

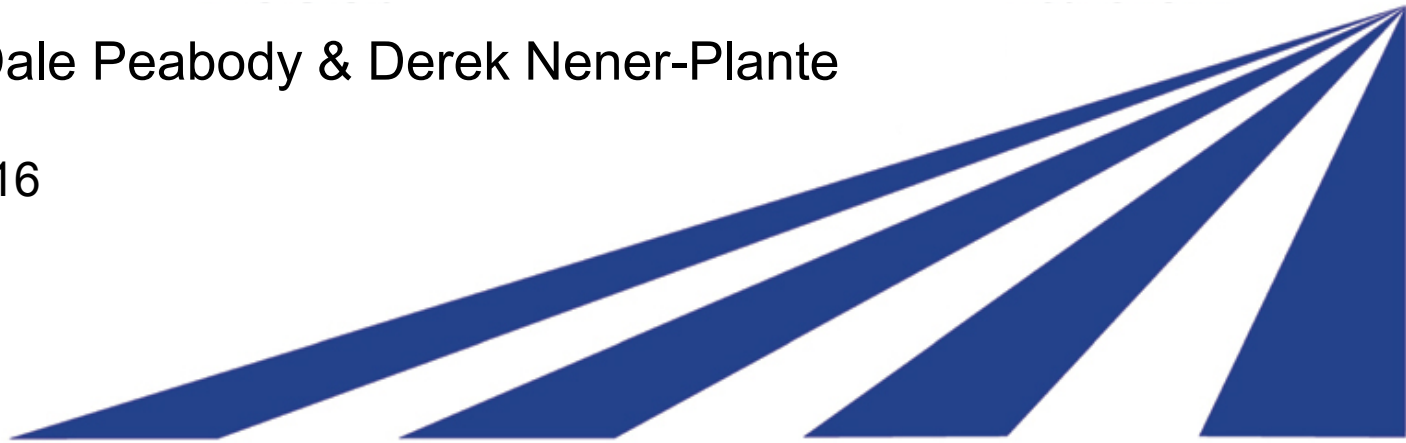


SHRP2 R07 Performance Specifications for Rapid Renewal

Peer-to-Peer Technical Exchange

Rick Bradbury, Dale Peabody & Derek Nener-Plante

September 20, 2016





**WELCOME TO
MAINE**
The Way Life Should Be



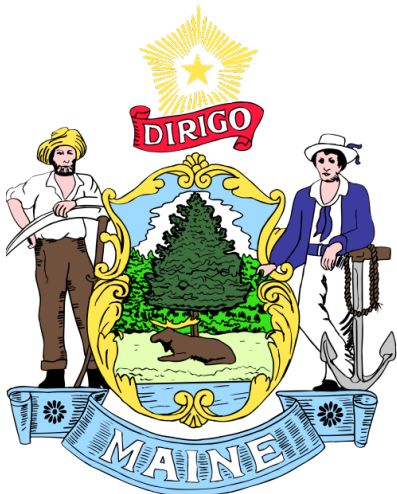
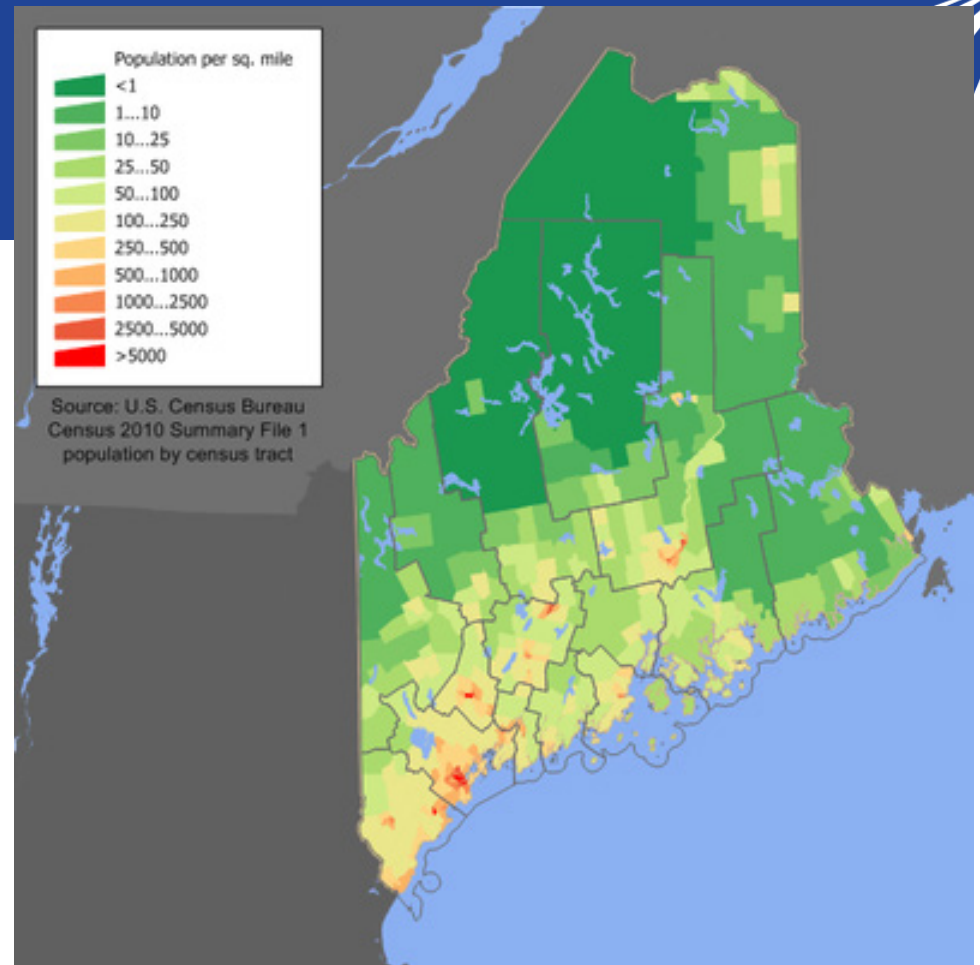
Title

Population = 1.33 million

Over 35,000 sq. mi.

Highest Point, 1 mile at Mt. Katahdin

1820 became the 23rd state





- State berry: Wild blueberry
- State bird: Black-capped chickadee
- State dessert: Blueberry pie
 - made with wild Maine blueberries
- State fish: Land-locked salmon
- State gemstone: Tourmaline
- State insect: European honey bee
- State mammal: Moose
- State soft drink: Moxie
- State soil: Chesuncook soil
- State treat: Whoopie pie
- State tree: Eastern White Pine



MaineDOT Three Year Program

- **\$2 Billion, 1600 Work Items**
- **\$244 M – 212 Miles for Highway Con/Rehab**
- **\$213 M - 718 Miles of Pavement Preservation**
- **\$83 M – 1800 Miles Light Capital Paving**
- **Maine – 23,000 Centerline Miles**
- **MaineDOT – 9000 Miles – IT'S ALL HMA!**

HMA Performance Spec. Experience



- HMA is accepted based on QA spec using PWL quality measure
 - VMA (use Superpave + 1%)
 - Voids
 - Asphalt Content
 - Density
- Smoothness Spec used on selected projects (generally Interstate and reconstruction)
- Centerline joint compaction spec on certain high priority projects (91% Gmm minimum)

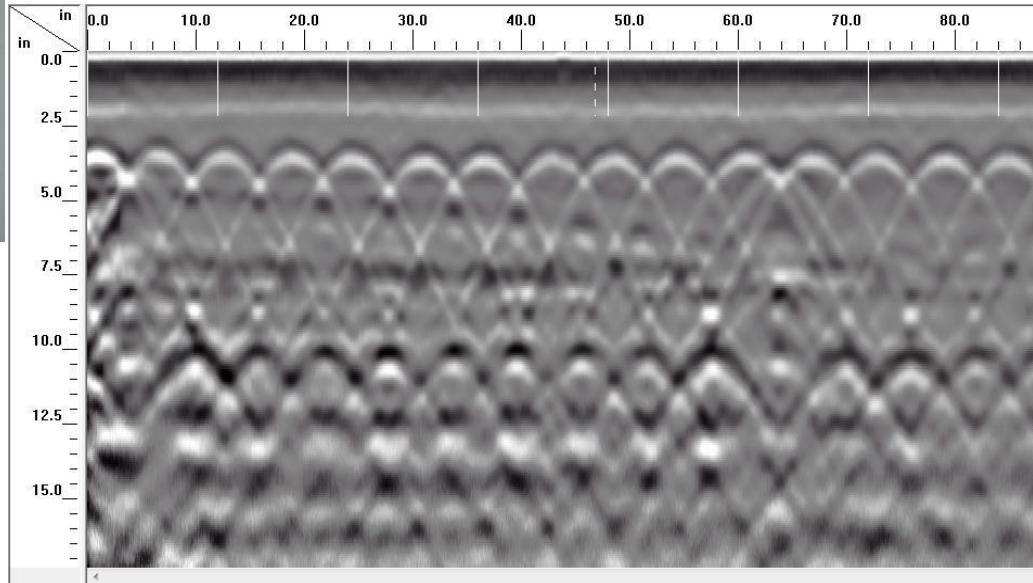
R07 Project #1

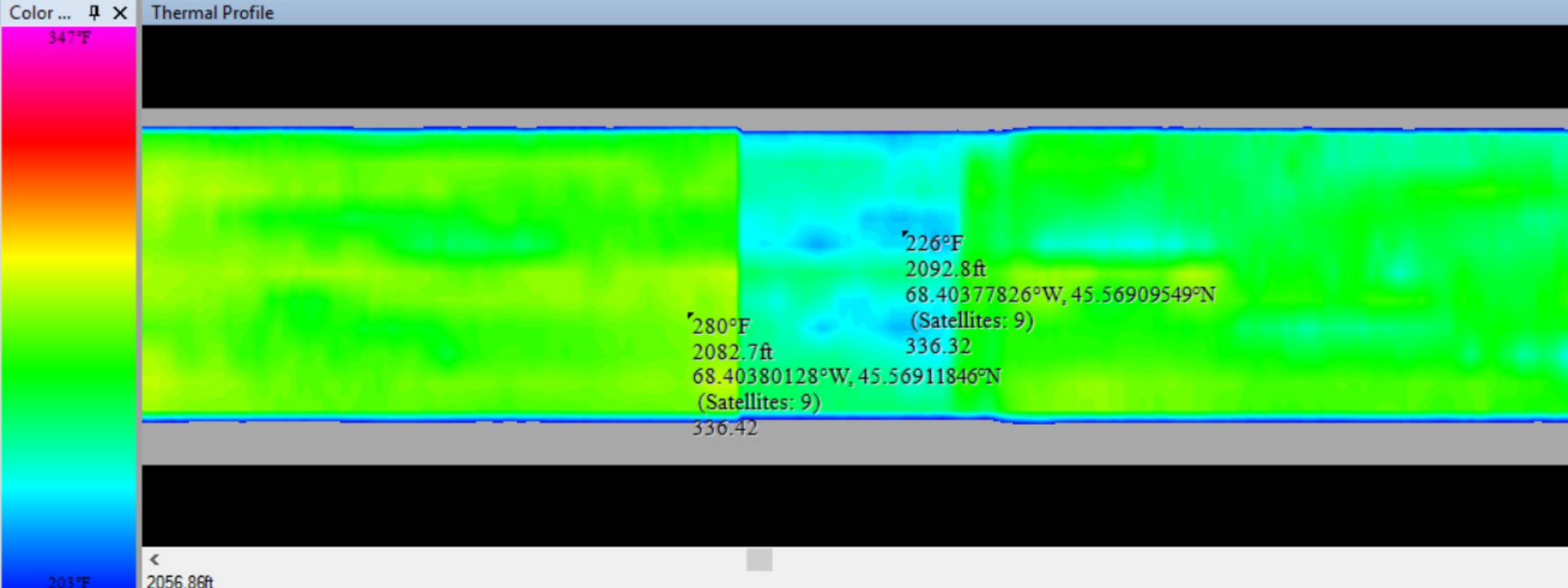
PART 1 – Asphalt Pavement

- ▶ Intelligent Compaction and Infrared Automated Thermal Profiling Systems
- ▶ Upgrade AMPT to conduct uniaxial fatigue in order to perform mix design evaluation
- ▶ Conduct GPR density profiles on two asphalt paving projects for mat and joint density – UPDATE: Demonstration on 3 projects in 2016
- ▶ Conduct moisture sensitivity testing on HMA specimens with Moisture Induced Stress Tester (MIST).
- ▶ Evaluate several asphalt mix designs with the Asphalt Pavement Analyzer, for both rut measurement and the Hamburg Wheel Tracker.
- ▶ Mix design analysis using the LVECD analysis program.

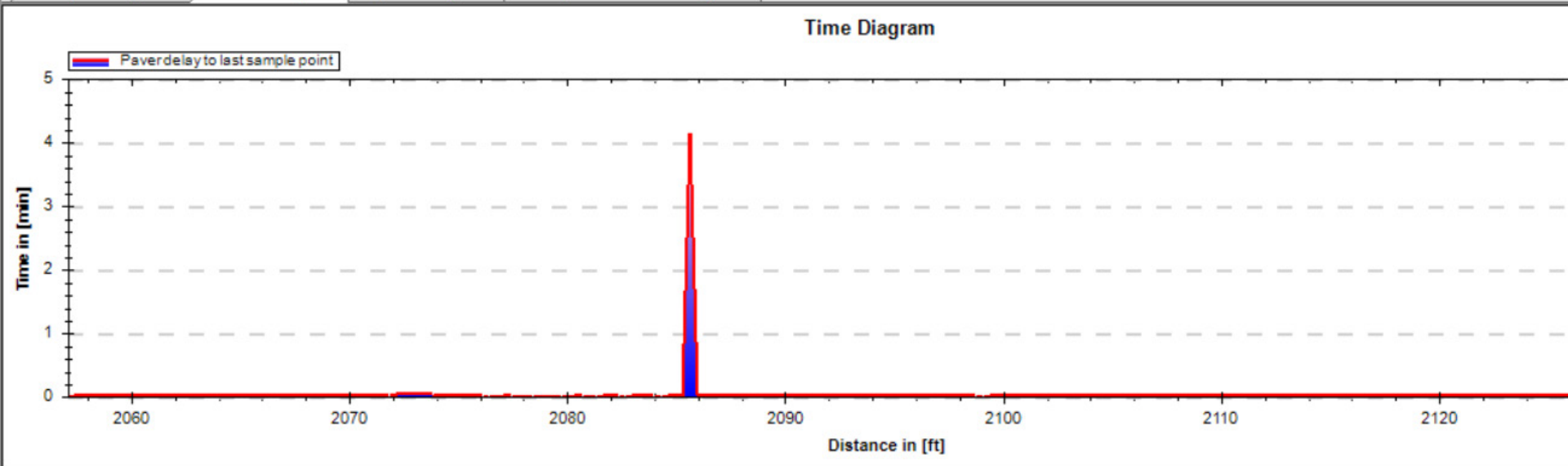
PART 2 – Concrete Bridge Deck

- ▶ Handheld Surface Resistivity Testing in the field for permeability. Compare field collected SRT to lab SRT values
- ▶ Measure depth and location of reinforcing steel with GPR.





Project Properties | **Time Diagram** | Speed Diagram | Temperature Class Diagram



R07 Project #2

- **Performance-based mix design system for asphalt pavements**
 - **R07 Guide offers potential tools**
- **Rutting potential by means of the Flow Number and Asphalt Pavement Analyzer**
- **Fatigue cracking prediction using Simplified Viscoelastic Continuum Damage (S-VECD) measurement**
- **Moisture damage potential using the Hamburg wheel tracker and the Moisture Induced Stress Tester**

Current Performance Specifications Experience

- **Quality Assurance Specs.** – What we've learned.....
- QC Plans, Quality Level Analysis w/Percent Within Limits, take your time with implementation using pilot projects to collect data and gain experience, get industry buy in, conduct combined DOT/Industry training/workshops
- Partnering with industry is **critical!**
- Finding the right measures is challenging, have at times good Pay Factor but poor product

Current Performance Specifications Experience

R07 Project #1 to date

- Demonstration IC and IR projects in 2015/2016
- Hamburg Testing on contractor mix designs
- Several projects using HWT for JMF approval
- Ultrasonic Pulse Velocity Test and Indirect Tensile Strength Test - Moisture conditioning with MIST Device

Barriers to PS Implementation

- IC requires base station for GPS correction
 - Overlay projects don't include GPS
- HMA industry slow to buy-in
 - QC managers not using data on demo projects
 - Slow to realize benefits
- HMA Mix – many Contractors don't have Hamburg, MIST device, AMPT, etc.
- No national agreement on asphalt cracking tests
 - SCB, DCT, cyclic fatigue, Texas OT, Beam fatigue
- Concrete – Internal and external resistance to change

2017 Projects – Asphalt

- Special Provision for IC w/base station and Pave-IR
 - Shadow pay adjustment for thermal uniformity
- Will also conduct GPR density scanning
- Expanded use of HWT for JMF approval/production monitoring
- QC Plans to address these technologies
- Build library of LVECD data for future PB design criteria

2017 Projects - Concrete

- Special Provision using GPR for rebar cover (w/shadow pay adjustment)
- Collect more data using SR for in-place testing
- Work with suppliers to implement Performance Engineered Concrete mixes
 - Optimized designs using Shilstone/Tarantula curve approach
- Pilot project to include concrete shrinkage testing
 - AASHTO T 160

Stupid Law?

024. In Augusta, Maine, it is illegal to stroll down the street playing a violin.

<http://weirdlaws.tumblr.com/>

