

FHWA Update

Suneel N. Vanikar, P.E.
Team Leader, Office of Pavement Technology

Office of Pavement Technology

- ▶ Reorganization is not yet official
- ▶ New name: Office of Asset Management, Pavement, and Construction
- ▶ New Teams
 - Asset Management – Steve Gaj
 - Design and Analysis – Suneel Vanikar
 - Materials – John Bukowski
 - Construction – Bryan Cowley



Design and Analysis

Team Leader– Suneel Vanikar

Mechanistic Empirical Pavement Design (MEPDG)

- ▶ Mobile Concrete Lab – Ongoing field projects to assist States in collecting Level 1 inputs
- ▶ Coefficient of Thermal Expansion (CTE) Tech Brief
 - FHWA-HIF-09-015
 - Highlights importance of CTE in MEPDG and updated data
- ▶ Technology Deployment Documents
 - Literature Review, White Paper, and TechBrief on implementation activities
 - Case Studies from MO, MT, IN on State implementation of MEPDG

NDT for Pavement Evaluation



Step-Frequency Ground-Penetrating Radar (SF-GPR)

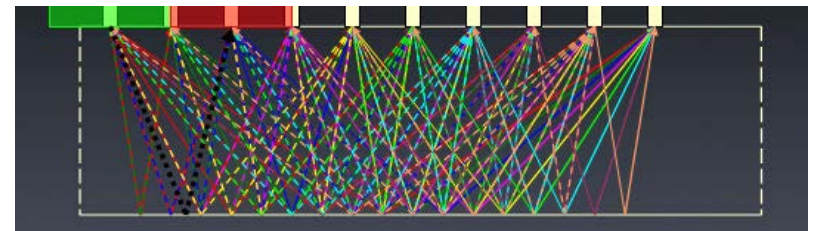
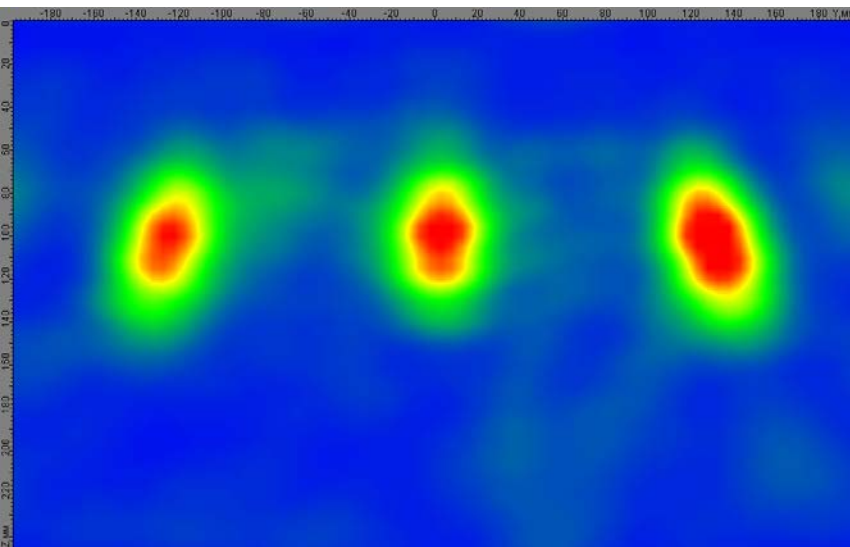
SHRP-2 GPR Product



Ultra-Sonic Testing Device: MIRA

MIRA – Ultrasonic Tomography Device

- ▶ 40 low-frequency, dry-point contact shear wave transducers
- ▶ Applications
 - Concrete cover depth
 - Layer thickness
 - Internal defect detection
 - Material properties (e.g., PCC strength)



Pavement Type Selection

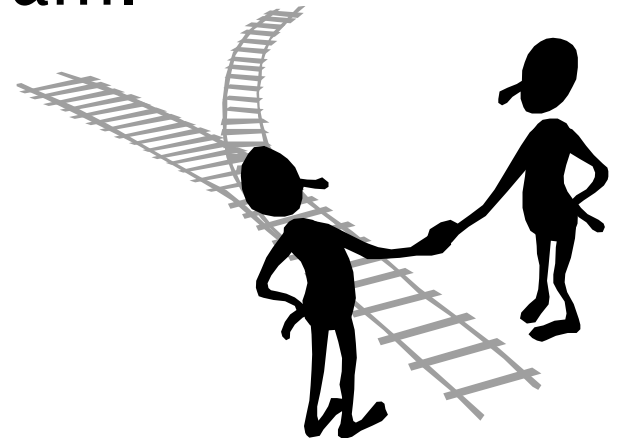
- ▶ Development of a FHWA Technical Advisory (TA) on Alternate Bidding (AB)
 - Will discuss when to use AB and how AB should be administered
 - Will incorporate information from NCHRP Report 703 “Guide to Pavement Type Selection”
 - TA will go through an internal review process and then will be provided to industry for review

Sustainable Pavements Program

- ▶ Support the US DOT goals for liveability and sustainable transportation.
- ▶ Increase the body of knowledge regarding “sustainability” aspects of concrete and asphalt materials in pavement design, construction, and maintenance.
- ▶ Increase the use of “sustainable” technologies and practices in pavement design, construction, and maintenance.

Sustainable Pavements Technical Working Group

- ▶ TWG is composed of stakeholders in State DOT's, academia, industry, and other government agencies.
 - 20 members and approximately 100 friends.
- ▶ Goal is for FHWA to gather feedback on the technical aspects of the Program.





Materials

Team Leader– John Bukowski

Advanced Concrete Pavement Technology Program (ACPT)

- ▶ Publish Tech Briefs and guidance documents
- ▶ Demonstration and loan of testing equipment for concrete and concrete pavements
- ▶ Delivery of workshops and conferences on selected Topics

Long-Life Concrete Pavement Conference
Seattle, Washington
September 18-21, 2012

Alkali-Silica Reactivity

- ▶ AASHTO PP 65-10 “*Standard Practice for Determining the Reactivity of Concrete Aggregates and Selecting Appropriate Measures for Preventing Deleterious Expansion in New Concrete Construction*” (AASHTO 2011)
- ▶ 9 Field trials implemented + 2 pending field trials
- ▶ Training program will be initiated in 2012
- ▶ Deployment program active until March 2013

Quality Control

- ▶ Development of a 1 ½ day workshop on QC/QA for concrete (available in 2012)
- ▶ Provide agencies with guidelines for concrete QC procedures and QA programs
- ▶ Explain that a QA program is more than testing
- ▶ Targeting both agency inspectors and contractor personnel

Cooperative Efforts

- ▶ ISU-CP Tech Center- Advancing concrete pavement technologies and providing technical expertise and technology transfer
 - 27 work plans including 4 pooled fund projects
 - Developed and delivered 80,000 guidance documents
 - Assisted with 39 field demonstration projects
 - Conducted 50 training workshops

Cooperative Efforts, Cont.

- ▶ CRSI– Advance Continuously Reinforced Concrete Pavements
 - *Manual for Design and Construction* published in 2009
 - Workshop Series started January 2010 with delivery completed in AR, AZ, CA, LA, GA, & OR

- ▶ ACI– Technology transfer of best practices for concrete materials and pavements
 - Seminars on (1) Cementitious Materials, (2) Chemical Admixture, and (3) Self Consolidated Concrete
 - Seminars have been given to 14 states (AZ, CA, DE, GA, KS, MN, MO, MT, NE, NM, NY, OK, PR, RI, & TX)

Cooperative Efforts, Cont.

- ▶ PCI– Advancing precast post-tensioned and dowelled systems



SHRP 2 and Precast Pavement Systems

- ▶ SHRP 2 Project R05 – Modular Pavement Technology
 - Report – *Precast Concrete Pavement Technology*
 - Model Specifications on fabricating and installing precast pavement systems
 - Implementation Phase is from 2011 through 2015 in cooperation with AASHTO



Construction

Team Leader- Bryan Cawley

Intelligent Construction Program

- ▶ **Goal** – To increase the use of intelligent construction (IC) technologies & techniques to deliver projects faster
- ▶ **First Steps:**
 - Identify existing & emerging technologies in the area of IC
 - Identify gaps/ areas in need of research
 - IC Strategic Roadmap
 - Implementation & deployment to improve quality and reduce time of construction

Intelligent Construction Focus Areas

- ▶ Structures (bridges, retaining walls, culverts)
- ▶ Pavements
- ▶ Embankment construction
- ▶ Construction quality and material testing
- ▶ Construction surveying
- ▶ Traffic management and work zones
- ▶ Construction equipment
- ▶ Construction management practices & technologies (data/ document management, alternative construction schedules)

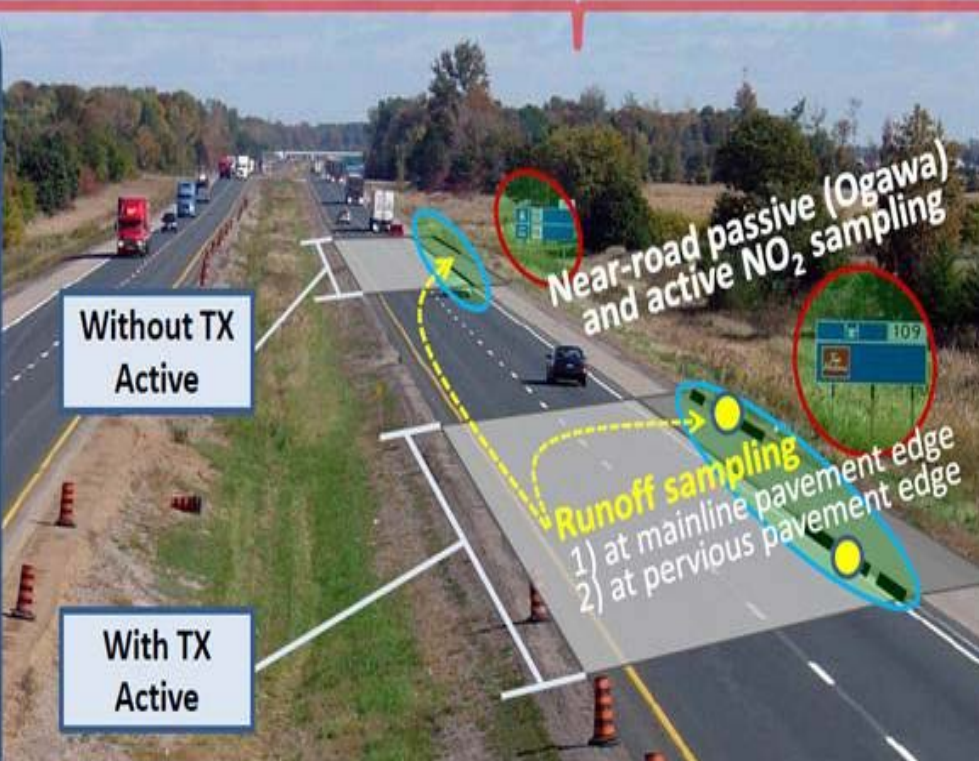
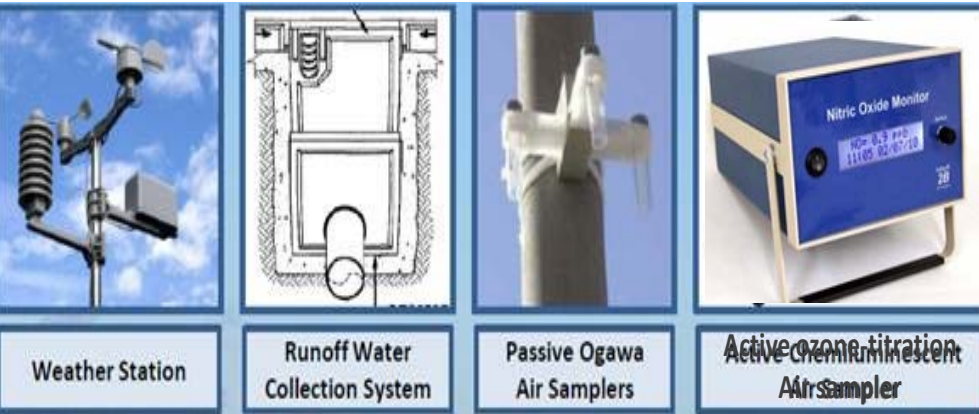
Moving Intelligent Construction Forward

- ▶ Workshop held in September 2011 to gather stakeholder feedback and benchmark the FHWA focus areas
- ▶ Areas and technologies will be prioritized and identified as:
 - Deployable
 - Verifiable
 - Needing further development

2-Lift Concrete Pavement

- ▶ SHRP-2 Product
- ▶ Kansas I-70 West of Abilene, Kansas
 - Constructed in 2008
 - Purpose
 - Evaluate the two-lift construction process
 - Utilize common US construction equipment
 - Successful project confirmed feasibility
- ▶ MnROAD test sections
 - Constructed in May 2010
 - Recycled concrete aggregate in the bottom lift
 - Exposed aggregate surface

2-Lift Concrete Pavement, cont.



- ▶ Missouri SH 141 in greater St. Louis
 - Constriction in 2011
 - Top lift with photocatalytic cement
 - Pervious concrete shoulders (also with photocatalytic cement)
 - Measurement of air quality and water quality to evaluate photocatalytic cement



Preservation

Team Leader- Steve Gaj

QUESTIONS?

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