Saskatchewan Ministry of Highways & Infrastructure
Medium Treatments

2009 Midwestern Pavement Preservation Partnership
Schaumburg, Illinois
October 27 – 29, 2009
Outline

• Background of Preservation Program Development
• Medium Treatments
  – Currently in use
  – Under Review
• Transportation Centre of Excellence
Background
Background

• Challenges
  – Compete for funding
    • Internally & Externally
  – Increased Exploration of Natural Resources
  – Increased Public Expectation
  – Reduced Aggregate Sources
Background

Performance Targets

Network Level Planning (Strategic)

Maintenance Management System

Project Level Planning (Tactical)

DELIVERY
Background

• Network Level Treatments
  - Heavy- Overlay
  - Medium- Microsurfacing, TLO
  - Light- Aggregate Seal
  - Routine- Maintenance

$/m^2
Medium Treatments

• Micro-surfacing
  – Started 2001 with pilot project
  – Completed 440 lane.km in 2009
    • 1.6 million square metres
  – Type 3 Micro-surfacing mix
  – Rut fill with scratch coat on AC surfaces
  – Rut fill with sealcoat on granular surfaces
Medium Treatments

• Micro-surfacing (continued)
  – 5 contracts in 2009 season
  – Contracts based on a per tonne liquid AC
  – $7.50 to $8.00/m²
    • $1600/tonne to $1980/tonne
    • 3700 tonnes rut fill, 1330 tonnes overlay
    • MHI pays for the liquid asphalt
    • Contractor responsible for everything else
      – EPS one year warranty
      – MHI does QA only.
Medium Treatments

• Mill/Fill
  – Profile/nominal mill only
  • If required
  – Mill minor ruts and restore cross slope
  – Overlay 30mm to 40mm maximum
  – ~ $9 to $15/m²
Medium Treatments

• Thin Lift Overlays
  – Type 200/300 AC
  – 20mm thickness
  – Aggregate top size 90 to 100 % passing 9mm
  – ~ $7.50/m²
Medium Treatments

• Rubber Crumb Thin Lift Overlays
  – Crumb rubber added to Type 200/300 liquid AC
    • Digested for 45 minutes
  – 20% crumb by weight liquid asphalt
  – ~ 7.5% total liquids (crumb plus AC)
  – Aggregate top size
    • 90 to 100 % passing 9mm
  – MHI looking at a slightly tighter mix
  – $8.25/m²
Medium Treatments

- Base stabilization/strengthening
- Granular pavements
  - Structure beginning to shove
    - Base quality has deteriorated over time
  - Addition of cement and/or emulsion blends
    - Lab mix design undertaken
    - Improves base quality and strength
      - Bonds fines together which improves structure drainage
    - 1.5% to 3% cement and/or emulsion added
      - Depending on design
  - Done using Region forces
Base Stabilization/Strengthening
Base Stabilization/Strengthening
Medium Treatments

• Hot-in-Place Recycled Asphalt Paving
  – Development stages
  – Contract set for 2010
  – Some spot HIR completed in 2008
  – 50 mm HIR (no additives or overlay)
    • ~ $10 to $15/m²
Medium Treatments Under Review

• RAP Slurry/slurry seals
  – Badly segregated surfaces, structurally sound

• Fibre Reinforced Chip Seal
  – High strength medium treatment, ~$6/m² US

• Nova Chip
  – Hot mix AC placed on a Nova Bond membrane
    • Polymer modified emulsion
    • Improves bond and seals existing surface
Medium Treatments Under Review

• Cold In-Place Recycle
  – Mitigate reflective cracking
  – Reuse existing materials
    • Preserve aggregates and bitumen
  – Helps reduce the carbon footprint
Medium Treatments Under Review

• Warm Mix Asphalt
  – Foaming, emulsions, synthetic binders etc.
  – Reduced asphalt mix production temp
    • Potential construction season extension
  – Reduced fuel consumption - energy savings
  – Reduced emissions, fumes and odors
  – Reduced asphalt aging (future cracking)
Medium Treatments Under Review

• Hot Asphalt Rubber Chip Seal
  – Used where micro-surfacing or TLO may not be appropriate
    • Severely cracked pavements
  – Can use ~ 3.5 tonnes crumb per km in process
    • Approaches current rubber TLO usage
  – Expected Cost ~ $5 to $8/m²
Preservation Requirements

• Value Engineering
  – Cost versus performance
• Long term sustainability
• Quantify benefits in terms of performance for preservation
  – MHI monitoring test sections on several projects in Saskatchewan.
    • TLOs, rubber TLOs, conventional projects (Highway 11 crumb project), stabilization projects.
• Reduction of carbon footprint
Saskatchewan Centre of Excellence in Transportation and Infrastructure
Centre of Excellence

- Mandate
  - Establish a world class research centre (access lead researchers and practitioners)
  - Develop improved infrastructure design and construction systems
  - Develop and implement improved infrastructure management systems (optimize value for money)
  - Contract research with Sask Private Sector firms (generate economic growth and export potential for Sask companies)
  - Provide world class training
Centre of Excellence

• Joint venture between public and private sectors
  – Saskatchewan MHI, U of S, C of T, City of Saskatoon, City of Regina

• Initial Operations focus on training and applied R and D
Centre of Excellence

• Models Texas DoT and Texas A&M
• Board of Directors includes (13 in total):
  – Deputy Minister SMHI
  – Dean of Engineering, U of S
  – Dallas Little – Texas A&M
  – Susan Tighe – University of Waterloo
  – Engin Ozberk – Cameco Corporation
  – Wayne Morsky – Morsky Industrial Services
  – Several Others
Centre of Excellence

• Training activities to date:
  – Asset Management “Boot Camps”
  – High level “Advanced Pavement Systems” courses
  – Review of numerous submissions from private sector companies
  – Preparation for high level geotechnical training course this winter.
  – Investigation of other potential partnership activities.
Questions???