

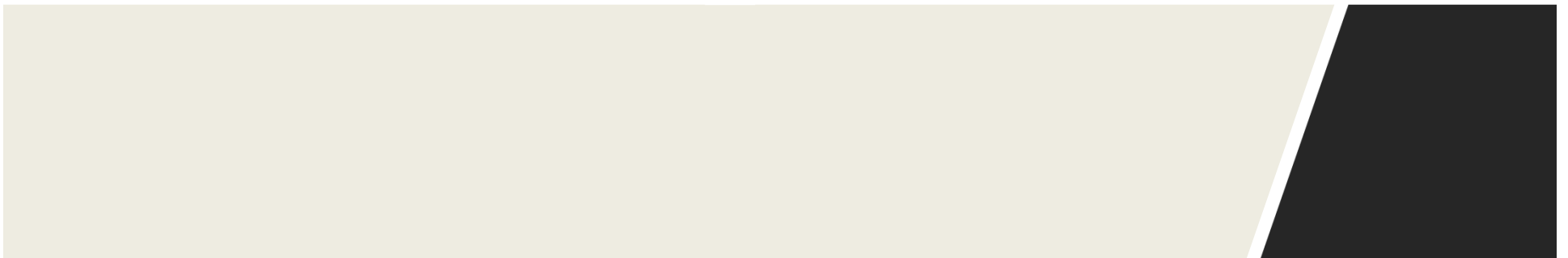
The Power Combination: Roadsoft & the Safety Application

Alexander Patsy, P.E. – Genesee County Road Commission

Pam Blazo, P.E. – Michigan DOT

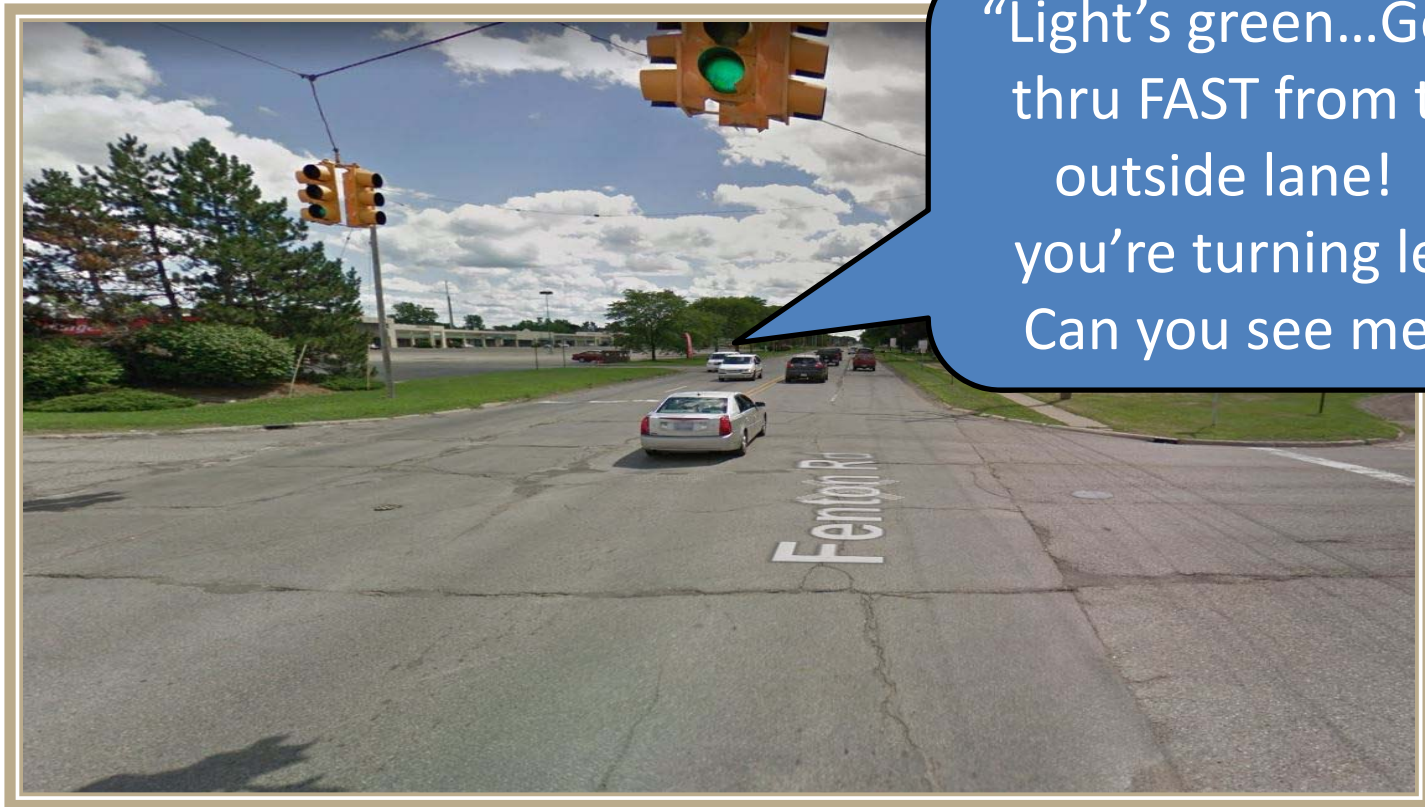
Presentation Outline

- Identify Potential Problems
- Requirements of the Safety Application
- Analyze Crash Frequency / Severity
- Double Check all UD 10's!
- Intersection Ranking
- Corridor Ranking



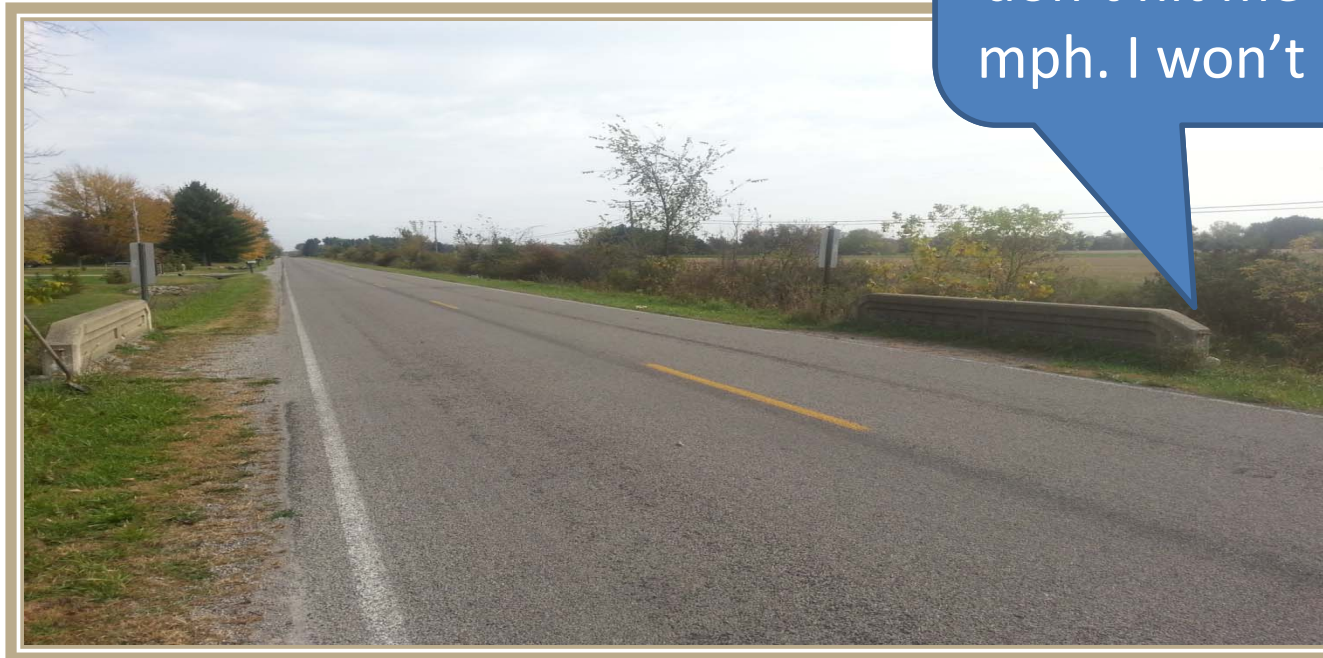
Identify Potential Problems

Non-Headed up Left Turn Lanes at Intersections



Identify Potential Problems

Non Break-away Items



I've been here a long time...Please don't hit me at 55+ mph. I won't move!

4 Lane Corridors w/ Heavy Left Turning Potential

“I need to brake fast to turn left here!...is anyone behind this pick-up truck...and is someone behind me?”



Identify Potential Problems

Hidden Signal Heads

I'm a signal ahead. Can you see me?

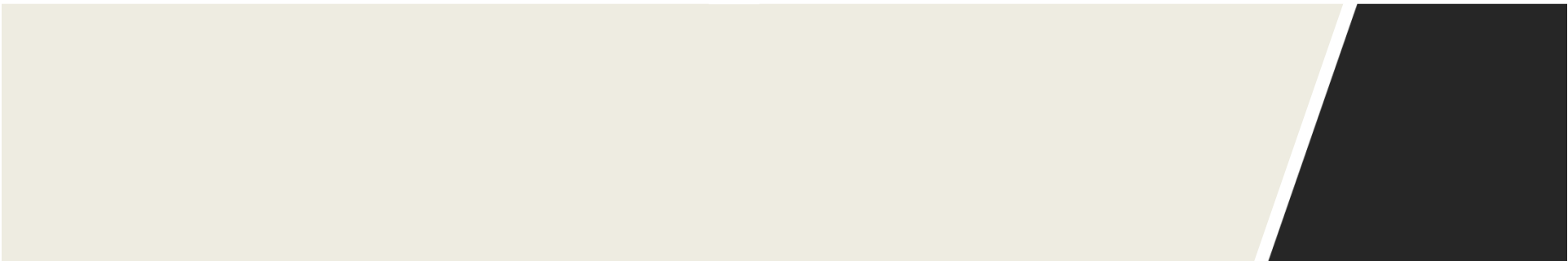


Identify Potential Problems

Horizontal Curves



Safety Application

- Synopsis of Existing Conditions
 - Proposed Fix via. MDOT Standards (AASHTO)
 - Engineer's Estimate (MERL)
 - Rate of Return Analysis (or HSM) (MDOT)
 - **Crash History, Rankings & Statistics (Roadsoft)**
 - **UD-10's (Roadsoft)**
- 



Using Roadsoft to Analyze Crash Frequency



2 Main Project Types for HSIP funding

Spot Location

Systemic

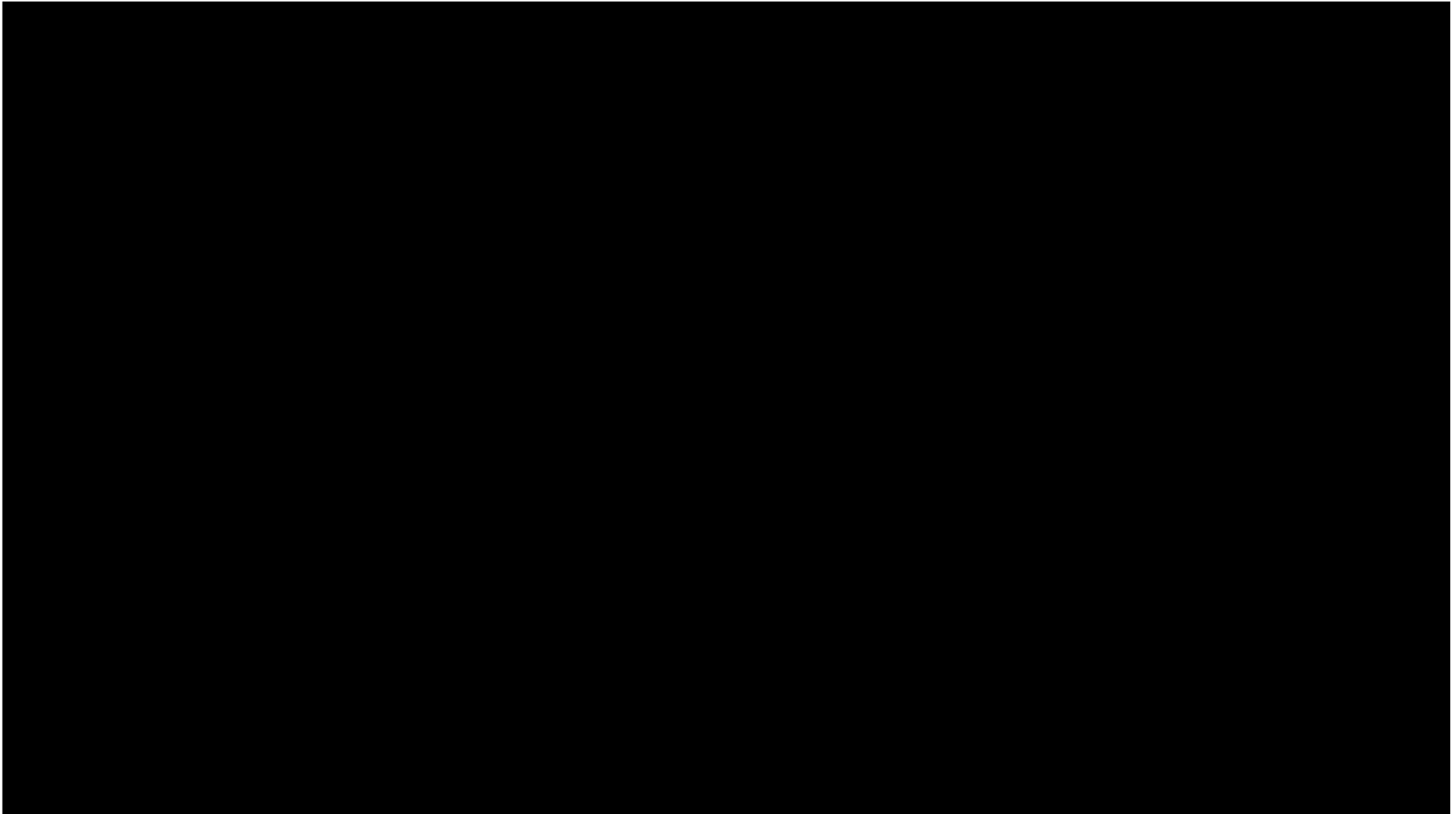


Spot Locations

Use Ranking Tools

- Intersection Ranking
- Segment Ranking

Intersection Ranking



Ranked by Total crashes

Ranked by K/A crashes

Legend: Contains a Trunkline Leg

Intersection Name
Caldwell Ave & Mackin Rd
N Dort Hwy & E Carpenter Rd
Dupont St & W Carpenter Rd
W Court St & S Linden Rd
W Vienna Rd & S I 75/Vienna RAMP
WB Vienna/SB I 75 RAMP & W Vienna R
E Mount Morris Rd & N State Rd & State F
S Saginaw St & Klein St & W Klein St
S Saginaw St & Saginaw/N I 475 RAMP
E Pierson Rd & North St
Lawndale Ave & Forest Hill Ave
Forest Hill Ave & Welch Blvd
S I 475/Kearsley RAMP & S I 475
S Dort Hwy & S Saginaw Rd
Whitehouse Dr & Beecher Rd

Crash Intersection Ranking

Filter

Columns

Run Ranking

Sort By

First Sort (#1)

Total Crashes

Order By

☐ Ascending
 ☒ Descending

Second Sort (#2)

Fatal/A Crashes

Order By

☐ Ascending
 ☒ Descending

Third Sort (#3)

Township

Other Settings

of Frozen Columns

0

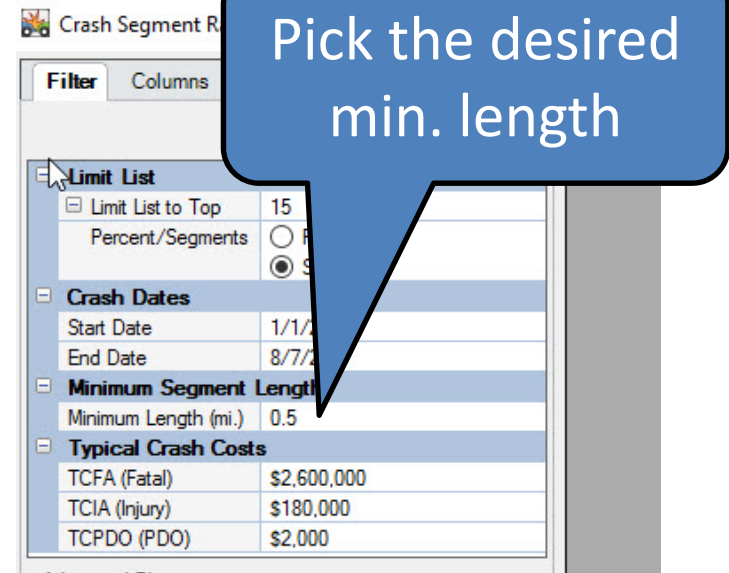
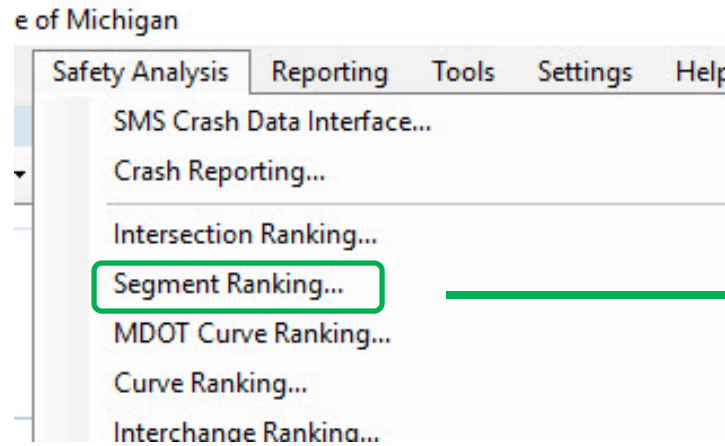
Field Name	Description
Intersection Name	Intersection Name
Township	City/Township
County	County
Total Crashes	Total Crashes

Legend: Contains a Trunkline Leg

Intersection Name	Township	County	Total Crashes
Corunna Rd & S Linden Rd	Flint Twp	Genesee	170
E Court St & S Center Rd	Flint	Genesee	163
E Hill Rd & W Hill Rd & Fenton Rd	Mundy Twp	Genesee	147
Lapeer Rd & S State Rd	Davison Twp	Genesee	146
Corunna Rd & S Ballenger Hwy	Flint	Genesee	144
S Dort Hwy & E Court St	Flint	Genesee	126
N Linden Rd & W Pierson Rd	Mt Morris Twp	Genesee	122
Miller Rd & S Linden Rd	Flint Twp	Genesee	120
Fenton Rd & W Bristol Rd & E Bristol Rd	Flint Twp	Genesee	114
S Linden Rd & Lennon Rd	Flint Twp	Genesee	112
E Bristol Rd & S Grand Traverse St	Burton	Genesee	112
Dort Hwy & E Grand Blanc Rd	Grand Blanc Twp	Genesee	112
S Saginaw Rd & E Hill Rd	Grand Blanc Twp	Genesee	109
N Grand Traverse St & W 5th Ave	Flint	Genesee	105
Corunna Rd & S Graham Rd	Flint Twp	Genesee	105

Intersection Ranking

Segment Ranking



Crash Segment Ranking

Filter Columns

Run Ranking

Sort By

First Sort (#1) TotalCrashes

Order By

Ascending

Descending

Second Sort (#2) ControlSection

Third Sort (#3) City

Other Settings

of Frozen Columns 0

SegmentName	PRNo	BMP	EMP	CSBmp	CSEmp	FromDesc	ToDesc	Length	CrashesPerMile	TotalCrashes
W Hill Rd	1519809	7.826	8.449	0.000	0.000	Bertolozzi Dr	E Hill Rd & Fenton Rd	0.623	205.46	128
Silver Pkwy	3251870	0.000	0.912	0.000	0.000	W Silver Lake Rd & Foley Glen Dr	Jennings Rd	0.912	98.68	90
W Vienna Rd	1494503	6.905	7.906	6.905	7.813	Webster Rd	Linden Rd	1.001	81.92	82
S I 75	1503107	11.318	11.916	0.000	0.598	Miller Rd	S I 75/ 69 And Miller RAMP	0.598	137.12	82
S I 75	1503107	13.452	14.594	2.134	3.052	Beecher Rd	Flushing Rd	1.142	65.67	75
N I 75	1497804	13.567	14.703	2.124	3.042	Beecher Rd	Flushing Rd	1.136	65.14	74
N US 23	1502907	4.369	5.781	4.369	5.123	Lahring Rd	N I 75/Thompson RAMP	1.412	50.99	72
Lapeer Rd	1495003	5.514	6.522	0.000	0.000	S Vassar Rd	S Irish Rd	1.008	70.44	71
S US 23	1502707	4.370	5.782	4.370	5.124	Lahring Rd	Thompson/S I 75 RAMP	1.412	48.87	69
Lapeer Rd	1495003	8.462	9.011	0.000	0.000	S State Rd	Russell Alger Dr	0.549	114.75	63
N I 75	1497804	11.546	12.305	0.103	0.601	Miller/N I 75 RAMP	Augusta St	0.759	83.00	63
N I 75	1497804	12.867	13.567	1.424	2.124	W Court St	Beecher Rd	0.700	85.71	60
S State Rd	1501502	6.472	7.463	6.472	7.370	E Maple Ave	E Bristol Rd	0.991	59.54	59
Dort Hwy	1497008	0.852	1.451	0.852	1.451	E Grand Blanc Rd	Tri Park Dr	0.599	98.50	59
N US 23	1502907	10.712	11.582	10.712	10.734	US 23 Crossover	N I 75/Hill RAMP	0.870	66.67	58

SegmentName	PRNo	BMP	EMP	CSBmp	CSEmp	FromDesc	ToDesc	Length	CrashesPerMile	TotalCrashes
W Vienna Rd	1494503	6.905	7.906	6.905	7.813	Webster Rd	Linden Rd	1.001	81.92	82
S I 75	1503107	13.452	14.594	2.134	3.052	Beecher Rd	Flushing Rd	1.142	65.67	75
N I 75	1497804	13.567	14.703	2.124	3.042	Beecher Rd	Flushing Rd	1.136	65.14	74
N US 23	1502907	4.369	5.781	4.369	5.123	Lahring Rd	N I 75/Thompson RAMP	1.412	50.99	72
Lapeer Rd	1495003	5.514	6.522	0.000	0.000	S Vassar Rd	S Irish Rd	1.008	70.44	71
S US 23	1502707	4.370	5.782	4.370	5.124	Lahring Rd	Thompson/S I 75 RAMP	1.412	48.87	69
N US 23	1502907	7.742	8.812	7.742	8.610	US 23 Crossover	Torrey Rd	1.070	53.27	57
W Vienna Rd	1494503	5.887	6.905	5.887	6.905	Elms Rd	Webster Rd	1.018	54.03	55
N Holly Rd	1497809	0.000	1.002	0.000	0.000	Ray Rd	E Baldwin Rd & Holly Rd	1.002	54.89	55
N US 23	1502907	6.431	7.442	6.431	7.442	City/Twp Line	W Baldwin Rd	1.011	54.40	55
W Baldwin Rd	1519309	10.058	11.698	0.000	0.000	Torrey Rd	N Fenton Rd & Fenton Rd	1.640	29.27	48
S US 23	1502707	3.355	4.370	3.355	3.700	US 23 Crossover	Lahring Rd	1.015	46.31	47
S State Rd	1501502	5.421	6.472	5.421	6.207	Hill Rd & State Rd	E Maple Ave	1.051	43.77	46
Seymour Rd	1509803	0.702	2.125	0.000	0.000	Cole Rd	Rolston Rd & W Rolston Rd	1.423	31.62	45
N I 75	1497804	3.686	4.729	3.686	4.729	Dort Hwy	I 75 Crossover	1.043	43.14	45

Print Report
 Export as File
 Trend Analysis
 View Crashes
 Close

- Highlight the desired segment
- Click on 'View Crashes'
- Opens Crash Grid view

Segment Ranking

Crash Grid

Segment: Lapeer Rd - From: S Vassar Rd To: S Irish Rd

Filter	Columns	PR MP	Road Name	CrashType	GreatestInjSev	UD10	CrashYear	CrashDate	AreaType	AreaCode	Fatals	A Injuries
	Sort By First Sort (#1) Order By CrashDate Ascending Second Sort (#2) Order By A Injuries Descending Third Sort (#3) Order By GreatestInjSev Descending Other Settings # of Frozen Columns 0	6.511	Lapeer Rd	Rear End Straight	No Injury	8288649	2012	2012-01-07	Intersection area	Other Intersection Related	0	0
		6.499	Lapeer Rd	Rear End Straight	Possible Injury	8260584	2012	2012-01-23	Intersection area	Other Intersection Related	0	0
		6.272	Lapeer Rd	Rear End Straight	No Injury	8286087	2012	2012-02-25	Midblock	Straight Roadway, Not Related to Others	0	0
		5.814	Lapeer Rd	Fixed Object	No Injury	8337662	2012	2012-05-13	Midblock	Straight Roadway, Not Related to Others	0	0
		6.522	Lapeer Rd	Head-On Left-Turn Not Associated with Driveway	No Injury	8347661	2012	2012-05-28	Intersection area	Within Intersection	0	0
		6.014	Lapeer Rd	Rear End Straight	No Injury	8361404	2012	2012-06-12	Midblock	Straight Roadway, Not Related to Others	0	0
		6.517	Lapeer Rd	Fixed Object	No Injury	8428719	2012	2012-09-18	Intersection area	Other Intersection Related	0	0
		6.518	Lapeer Rd	Head-On Left-Turn Not Associated with Driveway	No Injury	8434024	2012	2012-09-21	Intersection area	Within Intersection	0	0
		5.703	Lapeer Rd	Rear End Right Turn	No Injury	8455934	2012	2012-10-20	Midblock	Driveway Related Not Within 150 ft of Intersection	0	0
		5.515	Lapeer Rd	Head-On Left-Turn Not Associated with Driveway	No Injury	8478023	2012	2012-11-11	Intersection area	Within Intersection	0	0
		5.517	Lapeer Rd	Rear End Straight	No Injury	8478021	2012	2012-11-11	Intersection area	Other Intersection Related	0	0
		6.272	Lapeer Rd	Rear End Driveway	Possible Injury	8480931	2012	2012-11-16	Midblock	Driveway Related Not Within 150 ft of Intersection	0	0
		6.520	Lapeer Rd	Head-On Left-Turn Not Associated with Driveway	Possible Injury	8494710	2012	2012-11-22	Intersection area	Within Intersection	0	0
		6.520	Lapeer Rd	Head-On Left-Turn Not Associated with Driveway	No Injury	8491498	2012	2012-11-25	Intersection area	Within Intersection	0	0
		5.515	Lapeer Rd	Angle Straight	Possible Injury	8563378	2013	2013-02-03	Intersection area	Within Intersection	0	0
		6.513	Lapeer Rd	Rear End Straight	Possible Injury	8691715	2013	2013-08-04	Intersection area	Other Intersection Related	0	0
		6.222	Lapeer Rd	Other Object	No Injury	8698243	2013	2013-08-14	Midblock	Straight Roadway, Not Related to Others	0	0
		6.509	Lapeer Rd	Angle Turn	No Injury	8717243	2013	2013-09-08	Intersection area	Other Intersection Related	0	0
		5.522	Lapeer Rd	Rear End Straight	No Injury	8720811	2013	2013-09-09	Intersection area	Other Intersection Related	0	0
		6.022	Lapeer Rd	Misc. Single Vehicle	Non-Incapacitating Injury	8718692	2013	2013-09-12	Midblock	Straight Roadway, Not Related to Others	0	0
		6.370	Lapeer Rd	Fixed Object	Possible Injury	8727757	2013	2013-09-21	Midblock	Straight Roadway, Not Related to Others	0	0
		5.764	Lapeer Rd	Fixed Object	No Injury	8747080	2013	2013-10-17	Midblock	Straight Roadway, Not Related to Others	0	0
		6.014	Lapeer Rd	Animal	No Injury	8776605	2013	2013-11-13	Midblock	Straight Roadway, Not Related to Others	0	0
		6.014	Lapeer Rd	Animal	No Injury	8808503	2013	2013-12-11	Midblock	Straight Roadway, Not Related to Others	0	0
		6.427	Lapeer Rd	Angle Driveway	No Injury	8831607	2013	2013-12-27	Intersection area	Driveway Related Within 150 ft of Intersection	0	0
		6.518	Lapeer Rd	Angle Straight	No Injury	8831615	2013	2013-12-28	Intersection area	Within Intersection	0	0
		5.764	Lapeer Rd	Rear End Straight	No Injury	8834872	2014	2014-01-02	Midblock	Straight Roadway, Not Related to Others	0	0
		5.723	Lapeer Rd	Side-Swipe Opposite	No Injury	8834874	2014	2014-01-06	Midblock	Straight Roadway, Not Related to Others	0	0

0 Crashes in Queue

71 Crashes

View UD-10s Export as File Generate Reports Trend Analysis Apply as Selection

2013-12-27	Intersection area	Driveway Related Within 150 ft of Intersection	0	0
2013-12-28	Intersection area	Within Intersection	0	0
2014-01-02	Midblock	Straight Roadway, Not Related to Others	0	0
2014-01-06	Midblock	Straight Roadway, Not Related to Others	0	0

View UD-10s Export as File Generate Reports Trend Analysis Apply as Selection Close

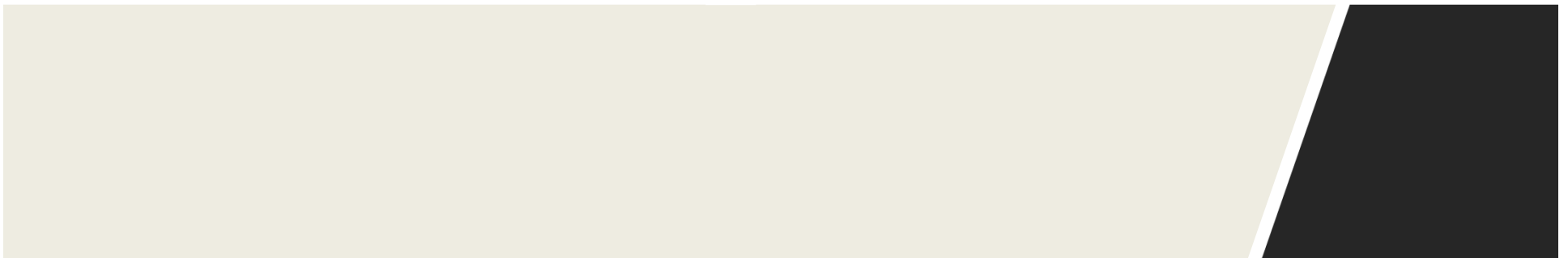


Viewing crash reports

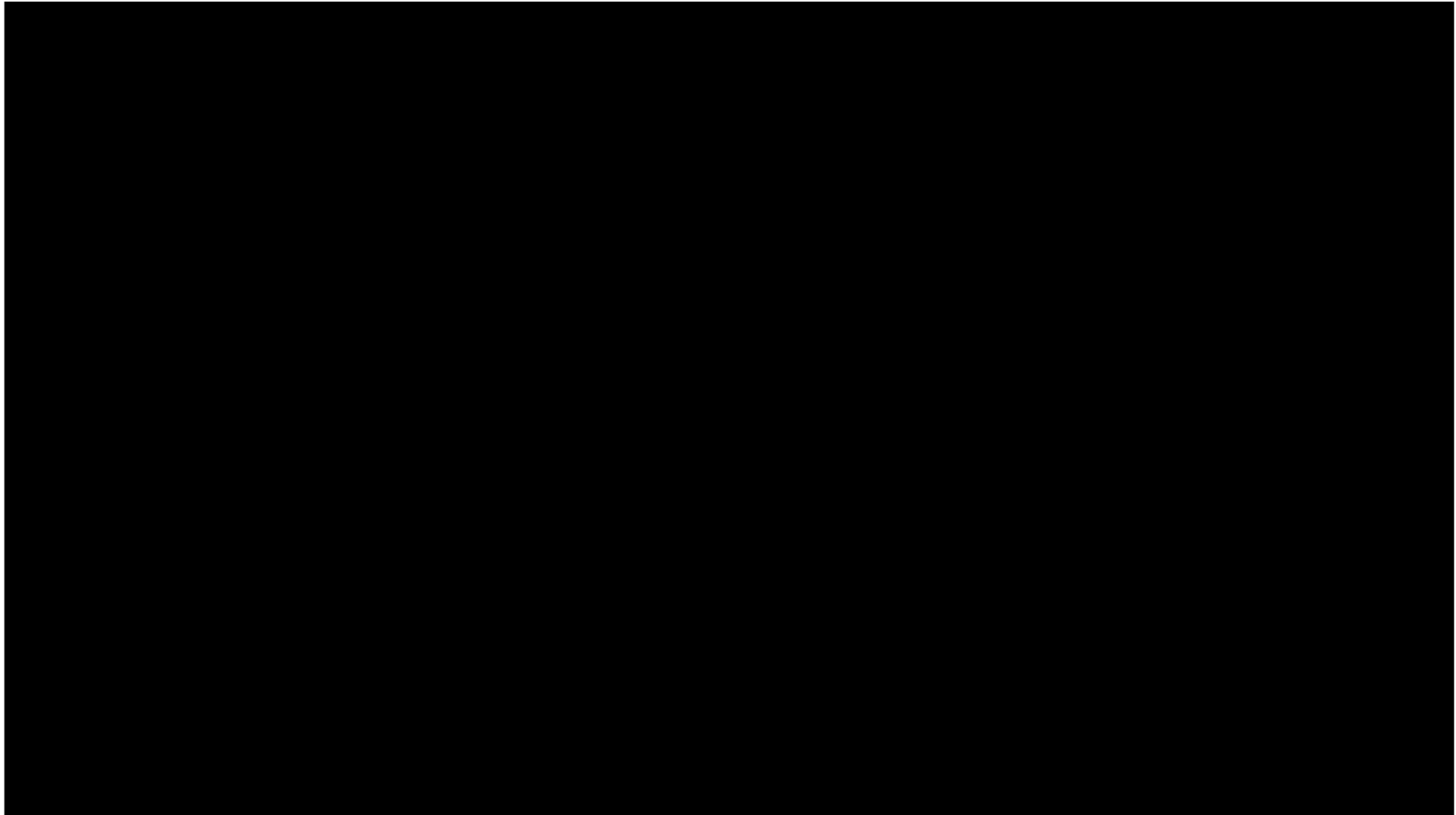


Double Check Your UD-10's

- Are crashes relevant to the proposed fix?
- Are they correctly recorded by crash type?
- What are the injury types?
- Was the crash recorded at the proper location?
- Was the UD-10 filed at the proper location?



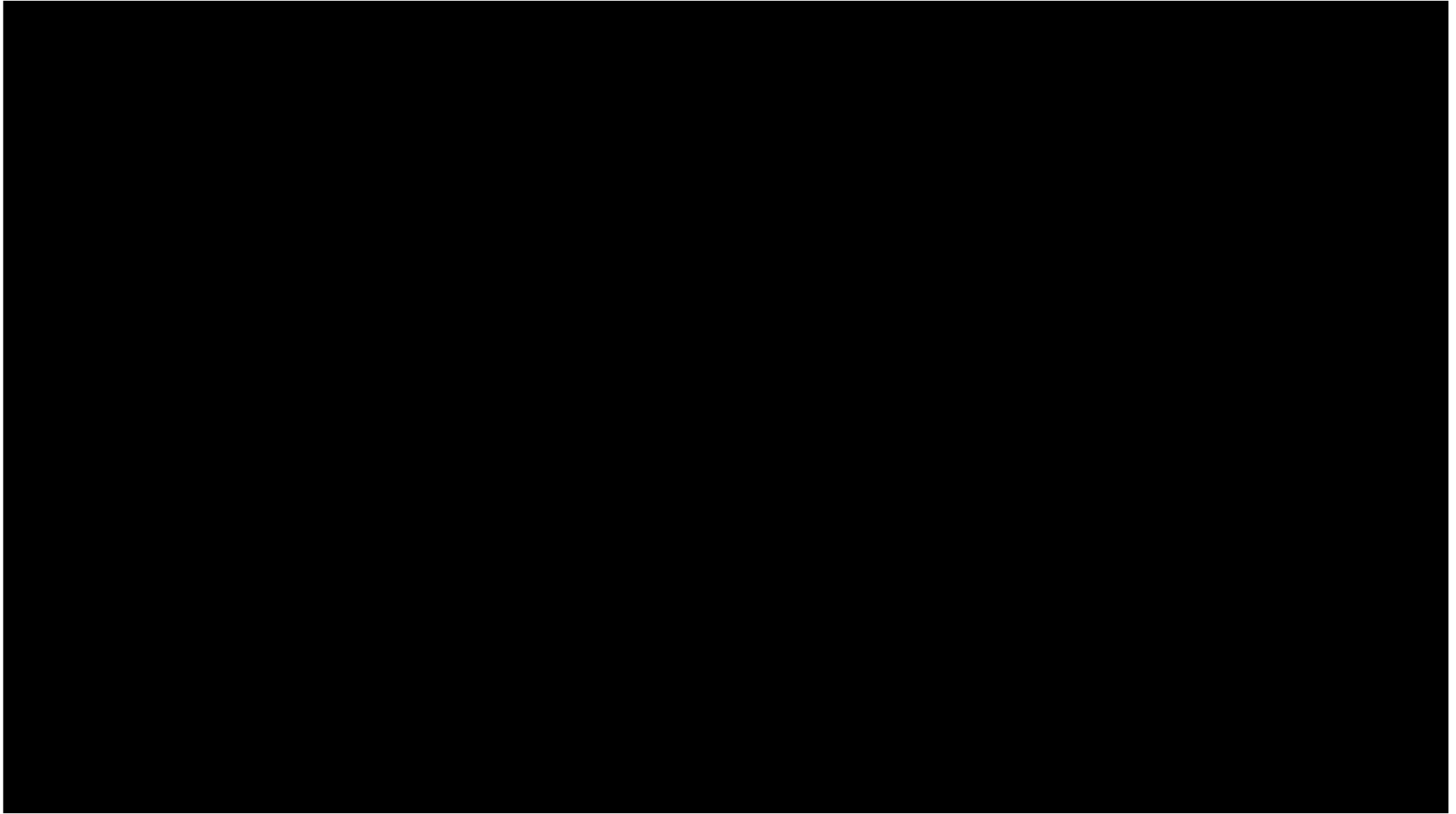
Using the Queue



The background of the slide features three overlapping circles in a medium blue color, set against a dark gray background. The circles are arranged horizontally, with the middle circle overlapping the other two. A horizontal light beige band runs across the center of the image, containing the title text.

Exporting to Google Earth

Roadsoft to Google Earth

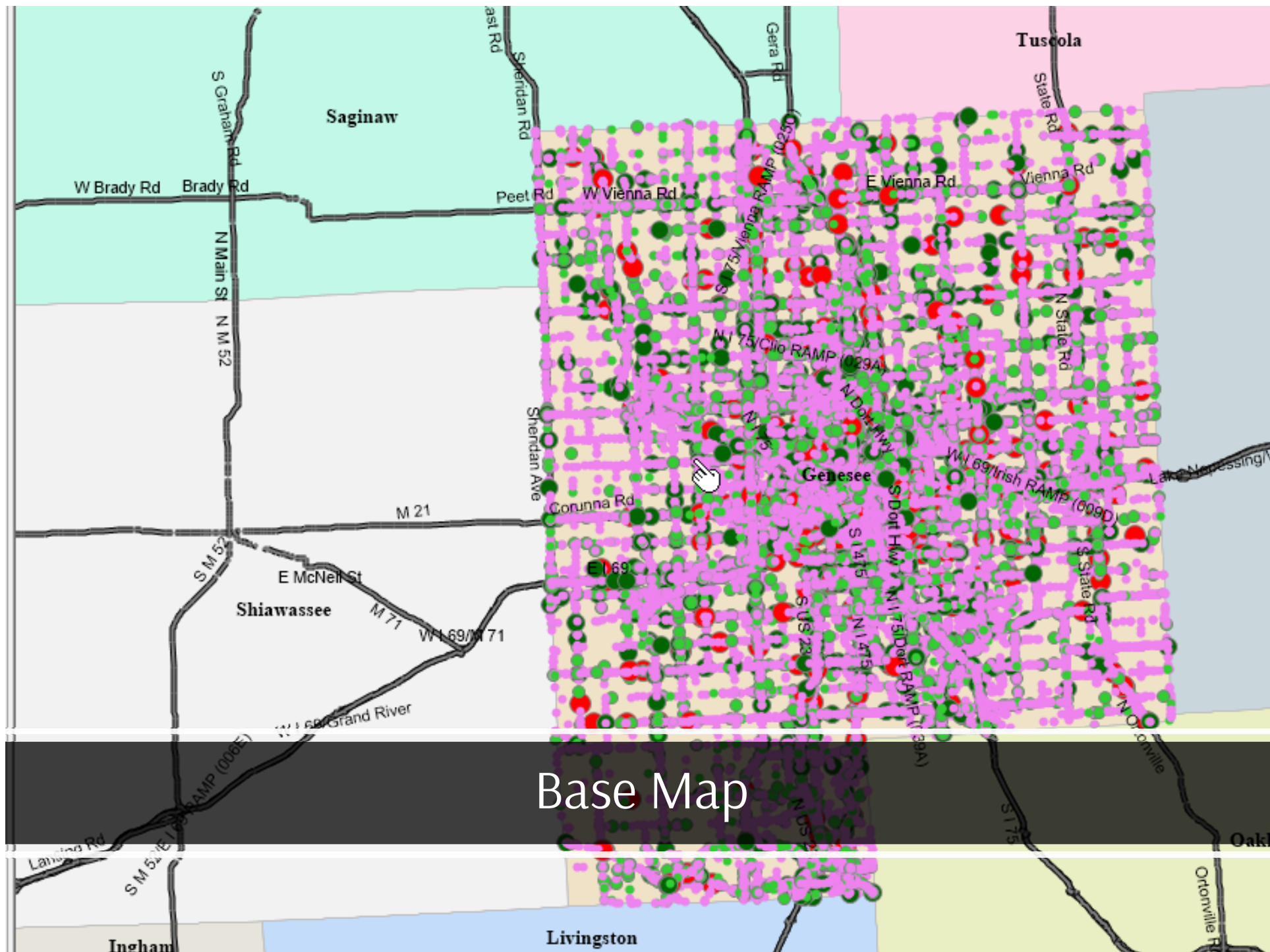


Combine ranking tools with Filters

Specific crash type

Specific countermeasure

Systemic Projects



Base Map

Angle Crashes with Injuries at Intersections

Filter based on
crash type

Crash Layer Filter Builder

Open Save Delete Clear

Crash

Find field...

Field

Crash Type

Damaged Public Property

Greatest Injury Severity

Lane Departure

Number of Fatalities

Operator:

Value:

Angle Driveway

Angle Straight

Angle Turn

Animal

Backing

Bicycle

Fixed Object

Head-on

Head-On Left Turn Driveway

Head-On Left-Turn Not Associated with Driveway

Add

Group:

1

Group	Field	Operator	Value(s)
1	Crash County	=	Genesee
1	Crash Type	=	Angle Driveway or Angle Straight or Angle Turn

Criteria

Crash County = Genesee

Crash Type = Angle Driveway or Angle Straight or Angle Turn

19428 crash(es) found (animal crashes included)

Apply as Filter Append to Selection Replace Selection

19,428 crashes

Angle Crashes with Injuries at Intersections

Filter based on
crash year

Crash Layer Filter Builder

Open Save Delete Clear

Crash Time

Find field...

Field

Hour of Crash

Month of Crash

Past X Years

Weekday of Crash

Year of Crash

Operator:

Value:

Add

Group:

1

Group	Field	Operator	Value(s)
1	Crash County	=	Genesee
1	Crash Type	=	Angle Driveway or Angle Straight or Angle Turn
1	Year of Crash	=	2016 or 2015 or 2014 or 2013 or 2012

Criteria

Crash County = Genesee

Crash Type = Angle Driveway or Angle Straight or Angle Turn

Year of Crash = 2016 or 2015 or 2014 or 2013 or 2012

8391 crash(es) found (animal crashes included)

Apply as Filter Append to Selection Replace Selection

8,391 crashes

Angle Crashes with Injuries at Intersections

Filter based on
greatest injury
severity

Crash Layer Filter Builder

Open Save Delete Clear

Crash

Find field...

Field	Operator	Value
Crash Type	=	Incapacitating Injury
Damaged Public Property	=	Killed
Greatest Injury Severity	=	No Injury
Lane Departure	=	Non-Incapacitating Injury
Number of Fatalities	=	Possible Injury
	=	Uncoded & Errors

Group: 1

Group	Field	Operator	Value(s)
1	Crash County	=	Genesee
1	Crash Type	=	Angle Driveway or Angle Straight or Angle Turn
1	Year of Crash	=	2016 or 2015 or 2014 or 2013 or 2012
1	Greatest Injury Severity	=	Incapacitating Injury or Killed or Non-Incapacitating Injury or Possible Injury

Criteria

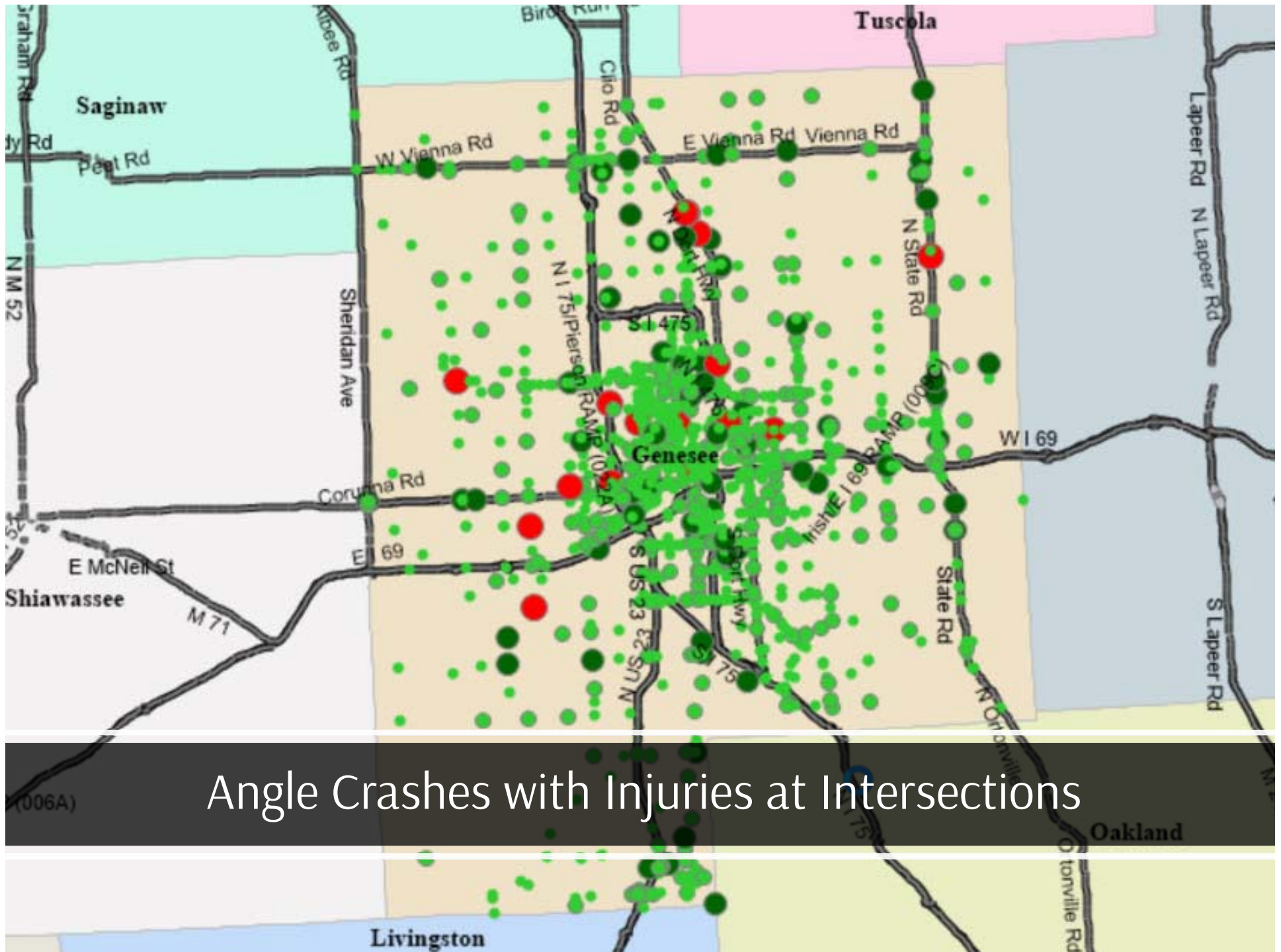
Crash County	=	Genesee
Crash Type	=	Angle Driveway or Angle Straight or Angle Turn
Year of Crash	=	2016 or 2015 or 2014 or 2013 or 2012
Greatest Injury Severity	=	Incapacitating Injury or Killed or Non-Incapacitating Injury or Possible Injury

2797 crash(es) found (animal crashes included)

Saved Filter: Genesee

Apply as Filter Append to Selection Replace Selection

2,797 crashes



Angle Crashes with Injuries at Intersections

Filter by Year



Specific Countermeasure

Fixed Object removal on HRRR eligible segment

Filter by NFC



Specific Countermeasure

Fixed Object removal on HRRR eligible segment

Filter by 'rural'



Specific Countermeasure

Fixed Object removal on HRRR eligible segment

Filter by 'FXOBJ'



Specific Countermeasure

Fixed Object removal on HRRR eligible segment