

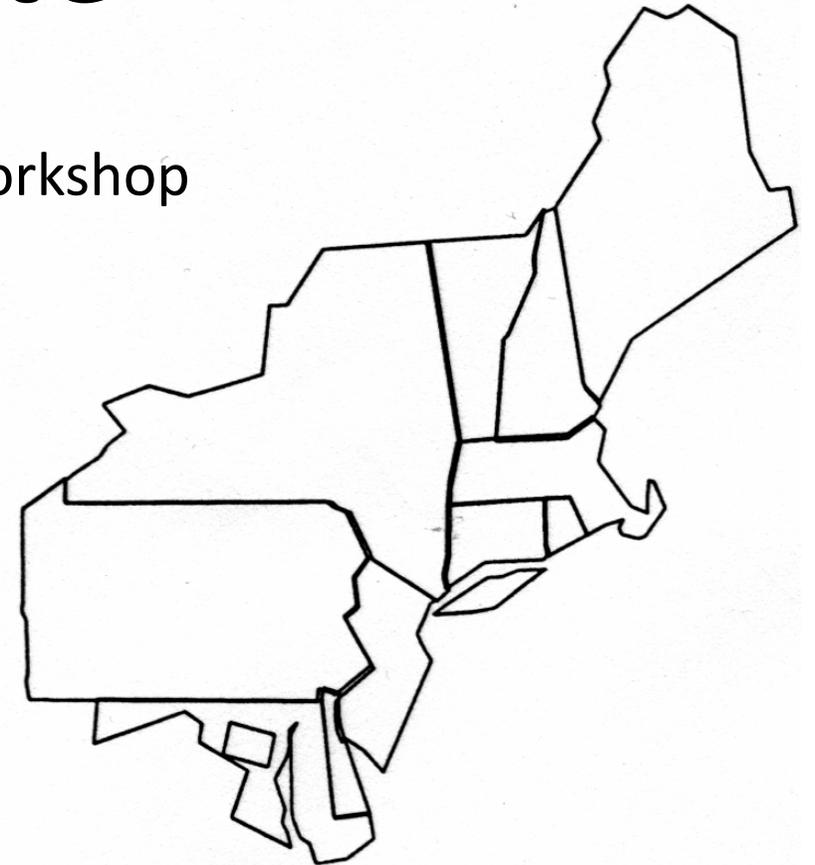
# NEAUPG Update

50<sup>th</sup> Mid-Atlantic Quality Assurance Workshop

Hershey, PA

February 8, 2017

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- MSCR % Difference
- REOB
- MSCR
- RAP
- $\Delta T_c$



Anton-Paar SmartPave Asphalt Rheometer

# Current Aging Approaches

- Current 20 hour PAV does not represent long enough aging condition to identify critical performance issues
  - Extend 20 hour PAV to 40 hour PAV
    - Longer time to grade binders
  - Use thinner films in the PAV
    - Less material for testing
  - Use extremely thin films in an oven
    - Very small amounts of binder – require special 4mm testing
- There is no durability or fatigue parameter
  - $G^* \sin \delta$  does not correlate well with fatigue or durability
- $\Delta T_c$  is intended to capture brittle cracking



Applied Test Systems PAV

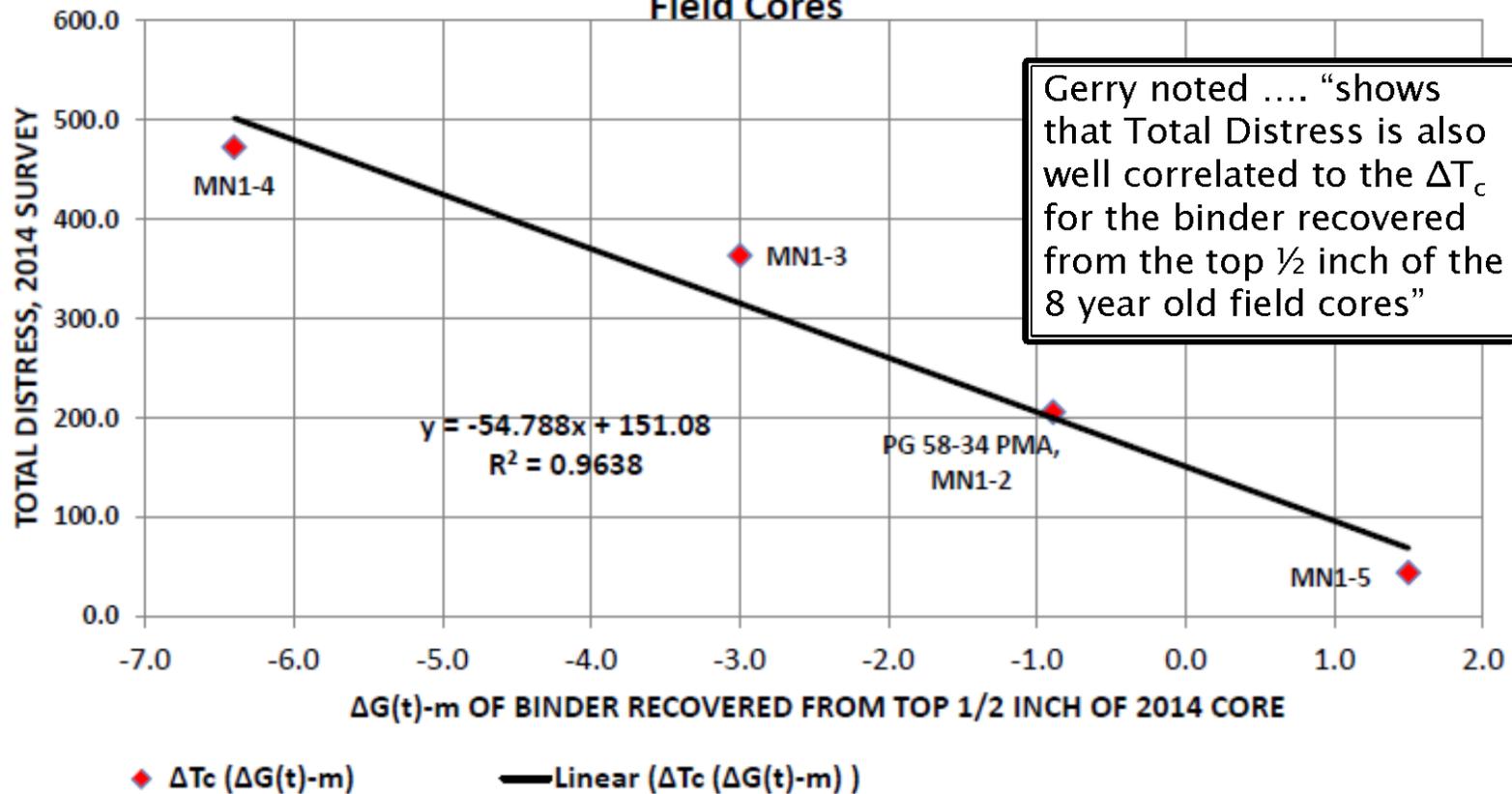
# What is $\Delta T_c$ ?

- Defined as the difference between S and m criteria with the BBR
- $\Delta T_c = T_{s(300 \text{ Mpa})} - T_{m(0.300)}$
- T is the grade temperature for either S or m
- $\Delta T_c = -3.0^\circ\text{C}$  - Cracking Warning
- $\Delta T_c = -5.0^\circ\text{C}$  - Cracking Limit

# $\Delta T_c$ vs Distress

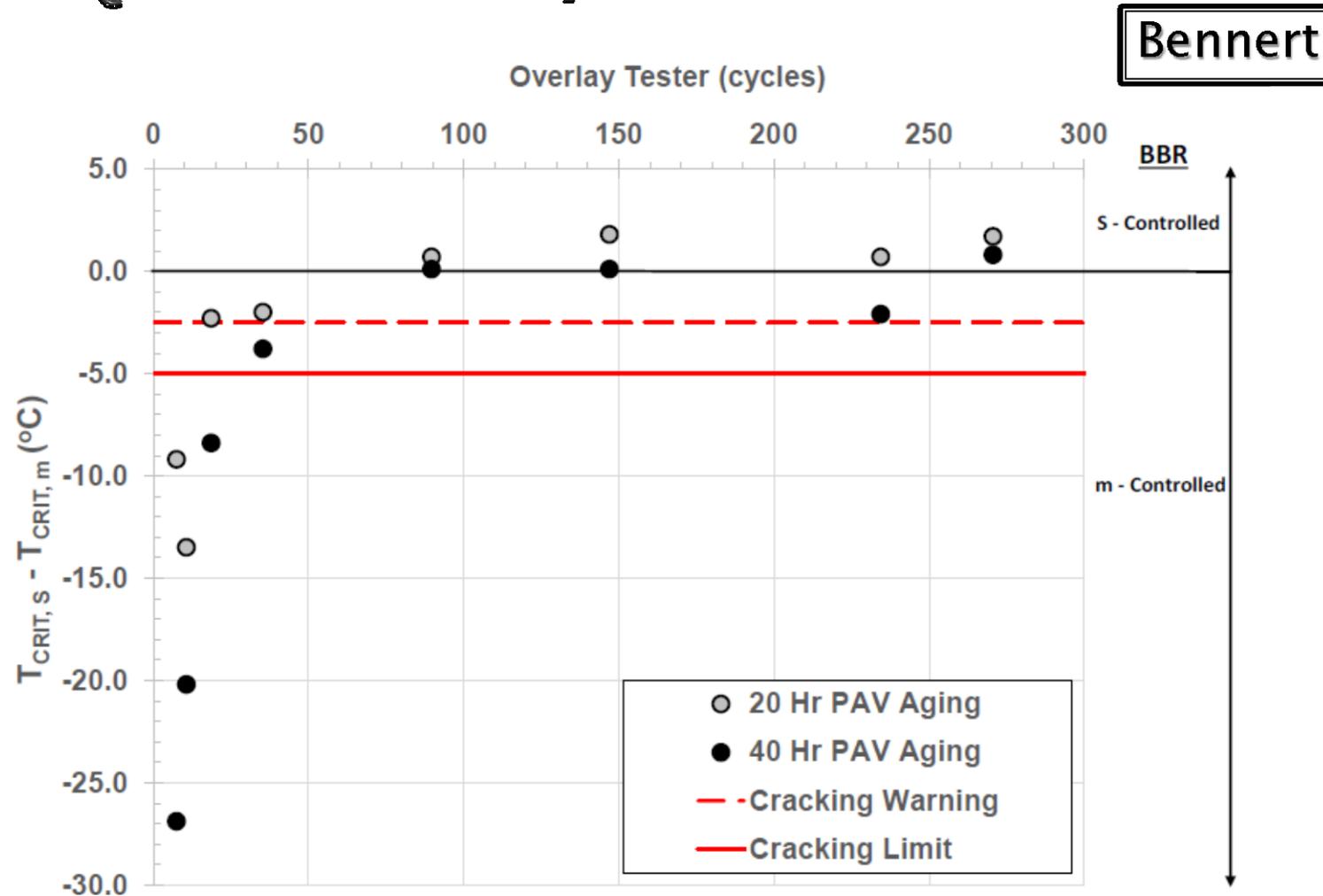
Reinke

Total Distress = F( $\Delta G(t)-m$ ) of Binder Recovered from top 1/2 inch of Field Cores



Gerry noted .... "shows that Total Distress is also well correlated to the  $\Delta T_c$  for the binder recovered from the top 1/2 inch of the 8 year old field cores"

# $\Delta T_c$ vs. Overlay Tester



# $\Delta T_c$ / Extended Aging ILS

- First ILS for  $\Delta T_c$  / Extended Aging in NE
  - 24 labs participating
  - Two binders – PG 58S-28 and PG 64E-22
- Testing of  $\Delta T_c$  at 4 different aging conditions
  - Method A – Standard 20 hours PAV aging
  - Method B – Extended aging of back to back standard 20 hours in PAV (20+20)
  - Method C – Extended aging of standard 20 hours – samples remain in PAV for approximately 4 hours w/o pressure, then again for standard 20 hours (20+4+20)
  - Method D – Extended aging of 40 hours in the PAV
- Need as more additives / rejuvenators become available
- Results will be shared at April meeting

- Performance test state survey
- Possible surrogate performance tests in NY
- Regional porous asphalt specification
- Asphalt research clearing house
- Performance related specification pooled fund study



## Concept:

- Performance Related Specifications (PRS) can improve asphalt pavement performance
- New tests, procedures, and practices must be implementable and administered on an agency wide basis
- Calibration by each agency will be required – develop pass/fail criteria, test temperature, strain rates, etc.
- Agencies should strive for regional uniformity in the specification provisions

## Approach:

- Pooled fund contract will be established with all the Resource Centers and administered by NHDOT
- Each state establishes their specific work plan/budget to accomplish their goals
- Each state will work with a selected Primary Resource Center – Resource Centers may work with one another to enhance data collection
- Data from all Resource Centers will be available

## Program:

- The Resource Centers shall be:
  - UNH – PI - Professor Jo Daniel
  - UMASS-Dartmouth – PI - Professor Walla Mogawer
  - Rutgers University – PI - Tom Bennert
  - Penn State University – PI - Mansour Solaimanian
  - VATRC – PI - Stacey Diefenderfer
- PI primary support
  - UNH – ME, NH, VT
  - UMASS – MA, CT, RI
  - Rutgers – NJ, DE, NY, PA
  - Penn State – PA
  - VATRC – MD, VA

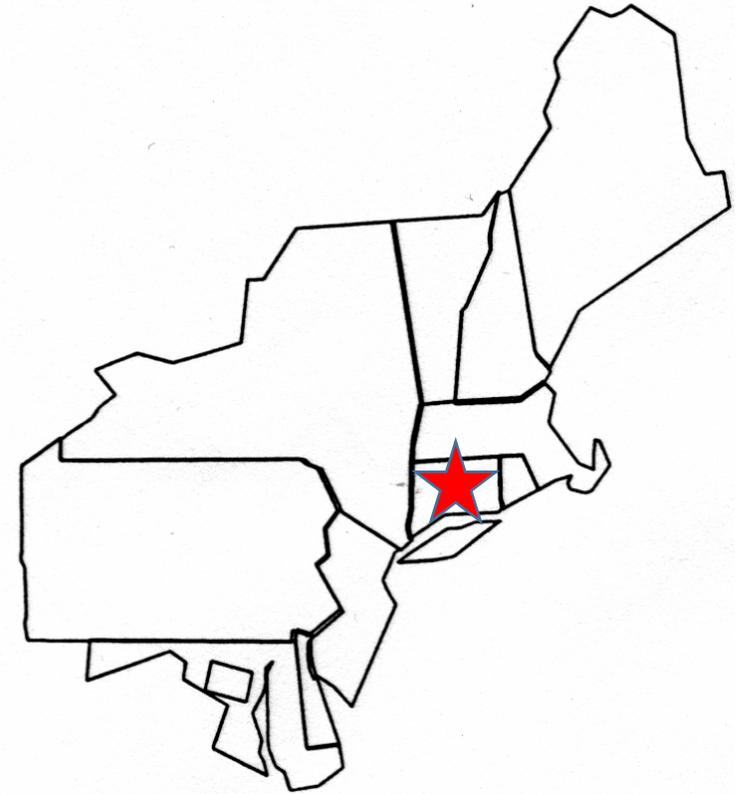


## Program:

- Each PI meets with respective state agency
- PI will finalize a work plan and budget
- PI will recommend appropriate tests and protocols to use for establishing the empirical relationships for good and poor performing mixes
- The PI will recommend performance criteria based on field samples of known performance
- Develop of a work plan to validate the PRS on field projects
- NY, NH, MA, VA, and PA currently on-board

# Mark Your Calendars

- Binder/Mix/Steering Committee Meeting
  - April 18 – Rocky Hill CT
- Annual NEAUPG Meeting
  - Hilton Hotel – Hartford, CT
  - October 18-19, 2017





# Questions

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