

# Unpaved Road Safety

*Michigan Local Road Safety Peer  
Exchange*

*Lansing, MI*

*October 11, 2018*



U.S. Department of Transportation  
**Federal Highway Administration**



**Safe Roads for a Safer Future**  
*Investment in roadway safety saves lives*

<http://safety.fhwa.dot.gov>

# Unpaved Road Safety

## Presentation

- Highlight the Importance of Safety on All Roads
- Discuss Safety on Unpaved Roads
  - Problem
  - Challenges
  - Safety Strategies
- County Perspective



Courtesy: Ken Skorseth

# Unpaved Road Safety

## The Problem...

- Towards Zero Deaths/Road to Zero?
- Unreported Crashes?
- Percentage of fatalities and serious injuries?
- Does existing technical safety literature comprehensively address unpaved road safety?



# Unpaved Road Safety

- Why be concerned with Unpaved Road Safety?
- What does the data show?





**567 Fatal Crashes**  
**629 Vehicles Involved**  
**1029 Persons Killed**  
**Economic Cost > \$1B\***  
**35% of Roads are Unpaved**



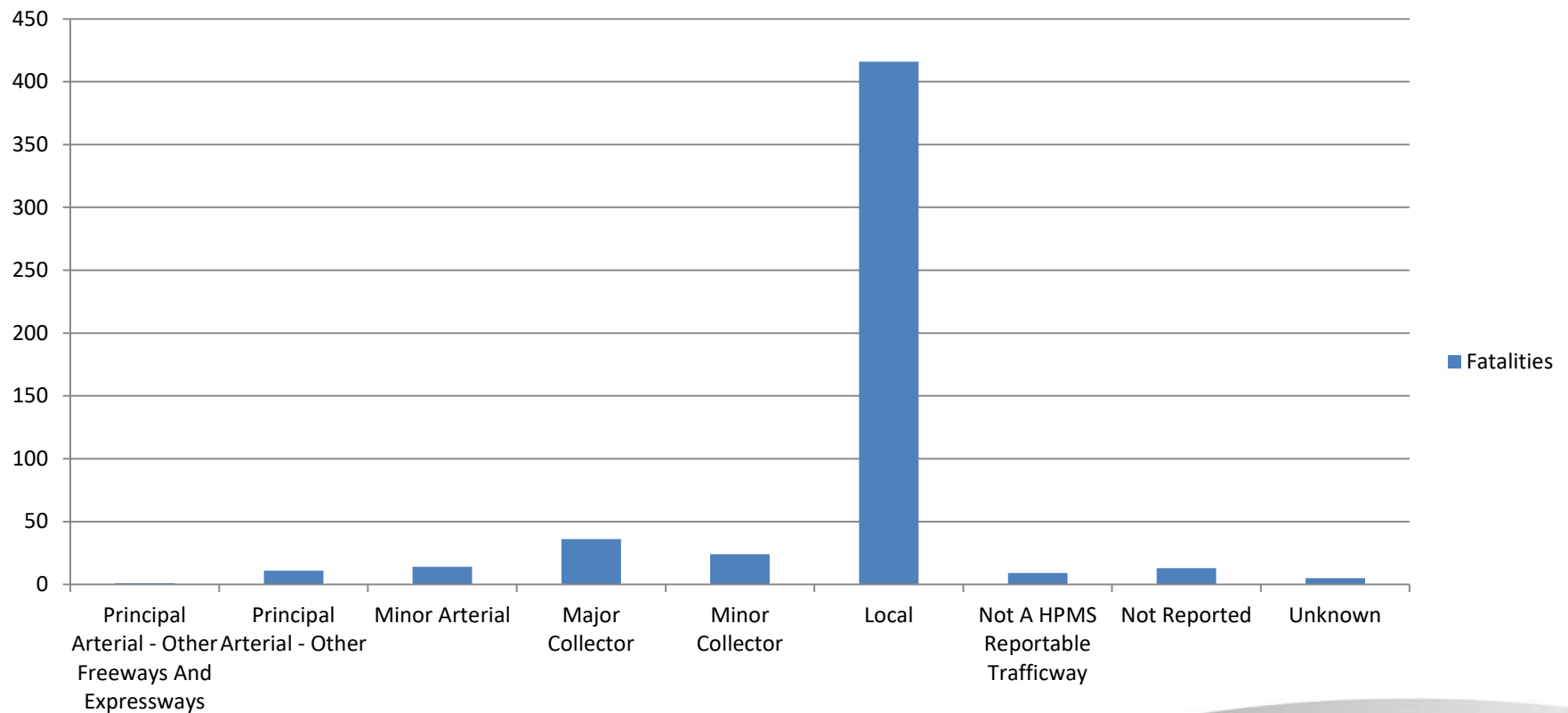


**33 Fatal Crashes**  
**35 Vehicles Involved**  
**42 Persons Killed**  
**30% of Roads are Unpaved**

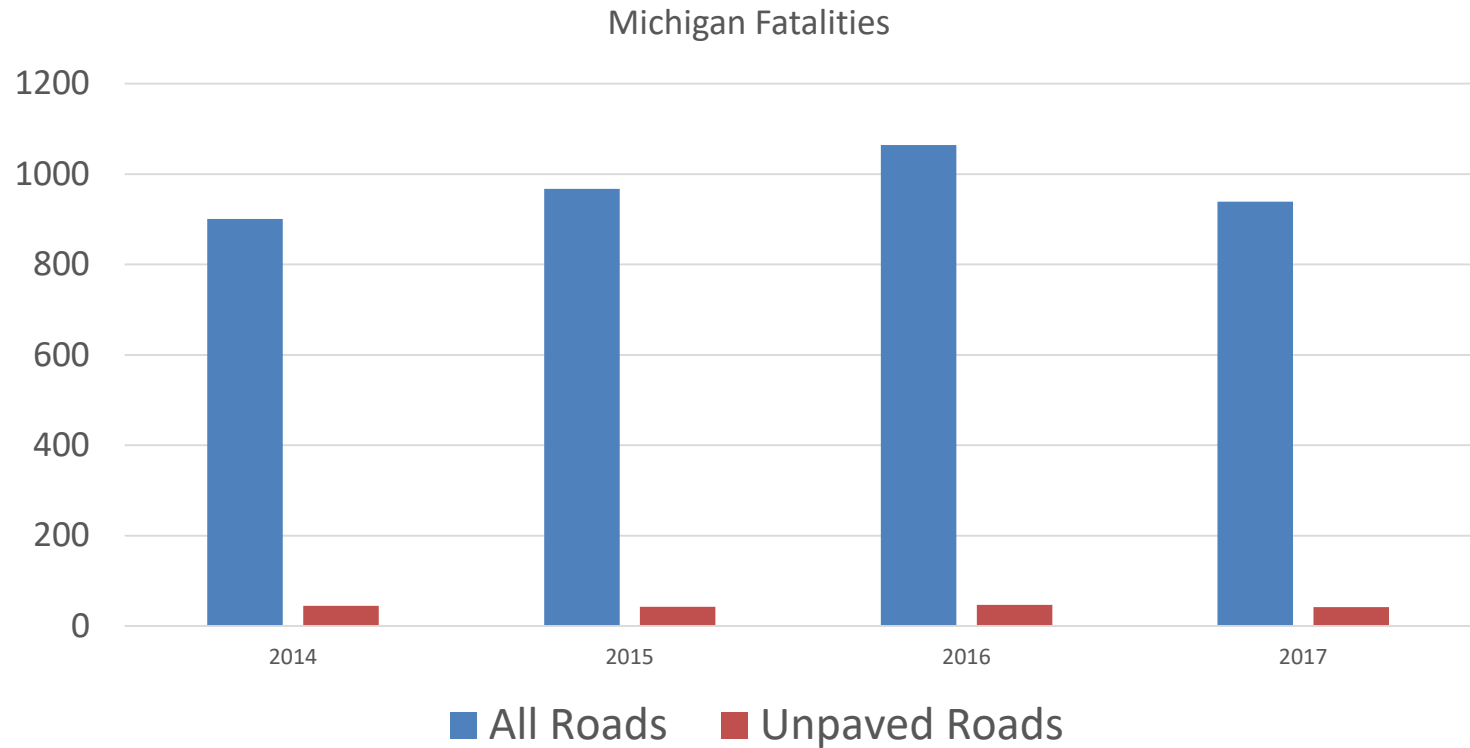


# Unpaved Road Safety

## Fatalities

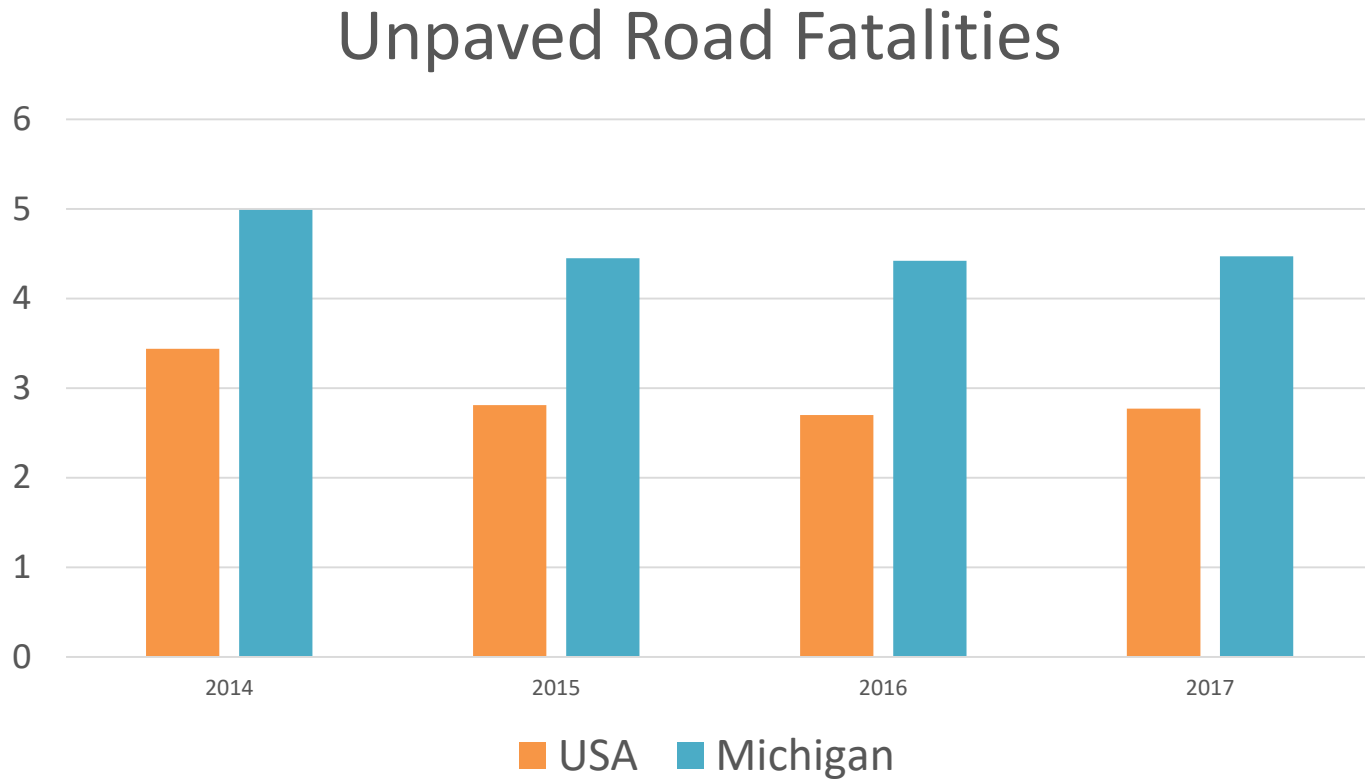


# Unpaved Road Safety



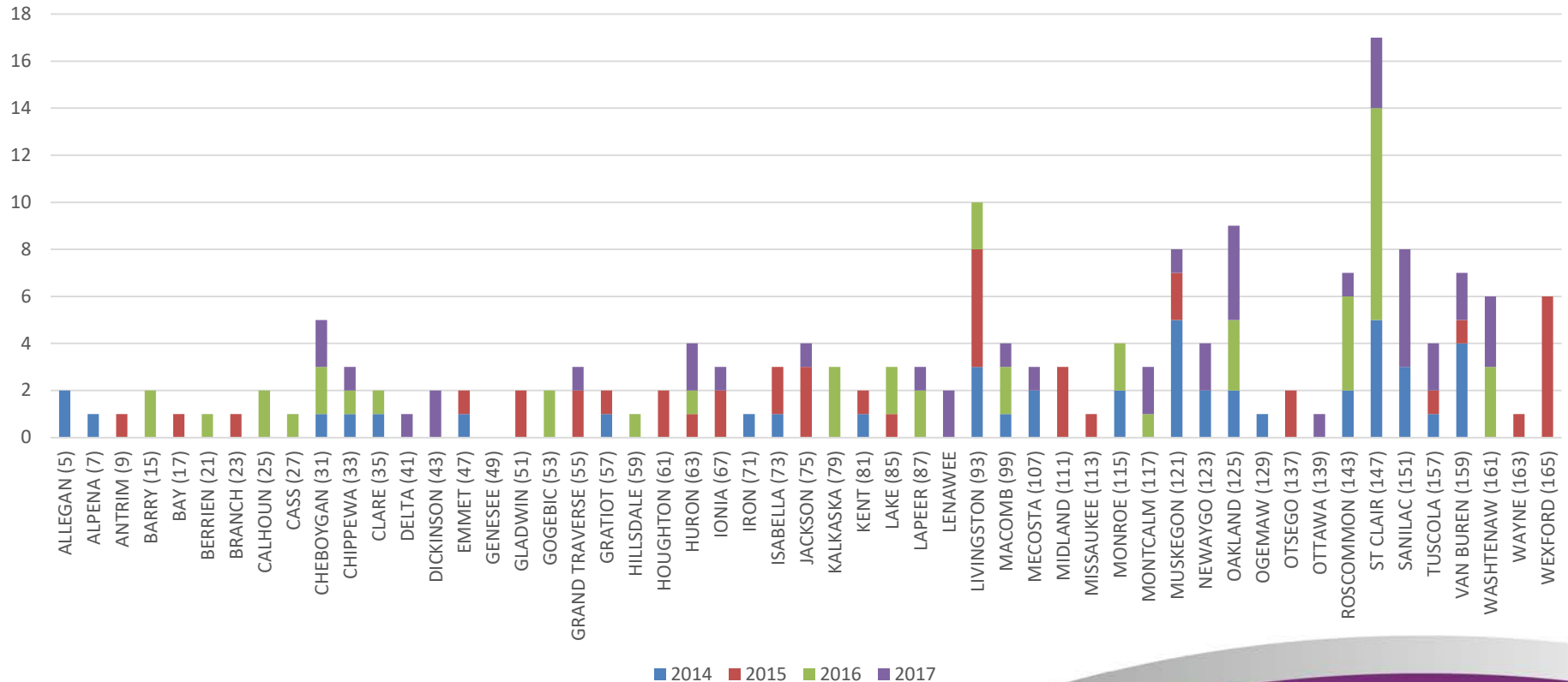


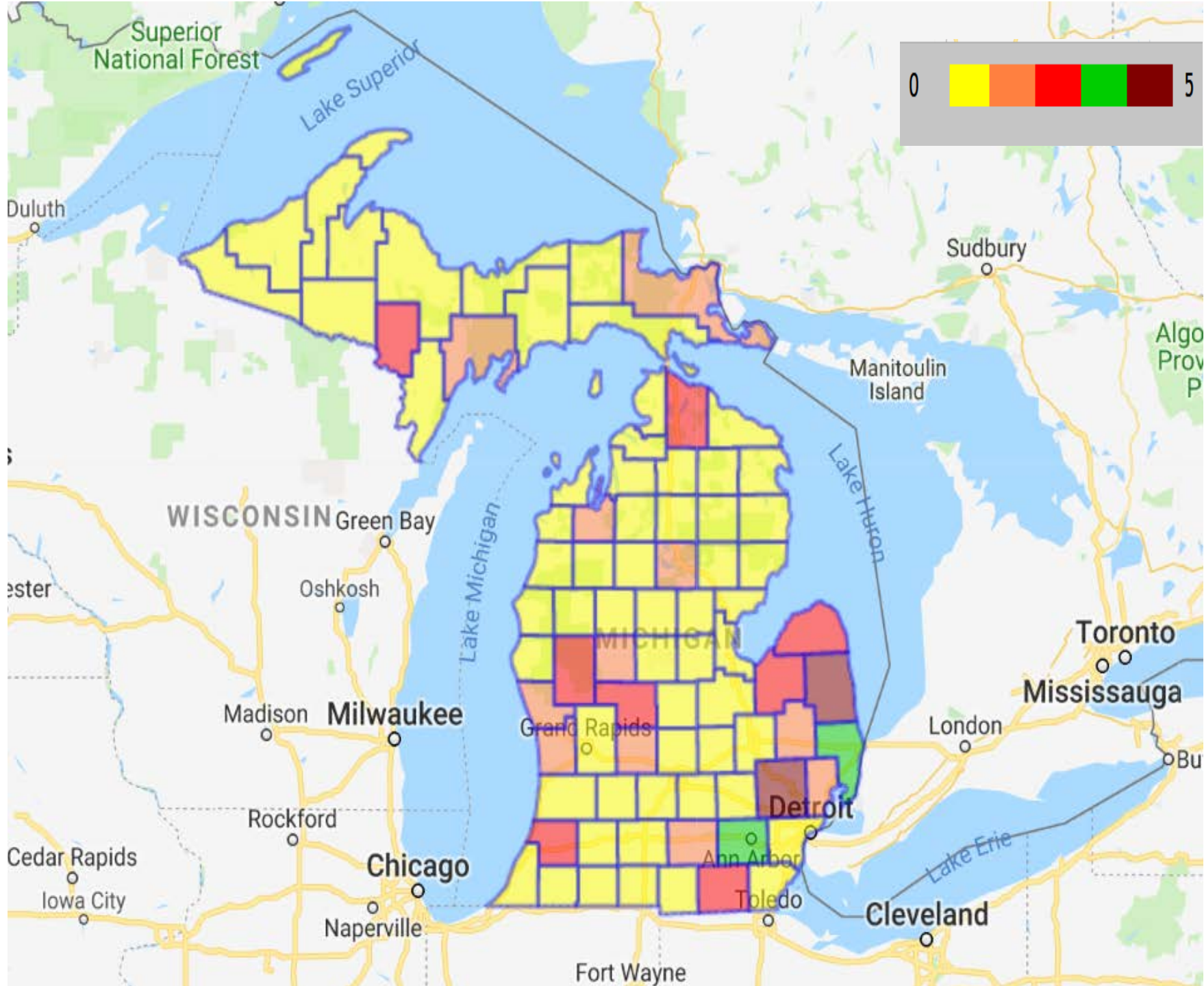
# Unpaved Road Safety



# Unpaved Road Safety

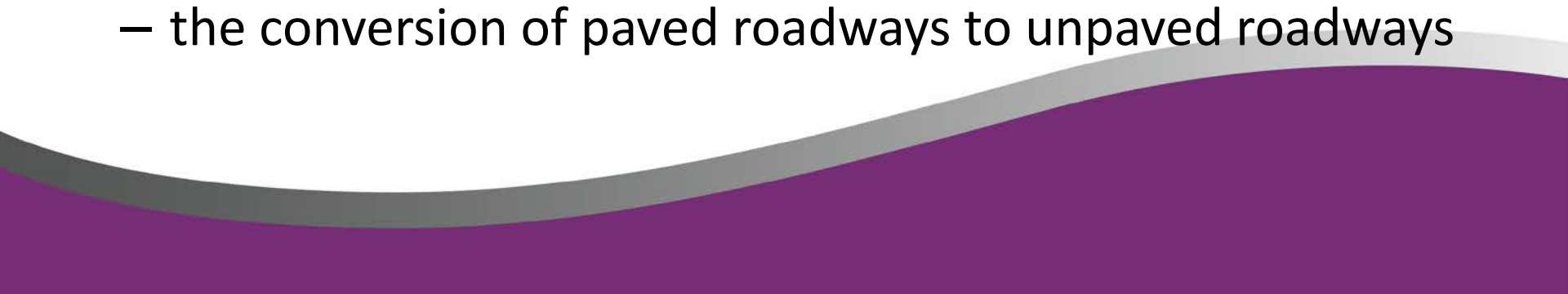
## Unpaved Road Fatalities By County







# Unpaved Road Safety

- 43 states had fatal crashes on unpaved roads in 2017.
  - Potential for large percentage of fatalities and serious injuries
    - lack of maintenance,
    - ex-urban development (semi-rural region lying adjacent to a city's suburbs),
    - Introduction of larger vehicles (commercial trucks)
    - larger agricultural equipment, and
    - the conversion of paved roadways to unpaved roadways
- 

**States with roads or road segments  
converted from paved to unpaved.**



Source: NCHRP Synthesis 485

# Unpaved Road Safety

- Main Crash Types
  - Run Off the Road
  - Animal Related
  - Intersection Related

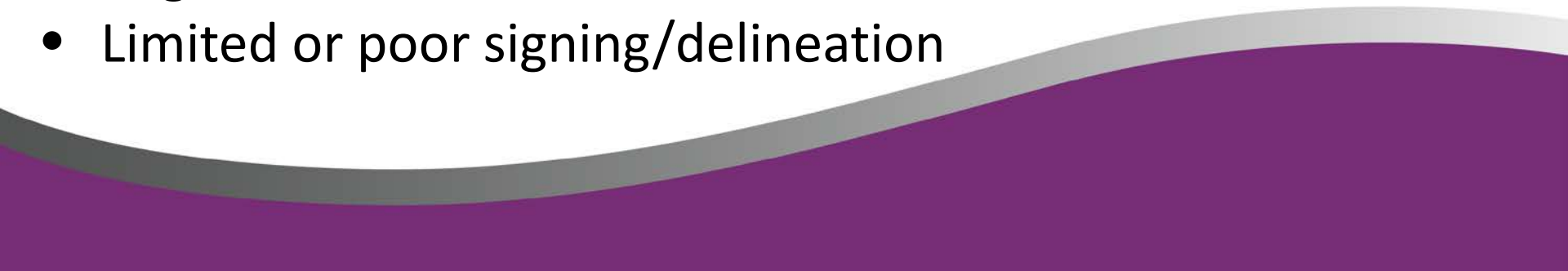


Courtesy: Ken Skorseth



# Unpaved Road Safety

## Some Contributing Features....

- Narrow lanes
  - Narrow/no shoulders
  - Reduced passing opportunities
  - Limited stopping/horizontal sight distances
  - Narrow bridges
  - Poor intersection sight distances
  - Roadside obstacles
  - No/limited clear zone
  - Vegetation
  - Limited or poor signing/delineation
- 
- The bottom of the slide features a decorative graphic consisting of two overlapping wavy lines. The upper wave is light gray, and the lower wave is a solid purple color, creating a modern, abstract border.

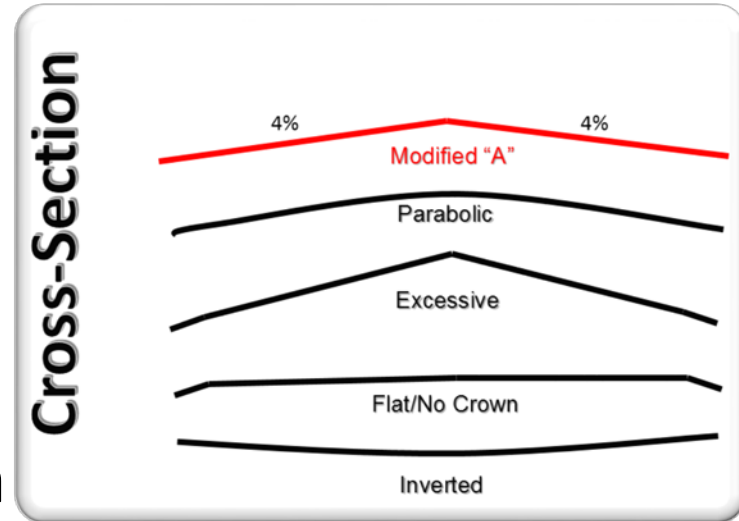
# Unpaved Road Safety

- Unpaved Road Surface Changes Rapidly
- Maintenance
  - Mow Shoulders
    - Prevent Secondary Ditches
    - Easier to Recover Loose Material
    - Keeps Drivers in their Lanes
    - Improves Sight Distance
    - Maintaining Clear Zones
      - Establish Recovery Areas
      - Remove fixed objects adjacent to road
      - Shield objects
      - Make objects traversable
  - Clear Vegetation



# Unpaved Road Safety

- Conduct grading operations:
  - Geometry (varies over time)
  - Provide smooth, stable surface
  - Grading/rock levels
  - Encourage drainage and crown
    - Appropriate roadway crown
  - Proper super-elevation
    - Address super elevation in Curves



Courtesy: Ken Skorseth



# Unpaved Road Safety

- Signs
  - Maintain Retro-reflectivity
  - Replacement Policy and Sign Maintenance
  - Add appropriate signs – intersections, curve warning, chevrons, advisory speed
  - Add appropriate reflective post strips
  - Delineation
  - Field reviews
  - Clean signs



# Unpaved Road Safety

- Barriers and Delineators
  - Unprotected Drop Offs
  - Define edge of roadway
- When feasible –
  - Flattening Vertical Curves
  - Straightening alignment



# Unpaved Road Safety

- Dust Control
  - Apply Stabilizers
    - Minimize dust loss - increase fines retention
    - Improve skid resistance
  - Improve Visibility for Road Users





# Unpaved Road Safety

- Realign Skewed Intersections
  - Better visibility of opposing traffic
  - Prevent road user confusion
- Widen Roadway
  - Passing room for opposing vehicles
  - Keep vehicles away from roadside/ditches



Image: Veneziano



# Gravel Road Basics for Safety in Van Buren County

*A Local Agency Limited Budget Approach  
to Rural Gravel Road Safety*



National Strategy On Highway Safety™

**PROUD PARTNER**

*TowardZeroDeaths.org*



# Protect the Investment and Gain Control over Your Surface Condition - Drainage



No Ditch



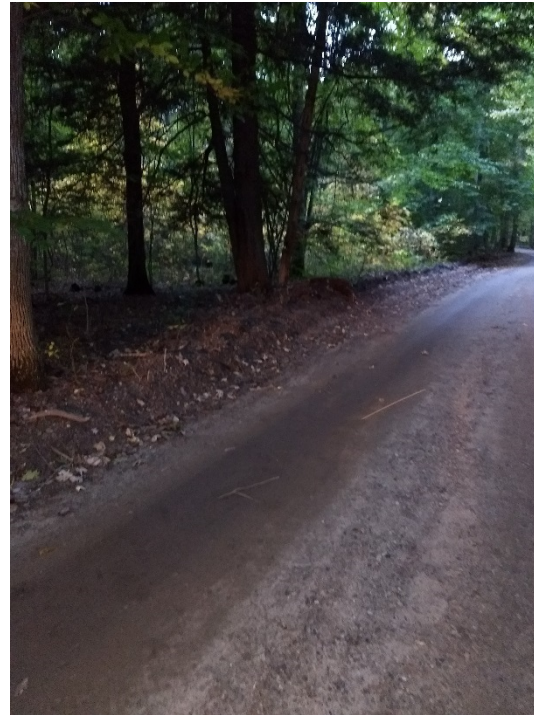
Cleared w/ Ditch



# A Firm Foundation is the Goal

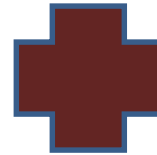


Poor Subgrade



Good Subgrade, Good  
Surface & Dust Control  
Binder

# Resurfacing and Shaping are a MUST!



Quality Surface for Ridability and  
Maintenance



# Open It Up & Air It Out!



Enclosed Canopy, Limited Air Movement, Holds Moisture

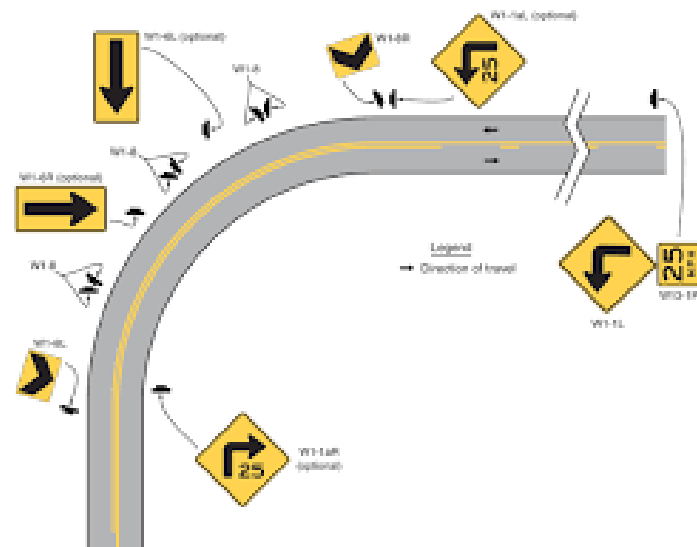


Basic Clearing to Open Canopy Allowing For Air Movement and Sunlight to Keep Surface Dry and Tight



# Delineation & Signage





# Summary.....

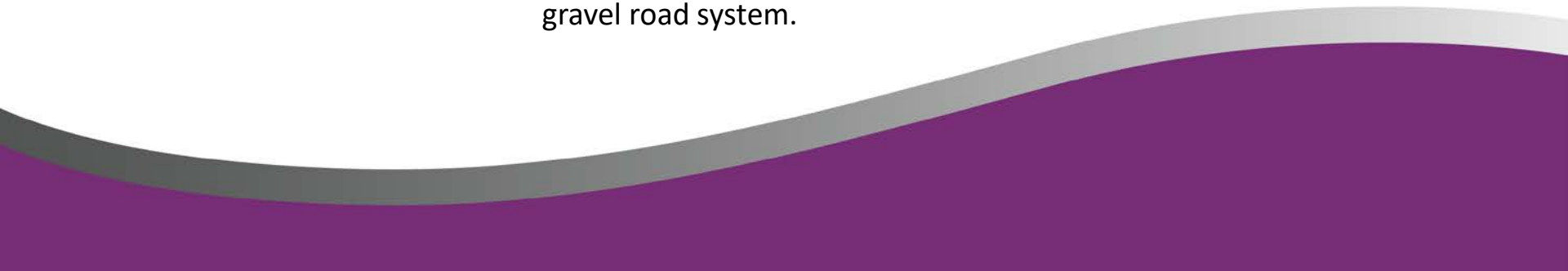
- \*Do what you can do with what you have.

- \*Review current practices and incorporate those additional steps in your maintenance processes.

- \*Ask for assistance.....LSI, peer road agencies, FHWA, LTAP

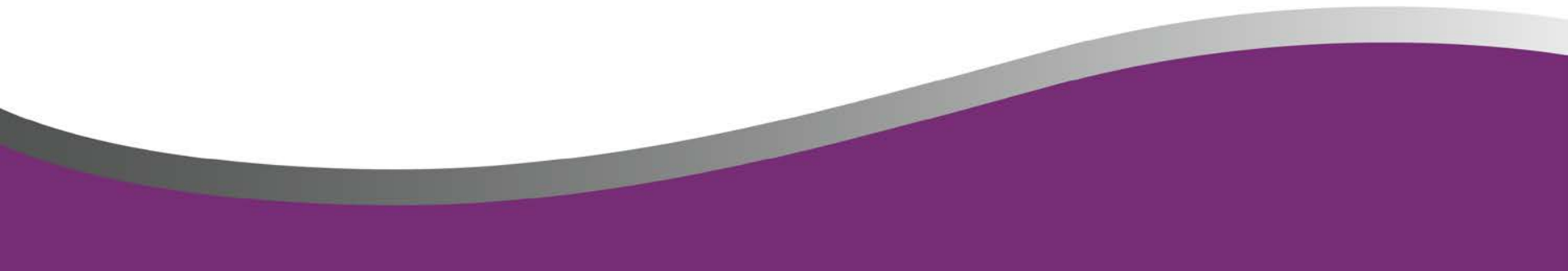
- \*We all have slightly different abilities within our crews and equipment but don't let that stop you from implementing those things you can and work on a plan to add more improvements as each year goes on.

- \*Remember that in Michigan around 60% of all fatalities occur on rural roads. The largest proportion of those miles are OURS, let's do all we can reduce and possibly eliminate those fatal and serious crashes on our rural gravel road system.





# Unpaved Road Safety

- Marketing/Training Safety on Unpaved Roads
  - Funding Projects on Unpaved Roads
    - Eligible for Highway Safety Improvement Program funds
  - Being Proactive and Systemic
  - Behavioral Issues
    - Speeding
    - Drivers Education (Unfamiliar with Unpaved Roads)
    - Enforcement
- 



# Unpaved Road Safety

## Unpaved Road Pooled Fund Study

- Exploring ways to advance safety on unpaved roads. Stakeholder/partners can participate in this proposed FHWA Transportation Pooled Fund (TPF) research effort.

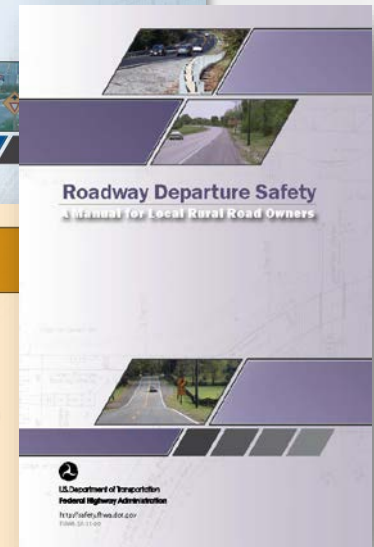
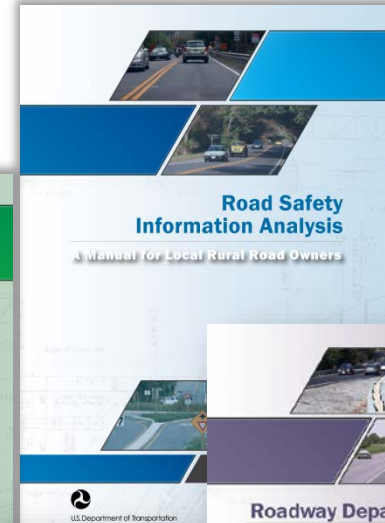
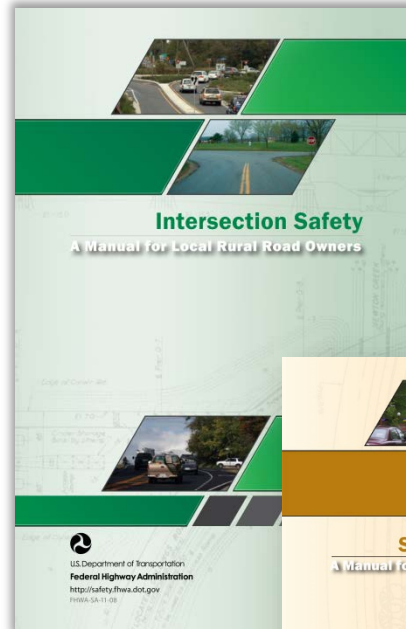
<http://www.pooledfund.org/Details/Solicitation/1419>



# Unpaved Road Safety




<https://www.fhwa.dot.gov/construction/pubs/ots15002.pdf>



[https://safety.fhwa.dot.gov/local\\_rural/training/](https://safety.fhwa.dot.gov/local_rural/training/)

# Conclusion

- Fatal Crashes are occurring on Unpaved Roads
  - States are Reverting Roadways
  - Limited Safety Data
  - Lack of Consistent Technical Information
  - Limited information on countermeasures addressing specific safety issues
  - Several LTAP Centers provide some training
  - Some success with traditional countermeasures and maintenance
  - Need for specific research
    - Determine effectiveness and use
- 

# Thank You!

rosemarie.anderson@dot.gov

