Preventive Maintenance Strategies for Trails

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The Road Not Taken

• Forgotten pavements
  – Recreational Trails
    – Shoulders
    – Parking lots

• Treatments
  – Crack Repair
  – Fog Seal or Chip Seal
  – Slurry or micro surfacing

• New products

• Resources
Expensive to build
Water, Water, Water
Crack Treatments
Rout and Seal

• R&S Transverse cracks.
• Use MnDOT 3723 low modulus sealant
• Or parking lot sealant
  – Do not use extra low modulus sealants:
    • MnDOT 3725
• Sealants need to be stiffer for pedestrians, bicyclists and roller bladers
Crack Filling

• Crack fill older cracks.
• Keep over bands narrow and thin
  – No more the \( \frac{3}{4} \) “ wider then crack on each side. Less then \( \frac{1}{8} \) “ thick
• Sealants
  – MnDOT 3719 Crumb rubber
    • Clean and seal
• Cracks may open in the winter
Just Right.
Too Wide and Thick
Crack Repairs

• Cracks >> wide
• 3 Methods
  – Mastic Sealants
  – Patch with HMA
    • Mill and Fill
    • HMA sand mix
  – Crumb rubber
“Don’t forget edge joints”
Fog Sealing Trails
Fog Sealing

- Light uniform application asphalt emulsion
- Materials
  - CSS-1h diluted, use on newer trails
    - Diluted one part water to one part emulsion
    - 29% residual asphalt
    - Better penetration
  - CRS-2Pd diluted, old raveled trails
    - Diluted one part water to three parts emulsion
    - 50% residual asphalt
    - Does not penetrate as good
    - Stays black longer
Fog Sealing

• Application
  – Rate 0.07 to 0.12 gal/sy

• Strengths
  – Easy
  – Minimum equipment
  – Great job water proofing surface
  – Fill pop outs and micro cracks
  – Protects HMA from
    • UV, oxidation, & de-ice chemicals
Fog Sealing

• Weakness
  – Needs curing time
    • Especially in shaded areas
  – Turn gray in 2 to 3 years
    • But is still sealing HMA
  – Will not fix structural issues
  – Does not improve ride
  – Lower friction characteristics
Chip Seal

- Know the trail USERS.
- A heavy asphalt membrane followed with layer of aggregate chips
- Strengths
  - Very tough
  - Fast
  - Improves friction characteristics
  - Long lasting
  - Stops aging of the HMA
Chip Sealing

• Weakness
  – Loose rock, until swept
  – Damage from turning traffic
  – Rougher than HMA
  – Heavy construction equipment
  – Does not fix structural issues
  – Does not improve ride
Chip Seal

- Use small chips – $\frac{1}{8}$ minus
- Roller bladers and bicyclist don’t like the texture of larger chips
- Apply when the trail is strongest
Chip Seal

- Lightly load vehicles
- Can use steel roller to smooth surface
- Fog sealing over chip seal to help smooth out the texture
Materials & Road Research
Slurry or Micro surface

- **Slurry, environmental cure**
  
  One stone thick

- **Micro surface, chemical cure**
  
  - Rut filling
Other – New(er) Products
Resources

- MnDOT Office of Materials & Road Research
- Mn LTAP classes
  - Chip sealing
  - HMA maintenance
  - Micro / Slurry Surfacing
- National Center for Pavement Preservation
Resources

• National Center for Pavement Preservation - 90 Videos !!
  http://nationalpavement2012.org/presentation-multimedia/
Conclusions

• Owners cannot afford to do nothing
• Fog Sealing will maintain the trails, shoulders, and parking lots
  – Earlier is better
  – Start at construction on a regular schedule
• Think out of the box
• Be proactive not reactive
• Have fun and be safe
Happy Trails to you!