Agenda

• Welcome
• Summary of Webinars 1 & 2
• Review of Homework from Webinar 2
• Countermeasures & Solutions
• Preparation for Face-to-Face Workshop
• Next Steps

“Do what you can, with what you have, where you are.”
– Theodore Roosevelt
Today’s Presenters

Brian Roberts
Executive Director,
National Association of County Engineers
Washington, DC

Scott Davis
Traffic Engineering & Operations Manager,
Thurston County, WA

Hillary Isebrands
Roadway Safety Engineer
FHWA, Resource Center Safety & Design Technical Service Team
Eagle, Colorado

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Safety Engineer,
FHWA Office of Safety
Ames, IA
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Matthew Enders
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Welcome Pilot Counties, Stakeholders, and States
25 Counties
Participating Counties

• **California** - Humboldt, Marin, Nevada, Trinity, Yolo
• **Colorado** - Adams, Archuleta, Garfield, Mesa, Pueblo, Yuma
• **Florida** - Alachua, Lake
• **Nevada** - Douglas, Elko
• **Ohio** - Champaign, Delaware, Franklin, Holmes
• **Wisconsin** - Brown, Columbia, Crawford, Eau Claire, Price, St Croix
# Participating States

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<td>Price</td>
<td>Don Grande</td>
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<td>St Croix</td>
<td>Robbie Krejci</td>
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Poll 1a

Do you have stakeholders in the room with you today?
- Yes
- No
Poll 1b

Who are your primary stakeholders?

- Law Enforcement
- Groups already established - SRTS task force, Traffic Safety Commissions, etc
- Elected Officials
- Other local agencies (cities, towns, MPO, RPA)
- Advocacy groups (peds, bikes)
- Schools or school district
- Department staff within your County
  - Maintenance staff
  - Public health staff
  - Road and Bridge
  - Engineering
- Other (fill in the blank)
2018 LRSP Pilot Milestones

January 24
Overview of LRSP Webinar

February 21
Data & Tools for LRSPs Webinar

March 21
Countermeasures and Solutions for LRSPs Webinar

April 22
Hands on LRSP Workshop in Wisconsin

Local Road Safety Plan Template

INTRODUCTION
Ohio’s Strategic Highway Safety Plan (SHSP) is the state’s action plan for improving transportation safety through its planning process and the funding of safety projects. The SHSP defines the goals and performance measures for the state’s transportation safety improvement program, and is intended to help Ohioans work together to make roads safer in our state. This webinar provides an overview of what the SHSP is and how it is used.

VISION & GOALS
Ohio’s Strategic Highway Safety Plan (SHSP) is a long-term strategic plan to improve transportation safety in Ohio. The SHSP provides a framework for identifying and implementing strategies to reduce transportation-related deaths and injuries, and is intended to guide the state’s transportation safety improvement efforts.

The vision of the SHSP is to create a safer, more efficient transportation system that is responsive to the needs of Ohio’s population and economy. The goals of the SHSP are to:

1. Reduce the number of fatalities and injuries on Ohio’s roads by 50% by 2020
2. Increase the number of Ohioans who use active transportation (walking, biking) to commute
3. Improve transportation safety for all modes of transportation

STRATEGIES
The SHSP identifies several strategies to achieve these goals, including:

1. Improving infrastructure and operations
2. Enhancing data and analysis capabilities
3. Implementing transportation safety education and outreach programs
4. Supporting behavioral changes and improvements in travel behavior

The SHSP is a living document, and will be updated on a regular basis to reflect progress and new developments.

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NACE LRSP Pilot Website


Project summary

Schedule

Project team contacts

Reference materials

NACE conference link
Summary of Webinar 1 & 2
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

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

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

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

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

In 2017, over 50% of fatalities occurred on rural roads, but just 19% of Americans live in rural areas.

Chevron signs reduce nighttime crashes by 25%.

Help Get People Home Safely

LOCAL ROAD SAFETY PLANS

START HERE!
Why would a local agency use a local road safety plan?

- Greater awareness of road safety and risks
- Support grant/funding applications
- Develop lasting partnerships
- Prioritize investments
- Achievable investments
- Reduction in severe crashes
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
Sources of Data

What if I do not have good local crash data?

Your state highway safety plan (SHSP) is always a good place to start. Although the SHSP may not be community specific it should provide statewide priorities which you can use to develop a emphasis areas for your community.
Safety Data & Risks

Safety Data

Crash
Roadway
Traffic Volume
Enforcement
Maintenance Logs
Road Safety Audits

Local Road Safety Plans
Citizen Requests Tracking System (Nevada County, CA)

Description
Shoulder has eroded due to a clogged culvert and unmaintained drainage ditch. The pavement lip is about 3" People heading south on Garden Bar always run the stop sign on Wolf and swing wide around this corner - I can see by the tire marks that someone has gone into the ditch recently and had to be pulled out.

1 COMMENTS
Add a comment...

Charlie Cain [Verified Official] 4 days ago
started to fill the shoulder and will finish when I have a few extra hours
Analyze Data to Identify Focus/Priorities

<table>
<thead>
<tr>
<th></th>
<th>Fatal/Serious Injury Crashes Only</th>
<th>Total Crashes</th>
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<tbody>
<tr>
<td></td>
<td>All Public Roads</td>
<td>All Counties</td>
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<tr>
<td><strong>Overall Numbers</strong></td>
<td></td>
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<tr>
<td>Total # of Collisions</td>
<td>11,001</td>
<td>2,699</td>
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<tr>
<td># of Fatal Collisions</td>
<td>2,188</td>
<td>23.4%</td>
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<tr>
<td># of Serious Injury Collisions</td>
<td>8,813</td>
<td>80.1%</td>
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<tr>
<td># of Alcohol-Related Collisions</td>
<td>2,684</td>
<td>310.0%</td>
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<tr>
<td>Total # of Fatalities</td>
<td>2,378</td>
<td>679</td>
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<tr>
<td>Total # of Injuries</td>
<td>15,491</td>
<td>3,736</td>
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<td><strong>By Collision Type</strong></td>
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<tr>
<td>Hit Fixed Object</td>
<td>3,159</td>
<td>28.7%</td>
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<tr>
<td>Overturn</td>
<td>965</td>
<td>8.8%</td>
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<tr>
<td>Head On</td>
<td>582</td>
<td>5.3%</td>
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<tr>
<td>Wildlife</td>
<td>96</td>
<td>0.9%</td>
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<td>Angle (T)</td>
<td>1,269</td>
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<tr>
<td>Rearend</td>
<td>819</td>
<td>7.4%</td>
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<td>Hit Pedestrian</td>
<td>1,680</td>
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<tr>
<td>Hit Cyclist</td>
<td>635</td>
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<tr>
<td>Sideswipe (Opposite Direction)</td>
<td>154</td>
<td>1.4%</td>
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<tr>
<td>Other</td>
<td>477</td>
<td>4.3%</td>
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<tr>
<td>Sideswipe (Same Direction)</td>
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<td>3.0%</td>
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<tr>
<td>Hit Parked Car</td>
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<td>1.4%</td>
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<td>Angle (Left Turn)</td>
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<td><strong>By Roadway Surface</strong></td>
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<td>Dry</td>
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<td>Wet</td>
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<td>Snow / Slush</td>
<td>144</td>
<td>1.3%</td>
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<tr>
<td>Ice</td>
<td>238</td>
<td>2.2%</td>
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<tr>
<td>Other</td>
<td>164</td>
<td>1.5%</td>
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</table>
Local Road Safety Plans

Example Crash Data By Facility

Source: MnCMAT Crash Data, 2005-2009
Severe is fatal and serious injury crashes (K+A).

5 Year Crashes: ATP 4
16,311
524

State System
10,123 – 62%
251 – 48%

Urban
820 – 23%
23 – 11%

Not Inters-Related
345 – 42%
11 – 48%

Run Off Road – 62 (18%), 5 (45%)
Rear End – 89 (26%), 0 (0%)
Head On – 13 (7%), 4 (36%)
Right Angle – 37 (11%), 1 (9%)

Unknown/Other
98 – 12%
2 – 9%

Inters-Related
377 – 46%
10 – 43%

Thru-Stop – 126 (41%), 5 (50%)
All Way Stop – 28 (7%), 0 (0%)
Other/Unknown – 105 (28%), 0 (0%)

Rural
2,707 – 77%
183 – 89%

Animal
585 – 22%
5 – 3%

Not Animal
2,122 – 78%
178 – 97%

Inters-Related
609 – 29%
61 – 34%

Unknown/Other
134 – 6%
3 – 2%

Not Inters-Related
1,379 – 65%
114 – 64%

Other/Unknown
332 – 55%
33 – 54%

Signalized
88 – 23%
1 – 10%

Run Off Road – 152 (45%), 21 (64%)
Right Angle – 30 (9%), 1 (3%)
Rear End – 39 (12%), 1 (3%)
Left Turn – 25 (7%), 2 (6%)

Signaled
5 – 1%
0 – 0%

Run Off Road – 35 (14%), 2 (8%)
Left Turn – 14 (6%), 0 (0%)
Rear End – 27 (11%), 0 (0%)

Head On – 58 – 11%
8 – 16%

Run off Road
930 – 67%
72 – 63%

On Curve
31 – 39%
8 – 40%

Categories shown are to highlight key crash data – since not all crash data is shown percentages may not add up to 100%.
### Local Road Safety Plans

**Rx**

**How Healthy is Your Road System?**

*Find out with systemic analysis*

Systemic analysis is like a health screening for your road system. Just as your doctor identifies risk factors for illness, systemic 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.

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**Systemic vs. Systemwide**

Systemic does not mean treating all locations. It allows agencies to treat the highest-risk sites within limited budgets.
Roadway Risk Factors

- Lane width
- Shoulder width and type
- Horizontal Curvature, delineation, and advance warning devices
- Pavement condition and friction
- Roadside rating
- Presence of centerline and edgeline markings
- Presence of centerline, edgeline, or shoulder rumble strips
- Driveway design and density
- Intersection skew angle
- Intersection traffic control devices
- Intersection in or near horizontal curve
- Presence of left and right turn lanes
- Average daily traffic volumes
- Proportion of commercial vehicles
- Posted or operating speed
- Adjacent land use (agricultural, commercial, schools, alcohol sales/establishments
- Crosswalk presence
- Crossing distance

FHWA’s Systemic Safety Project Selection Tool (page 18)

https://safety.fhwa.dot.gov/systemic/fhwasa13019/
## Risk Factors for Curves

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<th>ADT Range</th>
<th>Road Departure Density</th>
<th>Access Density</th>
<th>Curve Critical Radius Density</th>
<th>Edge Risk</th>
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**Purpose**
Evaluate the risk factors of the systems and locations selected for analysis using roadway and traffic characteristics in order to rank/prioritize at-risk locations.

**Description**
- Risk factors are not weighted.
- A star (★) indicates the corresponding risk factor is present.
- More ★s identify locations as higher priority candidates for safety investment.
Local Road Safety Plans

QUESTIONS

Links to Recording of Webinars 1&2

https://connectdot.connectsolutions.com/p1r4ybc eqo6/

https://connectdot.connectsolutions.com/pzkwlj6qdfp3/
Homework Review
Poll 2

How did the Homework go?

• It went well
• We encountered some challenges
• I need Help!
• What homework?
Webinar 2 Homework

• Review your safety data
• Review FHWA Systemic Safety Project Selection Tool
• Identify potential high priority focus areas
• Use the LRSP Template and start writing
Review your Safety Data
Review Systemic Safety Tool
Identify Priority Areas based on Data and Risks

- Roadway departure
- Intersections
- Pedestrians
- Bicyclists
- Speed related Crashes
- Unpaved roadways
Poll 3a

What sources of data/resources did you use to determine focus areas?

- SHSP
- Local Crash Data
- Maintenance Records
- Stakeholder Team
- Experience
- All of the above
- Not that far yet...
- Other (open text)
Poll 3b

What do you think is your highest priority focus area?

- Roadway departure
- Intersections
- Pedestrians
- Bicyclists
- Speed related Crashes
- Unpaved roadways
- Impaired drivers
- Other (open text)
Start a DRAFT of your LRSP

Local Road Safety Plan Template

Feel free to use this Word document to create your safety plan planning document. Delete any instructions and examples, and then start writing!

INTRODUCTION

Briefly describe your County’s commitment to transportation safety through this planning process and the drafting of this document. An introduction can be one or more paragraphs, and can be as general or specific as you’d like. It serves two purposes: it gives readers an idea of what the rest of the plan will say; and it provides a reason to keep reading. For example, you should include a description of the document; define the central concept—transportation safety; and perhaps provide some statistics that you’d like to change enough to take on this planning process.

For example, you might say, “The County is committed to improving transportation safety to reduce the risk of death and serious injury that result from incidents on our transportation systems. This plan tells the story of transportation safety needs and strategies for our County. Implementation of the plan will improve transportation safety for the county, its people, and its visitors. As part of an ongoing effort to make safety improvements, the Local Road Safety Plan was developed with input from several safety partners. In the past 5 years, (cite some statistic that you want to improve). The County is targeting (cite a goal that will improve this statistic) over the next 5 years.”

VISION & GOALS

Generate interest in the planning process by drafting a vision statement. It can be a team effort. A vision statement is an idealized description of your success. It should inspire, energize, focus, and help you and your partners picture success as you develop the plan.

The best vision statements describe the desired long-term, big picture outcomes that are five to ten years away. Summarize your Vision in a powerful phrase. This can greatly enhance the effectiveness of your vision statement. This phrase will serve as a trigger to the rest of the vision in the mind of everyone that reads it. If you are having trouble coming up with your summarizing phrase, try adding after you’ve written the rest of the vision statement.

Here are examples of a vision statement:

- To advance road safety in our County by reducing fatal and serious injuries and improving peoples lives.
- Create a County Culture inside and out that promotes and implements Toward Zero Deaths strategies.

Here are examples of goals to support the vision:

- Reduce the number of fatal crashes to Zero by 2010.
- Reduce the number of severe run off the road crashes by 50% by 2015.
- Implement proven safety solutions systematically to reduce fatal and severe crashes.
- Increase seat belt usage by 20% for teenage drivers.
Poll 4

Have you started a DRAFT of your LRSP?

• Yes
• No
• Sort of...
• Help!!!!
Safety Counterm easures & Solutions
Local Road Safety Plans

Video

Pennsylvania Success Story

https://www.youtube.com/watch?v=4jjAJytbEIs&feature=youtu.be
FHWA’s 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 SM
- 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

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

Source: Thinkstock

https://safety.fhwa.dot.gov/provencountermeasures/enhanced_delineation/
Roadside Design Improvements at Curves

1. Provide for a safe recovery
   - Provide a clear zone
   - Flatten Slopes
   - Add or widen shoulders

2. Reduce Crash Severity
   - Cable Barrier
   - Guardrail
   - Concrete Barrier

https://safety.fhwa.dot.gov/provencountermeasures/roadside_design/
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
Longitudinal Rumble Strips and Stripes

Rumble strips and stripes are designed to address these crashes caused by distracted, drowsy, or otherwise inattentive drivers who drift from their lane.

Source: Missouri DOT

SAFETY BENEFITS:

CENTER LINE RUMBLE STRIPS

44-64%
Head-on, opposite-direction, and sideswipe fatal and injury crashes

SHOULDER RUMBLE STRIPS

13-51%
Single vehicle, run-off-road fatal and injury crashes

Source: FHWA
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
FHWA's 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®
- Backplades 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

https://safety.fhwa.dot.gov/provencountermeasures/
NHTSA’s Countermeasures that Work

1. Impaired Driving
2. Seatbelts
3. Speed Limits
4. Distracted Driving
5. Motorcycles
6. Young Drivers
7. License Renewal
8. Education Campaigns
9. Bicycle Helmets

Publicized Sobriety Checkpoints

- Authorized in 38 States + DC
- Documented Crash Reduction
  - All Crashes: 10-15%
  - Alcohol-related crashes: 17%
  - Alcohol-related fatal crashes: 9%

Page 1-21,
**Short-Term High-Visibility Belt Law Enforcement**

Effectiveness: ★ ★ ★ ★ ★  
Cost: $$$  
Use: Medium†  
Time: Medium

† Used in many jurisdictions but often only once or twice each year

- **Documented Belt Use Increase**
  - 16% increase
- Increased use in conjunction with public education/outreach and paid/donated media

Page 2-17,  
Nighttime Enforcement

- Belt Use 18% lower at nighttime
- 64% of nighttime fatalities are unbelted (vs. 47% of daytime fatalities)
- DWI and Speed-related fatalities also higher at night

Page 2-20,
# Bicyclists

## 1. Children

<table>
<thead>
<tr>
<th>Countermeasure</th>
<th>Effectiveness</th>
<th>Cost</th>
<th>Use</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Bicycle helmet laws for children</td>
<td>★★★★☆</td>
<td>$$$</td>
<td>Medium</td>
<td>Short</td>
</tr>
<tr>
<td>1.2 Safe Routes to School (SRTS)</td>
<td>★★★</td>
<td>$</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>1.3 Bicycle safety education for children</td>
<td>★★★</td>
<td>$</td>
<td>Unknown</td>
<td>Short</td>
</tr>
<tr>
<td>1.4 Cycling skills clinics, bike fairs, bike rodeos</td>
<td>★</td>
<td>$</td>
<td>Unknown</td>
<td>Short</td>
</tr>
</tbody>
</table>

## 2. Adult Bicyclists

<table>
<thead>
<tr>
<th>Countermeasure</th>
<th>Effectiveness</th>
<th>Cost</th>
<th>Use</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Bicycle helmet laws for adults</td>
<td>★★★★☆</td>
<td>$</td>
<td>Low</td>
<td>Short</td>
</tr>
<tr>
<td>2.2 Bicycle safety education for adult cyclists</td>
<td>★★★</td>
<td>$$$</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

## 3. All Bicyclists

<table>
<thead>
<tr>
<th>Countermeasure</th>
<th>Effectiveness</th>
<th>Cost</th>
<th>Use</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Active lighting and rider conspicuity</td>
<td>★★★</td>
<td>$</td>
<td>High</td>
<td>Varies</td>
</tr>
<tr>
<td>3.2 Promote bicycle helmet use with education</td>
<td>★★</td>
<td>$$$</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>3.3 Enforcement strategies</td>
<td>★</td>
<td>$$</td>
<td>Unknown</td>
<td>Varies</td>
</tr>
<tr>
<td>3.4 Motorist passing bicyclist laws</td>
<td>★</td>
<td>$</td>
<td>Medium</td>
<td>Short</td>
</tr>
</tbody>
</table>

*High for active lighting laws; unknown for promoting other conspicuity measures

NHTSA’s Countermeasures that Work

1. Impaired Driving
2. Seatbelts
3. Speed Limits
4. Distracted Driving
5. Motorcycles
6. Young Drivers
7. License Renewal
8. Education Campaigns
9. Bicycle Helmets

Poll 5

• Which countermeasures would you like more information on?
  • Roundabouts
  • Signalized intersections
  • Pedestrian Hybrid Beacon
  • Medians & pedestrian islands
  • Corridor Access management
  • Speed Management
  • Education
  • Other (open text)
Thurston County, WA Case Study
Where is Thurston County
Recap

Focus Crash Type
Roadway Departure

Focus Facility
Arterial & Collector Roads

Risk Factors
Evaluated 19
Used 9

45% of all Fatal and Serious Crashes were reported in Horizontal Curves

Collected data on 270 curves
Data Analysis

Included as priority risk factor:
- Rural Minor Arterial (06): 58% (209)
- Rural Major Collector (07): 75% (49)
- Urban Minor Arterial (16): 17% (34)
- Urban Major Collector (17): 14% (6)

Not Included as priority risk factor:
- Rural Minor Collector (08): 8% (34)
- Urban Principal Arterial (14): 15% (54)

Legend:
- Green: Road (356 miles)
- Blue: Injury (430)
- Yellow: Fatal/Serious (65)
Risk Factors

9 Risk Factors

- Major Rural Collector
- Presence of Intersection
- Traffic Volume
- Edge Clearance Rating
- Width of Paved Shoulder
- Presence of Vertical Curve
- Consecutive Horizontal Curves
- Speed Differential
- Visual Trap
## Site Rankings

<table>
<thead>
<tr>
<th>Road Name</th>
<th>5 year crash rate</th>
<th>Fatal or Serious Crash</th>
<th>Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawks Prairie Rd</td>
<td>1.2</td>
<td>Yes</td>
<td>6</td>
</tr>
<tr>
<td>Johnson Point Rd</td>
<td>0.4</td>
<td>No</td>
<td>5.5</td>
</tr>
<tr>
<td>Waddell Creek Rd</td>
<td>10.3</td>
<td>Yes</td>
<td>5.5</td>
</tr>
</tbody>
</table>

**Images:**
- Hawks Prairie
- Johnson Pt
- Waddle Creek
Site Rankings

Number of Curves by Risk Score

- Risk Score 5-6: 8 curves
- Risk Score 4-5: 21 curves
- Risk Score 3-4: 65 curves
- Risk Score 2-3: 94 curves
- Risk Score 1-2: 64 curves
- Risk Score 0-1: 19 curves
Countermeasures Goals

Proven Countermeasure

Corridor Consistency

Low cost

Wide Spread

MUTCD compliance

Improved Roadside
Enhanced Delineation
Rumble Strips

Local Road Safety Plans
### Counterm easures Review

#### TRAFFIC SIGNS

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cost</th>
<th>Permitting</th>
<th>Right of Way</th>
<th>Maintenance</th>
<th>CMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chevron Align or Large Arrow</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>0.84</td>
</tr>
<tr>
<td>Florescent Yellow Signs</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>0.82</td>
</tr>
<tr>
<td>Supplement Street Name Signs</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>0.95</td>
</tr>
<tr>
<td>Increase advance curve/turn size</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>N/A</td>
</tr>
<tr>
<td>Supplemental Curve/turn Signs</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>N/A</td>
</tr>
</tbody>
</table>

#### PAVEMENT MARKINGS

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cost</th>
<th>Permitting</th>
<th>Right of Way</th>
<th>Maintenance</th>
<th>CMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Curve Markings</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>N/A</td>
</tr>
<tr>
<td>Enhanced Edge Lines (4” to 8”)</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Med</td>
<td>0.85</td>
</tr>
<tr>
<td>Dotted Extension Lines at Intersections</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Med</td>
<td>0.88</td>
</tr>
<tr>
<td>Reflective Pavement Markers</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>1</td>
</tr>
</tbody>
</table>

#### ROADWAY

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cost</th>
<th>Permitting</th>
<th>Right of Way</th>
<th>Maintenance</th>
<th>CMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widen Shoulder</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Low</td>
<td>0.4</td>
</tr>
<tr>
<td>Reflective Barrier Delineation</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>N/A</td>
</tr>
<tr>
<td>Shoulder Rumble Strips</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>0.7</td>
</tr>
<tr>
<td>Traverse Rumble Strips</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>0.94</td>
</tr>
</tbody>
</table>

#### ROADSIDE

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cost</th>
<th>Permitting</th>
<th>Right of Way</th>
<th>Maintenance</th>
<th>CMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object Removal</td>
<td>Med</td>
<td>Med</td>
<td>No</td>
<td>Low</td>
<td>0.62</td>
</tr>
<tr>
<td>Guardrail</td>
<td>Med</td>
<td>Med</td>
<td>No</td>
<td>Low</td>
<td>0.53</td>
</tr>
<tr>
<td>Flatten Side Slope</td>
<td>High</td>
<td>High</td>
<td>Possible</td>
<td>Low</td>
<td>0.82</td>
</tr>
</tbody>
</table>

#### OTHER (spot analysis improvements)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Cost</th>
<th>Permitting</th>
<th>Right of Way</th>
<th>Maintenance</th>
<th>CMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Street Lighting</td>
<td>Med</td>
<td>Low</td>
<td>No</td>
<td>Med</td>
<td>0.5</td>
</tr>
<tr>
<td>High Friction Surface (wet road)</td>
<td>Med</td>
<td>Low</td>
<td>No</td>
<td>Med</td>
<td>0.5</td>
</tr>
<tr>
<td>Radar Speed Sign</td>
<td>Med</td>
<td>Low</td>
<td>No</td>
<td>Med</td>
<td>0.95</td>
</tr>
<tr>
<td>Roundabouts</td>
<td>High</td>
<td>High</td>
<td>Yes</td>
<td>Low</td>
<td>0.29</td>
</tr>
<tr>
<td>Intersection lane narrowing with rumble strips</td>
<td>Med</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>0.7</td>
</tr>
<tr>
<td>Roadway Safety Reviews</td>
<td>Low</td>
<td>Low</td>
<td>No</td>
<td>Low</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Note: CMF’s reviewed in 2012 so may not be consistent with current research*
Countermeasures Selected

- Curve Signs (chevrons and arrows)
- Intersection extension lines
- Larger warning signs
- Enhanced Edge Lines

- Guardrail updates
- New guardrail
- Guardrail delineation

- Shoulder rumble strips
- Centerline rumble strips
- Raised reflective pavement markers (alternative)
## Application of Countermeasures

<table>
<thead>
<tr>
<th>Curve ID</th>
<th>Road Name</th>
<th>Risk Score</th>
<th>Corridor Consistency Score</th>
<th>Signing</th>
<th>New Guardrail</th>
<th>Guardrail Delineation</th>
<th>Guardrail Updates</th>
<th>Corridor SRS</th>
<th>Corridor RPMS</th>
<th>Intersection Extension Lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Hawks Prairie Rd NE</td>
<td>2.5</td>
<td>6.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Hawks Prairie Rd NE</td>
<td>6.5</td>
<td>6.5</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>03</td>
<td>Hawks Prairie Rd NE</td>
<td>3.5</td>
<td>6.5</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>04</td>
<td>Hawks Prairie Rd NE</td>
<td>2</td>
<td>6.5</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Implementation

Note: Improvements were completed over several HSIP funding programs and also through local forces
Summary

- LSRP by County staff
- 270 Signed Curves Prioritized
- Used Proven Countermeasures
- 35% Reduction in target crashes
Poll 6

Now that you have seen Thurston County’s example of using systemic safety, what aspect of their process has been most useful to you as you work towards safer roadways? (check all that apply)

- Access to data in a useable format
- Access to systemic safety training
- Identification of emphasis areas
- Risk factor selection
- Data Collection (roadway, traffic violations, maintenance)
- Risk Factor Analysis & prioritization
- Countermeasure Selection
- Implementation
- I don’t know
- Other (open text)
Local Road Safety Plans
April 22 Workshop
**Agenda for Workshop, April 22**

11:30am-11:40am  Opening remarks

11:40am-12:20pm  “Working” lunch (lunch provided) & General Discussion about LRSP Pilot with Q&A

12:20pm-1:50pm  Break out Groups (w/ tech assist)
                  Data & Risk Factors, Countermeasures, Plan writing

1:50pm-2:05pm  Break

2:05pm-2:50pm  LRSP Implementation

2:50pm – 3:35pm  LRSP Discussion by State

3:10pm-3:35pm  State DOT discussion

3:35pm-4:20pm  Report outs from Counties

4:20pm-4:30pm  Next Steps
Poll 7

Are you interested in reserving time during the “Office Hours” Sunday morning for additional technical assistance? (9:30-11am)

- Yes
- No
- Maybe
- I don’t know
Break-Out Groups

Data

Solutions

Plan Writing
Poll 8

Which Break-out Group do you think you want to participate in April 22? (Select your first choice)

- Data (review, analyze, determine focus area)
- Countermeasures and Solution Selection
- Plan Writing
- I don’t know
- Other (open text)
Things to Bring to Workshop

• County Map
• Safety Data
• Stakeholder Feedback
• DRAFT LRSP
• List of Questions for NACE Team
NACE Sessions that may be of Interest

- **Monday, April 23rd**
  - Autonomous Vehicle Technology
  - County Engineering 101 - Bridge inspection and load rating
  - Unmanned Aerial System (drones) and Mapping
  - Safety Data Analysis Tools (Case Examples of using systemic and usRAP in two counties)
  - Asset Management

- **Tuesday, April 24th**
  - Partnership Session (NLTAPA, FHWA, AASHTO, etc.)
  - Generations in the workforce

- **Wednesday, April 25th**
  - LRSP Pilot Panel Session
  - Proven Safety Countermeasures
  - Safety committee meeting
  - High Friction Surface Treatment Live-Demo
  - Pavement Preservation

http://www.naceevents.org/
Poll 9a

Will you be staying for the NACE meeting? (Monday-Thursday)

• Yes
• No
• I don’t know
Poll 9b

Have you made your hotel reservations?

- Yes
- No
- I don’t know
Travel Support Plans for April

Flights
Local Transportation
Hotel - Chula Vista Resort, 855-884-3434
Registration

FHWA Travel Coordinator:
Ariane Couch
ariane.couch@dot.gov
(202) 366-9265
Homework
Between Now and April 22

- Work on any homework from Webinars 1 & 2 you are still working on
- Use the LRSP Template and start writing
- Make a list of questions on Implementation of your plan
- Ask us for help any time!
Poll 10a

Reflecting on your accomplishments, check all that applied for your county:

- Reviewed SHSP
- Reviewed crash data
- Collected other safety related data
- Met with Stakeholders
- Analyzed crash data
- Selected a focus area
- Started a draft of a LRSP
- Other (open text)
What are your next steps?

- Schedule a call with the NACE Team
- Meet with Stakeholders
- Analyze crash data
- Select focus area(s)
- Select countermeasures
- Start a draft of a LRSP
- Consider implementation opportunities
- Other (open text)
Execute!

“A goal without a plan is just a wish”

- Antione de Saint-Exupery

“A good plan, violently executed now, is better than a perfect plan next week.”

- General George Patton
Thank you
See you in WI!