

**Region 7 Traffic Operations and Traffic Safety Research and Outreach
Focus Group Meeting
St. Joseph, Missouri
March 30, 2006**

The purposes for this meeting were to generate research and outreach topics for the Regional University Transportation Center (UTC), and also to encourage states in the region to collaborate on common issues through their own research programs. The Regional UTC solicits proposals and funds research at all universities in Region 7 through an annual solicitation for project proposals. This document will provide direction to faculty and research staff wishing to propose a project to the MTC.

At the meeting, the attendees were divided into four groups based on the interests of the attendees. The groups were:

- Low volume and rural roads safety and operations
- Freeway and urban surface street safety and operations
- Crash records, crash record analysis, education, enforcement, and incident management
- Work zones safety and operations

Each group brainstormed, developed potential research topics, and then each member of the group voted on each topic using the 10 – 4 method. The 10 – 4 method involves giving each member of the group 10 votes, and each member could cast as many as four votes for any single topic. Once each group had identified their highest priority topics, then the group reconvened and they cast their votes on all the top priority topics using the 10 – 4 method.

Low Volume and Rural Roads Safety and Operations

This group was lead by Tom Welch, of the Iowa Department of Transportation and members of the group included:

Troy Jerman, Iowa Department of Transportation
Chris Huffman, Kansas DOT
Dan Skouby, Missouri DOT
Nathaniel Albers, University of Missouri
David Schwartz, Kansas DOT
Jerry Roche, FHWA
Stan Young, Kansas DOT

Initial Topics and Votes. Below are listed topics ordered by the number of votes cast for the project within the group.

1. **Effectiveness of “safety corridor” programs.** Several states have developed safety corridor programs. These are programs that have identified corridors with above expected crash frequencies and use a team to identify treatments and strategies to reduce above expected crash frequencies. This project would involve a synthesis of programs conducted in other states and identification of the most promising for implementation in Region 7 states. Votes - 13
2. **Centerline Rumble Strips.** Centerline rumble strips are a recommended strategy in the NCHRP 500 series, but little statistical analysis has been conducted on their safety impacts. Missouri is in the process of including centerline rumble strips in a statewide resurfacing program and other states in the region have selectively applied centerline rumble strips. The purpose of this project will be to perform a definitive analysis of their safety benefits. Votes – 12
3. **Mail box /driveway encroachment.** Votes– 11
 - data
 - marketing tools
4. **Emergency responses.** Votes – 9
5. **Rural roundabouts.** Although there has been much guidance created over the last few years regarding the design of roundabout, little information is known about the use of roundabouts on rural two and four lane roadways. Votes – 8
6. **Intersection beacons.** Votes - 4
 - mainline only
 - mainline / side road
7. **Quality/Durability of milled in tape.** Votes – 3
8. **Change blindness.** Votes – 3
9. **Noise impacts of NCHRP Missouri center line and shoulder rumble strips.** Votes – 1
10. **Iowa top 30 curves.** Vote – 0
11. **Length of turn lane.** Vote - 0
12. **Offset right turn lanes.** Vote – 0

Freeway and urban surface street safety and operations

This group was lead by Tim Crouch, Iowa Department of Transportation, and members of the group included:

Willy Sorenson, Iowa Department of transportation
Mark Pohlmann, Schemmer Associates, Council Bluffs
Bob Alva, Kansas Division of Office of the Federal Highway Administration
Shauna Hallmark, CTRE/ISU
David Plazak, CTRE/ISU
Linda Voss, City of Topeka, KS
Tim Chojnacki, Missouri Department of Transportation

Ron Achelpohl, Mid American Regional Council

Initial Topics and Votes: Below are listed topics ordered by the number of votes cast for the project within the group.

1. **Design guidelines for flashing beacons in advance of signals on high speed roadways.** Several highway agencies have put signs with flashing beacons in advance of signals on high-speed highways. Although not always, the flashers are activated before the light changes indicating to the driver that they should be prepared to stop. This project would identify current design practices, develop recommended design guidelines, and document benefits found from the use of such signs. Votes – 10
2. **Quantifying air quality and energy impact of safety improvements.** Often projects that are conducted to improve safety, also have air quality benefits. Some cities apply for funding under the air quality banner when the intent of the project is really to make a safety improvement. This is done because air quality funding under the CMAQ program is more plentiful but it is difficult to quantify overlap between safety and air quality. This project would identify methods to determine the impacts for both safety and air quality. Votes - 9
3. **Quantifying benefits of video surveillance (camera deployment).** Video surveillance of highways has a number of benefits including being able to identify and verify incidents remotely, the ability to monitor traffic conditions, and adjust traffic control remotely. Video surveillance also has clear safety and security benefits for highway users. Although these benefits are understood and accepted, they have not been quantified. This project would assess the benefits and cost of video surveillance, and make recommendations on the use of video surveillance. Votes – 8
4. **Crash testing existing sign posts/poles with ITS equipment on them.** Poles and other roadside hardware are often used as mounting locations for camera, un-intrusive detectors, communications devices, etc. This project would look at the impact of these additions on the safety of these devices. Optimally, the safety of installations on existing roadside hardware would be evaluated through crash tests. Votes – 7
5. **Rural roundabouts.** There is much information regarding the use of roundabouts in urban areas, but there exists little information about the use and safety benefits of roundabouts on rural roadways. Votes – 7
6. **Ped flashers / treatments Midwestern experience.** Although there are warrants for signals, there is no similar guidance for pedestrian treatments at signalized intersection. This project will look at the Midwest experience to determine which treatments work best under varying traffic and pedestrian volumes. Votes - 7
7. **Benefit of reconstruction rural expressways to urban cross-section.** Evaluate benefits and costs of reconstructing rural expressways to an urban cross-section as development expands outwardly. Possibly there is a transition area as urban areas expand outwardly where it is most beneficial not to change anything with cross-section, just add traffic signals. Votes - 6
8. **Research on expressway intersection behavior of the minor roadway driver.** A number of issues with respect to driver behavior at median crossover intersections are not well understood and require more study. This includes gap acceptance behavior,

the impacts of alerting mainline drivers when vehicle is on side street, the use of yield and stop signs in median, and how medians too narrow to provide refuge for an entire truck, impacts gap selection. Votes - 6.

9. **Where should expressways be built?** Comparison of expressways with good and poor safety performance to identify appropriate characteristics and good design features for an expressway. Votes – 6
10. **Need demand / exposure data for peds / bikes.** There are few or no methods for estimating the number of pedestrians and bike riders that are generated by varying land uses. This project will investigate methods for estimating ped/bike demand in the upper Midwest. Votes - 4
11. **Synthesis of red light running / cameras.** This project would develop a synthesis of red light running experience and practices, including experiences with public education. Votes - 4
12. **Access management, what is needed for specific businesses.** This project would examine the amount and type of access required by varying types of commercial businesses to make each type of business successful. Votes – 4
13. **Alternative to adding turn lanes.** Adding a left turn lane can be very costly in built-up urban areas. This project would look at traffic signal operation (e.g., split phasing) and develop guidance on types of phasing that works best with regards to traffic operation and traffic safety at varying volumes (both left and through volumes). Votes - 3
14. **Best traffic control inside major traffic generator (malls).** Large traffic generators provide special problems for traffic operations. This project would document the best practice for traffic control around major traffic generators. Votes - 2
15. **When is arterial too cluttered?** This project would identify when too much visual clutter along an arterial becomes a safety problem as drivers are distracted by the clutter along the roadway. Votes - 2
16. **Best practices for operations procurement.** It is difficult procuring traffic operations systems using traditional price bidding. This project would investigate alternative procurement methodologies and document successes with each. Vote - 0
17. **Synthesis of best practices for incident management on expressways and arterial streets.** This project will conduct a synthesis of practices of incident management procedures on surface streets and non-access controlled roadways. The synthesis will cover general management, how to set up an incident management team, organizational issues, issues associated with diversion of traffic to city streets with little guidance, the use permanent static signs, and use of dynamic signs. Votes - 1
18. **Outreach – what not to do.** Develop materials identifying poor practices and illustrating why certain designs do not work from a traffic operations standpoint. A specific example is the intersection of Airport Road and Duff Avenue in Ames. Vote - 1
19. **Outreach Tools to educate public.** This project would develop outreach tools that could be used to educate the public about the importance of focusing their attention on the driving task and away from such distractions such as cell phone usage. Vote - 1
20. **Signal coordination updated.** Re-examine the benefits of signal coordination. Votes - 0

Work Zone Traffic Operations and Safety

This group was led and facilitated by Charles Nemmers of the University of Missouri Columbia. Other members of the group included:

Mark Bortle – Iowa Department of Transportation

Chris Jenkins – Traffic Engineering Design (Jackson County)

Yong Bai – University of Kansas

David LaRoche – Kansas Division office of the Federal Highway Administration

Jim Brachtel – Iowa Division office of the Federal Highway Administration

Jose Rodriguez – Missouri Department of Transportation (St. Joe District Office)

Shannon Stokes – University of Missouri Columbia

Ghulam Bham – University of Missouri Rolla

Initial Topics and Votes: Below are listed topics ordered by the number of votes cast for the project within the group.

1. **Speed management.** Group was concerned about a number of speed management issues, this included what speed is appropriate and the safest under varying work conditions. For example, are different speeds appropriate during night-time work versus day-time work, when work activity is near the travel lanes, when workers are present versus when workers are not present, does the appropriateness of a specific speed change with volume through the work zone, etc. The group also wanted to determine the most effective means of lowering speeds such as reducing lane widths, wider stripping, rumble strips, etc. and the most effective means of using enforcement personnel to manage speed. Votes - 21

The speed management issue that should be given the highest priority was the evaluation of the impact of speed on crash frequency and the resulting impact on delay. Priority issues also included policies on the speeds when workers were and were not present and appropriate protocols for setting speed limit policies.

2. **Planning for work zones.** An area needing more examination is the planning for work zone safety during the project planning stage. There is the need to simulate the impacts of lane closures and restrictions, the development of sequencing and scheduling to minimize impacts to traffic. Votes - 19

Issues requiring special investigation are the simulation of impacts and alternatives, and capacity analysis of lane closure and restrictions.

3. **Work zone traffic control devices.** Research is required on traffic control devices to determine effectiveness of traditional signs versus new dynamic signs, and where the application of dynamic message signs is most appropriate. Determining the effectiveness of various signing and marking practices should also involve market research of usage and standard protocol, processes, and measures to determine the effectiveness of traffic control devices. Of particular interest to the group was the determining effectiveness of traditional traffic control devices versus advance dynamic technology. Votes - 19

4. **Education.** Several types of education were discussed. Education for contract administration staff and contractor employees to help them to stay up with standards and current practices is valuable. The group was concerned about the loss of institutional memory of work zone traffic control as current traffic control plan designers and inspection staff retire. The group also thought there should be public education, particularly for young (inexperienced) drivers. More information should be included in State's driver's manual. Educating the public would also require market research to determine where the best approaches for making the public aware of work zone issues, and how to get the most impact for the limited resources available. Votes - 15

Types of education that should receive the most attention are education for workers, education for young drivers, and education for utility employees.

5. **Policies.** This topic was mostly concerned with public information and public involvement regarding work zones and methods for communicating information regarding work zones and congestion (e.g., web sites, signage, print and electronic media). How best to capture public involvement in work zone planning and design and in the Traffic Management Plan (TMP). Votes - 15

Topics emphasized under policy were the impacts of the new federal work zone rule, the impacts of growing truck volumes, and best practices for public involvement.

Crash Records, Emergency Management, and Education

This group was facilitated by Michael Trentacoste of the Federal Highway Administration. Other group members included:

Reginald Souleyrette, CTRE/ISU
Michael Briggs, Mid-American Regional Council
Dennis Burkheimer, Iowa Department of Transportation
Brian Chandler, Missouri DOT
Dean Landman, Kansas State University
John Lundell, University of Iowa Injury Precaution Research Center
Donald Neumann, FHWA
Lilliard Richardson, University of Missouri
Gundmundur F. Ulfarsson, Washington University
Fred Zwonechek, Nebraska Office of Highway Safety

Initial Topics and Votes: Below are listed topics ordered by the number of votes cast for the project within the group.

1. **Crash location – off system.** Most states do not have off-primary crash record locations. This is problematic for meeting SAFETEA-LU requirements to identify the top 5 percent of their crash locations. There are some solutions (e.g., TraCS

location tool). Research is required to identify and/or develop alternative approaches (e.g., sampling techniques). Votes – 10

2. **Quality of crash reports and timeliness.** Even if agencies have complete crash records, the quality and timeliness is critical to their effective use. Quality is primarily a training and attitude issue whereas timeliness is a technology and cost issue. Research is needed on the effect of quality and timeliness on safety programs and on measures that may be taken to improve same. Votes – 10 **Use of technology to improve crash data.** Votes – 9
3. **Integration of highway safety related databases.** CODES is an attempt at this. What other data (beyond crash, EMS and hospital) is needed and how can it be combined? Votes – 9
4. **Minimum road data requirements.** MIRE is the new counterpart to MMUCC. MIRE will focus on minimum road data elements needed. Input to this process needs to come from various disciplines. Research is needed on the extent to which this type of information is already available and the costs and benefits of providing it if it is not. New technologies for capture of this information should also be explored. Votes – 9
5. **Need exposure data, all modes.** Lacking are exposure data (miles driven, number of passengers, pedestrians, etc.) by time of day, age, location ... This project would identify methods to estimate exposure information for segments of the transportation stream that are not counted. Votes - 9
6. **Evaluating integrating crash costs for decision making.** Votes - 8
7. **Realistic real time routing info for incidents far enough ahead.** Sometimes information on detours is not provided in time for drivers to make the best decision about alternative routes. What is the magnitude of this problem? How do we improve the provision of the information? How do we handle institutional coordination issues, as well as provide the best routing? Sometimes no routing is provided – only diversion and drivers are left to fend for themselves and “follow the pack”. Votes – 8
8. **How to reach young male drivers.** How to get more “realistic” behind-the-wheel training with supervision – require parents to sign forms for graduated license practice? Other? Votes - 5
9. **User friendly analysis tools.** Votes – 6
10. **Measuring the effectiveness of enforcement programs.** How are the various disciplinary programs evaluated? If the overall goal is to save lives, how do we measure this against “what would have happened in the absence of the program? Votes - 5
11. **Command and control issues for incidents across jurisdictions.** When an incident impacts traffic across jurisdictional lines, there is often a lack of communication and effective coordination of command and control. This project will investigate the extent to which in ability to communicate between jurisdictions presents a problem and the magnitude of inefficiencies created by Command and Control issues across jurisdictional lines. Further, if this is a big problem, then how should it be solved? Votes – 4
12. **Legal and institutional barriers to access of crash data.** SAFETEA-LU is addressing part of this, but legal minds do not agree as to the protection from tort

provided by the law. Agencies tend to err on the conservative side re: public release of information. What is the societal cost of this conservatism? Votes - 4.

13. **How to measure impact of programs while other changes and trends occur.** This is a common problem particularly for databases for before and after studies with relatively short data collection periods. For example, during 2006 there may be changes in crash patterns and crash severity that results from escalating fuel prices (more lightweight vehicle, less VMT, portions of the population being priced out of their cars, etc.). Changes that are beyond the control of the analyst often make determining the actual impact of a change difficult. Votes - 3
14. **Coordinating enforcement, design and education- up front.** These groups work together mainly in reactive ways, if they work together at all. They need to become more aware of each other's activities (cross-pollinate) in the design stages (road design, program design). For example, law enforcement could discuss targeted enforcement with engineers who might suggest areas with unforgiving roadways or high turning volumes. Votes – 3
15. **How to share survey results.** Across jurisdiction – clearing house? Does there need to be a national highway safety clearinghouse (e.g., the NSEL list being proposed by FHWA). Vote – 1
16. **Minimum data elements – multi-disciplinary.** MMUCC and NEMESIS exist to standardize and promote the crash data elements required for effective safety programs. Do these specifications include all elements that various disciplines need for analysis? (Engineering, Emergency Response, Education and Enforcement). Vote – 1
17. **Crash data collection systems.** Vote - 1
18. **Assessment of impairment.** Vote – 0
19. **Assessment of distraction.** Research is needed on procedures that can be used to assess the impact of driver distraction on crash causation. Vote – 0
20. **Identify the role of planning in highway safety.** Vote – 0
21. **Sharing driver records across states and other borders – driver info.** Apparently, some states do not proactively share moving violations. How big is this problem? This (sharing) should be done – how? Vote - 0

Overall Prioritization

The group reconvened into one room and the facilitator for each group presented their five highest priorities. The highest priority projects are listed below, along with the number of votes each topic received.

1. Location, quality and timelines of crash data. Votes - 31
2. Need exposure data by mode, time of day, age, ... Votes - 25
3. Advanced Treatments for high-speed signals. Votes - 24 (tied for third)
4. Speed management in work zones. Votes - 24 (tied of third)
5. Planning methods for reducing work zone congestion and improving safety. Votes - 24 (tied for third)
6. Training regarding methods and standards for temporary work zone traffic control. Votes - 23
7. Research on the applicability, design, and benefits of rural roundabouts. Votes - 20 (tied for fifth)
8. Developing guidance for pedestrian treatments in the Midwest. Votes - 20 (tied for fifth)
9. Integration of safety databases. Votes - 19 (tied for sixth)
10. Quantifying Benefits of video surveillance (not video detection for traffic control). Votes - 19 (tied for sixth)
11. Effectiveness of Safety corridor programs. Votes - 18

12. Effectiveness of edge and center-line rumble strips. Votes - 17
13. Quantifying air quality impacts of safety and energy improvements. Votes - 16
14. Technology and real time data for incident prediction, detection and detour. Votes - 15
15. Road database & attributes for off-system. Votes - 12
16. Effectiveness of traditional and ITS work zone traffic control devices. Votes - 11
17. Mailbox / driveway entrance encroachments. Votes - 11
18. The impact of the new federal work zone rule and best practices for public involvement and planning. Votes - 9