Focused, Proven Safety that Counts

Rick O. Drumm, P.E.
FHWA – Highway Safety Engineer

Road School
March 6, 2019
FHWA Safety Initiatives

Focused ______________________
Proven Safety ______________________
that ______________________ Counts
(and Others)
FHWA Safety Initiatives

Focused **Approach to Safety**

Proven Safety **Countermeasures**

that

**Every Day** Counts

(and Others)
Focused, Proven Safety that Counts

• “Highway Safety is a great thing!”
• Focused Approach to Safety
• Proven Safety Countermeasures
• Every Day Counts
• Others
  • Systemic Safety
  • LRSP (Local Road Safety Plans
  • Data
  • Speed
• The Future
• The Challenge – Your Part
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National Safety Council on Preventable Injuries

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“Highway Safety is a great thing!”

- Rick O. Drumm
Focused Approach to Safety
Focused Approach to Safety

- Began in 2004
- Several iterations, most recently 2015
- Three (consistent) Focus Areas
  - Roadway Departure --------------- States
  - Intersection ---------------------- States
  - Pedestrian and Bicycle ----------- Cities and associated States
United States Fatalities by FHWA Focus Area

Average 2011-2013

- Roadway Departure Only Crashes: 50%
- Intersection Only Crashes: 12%
- Pedestrian/Bicycle Only Crashes: 11%
- Multiple Focus Areas: 16%
- Intersections and Pedestrians/Bicycles: 5.0%
- Intersections and Roadway Departures: 4.4%
- Roadway Departures and Pedestrian/Bicycles: 1.3%
- All Focus Areas: 0.2%

NOTE: Totals in the main and secondary pie charts do not add up to 100% and 11%, respectively, due to rounding.
Focused Approach to Safety

How Focus City designation is determined:

- Using 2011-2013 Fatality Data
- Take 50 cities with largest number of ped/bike fatalities (approx. \( \geq 10 \) /year)
- Two ways a City can be “chosen”:
  - Top 20 for number of ped/bike fatalities
  - Ped/bike fatality rate (per pop.) is greater than the average of top 50 cities

Indianapolis selected as Focus City for Pedestrian and Bicycle (Indiana a Focus State)
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**Average Annual Pedestrian/Bicyclist Involved Fatalities for the Top 50 Cities (2011-2013)**

**INDIANA, INDIANAPOLIS** 22.00 2.63
Focused Approach to Safety

• Benefits of being a Focus City/State (other than the sheer honor of it)
  Access to resources
  • Training
  • Workshops
  • Peer Exchanges

• Indy Major Activities
  • Pedestrian Crash Data Analysis
  • RSAs in Zones of Ped Safety Need
  • PSAP (Pedestrian Safety Action Plan)
Google
FHWA Focused Approach to Safety
Search Engine

Google

FHWA Focused Approach to Safety
Proven Safety Countermeasures
PSCs – The History

• 2008 –
  • PSCs initiated
  • 9 PSCs

• 2012
  • 9 PSCs
  • Some new, some revised, some kept

• 2017
  • 6 New PSCs
  • Kept all previous ones
  • Result – **20 (yes, 20!) Proven Safety Countermeasures**
FHWA Proven Safety Countermeasures
FHWA Proven Safety Countermeasures

- Roadside Design Improvement at Curves
- Reduced Left-Turn Conflict Intersections
- Systemic Application of Multiple Low Cost Countermeasures at Stop-Controlled Intersections
- Leading Pedestrian Interval
- Local Road Safety Plan

- USLIMITS2
- Enhanced Delineation and Friction for Horizontal Curves
- Longitudinal Rumble Strips and Stripes on Two-Lane Roads
- Median Barrier
- Safety Edge®

- Backplates with Retroreflective Borders
- Corridor Access Management
- Dedicated Left- and Right-Turn Lanes at Intersections
- Roundabouts
- Yellow Change Intervals

- Medians and Pedestrian Crossing Islands in Urban and Suburban Areas
- Pedestrian Hybrid Beacon
- Road Diet
- Walkways
- Road Safety Audit
Leading Pedestrian Interval

- Increased visibility of crossing pedestrians
- Reduced conflicts between pedestrians and vehicles
- Increased likelihood of motorists yielding to pedestrians
- Enhanced safety for pedestrians who may be slower to start into the intersection
Enhanced Delineation and Friction for Horizontal Curves

**Enhanced Delineation**
- Pavement Markings
- Post-mounted delineators
- Brighter/larger signs
- Dynamic curve warning signs

**Increased Pavement Friction**
- Sharp Curves
- Wet Conditions
- Polished Surfaces
- Excessive Speeds
Rumble strips and stripes are designed to address these crashes caused by distracted, drowsy, or otherwise inattentive drivers who drift from their lane.
Systemic Application of Multiple Low-Cost Countermeasures at Stop Controlled Intersections

1. Analyze systemwide data to identify a problem.
2. Look for similar risk factors present in severe crashes.
3. Deploy on a large scale low-cost countermeasures that address the risk factors contributing to crashes.

SAFETY BENEFITS:
- 10% Reduction in injury and fatal crashes
- 15% Reduction in nighttime crashes
Roundabouts

- Slow speeds for all users
- Reduced conflict points
- Less severe crashes
FHWA Proven Safety Countermeasures
Search Engine

FHWA Proven Safety Countermeasures
Every Day Counts
Every Day Counts

• Every 2 years, starting in 2011
• Presently in 5\textsuperscript{th} cycle. EDC-5
• Ready to implement or innovative technology for all areas of roads.
• For Safety:
  • EDC-4
    • DDSA (Data-Driven Safety Analysis)
    • STEP (Safe Transportation for Every Pedestrian)
  • EDC-5
    • STEP
    • Reducing Rural Roadway Departure
EDC-4

• Focus on uncontrolled crossings and unsignalized intersections
  • Road Diets
  • Pedestrian Hybrid Beacons
  • Pedestrian Refuge Islands
  • Raised Crosswalks
  • Crosswalk Visibility Enhancements

• For Indiana:
  • Develop an action plan to move pedestrian and bicycle safety forward.
  • Provide better guidance and direction to designers.
FoRRRRRRwD
Focus on Reducing Rural Roadway Departures
Other Initiatives:

Systemic Safety
The term "systemic safety improvement" means an improvement that is widely implemented based on high-risk roadway features that are correlated with particular crash types, rather than crash frequency.

-- 23 USC 148 (a)(12) Systemic safety improvement
Terminology

- **Site-specific “Hot-Spot” approach (aka high crash location):**
  - deploying site-specific improvements at locations with the highest frequency of crashes

- **Systematic Approach (aka systemwide):**
  - deploy countermeasures at all locations

- **Systemic approach:**
  - deploy low-cost countermeasures at locations with the greatest risk
Systemic Safety Analysis

• Assessing the potential for a specific type of severe crash to occur at a specific location because of the location’s characteristics or features (roadway factors).
How Healthy is Your Road System?

Find out with systemic analysis

Systematic analysis is like a health screening for your road system. Just as your doctor identifies risk factors for illness, systematic analysis identifies locations that are at highest risk for severe crashes. Practitioners can then prioritize projects based on risk and apply low-cost safety treatments to reduce severe crashes across the whole at-risk system.

**Symptoms**
Severe roadway departure crashes on curves.

**Possible Risk Factors:**
- Avg. Daily Traffic > 1,000 vehicles
- Curve Radius < 1,000 feet
- Intersection within Curve
- Visual Trap within Curve
- Severe Crash within Curve

**Diagnosis**
11% of all curves have 3 or more risk factors.

**Lab Results:**
- Curve A
- Curve B
- Curve C
- Curve D
- Curve E

**Treatment**
Prioritize highest risk sites and treat with low-cost countermeasures such as chevron signs or rumble strips.

**Follow-Up**
Track and evaluate safety improvements. Further remediation can be implemented as needed.

**Systemic vs. Systemwide**
Systemic does not mean treating all locations. It allows agencies to treat the highest-risk sites within limited budgets.
Systemic Approach

• Particularly applicable when a significant number of severe crashes happen over a wide area:
  – Rural Roadways
  – Local Roadways
  – May focus on specific crash types
    • Curve
    • Pedestrian
    • Intersections

May include treating locations that haven’t experienced severe crashes (yet)
INDOT Systemic Safety for Local Agencies

- Conduct inventory of traffic signs and upgrade warning and regulatory signs to meet MUTCD retroreflectivity requirements
- Improve the visibility of curves by upgrading curve warning signs and markings
- Improve visibility of unsignalized intersections by installing upgraded/new warning devices
- Install vehicle activated advanced warning systems at rural, unsignalized intersections
- Install new pedestrian crosswalk warning signs, flashing beacons or special pavement markings
- Install or upgrade pedestrian curb ramps and refuge areas at areas of high conflict between pedestrians and vehicular traffic
- Install pedestrian push button Countdown And Audible (APS) heads on traffic signals
- Make changes to yellow interval traffic signal timing or signal interconnect to improve safety
- Upgrade traffic signals to a minimum of one signal head per travel lane
- Install black backing plates with reflective border on all traffic signal heads
- Install UPS battery backup (emergency power) systems at traffic signal locations for continuous use during power outages
- Install emergency vehicle pre-emption systems at traffic signal locations to reduce response times and increase safety as the emergency vehicles pass through intersections
- Improve visibility of intersections by providing lighting
- Improve sight distance at intersections by installing slotted left turn lanes
- Install or upgrade passive or new active warning devices at railroad crossings
- Install railroad pre-emption systems at signalized intersections that are within the influence area of crossing railroad trains
- Install new centerline or edge line pavement markings on unmarked roadways
- Install raised medians for access control at intersections and roadway segments
- Add centerline and/or edge line rumble stripes (pavement markings over the rumble) to rural roads
- Complete road diet projects at locations that can be accomplished through the use of signs and pavement markings (Not Applicable to pavement reconstruction or geometric modifications)
- Add FHWA recommended High Friction Surface Treatments (HFST) to spot locations
- Upgrade guardrail end treatments to current standards
- Install guardrails or median barriers at locations where none existed previously
- Install median cable barrier systems on divided roads with grass medians
- Remove or shield permanent roadside safety obstructions
Other Initiatives:

LRSP

Local Road Safety Plans
LOCAL ROAD SAFETY PLANS: Your Map to Safer Roadways

No matter what your resources, a Local Road Safety Plan will guide you to data-driven solutions and safer roads.

https://safety.fhwa.dot.gov/provencountermeasures/local_road/

Choose Proven Solutions
- Chevrons
- Roundabouts
- Targeted Enforcement
- Crosswalks

Implement Solutions
- Education & Enforcement
- Capital Projects
- Maintenance Work

Identify Stakeholders
- Law Enforcement
- Public Health
- EMS
- Elected Officials

Use Safety Data
- Crashes
- Maintenance Logs
- Safety Audits
- Traffic Violations

In 2017, over 80% of fatalities occurred on rural roads, but just 15% of Americans live in rural areas.

More than 75% of all roads are maintained by local agencies.

LOCAL ROAD SAFETY PLANS
Help Get People Home Safely

START HERE!
Why Local Road Safety Plans?

More than **75%** of all roads are maintained by local agencies.

Approximately **40-60%** of fatalities occur on locally owned roadways.

Minnesota saw a **25%** reduction in county road fatalities after LRSP implementation.
First there was Harrison County

•Stay Tuned!
Over 300 Federally Recognized Tribes have Safety Plans.
Participating Counties

- **Georgia** – Athens-Clarke, Augusta-Richmond, Chatham, Cobb, Meriwether, Lowndes, Rockdale, Whitfield
- **Indiana** – Boone, Lake, Monroe, Montgomery, Steuben, NIRCC
- **Kentucky** – Boone, Boyle, Crittenden
Steps in the LRSP Development

- **Step 1: Establish Leadership**
- **Step 2: Analyze the Safety Data**
- **Step 3: Determine Emphasis Areas**
- **Step 4: Identify Strategies**
- **Step 5: Prioritize and Incorporate Strategies**
- **Step 6: Evaluate and Update the LRSP**

Local Road Safety Plans
“Do what you can, with what you have, where you are.”

– Theodore Roosevelt
Other Initiatives:

Speed
Speeding....

- Is exceeding the posted speed limit OR driving too fast for conditions

<table>
<thead>
<tr>
<th>Speeding-Related Fatalities</th>
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<tbody>
<tr>
<td>2016</td>
</tr>
<tr>
<td>2015</td>
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<tr>
<td>2014</td>
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<tr>
<td>2013</td>
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<td>2012</td>
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</tbody>
</table>
Speeding….

- Is a cross cutting safety issue impacts priority safety programs
  - 32% 15- to 20- year-old male drivers
  - 37% alcohol-impaired driving
  - 41% of run off road fatalities
  - 22% of intersection fatalities
  - 9 percent of pedestrian fatalities
Setting Appropriate Speed Limits

• USLIMITS2
  • — a web based tool for recommended speed limits
    safety.fhwa.dot.gov/uslimits
  • — NTSB speeding crash study recommendation H-17-27
• — FHWA Proven Safety Countermeasures
Right Design
Invites
Right Use
Speeding....

- Is a complex problem
  - public attitudes
  - driver behavior
  - vehicle performance
  - roadway characteristics
  - enforcement strategies
  - court sanctions
  - speed zoning
The Future of Highway Safety

• Continue emphasis on data
• Continue emphasis on Performance Measures
• And...

Safe Systems
Towards roads and traffic free from death and serious injury
Focused, Proven Safety that Counts

• “Highway Safety is a great thing!”
• Focused Approach to Safety
• Proven Safety Countermeasures
• Every Day Counts
• Others
  • Systemic Safety
  • LRSP (Local Road Safety Plans)
  • Speed
• The Future
• The Challenge – Your Part
Focused, Proven Safety that Counts

• “Highway Safety is a great thing!”
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• The Future
• The Challenge – Your Part
Your Turn

Go to padlet.com/rick_drumm/roadschool

Write down and submit one action:
- Location
- Data Collection
- Data Analysis
- RSA
- LRSP
- Countermeasure
- Systemic
Go to: padlet.com/rick_drumm/roadschool
Big Picture

• Data Collection
• Data Analysis
• Consider/Select Countermeasures
• Prioritize
• ACT
Final Thoughts

• We can make a difference.

• Cause Safety – ACT.

• Do not grow weary.
DO NOT BE AFRAID OF WORK THAT HAS NO END

-AVOT DE RABBI NATA