WINTER WORKSHOP 2021
THE BENEFITS OF DATA DRIVEN PAVEMENT PRESERVATION

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OUTLINE

- Why is this important to DelDOT?
- DelDOT pavement preservation history and efforts to improve over time
- DelDOT pavement management system and data collection process
- Case Study: Pavement analysis comparing OPC trends and the network backlog
WHY IS THIS IMPORTANT TO DELDOT?
IMPORTANCE OF PAVEMENT PRESERVATION

- DelDOT continually asked to do more with less
- The pavement network is the largest infrastructure investment in the state (worth $5 billion)
- Provides better overall network condition to traveling public
DELDOT PAVEMENT PRESERVATION HISTORY
Light surface treatments used to prolong the life of the underlying pavement structure

Life extending treatments by protecting the pavement structure from age hardening, oxidizing, and water intrusion through cracks to lower layers

Typically not considered structural treatments

Should be applied on roads in good cracking condition, and especially no roads that are structurally deficient
DelDOT is traditionally a Mill/Overlay agency

Preservation has been used on occasion over the years with varying levels of success

Most commonly on lower volume routes

Common treatments used by DelDOT:
- Microsurfacing
- Fog Seals
- Thin HMA Overlays
- Chip seal (only on existing chip seal roads)
DELDOT PAVEMENT MANAGEMENT SYSTEM AND DATA COLLECTION PROCESS
PAVEMENT CONDITION DATA COLLECTION

Courtesy: Mandli Communications
PAVEMENT MANAGEMENT SYSTEM

Flexible Non-Structural Index Decision Tree

- Interstate/Freeway/Prin. Arterial
  - Non-Structural Index < 55: Treatment = Rehab - Structural
  - 55 ≤ Non-Structural Index < 70: Treatment = Rehab - Functional
  - 70 ≤ Non-Structural Index < 85: Treatment = Preservation
  - Non-Structural Index ≥ 85: See Maintenance Branch

- Minor Art./Major Coll./Min. Coll.
  - Non-Structural Index < 50: Treatment = Rehab - Structural
  - 50 ≤ Non-Structural Index < 70: Treatment = Rehab - Functional
  - 70 ≤ Non-Structural Index < 85: Treatment = Preservation
  - Non-Structural Index ≥ 85: See Maintenance Branch

- Local
  - Non-Structural Index < 45: Treatment = Rehab - Structural
  - 45 ≤ Non-Structural Index < 70: Treatment = Rehab - Functional
  - 70 ≤ Non-Structural Index < 85: Treatment = Preservation
  - Non-Structural Index ≥ 85: See Maintenance Branch

- Suburban
  - Non-Structural Index < 40: Treatment = Rehab - Structural
  - 40 ≤ Non-Structural Index < 70: Treatment = Rehab - Functional
  - 70 ≤ Non-Structural Index < 85: Treatment = Preservation
  - Non-Structural Index ≥ 85: See Maintenance Branch

- Maintenance Branch
  - Block Crack Med % ≤ 5
  - Block Crack High % ≤ 1
  - Transverse Crack Med % ≤ 5
  - Transverse Crack High % ≤ 1: Treatment = Do Nothing
  - Block Crack Med % > 5
  - Block Crack High % > 1
  - Transverse Crack Med % > 5
  - Transverse Crack High % > 1: Treatment = Crack Seal

- Treatment = Crack Seal
PAVEMENT MANAGEMENT SYSTEM

Asphalt/Composite Age-based Preservation Decision Tree

- Functional Class = Interstate
  - Treatment = Do Nothing
- Functional Class = Non-Interstate
  - Pavement Age < 8
  - Preservation Count < 3
  - Years since Last Preservation < 8
  - Treatment = Do Nothing
  - Pavement Age >= 8
  - Preservation Count >= 3
  - Years since Last Preservation >= 8
  - Treatment = Do Nothing

Original Deterioration Curve

Preservation Deterioration Curve

Assumed End of Life Threshold

Additional Years of Pavement Life Due to Preservation Treatment
3.5 Years Average
CASE STUDY: 
ANALYZE NETWORK PERFORMANCE WITH AND WITHOUT PRESERVATION
ANALYSIS BUDGET: $80 MILLION
ANALYSIS LENGTH: 10 YEARS
REPORTED METRICS: OPC AND BACKLOG
OVERALL PAVEMENT CONDITION
OPC – TOTAL STATE NETWORK

Year

OPC

2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030

With Preservation

Without Preservation

8 Points
BACKLOG COST OF UNMET NEEDS TOTAL STATE NETWORK

- Year: 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030
- Backlog Cost: $0, $100,000,000, $200,000,000, $300,000,000, $400,000,000, $500,000,000, $600,000,000
- With Preservation
- Without Preservation

$300 Million
FINAL THOUGHTS

- Preservation is incredibly beneficial to network health
- Preservation is significantly cheaper per unit area compared to traditional mill/overlay
- DelDOT commitment to the program is required to:
  - Gain public buy-in
  - Gain agency buy-in
  - Attract contractor competition
- Use the tools and data available to DelDOT to assist in programming good preservation candidates