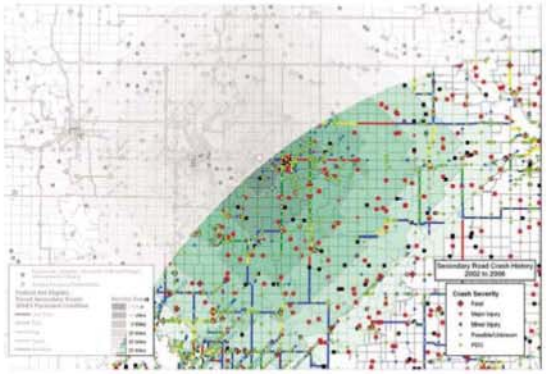
To: U.S. DOT/RITA, University Transportation Centers
Grant Number: DTRT13-G-UTC37
Project Title: University Transportation Center–Region 7, Iowa State University
Program Director: Shauna Hallmark
shallmar@iastate.edu
515-294-8103



MIDWEST TRANSPORTATION CENTER MTC

April 30, 2014

Recipient Organization: University Transportation Centers
Amy Stearns
U.S. DOT/RITA/mail code RDT-30
Work Station E33-472
1200 New Jersey Avenue, SE
Washington D.C. 20590-0001

Project Grant Period: September 30, 2013–September 30, 2017
Reporting Period End Date: March 31, 2014
Report Frequency: Semi-annual

Submitting Official Signature: Shauna L Hallmark

Shauna Hallmark

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1. Accomplishments

Major Goals and Objectives

MTC's theme is ***Data Driven Performance Measures for Enhanced Infrastructure Condition, Safety, and Project Delivery*** and will address related regional issues through a strategically focused program that is synergistic with U.S. DOT priorities and MAP-21 goals and objectives, with **State of Good Repair** as the primary goal. The objectives of the MTC are to

- Serve as a focal point within the region and nationally for research that develops data performance measures for Infrastructure Condition, Safety, and Project Delivery.
- Ensure efficient use of funds by building on existing programs, avoiding duplication, leveraging existing resources, and developing creative cooperative activities with industry.
- Develop products that are useful and relevant to stakeholders including regional, national, state, regional, and local transportation agencies as well as industry and other researchers.
- Provide leadership in the next generation of technology transfer. Beginning with the research itself—involving the user, innovative outreach, and new communications technology (i.e., phone apps).
- Develop the next generation of transportation professionals and provide opportunities for current professionals.
- Provide leadership opportunities for students and young professionals.
- Recruit and retain a diverse workforce.

Accomplishments Toward the Goals

Iowa State University had a kick-off meeting with partners and collaborator on Monday, December 2, 2013 from 10:00 AM – 2:00 PM. This meeting was held in Ames, Iowa. The goals and objectives for this MTC Program were discussed, and research topics identified. We scheduled regular teleconference team meetings, starting the first Tuesday of every month.

The MTC partners developed and finalized research competition guidelines to help each school evaluate and select research projects to be funded in the first round of the MTC. The ISU team worked with both Wichita State and Creighton to help them develop a transportation focused research program. UMC and UMSL worked with Harris-Stowe to develop their research effort. The following guidelines were used to finalize the funded research projects:

- Whether the topic aligned with the MTC theme
- Positive recommendation from subject matter experts
- Involvement of students
- Amount and type of matching funds
- Regional and national significance

The following section describes the process used by Iowa State to develop their first year research program.

On Thursday, February 6, 2014, from 2:00 PM – 4:00 PM, ISU hosted an Open House to explain and offer assistance for the MTC Research for Proposal (RFP) process. We had forms available, and the Director and administrative staff were present and answered questions from potential researchers. We had this

research evolve around MTC's theme of Data Driven Performance Measures for Enhanced Infrastructure Condition, Safety, and Project Delivery and had to address related regional issues through a strategically focused program that is synergistic with U.S. DOT priorities and MAP-21 goals and objectives, with State of Good Repair as the primary goal.

ISU received twenty-six proposals with $2.5 million funding requests. Twenty-one proposals received funding. The total federal funding plus match for these twenty-one projects equaled $2,445,054. Research proposals were reviewed by a subject matter expert at the Iowa DOT, Federal Highway Administration, or other academic institutions and research centers. Proposals were ranked using the criteria described earlier.

In a few cases, the reviewers thought the research ideas had merit but the proposals did not make a compelling case. Four projects were awarded at significantly lower amounts so the PI could first demonstrate proof of concept. Each was encouraged to develop their proof of concept in coordination with an agency, such as the Iowa DOT or industry, and then to resubmit for the next competition.

These research projects included cross-disciplinary researchers from across departments at Iowa State University. There were a total of nine different academic departments involved in this competitive research including the following departments:

- Agricultural & Biosystems Engineering
- Business Administration
- Center for Transportation Studies
- Civil, Construction & Environmental Engineering
- Industrial & Manufacturing Systems Engineering
- Institute for Transportation
- Statistics Department
- Supply Chain & Information Systems

These research projects also funded the following research assistants/students at Iowa State University, the total support includes 67 students:

- 15 PhD Students
- 31 Master's Students
- 20 Undergraduate Students

The tables below list the ISU research program in addition to the research program at partner institutions. Some of these projects have started and the rest will be starting soon. Our next report will include a summary of progress on the research program.

Iowa State University Funded MTC Projects

Project Title	PI Name	Department	Students
An Examination of How Firm Size Affects the Safety Performance of Commercial Drivers in the U.S. Motor Carrier Industry	Cantor, David	Supply Chain & Information Systems, Iowa State University	1- Undergraduate
Bio-cement for Road Repair	Chu, Jian	Civil, Construction & Environmental Engineering, Iowa State University	1- PhD Assistant
Data Driven Highway Infrastructure Resilience Assessment	Guiping, Hu	Industrial & Manufacturing Systems Engineering, Iowa State University	1- Masters
Research, Education and Development (RED) Examining Characteristics of Roadway Infrastructure in Various 3D Visualization Modes	Keren, Nir	Agricultural & Bio-systems Engineering, Iowa State University	1- PhD Assistant 1- Undergraduate
Using Operational Data to Access Mobility and Crash Experience During Winter Conditions	Hans, Zach	Institute for Transportation, Iowa State University	1- 1/2 time Masters
High Friction Surface Treatment for High Crash Locations	Hans, Zach	Institute for Transportation, Iowa State University	1- Masters
Evaluation of Temporary Rumble Strips	Hawkins, Neal	Institute for Transportation, Iowa State University	1- MS Assistant
Development of Rural Road Bridge Weigh-in-Motion System to Assess Weight and Configuration of Farm to Market Vehicles	Dahlberg, Justin	Institute for Transportation, Iowa State University	1- Research Assistant
Terrestrial Laser Scanning-Based Bridge Structural Condition Assessment	Turkan, Yelda	Civil, Construction & Environmental Eng, Iowa State University	1- PhD Engineering
Integration of Structural Health Monitoring into Multilayer Statewide Bridge Maintenance and Management Practices	Phares, Brent	Institute for Transportation, Iowa State University	1- Research Assistant
Development of Crash Modification Factors for Lane Departure Countermeasures	Hallmark, Shauna	Institute for Transportation, Iowa State University	2- Eng Graduates 1- Stats MS Assistant
Risk-Based Bridge Management: A Methodology to Assess and Incorporate Risk in Decision-Making	Aldemir-Bektas, Basak	Institute for Transportation, Iowa State University	1-1/4 time Masters
Development and Evaluation of Portable Device for Measuring Curling and warping in Concrete Pavements	Ceylan, Halil	Civil, Construction & Environmental Eng, Iowa State University	1- Research Assistant 3- undergraduates
Assessing Segment and Corridor-Based Travel Time Reliability on Urban Freeways	Dong, Jing	Civil, Construction & Environmental Eng, Iowa State University	1- Masters 1-PhD 1-undergraduate
Historical Performance Evaluation of Iowa Pavement Treatments Using Data Analytics	Jeong, David	Civil, Construction & Environmental Eng, Iowa State University	1- PhD Assistant

Project Title	PI Name	Department	Students
Previous Concrete Physical Characteristics and Effectiveness in Stormwater Pollution Reduction	Ong, Say K	Civil, Construction & Environmental Eng, Iowa State University	1-PhD 1- 1/4 time Masters
Developing Green, Highly Flowable, Rapid Set, High Performance Concrete for Pavement Patch Repair	Wang, Kejin	Civil, Construction & Environmental Eng, Iowa State University	1-Research Assistant 1-Undergraduate
Toward Autonomous and Robotic Infrastructure Construction: A Workshop and Field Studies of Productivity, Quality and Safety Impacts	White, David	Civil, Construction & Environmental Eng, Iowa State University	1-Research Assistant 4-Undergraduates
Development of a Mix Formation and Pavement Design Using Asphalt-Rubber Binders	Williams, Chris	Institute for Transportation, Iowa State University	1-Research Assistant
Data Driven Urban Traffic Prediction for Winter Performance Measurements	Zhu, Zhengyuan	Statistics, Iowa State University	1- Statistics Masters
Economic Impact of Multi-Span, Pre-Stressed Concrete Girder Bridges Designed as Simple Span vs Continuous Span	Hosteng, Travis	Institute for Transportation, Iowa State University	1- Research Assistant

Subcontractors on Funded MTC Projects

Project Title	PI Name	Department	Students
HSSU Transportation Asset Management Research Project	Fara Zakery	Business Administration, Harris Stowe State University	
Asset Utilization and Management in the Airport Ground Transportation Industry	Ray Mundy	Center for Transportation Studies, University of Missouri-St. Louis	3- PhD Students 4-Masters Students
Mass Transit Sustainability in the Saint Louis Region	Ray Mundy	Center for Transportation Studies, University of Missouri-St. Louis	3- PhD Students 4-Masters Students
Trucking & Rail Intermodal Hub in the Saint Louis Region	Ray Mundy	Center for Transportation Studies, University of Missouri-St. Louis	3- PhD Students 4-Masters Students
Safety and Operations Data: Visualization and Communication	Ravi Nath	Business Intelligence & Analytics, Creighton University	1- MS Student
Pavement Performance: New Approaches using Data Analytics	Cindy Corritore	Business Intelligence & Analytics, Creighton University	1- MS Student
Bridges for Life	Nemmers, Charles	Civil & Environmental Engineering, University of Missouri	4-Graduate
The Technology Project	Nemmers, Charles	Civil & Environmental Engineering, University of Missouri	3-Graduate
A Decision Support System for DOT Fleet Operations	Nemmers, Charles	Civil & Environmental Engineering, University of Missouri	2-Graduate
Risk and Failure Resilience Quantification of Interdependent Transportation Systems	Pingfeng Wang	Industrial & Manufacturing Engineering, Wichita State University	1- Graduate Student
Data-Driven Health Management of Electrical Vehicle Battery Systems	Pingfeng Wang	Industrial & Manufacturing Engineering, Wichita State University	1- Graduate Student

Plan for Next Reporting Period

The following activities are planned for the next reporting period:

- Monitor progress of the research program
- Formalize study abroad program for summer 2015
- Institute undergraduate research program
- Develop simulator scenarios with University of Iowa for K-12 outreach
- Field visits to all partners to coordinate future activities
- Produce additional content for Go! magazine
- Host a high school teacher who will be conducting research as part of an NSF research experience for teachers
- Beginning conference planning for the Mid-continent Research Symposium

Contact has been made with all individuals on the MTC Advisory Council, and arrangements will be made for council members to attend a meeting with MTC partner universities in the fall to discuss progress and opportunities.

We also plan to establish more educational, K-12, and outreach activities. Areas for collaboration are currently being investigated with internal and external university partners.

2. Products

Nothing to report.

3. Participants and Collaborating Organizations

The Midwest Transportation Center is composed of six universities, Iowa State University is the lead institution, and the Center is administered through ISU's Institute for Transportation. The key personnel will include the following people from each institution:

- Iowa State University (lead university; Director, Shauna Hallmark)
- Iowa State University (lead university; Associate Director, Omar Smadi)

- Iowa State University (lead university; Associate Director, Chris Williams)
- Creighton University in Omaha, Nebraska (partner leader Ravi Nath)
- Harris-Stowe State University in St. Louis, Missouri (partner leader Fatemeh Zakery)
- University of Missouri, Columbia in Columbia, Missouri (partner leader Charles Nemmers)
- University of Missouri, St. Louis in St. Louis, Missouri (partner leader Ray Mundy)
- Wichita State University in Wichita, Kansas (partner leader Pingfeng Wang)

Seward County Community College (partner leader Janese Thatcher) in Liberal, Kansas, is also a collaborator.

Iowa State University and the other partner and collaborative universities have set up a monthly teleconference meeting, the first Tuesday of every month. We have a standardized agenda which includes:

- Review of Previous Action Items
- Research Updates
- Advisory Council Updates
- Reports from Partnering Institutions
- Administrative Report
- New Business
- New Action Items

We also have a SharePoint site set-up for our MTC partners and collaborator to easily share files with the different institutions.

Iowa State University has been engaged with the Iowa Department of Transportation (Iowa DOT) to identify and collaborate on research projects. The Iowa DOT has pledged matching funds for our MTC research projects. Researchers at the partner schools have been working with their state transportation departments and other agencies to identify transportation projects and programs important to the Midwest and the various states. The team is working with the University of Iowa's Tier 1 UTC, "Safety Research Using Simulation Center Strategic Goal: Safety" to develop distracted driving scenarios for driving simulators which will be used to outreach to K-12.

Iowa State University has established a collaborative effort between the MTC Program and the Engineering Research Center for Biorenewable Chemicals (CBiRC) Department. The program is titled, "Research Experiences for Teachers" (RET) and is funded by the National Science Foundation (NSF). This Iowa State University program has been designed to inspire teachers through actively participating in scientific research. Each participating teacher is partnered with an ISU faculty mentor whom they will conduct research with over a six week period. Following the project description and statement regarding the global and/or societal context of the project given by faculty, the teacher must first reflect on the problem to be researched using his or her current knowledge base. At the completion of their 6 weeks of research, the teachers then develop an oral presentation of their research activities and share their experiences. In the summer of 2014 30 teachers will participate in the program which in turn will impact the education of thousands of students this coming fall. Objectives for this program are:

- Provide high school teachers with first-hand experience in methods and analysis of research
- Develop teaching techniques and create classroom materials based on their research experience

- Introduce teachers to the value of scientific inquiry in the context of high school STEM curricula
- Provide teachers with tools, experiences and on-going relationships with career scientists and fellow teachers to enable them to share scientific developments in STEM fields and inspire students desire to follow scientific career paths

4. Impact

Iowa State University and its partners have engaged in the educational and outreach activities summarized below. The subcontractors have engaged in outreach/educational activities as well.

Outreach Activities

Summary of Education and Outreach Activities

Date	Event	Topic	Impact
1/12/2014	TRB 2014 Annual Conference	Celebrating Our Legacy, Anticipating Our Future	107 participants
1/23/2014	2014 State Transportation Day	Future of Transportation Funding	120 participants
1/24/2014	Tom Maze Transportation Seminar	Kansas City Street Car Project	55 participants
1/31/2014	Tom Maze Transportation Seminar	The Future for Transportation	50 participants
2/7/2014	Tom Maze Transportation Seminar	Historical Perspective on Today's Railroad	60 participants
2/14/2014	Tom Maze Transportation Seminar	Marine Highways and Navigation	65 participants
2/21/2014	Missouri Society of Professional Engineers	MU Transportation Research Program	25 participants
2/28/2014	Tom Maze Transportation Seminar	Traffic Engineering and Modeling	55 participants
3/7/2014	Tom Maze Transportation Seminar	Missouri Bridge Replacement Program	50 participants
3/14/2014	Tom Maze Transportation Seminar	SHRP2 Research and Data Collection Effort	60 participants
3/13/2014	Transportation Engineering Association	Work Zone Safety	200 participants
3/28/2014	Tom Maze Transportation Seminar	Freight Movement in the Midwest and U.S.	30 participants

Tom Maze Transportation Seminars

The Tom Maze Transportation Seminars are presented at the Institute for Transportation (InTrans) weekly during Iowa State University's spring semester featuring nationally and internationally-recognized speakers. The seminar has become an important feature of graduate transportation education at ISU, and it is broadcast real-time to students at the University of Northern Iowa, the University of Missouri in St. Louis and Columbia, as well as other sites via the Iowa Communications Network. The ICN allows viewers at remote sites to actively participate in the seminar, and each presentation is compiled as part of the MTC website so it can be further utilized as a resource for transportation students.

Date: January 24, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Karen Clawson, Mid America Regional Council
Topic: Kansas City Street Car Project
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 55 participants

The Streetcar project was initiated due to population shifts in the greater Kansas City region and to address the need for more diverse transportation options. A study was first initiated to determine a locally preferred alternative for a downtown circulator service. Goals of the study were to 1)enhance linkages in downtown Kansas City, 2)support local and regional economic development, 3)strengthen downtown districts and urban centers, and 4)create an environment that will be sustainable. Part of the study consisted of a multi-tiered evaluation approach to determine the type of service that would be provided, as well as the preferred alignment and route. Multiple alternatives were evaluated, including the no-build alternative. Ultimately, a modern streetcar was chosen over an enhanced bus as the locally preferred alternative to serve as a downtown circulator. What followed was an aggressive project schedule to fund the needed infrastructure improvements, including the purchase of the streetcars themselves. This required close cooperation with the public, elected officials, and other regional transportation system operators. In the end, a new operating authority was established to operate the new streetcar service. The streetcar service has been very well received by the public, and expansion of the system is already being discussed.

Date: January 31, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Carlos Schwantes, Missouri Department of Transportation
Topic: Historical Perspective on Today's Railroad
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 50 participants

There is need to look beyond engineering, past design and construction to public involvement, funding, and innovations that are part of public infrastructure, and it was noted that there are many aspects involved in building a consensus which include addressing the need, finding solutions, transparency, and communication, among others. The Missouri DOT is facing challenges that will continue to grow into the future. The fuel tax revenue, the main source of funds for DOT projects, is dwindling which presents a very real problem. The solutions to these problems come in the form of innovations to the current system. One such solution may be in the form of project delivery. Rather than the typical design-bid-build process that we see today, design build may be a valuable method to consider to increase productivity. Management of the system may also help by coordinating arterials, freeways, and/or work zones in the event of accidents. Intelligent compaction can also lead to a great amount of time saved and costs prevented. With the booming technology world, it also makes sense to use electronic plans rather than printing off thousands of pages to contractors. The Missouri DOT is also working outside of roadways by making huge strides in freight. In the coming years transportation organizations may be under significant financial stress, but through the use of innovations, they will be able to maintain and advance the state's transportation system.

Date: February 7, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Kevin Schoenben, University of Missouri-St. Louis
Topic: Marine Highways and Navigation
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 60 participants

Changing values in America have significantly hampered the prospect of a large network of high-speed rail lines in the United States, and it was argued that these types of lines do not make much sense. Historical events such as the cutting off of funding for a supersonic Boeing airliner showed that Americans had lost their appetite for the fastest available trains, and although there have been high-speed rail experiments in the past in the U.S. none of these have been viable. It was argued the largest hurdle to high-speed trains in the United States was a network of feeder trains. All other nations with high-speed rail have a large and well-established network of secondary trains that complement higher-speed rail and the United States lacks any region that has a suitable rail network with the possible exception of the northeastern seaboard. The success of high-speed rail depends on great intermodal connections with a robust mass transit and commuter rail service; other countries have these things due to denser development and less automobile dependency. The United States may never be ready for high-speed rail. The currently proposed high-speed rail lines exist in isolation with other modes of transit and the high cost of building the lines may go to waste if there isn't adequate ridership. However, freight rail in America may be pushing the boundary of speed as companies try their hardest to get a products shipped faster than ever and even if high-speed passenger rail never takes off in America, high-speed freight rail may fill in those gaps.

Date: February 14, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Kevin Schoeben, University of Missouri-St. Louis
Topic: Marine Highways and Navigation
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 65 participants

In this session attendees were introduced to the freight transportation system in Illinois by comparing highways, railroads, and inland waterways within a national context. Also discussed were the increase of cargo mobility and freight flows based on predictions from 2010 and 2040, as well as the various locks/dams and ports throughout Illinois. A considerable length of time was spent discussing the "Waterway of the Saints" corridor and Illinois's collaboration with neighboring states (Iowa, Minnesota, Missouri, and Wisconsin). The presentation detailed the Illinois DOT's focus on an integrated multi-modal planning and programming approach and its commitment to promote sustainable practices and intermodal connections. These connections will provide for a more efficient, seamless, resilient, economical, safe, and reliable transportation system.

Date: February 28, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Derek Vap, HNTB
Topic: Traffic Engineering and Modeling
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 55 participants

HNTB representatives spoke about their use of Dynameq simulation software on the I-70 STEIS project in Kansas City, Missouri. They began by outlining the purpose and need for the project which included improving safety, reducing congestion, restoring and maintaining the existing infrastructure, improving accessibility, and improving goods movement. They then discussed what exactly Dynameq is and explained how it fits in with other simulation software. While mesoscopic simulation like Dynameq is not able to provide as detailed traffic information as microscopic simulation, it is able to provide more detail than macroscopic simulation on a larger scale than would be possible in the microscopic case. The mesoscopic simulation also has the benefit of being able to forecast future traffic information, which microscopic simulation has much more difficulty. After explaining the benefits of mesoscopic simulation and why they selected Dynameq, they spoke about how they implemented it on the I-70 project in Kansas City. They created a model in the software of subarea of approximately a fourth of Kansas City in order to see how the changes they proposed to I-70 would affect the surrounding network. The main goal of the project was to fix key bottlenecks, for which they initially developed 12 strategies to address. Those 12 strategies were narrowed to 3 alternatives which were 1) No build 2) Geometric improvements and 3) Interchange consolidations. In the end, their preferred alternative was a combination of geometric improvements and interchange consolidations.

Date: March 7, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Ken Warbritton, Missouri Department of Transportation
Topic: Missouri Bridge Replacement Program
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 50 participants

In 2006, Missouri began a project to replace 802 bridges as part of a public-private partnership. For the 554 bridges that needed to be completely rebuilt, one Design-Build contract was established with KTU Constructors, a collaborative company. The project had the goals to deliver good bridges at a great value, minimize public inconvenience, and to complete construction by December 31, 2013. The state was divided into regions that had approximately 100 bridges. The executives of the team met 3-4 times per year, while the central office and regional offices had daily calls and weekly meetings. There was daily on-site coordination for bridge workers. The arrangement of the project allowed for risk to be assigned between the parties. MoDOT took responsibility for right of way, environmental, community relations, inspections, and utilities. KTU took responsibility for design, suppliers, subcontractors, and the schedule. A standardized design was used for beam lengths and skews. MoDOT required a concrete deck for bridges over 1000 AADT. Bridges were to use MoDOT standards, but other standards could be brought for evaluation. When work began, there were approximately 10 bridges completed per week. The road was closed, no bypass was used, in order to save time. Beams were delivered to the site and stored until pier caps reached strength. Most bridge components were precast. The average completion time for a bridge was 42 days. The fastest single span bridge was completed in 8 days, a box culvert was completed in 27 hours. 156 bridges were completed in 2010, 281 in 2011, and 112 in 2012. The project finished under budget and 2 years ahead of the MoDOT requirement and 14 months ahead the KTU's

commitment. Construction schedules were shifted to accommodate election day, school years, local festivals, vacation destinations, and grain harvesting. Overall, the Design-Build contract method allowed for process and execution flexibility, adaptability to changes and innovations, and manageable risk.

Date: March 14, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Skylar Knickerbocker and Nicole Oneyear, Iowa State University
Topic: SHRP 2 Research and Data Collection Effort
Participants: Ames, Iowa; Columbia, Missouri; St. Louis, Missouri; Iowa City, Iowa; Others
Impact: 60 participants

One of the main research areas of the Second Strategic Highway Program (SHRP 2) is safety of highways and understanding drivers' behavior. The main goal of this research is to focus on certain highway sections to minimize traffic injuries and casualties by reducing crash severity. To achieve this goal, the researchers are establishing a database by taking into account both roadway characteristics and naturalistic driving. Intrans is making a huge contribution to SHRP 2 Project by helping to establish this database. The goal of the project is to link the Roadway Information Database and Naturalistic Driving Study (NDS) Database to support safety analysis.

The relationship between the driver behavior and roadway data such as roadway and environmental factors under SHRP 2 was then discussed. She also reviewed the Naturalistic Driving Study (NDS), which takes advantage of using data form drivers who drive instrumented cars with equipment to observe their behaviors while driving. Then, she mentioned how the Intrans research group established a relationship between the data stemming from NDS and the data coming from Roadway Information database (RID). She said that the group focused on curves and buffers to utilize data since these roadway factors were critical due to their high accident rates. After that, she emphasized their evaluation criteria for curves and buffets to take into consideration for analysis. Additionally, Ms. Oneyear gave some information about how the data were requested and how they made some reductions about roadway factors, vehicle factors, video, and kinematic driver factors. Her research goals for this study is to define normal curve driving based on curve geometry, ultimately detailing the relationship between driver distraction and other factors (other driver, roadway environmental characteristics).

Date: March 28, 2014
Location: Online broadcast hosted through Iowa State University in Ames, Iowa
Speaker: Mike Steenhoek, Soy Transportation Coalition
Topic: Freight Movement in the Midwest and U.S.
Participants: Students from Ames, Iowa; St. Louis, Missouri; Iowa City, Iowa; Other
Impact: 30 participants

The Soy Transportation Coalition, is an organization comprised of twelve state soybean boards, the American Soybean Association, and the United Soybean Board. The goal of Soy Transportation Coalition is positioning soybean industry stakeholders to benefit from a transportation system that delivers cost effective, reliable, and competitive service. Their objectives include seeking a cost effective transportation system for soy shippers and customers, working to ensure the U.S. transportation system has the infrastructure and capacity necessary for the long term competitiveness of the soybean industry, and so on. Based on their research, Mike Steenhoek explained why farmers care about transportation. He thought transportation cost occupied a large proportion of the overall cost of soybean and the

international competition depend on it. Then Mike Steenhoek argued how we allocate money is as important as how much money we allocate in transportation. He compared lock and dam projects with foreign example to describe alternative funding mechanism that provide. He found there are differences in opportunities for positive funding as well. He came to a conclusion that frustration is up and optimism is down. Furthermore, he argued a predictably good inland waterway system is better than a hypothetically great one. He pointed out building one new road will cost as much as maintaining 9 roads. We should think carefully about the method of building, expanding vs. preserving and maintaining. Such as Panama Canal expansion, is it an opportunity for increased efficiency, or are we shifting to the bottleneck? In order to best addressing the gap between the soy transportation condition and demand, Mike Steenhoek encouraged better evaluating the condition of bridge inventory, better evaluating the gap, and better technology for better bridge maintenance and stewardship. He also mentioned the importance of partnership, while visual inspection is variable and subjective. He proposed to examine various incentive to determine how the gap addressed, and profile a gain handler to highlight how much more economical rail projects could be.

Other Outreach Activities

Transportation Research Board 2014 Annual Conference

Date: January 12-16, 2014
Location: Washington, D.C.
Speaker: Multiple speakers
Theme: Celebrating Our Legacy, Anticipating Our Future
Participants: Transportation professionals, students, educators
Impact: 107 student participants from MTC partner universities (12,000 event attendees annually)

Transportation Engineering Association of Missouri (TEAM)

Date: March 13, 2014
Location: St. Louis, Missouri
Speaker: Henry Brown, University of Missouri-Columbia
Topic: Work Zone Safety Research
Participants: Transportation professionals
Impact: 200 participants

2014 State Transportation Day

Date: January 23, 2014
Location: Jefferson City, Missouri
Speaker: Charlie Nemmers, University of Missouri-Columbia
Topic: Future of Transportation Funding
Participants: Chamber of commerce, legislators, contractors, consultants, Missouri DOT
Impact: **120** participants

Missouri Society of Professional Engineers

Date: February 21, 2014
Location: Columbia, Missouri
Speaker: Charlie Nemmers, University of Missouri-Columbia
Topic: MU Transportation Research Program

Participants: Professional engineers and graduate students
Impact: 25 participants

Iowa State University has also developed a website for the MTC, and as research projects progress new information will be complied for access online. The goal of this website it to share research results, publications, outreach opportunities, and other resources with students, faculty, and transportation professionals.

5. Changes/Problems

Nothing to report.

6. Special Reporting Requirements

Nothing to report.