Agenda

• Welcome & Introductions
• Summary of Safety Data
• Systemic Analysis
• Proven Safety Countermeasures
• Future Schedule
• Q&A
## Participants

<table>
<thead>
<tr>
<th>GEORGIA – Lead Contacts</th>
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<tr>
<td>Athens-Clarke</td>
<td>Drew Raessler Tim Griffeth Scott Zehngraff</td>
<td>Greg Morris</td>
<td>Beverly Fontenot</td>
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## NACE Local Road Safety Plan Pilot 2.0

*(All webinars are from 1-2:15pm ET unless otherwise noted)*

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<thead>
<tr>
<th>Date</th>
<th>Subject</th>
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<tr>
<td>October 25, 29, 2018</td>
<td>LRSP &amp; Pilot Overview</td>
<td>75 min Webinar</td>
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<tr>
<td>November 14</td>
<td>LRSP Steps</td>
<td>75 min Webinar</td>
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<tr>
<td>December 4</td>
<td>Workshop</td>
<td>Savannah, GA</td>
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<td>December 5</td>
<td>Systemic Safety / LCSI Training ½ day</td>
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<td>National Summit on Rural Road Safety</td>
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<td>January 30, 2019</td>
<td>Safety Data &amp; Emphasis Areas</td>
<td>75 min Webinar</td>
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<td>February 27</td>
<td>Systemic Analysis &amp; Proven Safety Countermeasures</td>
<td>75 min Webinar</td>
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<td>(NEW DATE)</td>
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<tr>
<td>March 13</td>
<td>LRSP Implementation &amp; Funding Webinar</td>
<td>75 min Webinar</td>
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<td>April 17</td>
<td>Face to Face/Virtual Work Session – Writing your Plan</td>
<td>Wichita, KS</td>
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<td>(2:30-5:30pm ET)</td>
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<td>Next Steps Webinar</td>
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LRSP Pilot 2.0 Website

The pilot program is a partnership with the Federal Highway Administration (FHWA) and the National Association of County Engineers (NACE) through the Every Day Counts (EDC) Data Driven Safety Analysis Initiative. It will provide a unique opportunity for your agency and partners in your state to participate in a blended learning program including webinars and a "hands-on" workshop and roadway safety training in Savannah, GA December 4-5, 2018.

Local Road Safety Plan development has been a strategic priority for NACE and FHWA in recent years and is an FHWA Proven Safety Countermeasure. Development and implementation of LRSPs have been proven to reduce fatalities on local roads in states that have implemented them. The goal is for each local agency participating to have a draft LRSP at the completion of the pilot. This will be accomplished through a series of training webinars, a face-to-face workshop and safety training, data analysis support, technical assistance (from the state, federal and LTAP partners), and a resource website.

Some objectives of the pilot program include:
- Progress towards national and state goals of reducing fatal and injury crashes;
- Foster local, state, federal agency partnerships to advance local road safety;
- Complement existing LRSP efforts by FHWA, States, Tribes and Locals;
- Accelerate development and Implementation of LRSPs;
- Advance Risk Based, Data Driven and Systemic Approach to Improve Safety on Local Roads;
- Empower locals to incorporate safety into routine business (e.g. maintenance, capital improvements);

Participants

Local Road Safety Plans
Summary of Safety Data
Safety Data & Risks
<table>
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<tr>
<th>2011-2015 County X Data</th>
<th>Fatal/Serious Injury Crashes Only</th>
<th>Total Crashes</th>
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<tr>
<td></td>
<td>All Public Roads</td>
<td>All Counties</td>
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<td>Overall Numbers</td>
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<td>Total # of Collisions</td>
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<td># of Fatal Collisions</td>
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<td># of Serious Injury Collisions</td>
<td>8,813</td>
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<td># of Alcohol-Related Collisions</td>
<td>2,684</td>
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<tr>
<td>Total # of Fatalities</td>
<td>2,378</td>
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<td>Total # of Injuries</td>
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<td>By Collision Type</td>
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<tr>
<td>Hit Fixed Object</td>
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<td>Overturn</td>
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<td>Head On</td>
<td>582</td>
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<td>Angle (T)</td>
<td>1,269</td>
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<td>Rear-end</td>
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<td>Hit Pedestrian</td>
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<td>Hit Cyclist</td>
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<tr>
<td>Sideswipe (Opposite Direction)</td>
<td>154</td>
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<tr>
<td>Other</td>
<td>477</td>
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<td>Sideswipe (Same Direction)</td>
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<td>3.0%</td>
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<td>Hit Parked Car</td>
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<td>Angle (Left Turn)</td>
<td>665</td>
<td>6.0%</td>
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<tr>
<td>By Roadway Surface</td>
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<tr>
<td>Dry</td>
<td>8,124</td>
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<td>Wet</td>
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<tr>
<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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Local Road Safety Plans
Traffic Volumes

- Do you collect traffic volumes regularly?
  - Segments
  - Intersections

- Do you collect pedestrian and bicycle counts?

Maintenance Logs

- Signs knocked down
- Guardrail hit
- Shoulder edge drop off
- Vegetation removal
- Sign replacement
Poll 1

What Data are you Collecting for your LRSP? (open ended)
Systemic Analysis
Systemic Safety: Definition

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
Question:

• Which approach is crash-based?

  a) Site-Based (Hot Spot)
  b) Systematic
  c) Systemic
  d) All of the above
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

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.

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

Local Road Safety Plans

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

May include treating locations that haven’t experienced severe crashes (yet)
Benefits of Systemic Approach

- Acknowledges crashes alone are not always sufficient to establish prioritization.

- Proactive program to address fatalities and serious injuries that seemingly occurred at "random" locations.

- Complementary to site analysis approach.

- Greater knowledge regarding severe crashes, including contributing factors and location characteristics:
  - Improve planning, design, and maintenance practices.
  - Risk management for tort liability.
Poll 2

What examples of Roadway Locations in your jurisdiction can you think of that may be candidate for Systemic Safety improvements? (open ended)
Systemic Analysis Steps

1. Analyze data to identify focus/priorities
2. Analyze severe crashes to identify risk factors
3. Select over-represented risk factors
4. Analyze roadway network for presence of risk factors
5. Create prioritized list of roadway sections
6. Identify countermeasures to address prioritized locations
7. Develop a prioritized list of projects
Analyze Data to Identify Focus/Priorities

- **Basic crash details**
  - Primary crash type, junction relationship, fixed object struck

- **Roadway conditions**
  - Weather, roadway surface condition, light condition

- **Roadway details**
  - Roadway curvature, posted speed

- **Driver details**
  - Contributing circumstances, vehicle type

- **Pedestrian details**
  - Contributing circumstances, facility type used

- **Cyclist details**
  - Contributing circumstances, facility type used
Develop Crash Tree Diagrams

Example
All - %
Severe - %

State System
5,415 – 34%
170 – 47%

CSAH/CR
2,952 – 19%
103 – 29%

City, Township, Other
6,748 – 42%
80 – 22%

Unmappable
855 – 5%
7 – 2%

Urban
1,703 – 58%
32 – 31%

Rural
1,249 – 42%
71 – 69%

Not Inters-Related
755 – 44%
18 – 56%

Unknown/Other
93 – 6%
0 – 0%

Inters-Related
855 – 50%
14 – 44%

Animal
124 – 10%
3 – 4%

Not Animal
1,124 – 90%
68 – 96%

Run Off Road – 162 (21%), 6 (33%)
Head On – 59 (8%), 4 (22%)
Rear End – 193 (26%), 3 (17%)
“Other” – 61 (8%), 2 (11%)

Signalized
240 – 9%
5 – 3%

All Way Stop
107 – 9%
0 – 0%

Thru-Stop/Yield
332 – 9%
5 – 3%

Other/Unknown
176 – 9%
4 – 2%

Run Off Road – 50 (36%), 4 (36%)
Left Turn – 8 (6%), 2 (18%)
Head On – 7 (5%), 2 (18%)

Right Angle – 164 (46%), 6 (60%)
Left Turn – 9 (8%), 1 (10%)
Ran Off Road – 12 (11%), 1 (10%)

Image Source: St. Louis County Road Safety Plan
Systemic Analysis Steps

1. Analyze data to identify focus/priorities
2. Analyze severe crashes to identify risk factors
3. Select over-represented risk factors
4. Analyze roadway network for presence of risk factors
5. Create prioritized list of roadway sections
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Systemic Analysis Steps

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**Identify Risk Factors**

Source: YouTube - Sesame Street, One of these things
https://www.youtube.com/watch?v=rsRjQDrDnY8

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<th>Traffic Volume</th>
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<td>Average Daily Traffic (ADT)</td>
<td>Presence of Commercial Development</td>
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<td>Horizontal Curvature</td>
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<td>Proximity to Rail Crossing</td>
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<td>Access Density</td>
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<td>Distance from Previous Stop</td>
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<td>Roadside Rating</td>
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<td>Operating Speed</td>
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<td>Intersection Skew</td>
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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 Factor Collection Ideas

- Use aerial imagery, video logs
- Sign inventory, other mgmt systems
- Collect during slow times - maintenance crews, interns, sign folks, plow operators,…
- Use qualitative values when quantitative hasn’t been collected
CA: 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

Charlie Cain  Verified Official  4 days ago
started to fill the shoulder and will finish when I have a few extra hours
Descriptive Statistics

Potential Risk Factors for Rural Lane Departure Crashes

- Narrow Clearzone: 23% (System) / 38% (Crashes)
- Lane Width (< 12 ft): 25% (System) / 20% (Crashes)
- Paved Shoulder: 44% (System) / 12% (Crashes)
- Unpaved Shoulder: 66% (System) / 88% (Crashes)

Legend:
- Blue: Percent of System With Potential Risk Factor
- Orange: Percent of Severe Lane Departure Crashes Where Potential Risk Factor is Present
Data Analysis – Traffic Volume

Included as priority risk factor

- Percent Road Miles
- Percent Injury Crashes
- Percent Severe Crashes
Qualitative Approach to Risk

- **Use qualitative ratings when needed:**
  - *Good, Fair, Not-So-Good (curve radius, roadside, etc.)*
  - *High, Medium, Low (traffic volumes, crash frequency, etc.)*
- **It is important to include the risk factors that are key to your roadway network**

“There’s a lack of quantitative data, but there’s a wealth of qualitative data.”

Linda, National Park Service
## Risk Factors for Curves

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<th>Curve Critical Radius Density</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 candidate for safety investment.
Prioritization - Example for Minnesota

- Complete census of 504 curves
- 32 High Priority Curves (6%)

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<th>Curve Count</th>
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Local Road Safety Plans
Poll 3

How might ranking locations by risks help you prioritize investments? (open ended)
Proven Safety Countermeasures
Systemic Analysis Steps

1. Analyze data to identify focus/priorities
2. Analyze severe crashes to identify risk factors
3. Select over-represented risk factors
4. Analyze roadway network for presence of risk factors
5. Create prioritized list of roadway sections
6. Identify countermeasures to address prioritized locations
7. Develop a prioritized list of projects
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 EdgesSM
- 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

Source: CMF Clearinghouse, CMFDA 2418 and 2439

https://safety.fhwa.dot.gov/provencountermeasures/enhanced_delineation/
CA: High Friction Surface Treatment (HFST)
Rumble strips and stripes are designed to address these crashes caused by distracted, drowsy, or otherwise inattentive drivers who drift from their lane.
Local Road Safety Plans

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
Roundabouts

• Slow speeds for all users
• Reduced conflict points
• Less severe crashes

Source: Highway Safety Manual
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%

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

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

Poll 4

What low cost safety improvements are relevant to your roadway network? (open ended)
NACE Annual Meeting & Technical Conference
AS A COUNTY ROAD AND INFRASTRUCTURE PRACTITIONER, NACE 2019 IS ONE OF YOUR BEST INVESTMENTS. YOU’LL CONNECT WITH PROFESSIONAL PEERS FROM AROUND THE US; LEARN THE LATEST ON COST CUTTING AND STREAMLINING OPERATIONS; AND EXPAND YOUR TOOLKIT OF USABLE, INNOVATIVE SOLUTIONS.
Experience the best of America's Heartland!

Five Great Reasons to Attend

1. **SEE THE LATEST INNOVATIVE TECHNOLOGIES**
   Over 100 exhibitors will feature innovative solutions customized specifically for county infrastructure projects. Meet one-on-one with companies to discover answers to your on-the-job challenges and find the tools you need to succeed.

2. **SHARE IDEAS WITH YOUR PEERS**
   You know your solutions, but how are your peers handling those same issues? Meet with hundreds of road and bridge officials to exchange ideas plus have some fun! From the technical sessions to receptions to walking the exhibit aisles, you'll have plenty of opportunities to grow your professional network.

3. **EARN YOUR PDHS**
   For your PE continuing education requirements, many states recognize NACE’s Professional Development Hours. After the meeting, you can request a certificate documenting your hours earned in the specific technical areas.

4. **ADVANCE YOUR TRANSPORTATION KNOWLEDGE**
   With a variety of sessions, you’ll find topics that exceed your expectations. Expand your knowledge all in one place!

5. **BE IN THE KNOW**
   See NACE in action! The Annual Business Meeting and Awards Banquet gives members access to NACE leadership. Network with NACE members and learn all the ways NACE is working for you! Plus welcome your new NACE officers into their 2019–2020 terms.

Please contact Staci Morgan with any questions.

☎ 202.393.5041 • ℹ️ smorgan@naco.org

TECHNICAL TRACKS

- Structures
- Pavement Preservation
- Safety & Technology
- Unpaved Roads
- Emergency Preparedness
NACE 2019
Safety Technical Sessions

Safety education program begins on Sunday, April 14th with Low Cost Safety Improvement Workshop. The same workshop that was offered in Savannah. Monday, April 15th begins with Growing Positive Safety Culture which was also offered in Savannah too. Later, Monday afternoon you will learn simple strategies and tactics to communicate technical information to non-technical audiences and will be given some simple communication tools for crafting more effective messages. Tuesday, Rural Roadway Departure will come into focus as you learn about FHWA Everyday Count efforts. Finally, on Wednesday, you will get to ask question of your peers that have or are working on local road safety plans.
NACE 2019
General Information

EARLY BIRD DISCOUNT
Ends March 1, 2019
Registration $645 (members) & $745 (non-member)

NEW MEMBERS
Registration is $500 before March 1st

MEALS PROVIDED
Breakfast: Monday, Tuesday, Wednesday
Lunch: Monday, Tuesday, Wednesday
Dinner: Tuesday & Wednesday

https://www.naceevents.org/

Wichita, Kansas
Poll 5

Are you planning on attending NACE in Wichita, KS in April?

• Yes
• No
• Maybe
• I Don’t Know
Homework
LRSP Pilot Homework

• Finalize your Vision and Mission
• Contact stakeholders
• Request access to crash data (if you do not have it yet)

• **Ask for help with your crash data**
• **Determine your emphasis areas**
• **Select Risk Factors**
• **Analyze network for presence of risk factors**
• **Select Low Cost Countermeasures**
• **Start drafting your LRSP**

• **Ask us for help any time!**
Poll 6

What is your next step/action item?

• Open ended
### FHWA/NACE LRSP Pilot 2.0 Schedule

#### NACE Local Road Safety Plan Pilot 2.0

*(All webinars are from 1-2:15pm ET unless otherwise noted)*

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<tr>
<th>Date</th>
<th>Subject</th>
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<tr>
<td>October 25, 29, 2018</td>
<td>LRSP &amp; Pilot Overview</td>
<td>75 min Webinar</td>
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<td>November 14</td>
<td>LRSP Steps</td>
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<td>December 4</td>
<td>Workshop</td>
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<td>Systemic Safety &amp; LCS Training ½ day</td>
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<td>National Summit on Rural Road Safety</td>
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<td>Safety Data &amp; Emphasis Areas</td>
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<td>Systemic Analysis &amp; Proven Safety Countermeasures</td>
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<td>LRSP Implementation &amp; Funding Webinar</td>
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<td>April 17 (2:30-5:30pm ET)</td>
<td>Face to Face/Virtual Work Session – Writing your Plan</td>
<td>Wichita, KS (at NACE meeting)</td>
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<tr>
<td>May 22</td>
<td>Next Steps Webinar</td>
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“Do what you can, with what you have, where you are.”

– Theodore Roosevelt
## LRSP Pilot Team

<table>
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<tr>
<th>NACE</th>
<th>FHWA</th>
<th>LTAP</th>
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<tbody>
<tr>
<td>Scott Davis</td>
<td>Hillary Isebrands</td>
<td>Marie Walsh</td>
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<td>Jerry Roche</td>
<td>Matthew Enders</td>
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</tr>
<tr>
<td>Rosemarie Anderson</td>
<td><a href="mailto:Rosemarie.Anderson@dot.gov">Rosemarie.Anderson@dot.gov</a></td>
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Safe Roads Ahead
Local Road Safety Plans