Systemic Safety Implementation Peer Exchange

September 23 and 24, 2015

Phoenix, Arizona

Summary Report

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

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List of Acronyms

ADOT	Arizona Department of Transportation
ADT	average daily traffic
CEA	critical emphasis area
CM	collision countermeasures
CMF	crash modification factor
CSE	corridor safety evaluation
DDSA	data-driven safety analysis
EDC	Every Day Counts
FHWA	Federal Highway Administration
HFST	high friction surface treatments
ISIP	intersection safety implementation plan
ITD	Idaho Transportation Department
LHSIP	local highway safety improvement program
LHTAC	Local Highway Technical Assistance Council
LOSS	level of service of safety
LTAP	Local Technical Assistance Program
MAG	Maricopa Association of Governments
MPO	metropolitan planning organization
NCTCOG	North Central Texas Council of Governments
PDO	property damage only
PSA	public service announcement
RPO	regional planning organizations
RSA	road safety audits
RTSIMS	Regional Transportation Safety Information Management System
RwD	roadway departure
SHSP	strategic highway safety plan
SPF	safety performance functions
SSAR	systemic safety analysis report
TOPS	Traffic Operations and Safety Laboratory
WisDOT	Wisconsin Department of Transportation

Introduction and Overview

The systemic approach to safety involves the use of countermeasures that are widely implemented based on high-risk roadway features correlated with particular severe crash types. Data shows that a majority of fatal crashes occur on rural roads; however, these crashes are scattered across the many miles of rural roadways, making it difficult to isolate high-crash locations for safety improvements. The systemic approach to safety is a proactive technique that helps agencies broaden their safety efforts and consider risk as well as crash history when identifying where to implement low-cost safety improvements.

To assist agencies with advancing the implementation of the systemic approach, especially at the local level, the Federal Highway Administration (FHWA) Office of Safety hosted a Systemic Safety Implementation Peer Exchange on September 23 and 24, 2015, in Phoenix, Arizona. The peer exchange provided a forum for participants to discuss and exchange ideas on applying systemic safety analyses, how their agencies are implementing a systemic safety program, and on the systemic safety countermeasures being used.

More than 50 attendees participated in the peer exchange, including Federal, State, and local representatives from Arizona, Arkansas, California, Colorado, Idaho, Illinois, Nevada, Texas, and Wisconsin. FHWA formatted the peer exchange to provide a mix of presentations, facilitated roundtable discussions, and breakout sessions. This structure provided attendees with several opportunities to collect information from their peers and to examine different ways to advance the implementation of systemic safety projects. Representatives from each State were encouraged to share their noteworthy practices and strategies as well as to identify the challenges and barriers they experienced with the systemic approach to safety.

Each State delegation spent time developing action plans at the end of the peer exchange. A virtual peer exchange will be coordinated in approximately 2 years to follow up with attendees on their progress.

Key Takeaways

Attendees identified several key takeaways from the peer exchange including those outlined below.

- Road safety can be improved by working closely with local agencies to:
    - Develop and work on local safety plans with Local Technical Assistance Program (LTAP).
    - Make it easy for locals to understand the process.
    - Find and develop champions.
    - Communicate available resources.
    - Encourage regional planning organizations (RPOs) (and other local partners) to get more involved in local safety.
- It is important to visit local agencies in their own environment to provide more education and outreach on a variety of topics, including:

    - The environmental review process.
    - The systemic process and what a "good" systemic project is.
    - The types of countermeasures that are fundable.
- There is a need to provide more assistance to local agencies with Federal Aid.
- Agencies may be able to improve safety by developing a process or a position or hiring a consultant to manage the safety program.
- Local agencies need greater access to data.
- Local buy-in is crucial, but local agencies may be facing staffing shortages due to budget constraints.
- Safety committees established through metropolitan planning organizations (MPOs) or other District Offices can be used to help communicate success stories with the locals.

PEER EXCHANGE PROCEEDINGS – DAY 1

Welcoming Remarks

Arizona Department of Transportation (ADOT) Deputy State Engineer for Statewide Operations Jesse Gutierrez welcomed the group to the peer exchange and provided opening remarks. In his address he mentioned that the Arizona Strategic Highway Safety Plan (SHSP) used network crash data to identify focus crash types associated with fatalities and serious injury crashes. Mr. Gutierrez also mentioned that 30 crash characteristics included in the SHSP network screening helped identify candidate locations and countermeasures selection. This overall process helped ADOT implement an SHSP that supports the systemic process.

Karla Petty, the administrator for the FHWA Arizona Division, also provided welcoming remarks. She spoke for a few minutes on the data-driven safety analysis (DDSA) process and how it is a pillar for safety prioritization. With better informed decisions and targeted investments, progress can be made. She also mentioned that Arizona recently updated its SHSP and used a data-driven process for the development of the update. She stated that Arizona has experience with predictive analysis, and that their goal is to improve highway safety and reduce the number of fatal and serious injury crashes.

After the welcoming remarks, attendees introduced themselves, including their expectations for the peer exchange. Appendix A includes a complete list of all peer exchange attendees. The list below provides a summary of attendees' expectations.

- Learn the benefits of a systemic approach and identify what direct applications make a program systemic.
- Gather ideas for the methods and resources used to develop a systemic approach to safety.
- Learn more about systemic safety and what other States are doing systemically.
- Gather information to implement systemic safety.
- Learn more about applying systemic treatments.
- Identify ways to identify and prioritize the use of State and Federal funds, specifically HSIP funds.

- Learn more about benefit-cost (BC) analysis for systemic projects.
- Learn how States are addressing systemic safety in their HSIP.
- Learn how to transition from site analysis towards systemic analysis.
- Gather information on how to assist local agencies (city, county, and tribes) with implementing systemic improvements.
- Gather ideas for funding sources and incorporate the systemic safety approach into local projects.
- Identify ways to educate local agencies on the systemic approach.
- Learn how others are performing data collection at the local level.
- Identify best practices to implement systemic safety at the MPO and regional level.
- Learn about using predictive measures with limited data.
- Learn how States justified using the systemic approach vs. the hot spot approach.
- Learn how the systemic approach can address the crashes on the local roads to reduce fatal and serious injury crashes.
- Identify case studies and success stories that participants can share within their State.

Overview of the Systemic Approach to Safety

A systemic safety improvement is one that is widely implemented based on high-risk roadway features that are correlated with particular crash types. There is a difference between systematic and systemic safety.

- Systematic safety is deploying countermeasures everywhere – at all locations.
- Systemic safety is deploying countermeasures at locations with the greatest risk.

Some of the challenges associated with implementing the systemic safety approach include moving from a reactive to a proactive mindset and overcoming public and political resistance.

When analyzing the road system, agencies must look at the system as a whole. For example, when deciding where to install cable median barrier systemically, an agency should review not only crashes, but also factors such as traffic volume, the median width, location of entrance ramps, and weather or climate.

The following systemic safety countermeasures have proven successful:

- Cable median barrier
- Rumble strips/stripes
- Edge line pavement markings
- Chevrons on curves
- Signal upgrades
- Countdown pedestrian indications

The following systemic safety countermeasures are trending and show promise:

- High friction surface treatments (HFST)
- Safety Edge^{SM}
- Wrong-way driving treatments
- Alternative intersection design
- Data – this is important; the more data an agency has, the better its decisions will be

- Improved analysis tools

Gaps in systemic safety implementation include the following:

- Enforcement countermeasures
- Fewer signals
- Pedestrian/bicycle countermeasures
- Better roadway data
- Better crash data
- Public/political/management support

Following are some of the benefits of the systemic approach to safety:

- It is more proactive; systemic safety addresses locations at risk before a crash happens.
- It gives an agency better knowledge of their roadway system.
- It is a repeatable and defensible process.

FHWA's Every Day Counts (EDC) Initiative provides additional opportunities to advance the systemic approach to safety. Data-driven safety analysis is one of the innovations, which is the application of two science-based analysis approaches into one common transportation process. This leads to more informed decision making and fewer fatalities and serious injuries. Based on information in the 2014 HSIP reports, the States used about 24 percent of HSIP funds for systemic safety.

Analysis Approaches Session

Maricopa Association of Governments (MAG), Idaho Local Highway Technical Assistance Council (LHTAC), and Wisconsin Department of Transportation (WisDOT) gave presentations on their analysis approaches. Following is a summary of the information they shared as well as the roundtable discussion that took place after the presentations.

***Margaret Boone**, Maricopa Association of Governments*

The MAG's Transportation Safety Program was launched in 2001. It identified key regional transportation safety issues and needs. This program developed road safety initiatives at the State, regional, and local levels. Eventually, this program was taken over by the MAG Transportation Safety Committee in 2004, which was the first of its kind in the Nation.

As part of the MAG Safety Planning and Programming process, the MAG Transportation Safety Committee developed the MAG Strategic Transportation Safety Plan in 2005 and again in 2015, created an SHSP, performed crash data analysis using its Regional Transportation Safety Information Management System (RTSIMS) to rank high risk intersections, performed road safety audits (RSA) via on-call consultant contracts, developed regional crossing guard videos and held crossing guard safety workshops, programmed HSIP non-infrastructure projects, and performed other oversight for safety programs and projects.

MAG uses a Network Screening Methodology for to identify intersections to address. This was based on a TRB paper from research done at the University of Wisconsin, which was adopted by MAG in 2009 and revised in 2014. This methodology uses three factors: crash frequency, severity, and crash type. The intersection safety scores are incorporated into RTSIMS and are

used to identify HSIP projects. MAG has identified the following systemic safety countermeasures:

- Emergency vehicle pre-emption (which is used to reduce the overall amount of response time for emergency vehicles).
- 12-inch signal heads and the addition of signal heads over each lane.
- Countdown pedestrian signal heads.
- Sign management systems:
  - Asset management system for local agencies to see where their signs are and the shape they are in (e.g., retroreflectivity) and prioritize replacement of those signs.
  - LTAPs are good resources for sign management systems and upgrading retroreflectivity.
- Upgrade sign and pavement marking retroreflectivity.
- Flashing yellow arrows (this has a crash modification factor (CMF)).
- Clearview font on street name signs:
  - If people can identify the name of the street further back on a high-speed corridor, they can safely slow and make the turn.

The MAG HSIP sub allocation is $1.9 million/year between 2011 and 2018. The Arizona HSIP allocation is $42 million/year.

Information is available on the following websites:

- MAG Transportation Safety Webpage: http://azmag.gov/safety
- MAG Crash Data Link: http://azmag.gov/CrashData/
- MAG STSP 2015 Link: http://stsp.azmag.gov

Question: How do you put a BC ratio to something that is not quantifiable but clearly has a safety benefit?
Answer: The BC ratio for emergency vehicle preemption was not calculated for the HSIP.

***Laila Kral**, Idaho Local Highway Technical Assistance Council*

The LHTAC is funded through a portion of the State's gas tax. LHTAC provides project administration services to local agencies. The Local Highway Safety Improvement Program (LHSIP) worked with Idaho Transportation Department (ITD) to secure HSIP funds for locals. The two formed an agreement that the split between ITD and LHTAC will be based on crashes. The LHSIP selection process includes notifying agencies that they are eligible to apply for project funds (use letters, email, put information on their website, and conduct training workshops). The current eligibility requirement is for any agencies that had 3 or more fatal crashes in the previous year.

One challenge that LHTAC is facing is that they do not own the roadways so they cannot force a project to happen unless the local wants to do it. LHTAC sends out invitation packages that include:

- A letter.
- Instructions.
- Application.
- FHWA Toolbox of Countermeasures.
- Data – LHTAC does not own the data, it just shares data, which comes from ITD.
  - LHTAC shares this data publicly online.
  - Many data filters are available (more than 50).

LHTAC encourages locals to improve the intersections with characteristics similar to those that have experienced crashes rather than just fixing the intersections where there have been crashes. Also encourages improving a larger area and improving intersections with similar characteristics in a similar area along a segment. Locals put this information in their web page description to justify the funds.

Some of the common LHSIP projects include: new pavement markings, new or increased signing, flashing beacons, lighting improvements, access control, guardrails, road safety audits, pedestrian crossings, shoulder widening, retroreflective backplates, and road diets.
LHTAC groups sign projects into one contract where LHTAC buys the signs (no match required because the local forces install them). Procurement becomes the project. Locals still have to indicate the sign locations. LHTAC does not cut pieces out of the process (e.g., environmental), it streamlines the process by grouping the procurement. Stewardship agreement between LHTAC and ITD; LHTAC approves some projects and ITD approves others.

***Darren Schoer and Brian Porter**, Wisconsin Department of Transportation*

Local efforts began with the High Risk Rural Roads Program (HRRRP) under SAFETEA-LU. Wisconsin chose to continue program with MAP-21 (2013) with a focus on rural minor and major collector corridors on the local road network. Low cost treatments with low complexity were used to treat areas with run-off -road crashes experiencing fatalities and serious injuries.

HRRRP starts with an annual review of crash data statewide by WisDOT and the University of Wisconsin's Traffic Operations and Safety Laboratory (TOPS). WisDOT identifies candidate corridors by analyzing the most recent 5 years of run-off-the-road crash data on each candidate corridor. This helps further define the candidate corridors, which are then reviewed by WisDOT regional safety engineers. WisDOT selects 10 corridors each year for further evaluation and possible funding through HSIP. A consultant identifies locations within the corridors and determines which treatments to apply as part of a corridor safety evaluation (CSE). Locals can use the CSE to apply for HSIP project funding. The CSE is more of a data analysis. There have been varying responses to the program:

- Some have not participated at all.
- Some have requested the CSE but have not submitted an HSIP application.
- Some have requested the CSE but are doing the work outside of HSIP.
- Some requested the CSE but are only pursuing some of the treatments identified.

Bridge Friction Treatment Program

- Used FHWA's national bridge inventory data, crash data, and WisDOT roadway and traffic inventory data. Calculated a BC ratio for each bridge based on crash history, not risk, and ranked bridges.
- Used HSIP funding for bridges with BC ratio > 5. Some treatments were tied to other projects and others were stand alone.

Future Systemic Initiatives

- Roadway Departure Safety to target rollover and fixed object crashes using HFST, fixed object removal, etc.
- Expressway Intersection Safety to target right angle crashes using signing, markings, etc.

Roundtable Discussion on Analysis Approaches

- There is a misperception that systemic safety projects must be continuous (like rumble strips), but in reality they can be dispersed along the corridor (like signal upgrades).
- Need to balance the proactive systemic safety approach with hot spot treatments.
- Most often when using systemic safety with local agencies, you end up taking care of their hot spots because you are using data that includes those locations.
- Using HSIP funds on non-infrastructure activities.
    - Some are going to apply the systemic approach to enforcement.

Questions and Answers

Question: What do you do when the difference between a crash type A and crash type C is just a matter of inches?
Answer:

- Need to identify weight of the fatal and serious injury crashes.

Question: What are some of the measures you use to convince the county supervisors to get them to fund projects?
Answer:

- Market to the elected officials and make them aware of the problems that they might not even know about; prove that things are working in other areas.
- Nevada County put out a public service announcement (PSA) on highway friction surface treatments (HFST).
- There is a need to talk to elected officials about safety so when a fatality happens they know the transportation staff/department is working on the issue and solution.

Question: Is there a PSA on how to drive a roundabout?
Answer: https://www.youtube.com/watch?v=ONacAiKXe-8

Question: Are people using risk or anything else besides crash data in their analysis?

Answer:

- Some are using risk, but to back up the crash data.

Question: For property damage only (PDO) crashes, is anyone using a location with magnitude of PDO crashes?

Answer:

- Some have used PDOs so they weren't just chasing fatalities. This is a good indicator to see what is going wrong. Many times it is an inexpensive fix. Issue now is that larger jurisdictions are no longer collecting PDO data. In rural areas, PDOs are a good indicator because there are not many K and A type crashes (fatalities and incapacitating injuries, respectively).
- In Idaho, PDO crashes are weighted lower, but a location with a lot of PDOs will pop up.
- Total crashes can be a factor with systemic safety.

Question: Have States/local agencies identified their top locations (top 30, 40, or 50) and treatments/improvements?

Answer:

- Phoenix – Identifies the top 12 intersections. High crash frequency intersections are typically safe because of the volume (except for pedestrians/bikes). Not many options for high-ranking intersections because they are land locked.
- Phoenix – Analyzes crashes to see if they have anything in common. Used 35th Ave (a major alternative commuter route) to implement any new countermeasures because would be able to see biggest difference when something worked.
- Texas – Cannot ignore where the crashes are located. Texas has developed its own systemic safety program. Crash analysis led them to horizontal curves.
- Illinois – Starts off with document on systemic improvements, provides data trees, emphasis areas, and develops heat maps for the counties on how their area does with other areas with similar roadways. The top 35 counties with the highest crashes have County Highway Safety Plans.
- Washington LTAP does data analysis and local agencies are asked to submit systemic projects for funding.
- Nevada County – locals understand "low-cost projects;" they tune out "systemic projects."
    - Participants recommended that FHWA and State DOTs do more marketing and outreach so locals understand systemic and what the benefits are.
    - Sometimes having the State DOT recommend a countermeasure can work; feels like a solution looking for a problem, but some found that when they looked for places to apply HFST, they found lots (20 or more) of potential projects.

Systemic Countermeasures Session

Nevada, Colorado, and California gave presentations on the systemic safety countermeasures being used in their States. Following is a summary of the information they shared as well as the roundtable discussion that took place after the presentations.

***Lori Campbell and Ken Mammen**, Nevada Department of Transportation (DOT)*

One of the lessons learned from Nevada DOT was that the contract size created challenges. The DOT found it problematic to implement statewide projects and recommend dividing them into district-wide projects or even local jurisdiction-level projects. One example is a centerline rumble strip project where the agency wanted to install many miles of centerline rumble strips, but there were also many miles of various roadways with different characteristics and various maintenance issues. They installed over 3,000 miles in 4 years by focusing on installations within districts and localities.

Know your demographics: Nevada DOT installed cable median barrier on a State route with openings every 3 to 4 miles but with no other gaps. However, this roadway is a rural State route that has a lot of commuter traffic, and the police could not enforce speed limits for drivers on the other side of the barrier. In response, they had to install median crossovers and breaks in the barrier for law enforcement and emergency vehicles.

Persistence and education: Need to educate internal State DOT staff (e.g., designers).

- Had to educate them that the Safety Edge^{SM} is a simple, low-cost treatment.
- Concern that it would break off.
- People weren't convinced it was needed because shoulders were built up.
- Got it put in a couple of contracts and people saw that it works.
- Safety Edge^{SM} is now a design standard in Nevada.

Traffic safety does exist beyond crash data:

- Developed a Pedestrian Generator Matrix – does not use average daily traffic (ADT) and does not use crash data.
  - Fatalities were happening where drivers were not expecting them.
  - Fatalities were occurring on roads where the current functional classification is not how it was originally intended. For example, bars and casinos were classified as high generators.
- Also created a Crosswalk Decision Matrix.

Other systemic safety efforts:

- Flashing Yellow Arrow Project.
  - Systemic project across the State.
  - Other improvements you can do along with the primary project.
  - Unforeseen technical challenges related to physical implementation means upgrades are not always easy or inexpensive.
- Left turn crash reduction program.
- Improvements for bicycles.
  - Road Diets.

***Charles Meyer and Dave Swenka**, Colorado Department of Transportation (CDOT)*

In Colorado, the DOT has a Traffic Engineering and Safety Group, and its overall responsibility is to explicitly consider safety for all projects. The group provides recommendations for roadside and roadway improvements that will enhance safety within the scope of a project. The staff

also determines the safety implications of each design alternative for Environmental Assessments and Environmental Impact Statements.

CDOT is currently seeing a plateau in the reduction of fatalities. To make more progress, the agency is going to the next level, and that is getting to the locals. The foundation for CDOT's safety analysis is currently collected data. At present, the agency is collecting data on volume, terrain, number of lanes, etc. CDOT collects crash data from the Colorado Department of Revenue, which includes the location of the crash, date and time of the crash, number and type of vehicles, type of crash, road/weather conditions, direction of travel, and causal factors. One challenge in the analysis phase is that the roadway and crash databases are separated.

The agency uses two methodologies to measure the degree of safety: safety performance functions (SPF) and level of service of safety (LOSS) analysis. They apply these methods to system-level planning and program development, corridor level planning (environmental assessment and environmental impact statements), project-level decision support analysis, and in supporting the development of research papers and other information. Safety performance functions are predictive models for specific classes of roadway that reflect the relationship between traffic exposure measured in ADT and crash count for a unit of road section measured in crashes/mile/year. This provides CDOT with an estimate of the expected crash frequency and severity for a range of ADT.

The LOSS analysis describes the degree of safety of a roadway segment and communicates the magnitude of the safety problem of a roadway segment to other professionals or elected officials. This analysis brings the perception of roadway safety in line with the reality of safety performance, reflecting a specific facility and providing a frame of reference for decision making on non-safety motivated projects (resurfacing or reconstruction). In addition, the analysis provides a frame of reference from a safety perspective for planning corridor improvements.

Robert Peterson, *California Department of Transportation (Caltrans) Division of Local Assistance*

Local agencies maintain their own crash database or use the California Highway Patrol collision database. Annually, $67 million in HSIP funds are allocated. These funds can be spent on infrastructure and non-infrastructure projects. Projects are selected based on a BC ratio only, where the benefit is based on reduction in collisions over the life of the project and cost is based on the cost of the project.

A joint effort between Caltrans, FHWA, and SafeTrec developed a Local Roadway Safety Manual which assists local agencies to think systemically when analyzing their roadway networks. The manual is available at: http://www.dot.ca.gov/hq/LocalPrograms/HSIP/2015/Cycle%207/CA-LRSM-(Ver-1.2).pdf

Caltrans has identified 76 collision countermeasures (CM) to select from that are HSIP eligible:

- 18 for signalized intersections.
- 20 for non-signalized intersections.
- 38 for roadway segments.

The list also includes pedestrian/bicycle countermeasures.

Each CM lists the opportunity to implement using a systemic approach, what main crash type(s) the CM addresses, and the range of collision reduction one can expect. The BC calculation is based on the use of all crashes or specific crash types depending on the CM, one crash reduction factor for each CM, and the service life of the CM. In an effort to get local agencies to think systemically, they have:

- Repeated the message.
- Showed that systemic-type projects have a higher BC ratio.
- Provided the "carrot" by stating that 38 of the 76 countermeasures are 100 percent eligible for Federal funding.

Caltrans added restrictions in several high-cost, long-delivery countermeasures (such as realignment of a roadway); the agency wants locals to try low-cost safety improvements (HFST, warning signs) to prove they work. Project example: Nevada County submitted a Roadway Safety Signing Audit Project.

- Used Lidar to evaluate signs and discovered 300 signs can be removed (for example, replacing curve warning signs with chevrons).
- Calculated BC for systemic project; collision costs used for calculating the benefit: BC = 61.
- The limitation of this approach is that there is no collision rate comparison at the local level.
- Results: Increased the dollar amount per project.

Caltrans established a local HSIP Advisory Committee with representatives from cities, counties, MPOs, etc. They provide feedback and recommendations to Caltrans. Developing two new programs:

- Systemic Safety Analysis Report (SSAR) Program –The local agencies receive funding for the preparation of a SSAR that will cover the following items: crash data analysis, identify high-risk corridors, identify lower cost CMs, scopes potential for futures safety projects, and calculate BC ratios to help prioritize those projects. This also assists agencies that have limited or no traffic safety expertise.
- Proactive Safety Program is the systemic approach to safety that involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. The benefit of the Proactive Safety Program is that it does not require a BC to qualify, does not need right of way, and allows more projects to be funded around the State.

Roundtable Discussion on Systemic Countermeasures

- Is there guidance on crash tree analysis?
  - Some loose guidance in the Systemic Safety Project Selection Tool. Can go in whatever direction the data takes you. FHWA also has a research project to identify risk factors associated with particular severe crash types.
- Percentage of HSIP funds that go to the locals on non-State owned, public roads:
  - Definition of "local" varies.

    - AZ –20 percent.
    - ID – 25 percent.
    - NV – varies.
    - CA – 35 percent now, documented goal of 50 percent.
    - CO – program 50 percent, has started giving funds for tribal roads.
    - WI – 30 percent.
    - IL – varies from year to year—this year is $13m to $15m (about 20 percent).
    - TX – 10 percent.
    - AR – zero.
- Many times the Tribes will not work with the States in the Federal Aid Program because the State has to waive the Tribe's sovereignty when contracting for them to get the funds and Tribes will not do that; the only way they will work within the Federal program is to work within the Federal Lands program.
- The life of a countermeasure starts with implementing it in a high-crash location and seeing if it works; once it is known to work, it is applies systemically, and the countermeasure can be written into policies that will become design standards.
- Systemic safety countermeasures that are working:
    - Safety Edge.SM.
    - Rumble strips.
    - Chevrons – trending are LED chevrons that flash if a vehicle is going a certain speed.
    - Crosswalk enhancements – striping, signing, rapid rectangular flashing beacons.
    - Paved shoulders on curves.
    - IL is using a horizontal curve systemic approach – a package of systemic countermeasures on horizontal curves.
    - Cable median barrier.
    - Road Diets (for pedestrians/bikes).
    - Curb extensions for pedestrian/bike safety.
    - HFST.
    - Nevada is using shoulder widening and slope flattening, but they are expensive.
    - Shoulder delineation.
    - Lighting.
    - Reflective strips on sign posts.
- Opportunities for systemic implementation:
    - Retroreflective signal backplates.
    - Realigning signal heads over the lanes.
    - Wrong-way driving detection.
    - Queue detection.
    - Roundabouts.
    - Speed feedback signs with random enforcement – transition from higher speed road to lower speed.
    - Narrow lanes with wider shoulders.
    - Education and enforcement on rural roads.
    - Indicator light on signals to enable enforcement of red light running.
    - Pavement marking and signage at intersection on rural roads.
    - Identify testing new behavior-based messages on signs.

Takeaways – Regional & Local Perspectives Breakout by State

Texas

- Work on local road safety plans (with LTAP).
- Big variety in the way local projects funding is administered from the States.

Idaho

- Make it easy for locals to understand the process; don't speak in engineering terms.
- Lack of State resources available to have liaisons to locals.
- Locals need more assistance with Federal Aid.

Colorado

- Make it simple for the locals.
- Have a local champion and a State champion.
- Rather than bring locals into you, go out to them to provide education and outreach.
- Educate on the environmental process; it is not as difficult as the locals think it is.

Wisconsin

- Encourage RPOs (and other local partners) to get more involved in local safety.
- Work with LTAP to provide specific training on the systemic process and completing. applications; types of countermeasures that are fundable.

California

- Utilize the LTAP and the training they provide.
- Educate locals on "good" systemic projects.

Arkansas

- Develop a process and have a position or consultant to manage the program.
- 100% Federally funded projects for the locals.

Nevada

- Learned a lot of things they are doing right and a lot of things they can change.
- Need more data at the local level.

Illinois

- Local buy in is crucial but also very tough because of manpower challenges.
- Safety Committees through MPOs or other District Offices help.
- Communicate success stories with the locals.
- Effective communication goes a long way.

Arizona

- High level safety advocates are important, but also important to have safety advocates throughout the organization.
- Have an advocate at the MPO.

- Have diverse stakeholders throughout the process with specific duties.
- Local Safety Plans.
- Understand the implementation barriers.

PEER EXCHANGE PROCEEDINGS - DAY 2

The morning opening session generated the following discussion:

- Important to make data and information available to agencies.
  - MAG performs analysis and makes information available to the local agencies.
  - California has local road safety manual.
  - Some States are still using crash data in some capacity to support systemic safety.
  - Nevada has a matrix to support pedestrian safety.
  - California has a traffic operations policy with criteria that stipulates minimum pedestrian safety.
- FHWA indicated crash data can be a risk factor within systemic safety analysis. It can guide systemic safety improvements.
- BC analysis can be used for systemic safety improvements.
- Systemic improvements are rising to the top, even in locations where there are no crashes.
- Scope of systemic project is usually longer; it is easier to look at the crash data because it is more likely there has been one or more fatal crashes.
- Varies from State to State in how funding is split between systemic projects vs. hot spots.
- In California, Caltrans funds all of the systemic improvements and the hot spots fall to the bottom.
- Some States provide analysis for their locals; some are receptive and others do not want it. Ask the locals what they need. Some might just want the start of the analysis (such as crash trees). Some States provide training to their locals so they can perform their own analysis.
- Systemic lets you get a better unit cost because you are buying more.
- Idaho will let an agency combine improvements for one crash type in one application, but cannot combine intersection improvements and run-off-the-road improvements in one application.
- Ohio sets deadlines, but reviews applications on a case-by-case basis if they are submitted outside of the deadlines.
- New Mexico has continuous HSIP cycles instead of punctuated.
- Some States tell the locals the types of projects they should be looking at and some States perform analysis for their locals to help them develop projects.
- In Illinois, the DOT provides heat maps to the locals so they know where they should be looking.
- Nevada does the initial analysis, determines locations, and works with the locals on where there should be projects, then lets the project out. The whole process is collaborative.

- As a local, it is more helpful for the HSIP to be continuous because they can submit their HSIP applications when they have time. Then, when funding becomes available, there are applications already submitted that can be ranked. Flip side is that when it is punctuated, and there is no formal call for projects, then none would ever get submitted.

Systemic Implementation on Local and Rural Roads

Illinois, California, and North Central Texas Council of Governments (NCTCG) gave presentations on the systemic implementation efforts on local and rural roads in their States. Following is a summary of the information they shared as well as the roundtable discussion that took place after the presentations.

***Tim Sheehan and Sean Coyle**, Illinois Department of Transportation*

Illinois began systemic improvements in 2007 based upon the statewide analysis of trends for median crossover crashes. Illinois did not have the funding to install cable median barrier on all interstate miles. The agency was able to identify contributing factors such as ADT, median width, and interchange proximity as starting points, and from there identified and prioritized those routes where cable median barrier would be installed. They installed over 200 miles of cable median barrier from 2005 – 2008.
Illinois has also implemented systemic safety projects when performing RSAs in very complex, highly urbanized areas to address pedestrian and bicycle safety. A lengthy RSA was conducted in the Chicago Medical District that recommended tweaking the signal timing of the existing traffic signals for better synchronization and the addition of pedestrian countdown signals throughout the Medical District.

System-wide approaches have proven to be effective, prompting Illinois to develop systemic guidelines for district and local use. The guidelines outline an approach for identifying high-priority areas by using the network screening tools to integrate safety into projects and plans throughout the transportation management process. The screening tools used include emphasis area tables, data trees, heat maps, a "Five Percent" report (describes at least five percent of state jurisdiction highway locations exhibiting the most pressing safety needs), and detailed systemic analysis. This document has been made available on the Illinois DOT website to all district offices and all local agencies to help direct and enhance their safety programs.

Approximately half of severe roadway departure crashes occur on curves. The DOT identified the top 50 curves per district for improvements. The prevalent contributing factor was pavement edge drop off and lack of adequate shoulders. Shoulders with rumble strips have been proven effective.

Statewide analysis of pedestrian corridors - information was used to implement district-wide improvements.

District Improvements:

- Statewide priority to have paved shoulders on curves.
- 55 percent of injuries and fatalities are the result of roadway departures.

- 25 percent of injuries and fatalities are the result of intersections.
- Farmers run their oversize vehicles on the shoulders, which destroys the shoulder and creates large drop offs. The DOT had installed chevron signs, but crashes were still occurring on the curves. (3x more likely to run off the road on curves.) Realized what was happening with the farm equipment and paved shoulders to eliminate drop off/overcorrecting resulting in head-on crashes. No more fatal crashes since paving shoulder.
- Analyzed all curves on two lane highways for run off the road crashes over 7 years.
- Find the type of crash that is occurring; chevrons help for crashes occurring at night.
- Cost to pave shoulder is less if milling and repaving and adding a shoulder; if contractor is just adding/paving a shoulder, the asphalt costs more.

***Thomas Schriber**, Caltrans*

Caltrans developed a comprehensive plan to address roadway departure (RwD) crashes, which includes a 5-year program (currently in year 3). The goal is to reduce run off the road crashes by 10 to 15 percent. Caltrans noted that many roadway departure crashes occur on curves. The agency looked at a four-pronged approach that includes: traditional, systematic, enforcement and education, and comprehensive countermeasures. Enforcement focused on speed-related and under-the-influence crashes. The engineering countermeasures included:

- Centerline, edge line, and shoulder rumble strips
- HFST
- Pavement grooving
- Drainage improvements
- Raised pavement markers
- Delineators
- Signs

Other countermeasures included:

- Tree and utility removal
- Education
- Enforcement

Caltrans projected costs of $157 million for capital improvements. Thirteen million dollars projected for enforcement and educational efforts over a 5-year period. Caltrans is not at the point where they can measure effectiveness yet, but it is planned.
Implementation issues:

- Tree removal is problematic; some trees are protected (such as those at sites near Redwood National Park).
- Utility removal is a lengthy process.
- Rumble strips adversely affect bicyclists.

Investigations are more than 90 percent complete and the agency is about ready to start projects. Caltrans does not have a RwD plan on the local side because it doesn't have the local data. There is push back due to rumble strips and rumble stripes; the biggest issue is from

bicyclists. Installation is at the discretion of the Districts; one District has a policy that if adding a rumble strip, then a shoulder must be added or widened.

- IL has a bike friendly-rumble stripe that has gaps.
- New type of rumble strip tested in Eureka, CA is more rounded and wave-like to reduce noise.

***Sonya Landrum**, North Central Texas Council of Governments*

NCTCOG developed an Intersection Safety Implementation Plan (ISIP) in 2012 with support from FHWA because Texas was an Intersection Safety Focus State. NCTCOG used 5 years of crash data and received crash data from Texas DOT (TxDOT). It identified 1,047 intersections. Intersections with 10 or more crashes were included in the plan.

A workshop was held to examine possible countermeasures that would work in the NCTCOG region along with the cost and ease of implementation. Five countermeasures rose to the top:

1. Re-time traffic signals for better coordination and for proper red and amber change intervals.
2. Install additional signal heads – one signal head per approach.
3. Change permitted and protected/permitted left-turn phasing to protected.
4. Install basic pavement marking and sign improvements.
5. Install advanced signal ahead warning signs.

Estimated cost was $19.8 million at affected intersections. Important to have funding set aside to implement countermeasures. NCTCOG sent reminders to local agencies in their region when TxDOT sent out call for projects so that locals would submit applications for intersections projects in their jurisdiction that were included in the ISIP.

Question: How were countermeasures scored/selected?
Answer: Strawman countermeasures (an Excel document) were put together by an FHWA consultant and the group discussed their feasibility during a NCTCOG Intersection Safety Implementation Plan Workshop to make the final selection.

- Texas is now developing a State ISIP.
- Some are packaged with 2 county projects together.

Roundtable Discussion on Systemic Implementation on Local and Rural Roads

The following summarizes the open roundtable discussion on systemic implementation.

- Environmental (NEPA) process takes time.
  - Build it into the timeline and use a pre-planning process (such as a programmatic study – however, cannot use project funds if the study is done before the project).
  - Have State DOT assist.
  - Provide training.
- California Lesson Learned – As a State DOT, do not volunteer to let FHWA delegate authority to you. Do not do NEPA for FHWA. Inexperienced people who are very conservative will be doing the work, which slows the process way down.
- Intergovernmental agreements; can take a long time for a local agency to sign an agreement with the State.

- Number of different agencies/organizations involved with implementation.
  - Conflicting priorities between groups (for example, signal designs rated on how drawing looks).
- Dealing with utility companies is a challenge. For example, it can take 2 years to get the power company to put in power for lightning.
  - Utility relocation is the same way.
- Ensuring local agencies can deliver projects.
  - California local agencies must have a master agreement to show they can do the project. California also requires a public employee to be in charge of a project, but many Public Works Departments contract out the work of their Public Works, so that is an issue.
  - Some States work with their LTAPs to provide LPA certifications.
  - States need to help locals understand the Federal Aid Program.
    - Provide training.
    - Every Day Counts initiative on programmatic agreements. Arizona used this to streamline environmental clearances.
- Illinois conducts a one-day meeting with law enforcement to understand what the officers are going through. Brings together those who are getting the data and those who are using the data.
- Many locals will not use HSIP funds for safety projects because they are unable to do required maintenance.
- Link projects back to the SHSP to make it eligible for HSIP funds.
- California – had to stop 3 Road Diets due to local opposition. This was an implementation issue.
  - Phoenix does a lot of outreach when they are going to do a Road Diet; public meetings, which seem to help.
- Nevada – had to fill in rumble strips due to opposition.
  - Helps to have local knowledge. Talk to local maintenance staff.
  - Illinois – use test trials.
  - Phoenix – uses pilots for new countermeasures (e.g. a temporary roundabout with flexible curving and delineators).

Question and Answer Session

Question: How long should an HSIP project last? Once a countermeasure is installed, must rely on maintenance to keep it active which is an issue. Can HSIP be used again after 10 years?
Answer: It is up to the State. If pavement marking will not last, upgrade it to 6" to access HSIP funds.

Question: Are there effective processes to keep track of locals' access to HSIP funding? Do you see the same locals getting HSIP funds? How do you track the silent locals who are not addressing issues or getting HSIP funds? How do you get to the locals who are not aware of their issues and not in the HSIP rotation?

Answers:

- Illinois – get locals to help locals.
- Use the outreach they trust the most. LTAPs are a good mechanism because they are constantly in communication with the locals. Have the LTAPs send out the applications. Offer to visit with them and provide training. Many LTAP staff are on the State APWA Board.
- County and city conferences are a good place to present on the application process.
- MPOs are another mechanism to get to the locals.
- Texas - Use requests for training (on pavement management for example) and sneak in safety information (like safety improvements they see are feasible). Give them what they ask for, but sneak in safety.
- MAG – Include city managers when sending out call for projects. Use members of the Safety Committee to help smaller jurisdictions. Tempe helped small town of Guadalupe.

Breakout Discussion by State – Local and Regional Perspectives

This discussion focused on the challenges that local agencies are facing in applying the systemic safety approach to projects.

- Agencies discussed environmental challenges regarding the NEPA process.
  - There is a need for State DOT assistance and training.
  - "Do not volunteer to do NEPA for Feds."
  - Pre-planning process is a challenge.
  - Programmatic study.
- The number of agencies involved leads to conflicting priorities.
  - Processes delay implementation.
- Local utility issues—delays in process and policies.
  - Utility relocation takes years.
- Lack of knowledge and experience in Federal regulations.
  - One state swaps State funds for Federal funds to get money to local so they do not have to figure out Federal paperwork/processes.
  - Hard to do a joint project when there are multiple jurisdictions.
  - Lack of local agency expertise.
  - Need to better utilize expertise and regional agencies or LTAP to administer project/contract.
  - Regional/State bodies need to offer training to local agencies.
- Local agencies have a hard time figuring out the Federal-aid program
  - Educate/train.
  - EDC I and II initiative—programmatic agreements. Documents that establish a streamlined process for handling routine environmental requirements for commonly encountered project types.
  - Conference/summit (IL) to provide information (open dialogue with law enforcement).
- Maintenance of implemented countermeasures can be challenging.
- Linking countermeasures/issues to the SHSP – linkage not always clear.
- Local opposition to project/countermeasure.

    - Public outreach—meetings, postcards can help.
    - Can use a pilot/demonstration project/temporary set up to test the waters, gain buy-in.
- Getting to silent/inactive locals.
    - Use active locals, LTAP agencies, MPO/RPO for outreach.
    - Offer training in their areas.
    - Offer one-on-one contact.
    - American Public Works Association and National Association of County Engineers – county/local associations.
    - Attend county/city conferences or meetings.

ACTION PLAN REPORTS

Each state prepared an action plan based on the noteworthy practices heard during the peer exchange. The summary below highlights each State's action plan.

Arizona

- Conduct network screening to identify projects at locations that are candidates for systemic treatments and hot spots.
    - Screening software.
    - Champion is ADOT, MPOs, and locals, as their resources allow.
- Complete a treatment screening for identification of applications; eligible locations identified for systemic applications will establish treatments suitable for those locations.
- Identify scope of need and establish a multi-year program to address the systemic needs and implement them.

Nevada

- Implement a program of installing retroreflective backplates on all traffic signals on State and local roads.
    - Resources needed: FHWA, intersection Critical Emphasis Area (CEA) team, signal inventory, design staff.
    - Champion: Nevada DOT Traffic Safety, collaborative effort with locals since they maintain the signals.
- Identify problematic curves and install treatments on all roads.
    - Resources: GIS layer for all curves, existing sign inventory, county participation since lane departure on curves is on local roads.
    - Champion: Lane Departure CEA.
- Design an RSA database to identify systemic improvements and past mitigations that have proven effective.
    - Resources: RSA Reports, crash database, consultants to support.
    - Champion: RSA Coordinator.
- Provide ICE (Intersection Control Evaluation) Training to work towards developing a statewide policy.
    - Resource: FHWA RC; top down leadership support.
    - Champion: Intersection CEA.
- Investigative research for systemic improvements.

Arkansas

- Develop a pilot program using information learned at peer exchange. Want to address curves—two issues: want to combine countermeasures to address limited shoulders and horizontal curves on two-lane rural roads. Will have good roadway data to work with.
- Look at software analysis tools and developing crash trees. Need to back up decisions with data. Will use examples and best practices from peer exchange.
- On local program side, will develop a process for low-cost systemic improvements. Will need to sell to State management and want to have local management on board first. Backplates and chevrons are good ideas. Intersections will be more important to locals than segments.

- Keep application process simple.
- Conduct workshops to educate the locals.
- Will need to develop a process to help locals identify locations.
- Will start with progressive locals first and then follow with others shortly after.

Illinois

- Promote systemic safety statewide. Make more of a concerted effort to provide effective communication for a wide range of players. Get involved with the National Association of County Engineers and the American Public Works Association and provide locals with knowledge, assistance for safety opportunities, and available resources.
- Lobby to provide a dedicated Illinois DOT safety person in each of the 9 Districts.
- Conduct additional evaluation of systemic projects that have been completed; identify projects that do and do not work.
- Set up meeting with the State safety engineer for a debriefing to discuss strategies from the peer exchange.

Texas

- Form regional road safety teams. Use SHSP crash data and drill down to regions.
- Develop a systematic rumble strip plan; will require design manual changes.
- Develop a State Intersection Safety Improvement Plan.
    - Want it to be a funded action plan; will need HSIP funds.
- Use 100 percent Federal funding for local, off-system projects.
- Develop a communications strategy that gets the safety message to the locals. LTAP will assist with this through training and outreach.

California

- Bring multiple FHWA training sessions on systemic safety to the State.
    - Couple with existing summits or workshops that are already scheduled for the spring.
- Elevate role of LTAP with reaching out to the locals.
- Showcase successful systemic safety strategies. Need willing local agencies to help with this effort.
- Relate systemic safety projects to SHSP implementation. Promote systemic safety improvements.
- Engage LTAP to train on systemic safety and help locals deliver these types of projects.
- Perform before and after studies.

Wisconsin

- Conduct further investigation into a local systemic program. Follow up with other attendees from peer exchange on their ideas.
- Increase involvement, coordination, and utilization of LTAPs and regional organizations (RPCs).
- Perform a roadway departure crash study (beyond cross-over crashes).

Colorado

- Formalize program a little more and give the systemic approach more attention.

- CDOT just renewed SHSP and is moving into implementation, so this is a good segue for exploring options for systemic safety treatments.
- Reconnect and leverage off each other (between CDOT and LTAP).
- Establish a safety circuit rider program.
- Change the culture to promote systemic safety; to do this, subdivide funding and set aside an allotment for systemic applications.
- Build on relationship with locals by developing a summit or training session/workshop where CDOT will provide education to the locals and learn what the locals need to submit good applications.
- Develop a strategic plan for countermeasures, like the IL tool for cable median barrier.

Idaho

- Look into swapping HSIP funds with State funds for the local program to make it easier for locals to execute projects.
- Investigate methods for collecting full roadway data. Need this data of roadway characteristics to fully implement a systemic safety program.
- Have systemic training provided by the FHWA Resource Center.
- Develop potential countermeasures (toolboxes) for lane departure and intersections. Provide Idaho-specific white papers in these areas.
- Document the HSIP and how the funds are utilized.

APPENDIX A – LIST OF ATTENDEES

List of Attendees
Systemic Safety Implementation Peer Exchange
EDC-3 Data-Driven Safety Analysis Initiative
September 23 & 24, 2015

Richard Weeks	Arizona DOT
Dallas Hammit	Arizona DOT
Margaret Boone	Maricopa Association of Governments
Paul Casertano	Pima Association of Governments
Kerry Wilcoxon	City of Phoenix
Karla Petty	FHWA-Arizona
Kelly LaRosa	FHWA-Arizona
Aaron Williams	FHWA-Arizona
Adnan Qazi	Arkansas State Highway and Transportation Department
Kenneth-Bon Banga	Arkansas State Highway and Transportation Department
Lance Jobe	City of Rogers
Laura Carter	LTAP
Joe Heflin	FHWA-Arkansas
Thomas Schriber	Caltrans
Robert Peterson	Caltrans
Steve Castleberry	Nevada County
Rick Tippett	Trinity County
David Cohen	FHWA-California
Charles Meyer	Colorado DOT
David Swenka	Colorado DOT
Renée Railsback	Colorado LTAP
Janet Lundquist	Weld County Public Works
Dahir Egal	FHWA-Colorado
Glenda Fuller	Idaho Transportation Department
Kelly Campbell	Idaho Transportation Department
Laila Kral	Local Highway Technical Assistance Council
Kevin Kuther	Local Highway Technical Assistance Council
Lance Johnson	FHWA-Idaho
Tim Sheehan	Illinois DOT
Sean Coyle	Illinois DOT
Bonnie Flock	Kane County
Josh Sender	Peoria County
Alan Ho	FHWA-Illinois
Ken Mammen	Nevada DOT
Lori Campbell	Nevada DOT
Julie Masterpool	RTC Washoe

List of Attendees
Systemic Safety Implementation Peer Exchange
EDC-3 Data-Driven Safety Analysis Initiative
September 23 & 24, 2015

Eric Meyer	Department of Public Works City of Las Vegas
Juan Balbuena-Merle	FHWA-Nevada
Darren McDaniel	Texas DOT
Roy Parikh	Texas DOT
Sonya Landrum	North Central Texas COG
Ashley Mathews	Lone Star LTAP
Stephen Ratke	FHWA-Texas
Brian Porter	Wisconsin DOT
Darren Schoer	Wisconsin DOT
Bruce Barnes	Waukesha County Department of Public Works
Melissa Kraemer Badtke	East Central Wisconsin Regional Planning Commission
Dave Jolicoeur	FHWA-Wisconsin
Rosemarie Anderson	FHWA Headquarters
Karen Scurry	FHWA Headquarters
Dave Engstrom	FHWA Resource Center
Heather Rigdon	Leidos (contract support)

APPENDIX B – AGENDA

Systemic Safety Implementation Peer Exchange

EDC3 Data-Driven Safety Analysis Initiative

September 23-24, 2015

AGENDA

Participating States:
Arizona, Arkansas, California, Colorado, Idaho, Illinois, Nevada, Texas, Wisconsin

Wednesday, September 23

8:00 AM **Welcome**

- *Dallas Hammit, Arizona DOT Deputy Director for Transportation*
- *Karla Petty, FHWA Arizona Division Administrator*

Peer Exchange Objectives
Introductions/Expectations

9:00 AM **Overview of Systemic Approach to Safety**

- *Dave Engstrom, FHWA Safety & Design Technical Services Team*
- *Karen Scurry, FHWA Office of Safety*

10:00 AM **Break**

10:15 AM **State Presentations: Analysis Approaches**

- Region-wide Screening for Roadway Networks – *Margaret Boone, MAG*
- Data Driven Approach to Distributing Safety Funds – *Laila Kral, ID LHTAC*
- Use of Systemic Safety – *Darren Schoer & Brian Porter, WI DOT*

11:30 AM **Lunch on your own**

12:30 PM **Roundtable Discussion: Analysis Approaches**
Analysis tools and resources being utilized by state and local agencies to implement systemic safety

1:30 PM **State Presentations: Systemic safety countermeasures**

- Systemic Implementation of Proven countermeasures: Lessons Learned – *Lori Campbell & Ken Mammen, NV DOT;*
- Network Screening and Countermeasure Selection – *Charles Mayer, David Swenka, CO DOT*
- California Local HSIP – *Robert Peterson, Caltrans*

2:30 PM **BREAK**

2:45 PM **Roundtable Discussion: Systemic Countermeasures**
Countermeasures currently being used by states and local agencies for systemic safety implementation; other countermeasures agencies should be considering; benefits and challenges of implementation

3:30 PM **Breakout Discussion by State(s): Regional & Local Perspectives**
Engaging local and regional agencies in systemic safety approach. Discuss the successes and challenges and addressing the challenges.

4:30 PM **Report Back (Key Takeaways)**

5:00 PM **Wrap-up/Adjourn**

Thursday, September 24

8:00 AM **Recap of Day 1**

8:30 AM **State Presentations: Advancing Implementation of Systemic Safety Improvements**

- Systemic Safety Improvements, State & Local Efforts - *Timothy J. Sheehan & Sean P. Coyle, IL DOT*
- Roadway Departure Implementation Plan – *Thomas Schriber, Caltrans*
- Intersection Safety Implementation Plan – *Sonya Jackson Landrum, North Central Texas COG*

9:30 AM **Roundtable Discussion: Implementation**
Opportunities and challenges to systemic safety countermeasures implementation; strategies to overcome challenges and the role of regional and local agencies

10:15 AM **Break**

10:30 AM **Breakout Discussion: Funding sources**
Determining the right balance between spot and systemic safety improvements; developing systemic safety implementation plan on yearly/funding cycle basis; identifying funds to be used in implementation

11:30 AM **Report Back (Key Takeaways)**

12:00 PM **Lunch on your own**

1:00 PM **State Breakout Discussions: Action Plans**

- Including Roles and Responsibilities

2:15 PM **Report back**

2:45 PM **Wrap-up/Next steps**

3:00 PM **Adjourn – Safe travels!**

APPENDIX C – ADDITIONAL RESOURCES

Following are resources that are available to assist agencies with implementing systemic safety:

- FHWA Systemic Safety Project Selection Tool, training, and technical assistance. FHWA also coordinates peer exchanges and webinars. For detailed information on FHWA's resources, visit http://safety.fhwa.dot.gov/systemic/index.htm.
- Strategic Highway Safety Plans (Emphasis Areas are identified in these plans). More information may be found at http://safety.fhwa.dot.gov/hsip/shsp/.
- Intersection and Roadway Departure Safety Implementation Plans. More information may be found at http://safety.fhwa.dot.gov/roadway_dept/.
- US Road Assessment Program (usRAP). More information may be found at http://www.usrap.us/home/.
- Safety Analyst – There will be a new module in 2016 to support systemic safety analysis.