Evaluation of Pavement Preservation Treatments Used in Alaska

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Outline

- 2008 Alaska Pavement Condition Survey
- Objectives
- Pavement Preservation Definition
- Summer of 2011 Field Task
- PASER Evaluations
- Treatments Recommended for Alaska
- Database
- Summary

2008 Alaska Pavement Condition Survey

- Alaska Pavement Condition Improvement Projects are based on:
  - Asphalt Modulus Ratio
  - Roughness (IRI)
  - Rut Depth
  - Maintenance Expenditures

- Reactive Approach

Objectives

- Evaluate road sections in Alaska that have received a preservation treatment.
- Identify the types of treatments.
- Identify treatment performance using PASER.
- Which treatments should be considered for future use.

Pavement Preservation

- According to FHWA (2005), “pavement preservation represents a proactive approach in maintaining existing highways. It enables agencies to reduce cost, time consuming rehabilitation and reconstruction projects and the associated traffic disruptions. With timely preservation, we can provide the traveling public with improved safety and mobility, reduced congestion, and smother, longer lasting pavements.”

Pavement Preservation

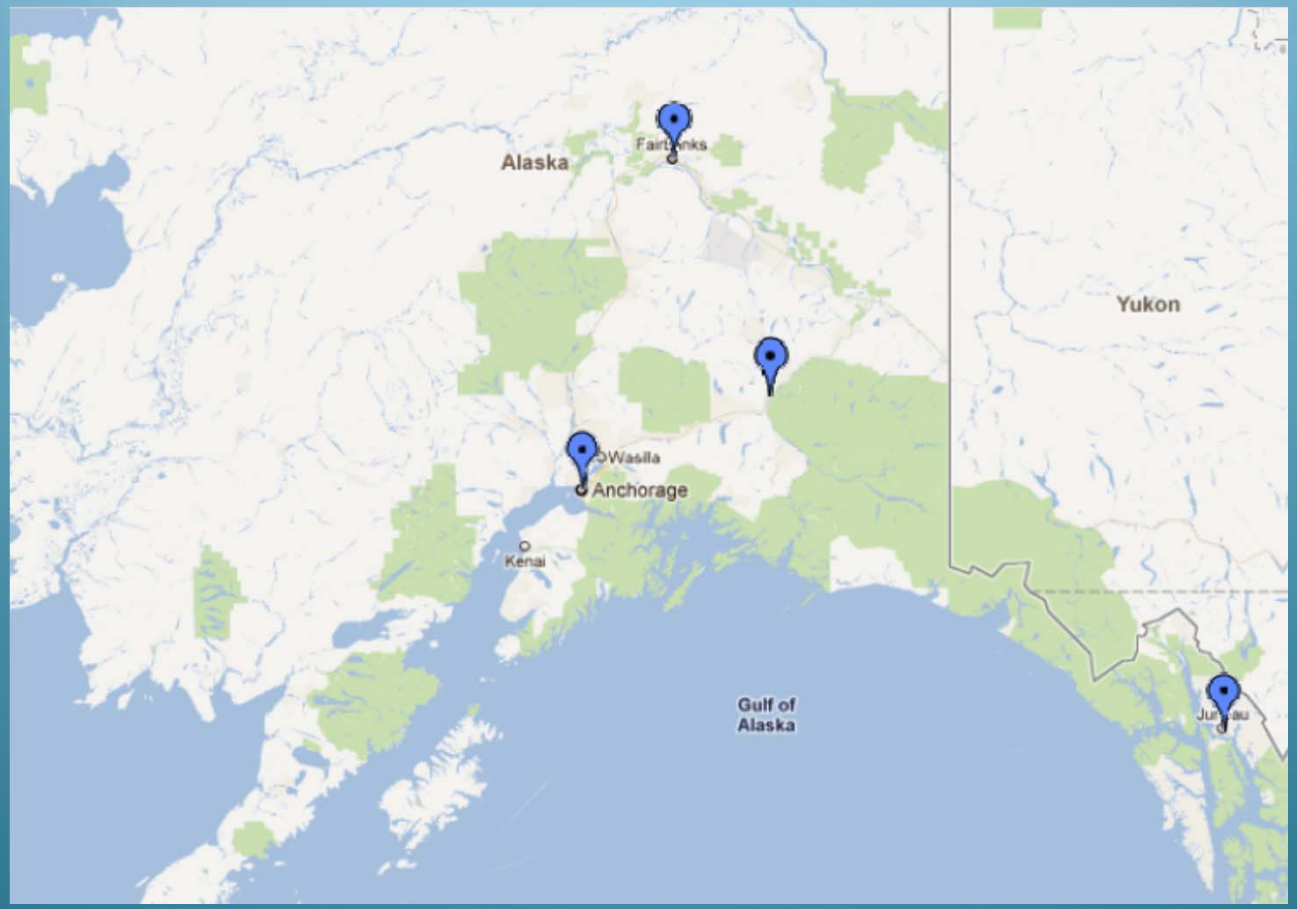
- Non-structural
- Lowest life cycle cost
- According to FHWA consists of minor rehabilitation, preventive maintenance and routine maintenance.

Summer of 2011 Field Task

- 44 sections evaluated using PASER

- Five cities/towns:
  - Anchorage
  - Fairbanks
  - Northpole
  - Juneau
  - Gakona

Cities and Towns



Treatments Used to Date

- Chip Seals
- Crack Sealing
- Pre-saw Cut
- Slurry Surfacings
- Thin HMA Overlays

PASER Evaluations

- PASER - **PA**vement **S**urface **E**valuation and **R**ating
- Maintained by the Wisconsin Transportation Information Center at the University of Wisconsin – Extention Program.
- Visual rating system ranging from 10 to 1.
- 10 is a newly constructed roadway.
- 1 is a completely broken down roadway.

PASER Evaluations
Thin HMA Overlay, Cross Way, North Pole

Before, PASER - 5

After, PASER - 9

PASER Evaluations
Double Chip Seal, Tok Cutoff, Gakona

Before, PASER - 5

After, PASER - 8

PASER Evaluations
Slurry Seal, Eielson Air Force Base

Before, PASER 7

After, PASER 9

PASER Evaluations
Crack Sealing, Fairbanks

Before, PASER - 6

After, PASER - 7

PASER Evaluations
Pre-cut Saw Joint, Thermal Crack, 25+ years old, Fairbanks

Pre-cut Saw Joint, PASER - 6

Thermal Crack, PASER - 6

Typical Distresses Noted

- Cracks – Alligator cracking
- Cracks – Block cracking
- Cracks – Longitudinal cracking
- Cracks – Transverse cracking
- Deformation
- Flushing / Bleeding
- Frost
- Permafrost
- Polishing
- Raveling
- Rutting
- Thermal

Treatment Summary

- 44 Sections Evaluated:
  - (8) Thin HMA overlays
  - (2) Slurry Seals
  - (25) Chip Seals
  - (8) Crack Sealing
  - (1) Pre-saw cut joint

Treatments Recommended for Alaska

- Current to be continued:
  - Chip Seals
  - Crack Sealing where Moisture needs to be mitigated
  - Thin HMA Overlays
- Further Trials:
  - Pre-saw cut joints in asphalt
  - Slurry surfacings
  - Micro-surfacing

Alaska Pavement Preservation Database

- Documentation of preservation projects.
- Share information among local, state, and federal agencies.
- Information recorded:
  - Conditional data, GPS, construction information, multiple year distress data, PASER ratings, supplemental reports, mapping, and photo's.

Pavement Preservation Database

UAF INE AUTC **Pavement Preservation Treatment Database**

testing, testing

Advance User

[Logout] [Edit Profile]

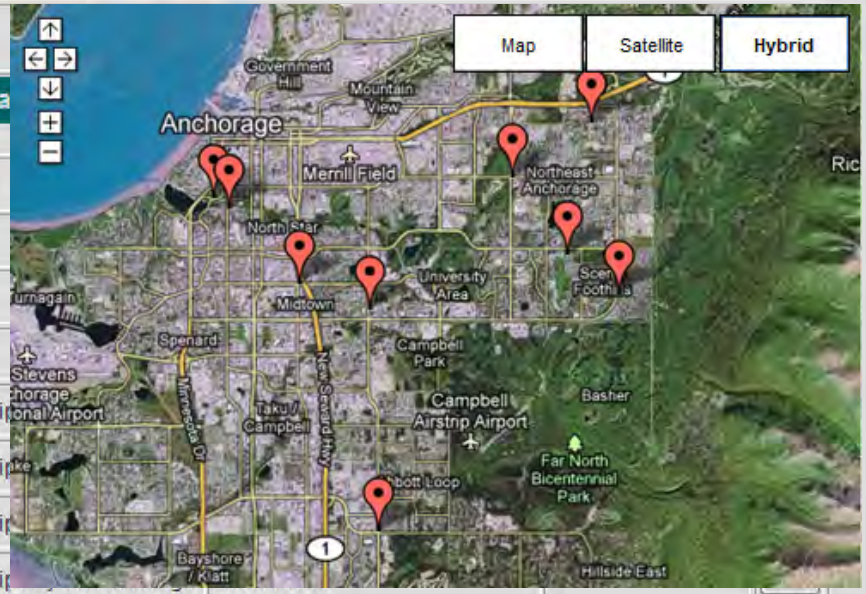
Search Treatments | Flexible Pavement Treatment | Preventive Treatment | View My Flexible Pavement Treatment

Add New Flexible Pavement Treatment

[Prev]--[First] Record (1 - 10) of 45

List of Flexible Pa

ID	Section ID	Preventive Treatment	District	
158	2	Chip Seals: Single Layer, AR	2 Anchorage	
160	650	Thin Overlay: Conventional	2 Anchorage	
161	1174	Chip Seals: Double Layer (non-PME)	14 Tazlina	
162	1828-1830	Chip Seals: Single Layer (non-PME)	2 Anchorage	Munici
163	1868-1873	Chip Seals: Single Layer (non-PME)	2 Anchorage	Munici
164		Microsurfacing: Type II	2 Anchorage	Munici
165		Chip Seals: Single Layer (non-PME)	2 Anchorage	Munici

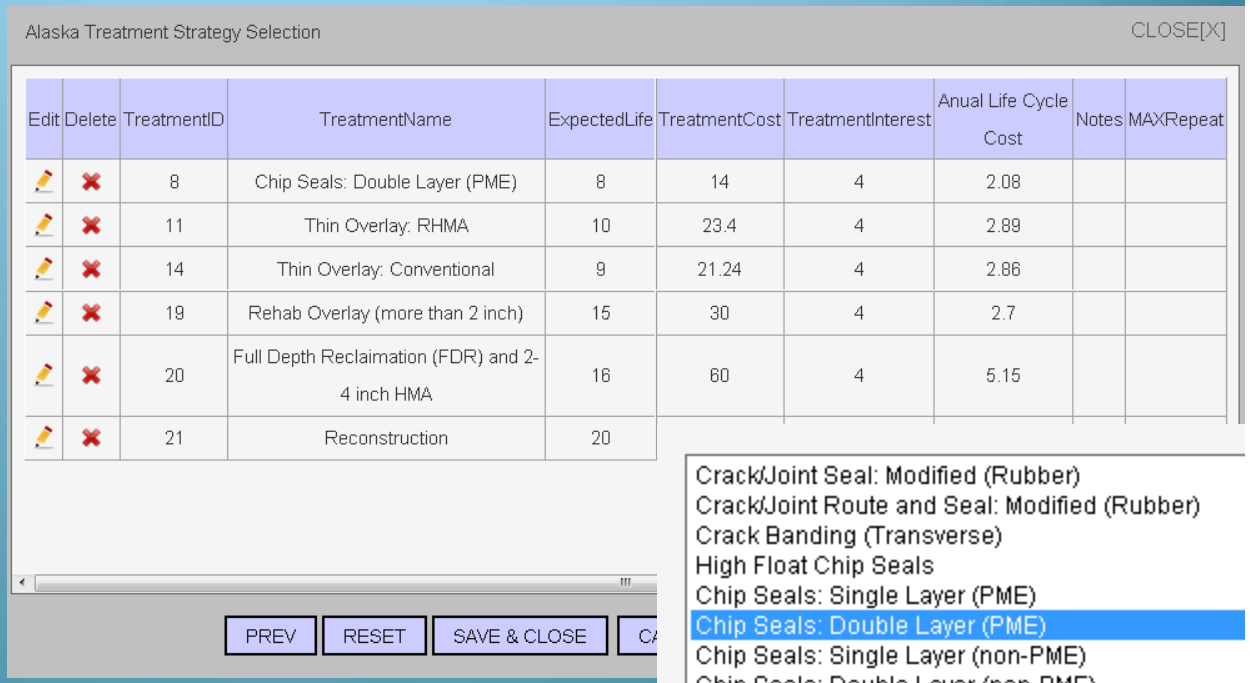


Alaska Pavement Preservation Database Strategy Selection

- Database supports recording discrete distress metrics such as annual IRI, Rut, PSR, Crack, etc.
- Intention is to perform regression analysis for prediction purposes that will aid in decision making for any PMS.
- The strategy selection option then will recommend treatments listed based on cost.

Strategy Selection Program

- Integrated with pavement preservation Database
- Life Cycle Cost Analysis
- Based on AK DOT treatment selection matrices



Alaska Pavement Preservation Database Strategy Selection

- Trialed for Cross Way in North Pole.
- Before; PASER = 5
- Three strategies were given:
  - Rehab overlay
  - Full depth reclamation
  - Reconstruction
- Thin HMA overlay was performed, agreeing with the least costly option.

Conclusions

- Thin HMA overlays are common in urban areas with higher ADT's.
- Thin HMA overlays are used to mitigate rutting in the Central region.
- Thin HMA overlay's are used to mitigate thermal cracking and permafrost degradation in the Northern region.
- Chip Seals are common on the lower ADT highways in the Interior and with the municipality of Anchorage.

Conclusions

- Crack Sealing is common all over the state.
- Slurry/Micro seals have performed well in the few trials and it is suggested to create more research projects.
- The pavement preservation database will provide documentation and analysis for more informed decisions making based on life cycle costs.

Thank you!
Questions?