



Fiscal Year
2016
Research
Program

(July 1, 2015 – June 30, 2016)

Ohio's Research Initiative for Locals
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In cooperation with the
Ohio Department of Transportation, Office of Statewide Planning and Research
Ohio Department of Transportation, Ohio Local Technical Assistance Program and the
U.S. Department of Transportation, Ohio Division of the Federal Highway Administration



Ohio’s Research Initiative for Locals (ORIL) is a program designed to provide practice-ready solutions to real-world issues faced on Ohio’s local transportation system through research. A collaborative effort between the Ohio Department of Transportation, the Ohio Township Association, the County Engineers Association of Ohio, the Ohio Municipal League, and Ohio’s institutions of higher education, ORIL is overseen by a Board consisting of 15 voting members and 3 support members

ORIL Mission:

ORIL develops, funds, and oversees transportation research projects to meet the needs of local agencies for the safety and economic well-being of the traveling public.

ORIL Vision:

ORIL with self-sustaining funding, identifies, manages, and facilitates strategic research that solves local transportation challenges with implementable and cost-effective solutions.

ORIL Board:

Organization Represented	Members
<i>Voting Board Members</i>	
County Engineers Association of Ohio	Brett Boothe, Gallia County Bill Lozier, Licking County Steve Luebbe, Fayette County Warren Schlatter, Defiance County
Ohio Municipal League	Terry Lively, Belmont County Paul Schmelzer, City of Findlay Leo Shanayda, City of Springfield Hassan Zahran, City of Columbus
Ohio Township Association	Greg Butcher, Violet Township
Ohio Department of Transportation	Jennifer Elston, District 8 Anna Kuzmich, District 11 Jack Noble, District 4 Brian Olson, District 4
Academia/Researchers	Rui Liu, Kent State University Eric Steinberg, Ohio University
<i>Support Board Members</i>	
FHWA Ohio Division Office Ohio LTAP Center ODOT Statewide Planning & Research	Frank Burkett Mike Fitch Vicky Fout



2016 Strategic Research Focus Areas:

Safety

Ensuring the safety of those utilizing and maintaining our transportation system is a priority for all transportation agencies. The traveling public expects the system to meet their individual needs in a manner that is safe, convenient, economic, and efficient with minimal disruption to their daily routines. In addition, protection for roadway crews working on-location is a prominent concern. Identifying, developing, and implementing corrective strategies before hazardous events occur is key to advancing a safe and reliable transportation system. For local agencies the identification of cost appropriate, yet effective, safety measures can often be a challenge.

Renewal/Infrastructure

Without meeting basic maintenance needs, pavements, bridges, signs, guardrail, pavement markings and other roadway features would degrade to the point of being hazardous. The major challenge is to sustain these conditions in a time of declining resources. As our infrastructure ages, it is important to find ways to preserve existing facilities, especially pavements and bridges, while improving design and construction methods which produce reliable, long-lasting facilities.

Operations & Business Practices

Local transportation agencies face a variety of challenges based on their geography, traffic, population density, funding, equipment, staffing, local expectations, governmental structure and history. The identification and evaluation of best practices can be difficult, given the uniqueness of individual organizations. The ability to be aware of existing research and its local applicability can be a challenge for local agencies.

Program Funding:

Funding for ORIL research projects is provided through the Ohio Department of Transportation's (ODOT's) State Planning and Research Part 2 (SP&R2) program. A total of \$500,000 was initially budgeted in ODOT's SP&R2 program to support ORIL projects during fiscal year (FY) 2016. All FY2016 ORIL funding is at a ratio of 80% federal SP&R2 funds with the mandatory 20% matching funds provided by ODOT utilizing state funds. ODOT's Research Section provides oversight of all federal and state funds utilized by ORIL. In addition, ODOT's Research Section acts as the contracting agent for ORIL and provides administrative support.

In support of research projects that incorporate aspects of both the state and local transportation systems, ODOT's Research Section has collaborated with ORIL to initiate more comprehensive studies. In these instances, ODOT's Research Section has provided financial contributions to the projects through its traditional SP&R2 program at a funding ratio of 80% federal funds and 20% state funds. The program overview (page 3) denotes the difference between the ORIL (i.e.: local focused) and ODOT (i.e.: state focused) budgets/programs. A total budget is provided to highlight the overall value of ORIL, the local research program.

All projects listed in this program book are also included in ODOT's FY2016 Research, Development and Technology Transfer program book, which was approved by the Ohio Division of the Federal Highway Administration on June 30, 2015.



FY2016 Proposed Projects (Projects anticipated to being after July 1, 2015)

RFP #	Project Title	Project Duration (months)	ORIL Budget (estimated)	ODOT Budget (estimated)	Total Budget (estimated)
2016-ORIL1	Best Practices of Road User Maintenance Agreements Amongst Local Government Agencies in Ohio Agency: Ohio University PI: Roger Green	16	\$130,696.90	\$0.00	\$130,696.90
2016-ORIL2	Synthesis of Research on Load Capacity of Concrete Slabs Without Plans Agency: University of Cincinnati PI: Richard Miller	18	\$59,530.20	\$0.00	\$59,530.20
2016-ORIL3	Structural Benefits of Concrete Paving of Steel Culvert Inverts Agency: Ohio University PI: Teruhisa Masada	16	\$190,802.20	\$0.00	\$190,802.20
2016-ORIL4	Recommendations and Strategies for IRP Truck Licensing Impacts for Ohio Counties Agency: University of Kentucky PI: Andrew Martin	12	\$40,000.00	\$0.00	\$40,000.00
TOTAL ESTIMATED BUDGET FOR FY 2016:			\$421,029.30	\$0.00	421,029.30

FY2016 Active Projects (Projects began prior to June 30, 2015. All funds encumbered during FY2015.)

SJN	Project Title	FY2015 ORIL Funding	FY2015 ODOT Funding	Total Funding
134997	Evaluation and Design of a TL-3 Bridge Guardrail System Mounted to Steel Fascia Beams Agency: RoadSafe, LLC PI: Chuck Plaxico Start Date: January 5, 2015 End Date: May 5, 2017	\$291,875.67	\$0.00	\$291,875.67
134847	Waterproofing Details of Connections for Adjacent Precast Concrete Box-Beam Bridges Agency: University of Akron PI: Anil Patnaik Start Date: January 16, 2014 End Date: January 16, 2016	\$60,446.00	\$210,000.00	\$270,446.00
134991	Investigation of In-Situ Strength of Various Construction/Widening Methods Utilized on Local Roads Agency: Ohio University PI: Shad Sargand Start Date: August 11, 2014 End Date: February 11, 2016	\$147,948.11	\$0.00	\$147,948.11
134989	Analysis of Ground Tire Rubber (GTR) in Mix Design on Local Roadways in Ohio Agency: Ohio University PI: Munir Nazzal Start Date: September 2, 2014 End Date: September 2, 2016	\$176,288.66	\$0.00	\$176,288.66
134988	Assessment of IRP Truck Licensing for Ohio Counties Agency: University of Kentucky PI: Andrew Martin Start Date: November 3, 2014 End Date: September 3, 2015	\$46,772.48	\$0.00	\$46,772.48
135031	Inspection, Repair, Retrofit Procedures, and Design Recommendations for Non-Redundant Steel Structures Agency: University of Cincinnati PI: James Swanson Start Date: November 3, 2014 End Date: November 3, 2015	\$87,534.19	\$0.00	\$87,534.19
134990	Storm Water Best Management Practices for Local Roadways Agency: GS&P/OH Inc. PI: Mark McCabe Start Date: September 9, 2014 End Date: September 9, 2015	\$179,690.45	\$0.00	\$179,690.45
134933	Evaluation and Analysis of Liquid Deicers for Winter Maintenance Agency: University of Akron PI: Bill Schneider Start Date: July 16, 2014 End Date: October 1, 2016	\$0.00	\$189,546.00	\$189,546.00
TPF-5(318)	Practical Design Guidelines for Replacement of Deficient Bridges with Low-Water Stream Crossing in the Rural Mid-West Agency: Kansas DOT PI: Susan Barker Start Date: May 2015 End Date: August 2016	\$0.00	\$30,000.00	\$30,000.00
TPF-5(310)	11 th International Conference on Low Volume Roads and Peer Exchange Agency: Iowa DOT PI: Vanessa Goetz Start Date: October 8, 2014 End Date: July 31, 2016	\$8,000.00	\$0.00	\$8,000.00
TOTAL BUDGET FOR FY 2015:		\$998,555.56	\$429,546.00	\$1,428,101.56

Total Value of ORIL Program: \$1,419,584.86 \$1,849,130.86



Project Title: Best Practices of Road User Maintenance Agreements Amongst Local Government Agencies in Ohio

ORIL RFP#: 2016-ORIL1 **State Job #:** 135251

PID: 100819 **Agreement #:** 27234

FY 2016 Funding: \$130,696.90 **Funding Source:** ORIL - SP&R2

Start Date: September 21, 2015 **End Date:** January 21, 2017

Research Agency: Ohio University **Researchers:** Roger Green

ORIL TAC: Joe Bachman, Tuscarawas County
Terry Bell, Jefferson County Township Association
Greg Butcher, Violet Township
Matt DeTemple, Ohio Township Association
Anna Kuzmich, ODOT District 11
Terry Lively, Belmont County
Bill Lozier, Licking County
Stephen McCall, Champaign County
Travis McGarvey, Paulding County
Roger Wright, Washington County

Project Summary:

Road User Maintenance Agreements (RUMAs) are legal agreements between local governments and for-profit organizations outlining the responsibility for road construction and repairs resulting from excessive damage to local infrastructure caused by those organizations activities. These RUMAs can also stipulate travel routes for heavy equipment haulers in order to ensure safety and help minimize damage to roadways as well as specify testing methods and rating criteria organizations are required to follow. The recent boom in the oil and gas industry in eastern Ohio has brought the use of RUMAs to the forefront. In 2012, Ohio passed Senate Bill 315 which requires well operators to enter into RUMAs or demonstrate a good-faith effort to do so. ODOT in collaboration with the Ohio Department of Natural Resources, the County Engineer’s Association of Ohio, and various local transportation officials created a RUMA template to assist local governments in developing RUMAs, but is not a mandated/standard document. Many counties and townships have taken this template and modified it to meet their specific purposes. As a result, a plethora of RUMA versions are in existence within Ohio. As industries such as oil and gas, wind power, coal, and timber expand or relocate production in Ohio, the utilization of RUMAs varies. The variations in requirements, language, and execution of Ohio RUMAs can lead to confusion not only among local governments, but also with the organizations/industries attempting to enter into these agreements. The issue is further complicated as some local governments may be using RUMAs in situations where they are not necessarily appropriate. A fair amount of research has been conducted nationally on the subject of RUMAs; however, it is not necessarily easily manageable or accessible to local transportation officials. A focused synthesis study to identify the current best practices for RUMAs is needed.

The goal of this research is to conduct a synthesis of current practices related to the development and execution of RUMAs. The objective of this research is to identify current best practices and provide recommendations for RUMA development to assist Ohio’s local transportation officials. The results of this research will highlight the practices that have produced the best return on investment in a clear and concise manner. This will provide inexperienced agencies with a better understanding on how to approach these agreements while more experienced agencies will have exposure to different philosophies and applications. Not only will local governments benefit from this research, but the industries/organizations that typically enter into these agreements may also benefit. This research can provide them with a better understanding of what local governments are trying to accomplish with RUMAs. A thorough review of the findings may also help industries to anticipate what may be required by the RUMAs used in specific counties, thereby helping them to estimate potential costs and efforts for their expanded development into a particular region.



Project Title: Structural Benefits of Concrete Paving of Steel Culvert Inverts
ORIL RFP#: 2016-ORIL3 **State Job #:** 135248
PID: 100810 **Agreement #:** 27231
FY 2016 Funding: \$190,802.20 **Funding Source:** ORIL - SP&R2
Start Date: TBD **End Date:** TBD
Research Agency: Ohio University **Researchers:** Teruhisa Masada

ORIL TAC: Doug Gruver, ODOT District 8
Ed Herrick, Franklin County
Frederick Pausch, County Engineer's Association of Ohio
Mike McColeman, ODOT Office of Hydraulic Engineering
Warren Schlatter, Defiance County

Project Summary:

Over time, a steel culvert invert will experience invert material loss due to corrosion and abrasive flow. The material loss progresses from minor perforations to ultimate invert loss if corrective action to protect the culvert invert is not taken. Invert material loss can lead to erosion of the supporting backfill which is an integral component for the structural integrity of a steel culvert. A common corrective maintenance action is to place 4-6 inches of concrete onto the invert of the steel culvert for the bottom 1/3 of the rise of the culvert. Light reinforcing mesh is attached to the culvert and concrete is poured and shaped to the bottom of the barrel in most applications. If total invert loss or significant backfill erosion has occurred and the exiting shape is unaffected, additional measures may be required such as: additional reinforcing steel and replacement of the backfill with cementitious materials.

This corrective maintenance action is cost effective and widely used because it seals the culvert invert, prevents backfill loss, and provides a protective layer between the abrasive flow and the steel material. However, the impact of this corrective maintenance action on the structural integrity of the culvert is unknown. Additionally, it is unknown if additional reinforcement is required when there is total invert loss and the existing shape is unaffected. While it is clear that the pipe has been weakened by the loss of the steel section, it is unclear if the stiffness of the added concrete compensates and restores the culvert to its original strength. Furthermore, once the floor is sealed with concrete, inspectors are unable to visually confirm additional damage to the remaining steel. This could adversely impact load capacity ratings causing some culverts to receive a higher load rating than is actually warranted. Research is needed to verify the viability of this practice and provide engineers with scientifically-based guidance on its proper application.

The goal of this research is to enhance the understanding of the mechanics of steel culverts and the impact that this common corrective maintenance action has on the structural integrity of the steel culvert. The objectives of this research are to: (1) determine and quantify the influence the repair has on the structural integrity of the culvert system, (2) determine if additional reinforcing steel is required when there is total invert loss, and (3) develop a scientifically-based, cost effective, repeatable methodology engineers can use to evaluate repairs to steel culvert inverts with deteriorated inverts. The results of this research may influence ODOT's current standard specifications for metal culverts (item 611.11). The findings will enable engineers to make more informed decisions on which culverts are ripe for the invert rehabilitation and the most appropriate application of this practice.



Project Title: Recommendations and Strategies IRP Truck Licensing Impacts for Ohio Counties

ORIL RFP#: 2016-ORIL4 **State Job #:** TBD

PID: TBD **Agreement #:** TBD

FY 2016 Funding: \$40,000.00 **Funding Source:** ORIL - SP&R2

Start Date: TBD **End Date:** TBD

Research Agency: University of Kentucky **Researchers** Andrew Martin
Jennifer Walton

ORIL TAC: Quan Boyd, Ohio Department of Public Safety – Bureau of Motor Vehicles
Stephanie Cook, Ohio Department of Public Safety – Tax Distribution Section
Paula Gilleland, Xerox – Ohio's IRP Consultant
Duke Hobson, Ohio Department of Public Safety – Bureau of Motor Vehicles
Jeff Honefanger, ODOT's Office of Permits
Leora Knight, Ohio Department of Public Safety – Tax Distribution Section
Anna Kuzmich, ODOT District 11
Jeff Linkous, Clinton County
Terry Lively, City of Marion
Sarah Lown, Western Reserve Port Authority
Randy Partika, Mahoning County
Tom Stiver, Xerox – Ohio's IRP Consultant

Project Summary:

The goal of this research is to expanded upon a previously conducted study (SJN: 134988) aimed at assessing the economic impact of non-Ohio registered commercial vehicle fleets based within Ohio jurisdictions. The objective of this project is to provide recommendations for short- and long-term solutions to address the registering and/or fee allocation process for IRP registration within Ohio. As a result, this will enhance the state's ability to ensure the appropriate retrieval and allocation of IRP registration revenue for maintaining Ohio's roadways. It will also equip local officials with the tools needed to conduct their own investigations as the economic and business situation of their locality changes over time.



Project Title: Evaluation and Design of a TL-3 Bridge Guardrail System Mounted to Steel Fascia Beams

ORIL RFP#: 2015-ORIL1 **State Job #:** 134997

PID: 98644 **Agreement #:** 26602

FY 2015 Funding: \$291,875.67 **Funding Source:** ORIL - SP&R2

Start Date: January 5, 2015 **End Date:** May 5, 2017

Research Agency: RoadSafe, LLC **Researchers:** Chuck Plaxico
Malcolm Ray

ORIL TAC: Brett Boothe, Gallia County
Scott Coleman, Logan County
Dennis Gonano, US Bridge
Sean Meddles, ODOT Structural Engineering
Eric Steinberg, Ohio University

Project Summary:

For structures with concrete bridge decks, the railing system is typically connected to the deck. However, for bridges on Ohio's local road system, non-concrete bridge decks (e.g. timber, asphalt filled steel stay-in-place forms, fiber reinforced composite, etc.) are very common and require the railing connection to be located on the fascia beam. Although this fascia mounted system is performing well on the local system, a crash tested version is not available and it is ineligible for use on federal aid projects. Research is needed to evaluate and, if necessary, improve the design of a bridge guardrailing system with steel bridge posts mounted to steel fascia beams.

The goal of this two-phased research project is to analyze and design a steel fascia beam mounted railing system for use on Ohio's local transportation system. The objective is to obtain MASH TL-3 approval of the designed system to allow for its use on federal aid and credit bridge projects. Since the connection would occur at the beam as opposed to the deck, the application of the system would be suitable with a myriad of bridge deck types. The ability to utilize materials other than concrete for bridge decks results in substantial cost savings for locals. Furthermore, the use of an approved railing system will enhance the overall safety of the traveling public and confidence in Ohio's local transportation system.



Project Title: Investigation of In-Situ Strength of Various Construction/Widening Methods Utilized on Local Roads

ORIL RFP#: 2015-ORIL3 **State Job #:** 134991

PID: 98611 **Agreement #:** 26597

FY 2015 Funding: \$147,948.11 **Funding Source:** ORIL - SP&R2

Start Date: August 11, 2014 **End Date:** February 11, 2016

Research Agency: Ohio University **Researchers:** Shad Sargand
Roger Green

ORIL TAC: Adam Au, ODOT Pavement Engineering
Mitch Blackford, ODOT District 6
Anna Kuzmich, ODOT District 11
James Wiechart, Mercer County
Warren Schlatter, Defiance County

Project Summary:

A common practice among local public agencies in Ohio is to reuse materials (e.g.: asphalt, concrete, Portland cement concrete, etc.) from projects to widening existing roads or backfill at other locations. A variety of other methods may also be utilized in conjunction with the repurposed materials (e.g.: fly ash, lime, fabric, etc.). The utilization of these techniques may be driven, in part, by budgetary constraints or material availability. While it is easy for local transportation officials to compare these methods based on costs, there is a lack of information available to compare the overall effectiveness of these methods in terms of projected strength or relative load capacity. In order to provide local governments with the tools necessary to assist in system preservation decisions, research into the performance of these methods is needed.

The goal of this research is to establish a range of structural coefficients (or moduli) for various materials utilized to widen/construct roads on Ohio's local system. The objective is to provide locals with a repeatable, non-destructive methodology to characterize the strength/load capacity of materials used in road widening/construction when established values are unavailable. The results of this research will provide local officials with enhanced knowledge and understanding of the potential structural integrity of materials being considered for use in roadway maintenance, improvement and construction projects. This will lead to more efficient design and greater confidence in the load carrying capacity of rural roads. It will provide a scientific basis for material selection to complement the readily available cost data, which will aid locals in managing budgets and ensuring the fiscal integrity of local pavement preservation programs.



Project Title: Inspection, Repair, Retrofit Procedures, and Design Recommendations for Non-Redundant Steel Structures

ORIL RFP#: 2015-ORIL6 **State Job #:** 135031

PID: 98639 **Agreement #:** 26601

FY 2015 Funding: \$87,534.19 **Funding Source:** ORIL - SP&R2

Start Date: November 3, 2014 **End Date:** November 3, 2015

Research Agency: University of Cincinnati **Researchers:** James Swanson

ORIL TAC: Brett Boothe, Gallia County
Mike Brokaw, ODOT Structural Engineering
Scott Coleman, Logan County
Dennis Gonano, US Bridge
Bill Lozier, Licking County
Matt Shamis, FHWA Ohio Division
Eric Steinberg, Ohio University

Project Summary:

There are approximately 1500 structures in Ohio with the designation of fracture critical. Of these, approximately 900 pony trusses reside on the county system. As a result, counties are responsible for conducting specialized arms-length inspections on the fracture critical members (FCM) of these structures every twenty four months, in addition to the annual routine inspection. The FCM inspections are both costly and difficult to perform often due to the location of the members. While the tension zones in the steel pony members are categorized as fracture critical per FHWA's Bridge Inspection Reference Manual (BIRM), a detailed analysis may prove otherwise. Research is needed to develop a modeling standard to analyze these structures and establish protocols, consistent with provisions outlined by FHWA, in order to refine fracture-critical designations.

The goal of this research is to provide analytical evidence and protocols that allow for the reduction of the number of fracture critical members to inspect on pony trusses utilized on Ohio's local roadway system. In addition to the analytical goal, there is an objective to develop a repair/retrofit procedure to eliminate non-redundancy or fracture critical elements of pony trusses, thereby transitioning from a non-redundant to quasi-redundant designation. The results of this research will provide local engineers with enhanced knowledge and understanding of the function of this structure type. It will also aid to educate bridge inspectors as to the actual in-field performance of pony trusses. Positive findings from this research will position locals for potential savings in terms of cost and time through the elimination of excessive and onerous inspections. This would further increase the desirability of the pony truss as a viable option to own and maintain; thereby, expanding its consideration for use by local transportation officials.



Project Title: Practical Design Guidelines for Replacement of Deficient Bridges with Low-Water Stream Crossing in the Rural Mid-West

ORIL RFP#: Pooled Fund SOL:1373 **State Job #:** TPF-5(318)

PID: 101663 **Agreement #:** N/A

FY 2015 Funding: \$30,000.00 **Funding Source:** ODOT - SP&R2

Start Date: May 2015 **End Date:** August 2016

Research Agency: Kansas DOT **Researchers** Susan Barker

ORIL TAC: Terry Lively, Belmont County
Bill Lozier, Licking County

Project Summary:

This is a pooled fund study being led by the Kansas Department of Transportation. The research is expected to be conducted by Dr. Bruce McEnroe of the University of Kansas and will last a total of 18 months. This research is contingent upon meeting the funding commitment level established by the Kansas DOT.

Many county-owned rural areas bridges are deficient and in need of replacement. Counties cannot afford to replace all deficient bridges and must prioritize their expenditures. In many locations the type and volume of traffic is too low to justify the expense of bridge replacement. This situation is worsening as the rural population declines. Some counties are closing low-volume roads rather than replacing deficient bridges. In some locations a low-water stream crossing might be a practical low-cost alternative to road closure.

County engineers and engineering consultants need guidelines to assess the practicality of replacing a deficient bridge with a low-water crossing and to select the best type of crossing. They also need straightforward design procedures and general design details for common types of crossings. Some general guidance on low-water crossings can be found in reports by the U.S. Forest Service (2006) and Iowa State University (2003). However, these reports do not provide some of the specific information needed for site assessment and crossing design.

This pooled fund study will produce a report that provides practical engineering guidance for the replacement of deficient bridges with low-water stream crossings in the rural Midwest. The report will address the following issues:

- 1) Site assessment and economics.
- 2) Selection of crossing type. The two basic types of low-cost low-water crossings are the unvented ford and the vented ford.
- 3) Design of roadway profile and culvert pipes.
- 4) Selection of crossing materials. Low-water crossings can be built of concrete, crushed stone, natural stone, stone reinforced with geogrid or geotextile, stone-filled gabions and other materials. We will provide guidelines for materials selection.
- 5) General design details. We will provide general design details for unvented fords and vented fords constructed of different materials. We will also provide guidance on signage of low-water crossings.



Project Title: 11th International Conference on Low Volume Roads and Peer Exchange

ORIL RFP#: Pooled Fund SOL:1378 **State Job #:** TPF-5(310)

PID: 101657 **Agreement #:** N/A

FY 2015 Funding: \$8,000.00 **Funding Source:** ORIL - SP&R2

Start Date: October 8, 2014 **End Date:** July 31, 2016

Research Agency: Iowa DOT **Researchers** Vanessa Goetz

ORIL TAC: Greg Butcher, Violet Township
Terry Lively, Belmont County

Project Summary:

This is a pooled fund study being led by the Iowa Department of Transportation. Those participating on behalf of ORIL will be expected to provide a presentation/report on the information obtained to their respective organization(s) to encourage technology transfer.

The Transportation Research Board (TRB) is hosting the 11th International Conference on Low-Volume Roads, in Pittsburgh, Pennsylvania, USA on July 12 to 15, 2015. The conference, held every four years, will feature the latest information about low-volume road management, design, construction, safety, maintenance, and many other related topics.

At this conference, those who administer, plan, design, build, or maintain low-volume roads will learn innovative ways of managing low-volume road systems. The conference is organized for practitioners worldwide in local, state, and federal agencies; universities; private firms; and international organizations. Previous conferences typically have attracted 250 to 300 transportation professional from around the world.

The focus of this pooled fund project will be to encourage states and other agency participation in the Low Volume Roads Conference. The primary activities of this pooled fund project are technology exchange, information sharing, and the facilitation of partnering relationships among state agencies, FHWA and other appropriate associations. Specifically this pooled fund will:

- 1) Provide communication and information sharing among member states. Discuss research, development and technology transfer needs in the areas of design, construction, maintenance, and safety on low volume roads and provide research ideas to TRB in connection with the 2015 11th LVR Conference.
- 2) 11th International Low Volume Roads Conference: Provide a technology and knowledge exchange forum to enhance the practical knowledge of conference participants concerning low volume road management with a focus on encouraging State DOT participation in the conference.
- 3) State DOT Meeting on Low Volume Road Issues: Provide a technology and knowledge exchange forum focused on State DOT Low Volume Road Issues during a workshop at the conference. Topics may include agency collaboration, funding, asset management, shared ROW/utilities, safety programs, emergency response, training and certifications, maintenance of traffic, federal oversight, standards and specifications, contracting methods, environmental issues, energy development, maintenance, material sources and quality, and bonding.

Deliverables will include quarterly administrative progress report updates (FHWA standard pooled fund format) and two final reports: a final summary report of the conference and a final report of the State DOT session at the conference. A follow-up webinar may be provided as funds allow.