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## Appendix D – Crash History Review Technical Memorandum



# Technical Memo

Date: Friday, May 10, 2019

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Project: Southern Meade County Corridor Study

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To: Study Advisory Team

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From: HDR

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Subject: Crash History Review

## Introduction

This memorandum documents a crash history review for the Southern Meade County Corridor Study, which includes the following roadways within the study area:

- Erickson Ranch Road/Deadwood Avenue
- Haines Avenue
- 143<sup>rd</sup> Avenue
- Nike Road
- Elk Creek Road

This review was conducted to help identify crash trends through the area and locations that may warrant consideration of safety-related improvements in future design.

## Methodology

Crash data for years 2014 through 2018 was provided by the South Dakota Department of Transportation (SDDOT) through a GIS geodatabase. Crashes were reviewed to identify any historical crash trends or high frequency areas to help develop potential crash mitigation measures for consideration in design. Analysis of the following roadway facilities was conducted:

- Intersections
- Roadway segments

All crashes occurring on a primary study corridor were sorted based on whether they were related to an analysis intersection or a roadway segment. Crashes occurring on local side-streets intersecting a primary study corridor were vetted to determine whether the crash was due to an event or causal factor along the primary study corridor.

Intersection and segment crash rates were calculated with available daily traffic count data provided by the SDDOT or collected as part of this study.



## Study Area Summary

The study area is located in southern Meade County, to the east and north of I-90, and is bound by the following:

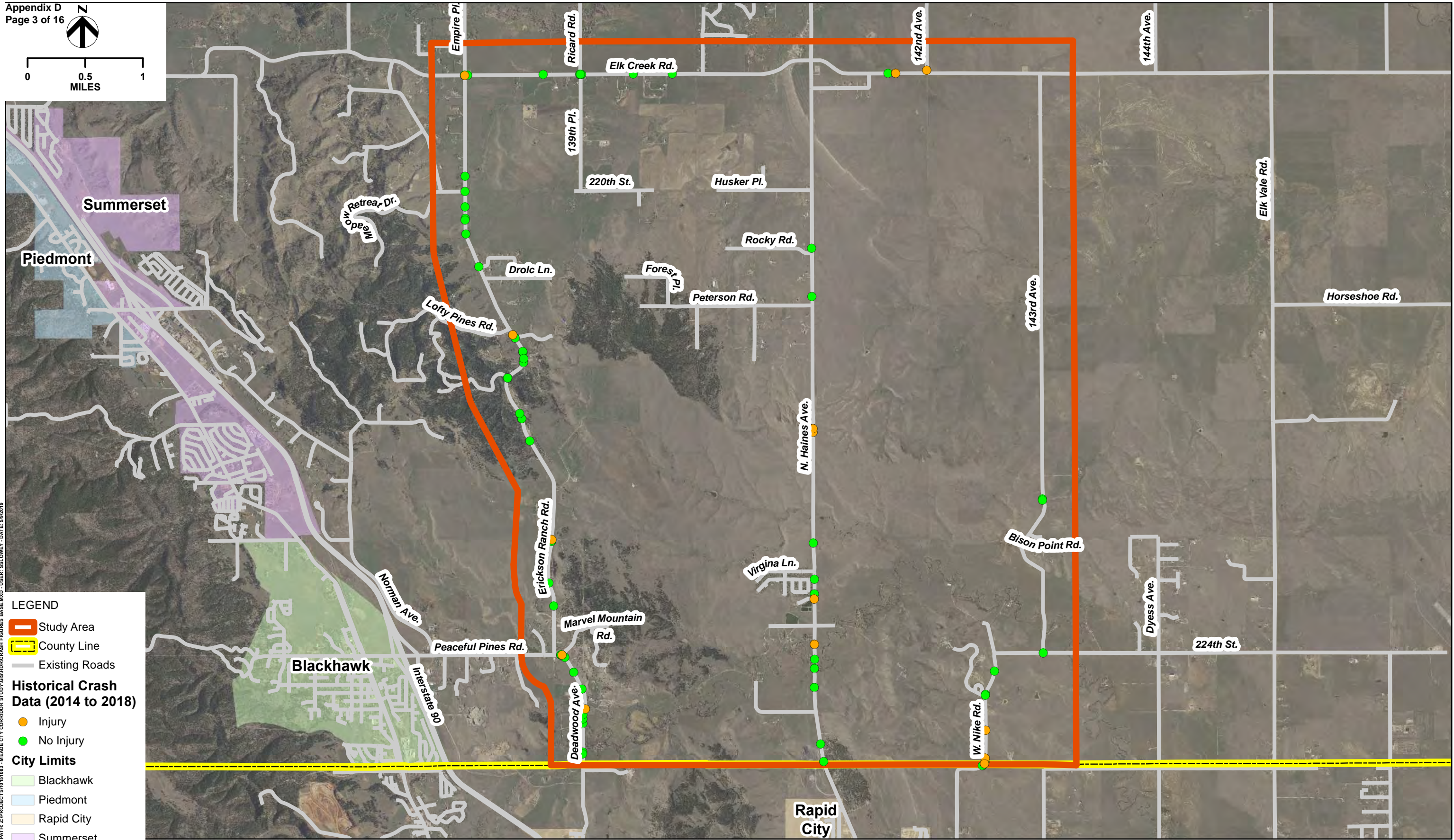
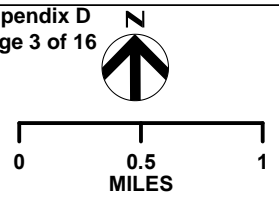
- Erickson Ranch Road/Deadwood Avenue (west)
- 143<sup>rd</sup> Avenue/Nike Road (east)
- Elk Creek Road (north)
- Meade County/Pennington County border (south)

The study corridors, and respective roadway surfacing, are as follows:

- North/south corridors:
  - Erickson Ranch Road/Deadwood Avenue
    - Paved 2-lane rural roadway
  - Haines Avenue
    - Paved 2-lane rural roadway
  - 143<sup>rd</sup> Street/Nike Road
    - Gravel roadway
- East/west corridors:
  - Elk Creek Road
    - Paved 2-lane rural roadway west of Haines Avenue
    - Gravel roadway east of Haines Avenue

Between 2014 and 2018, 74 crashes were reported in the study area on the primary study corridors. These crashes are shown spatially, identified as 'injury' or 'no injury' crashes, in Figure 1. Zero fatalities were reported within the study area during this timeframe. The appendix includes crash summaries for each of the individual crashes within the study area.

Two additional figures are also provided, which are variations of Figure 1. Figure 2 shows only the vehicle-animal crashes and Figure 3 omits the vehicle-animal crashes.



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**LEGEND**

- Study Area
- County Line
- Existing Roads

**Historical Crash Data (2014 to 2018)**

- Injury
- No Injury

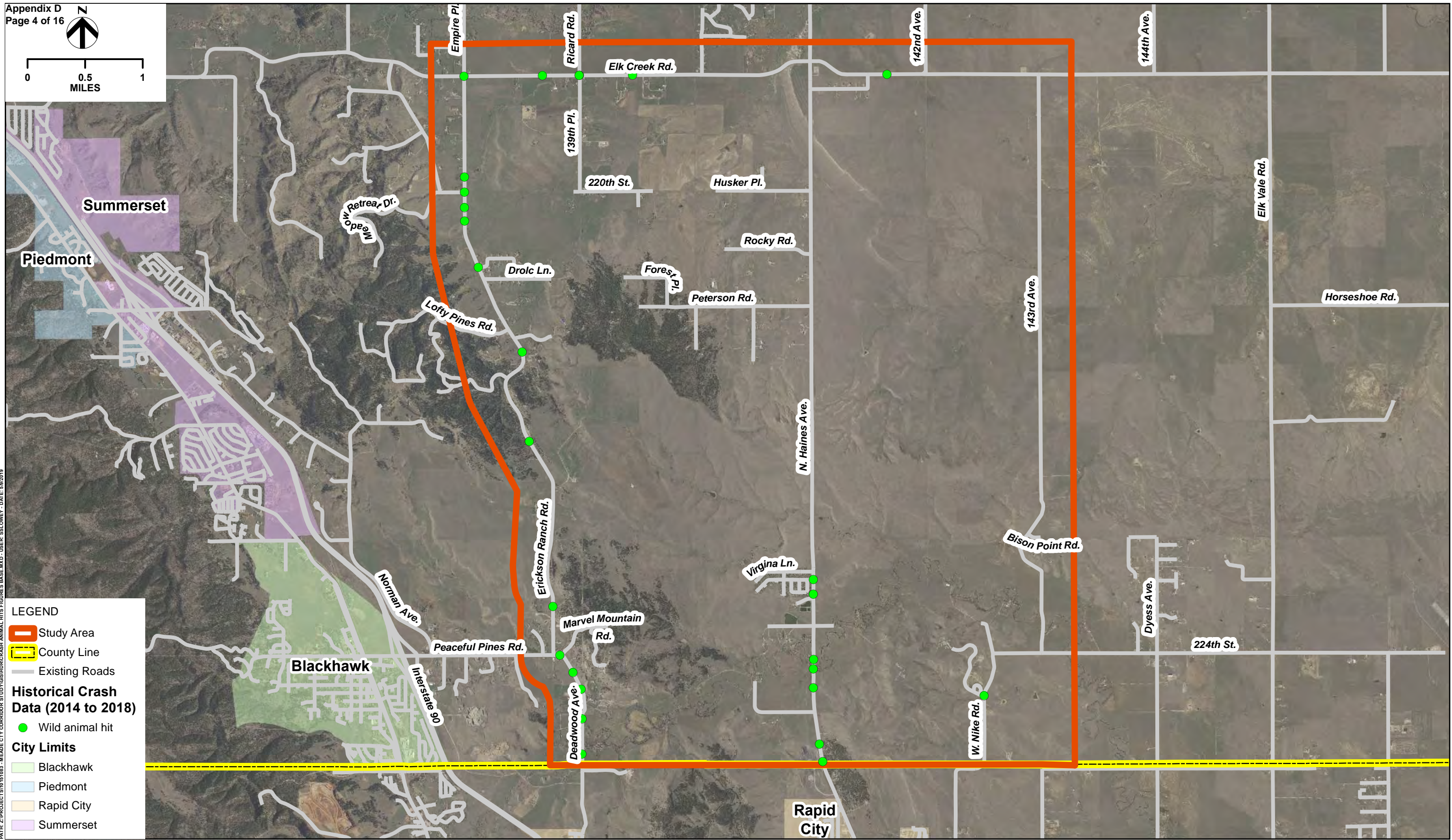
**City Limits**

- Blackhawk
- Piedmont
- Rapid City
- Summerset



**CRASH HISTORY (2014 - 2018)**  
SOUTHERN MEADE COUNTY CORRIDOR STUDY

DATE  
5/9/2019  
FIGURE  
1

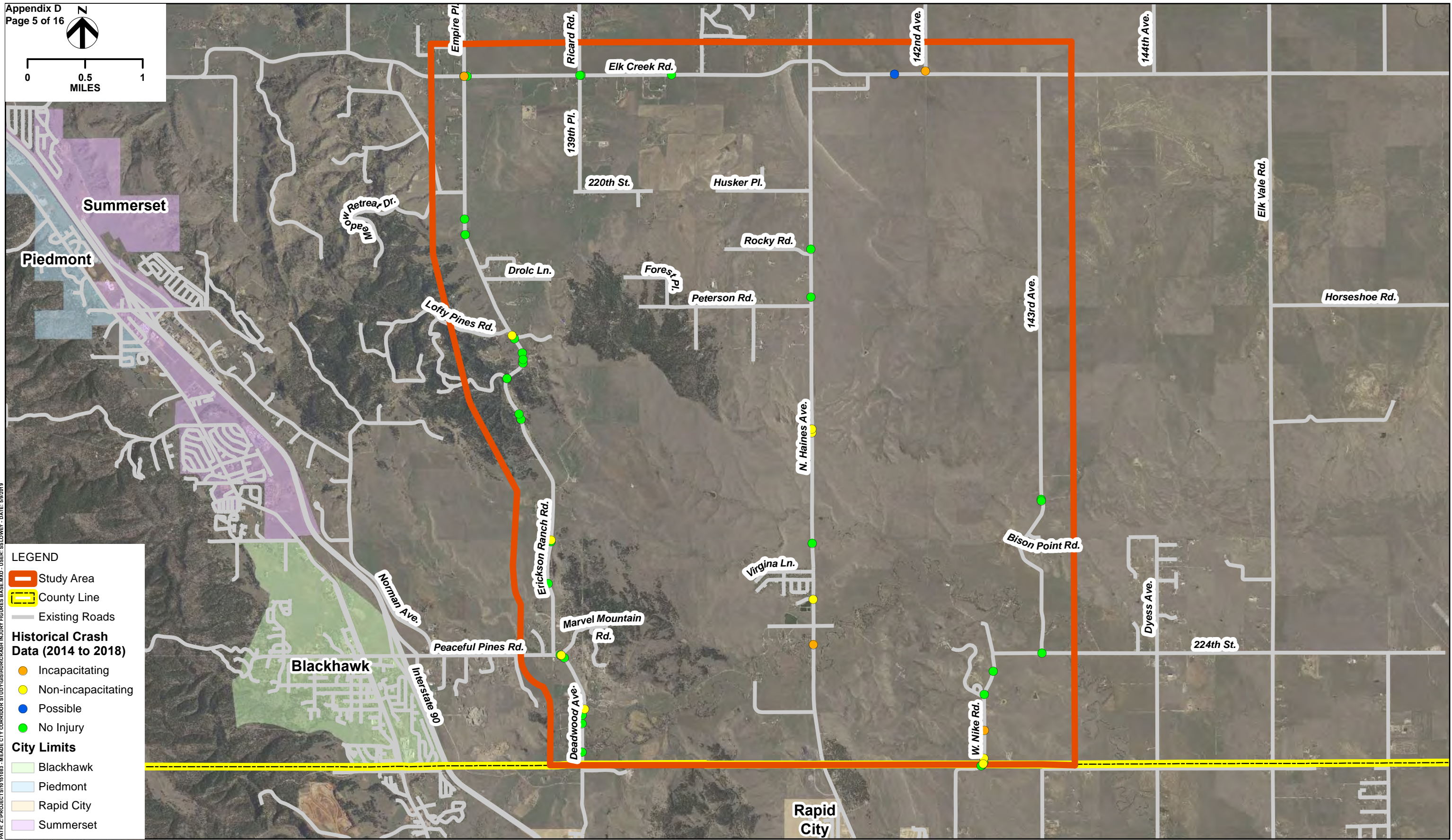


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**CRASH HISTORY (2014 - 2018)  
VEHICLE-ANIMAL CRASHES**  
SOUTHERN MEADE COUNTY CORRIDOR STUDY

DATE  
5/9/2019  
FIGURE  
2



PATH: Z:\PROJECTS\10151083 - MEADE CTY CORRIDOR STUDY\GIS\DR\CRASH INJURY FIGURES BASE.MXD - USER: SLSLOWEY - DATE: 5/9/2018

**LEGEND**

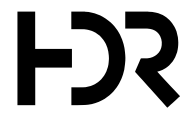
- Study Area
- County Line
- Existing Roads

**Historical Crash Data (2014 to 2018)**

- Incapacitating
- Non-incapacitating
- Possible
- No Injury

**City Limits**

- Blackhawk
- Piedmont
- Rapid City
- Summerset



**CRASH HISTORY (2014 - 2018)  
INJURY SUMMARY  
(VEHICLE-ANIMAL CRASHES OMITTED)**

SOUTHERN MEADE COUNTY CORRIDOR STUDY

DATE  
5/9/2019

FIGURE  
3



## Crash Rate Methodology

Crash rates and critical crash rates were calculated for both intersections and roadway segments. Intersection crash rates are calculated in terms of crashes per million entering vehicles (crashes/MEV). Roadway segment crash rates are calculated in terms of million vehicle miles traveled (crashes/MVMT).

Critical crash rates were calculated based on the statistical populations for each crash location (intersection or segment), using methods presented in the Highway Safety Manual (American Association of State Highway and Transportation Officials (AASHTO), 2010). A critical crash rate accounts for the random nature of crashes, a desired level of confidence, vehicle exposure, and similar facility types. Intersections and segments where the crash rate exceeds the critical rate should be investigated further. In the subsequent crash rate tables, locations that have a crash rate that exceeds the critical crash rate are highlighted in red. If the crash rate is less than the critical crash rate, that location is highlighted in green.

## Primary Study Corridor Intersections

Intersection-related crashes were evaluated at the following primary study corridor intersections, with results shown in Table 1:

- Elk Creek Road and Erickson Ranch Road
- Elk Creek Road and Haines Avenue
- Elk Creek Road and 143<sup>rd</sup> Avenue
- Peaceful Pines Road and Erickson Ranch Road/Deadwood Avenue
- 224<sup>th</sup> Street and 143<sup>rd</sup> Avenue

**Table 1: Primary Study Corridor Intersection Crash Rates**

Intersection	Total # Crashes	Daily Entering Volume (vpd)	Crash Rate (crashes/MEV)	Critical Crash Rate (crashes/MEV)	Crash/Critical Ratio
Elk Creek Road & Erickson Ranch Road	1	1,400	0.39	0.64	0.61
Elk Creek Road & Haines Avenue	0	950	0	-	-
Elk Creek Road & 143 <sup>rd</sup> Avenue	0	175	0	-	-
Peaceful Pines Road & Erickson Ranch Road/Deadwood Avenue	0	2,375	0	-	-
224 <sup>th</sup> Street & 143 <sup>rd</sup> Avenue	0	120	0	-	-
<i>Column Totals</i>	1	5,025			
<i>Weighted Average Rate</i>			0.11		

One crash was observed at the five primary study corridor intersections, at the Elk Creek Road and Erickson Ranch Road intersection. That crash resulted in an incapacitating injury involving a motorcycle departing the roadway while traveling northbound through the intersection.



## Primary Study Corridor Segments

The primary study corridors within the study area were divided into segments for analysis. Considerations in determining segment boundaries included such things as location of major intersections, changes in roadway surfacing, and/or notable increases or decreases in traffic volumes. The following segments were analyzed:

- Elk Creek Road – Erickson Ranch Road to Haines Avenue
- Elk Creek Road – Haines Avenue to 143<sup>rd</sup> Street
- Erickson Ranch Road – Elk Creek Road to Peaceful Pines Road
- Deadwood Avenue – Peaceful Pines Road to Meade County/Pennington County boundary
- Haines Avenue – Elk Creek Road to Virginia Lane
- Haines Avenue – Virginia Lane to Meade County/Pennington County boundary
- 143<sup>rd</sup> Avenue – Elk Creek Road to 224<sup>th</sup> Street
- 224<sup>th</sup> Street/Nike Road – 14<sup>rd</sup> Avenue to Meade County/Pennington County boundary

Tables 2 and 3 present the corridor segment crash rates and manner of collision and injury summary, respectively, for the eight corridor segments.

**Table 2: Corridor Segment Crash Rates**

Segment	Total # Segment Crashes	Segment Volume (vpd)	Segment Length (mi.)	Crash Rate (crashes/MVMT)	Critical Crash Rate (crashes/MVMT)	Crash/Critical Ratio
<b>Elk Creek Road –</b> <i>Erickson Ranch Rd to Haines Ave</i>	9	730 <sup>a</sup>	3.0	2.3	3.7	0.63
<b>Elk Creek Road –</b> <i>Haines Ave to 143<sup>rd</sup> Ave</i>	3	130 <sup>b</sup>	2.0	6.3	7.0	0.90
<b>Erickson Ranch Road –</b> <i>Elk Creek Rd to Peaceful Pines Rd</i>	23	1,050 <sup>a</sup>	5.3	2.3	3.1	0.73
<b>Deadwood Avenue –</b> <i>Peaceful Pines Rd to Meade County/Pennington County boundary</i>	12	1,700 <sup>a</sup>	1.1	3.5	3.8	0.92
<b>Haines Avenue –</b> <i>Elk Creek Rd to Virginia Ln</i>	5	880 <sup>b</sup>	4.5	0.7	3.3	0.21
<b>Haines Avenue –</b> <i>Virginia Ln to Meade County/Pennington County boundary</i>	9	1,970 <sup>b</sup>	1.7	1.5	3.4	0.44
<b>143<sup>rd</sup> Avenue –</b> <i>Elk Creek Rd to 224<sup>th</sup> St</i>	2	75 <sup>b</sup>	5.2	2.8	6.0	0.47
<b>224<sup>th</sup> Street/Nike Road –</b> <i>143<sup>rd</sup> Ave to Meade County/Pennington County boundary</i>	10 **	75 <sup>c</sup>	1.4	52.2	10.6	4.92
<i>Column Totals</i>	<b>73</b>	<b>6,610</b>	<b>24.2</b>			
<i>Weighted Average Rate</i>				<b>2.3</b>		

Notes: <sup>a</sup> 2015 SDDOT segment counts <sup>b</sup> segment counts collected as part of this study <sup>c</sup> estimated volume

\*\* Two crashes occurred in Pennington County, but were included in this total as they are part of a horizontal curve that begins in one county and ends in the other.



**Table 3: Corridor Segment Crash Summary**

Segment	Manner of Collision					Injury Severity		Total # Segment Crashes
	Rear End	Angle	Side Swipe	Roadway Departure	Wild Animal	Injury Crashes	Property Damage Only	
<b>Elk Creek Road –</b> <i>Erickson Ranch Rd to Haines Ave</i>	1			3	5		9	<b>9</b>
<b>Elk Creek Road –</b> <i>Haines Ave to 143<sup>rd</sup> Ave</i>				2	1	2	1	<b>3</b>
<b>Erickson Ranch Road –</b> <i>Elk Creek Rd to Peaceful Pines Rd</i>	3	2	1	9	8	2	21	<b>23</b>
<b>Deadwood Avenue –</b> <i>Peaceful Pines Rd to Meade County/Pennington County boundary</i>				7	5	2	10	<b>12</b>
<b>Haines Avenue –</b> <i>Elk Creek Rd to Virginia Ln</i>				5		2	3	<b>5</b>
<b>Haines Avenue –</b> <i>Virginia Ln to Meade County/Pennington County boundary</i>				2	7	2	7	<b>9</b>
<b>143<sup>rd</sup> Avenue –</b> <i>Elk Creek Rd to 224<sup>th</sup> St</i>				2			2	<b>2</b>
<b>224<sup>th</sup> Street/Nike Road –</b> <i>143<sup>rd</sup> Ave to Meade County/Pennington County boundary</i>				9	1	3	7	<b>10 **</b>
<b>Column Totals</b>	<b>4</b> (5%)	<b>2</b> (3%)	<b>1</b> (1%)	<b>39</b> (53%)	<b>27</b> (37%)	<b>13</b> (18%)	<b>60</b> (82%)	<b>73</b>

Notes: \*\* Two crashes occurred in Pennington County, but were included in this total as they are part of a horizontal curve that begins in one county and ends in the other.  
Due to rounding, percentages may not equal 100%.

Roadway departure is the predominant manner of collision along the study area corridor segments, accounting for over half of the total segment crashes (39 of 73; 53 percent). The next most frequent manner of collision is a vehicle-animal crash (27 of 73; 37 percent).

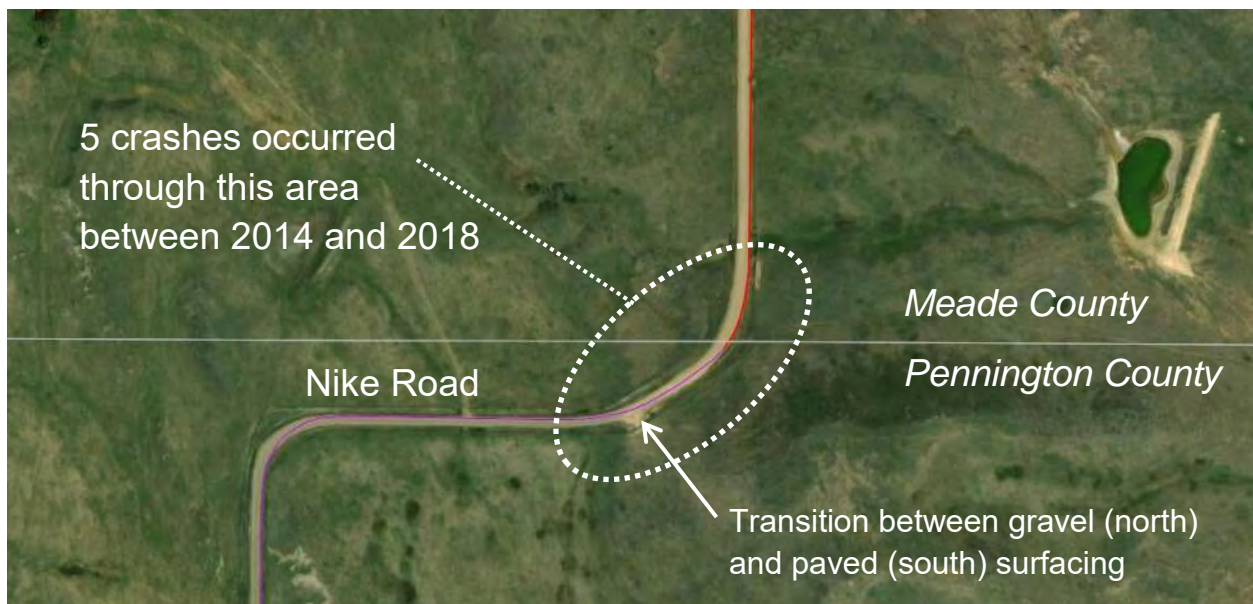
All 13 injury crashes were single-vehicle, roadway departure type crashes. Eight of these 13 crashes experienced an overturn/rollover event. Four other injury crashes struck a fixed object and one injury crash involved a vehicle-animal crash. All injury crashes occurred on dry roadways during clear weather conditions. Only two of these crashes were noted to have occurred on a curve.

Erickson Ranch Road exhibited the greatest number of access-related crashes, 5 crashes involving an angle or rear-end manner of collision.

The lone segment with a crash rate exceeding the critical crash rate was the 224<sup>th</sup> Street/Nike Road segment between 143<sup>rd</sup> Avenue and the Meade County/Pennington County boundary. This segment exhibited 10 crashes, three of which resulted in injuries. Nine of these 10 crashes were single-vehicle, roadway departure crashes.

Five of the 10 crashes occurred along the horizontal curve that crosses the Meade County/Pennington County boundary, shown in Figure 4. Two of these crashes occurred on the Pennington County side of the horizontal curve, but were included in this analysis to provide a complete review of the curve.

All five crashes were single-vehicle roadway departure crashes and four of the five involved a northbound vehicle. Vehicles traveling northbound approach the curve on a paved, 2-lane roadway, but the roadway transitions to gravel at the onset of the horizontal curvature. This can create a difficult situation for motorists when high speeds are involved. Four of the five crashes noted driving too fast for conditions and/or over-correcting/over-steering as a driver contributing circumstance. The fifth crash involved alcohol and careless driving.



**Figure 4: Nike Road Horizontal Curve at Meade County/Pennington County Boundary**

Aerial source: SDDOT Interactive Road System Map

Two additional roadway departure crashes occurred further north, along the horizontal curves between Pioneer Trail and 224<sup>th</sup> Street. Both vehicles struck fixed objects after leaving the roadway, with noted contributing factors being speed (overdriving road conditions) for one and distracted driving (careless driving) for the other.



## Crash Trend Summary

Overall crash trends observed through the study area are summarized as follows:

### Injury Crash Summary

- 14 of the 74 crashes involved an injury.
  - 0 fatalities
  - 4 incapacitating injury crashes
  - 9 non-incapacitating injury crashes
  - 1 possible injury crash
- For these 14 injury crashes, common crash characteristics included:
  - All 14 crashes were single-vehicle, roadway departure crashes.
    - 8 noted overturn/rollover as the most harmful event.
  - All 14 crashes occurred on dry road conditions.
  - 4 involved alcohol.
  - 3 noted speed as a causal factor.
  - 6 of the 11 vehicular crashes noted no seatbelt used.
  - 3 crashes involved motorcycles.

### Primary Study Corridor Intersection Summary

- Of the 4 intersections reviewed, only the Elk Creek Road and Erickson Ranch Road intersection experienced an intersection crash, which was a single-motorcycle roadway departure crash.

### Primary Study Corridor Segment Summary

- Single-vehicle, roadway departure crashes were the predominant manner of collision (53 percent of all segment crashes).
  - Most harmful events included overturn/rollovers and/or striking fixed objects.
- 20 of the 73 segment crashes occurred along a vertical curve.
  - Speed was noted as a contributing factor in 12 of these crashes.
  - 2 angle and 2 rear-end crashes occurred along horizontal curves, emphasizing the importance of good intersection sight lines for turning vehicles and stopping sight distance at all access points.
  - 2 of the 14 injury crashes occurred on horizontal curves within the study area.
- The predominant location for injury crashes was straight, flat roadway segments.
  - 11 of the 13 roadway segment injury crashes occurred on flat, straight segments.
  - Speed and/or alcohol were common driver contributing factors, with at least one of these occurring in 7 of the 11 crashes.
- Vehicle-animal crashes were the second most-frequent manner of collision (37 percent of all segment crashes).

Snowy or icy road conditions were noted in 23 of the 74 crashes, but none of these crashes resulted in an injury.



## New Corridor Considerations

The purpose of the Southern Meade County Corridor Study is to evaluate locations for a potential east-west corridor between Elk Creek Road and the Meade County/Pennington County boundary. Recognizing this proposed corridor will likely function similarly to the existing county roads in the area, the crash trends observed throughout the study area are likely to translate to this proposed corridor.

In consideration of the crash trends identified in this crash history review, the following considerations are recommended to be carried forward to the proposed east/west corridor:

- Speed is a frequent causal factor in crashes throughout the area. Countermeasures to be incorporated into the proposed corridor include:
  - Design horizontal and vertical curves to an appropriate design speed.
  - Design a forgiving roadside, with a clear zone that meets design guidelines, is free of fixed objects, and has recoverable side slopes.
- Design the proposed corridor commensurate with the intended function, such as:
  - Shoulders.
  - Appropriate roadway surfacing.
  - Intersection traffic control supporting route priority in the area.
- Intersections and access points.
  - Develop an access management plan for the proposed corridor that includes the following:
    - Identifies future access points and/or
    - Establishes access guidelines and requirements for future access based on guidelines presented in the *Meade County Comprehensive Plan* and the *Meade Moving Forward 2040 Transportation Plan*.
  - Avoid access points and intersections on horizontal or vertical curves where intersection sight distance and stopping sight distance needs are compromised.



## Appendix A – Individual Crash Summary Tables

**Primary Study Corridor Intersections (1 of 1)**

*Elk Creek Road and Erickson Ranch Road*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcyle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1807616	6/15/2018 18:16	Dry	Fence	Y	N	N	Incapacitating	No collision between 2 MV in transport	Intersection related	Straight and level	Clear	Northbound	None; Other

*Elk Creek Road and Haines Avenue*

0 crashes

*Elk Creek Road and 143rd Avenue*

0 crashes

*Peaceful Pines Road and Erickson Ranch Road/Deadwood Avenue*

0 crashes

2014-2018; Crash database provided by SDDOT.

**Primary Study Corridor Segments (1 of 3)**

*Elk Creek Road - Erickson Ranch Road to Haines Avenue*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcycle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1711818	9/16/2017 7:00	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Wild animal hit - d.o.	Wild animal hit - d.o.	Clear	Westbound	Wild animal hit - damage only
1414723	11/27/2014 17:25	Wet	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy	Westbound	Wild animal hit - damage only
1701025	1/25/2017 7:08	Snow	Overturn/rollover	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Westbound	Driving too fast for conditions; None
1613062	10/13/2016 6:50	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Eastbound	Wild animal hit - damage only
1515342	11/28/2015 14:30	Snow	Motor vehicle in transport	N	N	N	No injury	Rear-end ( front to rear )	Non-junction	Straight and level	Snow	Westbound	Followed too closely; None
1612594	9/29/2016 17:40	Dry	Fence	N	N	N	No injury	No collision between 2 MV in transport	Driveway access	Straight and level	Clear	Eastbound	Physical impairment; Running off road
1718011	12/20/2017 18:04	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy	Eastbound	Wild animal hit - damage only
1404446	4/11/2014 7:50	Dry	Highway traffic sign post/sign	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Eastbound	Exceeded posted speed limit; None
1714695	10/7/2017 7:06	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Wild animal hit - d.o.	Wild animal hit - d.o.	Clear	Westbound	Wild animal hit - damage only

*Elk Creek Road - Haines Avenue to 143rd Avenue*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcycle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1506683	5/31/2015 19:00	Dry	Overturn/rollover	N	N	N	Incapacitating	No collision between 2 MV in transport	Non-junction	Straight on grade	Clear	Eastbound	None; Running off road
1511094	9/18/2015 20:00	Unknown	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	<Null>	Westbound	Wild animal hit - damage only
1709181	7/20/2017 19:05	Dry	Overturn/rollover	N	Y	N	Possible	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Eastbound	Driving too fast for conditions; Over-correcting/over-steer

2014-2018; Crash database provided by SDDOT.

**Primary Study Corridor Segments (2 of 3)**

*Erickson Ranch Road - Elk Creek Road to Peaceful Pines*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcyle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1503898	4/15/2015 20:35	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1403476	3/11/2014 7:11	Slush	Motor vehicle in transport	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Snow	Eastbound; SB	Driving too fast for conditions; None
1502413	3/9/2015 13:24	Dry	Tree/shrubbery	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Clear	Northbound	Over-correcting/over-steering; Swerving or avoiding due
1701536	1/18/2017 7:06	Ice	Fence	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Curve and level	Clear	Southbound	Distracted (list distraction in narrative); None
1802576	2/12/2018 17:00	Ice	Motor vehicle in transport	N	Y	N	No injury	Angle	Non-junction	Curve on grade	Cloudy	Northbound; WB	Driving too fast for conditions; Failed to yield to vehicle; I
1512126	9/30/2015 17:19	Dry	Ditch	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Straight on grade	Clear	Northbound	Exceeded posted speed limit; Running off road
1500450	1/14/2015 17:30	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Westbound	Wild animal hit - damage only
1704314	3/9/2017 17:46	Ice	Motor vehicle in transport	N	N	N	No injury	Rear-end ( front to rear )	Intersection related	Curve on grade	Snow	Northbound	None
1415295	11/29/2014 18:13	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1515157	11/28/2015 14:15	Snow	Fence	N	N	N	No injury	No collision between 2 MV in transport	Intersection related	Curve on grade	Cloudy, Sn	Northbound	None
1812192	10/4/2018 23:20	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1704844	4/27/2017 15:32	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy	Northbound	Wild animal hit - damage only
1709182	7/19/2017 20:47	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Wild animal hit - d.o.	Wild animal hit - d.o.	Clear	Southbound	Wild animal hit - damage only
1413452	11/10/2014 13:15	Ice	Motor vehicle in transport	N	Y	N	No injury	Rear-end ( front to rear )	Intersection related	Curve on grade	Snow, Blov	Northbound	Driving too fast for conditions; None
1808880	7/27/2018 11:07	Dry	Motor vehicle in transport	N	N	N	No injury	Sideswipe, opposite direction	Non-junction	Straight and hill crest	Clear	Northbound; SB	Distracted (list distraction in narrative); Failure to keep in
1415347	11/24/2014 17:38	Ice	Motor vehicle in transport	N	Y	N	No injury	Rear-end ( front to rear )	Non-junction	Straight and level	Cloudy	Northbound	Driving too fast for conditions; Followed too closely; Non
1803985	4/2/2018 18:30	Snow	Motor vehicle in transport	N	Y	N	No injury	Angle	Non-junction	Curve and level	Sleet, hail (	Northbound; SB	Driving too fast for conditions; Failure to keep in proper l
1812065	9/29/2018 6:30	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Wild animal hit - d.o.	Wild animal hit - d.o.	Clear	Southbound	Wild animal hit - damage only
1512796	10/6/2015 10:30	Dry	Overturn/rollover	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Southbound	Exceeded posted speed limit; Running off road
1511600	9/27/2015 21:10	Wet	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy, Rai	Southbound	Wild animal hit - damage only
1703151	3/7/2017 23:01	Dry	Overturn/rollover	N	N	Y	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Curve and hill crest	Clear	Northbound	Over-correcting/over-steering; Running off road
1610118	8/13/2016 13:00	Dry	Overturn/rollover	Y	N	N	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Northbound	None; Running off road
1616148	12/6/2016 17:10	Dry	Animal - wild	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Northbound	None

*Deadwood Avenue - Erickson Ranch Road to County Line*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcyle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1613860	11/4/2016 6:42	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1503376	4/4/2015 23:30	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Eastbound	Wild animal hit - damage only
1800539	1/12/2018 6:00	Dry	Concrete traffic barrier	N	Y	N	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Curve on grade	Clear	Westbound	Driving too fast for conditions; None
1509759	7/15/2015 8:49	Sand, mud, dirt, gra	Parked motor vehicle	N	N	N	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Not on roadway; SB	Distracted (list distraction in narrative); None; Not applic
1515233	11/19/2015 10:15	Dry	Guardrail face	N	N	N	No injury	No collision between 2 MV in transport	Driveway access	Straight and level	Clear	Northbound	None; Running off road
1717486	12/16/2017 17:11	Wet	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy	Southbound	Wild animal hit - damage only
1508378	5/9/2015	Wet	Culvert	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve and level	Cloudy, Rai	Southbound	Driving too fast for conditions; Exceeded posted speed lir
1611425	9/19/2016 5:38	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1416393	11/16/2014 0:17	Snow	Fence	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Southbound	Driving too fast for conditions; None
1516846	12/26/2015 20:30	Snow	Fence	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve and level	Clear	Westbound	Driving too fast for conditions; None
1706544	5/24/2017 17:00	Dry	Tree/shrubbery	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Clear	Northbound	Exceeded posted speed limit; Improper passing
1512125	10/13/2015 6:45	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Southbound	Wild animal hit - damage only

2014-2018; Crash database provided by SDDOT.

**Primary Study Corridor Segments (3 of 3)**

*Haines Avenue - Elk Creek Road to Virginia Lane*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcycle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1609336	8/6/2016 21:30	Dry	Overturn/rollover	Y	N	N	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight on grade	Clear	Southbound	None; Swerving or avoiding due to wind, slippery surface
1416461	12/28/2014 11:20	Snow	Utility pole	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and hill crest	Cloudy	Northbound	None; Running off road
1709873	7/12/2017 21:27	Dry	Animal - wild	N	Y	N	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight and hill crest	Cloudy	Southbound	Exceeded posted speed limit; None
1506682	5/25/2015 18:00	Wet	Fence	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Rain	Northbound	Driving too fast for conditions; Over-correcting/over-steer
1403496	3/12/2014 7:30	Dry	Overturn/rollover	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Northbound	Over-correcting/over-steering; Running off road

*Haines Avenue - Virginia Lane to County Line*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcycle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1617465	12/26/2016 17:35	Snow	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy	Southbound	Wild animal hit - damage only
1812725	10/6/2018 19:45	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Cloudy	Southbound	Wild animal hit - damage only
1513659	11/8/2015 17:00	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Southbound	Wild animal hit - damage only
1802815	2/24/2018 17:06	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1810449	8/25/2018 20:58	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Wild animal hit - d.o.	Wild animal hit - d.o.	Cloudy	Southbound	Wild animal hit - damage only
1505010	4/21/2015 21:05	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1604416	4/11/2016 20:54	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1809236	7/31/2018 13:20	Dry	Culvert	N	N	N	Incapacitating	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Southbound	None; Running off road
1613080	10/14/2016 5:30	Dry	Overturn/rollover	N	N	Y	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Northbound	Drinking; Running off road

*143rd Avenue - Elk Creek Road to 224th Street*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcycle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1511901	9/27/2015 20:18	Wet	Embankment	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Rain	Northbound	Driving too fast for conditions; Over-correcting/over-steer
1505148	5/15/2015 0:05	Wet	Overturn/rollover	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Cloudy, Rai	Northbound	None; Running off road

*143rd Avenue - 224th Street to County Line*

AccidentNbr	AccidentDateTime	RoadCondDesc	MHEvnts	Motorcycle	Speed	AlcoholUse	InjurySeverity	MannerOfCollision	Junction	AlignmentDesc	Weather	TravelDirection	DriverContribCircum
1806958	6/9/2018 20:48	Dry	Overturn/rollover	N	N	Y	Incapacitating	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Northbound	Drinking; Running off road
1605022	5/1/2016 0:38	Dry	Fence	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Curve and level	Clear	Northbound	Distracted (list distraction in narrative); None
1617777	11/27/2016 11:49	Dry	Utility pole	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve and level	Clear	Northbound	Driving too fast for conditions; Running off road
1515275	11/29/2015 22:40	Snow	Rock	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Cloudy, Sni	Southbound	Driving too fast for conditions; None
1406043	5/23/2014 18:10	Dry	Overturn/rollover	N	Y	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Clear	Northbound	Driving too fast for conditions; Over-correcting/over-steer
1607751	6/30/2016 23:41	Dry	Animal - wild	N	N	N	Wild animal hit	No collision between 2 MV in transport	Non-junction	Wild animal hit - d.o.	Clear	Northbound	Wild animal hit - damage only
1713362	10/10/2017 11:39	Dry	Overturn/rollover	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Curve on grade	Clear	Northbound	Over-correcting/over-steering; Running off road
1509636	8/14/2015 0:55	Sand, mud, dirt, gra	Embankment	N	N	Y	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight on grade	Clear	Northbound	None; Running off road
1709506	8/3/2017 9:40	Dry	Overturn/rollover	N	N	N	Non-incapacitating	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Northbound	Over-correcting/over-steering; Running off road
1802814	2/10/2018 16:23	Snow	Mailbox	N	N	N	No injury	No collision between 2 MV in transport	Non-junction	Straight and level	Clear	Eastbound	Other; Wrong side or wrong way

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