Use of Warm Mix Asphalt at NYSDOT

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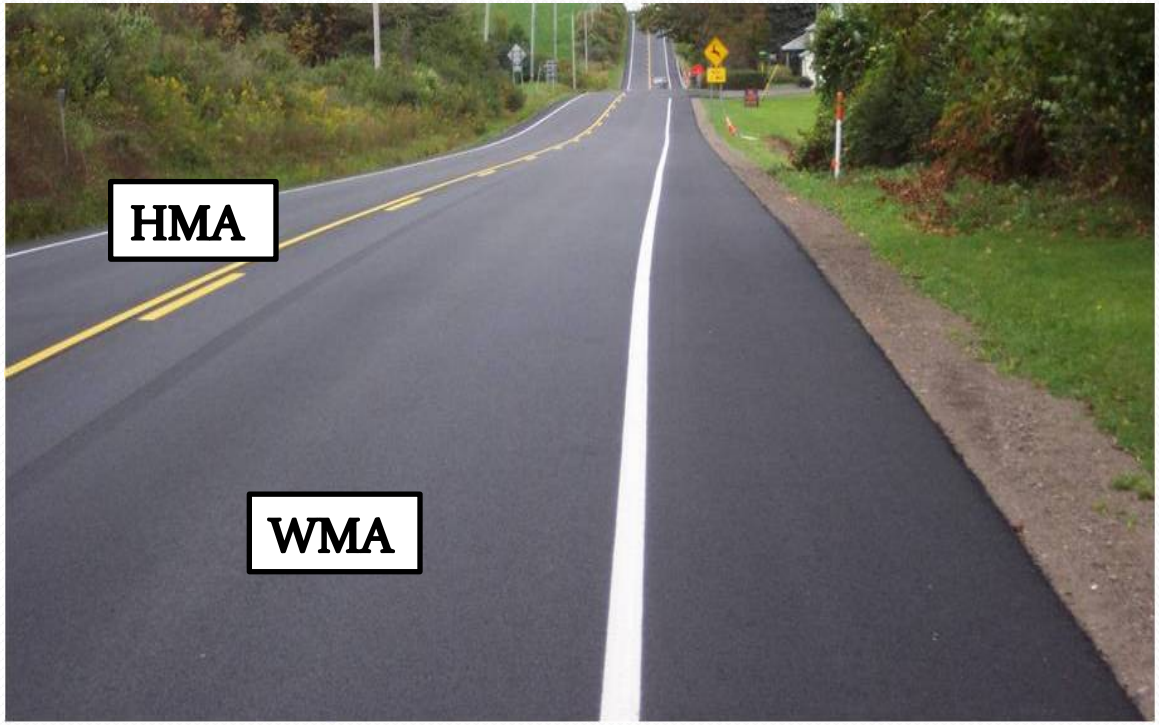
Overview

- Past Use of WMA at NYSDOT.
- What did we learn?
- Experimental Work Plan
- Current and Future Use of WMA at NYSDOT

Past Efforts

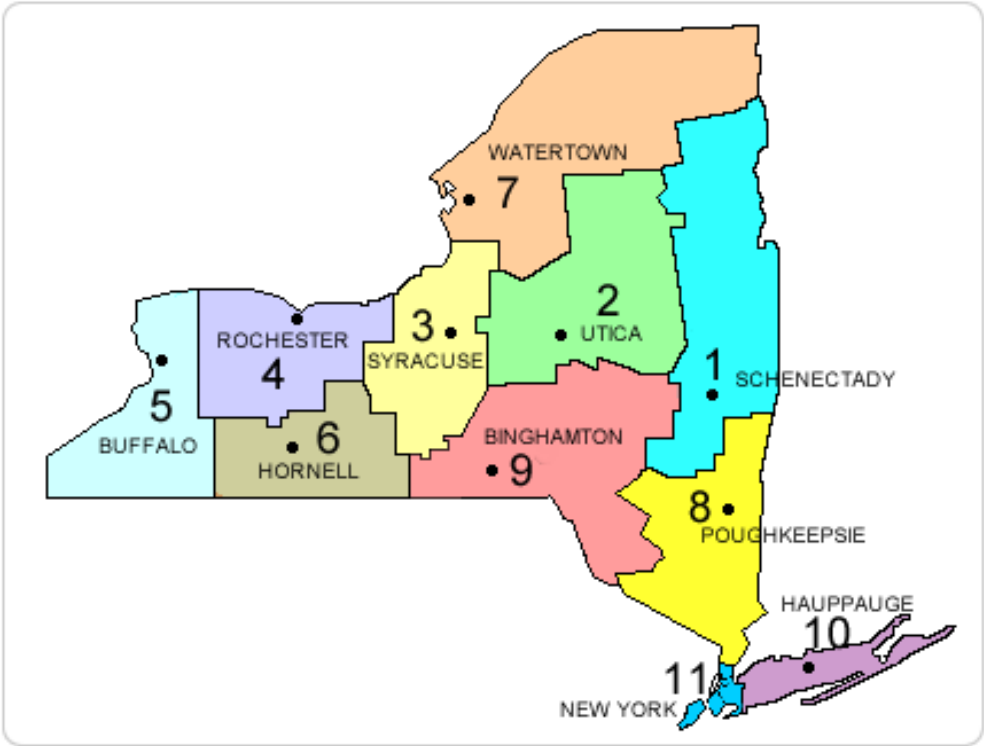
- Tracking national efforts since 2004.

- Trial sections being placed on NYSDOT roads since 2006



Past Efforts

- Prior to 2010, over 50,000 tons of WMA has been placed on NYSDOT projects.
- Several 400+ ton trial sections.
- Placed in 5 different Regions.
  - Majority of this work has been done in Region 3.
- 5 Different Technologies were used



Past Efforts

- **Region 1 (Albany)**

  - September 2008 – WMA using the Low Emission Asphalt (LEA) technology was placed on State Route 43 in the town of Stephentown.

  - December 2009 – Evotherm technology was used as a compaction aid on the approach ramp for the Crown Point Bridge ferry service.

Lake Champlain Bridge Crown Point, NY


Lake Champlain
Bridge
Crown Point, NY
12/15/2009


Lake Champlain
Bridge
Crown Point, NY
Link-Belt
HAMM
12/15/2009


Lake Champlain
Bridge
Crown Point, NY
HAMM


Lake Champlain
Bridge
Crown Point, NY

Past Efforts

- **Region 3 (Syracuse)**
  - September 2006
    - WMA using the Low Emission Asphalt (LEA) technology was placed on State Route 11 just south of Cortland.
    - WMA using Sasobit technology was placed on State Route 80 in the town Tully.
  - 2007 – Almost 35,000 tons of WMA using the LEA technology was placed on various State roads in Cortland County.
  - October 2009 – WMA using the Terex technology was placed on State Route 104B near the city of Mexico.


State Route 104B
Mexico, NY
TEREX
MIDLAND
10/23/2009


State Route 104B
Mexico, NY
10/23/2009


State Route 104B
Mexico, NY
264°
10/23/2009

Past Efforts

- **Region 5 (Buffalo)** - July 2009 – WMA using Hypertherm technology was placed on State Route 93 in Lockport.

Past Efforts

- **Region 7 (Watertown)** - June 2008 – WMA using Sasobit technology was placed on State Route 12 in the town of Clayton.

- **Region 9 (Binghamton)** – July/August 2009 – WMA using the LEA technology was placed on State Route 23 in the town of Pitcher.

Past Efforts at other agencies within New York

- **NYCDOT** – September 2008 – WMA using the Evotherm technology was placed on 168th street in Queens.
- **NYSTA –** July 2006 – WMA using the Sasobit technology was used to perform full depth repairs (18" deep) west of Syracuse.
- Various Counties have placed WMA trial sections, including **Albany**, **Washington**, **Jefferson**, **Erie**, **Westchester, Cortland**, and others.

What did we learn?

- Early age rutting has not been an issue.
  - NYSDOT WMA trials have not rutted.
  - We have not heard of rutting issues in other places.
  - We need more trials in varying traffic and climatic conditions to ensure there is not a problem.
- Moisture susceptibility has not been an issue.
  - WMA mixtures meet existing specification requirements.

What did we learn?

- Construction practices similar to conventional mixtures.
  - Handwork has not been a big issue.
  - Good pavement densities have been achieved using the same or less effort.

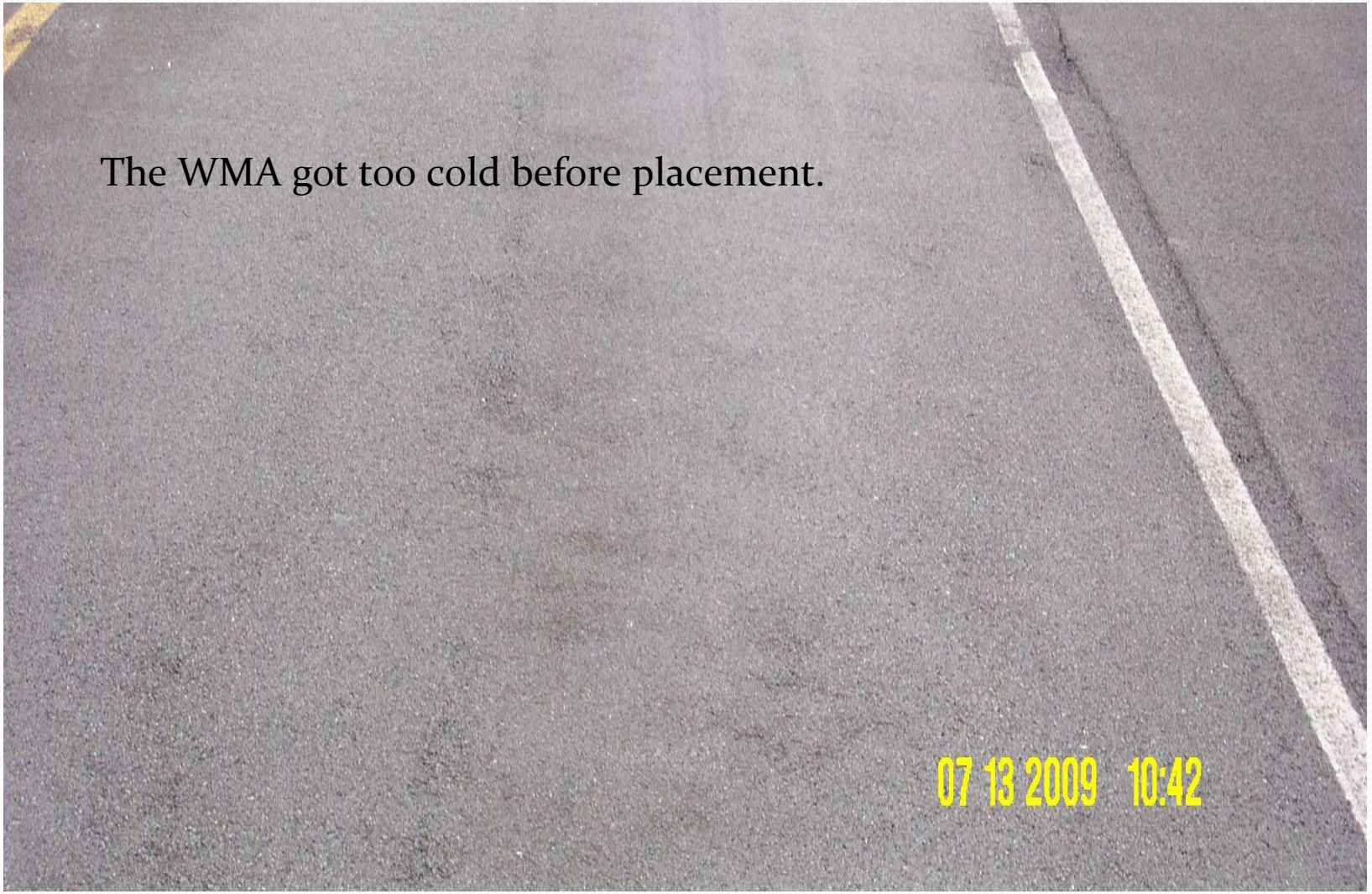

HYSTER
9/24/2008


NEW YORK CITY
DOT
9/24/2008

What did we learn?

- Construction practices similar to conventional mixtures (continued).
  - Mixtures still have to be handled and placed properly.
    - Appropriate temperatures must be maintained for the WMA technology.
    - Follow the usual practices to prevent segregation.
    - Proper paving practices need to be followed.

What did we learn?



What did we learn?

- Definite potential to open roadways to traffic sooner.
  - **NYSTA** – 18" full depth repairs.
    - Repair work was performed overnight and the roadway had to be fully opened to traffic by 6 am.
    - Conventional HMA repairs showed signs of rutting immediately.
    - WMA repairs did not rut.

What did we learn?

- Every technology is different – one size does not fit all.
  - Laboratory testing modification differ with technology.
    - Test sample conditioning varies.
    - Sample compaction temperature varies.
  - Some technologies require plant modification.

Experimental Work Plan

- Established a WMA Technical Workgroup
  - NYSDOT
  - NYSTA
  - FHWA – New York Division
  - AGC – New York State Chapter
  - New York Construction Materials Association
    - Asphalt Mixture Producers
    - PG Binder Suppliers
    - WMA Technology Providers

Experimental Work Plan

- Developed a programmatic experimental features plan.
- Objectives.
  - Expand experience and knowledge.
    - Various Agencies (NYSDOT, NYSTA, FHWA)
    - HMA Producers
    - Contractors
  - Evaluate more WMA mixtures
    - Varying aggregates and PG Binder sources.
    - Varying traffic and climatic conditions.
    - Cost
  - Validate the experimental WMA specification and procedures.

Experimental Work Plan

- Plan approach
  - Develop a WMA Approval Process
  - Develop a WMA Specification
  - Getting asphalt paving projects through out the state using this WMA specification out for bid.
  - Allow further substitution of WMA on existing asphalt paving projects.

Experimental Work Plan

- Developed an Approval Process for the WMA Technologies
  - Initial Meeting with NYSDOT
  - Resume of projects with Agency Contacts
  - Required Rut Performance Testing on NYSDOT Mix Design
    - Top Course 75 Gyration Mix Design
    - Non-RAP Mix
    - WMA Technology added at a typical rate
  - PG Binder and Additive Sample Submission
  - Development of “Production, Testing, and Compaction Details”

Experimental Work Plan

- Production, Testing and Compaction Details
  - Developed by the Technology
  - Procedures for the proper use of a given Technology
    - Directions for the PG Binder Supplier (if applicable)
    - Directions for the Mixture Producer
    - Directions for the QC and QA Technicians
    - Directions for the Contractor

Experimental Work Plan

- Production, Testing and Compaction Details (con't)
  - Example - Chemical and Organic Additives at the PG Binder Primary Source
    - What equipment is needed to properly mix the additive?
    - What are the proper dosage rates?
    - Storage/Handling requirements?
      - Storage of the additive?
      - Storage of PG Binder mixed with the additive?
    - Shipping requirements?

Experimental Work Plan

- Production, Testing and Compaction Details (con't)
  - Example – Foaming Processes At the Mixture Production Facility
    - Is the system compatible with drum plants? batch plants? both? various manufacturers?
    - What equipment does the Production Facility need? electrical requirements? water feed requirements?
    - How does this equipment fit into the automation and recordation systems? how is it calibrated?
    - What water dosage rates are recommended? what mixing temperature is recommended?
    - What equipment maintenance is required? daily? weekly? etc.

Experimental Work Plan

- Once a Technology is Approved
  - Added to NYSDOT's List of Approved Materials and Equipment
  - Contact person for the Technology Supplier
  - Link to the "Production, Testing and Compaction Details"

Technical Services - Materials - Approved List

Bituminous Materials

WARM MIX ASPHALT (WMA) TECHNOLOGIES

A. ORGANIC (WAXES) ADDITIVES (712-1010)

TECHNOLOGY	TECHNOLOGY PROVIDER	CONTACT	DETAILS (Approval Date)
SONNEWARMix™	Sonneborn, Inc. 575 Corporate Drive, Suite 415 Mahwah, NJ 07430	Chris Strack 203-261-8582 chris.strack@sonneborn.com	SONNEWARMix (06/08/2010)

B. CHEMICAL ADDITIVES (712-1020)

TECHNOLOGY	TECHNOLOGY PROVIDER	CONTACT	DETAILS (Approval Date)
Evotherm WMA	MWV Asphalt Innovations 5255 Virginia Avenue North Charleston, NC 29406	Everett Crews 843-697-5509 everett.crews@mwv.com	Evotherm (09/10/2010)
Low Emission Asphalt-Lite (LEA-Lite)	McConnaughay Technologies 1911 Lorings Crossing Cortland, NY 13045	Gregory Harder 866-622-8324 gharder@mcconnaughay.com	LEA-Lite (06/08/2010)

C. FOAMING PROCESSES (712-1030)

TECHNOLOGY	TECHNOLOGY PROVIDER	CONTACT	DETAILS (Approval Date)
Low Emission Asphalt (LEA)	McConnaughay Technologies 1911 Lorings Crossing Cortland, NY 13045	Gregory Harder 866-622-8324 gharder@mcconnaughay.com	LEA (06/08/2010)
Terex® foamed warm mix asphalt system	Terex Roadbuilding 9528 W. I-40 Service Road Oklahoma City, OK 73128	Scott McMaster 405-208-3982 scott.mcmaster@terex.com	Terex (07/27/2010)

Revised on: September 10, 2010

Experimental Work Plan

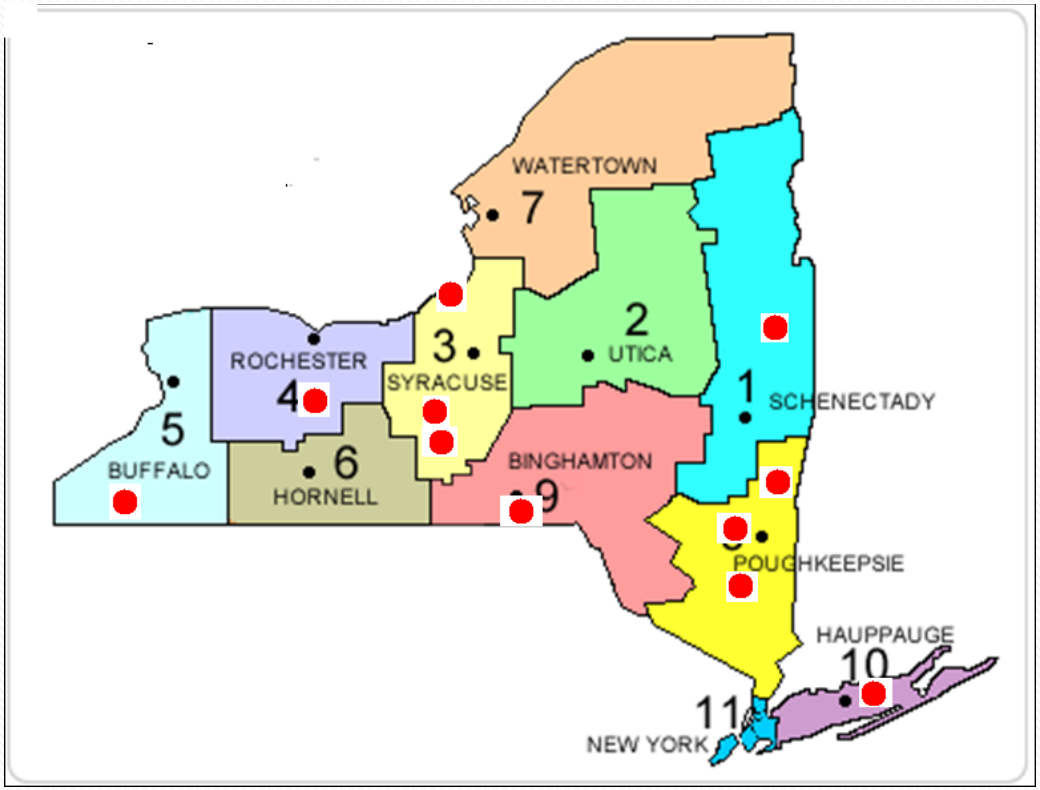
- Specifications
  - Required the use of an Approved Technology
  - Require the “Production, Testing, and Compaction Details” be followed
  - Required the Producer use an existing NYSDOT HMA Mix Design
  - Required some additional testing
    - Tensile Strength Ratio
    - Performance test for rutting
      - APA
      - Hamburg
      - AMPT Flow Number

Experimental Work Plan

- Solicit projects from our Regional Offices
  - Location
  - Traffic Volumes
  - Risk
  - Require at least a small HMA control section on each project

Current and Future Use of WMA at NYSDOT

- 2010
  - 9 Projects went out for bid
    - >30 million ESAL level
    - 3 Courses of WMA over Rubbilized PCC
  - 2 Projects with WMA Substitution



Current and Future Use of WMA at NYSDOT

- 2011
  - Continue with Projects from 2010
  - Put out more projects for bid
  - WMA substitutions on selected projects
- Future
  - Long term implementation looks very promising
  - Contractor/Mix Producer choice

Questions

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