AGENDA

1) Orientation / Sign-In / Polling

2) Public Comments

3) Welcome

4) Opening Statement

5) Working Group Updates

6) Organization / Industry Updates

7) Key Presentation / Questions and Answers

8) Next Working Group Meeting / Close

Use your cell phone, computer or tablet and log in to: www.menti.com
Enter Code 7397 1385
Teams Meeting Etiquette / Sign-In

- Mute Microphone unless presenting
- Turn Camera off unless presenting
- Use Chat window or Raise Hand for questions
- Please enter your Name, Company/Agency, E-mail in Chat

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INTERACTIVE POLLING – PART 1 OF 2

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SUPERVISOR JOEL ANDERSON – DISTRICT 2
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USING RAP IN PAVEMENT SEALS-PILOT STUDY-COUNTY OF SAN DIEGO

OCTOBER 2021
SAN DIEGO COUNTY PUBLIC WORKS
PILOT STUDY PROCESS

1. Research and Scope Development
2. Application
3. Monitoring and Testing
4. Final Evaluation and Report
USING RAP IN PAVEMENT PRESERVATION

- Environmental sustainability
- Cost savings
- Response to depleting aggregate resources
RAP-SLURRY SEAL

- LA County experience
- Reduced emulsion rates
- Darker surface
RAP-CHIP SEAL

- San Bernadino County Experience
- Same emulsion rates for single layer chips
- RAP-Double chip with reduced emulsion rates
- RAP slurry (Low/high traffic)
- Single chip using RAP (Low/high traffic, Desert Environment)
- Double chip, RAP+RAP (Low/high traffic, Desert Environment)
- Double chip, Virgin+RAP (Desert Environment)
FIBER REINFORCED ASPHALT CONCRETE (FRAC) PILOT STUDY-COUNTY OF SAN DIEGO

OCTOBER 2021
SAN DIEGO COUNTY PUBLIC WORKS
Objective
Evaluate crack mitigation and resistance to rutting of FRAC vs Control

Basis
• Place both FRAC and control AC at various settings (4 Locations Total)
• Visually inspect on 6-month intervals for 1st 3 years
• Annual inspection years 3-10
• Record frequency, level of Severity and growth

Report
Produce Final Report Detailing findings and make recommendations for continued use
FRAC PILOT STUDY-LOCATIONS

Location 1
• Neighborhood Collector with Wheel Path Rutting
• 4 Segments Corral Canyon Rd

Location 2
• Rural Arterial
• 4 Segments Skyline Truck Trail

Location 3
• Residential Streets with Minimal AC Thickness
• 7 Segments in Sweetwater CPG

Location 4
• High Volume Arterial with Engineered Base
• 4 Segments Camino Del Norte
FRAC PILOT STUDY TIMELINE

Research and Scope Development → Application → Evaluation → Final Report

Current Status
INTERACTIVE POLLING – PART 2 OF 2

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Brandon Milar - CalAPA

- The California Asphalt Pavement Association

Asphalt Industry Update
Brandon Milar - CalAPA

1) CCPIC Asphalt Specification available for agency use.
   b. Presentations available on the specification

2) CalAPA Hosting NCAT Airfield Asphalt Certification Program QC Manager Certification Course
   a. Ontario, CA
   b. Nov 16-18
BRANDON MILAR - CALAPA

3) CalAPA Technical Webinar – WMA
   a. Nov 3

4) Caltrans focus on Equity - Sustainability - Safety

3) Caltrans Pilot Projects
   a. HMA 40% RAP
   b. HMA w/ RAP & RAS
   c. RHMA w/ RAP
Brandon Milar, P.E.
Director of Technical Services
California Asphalt Pavement Association (CalAPA)
916-791-5044
bmilar@calapa.net
www.calapa.net
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Building Better Roads
Pavement Preservation Processes and New Technology

Including an introduction to RoadResource.org
Agenda

• Combination Products
• RAP in Preservation
• Introduction to PPRA RoadResource.org
• New Technology in Materials and Equipment
Why Combination Treatments are Used

Enhance the performance of multiple products.

Stop Gap: Something that serves a purpose for a short time but, is replaced as soon as possible.

- Combination treatment were used as a stop gap measure when funding was not available to complete full mill and fill or reconstruction
- Over time, properly place combination treatment were far outlasting the short-term goals.
Combination Options

**Fog Seal**
- Over crack treatment
- Over chip seals
- Over scrub seals
- Over slurry seal
- Over microsurfacing

**Crack Treatments**
- Prior to fog seal
- Prior to Chip Seal
- Prior to Slurry Seal
- Prior to Microsurfacing
- Prior to Thin HMAC Overlay

Note – Crack treatments should have ample time to cure prior to placing any of the above referenced surface treatments.

Note – check with suppliers and contractors for compatibility.
Combination Options

**Chip & Scrub Seal**
- SAMI – Stress Absorbing Membrane Interlayer
- Chip Seal prior to Asphalt Overlay
- Double Bituminous Surface Treatment
- Chip Seal with Fog Seal
- Cape Seal

**Slurry Seal & Microsurfacing**
- Scratch Course & Surface Course
- Rut Fill with Surface Course
- Rut Fill with HMAC overlay
- Over Crack Treatment
- With Fog Seal
- Cape Seal

**Thin Overlay**
- Over Crack Treatment
- Over Chip Seal (Stress Absorbing Membrane Interlayer)
Cape Seals

A cape seal is the application of any type of chip seal followed by one or more layers of a slurry seal or microsurfacing.
Cape Seals Don’ts

No, this is **NOT** a candidate for cape seal

Cape Seal?
Cape Seals

EDUCATION

• Identify the need and set a goal
• Understand your goal
• Select the proper treatment
• Educate Everyone!
  • The Agency
  • The Public
  • “Communicate realistic expectations when using pavement preservation as stop-gap measure.”

American Infrastructure Summer 2011
Cape Seals Challenges

Understanding when and where to apply chip seal

• It is **NOT** recommended to apply chip seal to
  • Small cul-de-sacs
  • In warmer climates
    • Stopping points
    • Intersections
    • At signal lights
Cape Seal Extras

Going the Extra Mile

• Micro Mill Edge Grind: Mill a build up edge flush with concrete curb. Clean any old slurry or chip seal off of the existing curb
Cape Seal Mistakes

When good intentions go bad

• An edge grind that should be flush but isn’t is very difficult to fix with a cape seal

• Pre-filling the edge with type III Polymer modified slurry seal is time consuming and inconvenient for residents but will do the job
Three Layer Cape Seals

How to handle streets with damage beyond the capability of a cape seal.
Three Layer Cape Seals

Three Layer Cape Seal

- Micro Surfacing Leveling Course
- Asphalt Rubber Chip Seal
- Slurry Seal
Three Layer Cape Seals
Reclaimed Asphalt Pavement (RAP)

- Chip Seal
  - Double Chip Seal
- Slurry Seal
- Cape Seal
• Supply

• Virgin Aggregate varies site by site but is pretty consistent in a single pit

• RAP supply varies by source, size and asphalt
<table>
<thead>
<tr>
<th>Concern Level</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little concern</td>
<td>Original Quarry Supply</td>
</tr>
<tr>
<td>Little concern</td>
<td>Rock Quality</td>
</tr>
<tr>
<td>Marginal concern</td>
<td>Original AC Aggregate size</td>
</tr>
<tr>
<td>Marginal concern</td>
<td>Method RAP was created</td>
</tr>
<tr>
<td>Heavy concern</td>
<td>Asphalt Binder</td>
</tr>
</tbody>
</table>
Crushing and Screening

• Segregation is Key
  • Don’t over crush!

Consistency is imperative!
Supply Management

- Import Management
  - Supply must be clean
    - No Fabric
    - No Base Material
    - No Native Soil
  - Load Crusher From Varying Locations
    - Mix the supply as much as possible
    - If supply has a location that fits a specific product, use it.
RAP Chip Seal

- Binders Used with RAP Chip
  - PMCRS2 – Typical polymer modified emulsion
  - PMRE – Polymer modified rejuvenated emulsion (also used as scrub seal)
Scrub Seal

Direction of Travel

Unfilled Crack →

Filled Crack →

Direction of Travel →

1

2

3
RAP Chip Seal

• Binders Used with RAP Chip
  • PMCRS2 – Typical polymer modified emulsion
  • PMRE – Polymer modified rejuvenated emulsion (also used as scrub seal)
  • Hot applied modified PG – Polymer modified hot asphalt.
Chip Sizes

- 5/16”
- 3/8”
- 1/2”

Poor product utilization due to segregation process.

Minimal windshield claims
# RAP Chip Gradation

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medium 3/8”</td>
</tr>
<tr>
<td>1/2” (12.5 mm)</td>
<td>100</td>
</tr>
<tr>
<td>3/8” (9.5 mm)</td>
<td>85-100</td>
</tr>
<tr>
<td>No. 4 (4.75mm)</td>
<td>0-15</td>
</tr>
<tr>
<td>No. 8 (2.36 mm)</td>
<td>0-5</td>
</tr>
<tr>
<td>No. 16 (1.18 mm)</td>
<td>-</td>
</tr>
<tr>
<td>No. 200 (75 um)</td>
<td>0-2</td>
</tr>
<tr>
<td>Residual Asphalt Content&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3.5% Min. (Based on dry weight of aggregate)</td>
</tr>
</tbody>
</table>

1. On unextracted RAP.  2. On extracted RAP. Determined by CT362, CT379 or CT382.
<table>
<thead>
<tr>
<th>Test</th>
<th>Test Method</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Wear (100) Revolutions</td>
<td>ASTM C 131</td>
<td>12% Maximum *</td>
</tr>
<tr>
<td>Percentage Wear (500) Revolutions</td>
<td>ASTM C 131</td>
<td>35% Maximum *</td>
</tr>
<tr>
<td>Cleanness Value</td>
<td>CT 227</td>
<td>Report Only</td>
</tr>
<tr>
<td>California Durability</td>
<td>CT 229</td>
<td>52 Minimum</td>
</tr>
</tbody>
</table>

Key RAP Chip Quality Requirements

- * On RAP Source Retained on Number 4 Sieve.
RAP Chip Material

Residual Asphalt

Chips

Single stones and conglomerations

Residual asphalt content will vary by sample
While the RAP chip seal may appear dirty, it is coated with small asphalt particles. The dusting of asphalt allows it to stick to any product. Adhesion is exceptional. Appearance is even better.
Slurry Seal and Microsurfacing

- Type II only
- Type III can be made by blending the segregated materials. Consistency in asphalt residual is challenging and excessive binder will rut and shove.
# RAP Slurry Seal

**RAP Slurry Dust**

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Actual Finished Product</th>
<th>Bare Aggregate</th>
<th>ISSA Specification Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Passing UN-extracted</td>
<td>Percent Passing Extracted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>95-100</td>
<td>95-100</td>
<td>90-100</td>
</tr>
<tr>
<td>No. 8</td>
<td>65-85</td>
<td>70-90</td>
<td>65-90</td>
</tr>
<tr>
<td>No. 16</td>
<td>35-60</td>
<td>50-75</td>
<td>45-70</td>
</tr>
<tr>
<td>No. 30</td>
<td>18-38</td>
<td>35-55</td>
<td>30-50</td>
</tr>
<tr>
<td>No. 50</td>
<td>8-25</td>
<td>22-40</td>
<td>18-30</td>
</tr>
<tr>
<td>No. 100</td>
<td>5-20</td>
<td>13-38</td>
<td>10-21</td>
</tr>
<tr>
<td>No. 200</td>
<td>2-12</td>
<td>10-20</td>
<td>5-15</td>
</tr>
<tr>
<td>Residual AC</td>
<td>6.5% Min.</td>
<td></td>
<td>Averages 7 – 7.3%</td>
</tr>
</tbody>
</table>

Residual AC 6.5% Min.
RAP Slurry Seal

Gradation Curves

- **Unextracted**
- **Extracted**
- **ISSA Type II**

Percent Passing

Grain Size (mm)
# RAP Slurry Seal

Typically 14% Residual asphalt

<table>
<thead>
<tr>
<th>Component</th>
<th>RAP</th>
<th>ISSA Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emulsion</td>
<td>10% - 14%</td>
<td>*12% - 18%</td>
</tr>
<tr>
<td>Residual AC</td>
<td>12.5% Min.</td>
<td>7.5% - 13.5%</td>
</tr>
</tbody>
</table>

*Caltrans Standard
Lessons Learned

The value of the residual asphalt in the RAP
• 7%+ residual asphalt is dry. How is it affective?
  • Time, Traffic and Heat
    • Over time the existing asphalt in the RAP will blend with the new asphalt binder in the emulsion
    • Traffic and high temperatures speed up the process
  • Too much binder will push and bleed in high heat
  • Initial mixing does not pre-wet aggregate easily
  • Early aggregate retention is challenging
Best Practices Unique to RAP

- Emulsion
  - PMCQS-1h 3%
  - MSE 3%
- RAP Aggregate
  - Keep moist, don’t over wet
  - Don’t allow pile to stack up too long
  - Don’t pre-load truck the day prior
- Application
  - Roll all material with Pneumatic Roller
RoadResource.org

A COMPREHENSIVE RESOURCE FOR OPTIMIZING NETWORK MANAGEMENT

Mike Concannon, P.E.
Pavement Recycling Systems, Inc.
AGENDA

1  Background

2  Website Features
   Treatment Toolbox | User Profile | Network Optimization
The Situation:

Demand is increasing for asphalt emulsions, preservation, and recycling.

However, many city and county agencies are still unaware of benefits and best practices to successfully choose and apply these treatments.
Three Associations Join Together to Support the Industry at Large
Two Guiding Questions

1. How do we equip road owners & end users with tools to increase the successful use of pavement preservation and recycling?

2. How do we better disseminate research, success stories, and learning across all agencies, making information more accessible?
Research & Collaboration

Competitive exploration & Industry affiliations

Input from over 45 agency and industry leaders

Interviews & beta-testing with agency-level users, pavement managers, DOTs, & roadway engineers

Page by page technical review from multiple committees

International data survey

Retreats with ISSA, AEMA & ARRA leadership

International data survey

Retreats with ISSA, AEMA & ARRA leadership
RoadResource.org
1. What treatment is right for my road?
   - Pavement Criteria Input
   - Photo Example Suggestions

2. Treatment Resource Center
   - Comprehensive Technical Menu
   - Regional Success Stories
   - Research and Performance
   - Spec Resources
Which treatment is best for my road?
Input pavement criteria or select photos for treatment options
### Treatment Resource Center

Ensure treatment success with comprehensive information on 18 treatments

---

**FOR PAVEMENT CONDITIONS C-D-F** (PCI of less than 70)

A cost-effective, long-lasting, greener alternative to conventional maintenance and rehabilitation techniques. Cold in-place recycling (CIR) is a process that cools milled and recycled the top 3.5 inches of asphalt using a continuous train operation. Through the complete reuse of existing material, CIR greatly reduces trucking, time and natural resources to significantly lower project costs. Generally, any road that is a candidate for mill & fill is a candidate for CIR.

- **20%-50% less expensive than conventional maintenance and reconstruction methods**
- **Reduce Greenhouse emissions by Up to 90%**
- **Reuse 100% of existing materials**
- **20%-40% faster construction times**
- **Adds 15-20 years (combined with appropriate wearing course)**
- **Most agencies use SDLs between 0.35-0.38 (recent research indicates values from 0.35-0.44 may be more appropriate)**

**ISSUES ADDRESSED**
- Frequent, severe, non-road distresses in top lift of hot mix
- All distresses within the recycling depth (3.5 inches)
- Reflective cracking from below CR layer
- Site 1A

**ATTRIBUTES**
- Eliminates defects within the recycling depth
- Blocks or slows reflective cracking
- Reuse existing material in place
- Replaces 1 or 2 lifts of hot mix
- Allows for road widening where desired

**COMMON COMBINATIONS**

---

<table>
<thead>
<tr>
<th>CIR</th>
<th>Optimum Performance</th>
<th>Average Performance</th>
<th>Stop-Gap Performance</th>
</tr>
</thead>
</table>
| Types of Distress | • Transverse, longitudinal, multiple cracking  
• Raveling  
• Oxidation | • Wheelpath cracking  
• Rusting (asphalt or subgrade) | • Alligator cracking from base failure  
• Distortion |
| Depth of Distress | Within treatment depth (2”-5”) | 1”-3” below treatment depth | More than 4”-6” below treatment depth |
| Life Extension | 20–25 years | 10–20 years | 5–10 years |

**EXAMPLES OF ROADS THAT HAVE BEEN TREATED WITH COLD IN-PLACE RECYCLING OVER VARIOUS STAGES IN SERVICE LIFE:**

- CIR 1A  
- CIR 3 years later: Prescott-Russell County Road, Ontario
- CIR 5 years later: Bloomington Road, Ontario
- CIR 7 years later: Hwy 61, Ontario

If a CIR mix ravel excessively due to rain, the mat can be re-processed with or without adding cement to facilitate drying.
Success Stories & Research

Use, performance & best practices in your region

OVERVIEW
ABOUT
PROCESS & VARIATIONS
EXPECTATIONS
COST
HISTORY
BEST PRACTICES
PRE-CONSTRUCTION
SITE SELECTION
MATERIAL SELECTION
NIX DESIGN
SPECIFICATION REVIEW
CONSTRUCTION
PREPARATION
WEATHER REQUIREMENTS
EQUIPMENT
CALIBRATION
TRAFFIC CONTROL
APPLICATION
QUALITY ASSURANCE
INSPECTION
TESTING PROTOCOL
TROUBLESHOOTING
ACCEPTANCE

Success Stories

Micro surfacing catching on in Sylvania
Sylvania, OH is using micro surfacing to save resurfacing streets. They expect 8 - 12 years with micro surfacing, costing 35% less than using asphalt mill and repa.

VIEW STORY

Micro Surfacing on High Volume Roads
Micro surfacing was successfully placed on the most congested road in the Greater Cleveland area. Working with the Ohio DOT, the contractor measured traffic disruption while placing a 1" thick layer of mixture.

VIEW STORY

The Town of Fairfield Saves Big with Micro Surfacing
The Town of Fairfield saves their network up to 40% in resurfacing costs by using micro surfacing as the primary backbone of a road preservation plan.

VIEW STORY

APRN Journal of Earth Sciences

AUTHORS
Onyelowe Ken C.1 and Okoasor F. O.2

SUMMARY
This study was centered on elucidating the chemical reactions that bring about soil stabilization and modification. It has been established that the chemical compounds found in soil, quartz, feldspar, dolomite, calcite, montmorillonite, kaolinite etc. react with the chemical constituents found in different identified chemical stabilizers. This research work will better place designers, constructors and researcher on the choice of soil chemical stabilizer and techniques and the extent of chemical reactions that take place during soil chemical stabilization.

CITATIONS
Onyelowe Ken C.1 and Okoasor F. O.2 1Department of Civil Engineering, College of Engineering and Engineering Technology, Umudike, Abia State, Nigeria 2Faculty of Engineering, University of Nigeria, Nsukka, Nigeria

VIEW FULL REPORT
**Compare Treatments**

**Project Cost & Environmental Benefits**

**NOTE ON COST:**
Every calculator gives users the ability to use average life extension numbers and cost data from an internationally aggregated cost survey (US & CA) or input their own costs and life extension relevant to their region.
SECTION 1

Treatment Toolbox

SECTION 2

PPRA User Account

Tailor tools & calculators to your area

SECTION 3

Network Optimization

WEB SITE FEATURES

User Account

Capabilities

• Enter unit cost, life extension, and structural numbers from your area

• Update units of measure for US or Canada
My PPRA Account

Input costs and life extension in your area to make the most of the site & tools

Change aggregate data into costs, life extension, and structural numbers relevant to you. Tools throughout the site automatically re-populate with your data every time you log in.
SECTION 1
Treatment Toolbox

SECTION 2
PPRA User Account

SECTION 3
Network Optimization

WEBSITE FEATURES

Information at the Network Level

Calculators & Concepts

• Network How-To
• Equivalent Annualized Cost
• Life Cycle Cost
• Remaining Service Life
• Cost-Benefit Value
Equivalent Annualized Cost

Compare treatment cost based on Life Extension

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Cost Per Sq Yard</th>
<th>Life Extension</th>
<th>EAC $ SY/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crack Seal</td>
<td>$0.50</td>
<td>2</td>
<td>$0.25</td>
</tr>
<tr>
<td>Fog Seal</td>
<td>$1.00</td>
<td>3</td>
<td>$0.33</td>
</tr>
<tr>
<td>Single Surface Tr.</td>
<td>$2.00</td>
<td>5</td>
<td>$0.40</td>
</tr>
<tr>
<td>Double Surface Tr.</td>
<td>$4.25</td>
<td>8</td>
<td>$0.53</td>
</tr>
<tr>
<td>Thin Overlays</td>
<td>$7.00</td>
<td>10</td>
<td>$0.70</td>
</tr>
<tr>
<td>Mill-and-Fill</td>
<td>$12.00</td>
<td>12</td>
<td>$1.00</td>
</tr>
<tr>
<td>Cold in Place</td>
<td>$17.00</td>
<td>15</td>
<td>$1.13</td>
</tr>
<tr>
<td>Reconstruction</td>
<td>$25.00</td>
<td>20</td>
<td>$1.25</td>
</tr>
</tbody>
</table>

EAC By Strategy $/SY/YEAR

- Crack Seal
- Fog Seal
- Single Surface
- Double Surface
- Thin Overlay
- Mill & Fill
- Cold in Place
- Reconstruction
Life Cycle Cost Calculator

Save big over the life of your pavement with progressive maintenance
Remaining Service Life

How much life is your network gaining or losing each year?

Critical Concept

A 500-mile network loses 500 mile-years of life annually.

Every year, every mile of your network loses 1 mile-year of life. To avoid losing ground, the roadway owner must design a treatment plan that adds 500 mile-years of life or more!

See how this agency reallocated funds to inject more life into their network, using the same budget.

Download the FHWA RSL pub IT-07-006
Cost-Benefit Value

Which projects will give the “biggest bang for the buck?”

\[
\text{CBV} = \frac{\text{Traffic} \times \text{Constraint Factor}}{\text{Life Extension}} \times \frac{\text{Unit Cost}}{\text{PCI}}
\]

### ROAD 1
- **Worst First Reconstruction**
- AADT: 5000
- PCI: 30
- CBV: \((5000 \times \text{PCI}) / (\text{AADT} \times \text{Life Extension}) \times \text{Unit Cost} / \text{PCI} = 15\) CBV

### ROAD 2
- **Pavement Preservation Chip Seal**
- AADT: 5000
- PCI: 75
- CBV: \((5000 \times \text{PCI}) / (\text{AADT} \times \text{Life Extension}) \times \text{Unit Cost} / \text{PCI} = 29\) CBV

### Table

<table>
<thead>
<tr>
<th>Road Name</th>
<th>Segment From / To</th>
<th>PCI</th>
<th>AADT</th>
<th>Length (ft)</th>
<th>Width (ft)</th>
<th>Treatment</th>
<th>Life Extension</th>
<th>Unit Cost</th>
<th>Segment Cost</th>
<th>Cumulative Cost</th>
<th>CBV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midway Road</td>
<td>Oakland to Indian</td>
<td>90</td>
<td>5000</td>
<td>28440</td>
<td>15</td>
<td>Paving / Resurfacing</td>
<td>20</td>
<td>0.07</td>
<td>$29,480</td>
<td>$29,480</td>
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**Critical Concept:**
For Equal Traffic, Preservation Has a Higher Benefit.
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FOR MORE INFORMATION

Mike Concannon, P.E.
Pavement Recycling Systems, Inc.
951-790-3430
mconcannon@pavementrecycling.com
Visit the new RoadResource.org
Fiberized Slurry Seal

• All slurry seal applications can have fiber added

• Understand the goal of the fiber
  • Added strength to the surface
  • Does not reduce reflective cracking.

• Specifications vary for size of fiber and method of delivery

• Fiber can show through surface and reflect as sparkles in headlights
Test Results with RAP Slurry Seal

• Forta Asphalt Binder test results show higher flexural tension and better wet track abrasion test results

• Independent testing agreed with the WTAT improvement.
Highly Modified Microsurfacing

• What lead to Hi Mod?
  • Request from agency for durability against snowplow

• What hurdles are created with Hi Mod?
  • Workability with additional polymer
  • Latex chemistries overriding asphalt chemistries
  • Manufacturing differences
Highly Modified Micro and Slurry Surfacing (High Mod)

- Increased Durability
- Accomplished with Conventional Equipment
- Improved resistance to plow and chain damage
- Improved resistance to power steering scuffing
- Modification of Base Asphalt

Contabro Durability Test

- CQS-1H Mass Loss 5.21%
- MSE 3% Mass Loss 2.89%
- High Mod MSE Mass Loss .04%
Micro Milling with Pavement Preservation

How to react to public perception and provide a better product
Micro Mill Benefits

• Improved ride
  • A new surface is expected to ride like a new surface
  • Preservation Treatments do little to improve the ride
• Reduce lip on gutter edge
• Remove Oxidized Surface
Micro-Mill Drum
Cutting Speed and Depth

Maintain a good pattern.
- Drum RPM
- Forward Speed

Don’t mill too deep
- Stay on top, avoid slippage between paving layers
Slurry and Microsurfacing mixing machines have been volumetrically controlled for years.

There are three manufacturing companies in the US. Two are still volumetric and one is computer controlled.

Computer control builds consistency and simplifies calibration.

Remote access to production will soon be available.
The computer controller not only controls main start and start/stop sequencing but provides instructions and data input for calibration.

To help prevent plugging of the pugmill, an interlock feature is included in the computer that prevents main start from engaging unless the pugmill is operating and it will dis-engage main start if the pugmill gets overloaded and starts to stall.

The display is ergonomically located at the operator control station. When not in use, the display is folded down and locked in the operator control station. When the display is raised up for operation, it becomes placed right in front of the operator as he stands at the operator station.

The EZ-OP PRO system also monitors ground travel and when the spreader box width is input into the computer, the production rate and spread rate can be displayed, as well as displaying an average distance remaining per load.
The telematics system is developed to improve the efficiency of construction. This system provide information in real time, over the cloud, to your computer, phone or tablet.
The Telematics pushe the material production information along with GPS location up to the cloud using wireless cellular technology. It will even store the information and automatically send it if there is a loss of connectivity. Using a cloud portal, the project manager can generate daily reports showing material usage and spread rate for a team of machines or an individual machine on a project. This saves time and allows for reporting without interruption to the crew or the project.

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Thank you

Questions
AGENDA

1) Orientation / Sign-In / Polling

2) Public Comments

3) Welcome

4) Opening Statement

5) Working Group Updates

6) Organization / Industry Updates

7) Key Presentation / Questions and Answers

8) Next Working Group Meeting / Close
MEETING ADJOURNED
THANK YOU FOR ATTENDING!