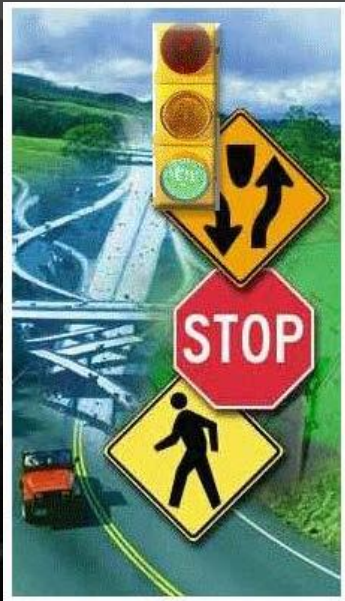
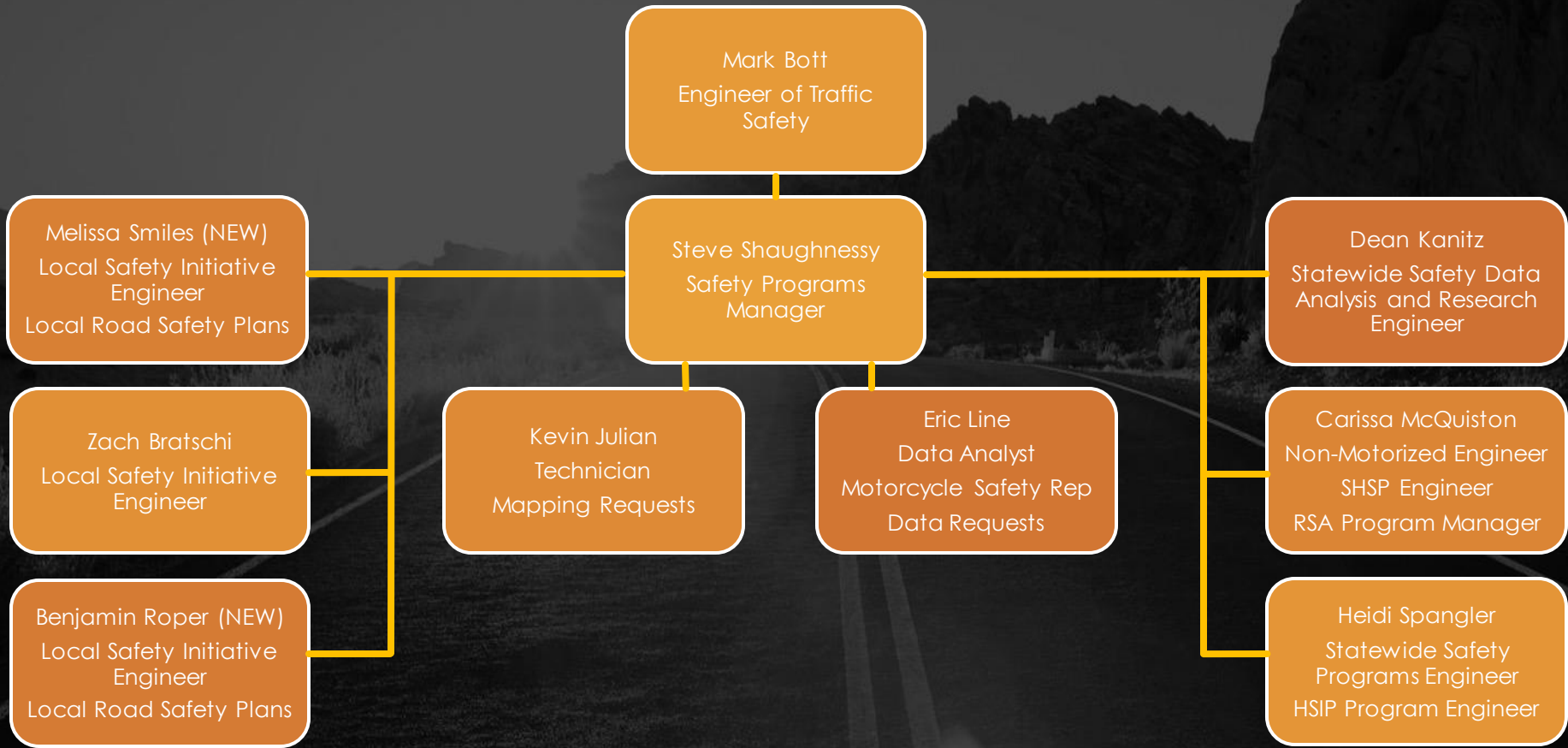
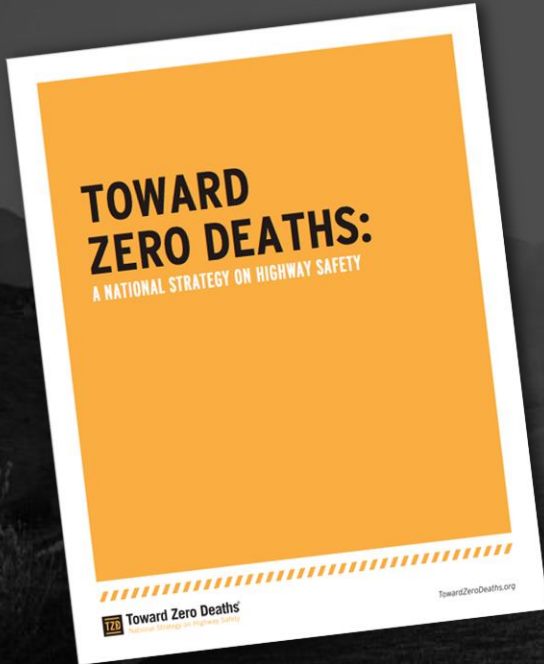


# Traffic and Safety 101



## Safety Programs Unit





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



# TZD Emphasis Areas

Drivers and Passengers



Vulnerable Users



Vehicles



Infrastructure



Emergency Medical Services



Data Processes

# How do we get there?

Focus on the Four “E’s”

Engineering

Education

Enforcement

Emergency Response

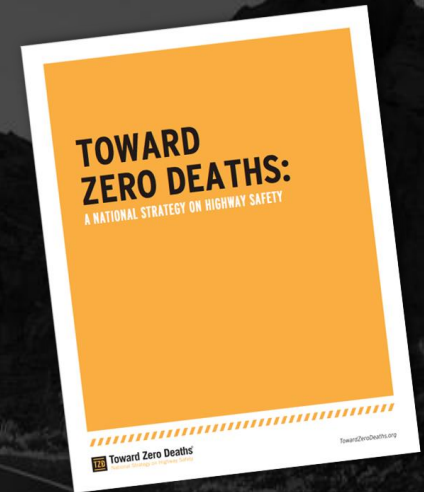
Promote Safety Improvements and Changes in Driver Behavior

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

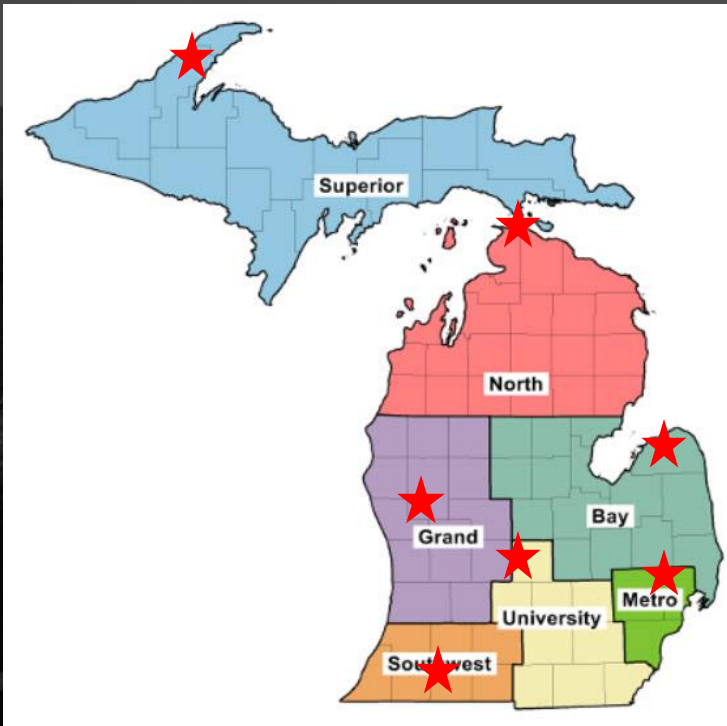


# Michigan Statistics



**1,028 Fatalities  
Occurred in 2017**

# Michigan Statistics



## Approximate Population of ...

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



# Traffic and Safety Engineering

Michigan has over 7 million licensed traffic engineers



# Traffic and Safety Engineering



Michigan has over 7 million TZD Champions

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

### SENIOR MOBILITY

MDOT has been working to meet the challenges of Michigan's aging population through:

- Enhanced signs and markings.
- Encouraging senior-friendly transportation options.
- Improving communications and coordination among partners.



### OPERATION LIFESAVER

Michigan Operation Lifesaver is part of a national, nonprofit organization dedicated to ending collisions, fatalities and injuries at highway-railroad crossings, as well as trespassing on railroad properties, by increasing public awareness of potential highway-railroad crossing, as well as trespassing hazards.



### HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)

The goal of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands.



### LOCAL SAFETY INITIATIVE (LSI)

MDOT created the LSI to provide technical traffic safety assistance to local road-owning agencies, such as cities, county road commissions and tribal governments. Historically, local roads experience a higher percentage of fatal and serious injuries in terms of miles driven than state owned roads.



### ROAD SAFETY AUDIT (RSA)

RSA is a formal safety performance examination of an existing or future road or intersection by an independent, multi-disciplinary team. The goal of the RSA is to analyze the selected project site and to identify short-term and long-term safety solutions.



### SAFE ROUTES 2 SCHOOL

Safe Routes to School is a federal program aimed at making it safe, convenient and fun for children to bicycle and walk to school in order for them to get the regular physical activity needed for good health.



### TRAFFIC INCIDENT MANAGEMENT

Traffic Incident Management is the planned and coordinated multi-disciplinary processes used to detect, respond to, and clear traffic incidents as quickly as possible while protecting the safety of on-scene responders and the traveling public.



### COMPLETE STREETS

Complete Streets are roadways planned, designed and constructed to provide appropriate access to all legal users in a manner that promotes safe and efficient movement of people and goods while respecting context and community values.



### WORK ZONE SAFETY

MDOT has worked to develop:

- Policies to reduce and eliminate crashes and fatalities in work zones.
- In-the-field work zone reviews.

**These programs represent the activities MDOT is involved in to improve safety on Michigan's roads. MDOT strives to ensure roads are as safe as possible in every stage – from design to construction to long-term support of users on the roads. Keeping safety on the forefront of all MDOT practices helps move Michigan Toward Zero Deaths.**



Prepared by: MDOT Graphics Unit - Bureau/Statewide Services/Operations  
Toward Zero Deaths/ Toward Zero Deaths Brochure TZD.indd (pt. 1/15)

# 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)



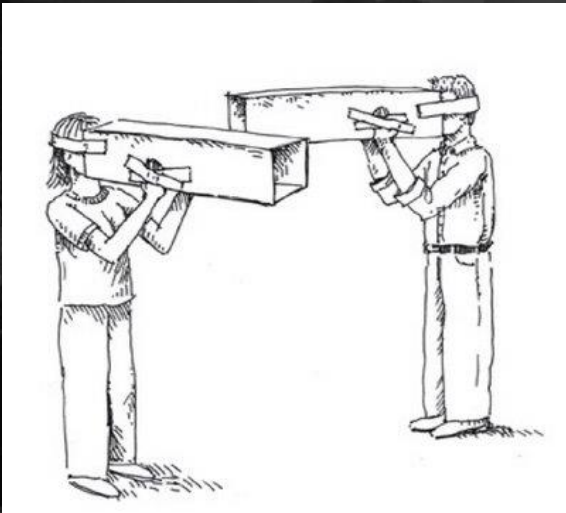
# Road Safety Audits



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

## Why have an RSA?

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



# Organizing the RSA

Engineering  
Enforcement

EMS

Maintenance

Local Officials

Adjacent property owners

Schools – Bus Drivers





# Conducting the RSA

Day and Night!!

Think about all modes of transportation

Think like unfamiliar driver



# RSA Team Findings

Crash  
Frequency

## RISK CATEGORY

A = Lowest priority  
F = Highest prior

|            |            |     |     |      |
|------------|------------|-----|-----|------|
| Frequent   | C          | D   | E   | F    |
| Occasional | B          | C   | D   | E    |
| Rare       | A          | B   | C   | D    |
|            | Negligible | Low | Med | High |

Crash Severity

# Local Safety Initiative



# What is LSI?

## 3 pronged approach to safety

#1 – Engineering

#2 - Tool Development

#3 - Training



### 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](mailto:leixt@michigan.gov).



**Toward Zero Deaths**  
National Strategy on Highway Safety

## The LSI Process

An Agency gets started :They MUST volunteer

Site specific analysis – RoadSoft

Field Reviews & Countermeasures

Projects – Funding LAP



# Highway Safety Improvement Plan



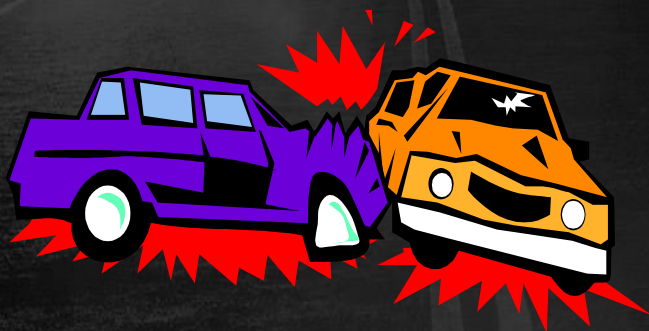
# Highway Safety Improvement Plan

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.



# Crash Analysis



# Crash Analysis

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.

# Crash Analysis

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

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

# Crash Analysis

Who:

TSC Traffic and Safety Engineer  
Region Traffic and Safety Engineer  
Consultant

When:

Scoping  
Preliminary Design

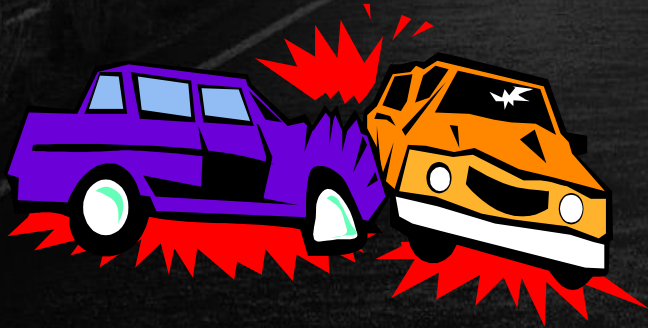
Tools:

Roadsoft  
Michigan Traffic Crash Facts

# Crash Analysis

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.







# Crash Data Analysis



## OFFICE MEMORANDUM

**DATE:** August 27, 2018      Electronic File: Traffic

**TO:** Dave McCaw,  
Cost and Scheduling Engineer  
Traverse City TSC

**FROM:** Krista Phillips  
Traffic and Safety Engineer  
Traverse City TSC

**SUBJECT:** Crash Analysis and Safety Review  
Route: M-72  
JN 200516A  
Location: M-72 from approximately Coleman Rd easterly to west of Tugan Rd, CS 45021

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 is 55 MPH throughout this corridor. There are two travel lanes with intermittent passing and turning lanes. The AADT is 5,301 vehicles/day with 5% commercial vehicles from Bugaj/Gray Road to Coleman Road while the AADT from Coleman Road to Fritz Road is 2,825 vehicles/day with 10% commercial vehicles. The summer ADT is approximately 8,300 vehicles/day. The composition of the 10' shoulder width varies throughout the corridor with 3' - 8' of TMA.

### 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.

| Crash Type   | Fatal Object | Rear End Straight | Angle Straight | Overturn | Misc. | Total |
|--------------|--------------|-------------------|----------------|----------|-------|-------|
| # of Crashes | 21           | 14                | 8              | 8        | 32    | 34    |
| % Crashes    | 23%          | 17%               | 10%            | 10%      | 38%   | 100   |

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 concentration of angle crashes 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 stop signs in foggy conditions. The second fatality occurred when a vehicle attempted to turn left into a private drive and collided head-on with a vehicle 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 vehicle head-on. A second vehicle traveling westbound was then struck.
3. A vehicle was traveling west on M-72 by Cedar Valley Road when it lost control in a heavy downpour. The vehicle crossed the centerline, striking an opposing vehicle head-on.
4. A westbound vehicle ran off the roadway to the right by Tilton Road, striking a guardrail. The vehicle then crosses to the opposite roadside and rolled over, coming to its final resting position.
5. A vehicle was traveling west on M-72 when it attempted to make a U-turn. A vehicle traveling east was struck by the turning vehicle and lost control, exiting the roadway and rolling. The turning vehicle fled the scene.
6. 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



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

“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

# What Will We Learn Today?

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

# What Will We Learn Today?

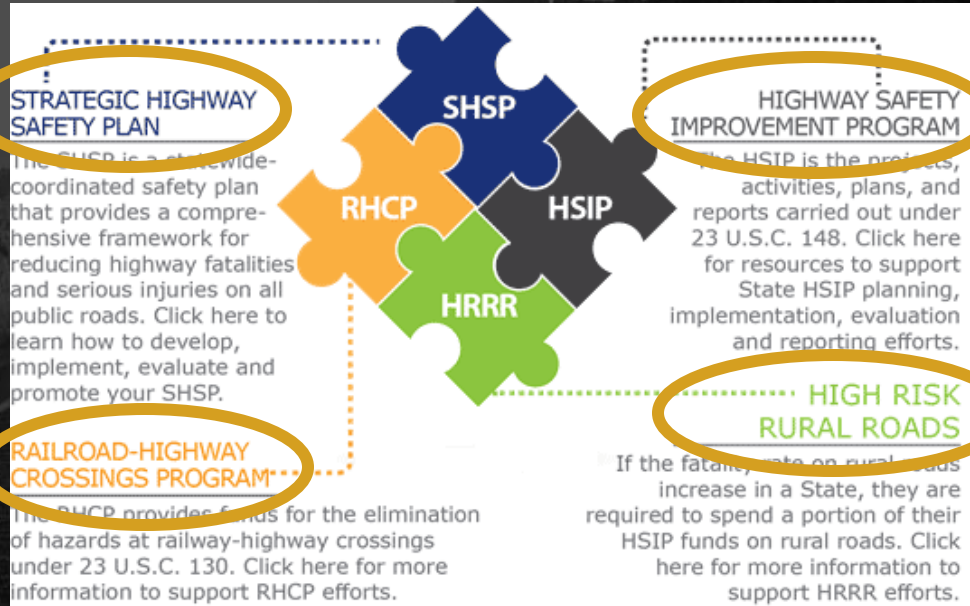
- Project Selection
- Time of Return Spreadsheet (TOR)
- Highway Safety Manual

# HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)



# Highway Safety Improvement Program (HSIP)

Statewide



Safety Programs

Office of Rail

Local Agency Programs

# HSIP - SHSP

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

# HSIP – SHSP – Four Broad Emphasis Areas:

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



# HSIP – SHSP – Four Broad Emphasis Areas:

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

# HSIP – SHSP - Four Broad Emphasis Areas:

- Engineering Infrastructure:
  - Traffic Safety Engineering

# HSIP – SHSP - Four Broad Emphasis Areas:

- 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)

# 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

# ACCIDENT

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

# CRASH

“Collide violently with an obstacle or another vehicle”



# ~~ACCIDENT~~ CRASH

# WHAT CAN YOU DO?

# Crash Phrases

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

# CRASH ~~ACCIDENT~~

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.





**ACCIDENTS**



# ROADSOFT



# Roadsoft Module

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

# Roadsoft Module

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



# 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

# Roadsoft Filter Builder

The screenshot displays the Roadsoft Filter Builder application window. The title bar indicates the user is logged in as 'spanglerh (FW17)' on a connection to '[RS\_STATE] on [DMBSQL12PROD/DMBSQL12PROD.1910]'. The interface includes a menu bar (File, Asset Management, Safety Analysis, Reporting, Tools, Settings, Help), a toolbar with navigation and filter options, and a main workspace divided into several panels.

**Map Layers Panel:** Shows a list of layers categorized into Point Layers (Culvert, Crash, Intersection), Line Layers (Driveway, MDOT Curve, Road), and Polygon Layers (City, Township, County, Planning Region, MDOT Region, Prosperity Region, MPO, TSC). The 'Crash' layer is currently selected.

**Crash Filter Builder Panel:** This panel is used to define search criteria. It features a search bar, a list of fields and groups, and a table for defining filter rules.

| Group | Field         | Operator | Value(s)                                     |
|-------|---------------|----------|--|
| 1     | Year of Crash | =        | 2018 or 2017 or 2016 or 2015 or 2014 or 2013 |
| 1     | MDOT Region   | =        | Region 4; Bay                                |

**Criteria Panel:** A summary view of the filter rules defined in the main panel.

| Criteria   |
|--|
| Year of Crash = 2018 or 2017 or 2016 or 2015 or 2014 or 2013 |
| MDOT Region = Region 4; Bay                                  |

**Results and Actions:** The bottom of the interface shows the results of the filter: '165614 crash(es) found (animal crashes excluded)'. Below this, there are buttons for 'Apply as Filter', 'Append to Selection', and 'Replace Selection'. A 'Saved Filter: Barry Co' label is also present.

# Roadsoft Intersection Collision Diagram

The screenshot displays the Roadsoft v2018.5 software interface for the State of Michigan. The 'Collision Diagram' menu is open, showing options such as 'SMS Crash Data Interface...', 'Crash Reporting...', 'Intersection Ranking...', 'Segment Ranking...', 'MDOT Curve Ranking...', 'Curve Ranking...', 'Interchange Ranking...', 'Collision Diagram...', 'Crash Segment Chart Map...', 'Trend Analysis...', 'Setup Weights for Intersection Ranking...', 'Export Crash Data to File...', 'NCHRP Documentation...', 'HSPTS Documentation...', 'Download UD-10s for current map selection...', and 'Include Animal Crashes...'. The 'Collision Diagram' window is active, showing the 'Collision Diagram Input' section with the following parameters:

| Collision Diagram Input                       |           |
|---|-----------|
| Crash Dates                                   |           |
| Start Date                                    | 1/1/2013  |
| End Date                                      | 9/20/2018 |
| Animal Crashes                                | Excluded  |
| Current Radius                                |           |
| Radius (ft.)                                  | 250       |
| Interior Buffer (ft.)                         | 0         |
| Current Intersection                          |           |
| PR Number                                     | 0         |
| CS Number                                     | 0         |
| Severity Statistics                           |           |
| PDOs  | 0         |
| Injuries                                      | 0         |
| Fatals  | 0         |
| Total Crashes                                 | 0         |
| Distances (ft.) of Summarized Incoming Blocks |           |
| 1st Block                                     | 50        |
| + 2nd Block                                   | 50        |
| + 3rd Block                                   | 50        |
| + Farthest Block                              | 8         |
| =   | -----     |
| Radius (ft.)                                  | 250       |

Below the input section, there is an 'Advanced Filter' section with an 'Open Filter' button. The filter is currently set to '(None)'. The advanced filter shows: 'Year of Crash = 2018 or 2017 or 2016 or 2015 or 2014 or 2013' and 'MDOT Region = Region 4; Bay'.

# Roadsoft Ranking Reports

**Crash Intersection Ranking**

Filter Columns [Run Ranking]

**Limit List**

- Limit List to Top: 100
- Percent/Intersections:  Percent  Intersections

**Crash Dates**

- Start Date: 1/1/2013
- End Date: 9/20/2018

**Radius**

- Radius (feet): 250

**Typical Crash Costs**

- TCSA (Fatal): \$2,600,000
- TCSA (Injury): \$180,000
- TCPDO (PDO): \$2,000

**Weights** [Define Weights...]

- Use Weight Set:  No
- Weight Set Name:

**Advanced Filter:** [Open Filter Builder]

Filter:

Animal Crashes: Excluded  
 Start Date >= 1/1/2013  
 End Date <= 9/20/2018  
 Radius = 250

**Advanced Filter:**

Year of Crash = 2018 or 2017 or 2016 or 2015 or 2014 or 2013  
 MDOT Region = Region 4: Bay

25900 Intersections Ranked

0 selections shown on Crash

| Intersection Name                                   | Township         | County    | Total Crashes | Fatal/A Crashes |
|---|------------------|-----------|---------------|-----------------|
| S Mission Rd & E Broomfield Rd                      | Mt Pleasant      | Isabella  | 414           | 2               |
| Tittabawassee Rd & Bay Rd                           | Saginaw Twp      | Saginaw   | 298           | 0               |
| N Center Rd & State St                              | Saginaw Twp      | Saginaw   | 230           | 0               |
| E Wackerly Rd & Eastman Ave                         | Midland          | Midland   | 201           | 0               |
| Kraft Rd & M 25                                     | Fort Gratiot Twp | St. Clair | 201           | 0               |
| Corunna Rd & S Linden Rd                            | Flint Twp        | Genesee   | 196           | 0               |
| E Court St & S Center Rd                            | Flint            | Genesee   | 190           | 0               |
| E Hill Rd & W Hill Rd & Fenton Rd                   | Grand Blanc Twp  | Genesee   | 185           | 0               |
| Lapeer Rd & S State Rd                              | Davison Twp      | Genesee   | 180           | 0               |
| Tittabawassee Rd & Fashion Square Blvd              | Saginaw Twp      | Saginaw   | 176           | 0               |
| Bay Rd & Shattuck Rd                                | Saginaw Twp      | Saginaw   | 175           | 1               |
| S Mission Rd & E Blue Grass Rd & W Campus Dr        | Union Twp        | Isabella  | 171           | 2               |
| E Wilder Rd & N Euclid Ave                          | Bangor Twp       | Bay       | 169           | 0               |
| N Saginaw Rd & Eastman Ave                          | Midland          | Midland   | 165           | 0               |
| Pine Grove Ave & Holland Ave                        | Port Huron       | St. Clair | 165           | 0               |
| 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               |
| Wieneke Rd & State St                               | Saginaw Twp      | Saginaw   | 157           | 1               |
| 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               |
| McCarty Rd & Bay Rd                                 | Saginaw Twp      | Saginaw   | 146           | 1               |
| S Dort Hwy & E Court St                             | 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               |
| N Main St & E Genesee St & S Main St & W Genesee St | Lapeer           | Lapeer    | 142           | 2               |
| N I 475 & S Grand Traverse St                       | Flint            | Genesee   | 141           | 2               |
| E Pickard St & N Mission Rd                         | Mt Pleasant      | Isabella  | 140           | 0               |
| Schust Rd & Bay Rd                                  | Saginaw Twp      | Saginaw   | 140           | 0               |
| Hemmeter Rd & State St                              | Saginaw Twp      | Saginaw   | 138           | 3               |

# Roadsoft Ranking Reports

**Crash Intersection Ranking**

Connection: [RS\_STATE] on [DMBSQL12PROD\DMBSQL12PROD.1910] as spanglerh (FW17)

**Filter** Columns Run Ranking

- Limit List**
  - Limit List to Top: 100
  - Percent/Intersections:  Percent  Intersections
- Crash Dates**
  - Start Date: 1/1/2013
  - End Date: 9/20/2018
- Radius**
  - Radius (feet): 250
- Typical Crash Costs**
  - TCSA (Fatal): \$2,600,000
  - TCIA (Injury): \$180,000
  - TCPDO (PDO): \$2,000
- Weights**
  - Use Weight Set:  No  Yes
  - Weight Set Name: [Define Weights...](#)

**Advanced Filter:**

[Open Filter Builder](#)

**Filter:**

Animal Crashes: Excluded  
 Start Date >= 1/1/2013  
 End Date <= 9/20/2018  
 Radius = 250

**Advanced Filter:**

Year of Crash = 2018 or 2017 or 2016 or 2015 or 2014 or 2013  
 MDOT Region = Region 4: Bay

25900 Intersections Ranked

0 selections shown on Crash

**Legend:** Contains a Trunkline Leg

| Intersection Name                                   | Township         | County    | Total Crashes | Fatal/A Crashes |
|---|------------------|-----------|---------------|-----------------|
| S Mission Rd & E Broomfield Rd                      | Mt Pleasant      | Isabella  | 414           | 2               |
| Tittabawassee Rd & Bay Rd                           | Saginaw Twp      | Saginaw   | 298           | 0               |
| N Center Rd & State St                              | Saginaw Twp      | Saginaw   | 230           | 0               |
| E Wackerly Rd & Eastman Ave                         | Midland          | Midland   | 201           | 0               |
| Kraft Rd & M 25                                     | Fort Gratiot Twp | St. Clair | 201           | 0               |
| Corunna Rd & S Linden Rd                            | Flint Twp        | Genesee   | 196           | 0               |
| E Court St & S Center Rd                            | Flint            | Genesee   | 190           | 0               |
| E Hill Rd & W Hill Rd & Fenton Rd                   | Grand Blanc Twp  | Genesee   | 185           | 0               |
| Lapeer Rd & S State Rd                              | Davison Twp      | Genesee   | 180           | 0               |
| Tittabawassee Rd & Fashion Square Blvd              | Saginaw Twp      | Saginaw   | 176           | 0               |
| Bay Rd & Shattuck Rd                                | Saginaw Twp      | Saginaw   | 175           | 1               |
| S Mission Rd & E Blue Grass Rd & W Campus Dr        | Union Twp        | Isabella  | 171           | 2               |
| E Wilder Rd & N Euclid Ave                          | Bangor Twp       | Bay       | 169           | 0               |
| N Saginaw Rd & Eastman Ave                          | Midland          | Midland   | 165           | 0               |
| Pine Grove Ave & Holland Ave                        | Port Huron       | St. Clair | 165           | 0               |
| 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               |
| Wieneke Rd & State St                               | Saginaw Twp      | Saginaw   | 157           | 1               |
| 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               |
| McCarty Rd & Bay Rd                                 | Saginaw Twp      | Saginaw   | 146           | 1               |
| S Dort Hwy & E Court St                             | 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               |
| N Main St & E Genesee St & S Main St & W Genesee St | Lapeer           | Lapeer    | 142           | 2               |
| N I 475 & S Grand Traverse St                       | Flint            | Genesee   | 141           | 2               |
| E Pickard St & N Mission Rd                         | Mt Pleasant      | Isabella  | 140           | 0               |
| Schust Rd & Bay Rd                                  | Saginaw Twp      | Saginaw   | 140           | 0               |
| Hemmeter Rd & State St                              | Saginaw Twp      | Saginaw   | 138           | 3               |

[Print Report](#) [Export as File](#) [Collision Diagram](#) [Apply as Selection](#) [Trend Analysis](#) [View Crashes](#)

# Roadsoft Ranking Reports

- Intersection Ranking
- MDOT Curve Ranking
- Curve Ranking

# Roadsoft Project Selection

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

# CRASH TYPES AND SAFETY COUNTERMEASURES



# Crash Types

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

# WHAT CAN YOU DO?



# RUMBLE STRIPS

44% REDUCTION IN FATAL AND SERIOUS INJURIES



# RUMBLE STRIPS – CRASH TYPES

**TZD**  
Toward Zero Deaths

For more information:  
[www.michigan.gov/rumblestrips](http://www.michigan.gov/rumblestrips)

**MDOT**  
Michigan Department of Transportation

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

**MDOT**  
Michigan Department of Transportation

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

# CABLE MEDIAN BARRIER

87% Reduction in Fatal and Serious Injuries



# CABLE MEDIAN BARRIER – CRASH TYPES



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

# ROUNDBABOUTS

78% Reduction in fatal and serious injuries

57% Reduction in all minor injuries



# ROUNDABOUTS

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





# SIGNING

- Reflective Sheeting on Sign Posts
- Wrong Way Movements
- 15% Reduction



# SIGNING

- Intersection Related
- Cross Traffic Does Not Stop
- Angle



# FIXED OBJECTS

## 75% Reduction Clear Zone Crashes



# SHOULDER WIDENING



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

# SHOULDER WIDENING

## 5% Reduction Per Foot



# ENHANCED DELINEATION

- Roadside Delineation



# ENHANCED DELINEATION

- Guardrail Delineation



# ENHANCED DELINEATION

- Curve Delineation





# PROJECT SELECTION





# Safety Scoping

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



# 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
- What is the “Biggest band for the buck?”



# TIME OF RETURN (TOR)

# TOR Steps

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

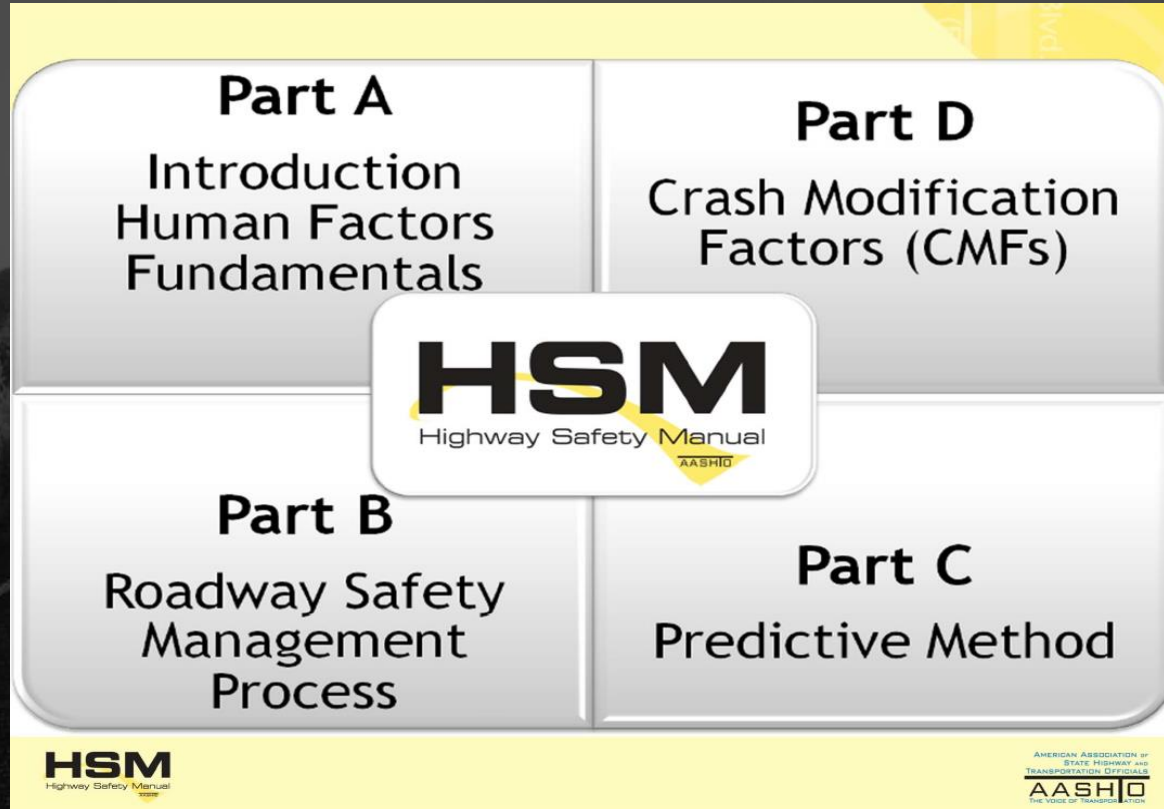
# TOR Steps

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

# HIGHWAY SAFETY MANUAL (HSM)



# HSM



# HSM

- PART A:
  - Human Factors
  - Fundamentals

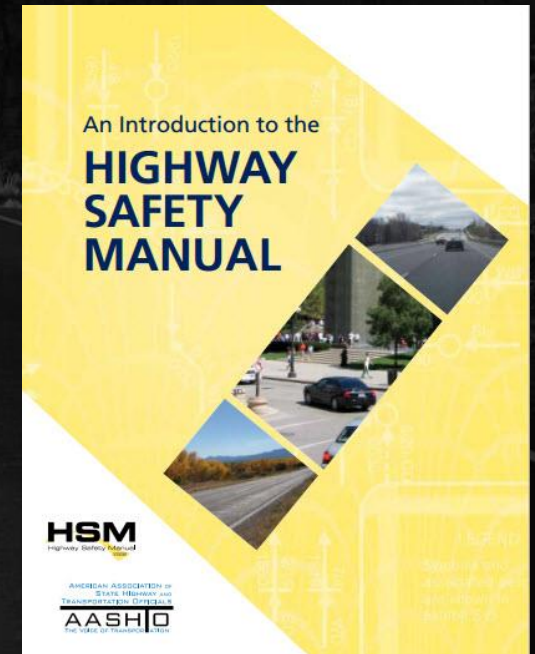


# HSM

- PART B – Roadway Safety Management

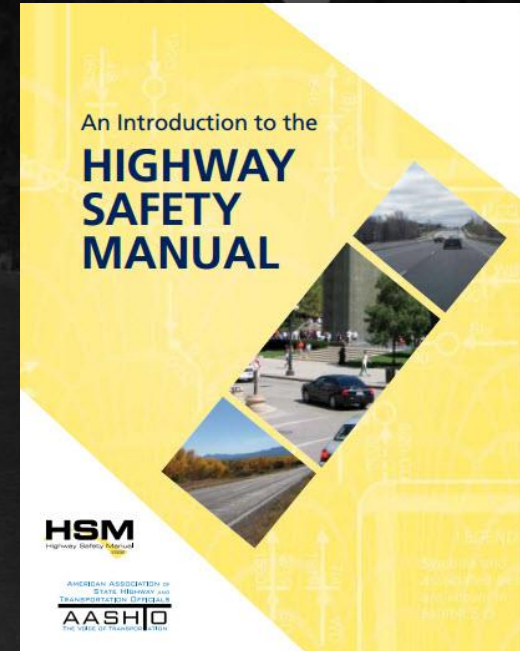
## Process

- Network Screening
- Countermeasures
- Prioritize Projects



# HSM

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

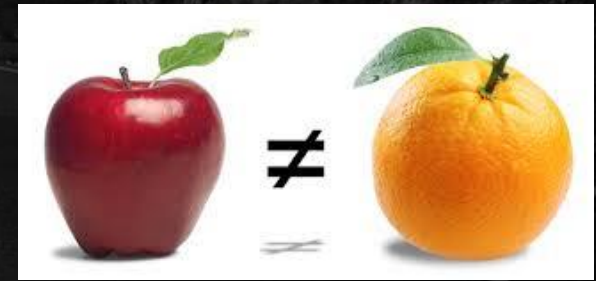


# HSM

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

# HSM Spreadsheet

- Formal Training Available
  - Dean Kanitz/Heidi Spangler
- Crash Modification Factors
  - [www.cmfclearinghouse.org](http://www.cmfclearinghouse.org)
- CMF are related (but not equal) to CRF's



# HSM Spreadsheet

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



# QUESTIONS?





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