

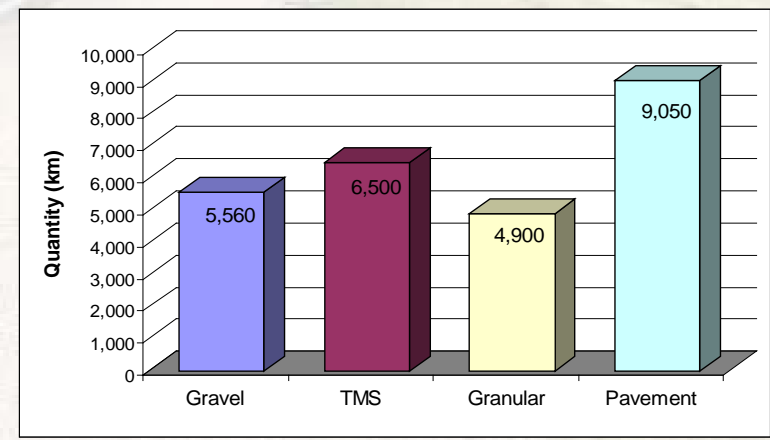
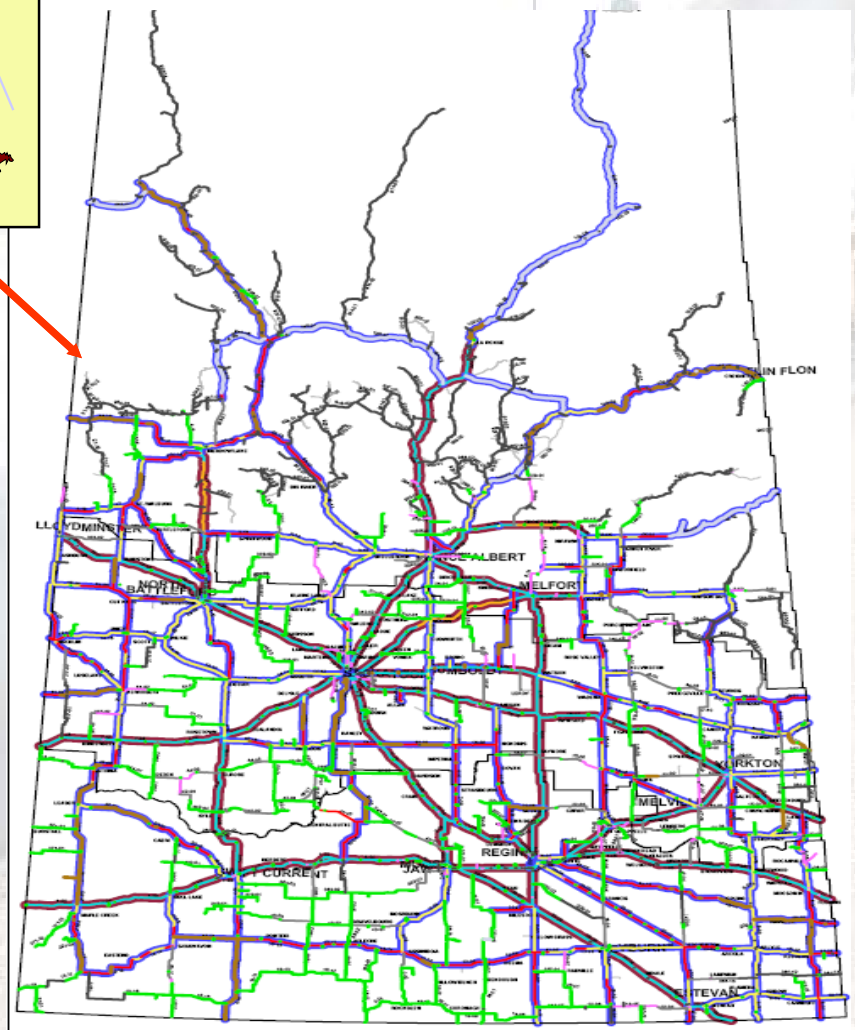
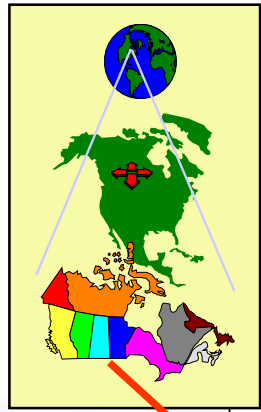
Saskatchewan Ministry of Highways & Infrastructure Medium Treatments

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

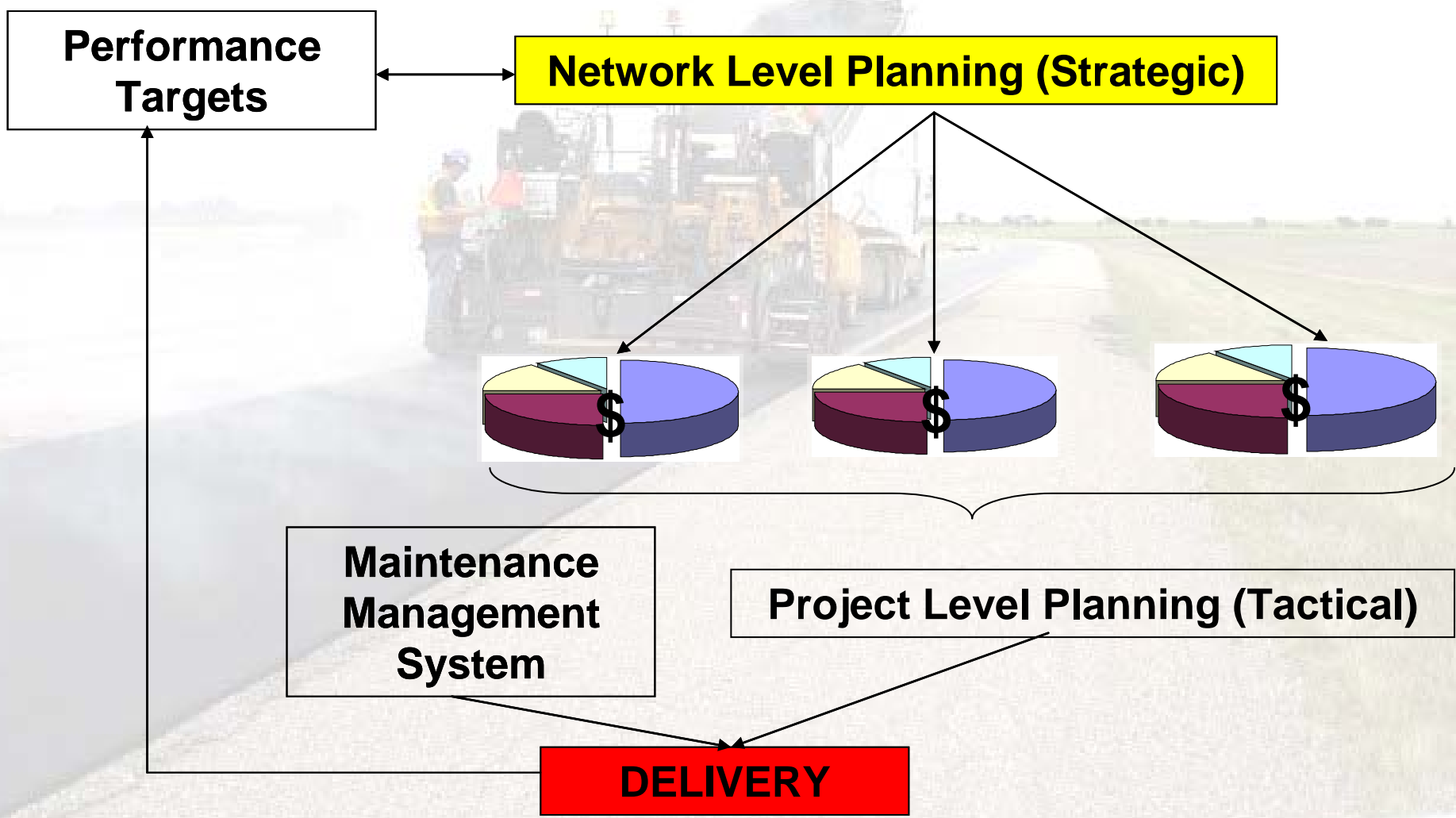
Background



Background

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

Background



Background

- Network Level Treatments

- Heavy- Overlay
- Medium- Microsurfacing, TLO
- Light- Aggregate Seal
- Routine- Maintenance



\$/m²

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???