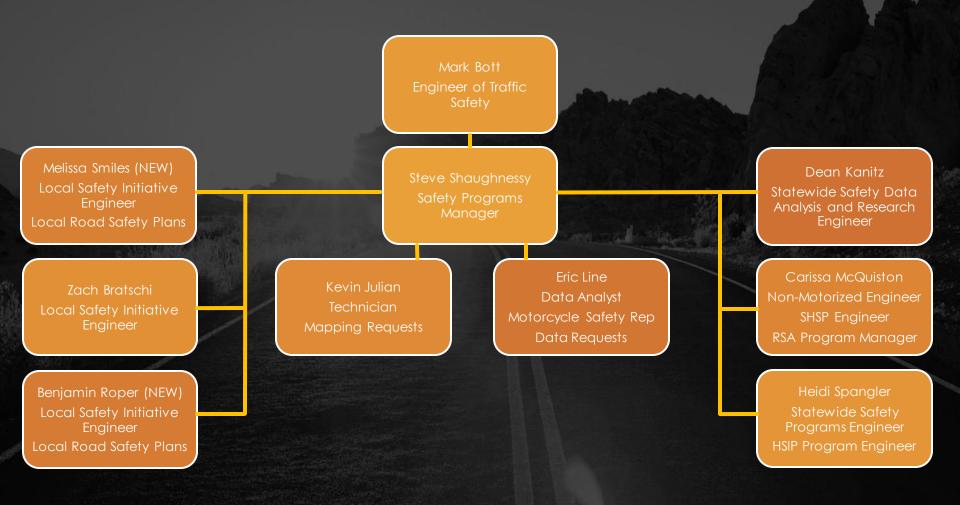
Traffic and Safety 101



Safety Programs Unit

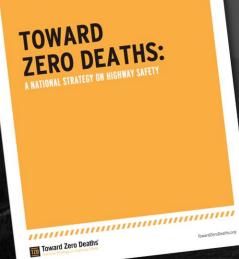


www.michigan.gov/ZeroDeaths





www.michigan.gov/ZeroDeaths



Vision: A highway system free of fatalities, changing the nation's culture to the point where even one traffic-related death is unacceptable





www.michigan.gov/ZeroDeaths

TZD Emphasis Areas

Drivers and Passengers





Infrastructure

Vulnerable Users



ILD EMPHOSIS Areas



Emergency Medical Services

Vehicles







www.michigan.gov/ZeroDeaths

How do we get there?
Focus on the Four "E's"
Engineering
Education
Enforcement
Emergency Response
Promote Safety Improvements and Changes in Driver Behavior
Culture Change (seatbelts / smoking / drunk driving)
Partnerships
We can't do it alone
Training



What do we need to do? Continue to attack the Sense of Complacency with Awareness Communication

Outreach

Education





www.michigan.gov/ZeroDeaths

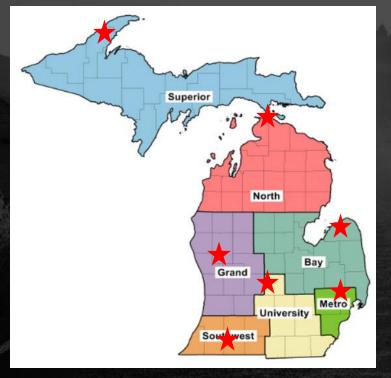
Michigan Statistics

1,028 Fatalities Occurred in 2017



www.michigan.gov/ZeroDeaths

Michigan Statistics



Approximate Population of ...

Calumet (879), Mackinaw City (859), Grant (881), Caseville (888), Augusta (899), Westphalia (876), or Clarkston (962)



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Traffic and Safety Engineering

Michigan has over 7 million licensed traffic engineers









www.michigan.gov/ZeroDeaths

Traffic and Safety Engineering







Michigan has over 7 million TZD Champions



www.michigan.gov/ZeroDeaths

THE SUM OF ALL OUR EFFORTS IS **ZERO**



www.michigan.gov/ZeroDeaths





www.michigan.gov/ZeroDeaths

Safety Initiatives

MDOT's Local Safety Initiative (LSI) is a free service to help local agencies identify safety issues and improve local road safety.

Road Safety Audits (RSA): formal safety performance examination of an existing or future road or intersection by an independent, multi-disciplinary RSA team.

Highway Safety Improvement Program (HSIP)









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Road Safety Audits

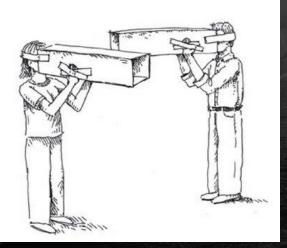


Road Safety Audits (RSA): formal safety performance examination of an existing or future road or intersection by an independent, multi-disciplinary RSA team.



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Why have an RSA?



"We already know what the problems are here. We already know what we want to do."



www.michigan.gov/ZeroDeaths

Organizing the RSA

Engineering Enforcement EMS Maintenance Local Officials Adjacent property owners Schools – Bus Drivers





www.michigan.gov/ZeroDeaths

Conducting the RSA

Day and Night!! Think about all modes of transportation Think like unfamiliar driver





www.michigan.gov/ZeroDeaths

RSA Team Findings

	Frequent	С	D	Е	F
Crash Frequency	Occasional	В	С	D	Е
RISK CATEGORY A = Lowest priority	Rare	А	В	С	D
F = Highest prior		Negligible	Low Crash Se	Med	High



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Local Safety Initiative





www.michigan.gov/ZeroDeaths

What is LSI?

3 pronged approach to safety

#1 – Engineering#2 - Tool Development#3 - Training

ČMDOT

What is the Local Safety Initiative?

The Michigan Department of Transportation's (MDOT) Local Safety Initiative (LSI) is a free service to help local agencies identify safety issues and improve local road safety. Analysis is offered on a first-come, first-served basis.

Once a local agency is enrolled, MDOT will:

 Perform a complete crash analysis of your local road system using RoadSoft software, as well as other data review tools.
 Compile a list of intersections and roadway segments of concern based on this analysis.

Perform a field visit with a local agency representative.

Perform an engineering study or other types of analysis, as needed.
 Identify and suggest potential improvements and countermeasures, many of which will be low-cost.

 Identify safety improvement projects that may be eligible for funding through Local Agency Programs.

Perform follow-up reviews and before-and-after analysis.

To enroll your local agency, contact Tracie Leix at 517-373-8950 or leixt@michigan.gov.





The LSI Process

An Agency gets started :They MUST volunteer Site specific analysis – RoadSoft

Field Reviews & Countermeasures

Projects – Funding LAP

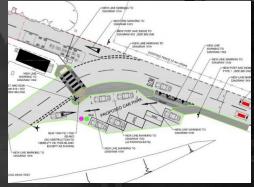


Benefits of the Local Safety Initiative



Safety to the Forefront

Michigan Department of Transportation 1627 (12/96)	LOCAL AGENCY PROGI SUBMIT	RAMS SAFETY PROJEC	т							
FUNDING TEMPLATE:		FISCAL VEAR: 2008								
LOCAL AGENCY		LOCAL AGENCY CONTACT								
City of ABC or XYZ Road Com	mission	Mr.Ms. Any Name								
PHONE NO.	FAX:ND.	EMAIL ADORESS								
(555) 555-1234	(555) 555-6789	name@emailaddress.com								
ALTERNATIVE CONTACT		PHONE NO.	FAX NO.							
Mr./Ms. Some One		(555) 555-5555	(555) 555-7890							
EMAIL ADDRESS										
name@emailaddress.com										
Intersection Improvement at M Proposed widening for left turn	I, LIMTS AND PROJECT DESCRIPTI ain Road and State Road in Application lanes, traffic signal upgrade with c to sections, clearing, and permane	Township, XYZ County. center left turn phase and countdo	wn pedestrian signals, extension							
PROPOSED COST	TIME OF RETURN (YEARS)	IMPROVEMENT CATEGORY (CHE	ECK THE CATEGORY THAT APPLIES							
\$200,000.00	5.0									
BENEFIT TO COST RATIO 11.1		Intersection Improvement								
PLEASE LIST THE CRASH REDU	CTION PACTORS USED:	Roadway and Structure Improvements								
Add Center Left Turn Lane: C	RF 30%, etc.	Roadside Improvements								
DOES A PROJECT INFACT A SCH ORGANIZATION? PLEASE DESC	IOOL OR OTHER SENSITIVE	Pedestrian and Dicycle in	nprovementa							
Yes, Central Elementary Schol this Intersection.	al is located in the SW quadrant of	Cener								
ROADWAY DATA		CROSS ROAD DATA (If an int	ersection improvement)							
PRIMARY ROUTE NAME		ROUTE NAME								
Main Road		State Road								
ADT		ADT								
12,000		2,500								
PERCENT COMMERCIAL	1NO. OF CRASHES	PERCENT COMMERCIAL	1NO. OF CRASHES							
5%	4	2%	2							
* NO. OF FATAL CRASHES	"NO. OF "A" TYPE CRASHES	'NO. OF FATAL CRASHES	190. OF 1AT TYPE CRASHES							
1	1	0	2							
*PERIOD OF CRASH DATA	FUNCTIONAL CLASSIFICATION	*PERIOD OF CRASH DATA	FUNCTIONAL CLASSIFICATION							
2001-2005	Rural Minor Arterial	2001-2005	Rural Minor Collector							
	d UD-10's to your project submittal with									
	OPOSED IMPROVEMENT WILL IMPR	OVE SAFETY AND REDUCE CRASH	4E5							
This project will reduce crashe Attach additional sheets if reco										



"Another set of Eyes"

Improved Safety Project Applications

Time Savings





Trust between MDOT and Locals



www.michigan.gov/ZeroDeaths

Highway Safety Improvement Plan





www.michigan.gov/ZeroDeaths

Highway Safety Improvement Plan

MAP-21 requires each State to submit a Highway Safety Improvement Program report that:

•Describes the progress being made to implement highway safety improvement projects;

•Assesses the effectiveness of those improvements; and

•Describes the extent to which the improvements have contributed to reducing fatalities and serious injuries on all public roads.









www.michigan.gov/ZeroDeaths

A Crash Analysis/ safety review is required for all 3R and 4R projects. The Project Manager should contact the TSC Traffic Engineer during scoping.

This review should consist of an analysis of 3 years of available crash data to determine where safety enhancements are warranted.

The review will identify any unusual occurrences or above average frequency crashes and will advise the Design Unit of any recommended measures to alleviate the situation.

Safety reviews more than 3 years old shall be updated to verify the original safety review.



3R/4R freeway projects should be reviewed to determine need for safety improvements:

- alignment modifications
- superelevation modifications,
- sight distance improvements,
- lengtheningramps,
- widening shoulders,
- flattening slopes,
- increasing underclearances,
- upgrading guardrail and bridge railings,
- shielding of obstacles
- removing or relocating obstacles to provide a traversable roadside



Who: TSC Traffic and Safety Engineer Region Traffic and Safety Engineer Consultant

When: Scoping Preliminary Design

Tools: Roadsoft Michigan Traffic Crash Facts



www.michigan.gov/ZeroDeaths

3 years of crash data reviewed.

The review will identify any unusual occurrences or above average frequency crashes and will advise the Design Unit of any recommended measures to alleviate the situation.





www.michigan.gov/ZeroDeaths

Summary of Crash Statistics

Michigan Department of Transportation Summary of Crash Statistics

TOTAL NUMBER OF CRAS CRASHES BY DAY OF WE		187 F	A	B/C and PDO	Total	% of Crashes	CRASHES BY TYPE		F	A	B/C and PDO	Total	% of Crashes
Sunday	-	0	0	26	25	13.4%	Angle Driveway	=	0	0	D	0	0.0%
Monday		1	0	45	48	24.6%	Angle Straight		0	0	6	6	3.2%
Tuesday		1	1	33	35	18,7%	Angle Turn		0	0	1	1	0.5%
Wednesday	=	0	0	16	15	8.0%	Animal	-	0	0	D	0	0.0%
Thursday	1.00	0	1	20	21	11.2%	Backing		0	ő	1	1	0.5%
Friday		0	0	26	25	13.4%	Bicycle	-	ő	ő	D	0	D.0%
Saturday	2	0	1	19	20	10.7%	Fixed Object		0	ő	58	58	31.0%
pamiday				12	20	10.150	Head-on	-	2	0	0	2	1.1%
		0001004					Head-on Left-Turn Driveway	2	õ	ŏ	D	D	0.0%
CRASHES BY SURFACE C							Head-on L-Turn Not Driveway		0	a	D	0	0.0%
Dry	=	1	0	69	70	37.4%	Hit Train	-	0	0	0	0	0.0%
wet	=	0	2	26	28	15.0%	Misc. Multiple Vehicle		0	1	13	34	7.5%
lcy	=	0	1	50	51	27.3%	Misc. Single Vehicle	2	0	0	19	19	10.2%
Snowy		1	D	36	37	19.8%		2	0	0	19	0	D.0%
Muddy		0	D	0	0	D.0%	Other Driveway		0	0	18	18	
Slushy	=	0	0	1	1	D.5%	Other Object	-	0	0	18	18	9.6%
Debris		0	0	0	0	D.0%	Overtum						
Wator	=	0	0	0	0	0.0%	Parking	-	0	0	D	0	0.0%
Sand		0	۵	0	0	D.0%	Pedestrian		0	0	1	1	D.5%
Oily		0	0	0	0	0.0%	Rear End Driveway	=	0	0	D	D	0.0%
Other		0	D	0	0	D.0%	Rear End Left Turn	=	0	0	D	0	0.0%
Unknown		0	0	0	0	0.0%	Rear End Right Turn	=	0	0	1	1	0.5%
Uncoded & Errors		0	0	0	0	0.0%	Rear End Straight		0	1	24	25	13.4%
		-			- 1	2.76.76	Side Swipe Opposite	=	0	0	D	D	D.0%
CRASHES BY TIME OF DA	¥_	0	D	2	2	1.1%	Side Swipe Same	*	0	1	27	28	15.0%
DIAM-026M		0	0	4	4	2 1%	CRASHES BY MONTH						
DTAM-02AM D2AM-03AM	-	0	0	4	4	2.1% 0.5%	January	=	0	0	40	40	21.4%
		0		1			February	=	0	1	23	24	12.8%
33AM-04AM	-		0		1	0.5%	March		0	0	6	6	3.2%
MAM-D5AM	-	0	0	5	5	2.7%	April		0	0	9	R	4.8%
DSAM-DBAM			D	8	9	4.8%	May		0	0	7	7	3 7%
06AM-07AM	-	0	0		6	3.2%	June	-	ő	0	8	8	4.3%
MA80-MA70		0	D	1D	10	5.3%	July	2	0	ő	20	20	10.7%
DRAM-ORAM		0	0	12	12	6.4%	August		ő	1	11	12	6.4%
DSAM-10AM	-	0	0	9	9	4.8%	September	2	1	0	8	9	4.8%
10AM-11AM		0	0	3	3	1.6%	October	-	0	0	12	12	6.4%
11AM-NOON	=	0	1	15	16	8.6%	November	2	0	1	21	22	11.8%
NOON-01PM		0	1	7	8	4.3%	December	-	1	1	17	18	9.6%
01PM-02PM	=	0	1	9	10	5.3%		-	0	0	17 D	18	9.6% 0.0%
02PM-03PM	=	1	D	4	5	2.7%	Uncoded & Errors	1	0	0	U	u	0.0%
D3PM-04PM	1.00	0	0	15	15	8.0%	CRASHES BY WEATHER CO	MIC	TION				
D4PM-D5PM	-	0	0	10	10	5.3%							
OSPM-06PM		D	D	15	15	8.0%	Clear	=-	1	0	69	70	37.4%
06PM-07PM	-	0	0	17	17	9.1%	Cloudy		0	0	31	31	16.6%
DZPM-08PM		0	D	8	8	4.3%	Fog	=	0	0	1	1	D.5%
08PM-09PM	=	0	0	8	8	4.3%	Rain	=	0	2	19	21	11.2%
DOPM-10PM	-	0	D	6	6	3.2%	Sleet/Hail	=	0	0	2	2	1.1%
10PM-11PM		0	D	5	5	2.7%	Snow	=	1	1	57	59	31.6%
11PM-MONT	=	0	0	2	2	1.1%	Wind		0	0	D	D	0.0%
Jncoded & Errors		0	D	0	0	0.0%	Blowing Snow	=	0	0	0	0	0.0%
			100		- C		Blowing Dirt		0	0	D	0	0.0%
							Smoke	=	0	0	D	D	D.0%
							Unknown		0	0	3	3	1.6%
							Uncoded & Errors	=	0	0	D	D	D.0%
2 (2018 \$1 we 37.64													Ran by Loycl

Michigan Department of Transportation Summary of Crash Statistics

CRASHES BY LIGHT CO	NDITION	F	A	B/C and PDO	Total	% of Crashes	CRASHES BY DRIVER VI			
Devlight	=	1	3	112	116	62.0%	Careless or Negligent	=	2	1.19
Dawn	-	0	0	4	4	2.1%	Fatal + A-Type	2	6	0.0%
Dusk		0	0	3	3	1.6%	Disobeved TGD =		2	1.13
Dark, Lighted	=	1	0	58	5	2.7%	Fatal + A-Type	=	0	
Dark, Unlighted		0	0	5	59	31.6%	Drove Left of Center	-	2	1.15
Other	-	0	0	0	0	0.0%	Fatal + A-Type	-	0	0.0%
Unknown		0	0	0	Ő.	0.0%	Drove Wrong Way		0	0.02
Uncoded & Errors		0	0	0	0	0.0%	Fatal + A-Type	11	0	0.0%
							Fail to Stop ACD	=	23	12.39
CRASHES BY SEVERITY	2						Fatal + A-Type	-	0	0.0%
Fatal		2	1.1%				Failed to Yield	-	9	4.8%
A-Incapacitating		3	1.6%				Fatal + A-Type	2		11.1%
B-Non-Incepecitating		6	2.7%				Improper Backing		1	0.5%
C-Possible Injury		15	8.0%				Fatal + A-Type	=	0	0.0%
Unintured		162					Improper Lane Use	=	7	3.7%
Uncoded & Errors		0	0.0%				Fatal + A Type		0	0.0%
Chebled & Lindis			0.078				Improper Pass		0	0.0%
CRASHES BY INVOLVE	IENT						Fatal + A-Type	=	0	0.0%
Drinking	-	6	3.2%				Improper Signal	=	0	
Drugs		3	1.6%				Fatal + A-Type	=	0	
Truck/Bus			21.4%				Improper Turn	=	2	1.15
Snowmobile	-	- 0	0.0%				Fatal + A-Type	-	0	
Emergency Vehicle		3	1.6%				Other	=	21	11.29
Off Road Vehicle	-	0	0.0%				Fatal + A-Type	10	0	
Pedestrian		- 1	0.5%				Reckless Driving	=	1	0.5%
Bicyclist		o	0.0%				Fatal + A-Type	-	0	0.0%
Farm Equipment	-	0	0.0%				Speed Too Fast			41.7%
Animal		0	0.0%				Fatal + A-Type	=	2	2.63
School Bus		ő	0.0%				Speed Too Slow	16	0	0.0%
		1	0.5%				Fatal + A-Type	=	0	
							Ran Red Light		9	4.8%
Motorcycle	-	0					Fatal + A-Type		0	0.0%
	-	0	0.0%					=		

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Crash Data Analysis

Michigan Department		MEMORANDUM
DATE:	August 27, 2018	Electronic File: Traffic
то:	Dave McCaw, Cost and Scheduling Engin- Traverse City TSC	cer
FROM:	Krista Phillips Traffic and Safety Engineer Traverse City TSC	<u> </u>
SUBJECT:	Crash Analysis and Safety I Routa: M-72 JN 200516A Location: M-72 from appro west of Burgai Rd, CS 45021	ximately Coleman Rd easterly to

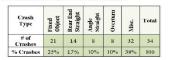
This crash analysis and safety review covers a five-and-a-half-year period from 2013 through August 2, 2018 for the subject location. The speed limit in 55 MPH throughout this coridor. There are two travel limes with intermittent passing and turning lanes. The AADT is 5,301 vehiclesiday with 9% commercial vehicles from largein Gray Road to Coleman Road while the AADT from Coleman Road to Fritz Road is 2,825 vehiclesiday with 10% commercial vehicles. The summer ADT is approximately 8,300 vehiclesiday. The composition of the 10° shoulder width varies throughout the corridor with 37 - 8° of TIMA.

Project Description

This project is currently scoped as a CPM 1.5-inch mill and HMA resurface for the mainline and shoulders with shoulder repairs.

Crash Summary

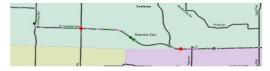
Over the five-and-a-half-year study period there were 83 total crashes, excluding animal crashes. There were two fatalities, six A injuries, eight B injuries, and thirteen possible injuries within this segment. The following table shows the distribution of crash type.



Page 1 of 3

Crash Concentration Summary

Below is a crash map from Roadsoft for the project limits. The large red dots are fatal crashes, the large green dots are A-injury crashes, the small green dots are other injury crashes, and the pink dots are property damage only crashes.



There is a consentration of angle erashes at Coleman Road, Maple City Road, and Cedar Road. Due to the high crash levels at these intersections, use of advance signing at these intersections as well as intermediate flaggers in the intersection is recommended to assist with traffic during construction.

There were two fatalities within the project limits. One fatality occurred at Maple City Road due to a motorist running the stops signs in foggy conditions. The second fatality occurred when a vchicle attempted to turn left into a private drive and collided head-on with a vchicle traveling in the opposite direction.

Six A-injuries occurred along this roadway segment. The six crashes occurred as follows: 1. A vehicle was traveling south on S. Coleman Road when the driver fell asleep. The vehicle

- left the roadway and hit a tree. 2. A vehicle was traveling east on M-72 by Cedar Valley Road when it lost control due to
- winter conditions. The car began to spin, striking an opposing tubicle head-one of see ond vehicle traveling westbound was then struck.
 A vehicle was traveling west on M-72 by Codar Valley Road when it lost control in a heavy
- A vehicle was traveling west on M-/2 by Cedar Valley Road when it lost control in a heavy downpour. The vehicle crossed the centerline, striking an opposing vehicle head-on.
 A westbound vehicle ran off the roadway to the right by Tilton Road, striking a guardrail.
- A westbound vehicle ran off the roadway to the right by 'filton Road, striking a guardrail. The vehicle then crosses to the opposite roadside and rolled over, coming to its final resting position.
- A vehicle was traveling west on M-72 when it attempted to make a U-turn. A vehicle traveling east was stuck by the turning vehicle and lost control, exiting the roadway and rolling. The turning vehicle fled the scene.
- A vehicle was traveling west on M-72 by Tager Road when it lost control and left the roadway. The vehicle rolled over and the driver was ejected.

Page 2 of 3



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SUBJECT:	Crash Analysis JN 116195/119943 CS 25091 (CS BMP 7.362 EMP 7.903) PR 1501502 (PR MP 7.362 EMP 7.903)
	M-15 From Bristol Road to Zip's Party Store Widening for Center Left Turn Lane

"A crash analysis was conducted for a 3-year period (June 1, 2013 to June 1, 2016) for the subject location.

The study was conducted along a 0.541 mile segment (PR MP 7.362 EMP 7.903) of trunkline. There were a total of 26 crashes. These resulted in 17 total injuries. Zero fatalities, zero A-injuries, and 17 B/C-injuries.

Of the 26 crashes, 9 (35%) were rear end straight crashes. 7 (27%) were angle straight crashes. The remaining 10 crashes (38%) were miscellaneous."



DESIGN BASIC TRAINING

SAFETY INFO October 3, 2018



www.michigan.gov/ZeroDeaths

What Will We Learn Today?

- Highway Safety Improvement Program (HSIP)
- Roadsoft Quick Tutorial
- Crash Types and Safety Countermeasures



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What Will We Learn Today?

- Project Selection
- Time of Return Spreadsheet (TOR)
- Highway Safety Manual



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HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)





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Highway Safety Improvement Program (HSIP)

RHCP

SHSP

HRRR

HSIP

Statewide

The SUSP is a of the idecoordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. Click here to learn how to develop, implement, evaluate and promote your SHSP.

AILROAD-HIGHWAY

STRATEGIC HIGHWAY

SAFETY PLAN

Office of Rail

The SUCP provides founds for the elimination of hazards at railway-highway crossings under 23 U.S.C. 130. Click here for more information to support RHCP efforts. HIGHWAY SAFETY IMPROVEMENT PROGRAM In HSIP is the projects, activities, plans, and reports carried out under 23 U.S.C. 148. Click here for resources to support State HSIP planning, implementation, evaluation and reporting efforts.

..... HIGH RISK RURAL ROADS

If the fatance rate on rural caos increase in a State, they are required to spend a portion of their HSIP funds on rural roads. Click here for more information to support HRRR efforts.

Safety

Programs

Local Agency Programs



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HSIP - SHSP

- Strategic Highway Safety Plan (SHSP)
 - Current Plan 2017 to 208
 - Development of new Plan 2019 2022
 - Governor's Traffic Safety Advisory

Commission (GTSAC)



- High Risk Behaviors:
 - Distracted Driving
 - Impaired Driving
 - Occupant Protection



- At Risk Road Users:
 - Commercial Motor Vehicle Safety
 - Motorcycle Safety
 - Ped and Bike Safety
 - Senior Mobility and Safety
 - Drivers Age 24 and Younger



Engineering Infrastructure:
 Traffic Safety Engineering



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- System Administration:
 - Traffic Incident Management (TIM)
 - Traffic Records and Information
 Systems



HSIP

- Local HSIP Local Agency Programs
 - Annual Call for Projects
 - High Risk Rural Roads (HRRR)



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HSIP

- Trunkline HSIP Safety Programs
 - Toward Zero Deaths #TZD
 - Annual Call for Projects
 - Road Safety Audits
 - High Crash List
 - Local Safety Initiative (LSI)



CRASH or ACCIDENT



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ACCIDENT

"An unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury"



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"Collide violently with an obstacle or another vehicle"



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WHAT CAN YOU DO?



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Crash Phrases

- Remember CRASHES CRASHES CRASHES
 - Fatal CRASHES
 - CRASH Reduction Factors
 - CRASH Modification Factors (Highway Safety Manual)
 CRASH Apply size
 - CRASH Analysis





Before the labor movement, factory owners would say "it was an accident" when American workers were injured in unsafe conditions.

Before the movement to combat drunk driving, intoxicated drivers would say "it was an accident" when they crashed their cars.

Planes don't have accidents. They crash. Cranes don't have accidents. They collapse. And as a society, we expect answers and solutions.

Traffic crashes are fixable problems, caused by inattentive drivers and driver behavior. They are not accidents. Let's stop using the word "accident" today.





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ROADSOFT



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Roadsoft Module

- Basic Crash Info
- Filter Builder
- Intersection Collision Diagram
- Ranking Reports
- Call for Projects



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#### Roadsoft Module

- User ID and Password
  - Contact Heidi Spangler
- Roadsoft MDOT SharePoint Site



www.michigan.gov/ZeroDeaths

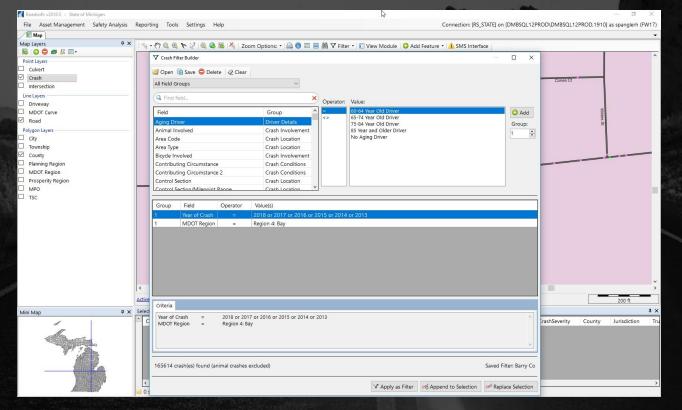
## Basic Crash Info

- Michigan State Police (MSP) Criminal Investigation and Identification Division (CJIC)
  MDOT Access to Data via Roadsoft (UD-10's)
- Finalized Data Spring of Following Year
  - 2018 Data = Finalized in Spring 2019



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#### Roadsoft Filter Builder

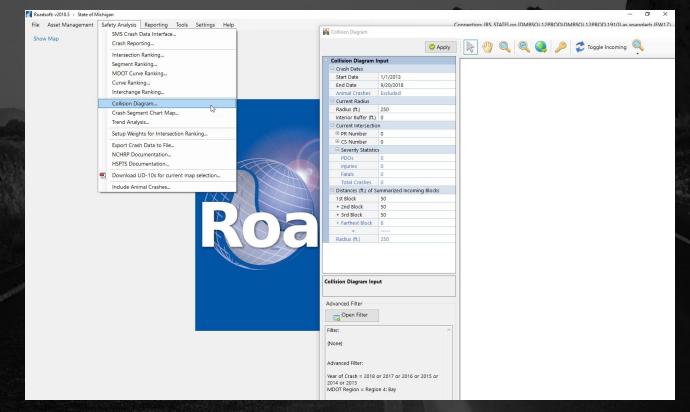


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#### Roadsoft Intersection Collison Diagram



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www.michigan.gov/ZeroDeaths

#### Roadsoft Ranking Reports

| 🔣 Roadsoft: v2018.5 : State of Mic           | higar                                | 1                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              |                                                     |                    |                  |                  | - a ×            |  |  |
|----------------------------------------------|--------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------------------------------------|-----------------------------------------------------|--------------------|------------------|------------------|------------------|--|--|
| File Asset Management                        | Safet                                | y Analysis                            | Reporting Tools Settings Help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                   |                                              | Connection: [RS_STATE]                              | on [DMBSQL12PR     | DD\DMBSQ         | L12PROD.1910] as | spanglerh (FW17) |  |  |
| Map                                          |                                      | SMS Crash Da                          | and output to make the second s | Crash Intersection Ranking        |                                              |                                                     |                    |                  |                  |                  |  |  |
| Map Layers                                   |                                      | Crash Reportin                        | ng                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   |                                              |                                                     |                    |                  |                  |                  |  |  |
| i 😼 🖸 🖨 🖨 🗰 •                                | Intersection Ranking                 |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              |                                                     |                    |                  |                  |                  |  |  |
| Point Layers<br>Culvert                      |                                      | Segment Ranking<br>MDOT Curve Ranking |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   | Run Ranking                                  | Intersection Name                                   | Township           | County           | Total Crashes    | Fatal/A Crashes  |  |  |
| Crash                                        |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 🗉 Limit List                      |                                              | S Mission Rd & E Broomfield Rd                      | Mt Pleasant        | Isabella         | 414              | 2                |  |  |
| Intersection                                 | Curve Ranking<br>Interchange Ranking |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | E Limit List to Top               | 100                                          | Tittabawassee Rd & Bay Rd                           | Saginaw Twp        | Saginaw          | 298              | 0                |  |  |
| Line Layers                                  |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Percent/Intersections             |                                              | N Center Rd & State St                              | Saginaw Twp        | Saginaw          | 230              | 0                |  |  |
| Driveway                                     |                                      | Collision Diag                        | ram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | r creeny mer sections             | O Intersections                              | E Wackerly Rd & Eastman Ave                         | Midland            | Midland          | 201              | 0                |  |  |
| MDOT Curve                                   |                                      | -                                     | nt Chart Map                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Crash Dates                       | 0                                            | Krafft Rd & M 25                                    | Fort Gratiot Twp   |                  | 201              | 0                |  |  |
| Road                                         | 100 C                                |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Start Date                        | 1/1/2013                                     | Corunna Rd & S Linden Rd                            | Flint Twp<br>Flint | Genesee          | 196              | 0                |  |  |
|                                              |                                      | Trend Analysis                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | End Date                          | 9/20/2018                                    | E Court St & S Center Rd                            |                    | Genesee          | 190              | 0                |  |  |
| Polygon Layers<br>City<br>Township<br>County |                                      | Setup Weights                         | s for Intersection Ranking                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 🖻 Radius                          |                                              | E Hill Rd & W Hill Rd & Fenton Rd                   | Grand Blanc Twp    |                  | 185              | 0                |  |  |
|                                              |                                      | Export Crash [                        | Data to File                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Radius (feet)                     | 250                                          | Lapeer Rd & S State Rd                              | Davison Twp        | Genesee          | 180              | 0                |  |  |
|                                              |                                      | NCHRP Docur                           | mentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Typical Crash Costs               |                                              | Tittabawassee Rd & Fashion Square Blvd              | Saginaw Twp        | Saginaw          | 176              | 0                |  |  |
| Planning Region                              |                                      | HSPTS Docum                           | pentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | TCFA (Fatal)                      | \$2,600,000                                  | Bay Rd & Shattuck Rd                                | Saginaw Twp        | Saginaw          | 175              | 1                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TCIA (Injury)                     | \$180,000                                    | S Mission Rd & E Blue Grass Rd & W Campus Dr        | Union Twp          | Isabella<br>Bay  | 171<br>169       | 2                |  |  |
| Prosperity Region                            | <u>.</u>                             | Download UD                           | 0-10s for current map selection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TCPDO (PDO)                       | \$2,000                                      | E Wilder Rd & N Euclid Ave                          | Bangor Twp         |                  |                  |                  |  |  |
|                                              |                                      | Include Animal Crashes                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Weights                           |                                              | N Saginaw Rd & Eastman Ave                          | Midland            | Midland          | 165              | 0                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   | Define Weights                               | Pine Grove Ave & Holland Ave                        | Port Huron         | St. Clair        | 165              | 0                |  |  |
| L 150                                        |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Use Weight Set<br>Weight Set Name | □ No                                         | Demille Blvd & S Main St                            | Lapeer             | Lapeer           | 164              | 0                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              | Corunna Rd & S Ballenger Hwy                        | Flint              | Genesee          | 162              | 2                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              | S Mission Rd & E Preston Rd & W Preston Rd          | Mt Pleasant        | Isabella         | 160              | 0                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Advanced Filter:                  |                                              | Wieneke Rd & State St                               | Saginaw Twp        | Saginaw          | 157              | 1                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 🗔 Open Filter Builder             |                                              | W I 69/Miller RAMP & Miller/N I 75 RAMP & Miller Rd | Flint Twp          | Genesee          | 153              | 1                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              | S Mission Rd & E High St                            | Mt Pleasant        | Isabella         | 150              | 0                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Filter:                           |                                              | McCarty Rd & Bay Rd                                 | Saginaw Twp        | Saginaw          | 146              | 1                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Animal Crashes: Excluded          |                                              | S Dort Hwy & E Court St                             | Flint              | Genesee          | 146              | 0                |  |  |
| ¢                                            |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Start Date >= 1/1/2013            |                                              | N Linden Rd & W Pierson Rd                          | Mt Morris Twp      | Genesee          | 145              | 2                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | End Date <= 9/20/2018             |                                              | Miller Rd & S Linden Rd                             | Flint Twp          | Genesee          | 144              | 1                |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Radius = 250                      |                                              | E Jenny St & S Eudid Ave                            | Bay City           | Bay              | 143              | 0                |  |  |
| Active Laver: Crash (Filter: Barry Co) 43*   |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              | N Main St & E Genesee St & S Main St & W Genesee St |                    | Lapeer           | 142              | 2                |  |  |
| Ad                                           |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Advanced Filter:                  |                                              | N I 475 & S Grand Traverse St                       | Flint              | Genesee          | 141              | 2                |  |  |
| Aini Map 🖡 🗙 Selection Information : Crash   |                                      |                                       | Year of Crash = 2018 or 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 17 or 2016 or 2015 or             | E Pickard St & N Mission Rd                  | Mt Pleasant                                         | Isabella           | 140              | 0                |                  |  |  |
| CrashiD PRNo PRName                          |                                      |                                       | 2014 or 2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 117 01 2010 01 2015 01            | Schust Rd & Bay Rd                           | Saginaw Twp                                         | Saginaw            | 140              | 0                |                  |  |  |
|                                              |                                      |                                       | MDOT Region = Region 4:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Bay                               | Hemmeter Rd & State St                       |                                                     |                    | 140              | 3                |                  |  |  |
|                                              |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ×                                 | <                                            | Saginaw Twp                                         | Saginaw            | 150              | 0                |                  |  |  |
|                                              |                                      |                                       | 25900 Intersections Ranke                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | a                                 | Print Report Export as File 😵 Collision Diag | ram 💮 Apply a                                       | s Selection        | 🂼 Trend Analysis | View Crashes     |                  |  |  |
|                                              |                                      | 5                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                                              |                                                     |                    |                  |                  |                  |  |  |
| <                                            |                                      |                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2                                 |                                              |                                                     |                    |                  |                  |                  |  |  |
|                                              | 1                                    |                                       | 0 selections shown on Crash                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | sh                                |                                              |                                                     |                    |                  |                  |                  |  |  |



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#### Roadsoft Ranking Reports

| Map                                        | L                                                                                                               | Reporting Tools Settings Help   |                                                                                                                    |                                                     |                                                                                                          |                                                                            |                                                                                                                |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | - a ×            |  |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--|
| Map Layers                                 | CAAC Create D                                                                                                   | Reporting tools settings thep   |                                                                                                                    |                                                     |                                                                                                          |                                                                            | Connection: [RS_STATE]                                                                                         | on [DMBSQL12PRC  | DD\DMBSQL | L12PROD, 1910] as                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | spanglerh (FW17) |  |
|                                            | SMS Crash Data Interface<br>Crash Reporting                                                                     |                                 |                                                                                                                    | Security Crash Intersection Ranking                 |                                                                                                          |                                                                            |                                                                                                                |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
| Map Layers Crash Reporting                 |                                                                                                                 |                                 | Filter Columns                                                                                                     |                                                     |                                                                                                          | Legend: Contains a Trunkline Leg                                           |                                                                                                                |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
| D. S. H.                                   |                                                                                                                 | - W                             |                                                                                                                    |                                                     |                                                                                                          | Intersection Name                                                          |                                                                                                                | Township         | County    | Total Crashes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Fatal/A Crashes  |  |
| Culvert                                    | Segment Ranking<br>MDOT Curve Ranking<br>Curve Ranking                                                          |                                 | Run Ranking                                                                                                        |                                                     |                                                                                                          | S Mission Rd & E Br                                                        | oomfield Rd                                                                                                    | Mt Pleasant      | Isabella  | 414                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                |  |
| Crach                                      |                                                                                                                 |                                 | 😑 Limit List                                                                                                       |                                                     |                                                                                                          | Tittabawassee Rd &                                                         |                                                                                                                | Saginaw Twp      | Saginaw   | 298                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| Intersection                               |                                                                                                                 | -                               | E Limit List to Top 100                                                                                            |                                                     |                                                                                                          | N Center Rd & State                                                        | and a second | Saginaw Twp      | Saginaw   | 230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| Line Layers                                | Interchange Ranking                                                                                             |                                 | Percent/Intersections                                                                                              | Percent                                             |                                                                                                          | E Wackerly Rd & Eastman Ave<br>Krafft Rd & M 25                            |                                                                                                                | Midland          | Midland   | 201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| Driveway                                   | Collision Diagram<br>Crash Segment Chart Map<br>Trend Analysis                                                  |                                 |                                                                                                                    | O Intersec                                          | 1                                                                                                        |                                                                            |                                                                                                                | Fort Gratiot Twp |           | 201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| MDOT Curve                                 |                                                                                                                 |                                 | Crash Dates                                                                                                        |                                                     |                                                                                                          |                                                                            |                                                                                                                |                  | Genesee   | 196                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| Road                                       |                                                                                                                 |                                 | Start Date         1/1/201           End Date         9/20/20                                                      |                                                     |                                                                                                          | E Court St & S Center Rd<br>E Hill Rd & W Hill Rd & Fenton Rd              |                                                                                                                | Flint            | Genesee   | 190                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| Polygon Layers                             |                                                                                                                 |                                 |                                                                                                                    |                                                     | -                                                                                                        |                                                                            |                                                                                                                | Grand Blanc Two  |           | 185                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| L City                                     | Setup Weights for Intersection Ranking                                                                          |                                 | C Radius                                                                                                           |                                                     |                                                                                                          | Lapeer Rd & S State                                                        |                                                                                                                | Davison Twp      | Genesee   | 180                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| L Township                                 |                                                                                                                 | Data to File                    | Radius (feet)                                                                                                      | 250                                                 |                                                                                                          |                                                                            |                                                                                                                | Saginaw Twp      | Saginaw   | 176                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| County                                     | NCHRP Docu                                                                                                      | umentation                      | TCFA (Fatal)                                                                                                       | \$2,600.000                                         |                                                                                                          |                                                                            |                                                                                                                |                  | Saginaw   | 175                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                |  |
|                                            | HSPTS Docur                                                                                                     | mentation                       | TCIA (Injury)                                                                                                      | \$180,000                                           |                                                                                                          | Bay Rd & Shattuck Rd<br>S Mission Rd & E Blue Grass Rd & W Campus Dr       |                                                                                                                | Saginaw Twp      | Isabella  | 175                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                |  |
| MDOT Region 👜                              | Download U                                                                                                      | D-10s for current map selection | TCPDO (PDO)                                                                                                        | \$2,000                                             |                                                                                                          |                                                                            |                                                                                                                | Union Twp        | Bay       | 169                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| Prosperity Region                          | in the second |                                 | Weights                                                                                                            | \$2,000                                             |                                                                                                          | E Wilder Rd & N Euclid Ave                                                 |                                                                                                                | Bangor Twp       | Midland   | 165                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| LI MPO                                     | Include Animal Crashes                                                                                          |                                 |                                                                                                                    |                                                     | Define Weights                                                                                           | N Saginaw Rd & Eastman Ave<br>Pine Grove Ave & Holland Ave                 |                                                                                                                | Midland          |           | 165                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
| TSC TSC                                    |                                                                                                                 |                                 | Use Weight Set                                                                                                     | No No                                               |                                                                                                          |                                                                            |                                                                                                                | Port Huron       | St. Clair | and the second s | 0                |  |
|                                            |                                                                                                                 |                                 | Weight Set Name                                                                                                    |                                                     |                                                                                                          | Demille Blvd & S Ma                                                        |                                                                                                                | Lapeer           | Lapeer    | 164                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |  |
|                                            |                                                                                                                 |                                 |                                                                                                                    |                                                     |                                                                                                          | Corunna Rd & S Ballenger Hwy<br>S Mission Rd & E Preston Rd & W Preston Rd |                                                                                                                | Flint            | Genesee   | 162                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                |  |
|                                            |                                                                                                                 |                                 | Advanced Filter:                                                                                                   |                                                     |                                                                                                          |                                                                            |                                                                                                                | Mt Pleasant      | Isabella  | 160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
|                                            |                                                                                                                 |                                 | Open Filter Builder                                                                                                |                                                     |                                                                                                          | Wieneke Rd & State                                                         |                                                                                                                | Saginaw Twp      | Saginaw   | 157                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                |  |
|                                            |                                                                                                                 |                                 |                                                                                                                    |                                                     |                                                                                                          |                                                                            | & Miller/N I 75 RAMP & Miller Rd                                                                               | Flint Twp        | Genesee   | 153                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                |  |
|                                            |                                                                                                                 |                                 | Filter:         ^           Animal Crashes: Excluded         Start Date >= 1//2013           End Date <= 9/20/2018 |                                                     |                                                                                                          | S Mission Rd & E Hi                                                        |                                                                                                                | Mt Pleasant      | Isabella  | 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
|                                            |                                                                                                                 |                                 |                                                                                                                    |                                                     |                                                                                                          | McCarty Rd & Bay F                                                         |                                                                                                                | Saginaw Twp      | Saginaw   | 146                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1                |  |
|                                            | S Dort Hwy & E Cou                                                                                              |                                 |                                                                                                                    |                                                     |                                                                                                          | Flint                                                                      | Genesee                                                                                                        | 146              | 0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
|                                            | N Linden Rd & W Pierson Rd                                                                                      |                                 |                                                                                                                    |                                                     |                                                                                                          | Mt Morris Twp                                                              | Genesee                                                                                                        | 145              | 2         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
|                                            | Miller Rd & S Linden Rd                                                                                         |                                 |                                                                                                                    |                                                     |                                                                                                          | Flint Twp                                                                  | Genesee                                                                                                        | 144              | 1         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
|                                            | E Jenny St & S Euclid Ave                                                                                       |                                 |                                                                                                                    |                                                     |                                                                                                          | Bay City                                                                   | Bay                                                                                                            | 143              | 0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
|                                            | Advanced Filter:                                                                                                | nced Filter:                    |                                                                                                                    | N Main St & E Genesee St & S Main St & W Genesee St |                                                                                                          | t Lapeer                                                                   | Lapeer                                                                                                         | 142              | 2         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
| Mini Map 🛛 🔍 Selection Information : Crash |                                                                                                                 |                                 | Advanced Pilter.                                                                                                   |                                                     |                                                                                                          | N I 475 & S Grand Traverse St                                              |                                                                                                                | Flint            | Genesee   | 141                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                |  |
| CrashID PRNo PRName                        |                                                                                                                 |                                 | Year of Crash = 2018 or 2017 or 2016 or 2015 or<br>2014 or 2013<br>MDOT Region = Region 4: Bay                     |                                                     |                                                                                                          | E Pickard St & N Mi                                                        | ssion Rd                                                                                                       | Mt Pleasant      | Isabella  | 140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
|                                            |                                                                                                                 |                                 |                                                                                                                    |                                                     |                                                                                                          | Schust Rd & Bay Rd                                                         |                                                                                                                | Saginaw Twp      | Saginaw   | 140                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0                |  |
|                                            |                                                                                                                 |                                 |                                                                                                                    |                                                     |                                                                                                          | Hemmeter Rd & Sta                                                          | ate St                                                                                                         | Saginaw Twp      | Saginaw   | 138                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                |  |
|                                            |                                                                                                                 | 25900 Intersections Ranked      |                                                                                                                    |                                                     | 🕞 Print Report 🕼 Export as File 😻 Collision Diagram 🎯 Apply as Selection 🚛 Trend Analysis 📀 View Crasher |                                                                            |                                                                                                                |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |
|                                            | 19 A                                                                                                            | <                               |                                                                                                                    |                                                     |                                                                                                          |                                                                            |                                                                                                                |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | >                |  |
| A                                          | 5                                                                                                               | 0 selections shown on Crash     |                                                                                                                    |                                                     |                                                                                                          |                                                                            |                                                                                                                |                  |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                  |  |



www.michigan.gov/ZeroDeaths

## Roadsoft Ranking Reports

- Intersection Ranking
- MDOT Curve Ranking
- Curve Ranking



www.michigan.gov/ZeroDeaths

### Roadsoft Project Selection

- Filter Selection
  - K/A/Crash Types/Surface Condition Filters
- Intersection Improvements
- Curve Improvements
- Systemic Treatments



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## CRASH TYPES AND SAFETY COUNTERMEASURES



www.michigan.gov/ZeroDeaths

## Crash Types

- Patterns Are there any?
- System Wide Plans
- Systemic Treatments
- Region TZD Implementation Plan



#### WHAT CAN YOU DO?





#### 



www.michigan.gov/ZeroDeaths

## RUMBLE STRIPS 44% Reduction in Fatal and Serious Injuries



#### 



www.michigan.gov/ZeroDeaths

#### RUMBLE STRIPS – CRASH TYPES



Centerline

Save Lives

For more information: www.michigan.gov/rumblestrips

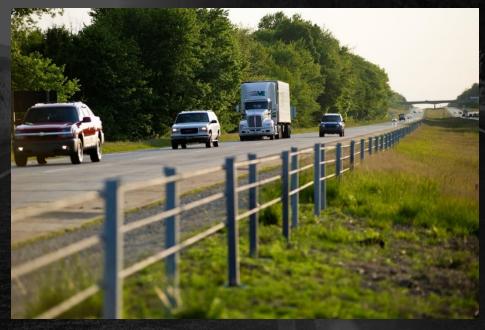


- Run Off Road Right or Left
- Centerline or Shoulder
- Fixed Object (trees, poles, ditches)
- Overturn

MDOT: Providing the highest quality integrated transportation services for economic benefit and improved quality of life.



## CABLE MEDIAN BARRIER 87% Reduction in Fatal and Serious Injuries







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## CABLE MEDIAN BARRIER – CRASH TYPES



- Lane Departure Related
- Run Off Road Left
- Cross Median
- Median Installation
- Overturn
- Head On

Toward Zero Deaths National Strategy on Highway Safety

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## ROUNDABOUTS 78% Reduction in fatal and serious injuries 57% Reduction in all minor injuries





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#### ROUNDABOUTS



- Intersection Related
- Angle
- Head On Left Turn
- Rear End



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# SIGNING Reflective Sheeting on Sign Posts Wrong Way Movements 15% Reduction





#### 



www.michigan.gov/ZeroDeaths



# signing

- Intersection Related
- Cross Traffic Does Not Stop
- Angle



# FIXED OBJECTS 75% Reduction Clear Zone Crashes

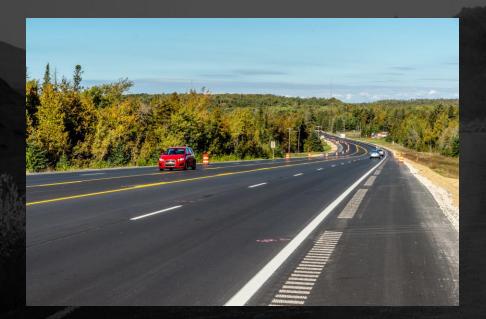


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## SHOULDER WIDENING



Lane Departure Related

- Run Off Road
- Centerline or Shoulder
- Fixed Object
  - (trees, poles, ditches)
- Overturn



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SHOULDER WIDENING 5% Reduction Per Foot







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ENHANCED DELINEATIONRoadside Delineation





www.michigan.gov/ZeroDeaths

ENHANCED DELINEATIONGuardrail Delineation







www.michigan.gov/ZeroDeaths

ENHANCED DELINEATIONCurve Delineation





www.michigan.gov/ZeroDeaths

PROJECT SELECTION



www.michigan.gov/ZeroDeaths

Safety Scoping

Establish Partners in Safety
Region/TSC/Lansing/Community
Think Outside the Design Box
Road Safety Audits
Roadsoft





www.michigan.gov/ZeroDeaths

Safety Call for Projects

The strategy of the Safety Program is to address correctable fatality (K) and serious injury (A) crashes, with cost effective safety improvements identified in the SHSP, to meet the statewide 2018 safety goals in the department's efforts of achieving the TZD vision.



Project Selection

- Roadsoft
- Crash Trends
- Systemic Treatments
- Region TZD Implementation Plan

- 1000 1002
- What is the "Biggest band for the buck?"



TIME OF RETURN (TOR)



www.michigan.gov/ZeroDeaths

TOR Steps

- Identify Crashes
- Analyze Crashes
 - Does your fix...FIX the CRASHES?
 - Did you miss CRASHES?
 - Include recent CRASH data



TOR Steps

Do Not Include Animal Crashes
Are Crashes mis-coded?
CRF's (Crash Reduction Factors) are PROVEN

COUNTERMEASURES

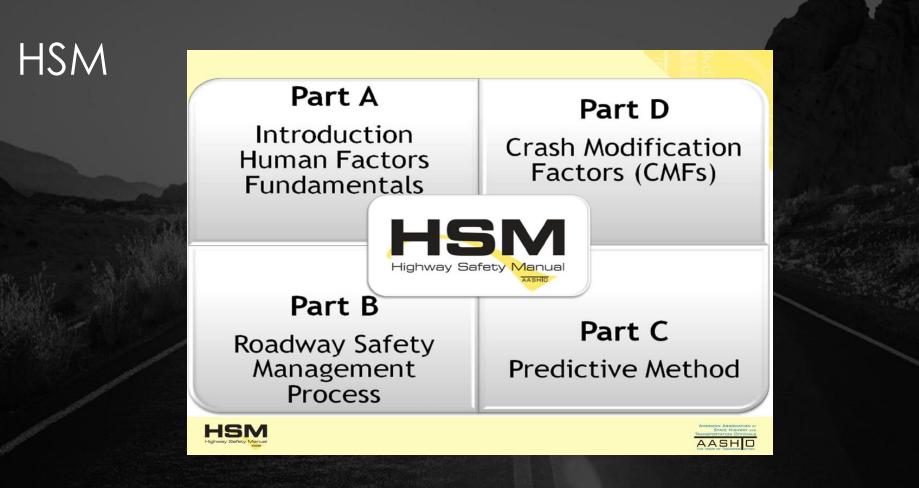


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HIGHWAY SAFETY MANUAL (HSM)



www.michigan.gov/ZeroDeaths





www.michigan.gov/ZeroDeaths

- PART A:
 - Human Factors
 - Fundamentals

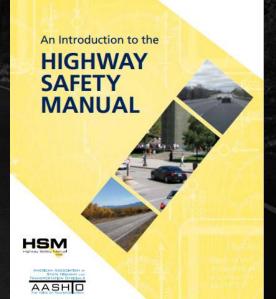


www.michigan.gov/ZeroDeaths

TowardZeroDeaths.org

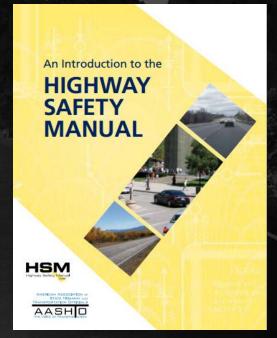
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- PART B Roadway Safety Management
 Process
 - Network Screening
 - Countermeasures
 - Prioritize Projects





- PART C Predictive Method
 - Network Screening
 - Countermeasures
 - Prioritize Projects





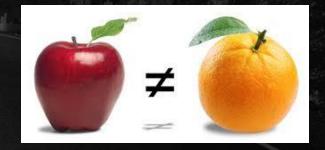
- PART D Crash Modification Factors
 - Roadway Segments
 - Intersections
 - Interchanges



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## HSM Spreadsheet

- Formal Training Available
  - Dean Kanitz/Heidi Spangler
- Crash Modification Factors
  - www.cmfclearinghouse.org



CMF are related (but not equal) to CRF's



www.michigan.gov/ZeroDeaths

### HSM Spreadsheet

- Network Screening Tool
- Regional Safety Performance Data
- Project Prioritization
- Give Predictive Analysis a Chance



# QUESTIONS?





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