collision	0.043	0.210	0.048	0.128	0.045	0.081	0.041	0.091
Single-vehicle collision	0.768	3.748	0.727	1.942	0.778	1.397	0.792	1.749
Other collision	0.024	0.117	0.022	0.059	0.023	0.041	0.024	0.053

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1E – Summary Results for Rural Multilane Roadway Segments

(1)	(2)	(3)	(4)
Crash severity level	**Predicted average crash frequency (crashes/year)** (7) from Worksheet 1C (a) or (b)	**Roadway segment length (mi)**	**Crash rate (crashes/mi/year)** (2)/(3)
Total	4.9	4.5	1.1
Fatal and Injury (FI)	2.7	4.5	0.6
Fatal and Injury[a] (FI[a])	1.8	4.5	0.4
Property Damage Only (PDO)	2.2	4.5	0.5

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1A – General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Curtis J. Arnzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Roadway Section	C3, Suburban
Date Performed	03/21/12	Jurisdiction	Latah County, Idaho
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	5
Length of segment, L (mi)		--	1.42
AADT (veh/day)	$AADT_{Hwy}$ = 53,800 (veh/day)	--	7,465
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	0
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	3
Minor commercial driveways (number)		--	12
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	7
Other driveways (number)		--	0
Speed Category		--	Posted Speed Greater than 50 mph
Roadside fixed object density (fixed objects / mi)		0	0
Offset to roadside fixed objects (ft) [if greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.00

Worksheet 1B – Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	0.94	1.00	0.94

Worksheet 1C – Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients		Overdispersion Parameter, k	Initial N_{bmnv}	Proportion of Total Crashes	Adjusted N_{bmnv}	Combined CMFs	Calibration Factor, Cr	Predicted N_{bmnv}
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-9.70	1.17	0.81	2.959	1.000	2.959	0.94	1.00	2.782
Fatal and Injury (FI)	-10.47	1.12	0.62	0.877	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.280	0.828	0.94	1.00	0.778
Property Damage Only (PDO)	-9.97	1.17	0.88	2.258	$(5)_{TOTAL}-(5)_{FI}$ 0.720	2.131	0.94	1.00	2.004

Worksheet 1D – Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type(FI)	Predicted $N_{bmnv\ (FI)}$ (crashes/year)	Proportion of Collision Type (PDO)	Predicted $N_{bmnv\ (PDO)}$ (crashes/year)	Predicted $N_{bmnv\ (TOTAL)}$ (crashes/year)
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.778	1.000	2.004	2.782
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.846	0.658	0.651	1.305	1.963
Head-on collision	0.021	0.016	0.004	0.008	0.024
Angle collision	0.050	0.039	0.059	0.118	0.157
Sideswipe, same direction	0.061	0.047	0.248	0.497	0.544
Sideswipe, opposite direction	0.004	0.003	0.009	0.018	0.021
Other multiple-vehicle collision	0.018	0.014	0.029	0.058	0.072

Worksheet 1E – Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients		Overdispersion Parameter, k	Initial N_{brsv}	Proportion of Total Crashes	Adjusted N_{brsv}	Combined CMFs	Calibration Factor, Cr	Predicted N_{brsv}
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-4.82	0.54	0.52	1.414	1.000	1.414	0.94	1.00	1.330
Fatal and Injury (FI)	-4.43	0.35	0.36	0.384	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.285	0.403	0.94	1.00	0.379
Property Damage Only (PDO)	-5.83	0.61	0.55	0.961	$(5)_{TOTAL}-(5)_{FI}$ 0.715	1.011	0.94	1.00	0.950

Worksheet 1F – Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type(FI)	Predicted $N_{brsv\ (FI)}$ (crashes/year)	Proportion of Collision Type (PDO)	Predicted $N_{brsv\ (PDO)}$ (crashes/year)	Predicted $N_{brsv\ (TOTAL)}$ (crashes/year)
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.379	1.000	0.950	1.330

		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.016	0.006	0.049	0.047	0.053
Collision with fixed object	0.398	0.151	0.768	0.730	0.881
Collision with other object	0.005	0.002	0.061	0.058	0.060
Other single-vehicle collision	0.581	0.220	0.122	0.116	0.336

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j** from Table 12-7	**Coefficient for traffic adjustment, t** from Table 12-7	**Initial N_{brdwy}** Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	**Overdispersion parameter, k** from Table 12-7
Major commercial	3	0.165	1.172	0.218	–
Minor commercial	12	0.053	1.172	0.281	
Major industrial/institutional	0	0.181	1.172	0.000	
Minor industrial/institutional	0	0.024	1.172	0.000	
Major residential	0	0.087	1.172	0.000	
Minor residential	7	0.016	1.172	0.049	
Other	0	0.027	1.172	0.000	
Total	–	–	–	0.549	0.10

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}** $(5)_{TOTAL}$ from Worksheet 1G	**Proportion of total crashes (f_{dwy})** from Table 12-7	**Adjusted N_{brdwy}** $(2)_{TOTAL} * (3)$	**Combined CMFs** (6) from Worksheet 1B	**Calibration factor, C_r**	**Predicted N_{brdwy}** (4)*(5)*(6)
Total	0.549	1.000	0.549	0.94	1.00	0.516
Fatal and injury (FI)	–	0.269	0.148	0.94	1.00	0.139
Property damage only (PDO)	–	0.731	0.401	0.94	1.00	0.377

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}** (9) from Worksheet 1C	**Predicted N_{brsv}** (9) from Worksheet 1E	**Predicted N_{brdwy}** (7) from Worksheet 1H	**Predicted N_{br}** (2)+(3)+(4)	**f_{pedr}** from Table 12-8	**Calibration factor, C_r**	**Predicted N_{pedr}** (5)*(6)*(7)
Total	2.782	1.330	0.516	4.628	0.023	1.00	0.106
Fatal and injury (FI)	–	–	–	–	–	1.00	0.106

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}** (9) from Worksheet 1C	**Predicted N_{brsv}** (9) from Worksheet 1E	**Predicted N_{brdwy}** (7) from Worksheet 1H	**Predicted N_{br}** (2)+(3)+(4)	**f_{bikr}** from Table 12-9	**Calibration factor, C_r**	**Predicted N_{bikr}** (5)*(6)*(7)
Total	2.782	1.330	0.516	4.628	0.012	1.00	0.056
Fatal and injury (FI)	–	–	–	–	–	1.00	0.056

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Collision type	**Fatal and Injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.658	1.305	1.963
Head-on collisions (from Worksheet 1D)	0.016	0.008	0.024
Angle collisions (from Worksheet 1D)	0.039	0.118	0.157
Sideswipe, same direction (from Worksheet 1D)	0.047	0.497	0.544
Sideswipe, opposite direction (from Worksheet 1D)	0.003	0.018	0.021
Driveway-related collisions (from Worksheet 1H)	0.139	0.377	0.516
Other multiple-vehicle collision (from Worksheet 1D)	0.014	0.058	0.072
Subtotal	0.917	2.381	3.298
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.006	0.047	0.053
Collision with fixed object (from Worksheet 1F)	0.151	0.730	0.881
Collision with other object (from Worksheet 1F)	0.002	0.058	0.060
Other single-vehicle collision (from Worksheet 1F)	0.220	0.116	0.336
Collision with pedestrian (from Worksheet 1I)	0.106	0.000	0.106
Collision with bicycle (from Worksheet 1J)	0.056	0.000	0.056
Subtotal	0.541	0.950	1.492
Total	1.458	3.332	4.790

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)** (Total) from Worksheet 1K	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)** (2) / (3)
Total	4.8	1.42	3.4
Fatal and injury (FI)	1.5	1.42	1.0
Property damage only (PDO)	3.3	1.42	2.3

Worksheet 2A – General Information and Input Data for Rural Multilane Highway Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD District 2	Intersection	C3 - Old US-95 South
Date Performed	03/10/12	Jurisdiction	Latah Co, ID
		Analysis Year	2017

Input Data				Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)				–	4SG
$AADT_{major}$ (veh/day)	$AADT_{Maj} =$	78,300	(veh/day)	–	5,800
$AADT_{minor}$ (veh/day)	$AADT_{Min} =$	25,000	(veh/day)	–	500
Intersection skew angle (degrees)				0	0
Number of non-STOP-controlled approaches with left-turn lanes (0, 1, 2)				0	1
Number of non-STOP-controlled approaches with right-turn lanes (0, 1, 2, 3, or 4)				0	1
Intersection lighting (present/not present)				Not Present	Not Present
Calibration Factor, C_i				1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Crash Severity Level	CMF for Intersection Skew Angle (CMF_{1i}) from Equations 11-18 or 11-20 and 11-19 or 11-21	CMF for Left-Turn Lanes (CMF_{2i}) from Table 11-22	CMF for Right-Turn Lanes (CMF_{3i}) from Table 11-23	CMF for Lighting (CMF_{4i}) from Equation 11-22	Combined CMF (CMF_{COMB}) (2)*(3)*(4)*(5)
Total	1.00	0.56	0.86	1.00	0.48
Fatal and Injury (FI)	1.00	0.45	0.77	1.00	0.35

Note: The 4-leg Signalized Intersection (4SG) models do not have base conditions and so can only be used for estimation purposes. As a result, there are not CMFs provided for the 4SG condition.

Worksheet 2C – Intersection Crashes for Rural Multilane Highway Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs from (6) of Worksheet 2B	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$ (3)*(5)*(6)
	a	b	c or d (4SG)	from Equation 11-11 or 11-12	from Table 11-7 or 11-8			
Total	-12.526	1.204	0.236	0.548	0.460	0.48	1.00	0.264
Fatal and Injury (FI)	-12.864	1.107	0.272	0.257	0.569	0.35	1.00	0.089
Fatal and Injury[a] (FI[a])	-11.989	1.013	0.228	0.170	0.566	0.35	1.00	0.059
Property Damage Only (PDO)	–	–	–	–	–	–	–	$(7)_{TOTAL} - (7)_{FI}$ 0.175

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	Proportion of Collision $Type_{(TOTAL)}$	$N_{predicted\ int\ (TOTAL)}$ (crashes/year)	Proportion of Collision $Type_{(FI)}$	$N_{predicted\ int\ (FI)}$ (crashes/year)	Proportion of Collision Type (FI[a])	N *predicted int* (FI[a]) (crashes/year)	Proportion of Collision Type (PDO)	$N_{predicted\ int\ (PDO)}$ (crashes/year)
	from Table 11-9	$(7)_{TOTAL}$ from Worksheet 2C	from Table 11-9	$(7)_{FI}$ from Worksheet 2C	from Table 11-9	$(7)_{FI}$[a] from Worksheet 2C	from Table 11-9	$(7)_{PDO}$ from Worksheet 2C
Total	1.000	0.264	1.000	0.089	1.000	0.059	1.000	0.175
		(2)*(3)$_{TOTAL}$		(4)x(5)$_{FI}$		(6)*(7)$_{FI}$[a]		(8)*(9)$_{PDO}$
Head-on collision	0.029	0.008	0.043	0.004	0.052	0.003	0.020	0.003
Sideswipe collision	0.133	0.035	0.058	0.005	0.057	0.003	0.179	0.031
Rear-end collision	0.289	0.076	0.247	0.022	0.142	0.008	0.315	0.055
Angle collision	0.263	0.069	0.369	0.033	0.381	0.022	0.198	0.035
Single-vehicle collision	0.234	0.062	0.219	0.020	0.284	0.017	0.244	0.043
Other collision	0.052	0.014	0.064	0.006	0.084	0.005	0.044	0.008

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2E – Summary Results for Rural Multilane Highway Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency (crashes / year) (7) from Worksheet 2C
Total	0.3
Fatal and Injury (FI)	0.1
Fatal and Injury[a] (FI[a])	0.1
Property Damage Only (PDO)	0.2

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2A – General Information and Input Data for Rural Multilane Highway Intersections

General Information		Location Information	
Analyst	Curtis J. Arnzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD District 2	Intersection	C3 - Eid Intersection
Date Performed	03/10/12	Jurisdiction	Latah Co., ID
		Analysis Year	2017

Input Data				Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)				–	
$AADT_{major}$ (veh/day)	$AADT_{M-D}$ =	78,300	(veh/day)	–	5,920
$AADT_{minor}$ (veh/day)	$AADT_{M-X}$ =	23 000	(veh/day)	–	65
Intersection skew angle (degrees)				0	0
Number of non-STOP-controlled approaches with left-turn lanes (0, 1, 2)				0	0
Number of non-STOP-controlled approaches with right-turn lanes (0, 1, 2, 3, or 4)				0	0
Intersection lighting (present/not present)				Not Present	Not Present
Calibration Factor, C_i				1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Multilane Highway Intersections

(1) Crash Severity Level	(2) CMF for Intersection Skew Angle (CMF_{1i}) from Equations 11-18 or 11-20 and 11-19 or 11-21	(3) CMF for Left-Turn Lanes (CMF_{2i}) from Table 11-22	(4) CMF for Right-Turn Lanes (CMF_{3i}) from Table 11-23	(5) CMF for Lighting (CMF_{4i}) from Equation 11-22	(6) Combined CMF (CMF_{COMB}) (2)*(3)*(4)*(5)
Total	1.00	1.00	1.00	1.00	1.00
Fatal and Injury (FI)	1.00	1.00	1.00	1.00	1.00

Note: The 4-leg Signalized Intersection (4SG) models do not have base conditions and so can only be used for estimation purposes. As a result, there are not CMFs provided for the 4SG condition.

Worksheet 2C – Intersection Crashes for Rural Multilane Highway Intersections

(1) Crash Severity Level	(2) SPF Coefficients from Table 11-7 or 11-8 a	b	c or d (4SG)	(3) $N_{spf\ int}$ from Equation 11-11 or 11-12	(4) Overdispersion Parameter, k from Table 11-7 or 11-8	(5) Combined CMFs from (6) of Worksheet 2B	(6) Calibration Factor, C_i	(7) Predicted average crash frequency, $N_{predicted\ int}$ (3)*(5)*(6)
Total	-12.526	1.204	0.236	0.339	0.460	1.00	1.00	0.339
Fatal and Injury (FI)	-12.664	1.107	0.272	0.148	0.569	1.00	1.00	0.148
Fatal and Injury[a] (FI[a])	-11.989	1.013	0.228	0.107	0.566	1.00	1.00	0.107
Property Damage Only (PDO)	–	–	–	–	–	–	–	$(7)_{TOTAL} - (7)_{FI}$ 0.191

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Multilane Highway Intersections

(1) Collision Type	(2) Proportion of Collision $Type_{(TOTAL)}$ from Table 11-9	(3) $N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(7)_{TOTAL}$ from Worksheet 2C (2)*(3)TOTAL	(4) Proportion of Collision $Type_{(FI)}$ from Table 11-9	(5) $N_{predicted\ int\ (FI)}$ (crashes/year) $(7)_{FI}$ from Worksheet 2C (4)x(5)FI	(6) Proportion of Collision Type (FI^a) from Table 11-9	(7) N *predicted int* (FI^a) (crashes/year) $(7)_{FI}$[a] from Worksheet 2C (6)*(7) FI [a]	(8) Proportion of Collision Type (PDO) from Table 11-9	(9) $N_{predicted\ int\ (PDO)}$ (crashes/year) $(7)_{PDO}$ from Worksheet 2C (8)*(9) PDO
Total	1.000	0.339	1.000	0.148	1.000	0.107	1.000	0.191
Head-on collision	0.029	0.010	0.043	0.006	0.052	0.006	0.020	0.004
Sideswipe collision	0.133	0.045	0.058	0.009	0.057	0.006	0.179	0.034
Rear-end collision	0.289	0.098	0.247	0.036	0.142	0.015	0.315	0.060
Angle collision	0.263	0.089	0.369	0.054	0.381	0.041	0.198	0.038
Single-vehicle collision	0.234	0.079	0.219	0.032	0.284	0.030	0.244	0.047
Other collision	0.052	0.018	0.064	0.009	0.084	0.009	0.044	0.008

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2E – Summary Results for Rural Multilane Highway Intersections

(1) Crash severity level	(2) Predicted average crash frequency (crashes / year) (7) from Worksheet 2C
Total	0.3
Fatal and Injury (FI)	0.1
Fatal and Injury[a] (FI[a])	0.1
Property Damage Only (PDO)	0.2

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Intersection	C3 - Old US-95 North
Date Performed	03/10/12	Jurisdiction	Latah County, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4SG
AADT $_{major}$ (veh/day)	$AADT_{maj}$ = 45,700 (veh/day)	--	45,700
AADT $_{minor}$ (veh/day)	$AADT_{min}$ = 9,300 (veh/day)	--	9,300
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	1
Number of major-road approaches with right-turn lanes (0,1,2)		0	1
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian ($n_{lanes x}$)		--	0
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1) CMF for Left-Turn Lanes	(2) CMF for Left-Turn Signal Phasing	(3) CMF for Right-Turn Lanes	(4) CMF for Right Turn on Red	(5) CMF for Lighting	(6) CMF for Red Light Cameras	(7) Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{comb}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.67	1.00	0.86	1.00	0.91	1.00	0.52

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1) Crash Severity Level	(2) SPF Coefficients from Table 12-10 a	b	c	(3) Overdispersion Parameter, k from Table 12-10	(4) Initial N_{bimv} from Equation 12-21	(5) Proportion of Total Crashes	(6) Adjusted N_{bimv} $(4)_{TOTAL}$*(5)	(7) Combined CMFs (7) from Worksheet 2B	(8) Calibration Factor, C_i	(9) Predicted N_{bimv} (6)*(7)*(8)
Total	-13.36	1.11	0.41	0.80	0.310	1.000	0.310	0.52	1.00	0.163
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.126	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.430	0.133	0.52	1.00	0.070
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.167	$(5)_{TOTAL}-(5)_{FI}$ 0.570	0.177	0.52	1.00	0.093

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1) Collision Type	(2) Proportion of Collision Type$_{(FI)}$ from Table 12-11	(3) Predicted N $_{bimv\ (FI)}$ (crashes/year) (9)$_{FI}$ from Worksheet 2C; (2)*(3)$_{FI}$	(4) Proportion of Collision Type $_{(PDO)}$ from Table 12-11	(5) Predicted N $_{bimv\ (PDO)}$ (crashes/year) (9)$_{PDO}$ from Worksheet 2C; (4)*(5)$_{PDO}$	(6) Predicted N $_{bimv\ (TOTAL)}$ (crashes/year) (9)$_{PDO}$ from Worksheet 2C; (3)+(5)
Total	1.000	0.070	1.000	0.093	0.163
Rear-end collision	0.421	0.029	0.440	0.041	0.070
Head-on collision	0.045	0.003	0.023	0.002	0.005
Angle collision	0.343	0.024	0.262	0.024	0.048
Sideswipe	0.126	0.009	0.040	0.004	0.013
Other multiple-vehicle collision	0.065	0.005	0.235	0.022	0.026

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1) Crash Severity Level	(2) SPF Coefficients from Table 12-12 a	b	c	(3) Overdispersion Parameter, k from Table 12-12	(4) Initial N_{bimv} from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27	(5) Proportion of Total Crashes	(6) Adjusted N_{bimv} $(4)_{TOTAL}$*(5)	(7) Combined CMFs (7) from Worksheet 2B	(8) Calibration Factor, C_i	(9) Predicted N_{bimv} (6)*(7)*(8)
Total	-6.81	0.16	0.51	1.14	0.105	1.000	0.105	0.52	1.00	0.055
Fatal and Injury (FI)	--	--	--	--	0.033	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.343	0.036	0.52	1.00	0.019
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.063	$(5)_{TOTAL}-(5)_{FI}$ 0.657	0.069	0.52	1.00	0.036

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)

Collision Type	Proportion of Collision Type$_{(FI)}$	Predicted N $_{bimv\ (FI)}$ (crashes/year)	Proportion of Collision Type $_{(PDO)}$	Predicted N $_{bimv\ (PDO)}$ (crashes/year)	Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.019	1.000	0.036	0.055
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.001	0.001
Collision with fixed object	0.762	0.014	0.834	0.030	0.045
Collision with other object	0.090	0.002	0.092	0.003	0.005
Other single-vehicle collision	0.039	0.001	0.023	0.001	0.002
Single-vehicle noncollision	0.105	0.002	0.030	0.001	0.003

Worksheet 2G – Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{pedi}	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.163	0.055	0.218	0.021	1.00	0.005
Fatal and injury (FI)	--	--	--	--	1.00	0.005

Worksheet 2H – Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I – Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 12-14					Overdispersion Parameter, k	$N_{pedbase}$ from Equation 12-29	Combined CMF (4) from Worksheet 2H	Calibration factor, C_i	Predicted N_{pedi} (4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{bike}	Calibration factor, C_i	Predicted N_{bike}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.163	0.055	0.218	0.016	1.00	0.003
Fatal and injury (FI)	--	--	--	--	1.00	0.003

Worksheet 2K – Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI) (3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	Property damage only (PDO) (5) from Worksheet 2D and 2F	Total (6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.029	0.041	0.070
Head-on collisions (from Worksheet 2D)	0.003	0.002	0.005
Angle collisions (from Worksheet 2D)	0.024	0.024	0.048
Sideswipe (from Worksheet 2D)	0.009	0.004	0.013
Other multiple-vehicle collision (from Worksheet 2D)	0.005	0.022	0.026
Subtotal	0.070	0.093	0.163
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.014	0.030	0.045
Collision with other object (from Worksheet 2F)	0.002	0.003	0.005
Other single-vehicle collision (from Worksheet 2F)	0.001	0.001	0.002
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.001	0.003
Collision with pedestrian (from Worksheet 2G or 2I)	0.005	0.000	0.005
Collision with bicycle (from Worksheet 2J)	0.003	0.000	0.003
Subtotal	0.027	0.036	0.063
Total	0.097	0.129	0.226

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.2
Fatal and injury (FI)	0.1
Property damage only (PDO)	0.1

Worksheet 2A – General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Curtis J. Arnzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Intersection	C3 - Clyde Road
Date Performed	03/10/12	Jurisdiction	Latah County, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3ST
AADT $_{major}$ (veh/day)	$AADT_{major}$ = 45,700 (veh/day)	--	7,465
AADT $_{minor}$ (veh/day)	$AADT_{minor}$ = 9,300 (veh/day)	--	50
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	0
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF_{1i}	CMF_{2i}	CMF_{3i}	CMF_{4i}	CMF_{5i}	CMF_{6i}	CMF_{COMB}
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	0.91	1.00	0.91

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N_{bimv}	Proportion of Total Crashes	Adjusted N_{bimv}	Combined CMFs	Calibration Factor, C_i	Predicted N_{bimv}
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	0.156	1.000	0.156	0.91	1.00	0.142
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.083	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.548	0.086	0.91	1.00	0.078
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.068	$(5)_{TOTAL}-(5)_{FI}$ = 0.452	0.071	0.91	1.00	0.064

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	Proportion of Collision Type$_{(FI)}$	Predicted N $_{bimv\ (FI)}$ (crashes/year)	Proportion of Collision Type $_{(PDO)}$	Predicted N $_{bimv\ (PDO)}$ (crashes/year)	Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.078	1.000	0.064	0.142
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.033	0.440	0.028	0.061
Head-on collision	0.045	0.004	0.023	0.001	0.005
Angle collision	0.343	0.027	0.262	0.017	0.044
Sideswipe	0.126	0.010	0.040	0.003	0.012
Other multiple-vehicle collision	0.065	0.005	0.235	0.015	0.020

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	SPF Coefficients			Overdispersion Parameter, k	Initial N_{bisv}	Proportion of Total Crashes	Adjusted N_{bisv}	Combined CMFs	Calibration Factor, C_i	Predicted N_{bisv}
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.034	1.000	0.034	0.91	1.00	0.031
Fatal and Injury (FI)	--	--	--	--	0.010	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.359	0.012	0.91	1.00	0.011
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.019	$(5)_{TOTAL}-(5)_{FI}$ = 0.641	0.022	0.91	1.00	0.020

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)

Collision Type	Proportion of Collision Type$_{(FI)}$	Predicted N $_{bfav\ (FI)}$ (crashes/year)	Proportion of Collision Type $_{(PDO)}$	Predicted N $_{bfav\ (PDO)}$ (crashes/year)	Predicted N $_{bfav\ (TOTAL)}$ (crashes/year)
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.011	1.000	0.020	0.031
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.000	0.000
Collision with fixed object	0.762	0.008	0.834	0.016	0.025
Collision with other object	0.090	0.001	0.092	0.002	0.003
Other single-vehicle collision	0.039	0.000	0.023	0.000	0.001
Single-vehicle noncollision	0.105	0.001	0.030	0.001	0.002

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{pedi}	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.142	0.031	0.173	0.021	1.00	0.004
Fatal and injury (FI)	--	--	--	--	1.00	0.004

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 12-14					Overdispersion Parameter, k	$N_{pedbase}$ from Equation 12-29	Combined CMF (4) from Worksheet 2H	Calibration factor, C_i	Predicted N_{pedi} (4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{bikei}	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.142	0.031	0.173	0.016	1.00	0.003
Fatal and injury (FI)	--	--	--	--	1.00	0.003

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	Fatal and Injury (FI) (3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	Property damage only (PDO) (5) from Worksheet 2D and 2F	Total (6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.033	0.028	0.061
Head-on collisions (from Worksheet 2D)	0.004	0.001	0.005
Angle collisions (from Worksheet 2D)	0.027	0.017	0.044
Sideswipe (from Worksheet 2D)	0.010	0.003	0.012
Other multiple-vehicle collision (from Worksheet 2D)	0.005	0.015	0.020
Subtotal	0.078	0.064	0.142
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.008	0.016	0.025
Collision with other object (from Worksheet 2F)	0.001	0.002	0.003
Other single-vehicle collision (from Worksheet 2F)	0.000	0.000	0.001
Single-vehicle noncollision (from Worksheet 2F)	0.001	0.001	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.004	0.000	0.004
Collision with bicycle (from Worksheet 2J)	0.003	0.000	0.003
Subtotal	0.017	0.020	0.037
Total	0.095	0.084	0.179

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.2
Fatal and injury (FI)	0.1
Property damage only (PDO)	0.1

Worksheet 2A – General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Intersection	C3 -Cameron Road
Date Performed	03/10/12	Jurisdiction	Latah County, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	4ST
AADT $_{major}$ (veh/day)	$AADT_{M-X}$ = 45,700 (veh/day)	--	7,455
AADT $_{minor}$ (veh/day)	$AADT_{M-X}$ = 9,300 (veh/day)	--	100
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	0
Type of left-turn signal phasing for Leg #1		Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2		--	Not Applicable
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) – Signalized intersections only			10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	0
Number of bus stops within 300 m (1,000 ft) of the intersection		0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	0

Worksheet 2B – Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	1.00	1.00	1.00	0.91	1.00	0.91

Worksheet 2C – Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	0.207	1.000	0.207	0.91	1.00	0.189
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.102	$\frac{(4)_{FI}/((4)_{FI}+(4)_{PDO})}{0.512}$	0.106	0.91	1.00	0.097
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.097	$\frac{(5)_{TOTAL}-(5)_{FI}}{0.488}$	0.101	0.91	1.00	0.092

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.097	1.000	0.092	0.189
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.041	0.440	0.041	0.081
Head-on collision	0.045	0.004	0.023	0.002	0.006
Angle collision	0.343	0.033	0.262	0.024	0.057
Sideswipe	0.126	0.012	0.040	0.004	0.016
Other multiple-vehicle collision	0.065	0.006	0.235	0.022	0.028

Worksheet 2E – Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{biev}**	**Proportion of Total Crashes**	**Adjusted N_{biev}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{biev}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.048	1.000	0.048	0.91	1.00	0.044
Fatal and Injury (FI)	–	–	–	–	0.015	$\frac{(4)_{FI}/((4)_{FI}+(4)_{PDO})}{0.353}$	0.017	0.91	1.00	0.015
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.027	$\frac{(5)_{TOTAL}-(5)_{FI}}{0.647}$	0.031	0.91	1.00	0.028

Worksheet 2F – Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)

Collision Type	Proportion of Collision Type$_{(FI)}$	Predicted N $_{bfav\ (FI)}$ (crashes/year)	Proportion of Collision Type $_{(PDO)}$	Predicted N $_{bfav\ (PDO)}$ (crashes/year)	Predicted N $_{bfav\ (TOTAL)}$ (crashes/year)
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.015	1.000	0.028	0.044
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.001	0.001
Collision with fixed object	0.762	0.012	0.834	0.024	0.035
Collision with other object	0.090	0.001	0.092	0.003	0.004
Other single-vehicle collision	0.039	0.001	0.023	0.001	0.001
Single-vehicle noncollision	0.105	0.002	0.030	0.001	0.002

Worksheet 2G – Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{pedi}	Calibration factor, C_i	Predicted N_{pedi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.189	0.044	0.232	0.021	1.00	0.005
Fatal and injury (FI)	--	--	--	--	1.00	0.005

Worksheet 2H – Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 12-14					Overdispersion Parameter, k	$N_{pedbase}$ from Equation 12-29	Combined CMF (4) from Worksheet 2H	Calibration factor, C_i	Predicted N_{pedi} (4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J – Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{bikei}	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.189	0.044	0.232	0.016	1.00	0.004
Fatal and injury (FI)	--	--	--	--	1.00	0.004

Worksheet 2K – Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	Fatal and Injury (FI) (3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	Property damage only (PDO) (5) from Worksheet 2D and 2F	Total (6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.041	0.041	0.081
Head-on collisions (from Worksheet 2D)	0.004	0.002	0.006
Angle collisions (from Worksheet 2D)	0.033	0.024	0.057
Sideswipe (from Worksheet 2D)	0.012	0.004	0.016
Other multiple-vehicle collision (from Worksheet 2D)	0.006	0.022	0.028
Subtotal	0.097	0.092	0.189
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.012	0.024	0.035
Collision with other object (from Worksheet 2F)	0.001	0.003	0.004
Other single-vehicle collision (from Worksheet 2F)	0.001	0.001	0.001
Single-vehicle noncollision (from Worksheet 2F)	0.002	0.001	0.002
Collision with pedestrian (from Worksheet 2G or 2I)	0.005	0.000	0.005
Collision with bicycle (from Worksheet 2J)	0.004	0.000	0.004
Subtotal	0.024	0.028	0.052
Total	0.121	0.120	0.241

Worksheet 2L – Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.2
Fatal and injury (FI)	0.1
Property damage only (PDO)	0.1

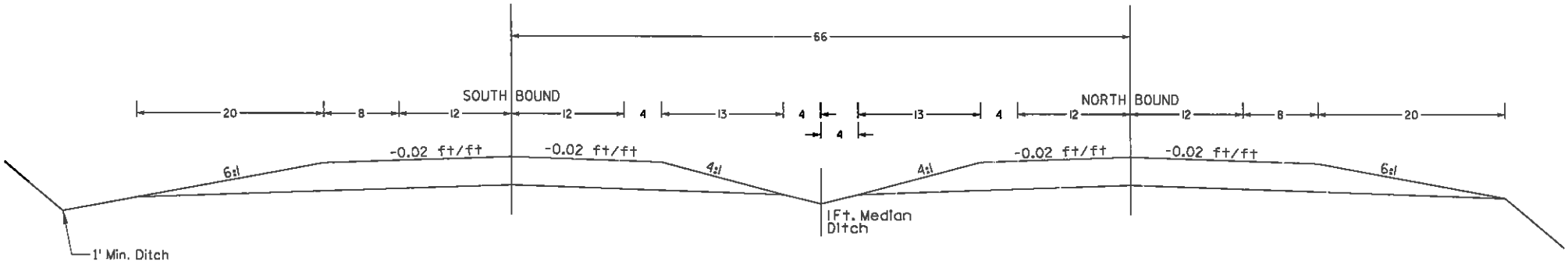
Appendix C.3

Typical Sections, AASHTO HSM Calculations, and Results For Alignment W4

W-4 TYPICAL SECTIONS

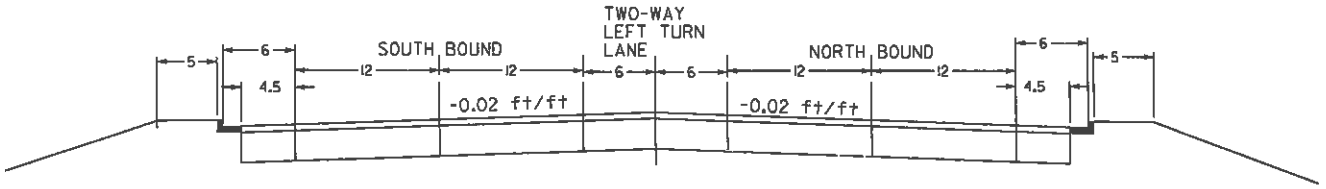
RURAL SECTION

Milepost 337.668 to Milepost 344.058



URBAN SECTION

Milepost 344.058 to Milepost 344.358



Worksheet 1A -- General Information and Input Data for Rural Multilane Roadway Segments

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD D2	Roadway Section	W4 Rural - Divided
Date Performed	03/21/12	Jurisdiction	Latah Co, ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (divided / undivided)		Undivided	Divided
Length of segment, L (mi)		--	6.4
AADT (veh/day)	$AADT_{MAX}$ = 89,300 (veh/day)	--	5,920
Lane width (ft)		12	12
Shoulder width (ft) - right shoulder width for divided [if differ for directions of travel, use average width]		8	8
Shoulder type - right shoulder type for divided		Paved	Paved
Median width (ft) - for divided only		30	30
Side Slopes - for undivided only		1:7 or flatter	Not Applicable
Lighting (present/not present)		Not Present	Not Present
Auto speed enforcement (present/not present)		Not Present	Not Present
Calibration Factor, Cr		1.00	1.00

Worksheet 1B (a) -- Crash Modification Factors for Rural Multilane Divided Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for Lane Width	CMF for Right Shoulder Width	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1rd	*CMF 2rd*	*CMF 3rd*	*CMF 4rd*	*CMF 5rd*	*CMF comb*
from Equation 11-16	from Table 11-17	from Table 11-18	from Equation 11-17	from Section 11.7.2	(1)*(2)*(3)*(4)*(5)
1.00	1.00	0.99	1.00	1.00	0.99

Worksheet 1C (a) -- Roadway Segment Crashes for Rural Multilane Divided Roadway Segments

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients** from Table 11-5			**N spf rd**	**Overdispersion Parameter, k**	**Combined CMFs** (6) from Worksheet 1B (a)	**Calibration Factor, Cr**	**Predicted average crash frequency, $N_{predicted\ rs(d)}$**
	a	b	c	from Equation 11-9	from Equation 11-10			(3)*(5)*(6)
Total	-9.025	1.049	1.549	6.980	0.033	0.99	1.00	6.910
Fatal and Injury (FI)	-8.837	0.958	1.687	3.821	0.029	0.99	1.00	3.783
Fatal and Injury[a] (FI[a])	-8.505	0.874	1.740	2.568	0.027	0.99	1.00	2.542
Property Damage Only (PDO)	--	--	--	--	--	--	--	$(7)_{TOTAL} - (7)_{FI}$ 3.127

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1D (a) -- Crashes by Severity Level and Collision Type for Rural Multilane Divided Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	**Proportion of Collision $Type_{(TOTAL)}$**	**$N_{predicted\ rs(d)\ (TOTAL)}$ (crashes/year)**	**Proportion of Collision Type(FI)**	**$N_{predicted\ rs(d)\ (FI)}$ (crashes/year)**	**Proportion of Collision Type (FI^a)**	**N *predicted rs* (FI^a) (crashes/year)**	**Proportion of Collision Type (PDO)**	**$N_{predicted\ rs(d)\ (PDO)}$ (crashes/year)**
	from Table 11-6	$(7)_{TOTAL}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{FI}$ from Worksheet 1C (a)	from Table 11-6	$(7)_{FI}{}^a$ from Worksheet 1C (a)	from Table 11-6	$(7)_{PDO}$ from Worksheet 1C (a)
Total	1.000	6.910	1.000	3.783	1.000	2.542	1.000	3.127
		$(2)*(3)_{TOTAL}$		$(4)x(5)_{FI}$		$(6)*(7)_{FI}{}^a$		$(8)*(9)_{PDO}$
Head-on collision	0.006	0.041	0.013	0.049	0.018	0.046	0.002	0.006
Sideswipe collision	0.043	0.297	0.027	0.102	0.022	0.056	0.053	0.166
Rear-end collision	0.116	0.802	0.163	0.617	0.114	0.290	0.088	0.275
Angle collision	0.043	0.297	0.048	0.182	0.045	0.114	0.041	0.128
Single-vehicle collision	0.768	5.307	0.727	2.750	0.778	1.978	0.792	2.477
Other collision	0.024	0.166	0.022	0.083	0.023	0.058	0.024	0.075

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1E -- Summary Results for Rural Multilane Roadway Segments

(1)	(2)	(3)	(4)
Crash severity level	**Predicted average crash frequency (crashes/year)** (7) from Worksheet 1C (a) or (b)	**Roadway segment length (mi)**	**Crash rate (crashes/mi/year)** (2)/(3)
Total	6.9	6.4	1.1
Fatal and Injury (FI)	3.8	6.4	0.6
Fatal and Injury[a] (FI^a)	2.5	6.4	0.4
Property Damage Only (PDO)	3.1	6.4	0.5

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 1A – General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Roadway Section	W4, Suburban
Date Performed	03/21/12	Jurisdiction	Latah County, Idaho
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	5T
Length of segment, L (mi)		--	0.3
AADT (veh/day)	$AADT_{M-Y}$ = 58,800 (veh/day)	--	7,465
Type of on-street parking (none/parallel/angle)		None	None
Proportion of curb length with on-street parking		--	0
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	2
Minor commercial driveways (number)		--	3
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	2
Other driveways (number)		--	0
Speed Category		--	Posted Speed Greater than 30 mph
Roadside fixed object density (fixed objects / mi)		0	0
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	30
Calibration Factor, Cr		1.00	1.00

Worksheet 1B – Crash Modification Factors for Urban and Suburban Roadway Segments

(1) CMF for On-Street Parking	(2) CMF for Roadside Fixed Objects	(3) CMF for Median Width	(4) CMF for Lighting	(5) CMF for Automated Speed Enforcement	(6) Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.00	1.00	1.00	0.94	1.00	0.94

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1) Crash Severity Level	(2) SPF Coefficients from Table 12-3 a	(2) SPF Coefficients from Table 12-3 b	(3) Overdispersion Parameter, k from Table 12-3	(4) Initial N_{bmnv} from Equation 12-10	(5) Proportion of Total Crashes	(6) Adjusted N_{bmnv} $(4)_{TOTAL}*(5)$	(7) Combined CMFs (6) from Worksheet 1B	(8) Calibration Factor, Cr	(9) Predicted N_{bmnv} (6)*(7)*(8)
Total	-9.70	1.17	0.81	0.625	1.000	0.625	0.94	1.00	0.588
Fatal and Injury (FI)	-10.47	1.12	0.62	0.185	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.280	0.175	0.94	1.00	0.164
Property Damage Only (PDO)	-9.97	1.17	0.88	0.477	$(5)_{TOTAL}-(5)_{FI}$ 0.720	0.450	0.94	1.00	0.423

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type$_{(FI)}$	(3) Predicted N $_{bmnv\ (FI)}$ (crashes/year)	(4) Proportion of Collision Type $_{(PDO)}$	(5) Predicted N $_{bmnv\ (PDO)}$ (crashes/year)	(6) Predicted N $_{bmnv\ (TOTAL)}$ (crashes/year)
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.164	1.000	0.423	0.588
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.846	0.139	0.651	0.276	0.415
Head-on collision	0.021	0.003	0.004	0.002	0.005
Angle collision	0.050	0.008	0.059	0.025	0.033
Sideswipe, same direction	0.061	0.010	0.248	0.105	0.115
Sideswipe, opposite direction	0.004	0.001	0.009	0.004	0.004
Other multiple-vehicle collision	0.018	0.003	0.029	0.012	0.015

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1) Crash Severity Level	(2) SPF Coefficients from Table 12-5 a	(2) SPF Coefficients from Table 12-5 b	(3) Overdispersion Parameter, k from Table 12-5	(4) Initial N_{brsv} from Equation 12-13	(5) Proportion of Total Crashes	(6) Adjusted N_{brsv} $(4)_{TOTAL}*(5)$	(7) Combined CMFs (6) from Worksheet 1B	(8) Calibration Factor, Cr	(9) Predicted N_{brsv} (6)*(7)*(8)
Total	-4.82	0.54	0.52	0.299	1.000	0.299	0.94	1.00	0.281
Fatal and Injury (FI)	-4.43	0.35	0.36	0.081	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ 0.285	0.085	0.94	1.00	0.080
Property Damage Only (PDO)	-5.83	0.61	0.55	0.203	$(5)_{TOTAL}-(5)_{FI}$ 0.715	0.214	0.94	1.00	0.201

Worksheet 1F – Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1) Collision Type	(2) Proportion of Collision Type$_{(FI)}$	(3) Predicted N $_{brsv\ (FI)}$ (crashes/year)	(4) Proportion of Collision Type $_{(PDO)}$	(5) Predicted N $_{brsv\ (PDO)}$ (crashes/year)	(6) Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.080	1.000	0.201	0.281

		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.016	0.001	0.049	0.010	0.011
Collision with fixed object	0.398	0.032	0.768	0.154	0.186
Collision with other object	0.005	0.000	0.061	0.012	0.013
Other single-vehicle collision	0.581	0.047	0.122	0.024	0.071

Worksheet 1G – Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	2	0.165	1.172	0.146	
Minor commercial	3	0.053	1.172	0.070	
Major industrial/institutional	0	0.181	1.172	0.000	
Minor industrial/institutional	0	0.024	1.172	0.000	
Major residential	0	0.087	1.172	0.000	
Minor residential	2	0.016	1.172	0.014	
Other	0	0.027	1.172	0.000	
Total	--	--	--	0.230	0.10

Worksheet 1H – Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL} * (3)$	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.230	1.000	0.230	0.94	1.00	0.216
Fatal and injury (FI)	--	0.269	0.062	0.94	1.00	0.058
Property damage only (PDO)	--	0.731	0.168	0.94	1.00	0.158

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{bmnv}**	**Predicted N_{brav}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{padr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.588	0.281	0.216	1.085	0.023	1.00	0.025
Fatal and injury (FI)	--	--	--	--	--	1.00	0.025

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{bmnv}**	**Predicted N_{brav}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{bikr}**	**Calibration factor, C_r**	**Predicted N_{bikr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.588	0.281	0.216	1.085	0.012	1.00	0.013
Fatal and injury (FI)	--	--	--	--	--	1.00	0.013

Worksheet 1K – Crash Severity Distribution for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)**	**Property damage only (PDO)**	**Total**
	(3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	(5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	(6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.139	0.276	0.415
Head-on collisions (from Worksheet 1D)	0.003	0.002	0.005
Angle collisions (from Worksheet 1D)	0.008	0.025	0.033
Sideswipe, same direction (from Worksheet 1D)	0.010	0.105	0.115
Sideswipe, opposite direction (from Worksheet 1D)	0.001	0.004	0.004
Driveway-related collisions (from Worksheet 1H)	0.058	0.158	0.216
Other multiple-vehicle collision (from Worksheet 1D)	0.003	0.012	0.015
Subtotal	0.223	0.581	0.804
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.001	0.010	0.011
Collision with fixed object (from Worksheet 1F)	0.032	0.154	0.186
Collision with other object (from Worksheet 1F)	0.000	0.012	0.013
Other single-vehicle collision (from Worksheet 1F)	0.047	0.024	0.071
Collision with pedestrian (from Worksheet 1I)	0.025	0.000	0.025
Collision with bicycle (from Worksheet 1J)	0.013	0.000	0.013
Subtotal	0.118	0.201	0.319
Total	0.341	0.782	1.123

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	1.1	0.30	3.7
Fatal and injury (FI)	0.3	0.30	1.1
Property damage only (PDO)	0.8	0.30	2.6

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	Idaho Transportation Dept. D2	Intersection	W4 - Old US-95 North
Date Performed	03/10/12	Jurisdiction	Latah County, ID
		Analysis Year	2017

Input Data				Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)				--	4SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ =	45,700	(veh/day)	--	5,200
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ =	9,300	(veh/day)	--	1,400
Intersection lighting (present/not present)				Not Present	Present
Calibration factor, C_i				1.00	1.00
Data for unsignalized intersections only:				--	--
Number of major-road approaches with left-turn lanes (0,1,2)				0	1
Number of major-road approaches with right-turn lanes (0,1,2)				0	1
Data for signalized intersections only:				--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]				0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]				0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]				--	0
Type of left-turn signal phasing for Leg #1				Permissive	Not Applicable
Type of left-turn signal phasing for Leg #2				--	Not Applicable
Type of left-turn signal phasing for Leg #3				--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)				--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]				0	0
Intersection red light cameras (present/not present)				Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only					10
Maximum number of lanes crossed by a pedestrian (n_{lanesx})				--	0
Number of bus stops within 300 m (1,000 ft) of the intersection				0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				0	1

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{comb}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.67	1.00	0.86	1.00	0.91	1.00	0.52

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-13.36	1.11	0.41	0.80	0.480	1.000	0.480	0.52	1.00	0.252
Fatal and Injury (FI)	-14.01	1.16	0.30	0.69	0.174	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.376	0.181	0.52	1.00	0.095
Property Damage Only (PDO)	-15.38	1.20	0.51	0.77	0.288	$(5)_{TOTAL}-(5)_{FI}$ = 0.624	0.299	0.52	1.00	0.157

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.095	1.000	0.157	0.252
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.421	0.040	0.440	0.069	0.109
Head-on collision	0.045	0.004	0.023	0.004	0.008
Angle collision	0.343	0.032	0.262	0.041	0.074
Sideswipe	0.126	0.012	0.040	0.006	0.018
Other multiple-vehicle collision	0.065	0.006	0.235	0.037	0.043

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-6.81	0.16	0.51	1.14	0.181	1.000	0.181	0.52	1.00	0.095
Fatal and Injury (FI)	--	--	--	--	0.056	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.333	0.060	0.52	1.00	0.032
Property Damage Only (PDO)	-8.36	0.25	0.55	1.29	0.112	$(5)_{TOTAL}-(5)_{FI}$ = 0.667	0.121	0.52	1.00	0.063

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)

Collision Type	Proportion of Collision Type$_{(FI)}$	Predicted N $_{bfav\ (FI)}$ (crashes/year)	Proportion of Collision Type $_{(PDO)}$	Predicted N $_{bfav\ (PDO)}$ (crashes/year)	Predicted N $_{bfav\ (TOTAL)}$ (crashes/year)
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.032	1.000	0.063	0.095
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.003	0.000	0.000
Collision with animal	0.003	0.000	0.018	0.001	0.001
Collision with fixed object	0.762	0.024	0.834	0.053	0.077
Collision with other object	0.090	0.003	0.092	0.006	0.009
Other single-vehicle collision	0.039	0.001	0.023	0.001	0.003
Single-vehicle noncollision	0.105	0.003	0.030	0.002	0.005

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{pedi}	Calibration factor, C_i	Predicted N_{padi}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	0.252	0.095	0.347	0.021	1.00	0.007
Fatal and injury (FI)	--	--	--	--	1.00	0.007

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 12-14					Overdispersion Parameter, k	$N_{padbase}$ from Equation 12-29	Combined CMF (4) from Worksheet 2H	Calibration factor, C_i	Predicted N_{padi} (4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	1.00	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	--

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	Predicted N_{bimv}	Predicted N_{biav}	Predicted N_{bi}	f_{bikei}	Calibration factor, C_i	Predicted N_{bikei}
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.252	0.095	0.347	0.016	1.00	0.006
Fatal and Injury (FI)	--	--	--	--	1.00	0.006

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
Collision type	Fatal and injury (FI) (3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	Property damage only (PDO) (5) from Worksheet 2D and 2F	Total (6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.040	0.069	0.109
Head-on collisions (from Worksheet 2D)	0.004	0.004	0.008
Angle collisions (from Worksheet 2D)	0.032	0.041	0.074
Sideswipe (from Worksheet 2D)	0.012	0.006	0.018
Other multiple-vehicle collision (from Worksheet 2D)	0.006	0.037	0.043
Subtotal	0.095	0.157	0.252
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.001	0.001
Collision with fixed object (from Worksheet 2F)	0.024	0.053	0.077
Collision with other object (from Worksheet 2F)	0.003	0.006	0.009
Other single-vehicle collision (from Worksheet 2F)	0.001	0.001	0.003
Single-vehicle noncollision (from Worksheet 2F)	0.003	0.002	0.005
Collision with pedestrian (from Worksheet 2G or 2I)	0.007	0.000	0.007
Collision with bicycle (from Worksheet 2J)	0.006	0.000	0.006
Subtotal	0.044	0.063	0.108
Total	0.139	0.220	0.359

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)
	(Total) from Worksheet 2K
Total	0.4
Fatal and injury (FI)	0.1
Property damage only (PDO)	0.2

Worksheet 2A – General Information and Input Data for Rural Multilane Highway Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD District 2	Intersection	W4, Old US-95 South
Date Performed	03/10/12	Jurisdiction	Latah Co., ID
		Analysis Year	2017

Input Data				Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)				--	3SG
$AADT_{major}$ (veh/day)	$AADT_{maj-X}$ =	78,300	(veh/day)	--	5,920
$AADT_{minor}$ (veh/day)	$AADT_{min-X}$ =	23,010	(veh/day)	--	500
Intersection skew angle (degrees)				0	0
Number of non-STOP-controlled approaches with left-turn lanes (0, 1, 2)				0	1
Number of non-STOP-controlled approaches with right-turn lanes (0, 1, 2, 3, or 4)				0	1
Intersection lighting (present/not present)				Not Present	Present
Calibration Factor, C_i				1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Crash Severity Level	CMF for Intersection Skew Angle (CMF_{1i}) from Equations 11-18 or 11-20 and 11-19 or 11-21	CMF for Left-Turn Lanes (CMF_{2i}) from Table 11-22	CMF for Right-Turn Lanes (CMF_{3i}) from Table 11-23	CMF for Lighting (CMF_{4i}) from Equation 11-22	Combined CMF (CMF_{COMB}) (2)*(3)*(4)*(5)
Total	1.00	0.56	0.86	1.00	0.48
Fatal and Injury (FI)	1.00	0.45	0.77	1.00	0.35

Note: The 4-leg Signalized Intersection (4SG) models do not have base conditions and so can only be used for estimation purposes. As a result, there are not CMFs provided for the 4SG condition.

Worksheet 2C – Intersection Crashes for Rural Multilane Highway Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs from (6) of Worksheet 2B	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$ (3)*(5)*(6)
	a	b	c or d (4SG)	from Equation 11-11 or 11-12	from Table 11-7 or 11-8			
Total	-12.526	1.204	0.236	0.548	0.460	0.48	1.00	0.264
Fatal and Injury (FI)	-12.664	1.107	0.272	0.257	0.569	0.35	1.00	0.089
Fatal and Injury[a] (FI[a])	-11.989	1.013	0.228	0.170	0.566	0.35	1.00	0.059
Property Damage Only (PDO)	--	--	--	--	--	--	--	$(7)_{TOTAL}$ - $(7)_{FI}$ 0.175

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	Proportion of Collision $Type_{TOTAL}$ from Table 11-9	$N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(7)_{TOTAL}$ from Worksheet 2C (2)*$(3)_{TOTAL}$	Proportion of Collision $Type_{FI}$ from Table 11-9	$N_{predicted\ int\ (FI)}$ (crashes/year) (7)FI from Worksheet 2C (4)x$(5)_{FI}$	Proportion of Collision Type (FI^a) from Table 11-9	$N_{predicted\ int}$ (FI^a) (crashes/year) $(7)_{FI}{}^a$ from Worksheet 2C (6)*$(7)_{FI}{}^a$	Proportion of Collision Type (PDO) from Table 11-9	$N_{predicted\ int\ (PDO)}$ (crashes/year) $(7)_{PDO}$ from Worksheet 2C (8)*$(9)_{PDO}$
Total	1.000	0.264	1.000	0.089	1.000	0.059	1.000	0.175
Head-on collision	0.029	0.008	0.043	0.004	0.052	0.003	0.020	0.003
Sideswipe collision	0.133	0.035	0.058	0.005	0.057	0.003	0.179	0.031
Rear-end collision	0.289	0.076	0.247	0.022	0.142	0.008	0.315	0.055
Angle collision	0.263	0.069	0.369	0.033	0.381	0.022	0.198	0.035
Single-vehicle collision	0.234	0.062	0.219	0.020	0.284	0.017	0.244	0.043
Other collision	0.052	0.014	0.064	0.006	0.084	0.005	0.044	0.008

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2E – Summary Results for Rural Multilane Highway Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency (crashes / year) (7) from Worksheet 2C
Total	0.3
Fatal and Injury (FI)	0.1
Fatal and Injury[a] (FI^a)	0.1
Property Damage Only (PDO)	0.2

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2A – General Information and Input Data for Rural Multilane Highway Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95, Thorncreek to Moscow
Agency or Company	ITD District 2	Intersection	W4 - Eid Intersection
Date Performed	03/10/12	Jurisdiction	Latah Co., ID
		Analysis Year	2017

Input Data				Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)				–	[illegible]
$AADT_{major}$ (veh/day)	$AADT_{HWY}$ =	79,300	(veh/day)	–	3,928
$AADT_{minor}$ (veh/day)	$AADT_{HWY}$ =	23,000	(veh/day)	–	65
Intersection skew angle (degrees)				0	0
Number of non-STOP-controlled approaches with left-turn lanes (0, 1, 2)				0	0
Number of non-STOP-controlled approaches with right-turn lanes (0, 1, 2, 3, or 4)				0	0
Intersection lighting (present/not present)				Not Present	[illegible]
Calibration Factor, C_i				1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Crash Severity Level	CMF for Intersection Skew Angle (CMF_{1i}) from Equations 11-18 or 11-20 and 11-19 or 11-21	CMF for Left-Turn Lanes (CMF_{2i}) from Table 11-22	CMF for Right-Turn Lanes (CMF_{3i}) from Table 11-23	CMF for Lighting (CMF_{4i}) from Equation 11-22	Combined CMF (CMF_{COMB}) (2)*(3)*(4)*(5)
Total	1.00	1.00	1.00	1.00	1.00
Fatal and Injury (FI)	1.00	1.00	1.00	1.00	1.00

Note: The 4-leg Signalized Intersection (4SG) models do not have base conditions and so can only be used for estimation purposes. As a result, there are not CMFs provided for the 4SG condition.

Worksheet 2C – Intersection Crashes for Rural Multilane Highway Intersections

(1)	(2) SPF Coefficients from Table 11-7 or 11-8			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	a	b	c or d (4SG)	$N_{spf\ int}$ from Equation 11-11 or 11-12	Overdispersion Parameter, k from Table 11-7 or 11-8	Combined CMFs from (6) of Worksheet 2B	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$ (3)*(5)*(6)
Total	-12.526	1.204	0.236	0.339	0.460	1.00	1.00	0.339
Fatal and Injury (FI)	-12.864	1.107	0.272	0.148	0.569	1.00	1.00	0.148
Fatal and Injury[a] (FI[a])	-11.989	1.013	0.226	0.107	0.566	1.00	1.00	0.107
Property Damage Only (PDO)	–	–	–	–	–	–	–	$(7)_{TOTAL} - (7)_{FI}$ 0.191

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	Proportion of Collision $Type_{TOTAL}$ from Table 11-9	$N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(7)_{TOTAL}$ from Worksheet 2C	Proportion of Collision $Type_{FI}$ from Table 11-9	$N_{predicted\ int\ (FI)}$ (crashes/year) $(7)_{FI}$ from Worksheet 2C	Proportion of Collision Type (FI[a]) from Table 11-9	N *predicted int* (FI[a]) (crashes/year) $(7)_{FI}$[a] from Worksheet 2C	Proportion of Collision Type (PDO) from Table 11-9	$N_{predicted\ int\ (PDO)}$ (crashes/year) $(7)_{PDO}$ from Worksheet 2C
Total	1.000	0.339 $(2)*(3)_{TOTAL}$	1.000	0.148 $(4)x(5)_{FI}$	1.000	0.107 $(6)*(7)_{FI}$[a]	1.000	0.191 $(8)*(9)_{PDO}$
Head-on collision	0.029	0.010	0.043	0.006	0.052	0.006	0.020	0.004
Sideswipe collision	0.133	0.045	0.058	0.009	0.057	0.006	0.179	0.034
Rear-end collision	0.289	0.098	0.247	0.036	0.142	0.015	0.315	0.060
Angle collision	0.263	0.089	0.369	0.054	0.381	0.041	0.198	0.038
Single-vehicle collision	0.234	0.079	0.219	0.032	0.284	0.030	0.244	0.047
Other collision	0.052	0.018	0.064	0.009	0.084	0.009	0.044	0.008

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2E – Summary Results for Rural Multilane Highway Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency (crashes / year) (7) from Worksheet 2C
Total	0.3
Fatal and Injury (FI)	0.1
Fatal and Injury[a] (FI[a])	0.1
Property Damage Only (PDO)	0.2

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2A – General Information and Input Data for Rural Multilane Highway Intersections

General Information		Location Information	
Analyst	Curtis J. Amzen	Roadway	US-95 Thorncreek to Moscow
Agency or Company	ITD District 2	Intersection	US-95 Jackson
Date Performed	03/10/12	Jurisdiction	Latah Co., ID
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 4ST, 4SG)		--	3ST
$AADT_{major}$ (veh/day)	$AADT_{maj} =$ 78,300 (veh/day)	--	3,320
$AADT_{minor}$ (veh/day)	$AADT_{min} =$ 25,000 (veh/day)	--	50
Intersection skew angle (degrees)		0	0
Number of non-STOP-controlled approaches with left-turn lanes (0, 1, 2)		0	1
Number of non-STOP-controlled approaches with right-turn lanes (0, 1, 2, 3, or 4)		0	0
Intersection lighting (present/not present)		Not Present	Not Present
Calibration Factor, C_i		1.00	1.00

Worksheet 2B – Crash Modification Factors for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Crash Severity Level	CMF for Intersection Skew Angle (CMF_{4i}) from Equations 11-18 or 11-20 and 11-19 or 11-21	CMF for Left-Turn Lanes (CMF_{2i}) from Table 11-22	CMF for Right-Turn Lanes (CMF_{3i}) from Table 11-23	CMF for Lighting (CMF_{4i}) from Equation 11-22	Combined CMF (CMF_{COMB}) (2)*(3)*(4)*(5)
Total	1.00	1.00	1.00	1.00	1.00
Fatal and Injury (FI)	1.00	1.00	1.00	1.00	1.00

Note: The 4-leg Signalized Intersection (4SG) models do not have base conditions and so can only be used for estimation purposes. As a result, there are not CMFs provided for the 4SG condition.

Worksheet 2C – Intersection Crashes for Rural Multilane Highway Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)
Crash Severity Level	SPF Coefficients from Table 11-7 or 11-8			$N_{spf\ int}$	Overdispersion Parameter, k	Combined CMFs from (6) of Worksheet 2B	Calibration Factor, C_i	Predicted average crash frequency, $N_{predicted\ int}$ (3)*(5)*(6)
	a	b	c or d (4SG)	from Equation 11-11 or 11-12	from Table 11-7 or 11-8			
Total	-12.526	1.204	0.236	0.318	0.460	1.00	1.00	0.318
Fatal and Injury (FI)	-12.664	1.107	0.272	0.137	0.569	1.00	1.00	0.137
Fatal and Injury[a] (FI[a])	-11.989	1.013	0.228	0.100	0.566	1.00	1.00	0.100
Property Damage Only (PDO)	--	--	--	--	--	--	--	$(7)_{TOTAL}$ - $(7)_{FI}$ 0.181

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2D – Crashes by Severity Level and Collision Type for Rural Multilane Highway Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Collision Type	Proportion of Collision Type$_{(TOTAL)}$ from Table 11-9	$N_{predicted\ int\ (TOTAL)}$ (crashes/year) $(7)_{TOTAL}$ from Worksheet 2C $(2)*(3)_{TOTAL}$	Proportion of Collision Type$_{FI}$ from Table 11-9	$N_{predicted\ int\ (FI)}$ (crashes/year) $(7)_{FI}$ from Worksheet 2C $(4)x(5)_{FI}$	Proportion of Collision Type (FI^a) from Table 11-9	N *predicted int* (FI^a) (crashes/year) $(7)_{FI}{}^a$ from Worksheet 2C $(6)*(7)_{FI}{}^a$	Proportion of Collision Type (PDO) from Table 11-9	$N_{predicted\ int\ (PDO)}$ (crashes/year) $(7)_{PDO}$ from Worksheet 2C $(8)*(9)_{PDO}$
Total	1.000	0.318	1.000	0.137	1.000	0.100	1.000	0.181
Head-on collision	0.029	0.009	0.043	0.006	0.052	0.005	0.020	0.004
Sideswipe collision	0.133	0.042	0.058	0.008	0.057	0.006	0.179	0.032
Rear-end collision	0.289	0.092	0.247	0.034	0.142	0.014	0.315	0.057
Angle collision	0.263	0.084	0.369	0.051	0.381	0.038	0.198	0.036
Single-vehicle collision	0.234	0.074	0.219	0.030	0.284	0.029	0.244	0.044
Other collision	0.052	0.017	0.064	0.009	0.084	0.008	0.044	0.008

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Worksheet 2E – Summary Results for Rural Multilane Highway Intersections

(1)	(2)
Crash severity level	Predicted average crash frequency (crashes / year) (7) from Worksheet 2C
Total	0.3
Fatal and Injury (FI)	0.1
Fatal and Injury[a] (FI[a])	0.1
Property Damage Only (PDO)	0.2

NOTE: [a] Using the KABCO scale, these include only KAB crashes. Crashes with severity level C (possible injury) are not included.

Appendix C.4

Traffic Counts For Project Area

Assumed ADT's of Project Area and County Roads

ADT Volume Projection Report

Route	US095			Traffic Data	2010
Segment From	1539	Milepost From	337.180	Start Projection	2017
Segment To	1540	Milepost To	342.930	End Projection	2037

	Segment		Milepost										
Year	From	To	From	To	AADT	CAADT	DHV	DHV %	CDHV	CDHV %	DIR	From Description	To Description
2010	001539	001539	337.180	337.668	4,900	650	567	11.5	53	8.106	60/40%	THORN CREEK RD	END NEW ALIGNMENT
	001540	001540	337.668	339.620	4,900	680	567	11.5	55	8.106	60/40%	END NEW ALIGNMENT	EID RD
			339.620	342.930	5,300	680	611	11.5	55	8.071	60/40%	EID RD	
	2010		**Weighted**		**5,130**	**677**	**593**	**11.50**	**55**	**8.07**			
2017	001539	001539	337.180	337.668	5,654	809	650	11.4	65	8.044	60/40%	THORN CREEK RD	END NEW ALIGNMENT
	001540	001540	337.668	339.620	5,657	847	650	11.4	68	8.044	60/40%	END NEW ALIGNMENT	EID RD
			339.620	342.930	6,113	847	700	11.4	68	8.014	60/40%	EID RD	
	2017		**Weighted**		**5,920**	**843**	**679**	**11.40**	**68**	**8.01**			
2037	001539	001539	337.180	337.668	7,809	1,264	885	11.3	100	7.934	60/40%	THORN CREEK RD	END NEW ALIGNMENT
	001540	001540	337.668	339.620	7,821	1,323	886	11.3	105	7.933	60/40%	END NEW ALIGNMENT	EID RD
			339.620	342.930	8,437	1,323	954	11.3	105	7.912	60/40%	EID RD	
	2037		**Weighted**		**8,175**	**1,318**	**925**	**11.30**	**104**	**7.91**			

ADT Volume Projection Report

Route US095 — Traffic Data 2010
Segment From 1540 — Milepost From 342.93 — Start Projection 2017
Segment To 1540 — Milepost To 344.11 — End Projection 2037

Year	Segment From	Segment To	Milepost From	Milepost To	AADT	CAADT	DHV	DHV %	CDHV	CDHV %	DIR	From Description	To Description
2010	001540	001540	342.933	344.116	6,500.	520	742	11.4	42	7.992	60/40%	CLYDE RD	PALOUSE RIVER DR
	2010	Weighted averages			6,500	520	742	11.4	42	7.99			
2017		001540	342.933	344.116	7,465	647	848	11.3	51	7.947	60/40%	CLYDE RD	PALOUSE RIVER DR
	2017	Weighted averages			7,465	647	848	11.3	51	7.95			
2037		001540	342.933	344.116	10,221	1,011	1,148	11.2	80	7.865	60/40%	CLYDE RD	PALOUSE RIVER DR
	2037	Weighted averages			10,221	1,011	1,148	11.2	80	7.87			

Assumed ADTs of County Roads within Thorncreek to Moscow Corridor

E2
North Old US-95 – 1450
South Old US-95 – 500

C3
North Old US-95 – 500
South Old US-95 – 500
Eid Road – 65 (From North Latah Highway District Transportation Plan)
Clyde Road – 50
Cameron Road – 100

W4
North Old US-95 – 1450
South Old US-95 – 500
Jacksha Road – 50
Zeitler Road – 50
Snow Road – 50
Eid Road – 65 (From North Latah Highway District Transportation Plan)

Appendix D

Thorncreek Road to Moscow Environmental Matrix Safety Analysis Alignments Carried Forward

Dated February 15, 2011

THORNCREEK ROAD TO MOSCOW
ENVIRONMENTAL MATRIX
SAFETY ANALYSIS
ALIGNMENTS CARRIED FORWARD

DHP-NH-4110 (156)
KEY # 09294

DISTRICT TRAFFIC ENGINEER

David R Couch

David P. Couch, P.E.

Feb 15, 2011

Date Revised.

In order to compare the Accident Rates for the Alternatives/Alignments the following assumptions will be made: 1) Limited Access, Accident Rate of 0.60, Road Type 78; 2) Partial Control Access, Accident Rate of 0.89, Road Type 75, Alternative/Alignment C-1will be used as a BASE for the comparison as it would have the greatest number of field, residential, county road and commercial approaches associated with it. For the remainder of the 3 Alternative/Alignments carried forward the Base Accident Rate (MVM) will fall between 0.60-Limited Access and 0.89-Partial Control Access and will be prorated accordingly depending on the number of Total Turning Movements estimated for each Alternative/Alignment. The Road Types 75 and 78 are from the Current Idaho Transportation Department "Safety Evaluation Instruction Manual", Dated March 4, 1999, Page 31, Chart III-SEGMENT, b) RURAL.

BASE

Approach Type & No.			Est. No. Turns/Day
(F)	Field	= 10	0.10
(R)	Residential	= 24	10
(CT)	County	= 7	200
(C)	Commercial	= 14	100

Total Turning Movements (TTM) = (F x 0.1)+(R x 10)+(CT x 200)+(C x 100)
= (10 x 0.1)+(24 x 10)+(7 x 200)+(14 x 100)
(TTM) = 3041

3041/0.29 = **10,486** *(Use this to calculate the Accident Adjustment Rate (AAR) for subsequent alignments)*
NOTE: 0.29 is the Difference between 0.89-Accident Rate for Road Type-75 and 0.60-Accident Rate for Road Type-78 taken from ITD Safety Evaluation Instruction Manual and 3451 is the TOTAL ESTIMATED TURNING MOVEMENTS for C-1 .(See Page 12 for calculation methodology.)

W-4

Approach Type & No.			Est. No. Turns/Day
(F)	Field	= 17	0.10
(R)	Residential	= 8	10
(CT)	County	= 4	200
(C)	Commercial	= 5	100

Total Turning Movements (TTM) = (F x 0.1)+(R x 10)+(CT x 200)+(C x 100)
= (17 x 0.1)+(8 x 10)+(4 x 200)+(5 x 100)
(TTM) = 1381.7

Adjusted Accident Rate (AAR) = 1381.7/10486 + 0.60
= **0.73 AAR**

ACCIDENTS/YEAR & COST of ACCIDENTS/YEAR

AVERAGE DAILY TRAFFIC = 6150
YEAR = 365 (days)
LENGTH = 6.69 Miles
ADJUSTED ACCIDENT RATE = 0.73

Million Vehicle Miles (MVM) $= \frac{ADT \times YEAR^{(DAYS)} \times LENGTH^{(MILES)}}{1{,}000{,}000}$

$= \frac{6150 \times 365 \times 6.69}{1{,}000{,}000}$

= 15.02 (MVM)

Accidents/Year (A/Y) = Accident Rate x MVM
= 0.73 x 15.02
= **10.96 (A/Y)**

1.2% Fatal Accidents/Year (FA/Y) = 1.2% of 10.96 (A/Y)
= **0.13 FA/Y**
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10

37.7% Injury Accidents/Year (IA/Y) = 37.7 % of 10.96 (A/Y)
= **4.13 IA/Y**
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10

ESTIMATED COST OF ACCIDENTS/YEAR

0.13 FA/Y @ $3,129,653/Accident = **$407,000/Year**
4.13 IA/Y @ $282,873/Accident = **$1,168,000/Year**
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 8-Table 4

C-3

Approach Type & No.			Est. No. Turns/Day
(F)	Field	= 10	0.10
(R)	Residential	= 11	10
(CT)	County	= 5	200
(C)	Commercial	= 15	100

Total Turning Movements (TTM) = (F x 0.1)+(R x 10)+(CT x 200)+(C x 100)
= (10 x 0.1)+(11 x 10)+(5 x 200)+(15 x 100)
(TTM) = 2611

Adjusted Accident Rate (AAR) = 2611/10486 + 0.60
= 0.85 AAR

ACCIDENTS/YEAR & COST of ACCIDENTS/YEAR

AVERAGE DAILY TRAFFIC = 6150
YEAR = 365 (days)
LENGTH = 5.9 Miles
ADJUSTED ACCIDENT RATE = 0.85

Million Vehicle Miles (MVM) $= \frac{ADT \times YEAR^{(DAYS)} \times LENGTH^{(MILES)}}{1{,}000{,}000}$

$= \frac{6150 \times 365 \times 5.9}{1{,}000{,}000}$

= 13.24 (MVM)

Accidents/Year (A/Y) = Accident Rate x MVM
= 0.85 x 13.24
= 11.25 (A/Y)

1.2% Fatal Accidents/Year (FA/Y) = 1.2% of 11.25 (A/Y)
= 0.13 FA/Y
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10

37.7% Injury Accidents/Year (IA/Y) = 37.7 % of 11.25 (A/Y)
= 4.24 IA/Y
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10

ESTIMATED COST OF ACCIDENTS/YEAR

0.13 FA/Y @ $3,129,653/Accident = **$407,000/Year**
4.24 IA/Y @ $282,873/Accident = **$1,200,000/Year**
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 8-Table 4

E-2

Approach Type & No.			Est. No. Turns/Day
(F)	Field	= 13	0.10
(R)	Residential	= 4	10
(CT)	County	= 2	200
(C)	Commercial	= 5	100

Total Turning Movements (TTM) = (F x 0.1)+(R x 10)+(CT x 200)+(C x 100)
= (13 x 0.1)+(4 x 10)+(2 x 200)+(5 x 100)
(TTM) = 941.3

Adjusted Accident Rate (AAR) = 941.3/10486 + 0.60
= 0.69 AAR

ACCIDENTS/YEAR & COST of ACCIDENTS/YEAR

AVERAGE DAILY TRAFFIC = 6150
YEAR = 365 (days)
LENGTH = 5.85 Miles
ADJUSTED ACCIDENT RATE = 0.69

Million Vehicle Miles (MVM) $= \frac{ADT \times YEAR^{(DAYS)} \times LENGTH^{(MILES)}}{1{,}000{,}000}$

$= \frac{6150 \times 365 \times 5.85}{1{,}000{,}000}$

= 13.13 (MVM)

Accidents/Year (A/Y) = Accident Rate x MVM
= 0.69 x 13.13
= 9.06 (A/Y)

1.2% Fatal Accidents/Year (FA/Y) = 1.2% of 9.06 (A/Y)
= 0.11 FA/Y
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10

37.7% Injury Accidents/Year (IA/Y) = 37.7 % of 9.06 (A/Y)
= 3.42 IA/Y
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10

ESTIMATED COST OF ACCIDENTS/YEAR

0.11 FA/Y @ $3,129,653/Accident = **$344,000/Year**
3.42 IA/Y @ $282,873/Accident = **$968,000/Year**
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 8-Table 4

EXISTING

ACCIDENT RATE = 1.63
(ITD Safety Evaluation Manual-Page 31, III. SEGMENT, b) RURAL, ROAD TYPE-45)

ACCIDENTS/YEAR & COST of ACCIDENTS/YEAR

AVERAGE DAILY TRAFFIC = 6150
YEAR = 365 (days)
LENGTH = 5.9 Miles
ACCIDENT RATE = 1.63

Million Vehicle Miles (MVM) $= \frac{ADT \times YEAR^{(DAYS)} \times LENGTH^{(MILES)}}{1{,}000{,}000}$

$= \frac{6150 \times 365 \times 5.9}{1{,}000{,}000}$

= 13.24 (MVM)

Accidents/Year (A/Y) = Accident Rate x MVM
= 1.63 x 13.24
= 21.58 (A/Y)

1.2% Fatal Accidents/Year (FA/Y) = 1.2% of 21.58 (A/Y)
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10
= 0.26 FA/Y

37.7% Injury Accidents/Year (IA/Y) = 37.7 % of 21.58 (A/Y)
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 17-Table 10
= 8.14 IA/Y

ESTIMATED COST OF ACCIDENTS/YEAR

0.26 FA/Y @ $3,129,653/Accident = **$814,000/Year**
8.14 IA/Y @ $282,873/Accident = **$2,303,000/Year**
Idaho Traffic Collisions-2003
ITD-Office of Highway Safety
Page 8-Table 4

CALCULATION METHODOLOGY

To prorate the accident rate for the various alternatives/alignments the following proportion was used:

$$\frac{TTMx}{3041} = \frac{ARx}{0.29}$$

Where: TTMx is the total turning movements estimated for each alternatives/alignments.

3041 is the TTM for the base alignment which represents Road Type 75 and an accident rate of 0.89.

ARx is the accident rate variation.

0.29 is the total accident rate variation between Road Types 75 and 78. (Accident Rates of 0.89 and 0.60 respectively)

THE EQUATION CAN BE REDUCED TO THE FOLLOWING:

$$\frac{TTMx}{10,486} = ARx$$

ARx is then added to the Base Accident Rate of 0.60 for Road Type 78.

Reference: Transportation Research Record 2171;
"Unsignalized access spacing influences roadway safety. Increased access spacing provides greater separation between conflict points and simplifies turning maneuvers. This, in turn, generally leads to fewer crashes and lower vehicle delay. From a review of corridor access studies, Gluck et al. found that increasing access density from 10 to 20 accesses per mile increased the crash rate by 30%-40% while an increase to 40 accesses per mile increased crash rates by about 60% "(Gluck, J., H.S. Levinson, and V. Stover. NCHRP Report 420)

CLIMATE AND WILDLIFE SAFETY ANALYSIS

In November 2007, the Federal Highway Administration (FHWA) performed a review and made comment on the Safety Study prepared for the Thorncreek Road to Moscow DEIS. Based upon that review, the FHWA instructed the ITD to integrate an analysis of wildlife/vehicle collisions and climate affects into the safety evaluation prepared for the project. The following is a summary of those analyses. To review the assessments in full, go the ITD project website

Summary: Climate / Safety Analysis:
The observed and estimated weather-related accident potential associated with the road alignment characteristics of slope and radius of horizontal curvature for the existing US Highway 95 between Thorncreek Road and Moscow, Idaho, and three proposed alternative routes have been compared. The cumulative weather-related accident potential associated with the weather which occurred between 1999-2003 were 15.6 accidents per year for the existing US95, 10.1 accidents per year for W-4, 8.6 for C-3 and 8.1 for E-2. The three alternative routes all have a lower weather-related accident potential than does the existing US 95, ranging from one-third (W-4) to nearly 50% (E-2) less accident potential. This reduced accident potential is achieved by incorporation of design standards that reduce the slopes and lengthen the radii of horizontal curvature of the alternative routes compared to the existing US 95.

A comparison of the three proposed alternative routes shows alternative W-4 to have distinctly higher accident potential than either C-3 or E-2. Between the latter two alternatives, E-2 may have slightly lower accident potential than C-3 owing to the fact that the radii of curvature on E-2 were more consistently longer than those on alternative C-3, and curve radius is the most influential factor affecting weather-related accident potential.

Summary: Wildlife / Safety Analysis:
Because vehicle-wildlife collisions are directly related to motorist safety, the Eastern alignment (E-2) would rank lowest in motorist safety due to its proximity to year-round habitat on Paradise Ridge. Likewise, based on the above segment review and distance from good ungulate habitat, the Western alignment (W-4) would be safest for motorists. However, taken in perspective, 16 accident reports involving wild animals (presumably large mammals) on US 95 between Thorncreek Road and Moscow over a 4-year period is not significant. Many other stretches of US 95 and other highways in Idaho have that number of ungulate road-kills in a single season, or even month.

Appendix E

Safety Evaluation For Western Ecosystems Technology's Assessment of Potential Big Game Impacts Associated with Highway Alternative from Thorncreek Road to Moscow

ITD 0500 (Rev.10-07)

Department Memorandum

Idaho Transportation Department

DATE: DECEMBER 9, 2010 **Program Number(s)** P042040

TO: KENNETH G. HELM
SENIOR TRANSPORTATION PLANNER

Key Number(s) 9294

FROM: DAVID P. COUCH, P.E.
TRAFFIC ENGINEER

Program ID, County, Etc. THORNCREEK
ROAD TO MOSCOW

RE: SAFETY EVALUATION FOR WESTERN ECOSYSTEMS TECHNOLOGY'S ASSESSMENT OF POTENTIAL BIG GAME IMPACTS ASSOCIATED WITH HIGHWAY ALTERNATIVE FROM THORNCREEK ROAD TO MOSCOW

The Idaho Transportation Department (ITD) maintains a Crash Analysis Report System (CARS), which is compiled from Vehicle Crash Reports, and a High Accident Location (HAL) reporting system. For the purposes of this analysis, ITD has applied the HAL methodology to the CARS database, as means to monitor the frequency and severity of wild animal/vehicle collisions on the Thorncreek Road to Moscow project segment of US-95. ITD has implemented the proposed monitoring as follows:

A Vehicle Crash Report (VCR) shall be filled out for every crash that involves a motor vehicle which occurs within highway right-of-way and results in more than $1,500 ($750 before January 1, 2006) property damage for any one person involved in the crash, or results in an injury to any person involved. All law enforcement agencies in Idaho are required by Idaho Code to send the VCR reports to the Office of Highway Safety and ITD. This data is compiled into the CARS database.

The HAL program produces several reports annually. The primary reports are the interstate segment report, the interstate-interchange report, the noninterstate segment report, and the noninterstate intersection report. The HAL program uses a crash frequency and severity methodology to identify problem road segments. To identify high crash roadway sections within the Thorncreek Road to Moscow Segment of US-95, the HAL program uses nonintersection related crashes in a clustering process to identify highway segments that have a history of crashes. The HAL program analyzes all reportable crashes in which an injury or property damage occurs.

The ITD will apply the HAL methodology to the highway segment of the Thorncreek Road to Moscow project. If, at any time, the Thorncreek Road to Moscow project has a roadway segment which becomes listed under the HAL criteria due to repetitive wild animal/vehicle collisions, ITD will correct the problem by implementing corrective maintenance measures, or by initiating a safety improvement project, to reduce crashes. Such measures or projects could include vegetation removal, game crossing warning signing, fencing, installation of wildlife detection system(s) and slope design changes adjacent to that section of US-95.

CONTINUED...

Currently, a review of crash data from 2004 through 2008 crash records indicate there were 12 property damage only and three Type "C" nonevident injury crashes which occurred in the Thorncreek Road to Moscow segment of U.S. 95 as a result of wild animal/vehicle collisions. These 15 wild animal/vehicle crashes represent 12.8% of the total 117 crashes that were reported along the referenced segment of U.S. 95 during the 2004 - 2008 time periods. To mitigate for the potential for wild animal/vehicle collisions, the design of the new highway will straighten and flatten curves and slopes and provide wide shoulders for emergency/avoidance maneuvers. Based on existing crash reports, the low frequency and randomness of animal collisions and the flatter more open characteristics of the proposed roadway section, animal crashes are not anticipated to be a significant motorist safety concern.

5 YEAR WILD ANIMAL/VEHICLE CRASH SUMMARY 2004 – 2008

YEAR	TOTAL Animal/ Vehicle Collisions	No. Fatal Accidents	A Injury Accidents	B Injury Accidents	C Injury Accidents	Property Damage Only
2004	3	0	0	0	1	2
2005	5	0	0	0	1	4
2006	1	0	0	0	0	1
2007	3	0	0	0	1	2
2008	3	0	0	0	0	3
TOTALS	**15**	**0**	**0**	**0**	**3**	**12**

- Fatality: Dead at the scene as a result of the accident
- A-Injury Accident: Any incapacitating injury, other than fatal, which prevents the injured person from walking, driving or continuing normal activities.
- B-Injury Accident: Any evident but nonincapacitating injury which is evident to observers at the scene of the accident
- C-Injury Accident: Any nonevident injury/complaint reported or claimed which does not fall in the injury categories.
- Report Criteria: U.S. 95, Segment code 001540; MP 337.189 – 344.004

References:

Idaho Transportation Department. High Accident Location Report Methodology.
Idaho Transportation Department. Crash Analysis Report System.
Idaho Transportation Department. Idaho Police Accident Report Form Manual.

DPC:SS:ss/z:\ADMIN\OM\WRDFILES\ADM\9294 Safety Memo.docx

cc: DE2 PDE2 DTE2 EPS