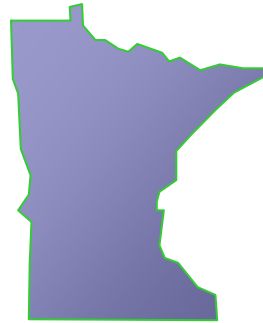


Minnesota Road Research Facility



*Tim Clyne, Mn/DOT
MnROAD Open House
August 23, 2010*



MnROAD

Office of Materials and Road Research

A long-term accelerated pavement testing facility that gives researchers a unique, real-life laboratory to study and evaluate the performance of materials used in roadway construction.



Low Volume Road

Interstate 94

Mainline

MnROAD Original Construction

History of Test Sections

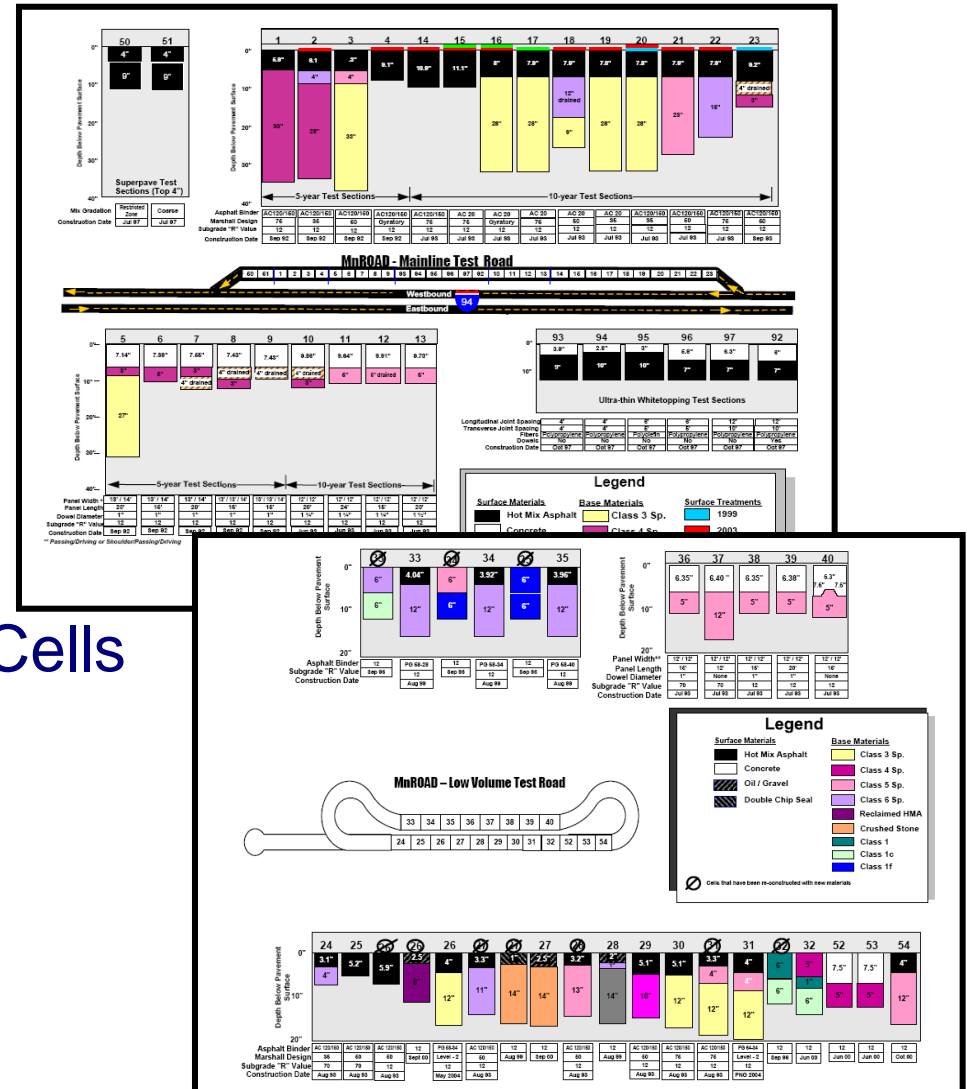
- Original Funding (\$25M)
- Original Construction ('92-'93)
- Open to Traffic ('94)

Layout and Designs

- Mainline / Low Volume Road
- Asphalt, Concrete, Aggregate Cells
- 3,5,10 Year Designs

Phase I

- 1994-2006



MnROAD Traffic Loadings



Low Volume Road Traffic

MnROAD 5-axle Semi

Inside Lane = 80k truck 5 days/week

Outside Lane = 102k truck (pre-2007); no traffic since then

PCC ~ 20,000 ESALs per year

HMA ~ 15,000 ESALs per year



Mainline Traffic

I-94 WB Public Traffic

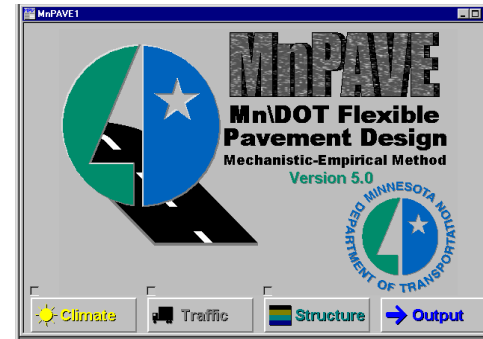
28,000 AADT

14% HCAADT

PCC = ~ 1 Million ESALs per year
HMA = ~ 0.6 Million ESALs per year

MnROAD Phase I Accomplishments

- Save \$33M annually
- Seasonal Load Limits
 - Spring Restrictions / Winter Overloads
- Improved Design Methods
 - Mechanistic Empirical Designs
- Improved Construction Methods
 - Profiler Certification
 - Dynamic Cone Penetrometer
 - Intelligent Compaction
- Initial Findings
 - Environment Drives Pavement Performance
 - Current Designs are too Conservative
- Young Engineer Training & Education



Transportation Engineering & Road Research Alliance (TERRA)

■ Mission:

- To develop, sustain, and communicate a comprehensive program of research on pavement, materials, and related transportation engineering challenges including issues relating to cold climates

■ Vision:

- To be a dynamic partnership of government, industry and academia that continuously advances innovations in road engineering and construction



TERRA Members

■ Government

- Michigan Department of Transportation
- Minnesota Department of Transportation
- Minnesota Local Road Research Board
- New York State Department of Transportation
- North Dakota Department of Transportation
- Norwegian Public Roads Administration
- United States Federal Highway Administration
- Wisconsin Department of Transportation

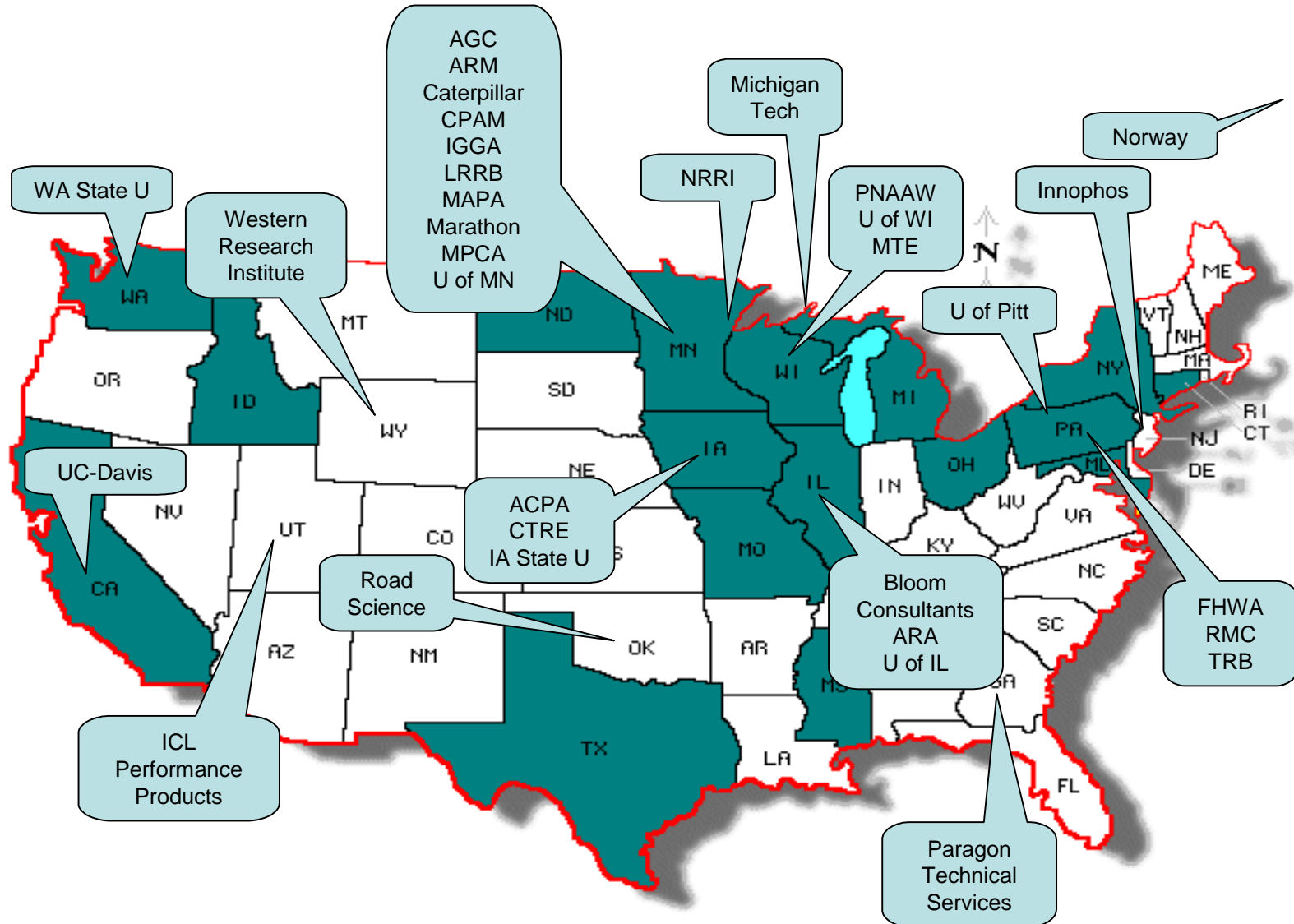
■ Academia

- Iowa State University
- Michigan Technological University
- University of Minnesota

■ Industry

- Aggregate and Ready Mix Association of Minnesota
- American Concrete Pavement Association
- Associated General Contractors of Minnesota
- Caterpillar Global Paving
- Concrete Paving Association of Minnesota
- Mathy Construction Company
- Minnesota Asphalt Pavement Association
- Automotive Trans Service Superintendents Association
- RMC Research and Education Foundation
- Road Science

TERRA – MnROAD Partners



Core Research Areas



- Innovative Construction
- Green Roads
- Preservation and Rapid Renewal
- Surface Characteristics
- Non-Pavement Research

Phase II MnROAD Research + Construction

■ MnROAD Research Funding

- 7 Pooled Fund Projects
 - 17 States, FHWA, LRRB, Industry
 - \$3.8 Million
 - LRRB contributed (\$530,000)
- 15 Minnesota Projects
 - Mix of Industry, LRRB, Mn/DOT
 - Continuing Partnership development



■ MnROAD Reconstruction Funding

- FHWA (SP&R) \$4.3 Million
- Industry Partnerships > \$675,000 Cash & In-kind
- State Road Construction \$1.0 Million

Phase II MnROAD Reconstruction

■ 2007

- \$432,525
 - Midwest Asphalt – Grading & HMA Paving
 - Commercial Asphalt – HMA Production
- 8 Cells on LVR – all HMA
 - 3 Research Studies

■ 2008

- \$2,239,423
 - Progressive Contractors Inc. – Grading & PCC Paving
 - Hardrives – HMA Production & Paving
- 24 Cells on ML and LVR – HMA and PCC
 - 12+ Research Studies

■ 2010

- \$682,624
 - CS McCrossan – Grading, PCC & HMA Paving
- 3 Composite Pavement Cells on ML



Instrumentation

Soil Pressure
HMA and PCC Strains
Deflection
Weigh in Motion
Temperature
Moisture
Frost
Lysimeter



Pavement Monitoring Tools

Sound Impedance
Tube



Data Validation Tools

R:\MnROADData - Collection\FWD - Falling Weight DeflectometerData\201...

Add Files to List

Scan Selected Files

Export Selected to Oracle

Move Selected to Archive

Close

Select All Files

Deselect All Files

FWD File Name	Status
<input type="checkbox"/> 0010WPP021710.mdb	scan failed
<input type="checkbox"/> 001ADWPD021710.mdb	scan failed
<input checked="" type="checkbox"/> 001MDLD021710.mdb	scan passed
<input type="checkbox"/> 001MDLP021710.mdb	scan failed

FWD Scan

Evaluate Sensors - Windows Internet Explorer

http://mt23loader.ad.dot.state.mn.us/mnroad/sensor/evaluate/927

MnDOT Road Research Facilities DB Maintenance

Logged in as dynltim (log out)

Select Cell

Please choose an evaluation method.

Select a Cell

- HMA Cell 1 (110284.54 - 110839.54) (Oct 15, 1992 - now)
- HMA Cell 1 (110284.54 - 110839.54) (Jul 7, 2006 - now)
- HMA Cell 2 (110839.54 - 111399.54) (Oct 1, 2008 - now)
- HMA Cell 2 (110839.54 - 111399.54) (Sep 28, 1992 - now)
- HMA Cell 3 (111399.54 - 111984.54) (Oct 29, 2008 - now)
- HMA Cell 3 (111399.54 - 111984.54) (Oct 28, 1992 - now)
- HMA Cell 4 (111984.54 - 112585.0) (Sep 29, 1992 - Jul 8, 2008)
- HMA Cell 4 (111984.54 - 112585.0) (Oct 29, 2008 - now)
- PCC Cell 5 (112585.0 - 113172.5) (Oct 15, 1992 - now)
- PCC Cell 6 (113172.5 - 113710.0) (Oct 15, 1992 - May 1, 2009)
- PCC Cell 7 (113710.0 - 114255.0) (Sep 16, 1992 - now)
- PCC Cell 8 (114255.0 - 114795.0) (Sep 16, 1992 - now)
- PCC Cell 9 (114795.0 - 115327.5) (Sep 16, 1992 - now)
- PCC Cell 10 (116753.0 - 117302.5) (Jun 14, 1993 - now)
- PCC Cell 11 (117302.5 - 117835.0) (Jun 14, 1993 - now)
- PCC Cell 12 (117835.0 - 118345.0) (Jun 14, 1993 - now)

Reliable

Dead

Questionable

18 March 2010

Method: SDK truck

Reason:

Add Evaluation(s)

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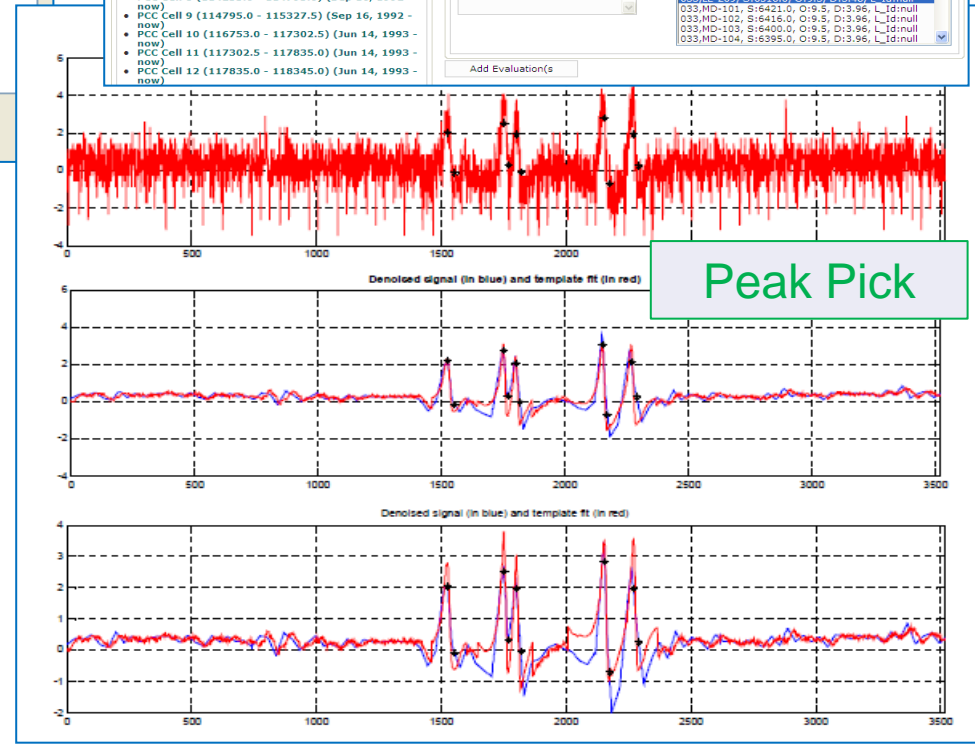
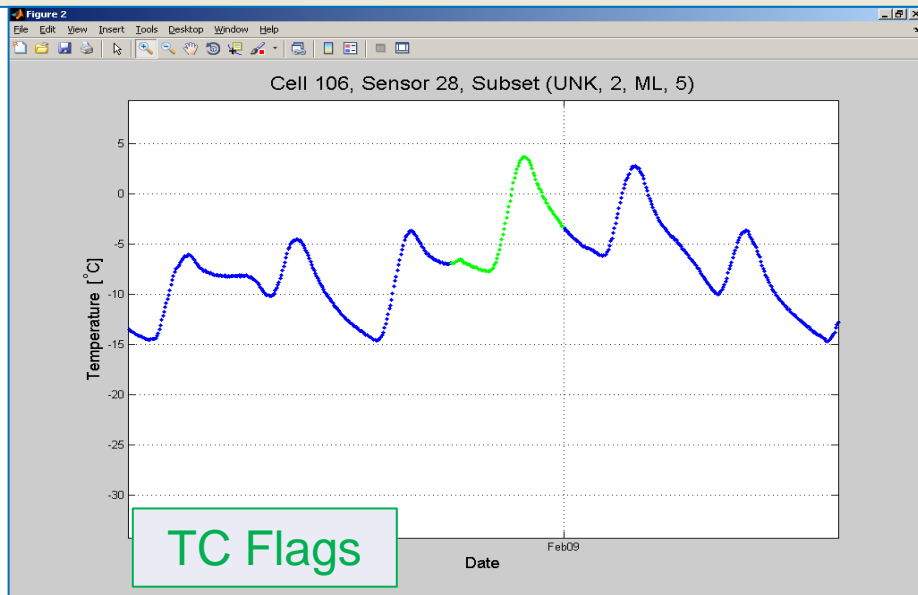
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033.MD-104, S:6395.0, O:9.5, D:3.96, L:Id:null

"PAT"



MnROAD Future



- National Facility
- TERRA Partners
- Advancing Innovation

MnROAD's next phase will continue to have a positive impact on pavements and transportation nationwide

Today's Agenda

- 9:30 & 10:30 am – Bus Tours
- 9:30 am – Asphalt Lessons Learned
- 10:30 am – Concrete Lessons Learned
- 11:30 am to 1:00 pm – Lunch On Your Own
- 1:00 to 3:30 pm – SHRP II Presentations
- Ongoing – Poster Sessions (West Polebarn)
- Ongoing – Equipment Demos (Parking Lot)
- Ongoing – 4 Page Handouts

Logistics

- Be safe while walking, touring, driving
- Restrooms
- Snacks & refreshments
- Ask us for help!

