

# SHRP2 R07 Performance Specifications Peer Workshop

Montgomery, Alabama

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

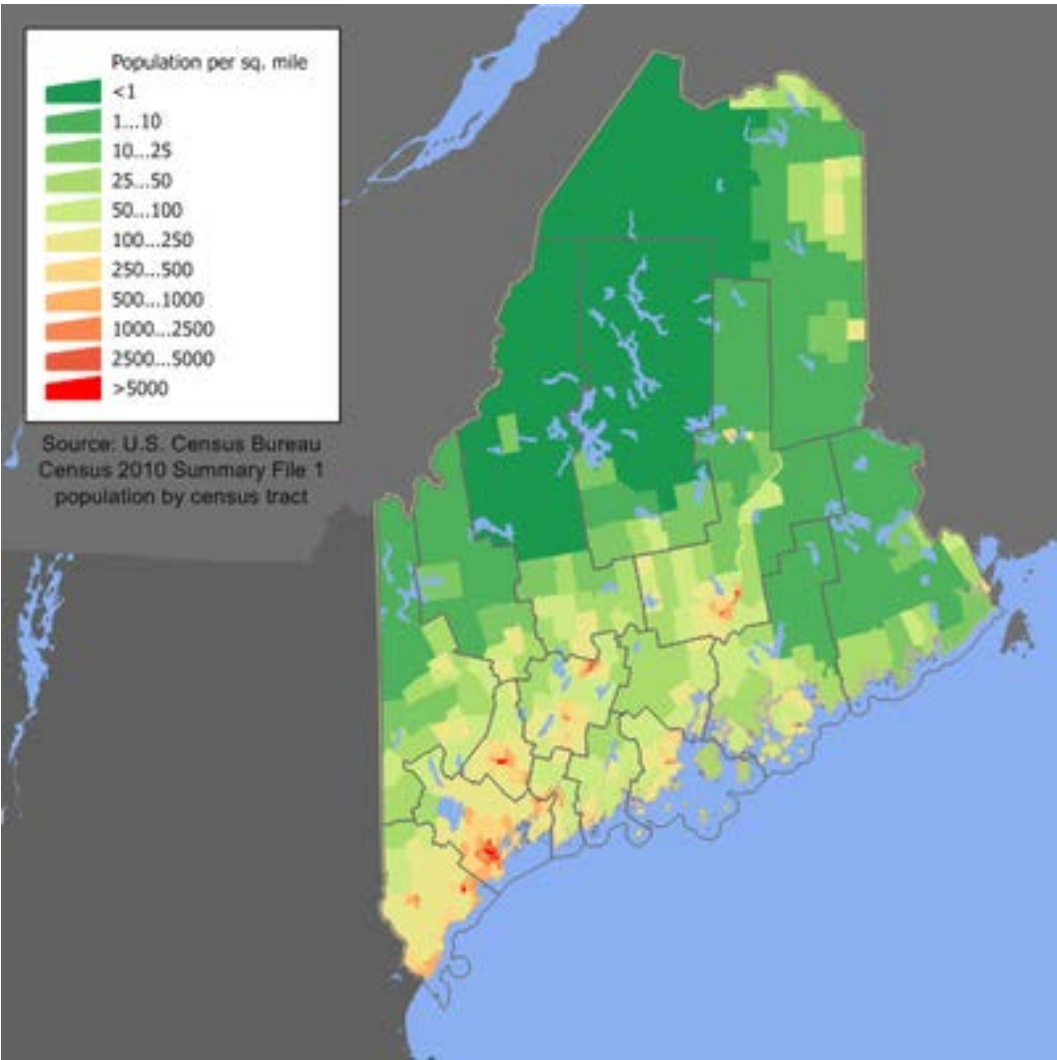


Population = 1.33 million

Over 35,000 sq. mi.

Highest Point, 1 mile at Mt. Katahdin

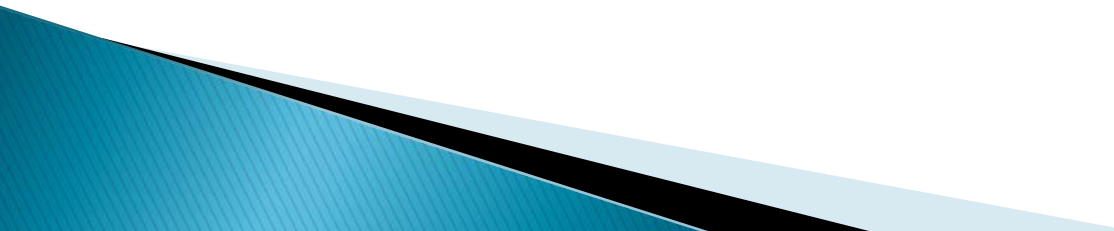
1820 became the 23<sup>rd</sup> state



- ▶ 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 series
- ▶ 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!**
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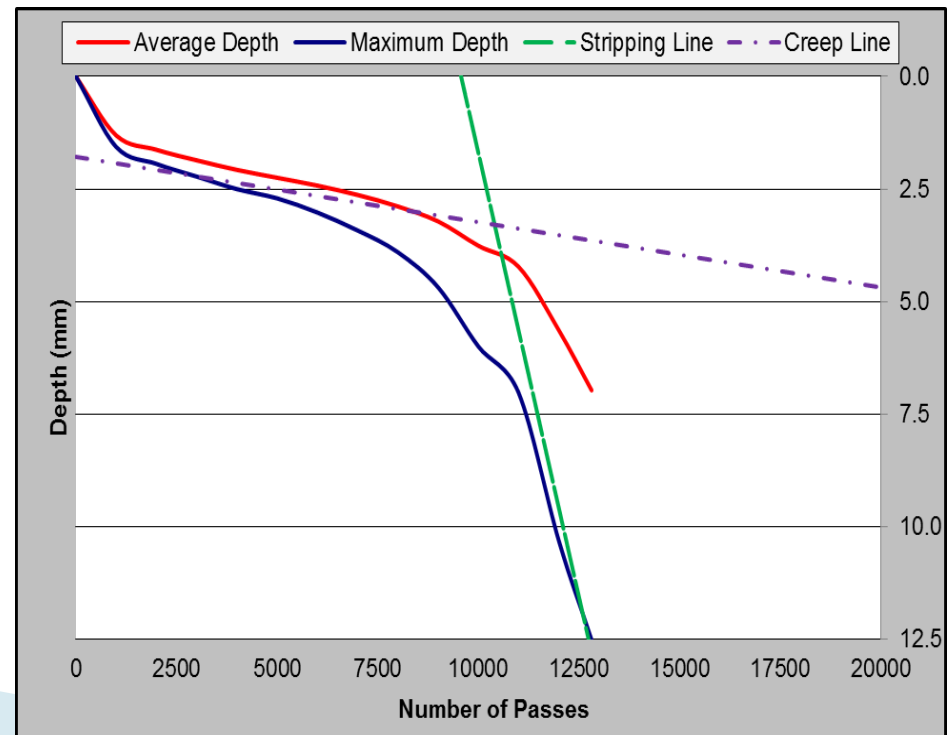


# HMA Performance Spec. Experience

- ▶ HMA is accepted based upon QA spec with PWL related to measures
  - VMA (Use Superpave +1%)
  - Voids
  - Asphalt Content
  - Density
- ▶ Ride specification used on selected projects (generally Interstate and reconstruction)
- ▶ Centerline joint compaction specification on certain high priority projects (91% minimum PWL)

# HMA Performance Spec

- ▶ Current initiative to gain durability not achieved with the current process
- ▶ Starting a phased in implementation of HWT specification in 2016





# Concrete Performance Specifications Experience

- ▶ **20 years QA specifications**
  - Permeability (RCP => SRT) – PWL
  - Air Content
  - Compressive Strength
  - Rebar Cover – (discontinued)
  
- **Mix Designs**
  - Class A, Class LP
  - ASR specification





# R07 Project #1

## PART 1 – Asphalt Pavement

- ▶ Intelligent Compaction and Infrared Automated Thermal Profiling Systems
- ▶ Upgrade Maine's existing AMPT with a uniaxial fatigue kit in order to perform mix design evaluation
- ▶ Conduct GPR density profiles on two asphalt paving projects for mat and joint density
- ▶ Conduct moisture sensitivity testing on HMA specimens with the 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 HMAQRSS software developed by NCHRP 9-22.

## 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.
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# 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
- ▶ 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
  - Data collected needs to be analyzed
- ▶ Hamburg Testing on contractor mix designs
- ▶ Ultrasonic Pulse Velocity Test and Indirect Tensile Strength Test – Moisture conditioning with MIST Device



# Barriers to PS Implementation

- ▶ IC and IR technologies are complex, x/y coord., how are values calculated?, etc. Equipment cost, training, industry buy in
- ▶ More difficult for smaller contractors
- ▶ HMA Mix – Contractors don't have APA, Hamburg, MIST device, AMPT
- ▶ Concrete – GPR requires ground-truthing with drilling




# R07 Goals

- ▶ Short-term (1–2 years), and long-term (4–6 years)
  - ▶ Pilots for IR/IC, shadow testing for mix performance
  - ▶ Pilots and shadow testing for concrete GPR and SRT
  - ▶ Incorporate HMA Mix design devices into approval process
- ▶ Long term –
  - ▶ Implement performance mix design & IC/IR for HMA pavements
  - ▶ Implement concrete GPR and field SRT, consider concrete cracking specification for new decks



# Why Pursue Performance Specifications?

- ▶ Density and uniformity of thin HMA overlays
  - ▶ Improve overall HMA performance
  - ▶ Replace destructive testing with NDT
  - ▶ Give contractors tools to improve product/uniformity
  - ▶ Concrete – provide assurance for rebar cover = longer service life
  - ▶ Field SRT provides near-immediate feedback on permeability versus 28 to 56 day delay for lab tests
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# Stupid Law?

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

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



