Agenda
Definitions
Key Finding
ESL Background
Study Overview
Results
Critical Distress Point

![Graph showing the relationship between PASER rating and years, indicating the Critical Distress Point (CDP).]
Extended Service Life

![Graph showing PASER Rating and years](image)

- PASER Rating: 10
- ESL: 5
- CDP: 20

Years: 1 5 10 15 20 25 30
### Key ESL Finding

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Lifespan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip Seal</td>
<td>4.1 years</td>
</tr>
<tr>
<td>Chip Seal + Fog</td>
<td>7.1 years</td>
</tr>
</tbody>
</table>
Roadsoft Tool Background
Needed ESL Calculator Updates
Needed ESL Calculator Updates
Measuring ESL: Actual vs. Modeled
Other Studies use Aggregate Modeling Techniques

\[ Y = 1.2334 e^{0.3345X} \]

\[ Y = 1.454 e^{0.15X} \]
We used Individual Element Modeling.
Why don’t more people use this method for analysis?
Study Data Selection Criteria

• Asphalt pavements
• Federal aid eligible roads
• 1st applied treatment ever or after a heavier treatment
• 3 rating points before and after treatment
• Only rating data prior to 2000
Data That Met Criteria

- Agencies: 29
- Miles: 1710
- Segments: 6236
14 Treatments Meeting Criteria

- Cape Seal
- Chip Seal
- Chip Seal + Fog
- Microsurface
- Slurry Seal
- Thin Overlay
- Cold in Place (CIP) + Overlay
- Crush & Shape
- Hot in Place (HIP)
- HIP + Overlay
- HMA Wedge + Chip Seal
- HMA Wedge + Overlay
- Thick Overlay
- Reconstruction
5 Treatments with Enough Data

Chip Seal
Chip Seal + Fog
Thin Overlay
Crush & Shape
Thick Overlay
Seal Coat (Chip Seal)
Chip Seal Results

**Chip Seal ESL**

- **Statistics**
  - Miles = 784.858
  - Weighted Average = 4.1
Chip Seal + Fog Seal
Chip With Fog

Chip Seal + Fog ESL

Statistics
Miles = 195.890
Weighted Average = 7.1
Thin Asphalt Overlay
Thin Asphalt Overlay

**Thin Overlay ESL**

**Statistics**
- Miles = 161.899
- Weighted Average = 6.9
Crush and Shape
Crush and Shape

Crush & Shape ESL

Statistics
Miles = 142.537
Weighted Avg = 11.3
Thick Asphalt Overlay
Thick Asphalt Overlay

Thick Overlay ESL

Statistics
Miles = 301.760
Weighted Average = 9.1
Zero or Low ESL Gain?
Age VS Load Related Distress

- Transverse Cracking
- Longitudinal Cracking
- Block Cracking
- Rutting
- Cracking in the Wheel Path
- Alligator Cracking
Other Variables
Legal System
National Function Class
Lanes
Region
Region Breakdown

Chip Seal
Thick Overlay
Points To Take Away

Study looked at worst case analysis for ESL
Local agencies are collecting high quality data
Local agencies gain significant benefit with treatments
Cost effective analysis should drive practice
You have the data and tools to do this yourself
Contact Information

Michigan Transportation Asset Management Council

www.michigan.gov/tamc

Michigan’s Local Technical Assistance Program

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