

# SAFETEA-LU

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- Says Develop a Strategic Highway Safety Plan (SHSP) that:
  - ... Analyzes and make effective use of State, Regional or Local crash data .....

# HIGHWAY SAFETY IMPROVEMENT PLAN (HSIP)

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- Safe Routes to Schools
- Highway Rail Crossing
- Strategic Highway Safety Plan (SHSP)
- High Risk Rural Roads (HRRR)

# Strategic Highway Safety Plan (SHSP)

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- **DATA DRIVEN**
  - Reactive -- RSI
  - Proactive -- RSA & Action Plan

# Strategic Highway Safety Plan (SHSP)

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- **REACTIVE:**
  - RSI Process
    - Plot Map Search to Identify Spot Locations or 1 Mile Segments With 5 or More Crashes in Most Recent 3 Years
    - Locations From Regions, Cities, Highway Patrol

# Strategic Highway Safety Plan (SHSP)

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- **PROACTIVE:**
  - RSA/RSAR – Review of Project Plans or Existing Roadway by Independent Team
  - SHSP Action Plan

# Strategic Highway Safety Plan (SHSP)

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- SHSP Action Plan
  1. Roadway Departure Crashes
    - Fixed Object Hits
    - Overturned Off Roadway
    - Overturned On Roadway

# Strategic Highway Safety Plan (SHSP)

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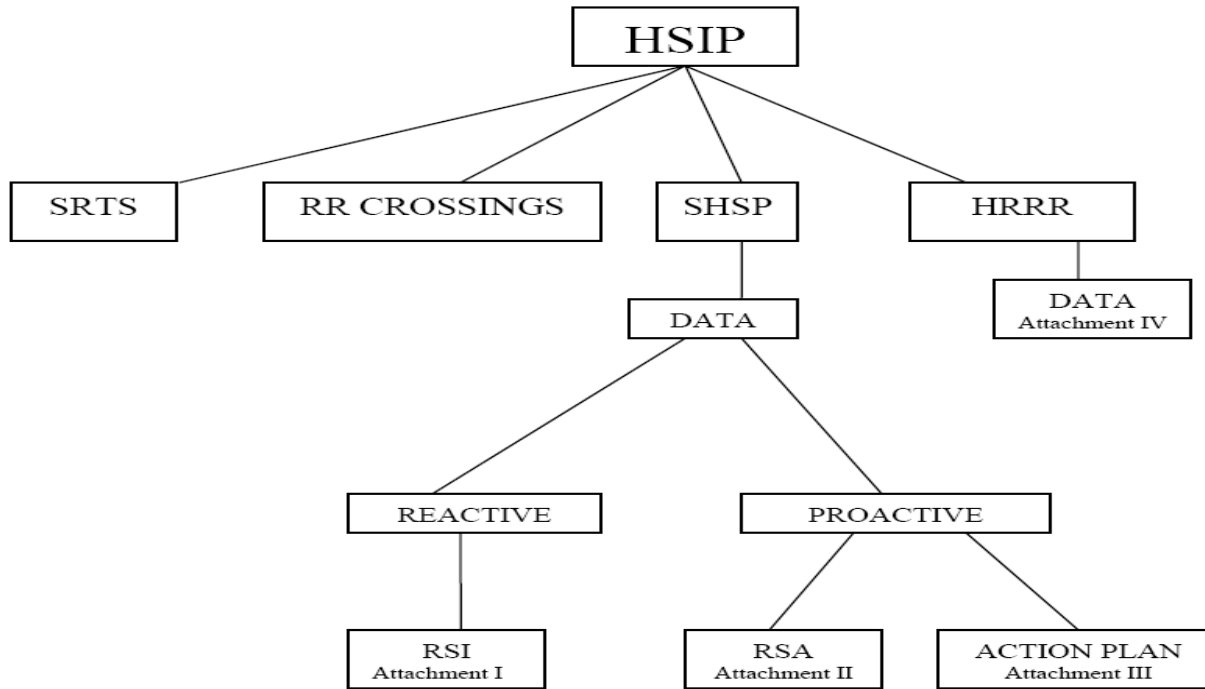
- SHSP Action Plan
  - 2. Roadway Departure Crash Countermeasures
    - Rumble Strips
    - Delineation
    - Edgeline Enhancements

# Strategic Highway Safety Plan (SHSP)

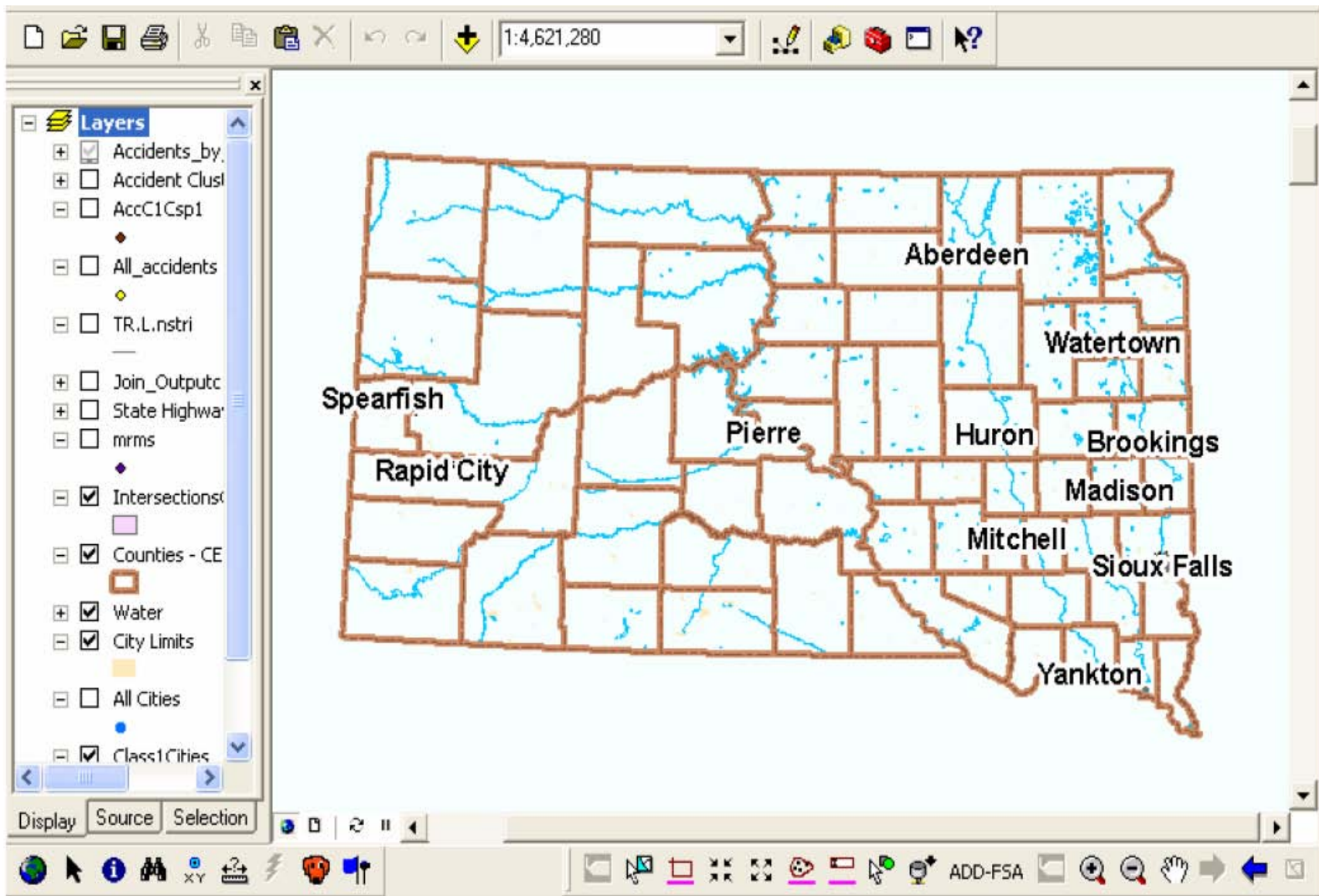
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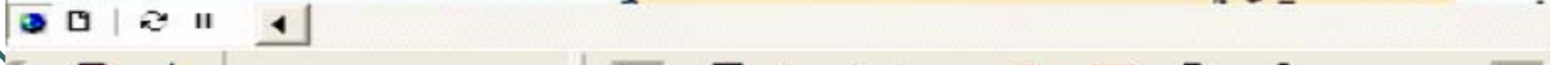
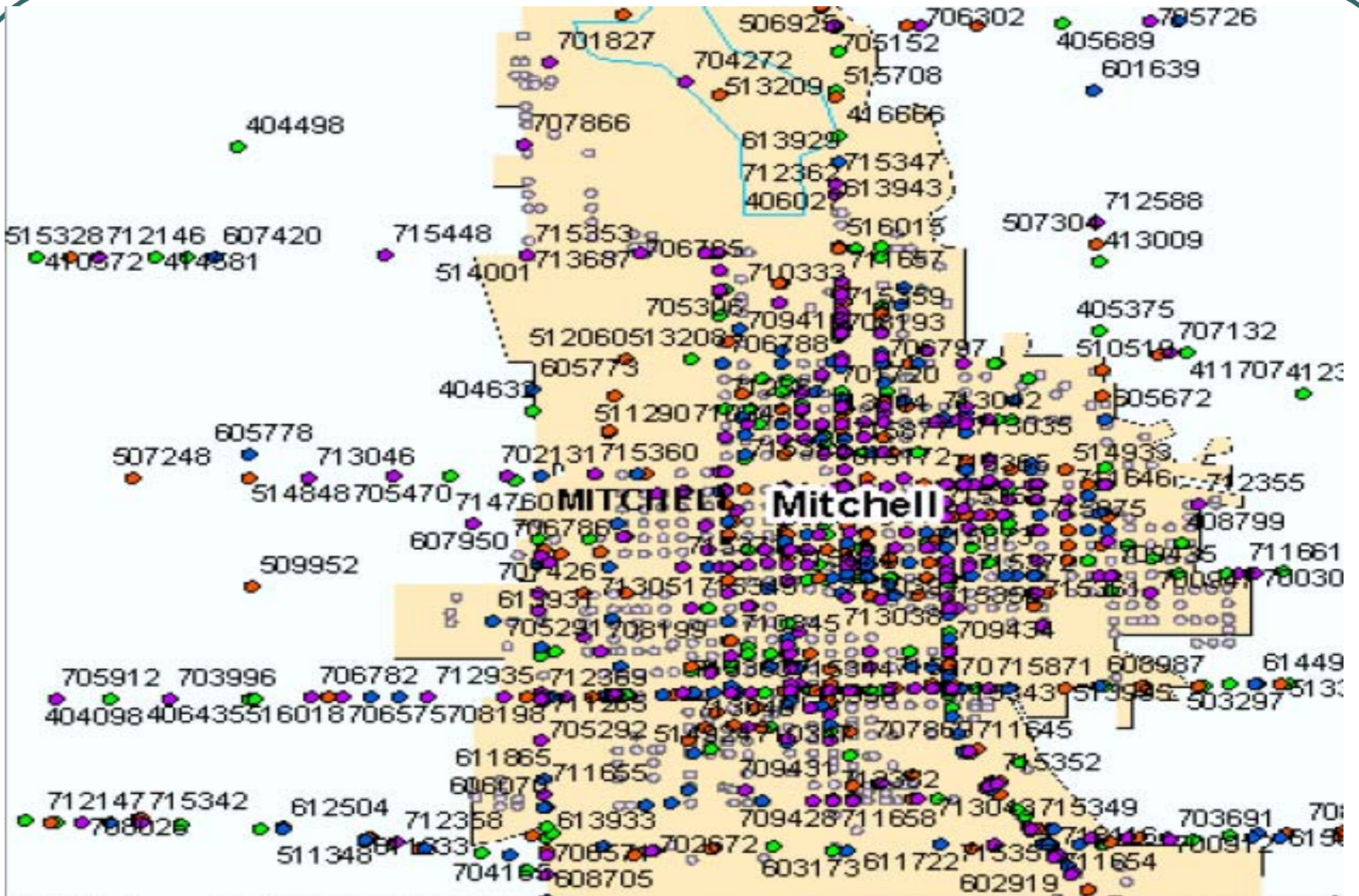
- SHSP Action Plan
  - 3. Prioritization
    - Functional Class
    - ADT
    - Crash Rate
    - Percent of Roadway Departure Compared to Total Crashes

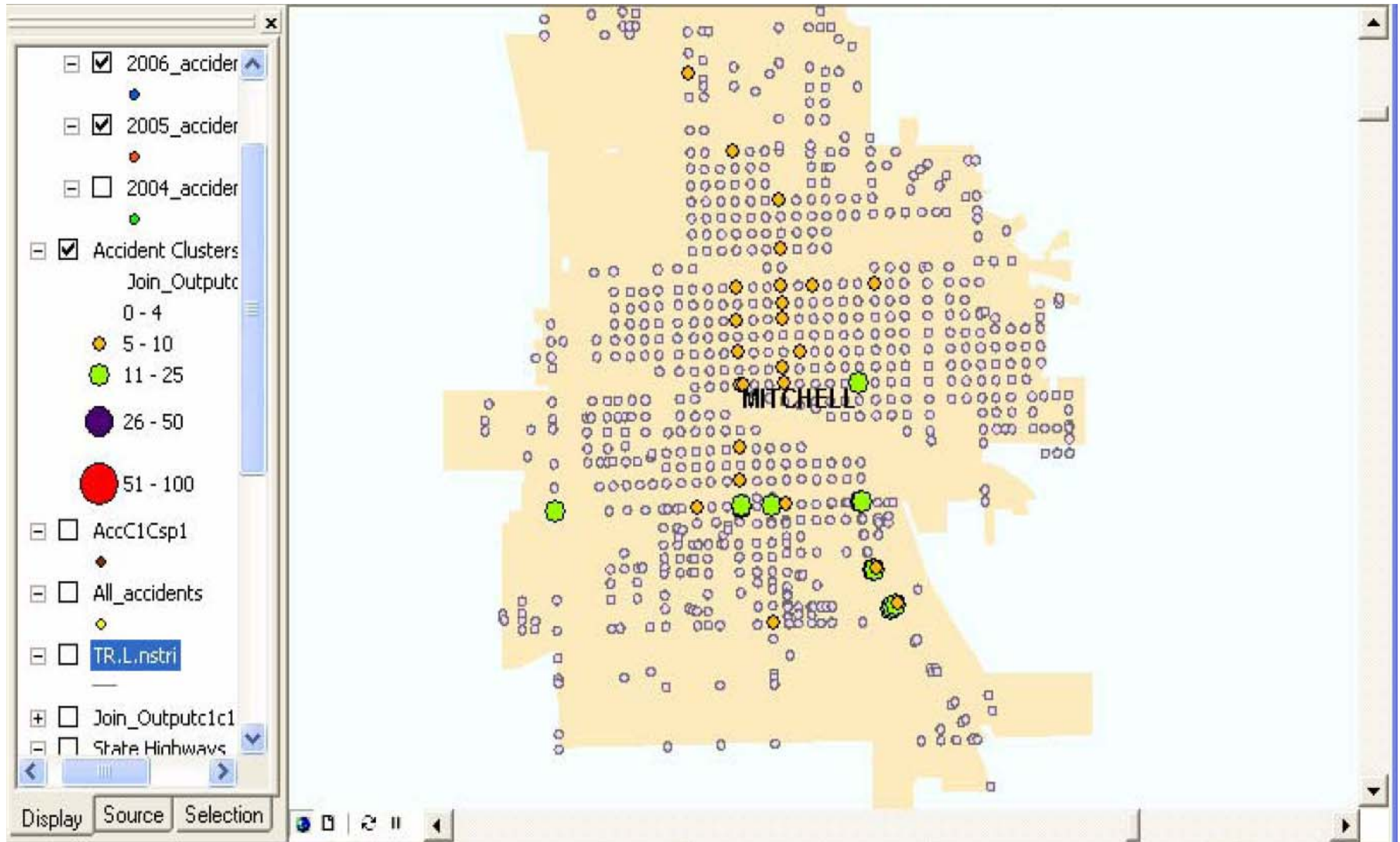


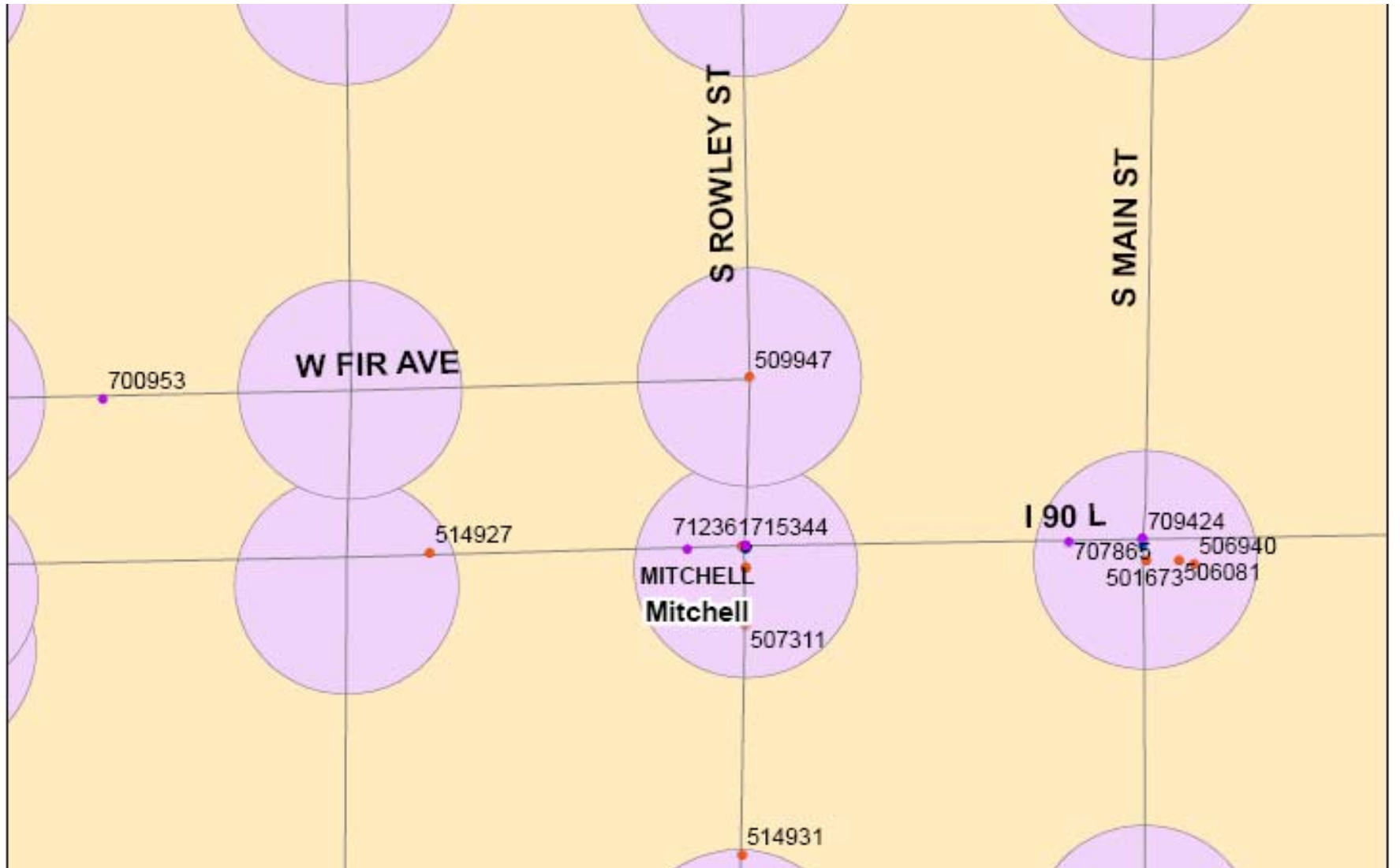


HSIP – Highway Safety Improvement Program  
 SRTS – Safe Routes To Schools  
 SHSP – Strategic Highway Safety Plan  
 HRRR – High Risk Rural Roads  
 RSI – Roadway Safety Improvement  
 RSA – Roadway Safety Audits









Mitchell - I 90L & S Rowley St

Date Range: 01/01/2005 Thru 12/31/2007

Accident Nbrs: 701714, 704611, 704616, 705302, 709426, 710338, 712361, 715344, 606066, 607117, 608389, 610138, 612499, 503716, 507311, 508950, 514094, 516019

**Accident Summary**

**Driver Contributing Circumstances**

Speed-Over Limit	Speed-Over Safe	Failure to Yield	18	Run Off Road	Distracted
Follow Too Close	Improper Passing	Wrong Side Road		Swerving/Avoiding	
Turn/Lane Change	Improper Signal	Improper Back/Park		Overcorrection	
Fell Asleep	Traffic Signal	Other		Cellular/Electronic	

**Surface Condition**

**Weather**

**Relation To Intersection**

Dry	15			Non-Intersection		Driveway	2
Wet	2	Clear	12	4 Way Intersection	16	Rail Crossing	
Ice / Frost		Rain		T Intersection		Cross Over	
Snow / Slush	1	Cloudy	6	Y Intersection		Other	
Other		Other		5 Way Intersection		Alley	
Sand/Dirt/Gravel	0			Intersection Relat		Bike path	
Unknown	0			Interchange		Unknown	0
Wild Animal	0			Wild Animal	0		

**Road Alignment**

**Driver Alcohol / Drugs**

**Vehicle Type**

Straight Level	18	Unknown	0	Alcohol	Car	26	Van/Bus
Straight Grade		Wild Animal	0	Drugs	Sport Utility Vehicle	2	Motorhome
Straight Crest				Both	Pickup	3	Single Unit Truck
Curve Level					Mini Van	4	Farm Machinery
Curve Grade					Cargo Van		Heavy Equipment
Curve Crest					Truck / Semi		Other
					Motorcycle	1	

Time	12	1	2	3	4	5	6	7	8	9	10	11	Total
AM								1				2	3
PM	1	1	2	4	5	1	1						15

**Accident Severity - Injury Totals**

**Lighting Conditions**

Fatality	Injury2	Injury3	Injury4	No Injury	Light	Dawn	Dusk	Not lighted	Lighted	Other
0	3	2		33	17				1	

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
	1		3	1	1	2	3	2	1	2	2	18

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	1	6	5	1	4	0

**Property Damage Estimate** \$111,079.00

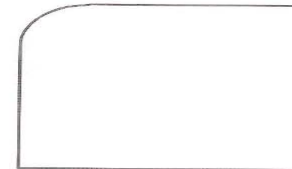
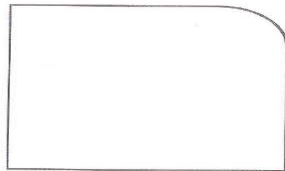
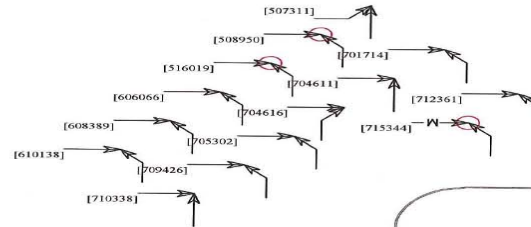
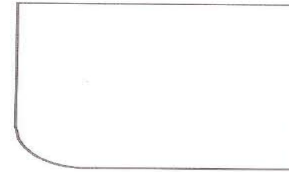
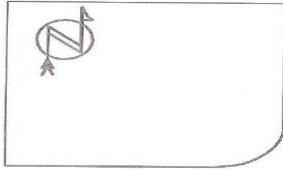
Mitchell - I 90L & S Rowley St

Date Range: 01/01/2005 Thru 12/31/2007

Accident Numbers:	701714, 704611, 704616, 705302, 709426, 710338, 712361, 715344, 606066, 607117, 608389, 610138, 612499, 503716, 507311, 508950, 514094, 516019					
503716	04/05/2005 1:01:00PM	Four-way intersection	090 L	333.00 +	0.36	PDO
507311	07/06/2005 4:41:00PM	Driveway access related		0.00 +	0.00	PDO
508950	08/03/2005 4:14:00PM	Four-way intersection	090 L	333.00 +	0.37	Injury
514094	12/02/2005 6:37:00PM	Four-way intersection	090 L	333.00 +	0.37	PDO
516019	12/30/2005 2:13:00PM	Four-way intersection	090 L	333.00 +	0.37	Injury
606066	06/11/2006 3:00:00PM	Four-way intersection	090 L	333.00 +	0.37	PDO
607117	07/05/2006 4:16:00PM	Four-way intersection	090 L	333.00 +	0.37	PDO
608389	08/18/2006 12:55:00PM	Four-way intersection	090 L	333.00 +	0.37	PDO
610138	09/26/2006 11:35:00AM	Four-way intersection	090 L	333.00 +	0.37	PDO
612499	11/07/2006 5:35:00PM	Four-way intersection	090 L	333.00 +	0.37	PDO
701714	02/06/2007 3:15:00PM	Four-way intersection	090 L	333.00 +	0.36	PDO
704611	04/12/2007 3:47:00PM	Four-way intersection	090 L	333.00 +	0.36	PDO
704616	04/23/2007 7:49:00AM	Driveway access	090 L	333.00 +	0.37	PDO
705302	05/16/2007 11:47:00AM	Four-way intersection	090 L	333.00 +	0.36	PDO
709426	08/21/2007 4:41:00PM	Four-way intersection	090 L	333.00 +	0.36	PDO
710338	09/18/2007 3:25:00PM	Four-way intersection	090 L	333.00 +	0.36	PDO
712361	10/31/2007 4:07:00PM	Four-way intersection	090 L	333.00 +	0.36	PDO
715344	11/16/2007 2:59:00PM	Four-way intersection	090 L	333.00 +	0.36	Injury

# Mitchell I 90L and S Rowley St

18 Crashes



- ← Straight
- ←↓ Stopped
- ←↑ Unknown
- ←↔ Backing
- ←↔↔ Overtaking
- ←↔↔ Sideswipe

(O) crashes could not be placed in this schematic

- ▭ Parked
- ←↔ Erratic
- ←↔ Out of control
- ↗ Right turn
- ↖ Left turn
- ↻ U-turn

- × Pedestrian
- ⊗ Bicycle
- Injury
- ⊙ Fatality
- 💡 Nighttime
- ⚠ DUI

**Fixed objects:**

- General
- ⊞ Signal
- ⊞ Tree
- ⊞ Pole
- ⊞ Curb
- ⊞ Animal
- ◁ 3rd vehicle
- \* Extra data

Pd' Programming, Inc. 01/20/2009



# Crash Rate

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$$R = \frac{2 (A) (1,000,000)}{(T) (V)}$$

- R = Accident rate expressed in accidents per Million entering vehicles.
- A= Number of accidents during days of study.
- T= Time period in days.
- V= Total average daily traffic entering and departing the intersection.

# Crash Rate

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- $A = 18$  Accidents (3yrs)
- $T = 365 \text{ days/yr} \times 3 \text{ yrs} = 1095 \text{ days}$
- $V = \text{ADT Entering \& Leaving} - 25,435$   
ADT

# Crash Rate

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$$R = \frac{2 (18) (1,000,000)}{1095 (25,435)}$$

$$R = \frac{36,000,000}{27,851,325}$$

R = 1.29 Accidents Per Million Entering  
Vehicles

**BENEFIT/COST ANALYSIS**  
**PROJECT NAME: Mitchell - I90 Loop & Rowley**

Variables		Constants	
Const. Improve. Cost	\$636,000	* Fatal Accident Cost	\$62,925
Annual O & M Before	750	* Injury Accident Cost	\$62,925
Annual O & M After	500		
Number Fatal Accidents	0		
Number of Injury Accds.	3	* Prop. Damage Acc. Cost	\$62,925
Number of Fatalities	0	Services Life	20
Number of Injuries	5	Salvage Value	0
Number Prop. Damage Acc's	15	Interest Rate	10%
Accdt. Reduct. Factr	0.40		
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Capital Recovery	0.117	Present Worth Fctr	0.149
Sinking Fund	0.017	Present Worth Fctr Ser	8.514
EUAB	151020.00	PWOB	1285718.39
EUAC	74454.32	PWOC	633871.61
# B/C = EUAB/EUAC =	2.03	B/C = PWOB/PWOC =	2.03

This analysis is based on accident reports on file in the DOT Office of Accident Records for a three year period from January 1, 2005 through December 31, 2007

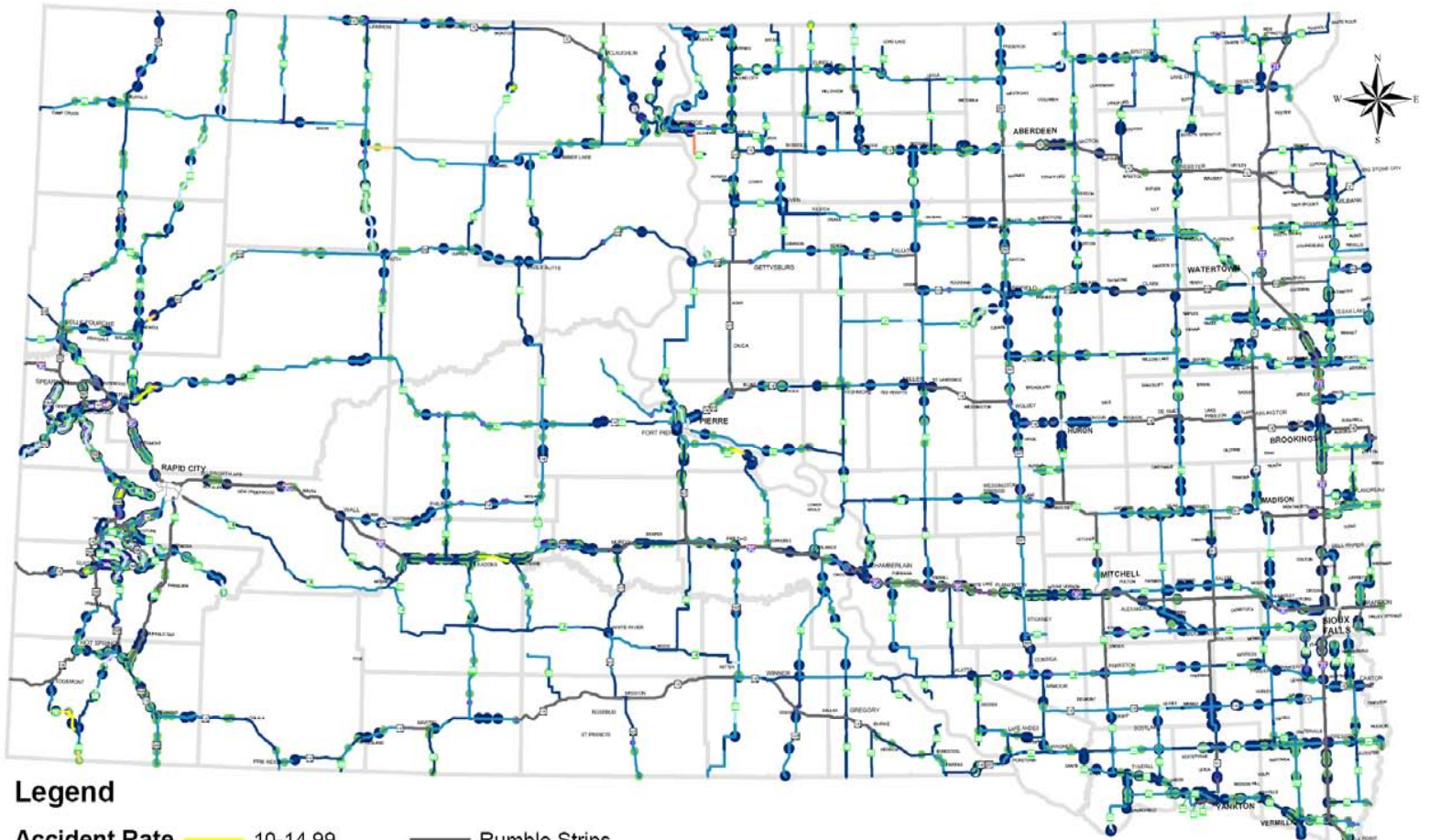
This analysis is based on realignment of the intersection and installation of signal.

Cliff Reuer..... February 17, 2009

\* RATES CALCULATED BY ROADWAY SYSTEM USING 3 YEAR ACCIDENT EXPERIENCE AND THE FOLLOWING FORMULA:

DEATHS \* \$3,200,000 +inc-injuries\*\$220,000+non-inc\*\$45,500+possible\*\$24,400+pdo\*\$2,600  
 fatal accid + inc-injury accid + non-inc accid + possible injury accid + property damage only accid

# Accident Rates for Roadways Without Rumble Strips



## Legend

Yellow line	10-14.99	Black line	Rumble Strips
Dark blue line	0-0.99	Purple dot	Rollovers on Roadway
Light blue line	1-4.99	Green dot	Rollovers off Roadway
Orange line	15-19.99	Blue dot	Fixed Objects off Roadway
Red line	20-20.99		
Dark red line	Greater than 30		

Prepared by  
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 Office of  
 Transportation Inventory Management  
 in cooperation with the  
 U.S. Department of Transportation  
 Federal Highway Administration

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RAPID CITY

44

385

HILL CITY

16

79

KEYSTONE

244

40

16

HERMOSA

385

89

87

16A

36

STER

16A

40

FAIRBURN

