Design and Rehabilitation of Local Roadways for Ohio’s Counties

A Report from the Workshop held April 28, 2015 at the Cherry Valley Lodge in Newark Ohio

Prepared by Shad Sargand, Gayle Mitchell, and Roger Green

December 2015

Final Report

Ohio Research Institute for Transportation and the Environment
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Contents

Introduction ............................................................................................................................................. 1
Workshop Agenda ................................................................................................................................. 1
Summary of Sessions ............................................................................................................................. 2
Survey Results ......................................................................................................................................... 6
Matrix ................................................................................................................................................... 14
Next Steps ............................................................................................................................................. 14

Appendix A: Agenda with biographical sketches of presenters .......................................................... 15
Appendix B: Questionnaire given to workshop attendees ................................................................. 19
Appendix C: Strategic Research Plan Matrix ....................................................................................... 22
Figures
Figure 1. Pavement mileage of counties and cities responding to workshop survey. ............... 7
Figure 2. Overall percentage of pavement surface types in responding counties.................. 7
Figure 3. Combined responses to Questions 3 and 4 of survey, indicating budget percentages allocated to pavement maintenance, culverts, ditch cleaning, and other drainage work. .......... 8
Figure 4. Details on pavement maintenance expenses from survey respondents. .................. 9
Figure 5. Top three pavement maintenance and construction issues as reported by survey respondents. ................................................................................................................. 10
Figure 6. Top three culvert maintenance and construction issues as reported by survey respondents. ................................................................................................................. 10
Figure 7. Type of pavement management system used by counties responding to survey. Respondents were asked if their system was formal or informal and to describe their system.... 11
Figure 8. Procedures used by respondents to determine causes of distress in pavements......... 11
Figure 9. Responses to survey Question 7 regarding responses to common problems in counties. ................................................................................................................. 12
Figure 10. Survey responses on possible need for a laboratory facility dedicated to local infrastructure needs........................................................................................................ 12
Figure 11. How survey respondents learn about and decide to implement new technologies. ... 13
Figure 12. How survey respondents evaluate new materials and road system solutions. ........ 13
Acknowledgements

The authors wish to thank the Ohio County Engineers Association, and its President, Doug Davis, for their sponsorship of this workshop. Thanks are also extended to Dennis Irwin, Dean of the Russ College of Engineering and Technology at Ohio University, for arranging the college’s support of the workshop. Thanks also to all the speakers who contributed to a successful program.
Introduction

The Workshop on Design and Rehabilitation of Local Roadways for Ohio’s Counties, sponsored by the County Engineers Association and Ohio University’s Ohio Research Institute for Transportation and the Environment (ORITE), was held at Cherry Valley Lodge, Newark, Ohio on April 28, 2015. The workshop was attended by a hundred people, including city and county engineers and personnel, ODOT engineers, industry experts, construction experts, and academicians, who heard presentations and discussed pavement and drainage issues of concern to local agencies. The objective of the workshop was to develop a matrix of issues county engineers need to solve and to identify common infrastructure problems counties share.

Funding for roadway infrastructure is declining, while economic development increases roadway use and demand. This impact, along with the changing mission of facilities and aging infrastructure, requires new technology, new materials and construction techniques, and additional training to sustain the county infrastructure system. ORITE’s successful workshop for ODOT in 2001, “Improving the Structural Performance of Highway Pavements,” resulted in a roadmap and decision matrix that ODOT followed for conducting pavement investigations. This CEAO/ORITE workshop is modeled on the earlier workshop, applying similar objectives to create a useful result for local agencies faced with solving common problems.

The workshop focused on the importance of county roadways in Ohio, along with state low-volume roads. Topics addressed included major rehabilitation strategies for county and township roads, either full-depth or partial-depth. The materials used in low-volume roadways were discussed, such as hot mix asphalt, polymer modified asphalt, chip and seal, stone aggregate, base materials, and subgrade soils and stabilization treatments. Construction issues and solutions were discussed, including perpetual pavements and drainage such as culverts and pipes. There was a presentation about ODOT’s program Ohio’s Research Initiative for Locals (ORIL). Finally there were presentations on the evaluation of pavement to identify problems, and the types of facilities and equipment available or needed to address these problems.

Workshop Agenda

The workshop included twelve presentations by thirteen speakers:

8:30-8:45 AM  Introduction and Welcome – Doug Davis, President, CEAO
8:45-9:00 AM  How a University Can Assist in Local Infrastructure Issues – Dennis Irwin, Dean, Russ College of Engineering and Technology, Ohio University
9:00-9:30 AM  Construction Issues and Solutions – Steve Williams, Deputy Director, ODOT District 10
9:30-10:15 AM Major Rehabilitation Strategies for County and Township Roads – Chris Bauserman, Delaware County Engineer
10:15-10:30 AM Break
10:30-11:00 AM Innovative Pavement Rehabilitation Techniques Using Asphalt Recycling Technology – Jason Wielinski, Research Engineer, Asphalt Materials Inc.
11:00-11:30 AM Specifying Asphalt Pavement the ODOT Way – David Miller, Assistant Administrator, ODOT Office of Pavement Engineering
11:30-12:00 PM  Culvert Condition Assessment and Rehabilitation – Jeff Syar, Administrator, ODOT Office of Hydraulic Engineering
12:00-1:00 PM  Lunch
1:00-1:30 PM  ODOT: Ohio’s Research Initiative for Locals (ORIL) – Vicky Fout, Implementation Manager, ODOT Office of Statewide Planning and Research
1:30-2:15 PM  Design of Asphalt Structural Overlays – Cliff Ursich, President and Executive Director, Flexible Pavements of Ohio
2:15-3:00 PM  Whitetopping on Rural Highways – Mark Pardi, Central/SE Director of Promotion, and Jim Barnhart, Senior Engineer, Ohio Concrete
3:00-3:15 PM  Break
3:15-3:30 PM  Viewpoint of ODOT on Local Roadways in Ohio – Dave Slatzer, Deputy Director of Engineering, ODOT
3:30-4:15 PM  Evaluation of Pavements – Shad Sargand, Russ Professor, Civil Engineering Department, Ohio University
4:15-5:00 PM  Survey and Workshop Deliverables

PDF files of the PowerPoint presentations for the talks above, excepting those by Doug Davis, Dennis Irwin, Vicky Fout, and Dave Slatzer, who did not use presentations, have been made available online at: https://www.ohio.edu/engineering/orite/ceao.cfm. A version of the Agenda with biographical sketches of the speakers embedded is in Appendix A.

Summary of Sessions

Introduction and Welcome – Doug Davis, President, CEAO. President Davis greeted the crowd and set the tone for the workshop.

How a University Can Assist in Local Infrastructure Issues – Dennis Irwin, Dean, Russ College of Engineering and Technology, Ohio University. Dean Irwin discussed the following points in his remarks:

- Ohio University’s Russ College of Engineering and Technology has a focus area in transportation.
- For the last three decades, our research has had a major impact on ODOT designs and specifications, especially in hydraulics and pavements.
- The Russ College has invested significant funding to acquire and enhance equipment and facilities in the transportation area.
- The facilities ORITE has for transportation research are among the finest in this part of the United States.
- ORITE facilities include nondestructive testing equipment, the Ohio University Mobile Civil Infrastructure Laboratory, the Accelerated Pavement Load Facility, cone penetrometer truck, dynamic cone penetrometer, and much more.
- ORITE’s efforts in the past have been focused on research at the state level.
- Now there is a new generation of county engineers with the ambition to improve infrastructure and employ new technology, and ORITE wants to participate in this trend by conducting research to benefit local officials.
- I hope this workshop will be the launching point for a partnership between the county engineers of the state and the Russ College going forward.
At the end of the day there will be action items designed to advance this partnership and allow county engineers to fully take advantage of the best technology available.

Construction Issues and Solutions – Steve Williams, Deputy Director, ODOT District 10. Issues and topics included transportation funding, the small construction process (plan development, contract, sale and award, and bundling), issues with that process, and final inspections. The presentation included many examples of “things that shouldn’t happen” in completed projects, and some discussion of what ODOT has learned from County Engineers.

Major Rehabilitation Strategies for County and Township Roads – Chris Bauserman, Delaware County Engineer. This presentation was retitled “Full Depth Pavement Reclamation”. The process of full-depth reclamation of asphalt roads was presented, wherein the pavement and base, along with any overlays, is pulverized and turned into a stabilized base on which a new surface course is applied. Slope adjustments and widening can be included as part of the operation. On major advantage is reflective cracking is reduced or eliminated. The presentation included discussion of a test project. While full depth reclamation (FDR) costs about twice as much initially as an overlay and is a more intensive process, maintenance costs are reduced by about two-thirds, yielding significant lifetime savings with improved performance.

Innovative Pavement Rehabilitation Techniques Using Asphalt Recycling Technology – Jason Wielinski, Research Engineer, Asphalt Materials Inc. This presentation included a discussion of in-place recycling methods, including full depth reclamation (FDR) and cold in-place recycling (CIR), also known as partial depth recycling. Each process was described. Because CIR is comparable to a “mill and fill” job with its limited depth, it is a reasonable choice for roads that don’t have deep distress and cracking, while FDR is more equivalent to a full reconstruction and requires an additional surface course.

Specifying Asphalt Pavement the ODOT Way – David Miller, Assistant Administrator, ODOT Office of Pavement Engineering. A detailed presentation of ODOT’s asphalt pavement items: 301, 302, 441, and 442, was given. Item 441 is a Marshall mix design for roads with 50-1500 trucks per day, while Item 442 is a Superpave design for roads with more than 1500 trucks per day. Details of binders, mixes, and 446 and 448 acceptance procedures were given. Also discussed were low-traffic mixes, ODOT SS 823 for less than 50 trucks per day, driveways, bike paths; and FPO 404 LVT for less than 2500 ADT. Other contract items in the ODOT Construction and Material Specifications were touched on.

Culvert Condition Assessment and Rehabilitation – Jeff Syar, Administrator, ODOT Office of Hydraulic Engineering. This presentation answered the questions “How many culverts do you have?”, “What types of problems do you have [with culverts]?”, “How are you going to fix the problems you have?”, and “How much finding do you need to address the culvert problems?”. The answer is a culvert inventory, inspection, and management program. Culvert inspection examples were presented. Culvert rehabilitation methods were presented in order of increasing linear foot cost: field paving, resin-based nonstructural liner, liner pipe, spray applied structural liner, and spiral wound liner. Additional rehabilitation methods included internal joint band, boring or jacking of conduit, cured in-place liner, tunnel liner plate, and microtunneling. Pipe bursting will be added to the ODOT specifications as a new method.
**ODOT: Ohio’s Research Initiative for Locals (ORIL)** – Vicky Fout, Project Manager, ODOT’s Office of Statewide Planning and Research. This presentation provided an overview of the ORIL program. ORIL is one of three state-sponsored, local-focused transportation research programs in the county. It is a collaborative effort between ODOT, County Engineer’s Association of Ohio, Ohio Township Association, Ohio Municipal League, FHWA, and Ohio-based universities. ORIL develops, funds, and oversees transportation research projects to meet the needs of local public agencies for the safety and economic well-being of the traveling public and Ohio. Information was provided on current research projects, with emphasis on the studies focused on pavements/materials: Investigation of In-Situ Strength of Various Construction/Widening Methods Utilized on Local Roads, Analysis of Ground Tire Rubber in Mix Design on Local Roadways in Ohio, and the TRB 11th International Conference on Low Volume Roads and Peer Exchange. Additional information on the ORIL program and projects are available online at: [http://oril.transportation.ohio.gov](http://oril.transportation.ohio.gov).

**Design of Asphalt Structural Overlays** – Cliff Ursich, President and Executive Director, Flexible Pavements of Ohio. Asphalt concrete overlays can be used to remedy functional issues, such as surface friction or hydroplaning, or for structural purposes, i.e. to improve load bearing properties of the pavement. The thickness design of an overlay begins by understanding the structural capacity of the existing pavement and the structural capacity required to carry the traffic on the pavement over its lifetime. The difference determines the structural number of the overlay design, which is equal to the layer coefficient based on the mix times the thickness. The first steps in the design require knowing the existing pavement design and structure along with current state of distress (mean depth of rutting, extent of cracking, etc.) and the pavement requirements to handle future traffic. Input data may come from distress survey, materials testing, nondestructive testing, or estimate of fatigue damage (remaining life). Some detailed examples are worked out following the procedure in Asphalt Institute publication IS-139, *A Simplified Method for The Design of Asphalt Overlays For Light to Medium Traffic Pavements*. Also recommended is the AASHTO Guide for the Design of Pavement Structures, Part 3, Chapter 5 “Rehabilitation Methods With Overlays”.

**Whitetopping on Rural Highways (or Design and Rehabilitation of Local Roadways for Ohio’s Counties)** – Mark Pardi, Central/SE Director of Promotion, and Jim Barnhart, Senior Engineer, Ohio Concrete. Concrete overlays can be either bonded to the existing pavement, which must be in fair to good structural shape, or unbonded, where the old pavement serves as a subbase. Overlays can be applied without removing existing pavement and can be cost-effective with a lifetime of 15 to 30 years or more depending on thickness. Most of the presentation is devoted to discussing recent overlay projects. The presenters recommend the Guide to Concrete Overlays from the National Concrete Pavement Technology Center. Bonded overlays can be applied to fair to good HMA pavements with limited fatigue cracking, no stripping or raveling, and with a thickness of at least 3 in (7.6 cm) after milling. Bonded concrete overlays feature shorter slabs that act as paver blocks and use of fiber reinforcement in the concrete mix to increase toughness. The University of Pittsburgh BCOA-ME design web app is introduced, and some example installations around Ohio are discussed.
Viewpoint of ODOT on Local Roadways in Ohio – Dave Slatzer, P.E., Deputy Director of Engineering, ODOT. The full text of Deputy Director Slatzer’s prepared remarks follows:

I want to thank you all for attending today’s workshop, as it shows your commitment to improving Ohio’s infrastructure. It is through workshops such as this that Ohio will benefit from an improved infrastructure system of which we should be proud. And we can be proud of what we have accomplished to date with our interstates and other major routes. Local and county roads are an essential part of Ohio’s road system, and ODOT works with county engineers as much as possible. For the last few years ODOT has even directed research resources to counties via the Ohio Research Initiative for Locals (ORIL), which you heard about today.

When I was director previously, ODOT established in 1996 the Strategic Highway Research Program (SHRP) test road on US Route 23 in Delaware County. We had a team of people, including Ron Zook, Nancy Hall, Mike Flynn, and Bill Edwards, who worked to identify a site and a plan that would meet the needs of the SHRP Long Term Pavement Performance (LTPP) program for five Specific Pavement Study (SPS) areas while meeting ODOT research needs. The research team was a joint collaboration of six universities across the state, led by Ohio University. Many new ideas for designing and building pavements were tested on that road and a lot of valuable lessons learned.

In 2001, a workshop was held in Granville to consolidate the lessons coming from the test road and provide a direction for future state highway infrastructure research. The outcome of that workshop was a matrix that helped prioritize and guide long-term strategic planning for ODOT pavement research, and served as a model for planning strategic research across the Department. The workshop focused on issues of safety, operations, business practices, and infrastructure preservation. As a testimony supporting this approach, major accomplishments, such as identifying the optimal timing for preventive maintenance, correct use of the fractured slab techniques, rational selection of base type for asphalt and concrete pavement, incorporating the benefits of stabilized subgrade into the thickness design process, and developing a design procedure for perpetual asphalt pavement has been achieved. As a result, Ohio’s pavement program is more cost effective and our highways are now clearly the best in our region, a fact of which I and the entire Department can be proud. In addition, we saved money in the process, which enabled additional projects to be built.

The goal for this workshop is to initiate a similar effort to improve local roads, and enable local, city, and county engineers to take advantage of new techniques and materials which will improve the performance and quality of our low-volume roads and thus make life that much better for the taxpayers who drive on them.

Evaluation of Pavements – Shad Sargand, Russ Professor, Civil Engineering Department, Ohio University. The presentation begins with a discussion of factors that can affect pavement performance, including structural behavior due to material properties; traffic load factors such as weight, volume, and speed; and environmental factors, such as temperature and subgrade...
moisture. Pavement evaluation is discussed with reference to the Long-Term Pavement Performance Distress Identification Guide and to ODOT’s Pavement Condition Rating System. Several evaluation techniques are presented, including rut measurements with dipstick, profilometer, or LRMS; coring; ground penetrating radar (GPR); ride quality measured by International Roughness Index (IRI), recorded using inertial profilers; skid resistance, falling weight deflectometer (FWD) and light weight deflectometer (LWD); Portable Seismic Properties Analyzer (PSPA); Dynamic Cone Penetrometer (DCP). Many of these capabilities are provided in ORITE’s Mobile Civil Infrastructure Laboratory (MCIL).

Survey and Workshop Deliverables. At the last session of the workshop, participants were given a survey questionnaire that asked for data about the nature and maintenance of roads in the respondent’s jurisdiction and for informed opinions on issues related to low-volume roads. The responses are discussed in the next section of this report.

Survey Results

During the workshop, participants completed the questionnaire shown in Appendix B. Responses were received from representatives of 18 counties (Adams, Champaign, Columbiana, Fairfield, Fulton, Gallia, Harrison, Licking, Marion, Mercer, Montgomery, Morgan, Morrow, Muskingum, Ross, Sandusky, Summit, and Washington) and 1 city (Mount Vernon), for a total of 19 respondents. The results of the questionnaire are presented below.

An initial question was used to identify the types of pavements the counties must maintain. Responses are shown in Figure 1. The numbers from Figure 1 were averaged to find the overall percentage of various pavement types used in responding counties. As shown in Figure 2, 88% of the county roads, in the counties surveyed, are either asphalt or chip seal.
Figure 1. Pavement mileage of counties and cities responding to workshop survey.

Figure 2. Overall percentage of pavement surface types in responding counties.
The survey results are discussed here in a more logical topical order than that presented originally in Appendix B. Questions 3 and 4 of the survey focused on the expenditures of funds for pavement and culverts. As shown in Figure 3, a majority of funding, over 70% of the combined pavement and drainage budget, was allocated to the maintenance of pavements.

![Expenditures (pavements and culverts)](image)

**Figure 3.** Combined responses to Questions 3 and 4 of survey, indicating budget percentages allocated to pavement maintenance, culverts, ditch cleaning, and other drainage work.

When the pavement expenditures are analyzed in more detail (also part of Question 3), results shown in Figure 4, it was observed the asphalt overlays and chip seals are the primary rehabilitation strategies for most counties. It was also noted a majority of the counties surveyed employed a range of strategies from reconstruction to skin patching.
The remaining questions on the survey had a free response format. To create the following graphs, common responses were identified and sorted into bins to create pie charts. For some questions, there was more than one response in a survey, so the number of responses may exceed the number of responses.

Workshop attendees were asked to list the top three pavement and culvert issues in their county/jurisdiction in Question 1 and Question 2, respectively. For pavements, material durability and funding are top issues, as shown in Figure 5. Safety, alignment/ride quality, is lesser importance but still important. Material durability (wear/deterioration) was also a top issue for culverts, as shown in Figure 6. Capacity, cover, clear zone, and sedimentation/debris was lesser importance but still important.
Figure 5. Top three pavement maintenance and construction issues as reported by survey respondents.

Figure 6. Top three culvert maintenance and construction issues as reported by survey respondents.
Question 6 asked for a description of the pavement management system used in the respondent’s jurisdiction, and whether it was formal or informal. As shown in Figure 7, pavement management is ad hoc at best (72% indicated their system was informal). Responses to Question 11, regarding the procedure used to evaluate pavement distresses, showed that a majority of the counties determine cause of distress by visual inspection and/or engineering judgment/personal experience, as shown in Figure 8, indicating a need for an easy, economical method of evaluation.

**Pavement Management System**

![Pie chart showing the distribution of pavement management systems](chart.png)

- 72% formal
- 28% informal
- 37% worst first
- 16% micropaver
- 16% ODOT PCR based
- 11% in house
- 5% no response
- 1% consultant

**Figure 7.** Type of pavement management system used by counties responding to survey. Respondents were asked if their system was formal or informal and to describe their system.

**What procedure, if any, do you have in place in your jurisdiction to evaluate the causes of distress in existing roads before deciding on a course of rehabilitation?**

- 9 coring
- 4 performance
- 5 visual inspection
- 5 experience/judgment
- 3 consultant
- 1 coring

**Figure 8.** Procedures used by respondents to determine causes of distress in pavements.
A series of questions were included in the questionnaire to identify areas of support which could benefit the counties. Responding to Question 7, a majority of the counties want a unified approach to addressing issues but some say with limitations, as shown in Figure 9. A majority also indicate a laboratory facility is needed or would help, based on responses to Question 8 shown in Figure 10. Based on responses to Question 9, depicted in Figure 11, on how counties learn about new technologies, conferences/workshops provide the most commonly cited method for technology transfer. Most implementation of new technology is based on performance elsewhere or test sections constructed in the county, as shown by responses to Question 10 graphed in Figure 12.

![Figure 9](image9.png)

**Figure 9.** Responses to survey Question 7 regarding responses to common problems in counties.

![Figure 10](image10.png)

**Figure 10.** Survey responses on possible need for a laboratory facility dedicated to local infrastructure needs.
Figure 11. How survey respondents learn about and decide to implement new technologies.

Figure 12. How survey respondents evaluate new materials and road system solutions.
Matrix
A local government strategic research plan (SRP) matrix was developed considering the results of the questionnaire and active projects in the ODOT ORIL program. The SRP matrix is attached as Appendix C.

Next Steps
The SRP matrix was finalized in preparation for this report. Due to audience enthusiasm for this topic, a follow-up workshop is proposed for Summer 2016, with the exact date and location to be determined. The workshop will include a review of findings from this workshop, presentation of the SRP matrix, and discussion of implementation.
Appendix A: Agenda with biographical sketches of presenters.

Note that this information was current as of the date of the workshop.

WORKSHOP: DESIGN AND REHABILITATION OF LOCAL ROADWAYS FOR OHIO’S COUNTIES
Tuesday April 28, 2015
Cherry Valley Lodge, 2299 Cherry Valley Road, Newark, Ohio

8:30-8:45 AM Introduction and Welcome – Doug Davis, President, CEAO

8:45-9:00 AM How a University Can Assist in Local Infrastructure Issues – Dennis Irwin, Dean, Russ College of Engineering and Technology, Ohio University

Dennis Irwin
Dean of the Russ College of Engineering and Technology at Ohio University

Dennis Irwin became dean of the Fritz J. and Dolores H. Russ College of Engineering and Technology at Ohio University in July 2002. Irwin was chair of the College’s School of Electrical Engineering and Computer Science from 1997 to 2002. He was selected as the school’s Outstanding Graduate Instructor and Outstanding Undergraduate Instructor three times each.

Dr. Irwin currently serves on the nomination committee for the National Academy of Engineering’s Russ Prize, the world’s highest honor in bioengineering. He is also a faculty member of the International Space University, and serves on the Ohio Society Professional Engineers (OSPE) board of directors, which in 2012 awarded him the OSPE Uncommon Engineer Award. He is an associate fellow of AIAA and senior member of IEEE.

Dr. Irwin, who holds a certificate from Harvard University’s Institute for Management and Leadership in Education, received his Ph.D., M.S., and B.S., all in electrical engineering, from Mississippi State University. He is also a licensed Professional Engineer in the state of Ohio.

9:00-9:30 AM Construction Issues and Solutions – Steve Williams, Deputy Director, ODOT District 10

Steve Williams
Deputy Director at ODOT District 10

Steve Williams began his career at ODOT in July 1987 as an Engineer-in-Training. Since then, Williams has held multiple positions within the Department, including Project Engineer, Area Construction Engineer, and District Construction Engineer. Steve was appointed District Deputy Director in January 2011.

During his tenure at ODOT he has advanced over 1.1 billion dollars of new construction including US50 Athens to Coolville, US33 Athens to Darwin, The Ravenswood Connector, The Pomeroy-Mason Bridge, and The Nelsonville Bypass.

Steve has a Bachelor of Science in Civil Engineering from Ohio University and is a Licensed Professional Engineer in the State of Ohio.

9:30-10:15 AM Major Rehabilitation Strategies for County and Township Roads – Chris Bauserman, Delaware County Engineer

Chris Bauserman
Delaware County Engineer
Chris Bauserman has served as the County Engineer in Delaware County, Ohio since February of 1996. Prior to this, he served as Assistant County Engineer for 7 years. His career also includes work in the consulting and highway construction fields.

He holds a Bachelor of Science degree in Civil Engineering from Ohio Northern University, and is a past President of the National Association of County Engineers. He currently serves as the second vice president of the County Engineers Association of Ohio.

Over the past 10 years, Chris has presented asset management papers to a number of organizations including the National Pavement Preservation Conference, the Asphalt Recycling and Reclaiming Association and the Purdue Road School.

10:15-10:30 AM  Break

10:30-11:00 AM  Innovative Pavement Rehabilitation Techniques Using Asphalt Recycling Technology – Jason Wielinski, Research Engineer, Asphalt Materials Inc.

Jason Wielinski
Research Engineer at Asphalt Materials Inc.

Jason Wielinski is an asphalt research engineer with the Heritage Research Group in Indianapolis, Indiana. Prior to joining HRG in 2008, he was a quality control engineer with Granite Construction in Reno, Nevada. He has a Bachelor of Science in Civil Engineering degree from the University of Toledo and a Masters of Science in Civil Engineering degree from Auburn University. He is a professional engineer registered in the state of Indiana. His expertise includes mix designs for cold in-place recycling and FDR projects, pavement design and performance testing of bituminous based construction materials.

11:00-11:30 AM  Specifying Asphalt Pavement the ODOT Way – David Miller, Assistant Administrator, ODOT Office of Pavement Engineering

David Miller
Assistant Administrator at ODOT Office of Pavement Engineering

Dave Miller is a 1990 graduate of Tri-State University with a Bachelor of Science Degree in Civil Engineering and is a Registered Professional Engineer in the State of Ohio. Dave has worked for the Ohio Department of Transportation in the Office of Pavement Engineering for almost 25 years. For the past 15 years or so his duties have included writing and reviewing specifications on the asphalt pavement, concrete pavement, and geotechnical specifications committees. Today he is here to speak to us about ODOT’s asphalt specifications.

11:30-12:00 PM  Culvert Condition Assessment and Rehabilitation – Jeff Syar, Administrator, ODOT Office of Hydraulic Engineering

Jeffrey E. Syar
Administrator at ODOT Office of Hydraulic Engineering

Mr. Jeffrey E. Syar is currently serving as the Office Administrator of Hydraulic Engineering with the Ohio Department of Transportation (ODOT). He has been in this role since May of 2011.

He is active in Transportation Research Board committees and research pertaining to buried conduit, conduit durability, and soil interaction. He is serving as the Vice Chair of the AASHTO NTPEP technical committee on non-structural spray applied liners.

Prior to this position, he served as the Digital Mapping Manager with the ODOT Office of Aerial Engineering. In this position his section utilized airborne Light Detection and Ranging data and
photogrammetry to produce digital mapping for ODOT engineering projects. He served as a Hydraulic Engineer in the ODOT Office of Structural Engineering from February 2002 to June 2006.

Prior to employment at ODOT, he was a design Consultant from June 1996 to February 2002 where he performed roadway, railway, and bikeway designs with an emphasis on hydrology and hydraulics.

He is a graduate of Ohio University with a Bachelor of Science degree in Civil Engineering and he is a registered Professional Engineer in the State of Ohio.

12:00-1:00 PM  Lunch

1:00-1:30 PM  ODOT: Ohio’s Research Initiative for Locals (ORIL) – Vicky Fout, Implementation Manager, ODOT Office of Statewide Planning and Research

Vicky Fout
Project Manager at ODOT’s Office of Statewide Planning and Research

Vicky Fout is a Project Manager for ODOT’s Office of Statewide Planning & Research. She joined ODOT in 2001 and has spent the majority of her time overseeing transportation research projects and programs. In addition to managing statewide planning studies, Vicky currently coordinates activities and projects for Ohio’s Research Initiative for Locals (ORIL), a program designed to address the transportation research needs of Ohio’s Local Public Agencies. She has a Master’s degree in Business Administration from Franklin University and a Bachelor’s degree in Specialized Studies from Ohio University.

1:30-2:15 PM  Design of Asphalt Structural Overlays – Cliff Ursich, President and Executive Director, Flexible Pavements of Ohio

Clifford Ursich
President and Executive Director of Flexible Pavements of Ohio

Cliff Ursich is President & Executive Director of Flexible Pavements of Ohio; Ohio’s asphalt paving association. He has been on staff at Flexible for twenty four years and has held positions as Pavements & Materials Engineer and Executive Vice President.

A Civil Engineering graduate of The Ohio State University, Mr. Ursich is a registered professional engineer in Ohio.

He is a former Ohio Department of Transportation district engineer of tests. He is a member of the American Society of Testing and Materials (ASTM) and the Association of Asphalt Paving Technologists (AAPT)

2:15-3:00 PM  Whitetopping on Rural Highways – Mark Pardi, Central/SE Director of Promotion, and Jim Barnhart, Senior Engineer, Ohio Concrete

Mark Pardi
Central & Southeast Director of Ohio Concrete

Mark Pardi is a Professional Engineer and LEED GA with Ohio Concrete (Ohio Ready Mixed Concrete Assn.). He serves as the Central and Southeast Ohio Promotion Director and technical resource contact for the concrete industry. Mark has worked in the Concrete Industry for 35 years, including Highway Construction, Ready Mixed Production and the Concrete Association.

Mark is the American Concrete Pavement Association, Ohio Chapter representative and is the concrete industry liaison with ODOT and participates on the ODOT Specification Committee.

Note: As of July 2015, Mark was promoted to Field Engineer.
Jim Barnhart
Senior Engineer at Ohio Concrete

Jim Barnhart has worked for the last 18 years as the Senior Engineer for the Ohio Ready Mixed Concrete Association. His primary duties include: Instructor for the American Concrete Institute (ACI) certification programs; trouble shooting concrete issues; designing concrete parking lots and local roads and streets.

Prior to joining Ohio Ready Mix, Jim retired from ODOT as the Bridge Maintenance and Inspection Engineer.

Note: Jim retired from Ohio Concrete as of July 2015.

3:00-3:15 Break
3:15-3:30 PM Viewpoint of ODOT on Local Roadways in Ohio – Dave Slatzer, Deputy Director of Engineering, ODOT
3:30-4:15 PM Evaluation of Pavements – Shad Sargand, Russ Professor, Civil Engineering Department, Ohio University

Shad M. Sargand
Russ Professor of Civil Engineering at Ohio University

Professor Sargand earned his PhD in civil engineering from Virginia Tech in 1981. Since then he has been on the faculty of the civil engineering department of Ohio University’s Russ College of Engineering and Technology, and was named Russ Professor in 1990. He has authored over 200 journal articles, conference papers, and technical reports. Since its inception in 1995, he has been the lead researcher of the Ohio Strategic Highway Research Program National Test Road on US Route 23 in Delaware County, Ohio, which has contributed enormous amounts of valuable data for the Long Term Pavement Performance (LTPP) database. He also led another test road effort on US Route 30 in Wooster, Ohio. He is the Associate Director of the Ohio Research Institute at Ohio University, which operates the Asphalt Laboratory and Accelerated Pavement Load Facility in Lancaster, Ohio. Professor Sargand has at least five nationally recognized awards and honors for his research, including most recently the William W. “Bill” Baker Award from Flexible Pavements of Ohio in March 2011 for his “commitment to quality and overall impact on the Ohio asphalt paving industry.”

4:15-5:00 PM Survey and Workshop Deliverables
Appendix B: Questionnaire given to workshop attendees.
Note: This questionnaire was originally configured to fit on both sides of one sheet of legal size paper.

CEAO-ORITE County Engineers Workshop Survey, April 28, 2015

Name: ___________________________ Job title: ___________________________

Name of organization you work for: ___________________________

My affiliation is (check blank to left of the option that describes you):

____ County   ____ Township   ____ City   ____ Village   ____ Industry

____ ODOT District   ____ ODOT Central HQ   ____ Academia   ____ Other (explain)

If you represent a county, township, city, or village, what is the approximate total number of lane miles of
roadways in your system (enter N/A if not applicable)? ________________

If you represent a city, county, township, or village, please list the approximate percentage of your
system that has

____% Asphalt surface   ____% Concrete surface   ____% Aggregate surface

____% Chip and seal surface   ____% Brick surface   ____% Other (list) ________________

If you are employed by a county, township, city, or village, begin with Question 1; else skip to Question 5.

1. List the top three issues you have with the pavement network in your jurisdiction.

2. List the top three issues you have with culverts in your jurisdiction.

3. What are your approximate expenditures on pavement maintenance, and percentages spent on
the following categories (As an alternative, you can specify number of lane miles treated in each
category):

$_______ Total pavement maintenance budget

______% Pavement reconstruction   ____% Chip & Seal

______% Asphalt overlays   ____% Aggregate   ____% Cold Mix

______% Skin Paving   ____% Other major pavement maintenance items (specify)

4. What are your approximate expenditures on culverts and drainage maintenance, as spent on the
following:

$_______ Culverts   $_______ Cleaning ditches   $_______ Other major items (specify)
5. What innovative material or construction techniques are you using to construct/install/maintain pavement and/or culverts?

6. Do you use a (circle one:) formal or informal pavement management system? Please describe it.

7. Would you like to see a unified process developed to devise solutions and respond to common needs that occur across multiple counties? What form would you envision this process taking?

8. It is not practical for each county to evaluate every new material or construction technique. Do you see a need for a field and laboratory facility in the state dedicated to responding to local needs? What capacities should be included in such a facility?

9. How does your jurisdiction learn about, decide to implement, and determine the benefits of new technologies related to building and maintaining your road network?

10. If a vendor develops a new material or solution to a road system problem, how do you decide whether to adopt or decline it?

11. What procedure, if any, do you have in place in your jurisdiction to evaluate the causes of distresses in existing roads before deciding on a course of rehabilitation?

12. In designing or planning pavements, how do you accommodate or account for the impacts of environmental factors such as daily and yearly temperature cycles, moisture levels, freeze/thaw, etc.?
13. What additional seminar or workshop topics or areas would be useful to you in your current position?

14. What are the most useful things you heard in today’s workshop? What aspects of the workshop were least useful or could be improved?

15. Please share any other comments you wish to add.

When completed, please email to: mitchelg@ohio.edu
Or mail to: ORITE
151 Stocker Center
1 Ohio University
Athens OH 45701-2979

Thank you for completing this survey
## Appendix C: Strategic Research Plan Matrix

<table>
<thead>
<tr>
<th>Research Focus Areas</th>
<th>Safety</th>
<th>Transportation Policy and Organization</th>
<th>Innovative Transportation Financing and Business Practices</th>
<th>Infrastructure Preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td>Pavement</td>
</tr>
<tr>
<td>Ensure Safety of Those Utilizing and Maintaining Transportation System</td>
<td>Investigate Policies and Their Impacts</td>
<td>Improve Management Decision Making Through the Development and Implementation of a Comprehensive Pavement Management System</td>
<td>Extend Life and Durability of Existing Transportation System</td>
<td>Improve Pavement Performance Prediction</td>
</tr>
<tr>
<td>Proposed Projects</td>
<td>length of culvert relative to clear zone</td>
<td>harmonization of geometric, construction, and material specifications for local government</td>
<td>lack of funding</td>
<td>need to improve performance of asphalt and chip seals (aging too fast)</td>
</tr>
<tr>
<td>roads not wide enough for safety</td>
<td></td>
<td></td>
<td>no base under existing pavement or insufficient for traffic</td>
<td>strategies for sudden increase in truck loadings</td>
</tr>
<tr>
<td>poor alignment and cross section</td>
<td></td>
<td></td>
<td>decrease deterioration of pavement edge</td>
<td></td>
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<tr>
<td>poor ride quality (especially chip seal)</td>
<td></td>
<td></td>
<td>weak subgrades</td>
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<tr>
<td>extending the life of pavement marking for chip seal surfaces</td>
<td></td>
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<tr>
<td>Contact Person (phone, email)</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Drainage/Culvert</td>
<td>Liveable Communities</td>
<td>Public/Mass Transportation</td>
<td>Green Energy Technology</td>
<td>Local Government Focus Areas</td>
</tr>
<tr>
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<tr>
<td>Extend Life and Durability of Existing Drainage System</td>
<td>Maximize Effectiveness of Rehabilitation and Maintenance Strategies</td>
<td>Allow Ohioans to have access to adequate, affordable, and environmentally sustainable travel options</td>
<td>Evaluate the use of recyclable techniques, renewable materials, permeable surfaces, and innovative techniques to mitigate environmental impact</td>
<td></td>
</tr>
<tr>
<td>lack of cover</td>
<td>undersized</td>
<td>lack of an inventory system or outdated inventory system</td>
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<tr>
<td>bulging seams and deformation</td>
<td>sediment</td>
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<tr>
<td>erosion at outlet</td>
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<tr>
<td>poor drainage of pavement</td>
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<tr>
<td>no base under existing pavement or insufficient for traffic</td>
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<tr>
<td>acid water deteriorates inverts</td>
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