NJDOT STATE REPORT

NORTHEAST PAVEMENT PRESERVATION PARTNERSHIP ANNUAL MEETING APRIL 29 – MAY 1, 2015

NEWARK, DELAWARE

OVERVIEW

- Pavement Specification Changes
- Status of NJDOT Highway System
- NJDOT Pavement Preventive Maintenance Treatments
- Recycling and Porous Pavement

PAVEMENT SPECIFICATION CHANGES

SPECIFICATION CHANGES

- Warm Mix Asphalt additives are now permissible in all HMA mixes
 - Promotes better compaction
 - Reduces VOC's
- HMA mixes designated by "H" compaction level have been eliminated
- MSCR test is now adopted by northeast states including NJ
 - Binder designated PG 76-22 is replaced by PG 64E-22 for polymer modified asphalt
 - Example: Hot Mix Asphalt 12.5M<u>E</u> Surface Course

SPECIFICATION CHANGES

- Division 420 Pavement Preservation Treatments added to the SI
 - Section 421 Micro Surfacing and Slurry Seal
 - Section 422 Fog Seal
 - Fog Seal Surface Treatment
 - Fog Seal Strip

STATUS OF NJDOT HIGHWAY SYSTEM

NJDOT Maintained Pavement Status Based on IRI & SDI (Based on 2014 Data) Good 25% Deficient 44% Fair 31% Source: NJDOT Pavement Management System, 2014 Data





Source: NJDOT Pavement Management System, 2014 Data

Deficient □Fair ∎Good % of System Lane Miles _28 .27 Ŧ 2000-2001 2002-2003 Data Collection Cycle

Multi-Year Status of State Highway System

Source: NJDOT Pavement Management System

Deficient By IRI Only Deficient By SDI Only Deficient By Both Total Deficiency % of System Lane Miles Deficient $\langle\!\!\!/$ ²⁰19 /// 11 11 2000-2001 2002-2003 Collection Cycle

Multi-Year Deficiency of State Highway System

Source: NJDOT Pavement Management System

PAVEMENT FUNDING HISTORY



NJ State Highway System Lane Miles of Major Pavement Work Completed (Total system mainline lane miles = 8403)



Lane Miles



NJ State Highway System Annual Preventive Maintenance Pavement Investment



NJDOT PAVEMENT PREVENTIVE MAINTENANCE TREATMENTS

Thin Surface Highway Improvement Treatments

- High Performance Thin Overlay (HPTO)
- Ultra-Thin Friction Course (Novachip or Ultra-Thin Bonded Wearing Course)
- Asphalt Rubber Gap Graded (ARGG,
- Micro-surfacing and Slurry sea
- Fog seal
- Micro-milling

UPCOMING PAVEMENT PRESERVATION PROJECTS

(55)

I-80 EB MP 12.84 - 28.15

- Warren Co. & Morris Co.
- High Performance Thin Overlay Mainline
- Slurry Seal Ramps
- \$5-10 Million

I-195 EB MP 16.00 - 34.17

- Monmouth Co. & Ocean Co.
- Ultra Thin Friction Course Mainline



- Micro Surface Ramps
- \$5-10 Million

I-287 MP 0.00 - 5.84

- MIDDLESEX CO.
- MICRO SURFACE SCRATCH COURSE & HIGH PERFORMANCE THIN OVERLAY SURFACE COURSE
- MICRO SURFACE RAMPS
- \$5-10 MILLION

ROUTE 55 SB MP 40.00 - 26.50

- CUMBERLAND CO. & GLOUCESTER CO.
- MICRO SURFACE
 - <\$5 MILLION

UPCOMING PAVEMENT PRESERVATION PROJECTS

<u>I-80 EB & WB MP 28.1 – 41.5</u>

- Morris Co.
- High Performance Thin Overlay
 Mainline
- > \$10 Million

<u>I-80 WB 0.5 – 12.8</u>

- Warren Co.
- Micro surface
- \$5-10 Million

Additional Projects for FY2015:

- RT. 37 MP 0 6.27 IN OCEAN CO.
 - Slurry Seal
- I-78 MP 42.2 50.6 IN SOMERSET CO. & UNION CO.
 - HPTO
- I-80 EB MP 58.2 65.4 IN BERGEN CO. & PASSAIC CO.
 - Ultra-Thin Friction Course
- RT. 208 MP 3.32 10.07 IN BERGEN CO. & PASSAIC CO.
 - Micro Surfacing
- I-295 MP 14.6 24.5 IN GLOUCESTER CO.
 - HPTO

TOTAL +/- \$20 MILLION

HPTO

- High Performance Thin Overlay 1" +/- thickness
- Hot Mix Asphalt
- 4.75 mm nominal maximum size aggregate
- 7% min. PG 76-22 (or PG 64E) asphalt binder
- Volumetric Mix Design Requirements
- Mix Performance Test Requirements
 - APA Rut Test



HPTO ASPHALT PAVEMENT ANALYZER



HPTO

- Improves ride quality
 - 70% improvement on some projects
- Seals out water
- Renew road surface
- Quick open to traffic
- Minimal RAP
- Placed with a Conventional Paver or spray paver
- Bond is critical!!



ULTRA-THIN FRICTION COURSE



UTFC – SPRAY PAVER

RoadTec

Vogele





The Self-Priming Paver

ULTRA-THIN FRICTION COURSE



- Slight Improvement in ride quality
- Seals out water
- Renew road surface
- Quick open to traffic
- Minimal RAP
- Placed with spray paver
 - Superior bond with existing pavement
 - No tracking by HMA trucks!!

ASPHALT RUBBER GAP GRADED (ARGG)

- Asphalt Rubber Gap Graded 3/8" NMS
 - Surface Course (no RAP)
 - Intermediate Course (10% max RAP allowed)
 - 7% minimum AR modified binder
 - 15% minimum crumb rubber
- NJDOT Operations requested an alternative to AROGFC due to struggle with Winter Maintenance icing issues
- Field and lab performance of rubber modified asphalt mixtures continues to be excellent





ROUTE 72 MP 13.8 TO MP 18.5 ARGG

- Composite pavement with high severity reflective cracking of the existing 3" thick HMA overlay
- Design
 - Mill 3" and pave with
 - 1.5" thick Asphalt Rubber Gap Graded (ARGG) Surface Course
 - 1.5" thick Asphalt Rubber Gap Graded (ARGG) Intermediate Course (10 % RAP)
 - Shoulders
 - Mill 2" and pave 2" HMA 12.5M64 Surface Course
 - EB Shoulder MP 16 to 18.5
 - 2" HMA 12.5M64 Surface Course
 - 8" Full Depth Reclamation (FDR) with 5% cement

ROUTE 72 MP 13.8 TO MP 18.5 ARGG





ROUTE 72 MP 13.8 TO MP 18.5 ARGG

- Ride quality was improved by 67%
- Average IRI = 39 in/mile
- Air void incentive = 2% (out of 4%)
- 1st successful ARGG project
- 1st successful FDR project
- Not a good preventive maintenance example but
 - Considering for Preventive Maintenance "Tool Box" for future projects



MICRO-SURFACING AND SLURRY SEAL

- Cold applied mixture of polymer modified asphalt emulsion (CSS-1hPM), high quality aggregate, mineral filler, water, and additives
- Can apply in variable thick crosssections: wedges, ruts, scratch courses or final riding surfaces
- Good skid-resistant surface (high wet friction coefficient)
- Types of equipment
 - Truck mounted slurry paver
 - Continuous slurry paver
 - Support vehicles





MODIFIED MICRO-SURFACING RUT BOX



- Longitudinal joint fill/repair
- Fill RPM holes
- Rumble strip fill
- Approximately 24" wide



MICRO-SURFACING / SLURRY SEAL

- Slight Improvement in ride quality
- Seals out water
- Renew road surface
- Quick open to traffic
- Minimal RAP
- 25% of the cost of mill and pave
 Disadvantages
- Cracks will reflect th
- Chacks win reliect through
- Public sensitive to tire noise/macro texture
- Very weather sensitive



FOG SEAL

- Mixture of asphalt emulsion and water: ss-1h, css-1h or cqs-1h
- Applied with asphalt distributor
- Light sand application (0.25 to 0.5 lbs./sy)
- Benefits
 - Seals out water
 - Protects surface from oxidation and raveling
 - Quick open to traffic
 - No RAP
 - Pennies on the dollar





MICRO-MILLING

- More teeth than fine or standard milling drum; 3 times standard
- Transitions for thin overlays
 - Beginning and end of treatment
 - Bridge approaches
 - Bridge vertical under-clearance
- Maintain elevations, removes traffic striping/markings and improves bonding
- Improves Ride Quality
- Can be final riding surface if necessary



A micro-milling drum with 3 times (est.) more bits than a standard drum (Courtesy of Keystone Engineering)



RECYCLING AND POROUS PAVEMENT

HOT IN-PLACE RECYCLING (HIR)

- Less cost
- Perform similar to resurfacing
- Minimal RAP
- Rejuvenating oil added
- Opportunity for more thin overlays
- Opening to traffic similar to HMA paving
- Future project Rt.50 MP 10 11
 - 1" thick HPTO
 - 1.5" depth HIR of existing HMA



COLD IN-PLACE RECYCLING (CIR)

- Less cost
- Perform similar to resurfacing
- Minimal RAP
- Emulsified or foamed asphalt stabilizer
- Renew pavement structure
- Opening to traffic similar to HMA paving
- Requires HMA overlay or surface treatment
- Future projects
 - Rt.83 MP 0 3.81
 - Route I-287 Shoulders MP 47.1 58.4



FULL DEPTH RECLAMATION (FDR)

- Recycle thin structurally failed HMA pavements in-place
- Cost less
- No RAP or excavation
- Stabilize with emulsion, foamed asphalt or cement
- Restore or improve pavement structure
- Can be opened to traffic, but exercise caution
- Requires HMA overlay
- Future projects
 - Route 22 WB Shoulder MP 34.3 36.9
 - Route 55 SB Shoulder MP 21.8 26.5





ROUTE 72 MP 13.8 TO MP 18.5 FULL DEPTH RECLAMATION









POROUS PAVEMENT

- Reduce storm water runoff and contaminants in waterways
- Promote groundwater recharge
- Rt.27 Six Mile Run Bridge project, Middlesex and Somerset Counties is currently in construction
 - Full depth porous asphalt shoulders
 - 2" MOGFC
 - 8" ASDC (modified)
 - 12" to 36" Coarse Aggregate No.57 stone
 - geotextile (drainage and stabilization)



FUTURE OF HMA PRODUCTION

NJDOT ASPHALT PLANT



NJDOT PAVING CREW



QUESTIONS?

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