Transportation Pooled Fund #954

“Accelerated implementation of intelligent compaction for embankment subgrade soil, aggregate base, and asphalt pavement material”

3-year IC study for all the above materials

12 participating States

12+ field demonstration
IC Field Demo Schedule

- **TX**: Mini demo 2008
- **KS**: Mini demo 2009
- **MN**: Mini demo 2010

Map showing states with demo schedules.
Objectives

- Accelerated development of QC/QA specifications for subgrade soils, aggregate base and asphalt pavement materials
- Develop an experienced and knowledgeable IC expertise base within Pool Fund participating State DOTs
- Identify and prioritize needed improvements to and/or research of IC equipment and field QC/QA testing equipment
Prioritization of IC Improvements

- Simplifying IC usage
- Achieving greater IC value, cost benefit, etc.
- Improved accuracy
Task Working Group (TWG)

- Pooled Fund State Representatives
  - Dr. George K. Chang, P.E.
    Transtec Group, Inc.
    PI

- Mr. Victor Gallivan
  FHWA
  COTR

- IC Roller Vendor Representatives
  - Mr. Bob Horan
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  Co-PI

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THE TRANSTEC GROUP
Application of Material Types

- Type I : Non-cohesive subgrade soil
- Type II : Cohesive subgrade soils
- Type III : Aggregate base material
- Type IV : Asphalt pavement material
- Type V : Stabilized base material
IC Roller Requirements

- Continuous roller-integrated measurement system
- Real-Time Kinematic (RTK) Global Position System (GPS) based mapping
- Real-time onboard display and integrated software reporting system
- (Optional) Feedback control
Participating Soil/SB Rollers

- Ammann/Case
- Bomag America
- Caterpillar
- Dynapac
- Sakai America
Participating Asphalt Rollers

Ammann/Case

Dynapac

Bomag America

Caterpillar

Sakai America
In-Situ Testing Methods

Which tests can be used as companion tests to RMV?

Impact Force from Rollers
LWD/FWD 300 mm
LWD 200 mm
Nuclear Density Gauge
Dynamic Cone Penetrometer

Area over which the roller MV's are averaged
In-situ spot test measurements

Distance = Roller travel in 0.5 sec.

Influence depths are assumed ~ 1 x B (width)

Courtesy of Dr. David White
In-Situ Test Methods for HMA

NG

NNG

LWD-a

PSPA
In Situ Test Methods for Soils/SB/STB
Key Findings

- Values of mapping existing support before construction or overlay
- Significant improvements of rolling patterns, thus, consistent products
- Improvement of roller operators’ accountability
Key Findings (cont’d)

- Construction process-control greatly improved
- IC-MVs correlate to various in-situ point measurements
- Measurement influence depth varies depending on technology and site conditions
- Machine operation parameters influence MVs
IC Clearing House

www.IntelligentCompaction.com