

## TERRA 2012 Highlights

The Transportation Engineering and Road Research Alliance (TERRA) facilitates the implementation of collaborative pavement and road research engineering innovations. The success of TERRA efforts continues primarily because of the committed service of its increasing membership, the TERRA board, and three active committees structured around the organization's strategic directions. This brief report highlights TERRA research, engagement, and communications activities during the past year.



TERRA Innovation Series event participants watch a UAV demo at Michigan Tech in August 2012.

### Research and Implementation

The TERRA Research and Implementation Committee guides research projects and initiatives that involve collaborations among agency, industry, and academic partners, including a series of pooled-fund projects initiated through the Federal Highway Administration (FHWA) Transportation Pooled-Fund Program. Highlights from 2012:

- The Wisconsin and Minnesota DOTs completed a joint study of trucks and roundabouts. The study was undertaken to better understand and, where possible, to improve upon how trucks are accommodated at multilane roundabouts on state trunk highways. The four-phase study included input from the trucking industry. It is expected that the Wisconsin and Minnesota DOTs will revise their existing roundabout design guides with findings from the study.
- A TERRA-initiated pooled fund project will create a unified national design guide for unbonded concrete overlays of existing concrete and composite pavements. The design guide will be based on mechanistic-empirical principles, including the effects of various concrete overlay materials, separator layer (interlayer) types, panel thickness and panel size, joint load transfer mechanisms, traffic loads, and climates (nationwide) in which they must perform.
- Research by the Minnesota Department of Transportation and the Minnesota Local Road Research Board examined the durability, maintenance requirements, hydrologic benefits, and environmental considerations of a full-depth porous asphalt pavement installed on a low-volume roadway in a cold climate. Published study findings demonstrate the effectiveness of porous asphalt in certain situations and offer insights about the design and maintenance of porous asphalt pavements in cold climates.



WisDOT and MnDOT completed a joint study of trucks and roundabouts.

### Engagement

The TERRA Member and Partner Engagement Committee encourages new ways of thinking about research problems by emphasizing partnership and cooperation to address the large-scale challenges before transportation professionals and policymakers. Highlights from 2012:

- TERRA is preparing a new strategic and organizational plan to be implemented July 1, 2013. The TERRA board, led by a trained facilitator, met in August 2012 in Houghton, Michigan, to reexamine the organization's mission and priorities because TERRA has expanded significantly since its inception in 2004. Changes include a stronger focus on implementation and a reorganized organizational structure to better develop research and implementation needs.
- During the past year, funding from research projects initiated by TERRA totaled \$653,000. Those projects include monitoring turbidity during construction, repairing and patching pavement, and improving the design of unbonded concrete overlays.
- TERRA enhanced its international and Nordic ties as Tomas Winnerholt, pavement design specialist for the Swedish Transport Administration, visited the Minnesota Department of Transportation for three weeks. Winnerholt exchanged technical information on pavement design, rehabilitation, and construction, as well as on the implementation of intelligent construction, design-build-operate-maintain, and Sweden's approach to prioritizing and implementing research.

## Communications and Outreach

The TERRA Marketing and Communications Committee is focused on providing up-to-date information about ongoing research, communicating research results to a variety of audiences worldwide, and engaging stakeholders in a dialogue on road research and implementation activities. Highlights from 2012:

- A record 220 people attended the annual TERRA Pavement Conference in February—more than any other year in the 16-year history of the conference. Conference presentations by international, national, and regional speakers shared innovations related to asphalt and concrete pavement, pavement preservation, low-volume roads, MnROAD research, and more.
- Remote-sensing technologies in asset management, structural-health monitoring, and non-destructive evaluation were featured during a half-day TERRA Innovation Series event in August at Michigan Tech in Houghton. The event was held in conjunction with the TERRA summer board meeting and strategic planning retreat.
- TERRA cosponsored webinars about two national pooled-fund studies that investigated the low-temperature behavior and performance of asphalt pavements, HMA pavement warranties and performance specifications, and the latest recommendations for chip sealing. These low-cost seminars attracted broad online participation by bringing together a diverse group of transportation researchers and practitioners sharing their latest findings.

## TERRA Members

The TERRA Board includes representatives of industry associations, transportation agencies, and university research organizations who collaborate to set directions for TERRA research and outreach activities. The year's key highlights include welcoming American Engineering Testing and the National Center for Pavement Preservation as members.

## Organizations currently represented on the TERRA board:

### Industry

- Aggregate & Ready Mix Association of Minnesota
- American Concrete Pavement Association
- American Engineering Testing, Inc.\*
- Associated General Contractors of Minnesota
- Braun Intertec
- Caterpillar
- Concrete Paving Association of Minnesota
- Mathy Technology and Engineering Services
- Minnesota Asphalt Pavement Association
- RMC Research and Education Foundation
- Road Science, A Division of ArrMaz Custom Chemicals

### National Transportation Agencies

- Norwegian Public Roads Administration
- United States Federal Highway Administration



Next Generation Concrete Surface, also known as innovative diamond grinding, was used on I-35 in Duluth, Minnesota.

## Fact sheets

A new TERRA fact sheet provides an overview of the Next Generation Concrete Surface (NGCS), also known as innovative diamond grinding, which made history as the first new concrete pavement texture to be introduced in the last several decades and as the quietest texture yet developed for non-porous concrete pavements. This publication adds to an ongoing series of fact sheets to highlight timely research topics.

### Fact sheet topics:

- Quiet, Safe, and Smooth Concrete Pavements
- Low-Cost Engineering Infrastructure Safety Improvements
- Concrete Overlays
- Greenroads
- Impacts of Heavy Farm Equipment on Rural Roads
- Shoulder and Centerline Rumble Strips
- Warm-Mix Asphalt
- Pervious Concrete
- Full-Depth Reclamation (FDR)
- Implementation of New Technologies
- Low-Volume Roads

### State and Local Transportation Agencies

- Iowa Department of Transportation
- Michigan Department of Transportation
- Minnesota Department of Transportation
- Minnesota Local Road Research Board
- New York State Department of Transportation
- North Dakota Department of Transportation
- Wisconsin Department of Transportation

### University Research Organizations

- Iowa State University
- Michigan Technological University
- National Center for Pavement Preservation\*
- University of Minnesota

\* new member in 2012