Rural Roadway Safety in Alabama

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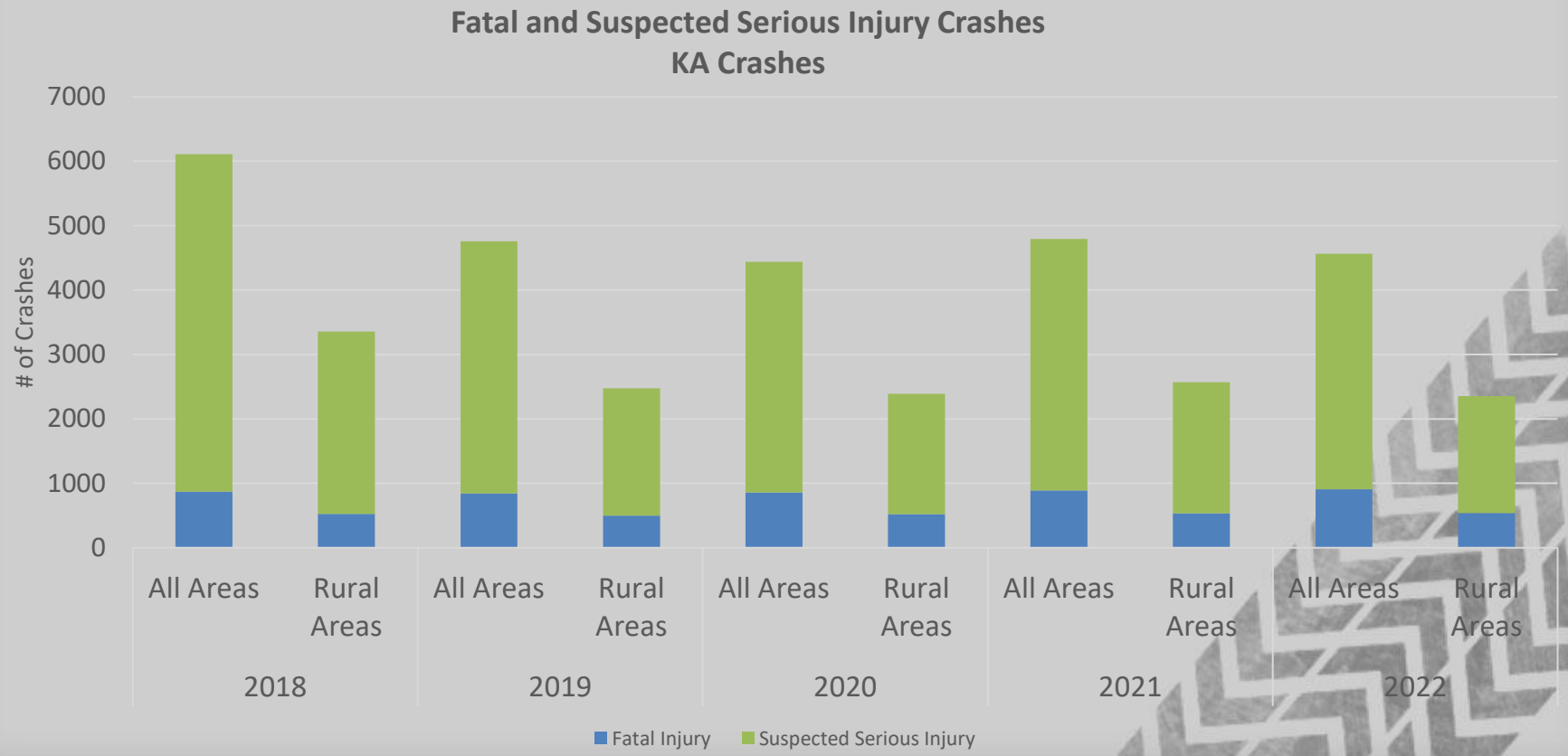
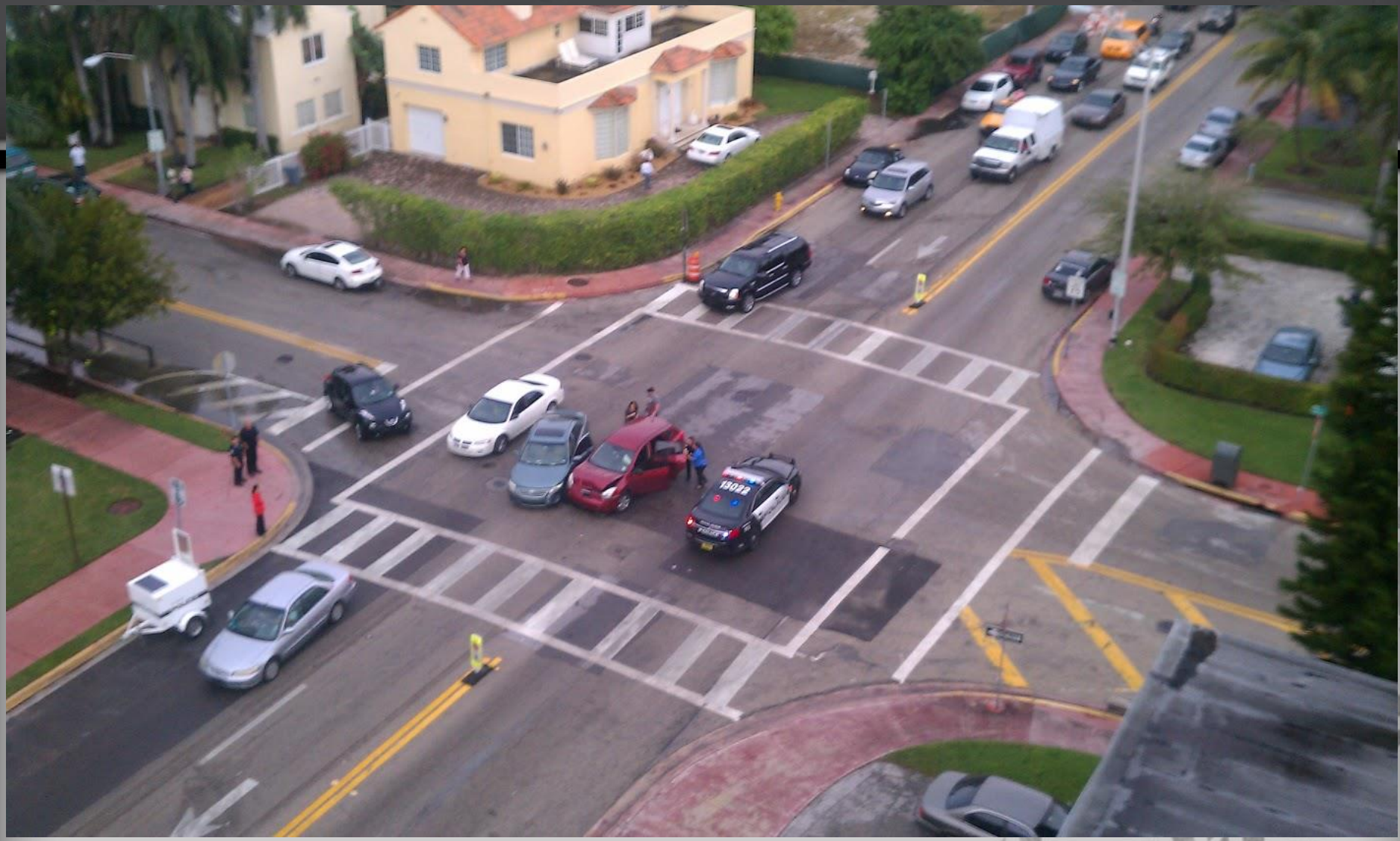
Alabama Traffic Fatalities



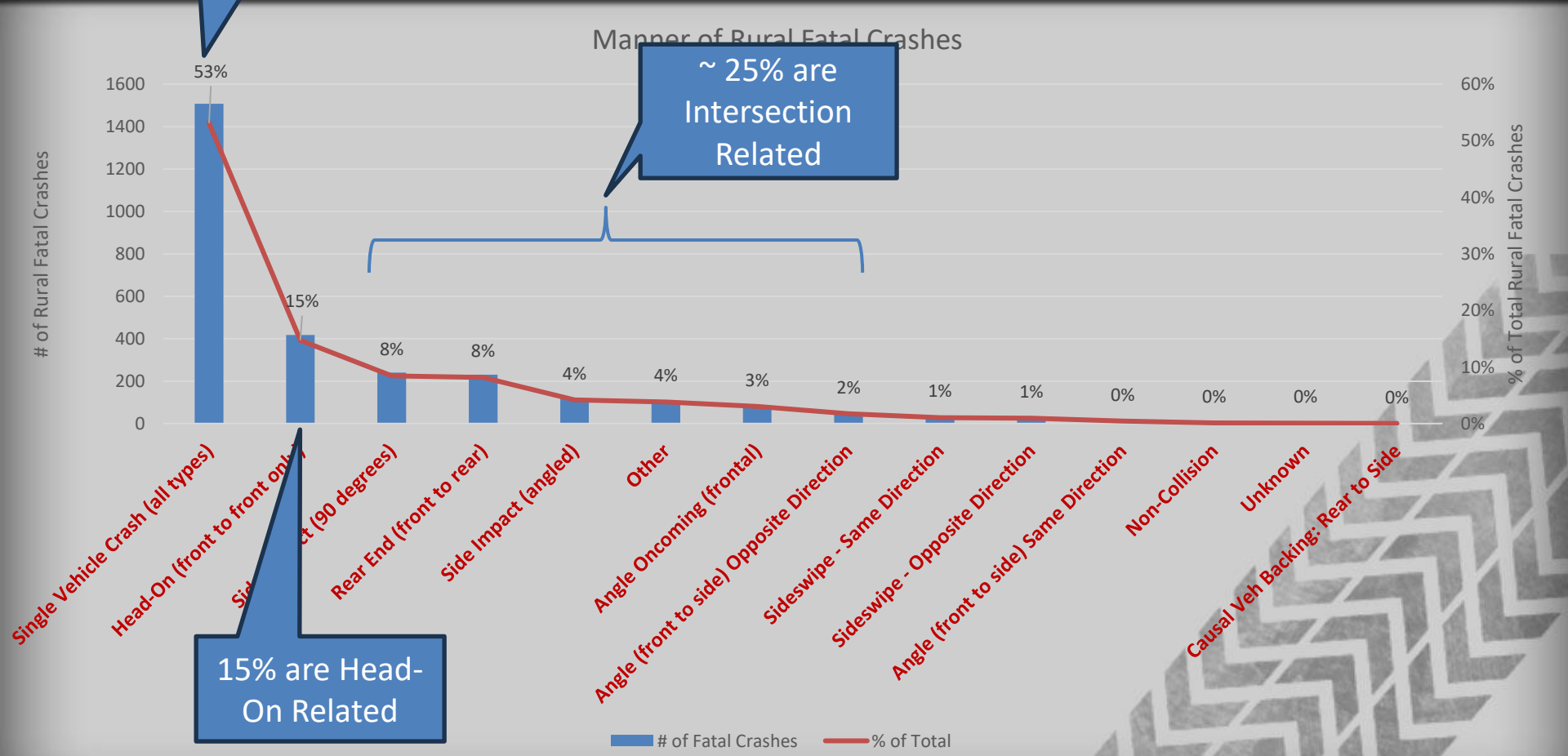
“IF YOU THINK GOOD DESIGN IS EXPENSIVE, YOU SHOULD LOOK AT THE COST OF BAD DESIGN”

DR. RALF SPETH, FORMER CEO JAGUAR



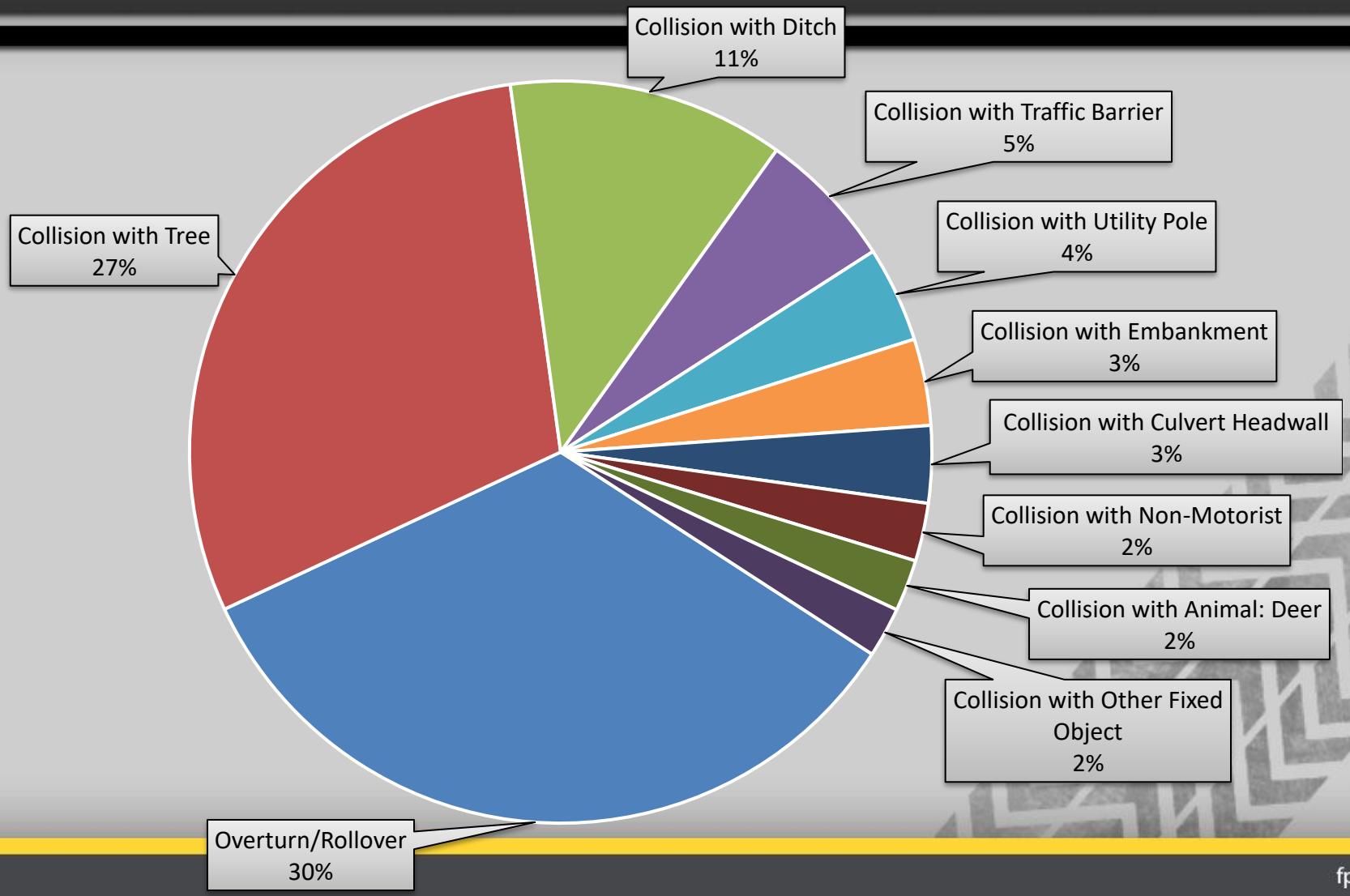
Rural Fatal Crashes

More than Half are Single Vehicle Related



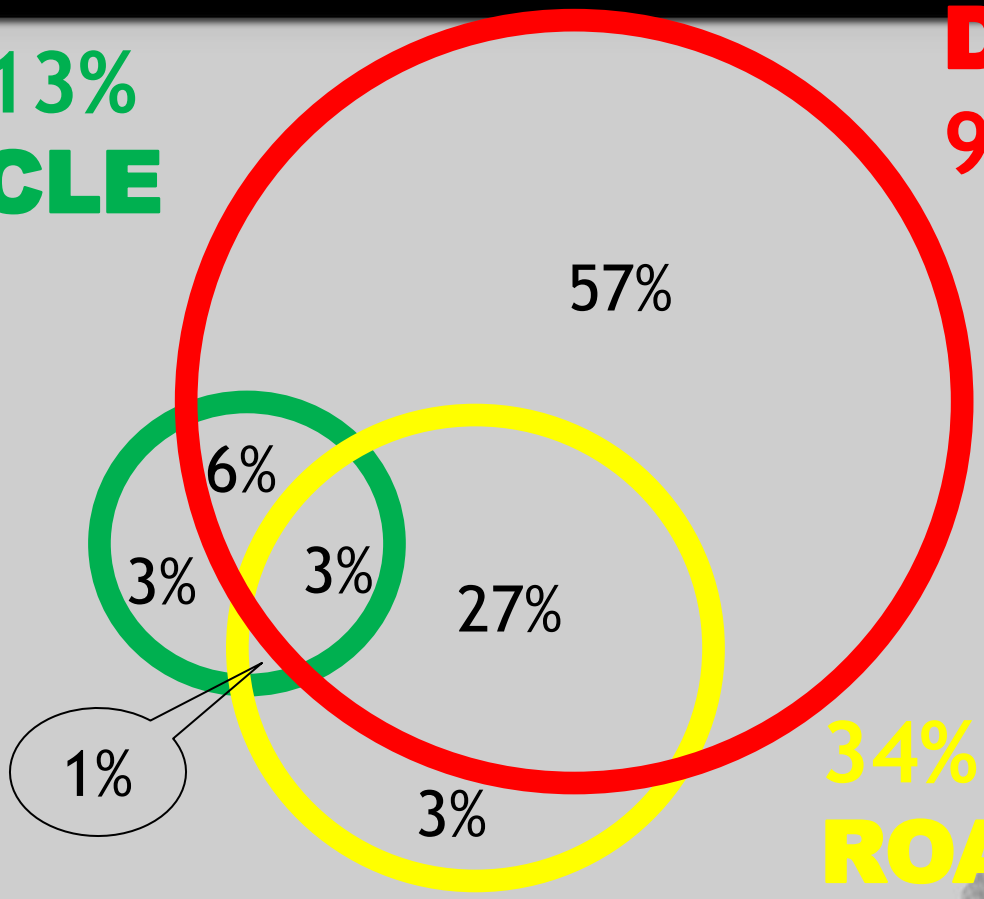
15% are Head-On Related

Single Vehicle KABC Crashes – Most Harmful Event

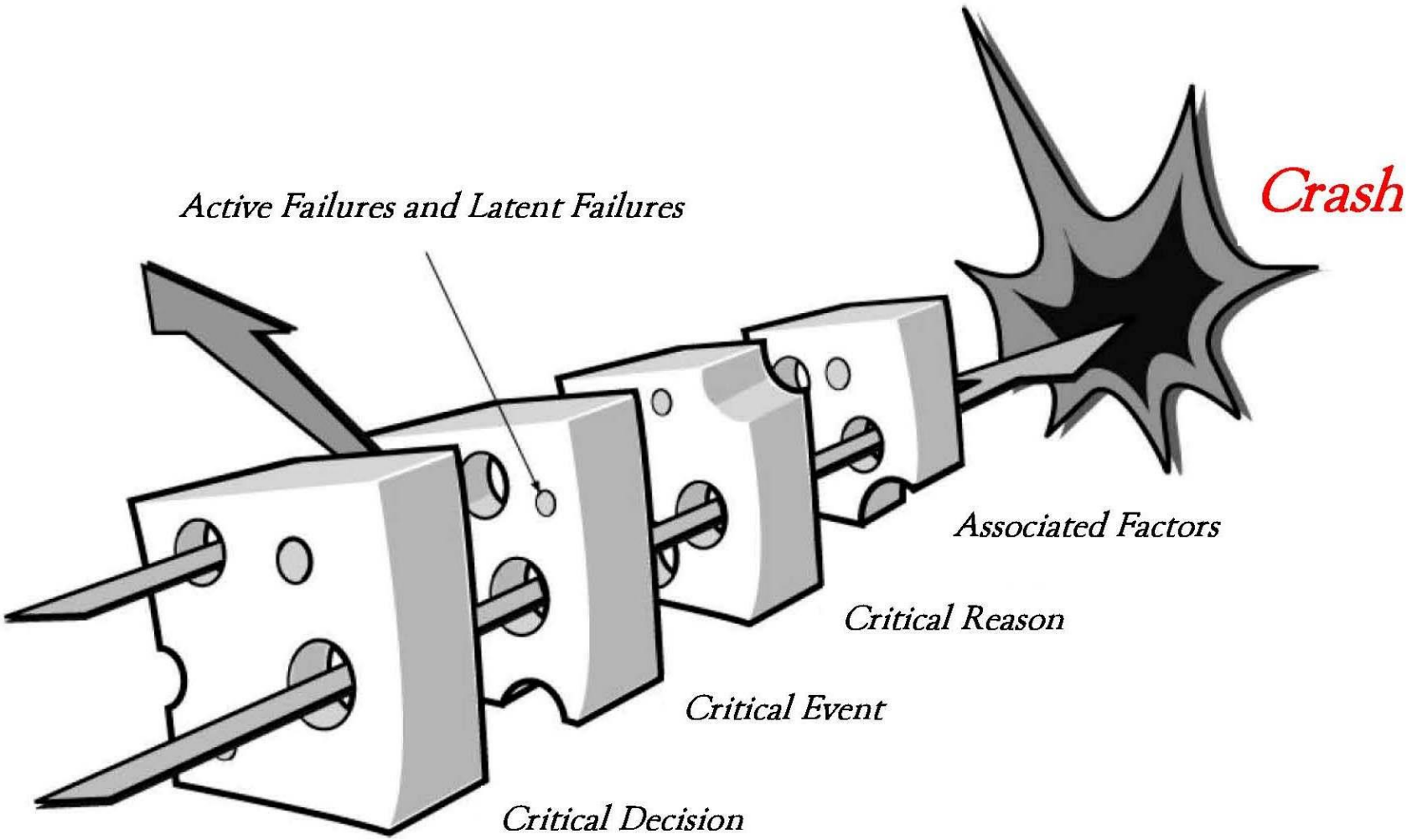



YOU'RE
IN A BOX ON
WHEELS HURTLING
ALONG SEVERAL TIMES
FASTER THAN EVOLUTION COULD
POSSIBLY HAVE PREPARED
YOU TO GO
NEXT 5 MILES

Crash Contributing Factors



Treat, 1979;
Graphic Credit: Thomas Neuman


Active Failures and Latent Failures
Crash
Associated Factors
Critical Reason
Critical Event
Critical Decision

Commonly Held View

Most design engineers believe a design value published in a manual is there primarily for safety reasons, and that any deviation from that value will result in significant degradation in safety.

In Fact

Rigid design standards in many cases have evolved to serve three purposes:

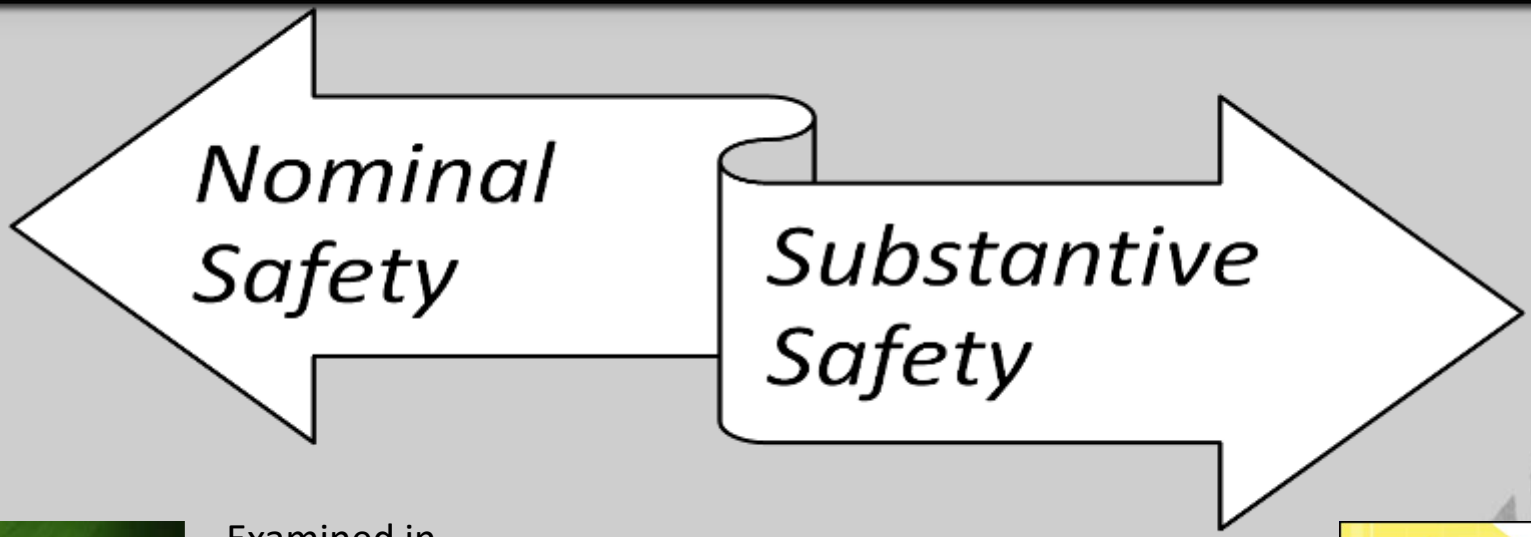
- Efficiency in design,
- As a quality control measure,
- Efficiency in construction.

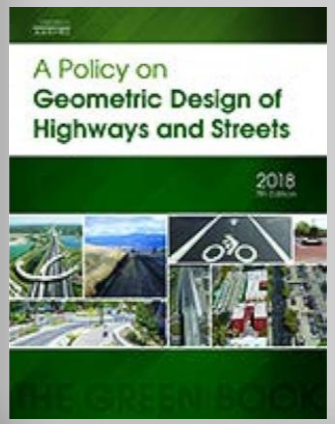
Philosophical Considerations in Highway Design

"The direct application of established design criteria or standards (i.e., nominal safety) is no assurance that a certain quality of design (i.e., substantive safety) will be achieved—indicating that such criteria are not sufficient in themselves."

Jack E. Leisch
"Dynamic Design for Safety"
ITE 1972

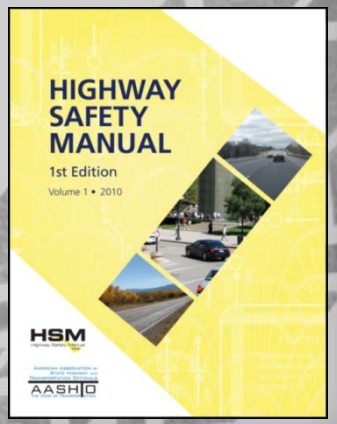
Nominal versus Substantive Safety





Examined in reference to compliance with standards, warrants, guidelines and sanctioned design procedures

The expected or actual crash frequency and severity for a highway or roadway



Focus on Standards

The focus on rigid standards has been translated in the minds of designers to a belief that standards equals safety, and that no compromises can be accepted.

This view holds even with design values that clearly are not related to substantive safety.

Training

- For the most part, we have focused on the importance of nominal safety, and
- Many designers have been taught that adherence to nominal safety directly translates into substantive safety performance.

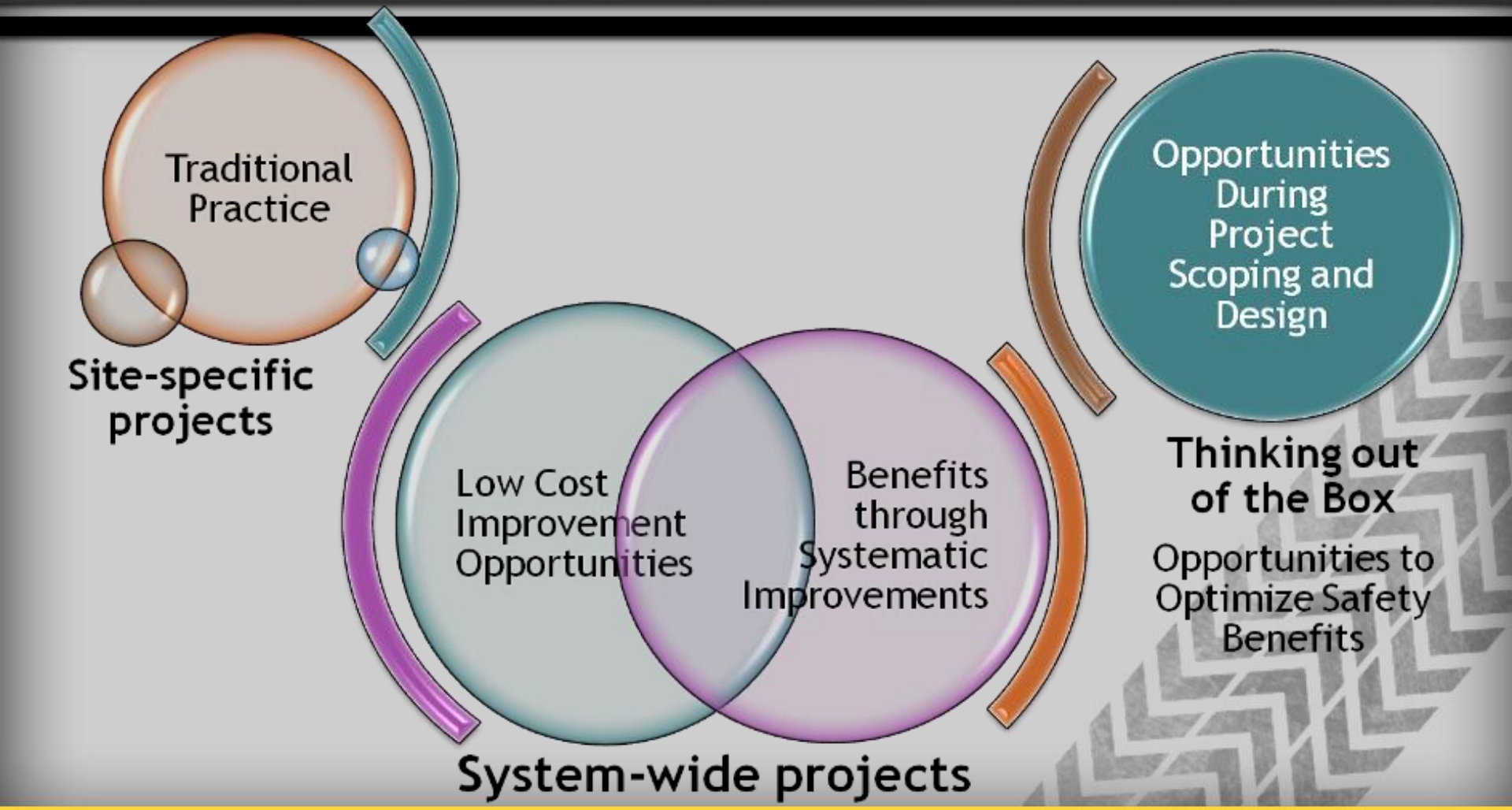
Design Decisions Safety Implications

Traffic volume is the chief determinant of likelihood of crash occurrence.

The length of highway over which the exception occurs strongly influences relative risk.

The design element or feature in question (lane width, shoulder width, superelevation, curvature, grade) will have differing expected sensitivities based on the type of facility.

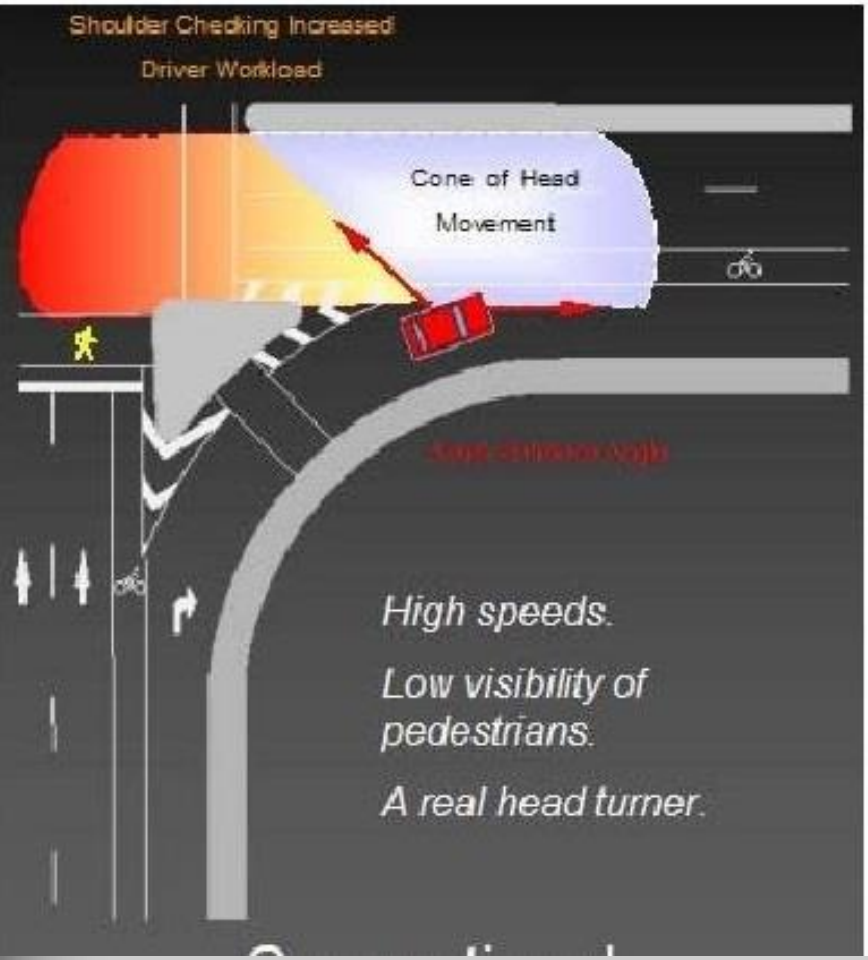
Different Approach

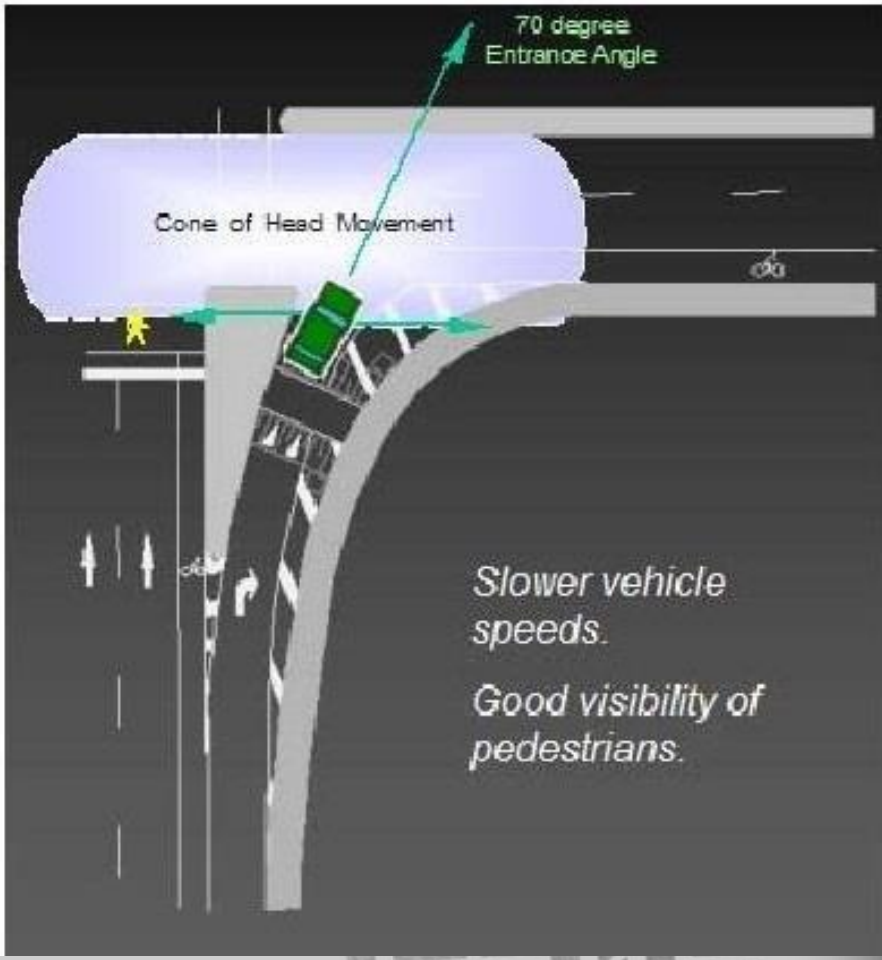


Design Countermeasures to Address Safety In Rural Areas

- Intersection Design
- Roadway Departures

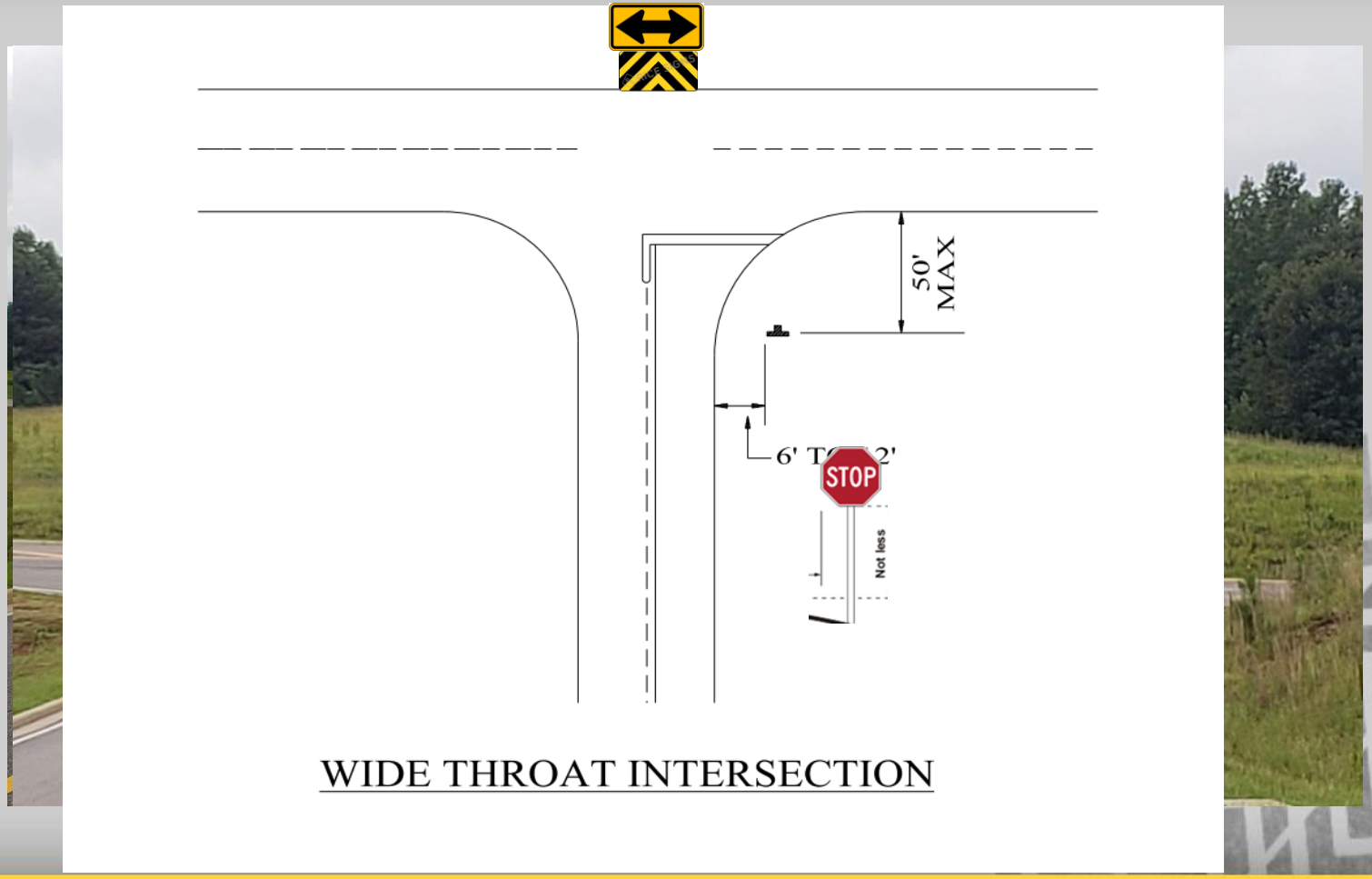
Older Driver and Pedestrian Safety Issue





https://www.dot.state.al.us/publications/Design/pdf/TrafficSafetyOp/SmartChannel.pdf

Rural Intersection Signing



WIDE THROAT INTERSECTION

These are Not the Same

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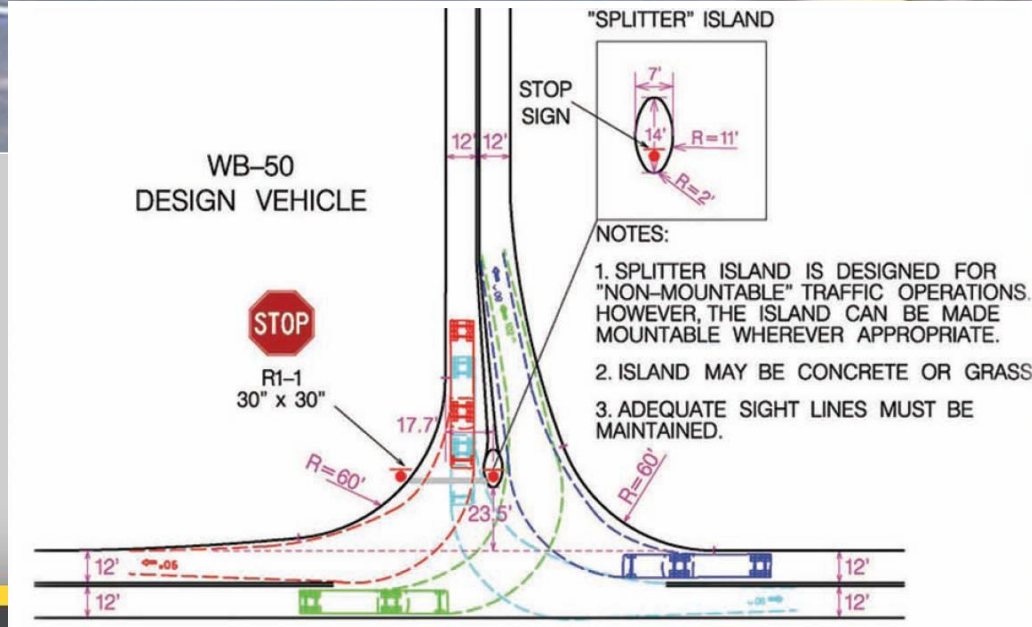
Rural Intersections

Estimated Safety Impacts
64% Reduction in All Crashes
74% Reduction in FA Crashes

https://www.dot.state.al.us/publications/Design/pdf/TrafficSafetyOp/SplitterIslandDetail.pdf



Directional Crossovers

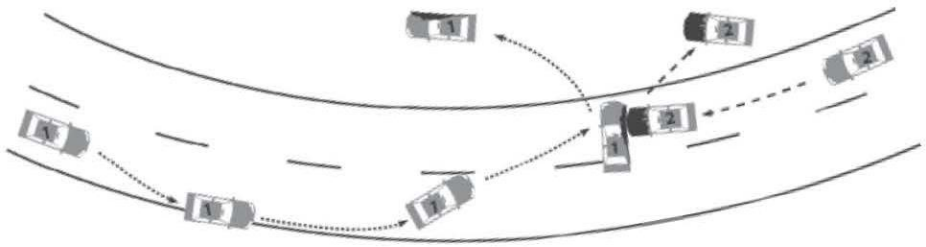
Alternative Intersection/Interchange Design

dot.state.al.us/publications/Design/pdf/TrafficSafetyOp/RoundaboutPlanningDesignOpManual.pdf

Shoulders

Crash Reduction from 42% for all crashes up to 77% reduction for KABC Crashes

Safety Edge
i.e., Compacted Pavement Wedge



This is a typical diagram for a crash caused by tire scrubbing. The vehicle at left scrubbed the edge of the pavement, and when it returned, the driver overcorrected, lost control, crossed into the adjacent lane, and struck an oncoming vehicle.

Graphic Source: AAA Foundation for Highway Safety

Crash reduction ranges from 13% to 29%

CMF_{ROR} = 0.975 – (0.432 × Expected ROR crash frequency per mile-year)

Roadside Barriers

Crash reduction ranges from 9% for All Crashes to 51% for Run-Off-Road Crashes

Median Barriers

Crash Reduction up 43% for Fatal Crashes

Cross Centerline Crash

Centerline Rumble Stripes

Crash Reduction Ranges from 9% for All Crashes to 49% for Head-On and Sideswipe Crashes

Edge Lines

Crash reduction ranges from 15% for All Crashes to 20% for KABC Crashes in Rural Areas

Horizontal Curve Alignment Signing

Crash Reduction Ranges from 37% for All Crashes to 60% for Wet Pavement Related Crashes

These Are Not the Same

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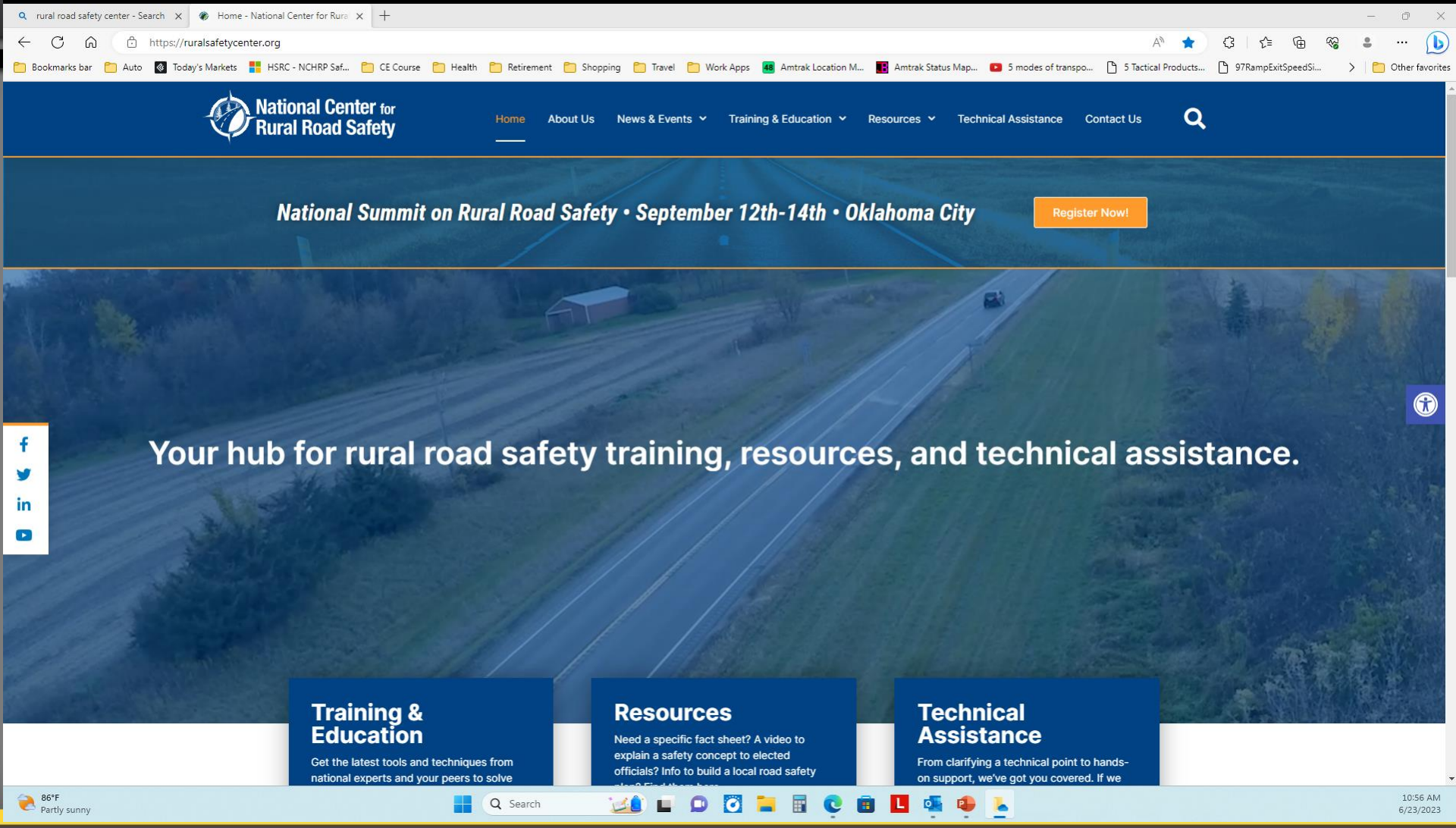
National Center for Rural Road Safety



RRSC Resources

- Road Safety Champion Program
- Rural Safety Summits
- Annual Rural Road Safety Awareness Week
- Monthly Webinars
- Website full of resources at www.ruralsafetycenter.org
- Socials & Newsroom
- Training E-blasts
- Technical Assistance

Road Safety Champion Program (RSCP)

- Certificate program for the workforce responsible for operating, maintaining, and designing local and rural roads
- Provides "Road Safety 101" level knowledge
  - ***Available now*** – Seven core modules with foundational roadway safety content
  - ***Coming soon*** – Four career pathway modules with more targeted information
- All content can be modified to fit local needs

Find out more at www.ruralsafetycenter.org/road-safety-champion-program

National Summit on Rural Road Safety

THANK YOU

For your contribution to saving lives

Questions?