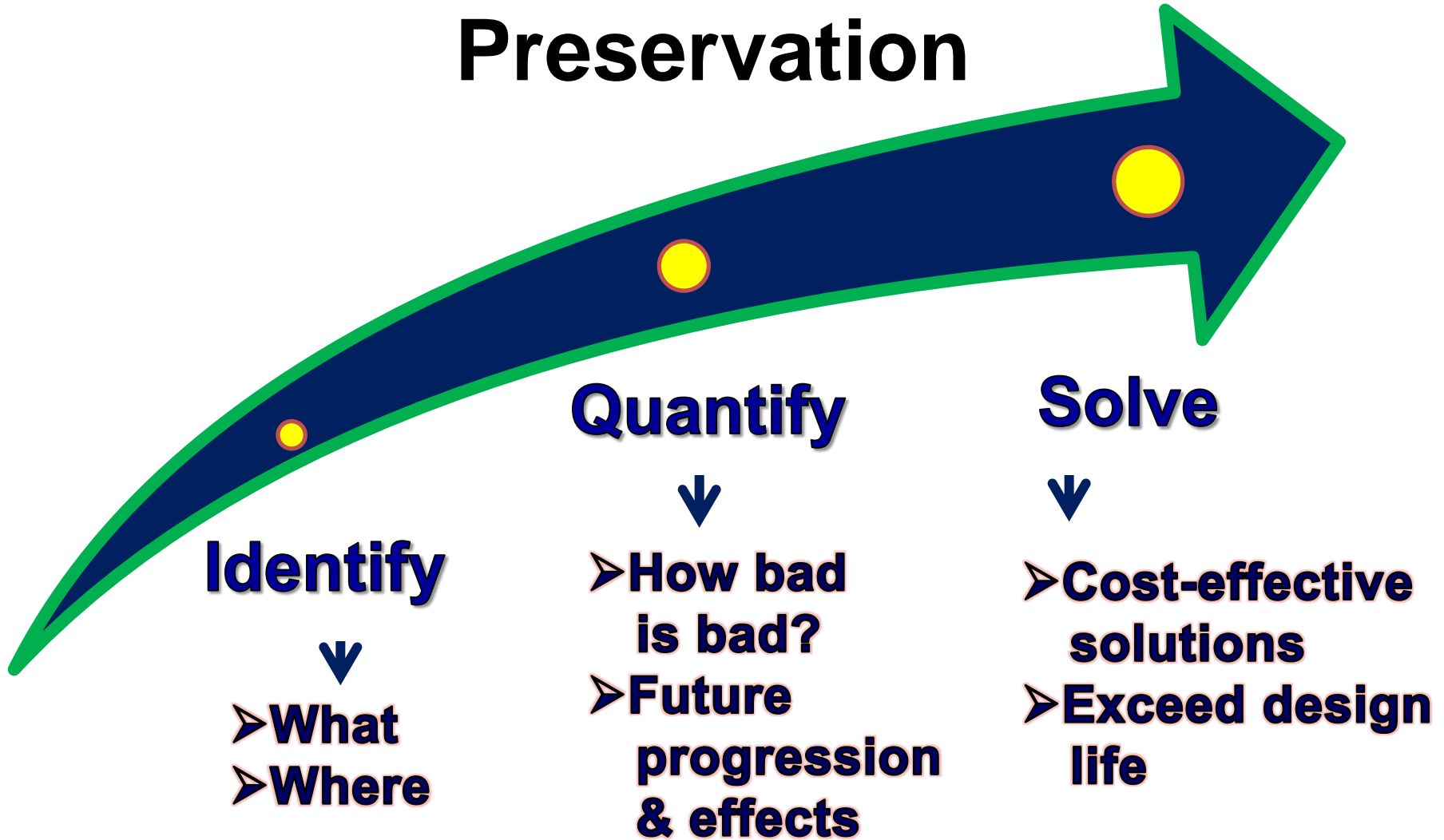


INNOVATIVE MATERIAL SYSTEMS FOR THE SUSTAINABILITY OF RIGID AND FLEXIBLE PAVEMENTS

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Preservation



Pavement Preservation Program

- Establish specific goals of the program
- Set performance levels to determine the effectiveness of the program
- Identify elements to receive preservation treatments
- Determine materials/treatments specific to each element (cont)



Pavement Preservation Program

- Program treatment cycles
- Determine the effectiveness of the materials and treatments
- Modify Preservation Program (materials/treatments) if necessary



Preservation Treatments

- Joints
- Partial and Full Depth Concrete Repairs
- Surface Treatments



Joints

Pre-formed Seal Silicone



Joints

Pre-formed Polymer Foam



Joints

Pre-formed Compression Seals



Joists

Polyurethane Elastomeric Headers



Joints

Methyl Methacrylate Headers



Joins

Preservation and Repair

- Annual inspection and cleaning of debris
- Re-apply adhesive on un-bonded locations
- Remove and replace joint sections that are torn or perforated
- Maintain headers and joint bonding surfaces.



Partial and Full Depth Concrete Repairs Materials

- Portland Cement Concrete

- 28 Day Cure
- Curing Compound (Wet Cure)

- Fast Setting Concrete

- 1-4 Hour Cure
- Wet Cure

- Polymer Concrete

- 1 Hour Cure
- Dry Cure



Proper Repair Procedure

- **Determine the extent of the repair area**
 - Chain drag
 - Hammer sounding
 - Ground penetrating radar
 - (GPR)
- **Preparation**
 - Saw cut perimeter
 - Jackhammer damaged area (30lb max)
 - Sand blast reinforcing
 - Clean with dry compressed air



Proper Repair Procedure

- Mixing/Placing of Repair Material
 - Mixing equipment
 - Vibration
 - Finishing
- Curing
 - Wet cure
 - Curing compound
 - Dry cure



Preservation Considerations

- Deterioration Can Expand Very Quickly
- Public Serviceability, Opinion and Safety
- Rehabilitation and Replacement is Expensive
- Preservation Treatments are Cost Effective
- Preservation Treatments Extend Serviceable Life



Surface Treatments

- Surface and Crack Sealing
- Wearing Surface
 - Skid Resistance
 - Waterproofing
 - Wearing Surface



Treatment Timing

- When is the Best Time to Seal Surfaces and Cracks
 - New Construction/Rehabilitation
 - Existing Decks with Cracking
 - Decks with Cracking and Extensive Spalling



Rigid Pavement Sealing Materials

- Silane and Siloxane
water or solvent based
(percent active solution)
- Linseed Oil
- Methyl Methacrylate & High
Molecular Weight Methacrylate
- Low Viscosity Epoxy



Material Characteristics

▪ Silane/Siloxane/Linseed Oil

- Make surface porosity and smaller cracks hydrophobic
- Will not seal larger cracks
- Must be re-applied to decks to maintain effectiveness
- Low initial cost
- Easy to apply



Material Characteristics

- **Methyl Methacrylate, High Molecular Methacrylate, Low Viscosity Epoxy**
 - Seal surface porosity and cracks
 - Good penetration into cracks and seal with cured material
 - Reapplication not required
 - Higher cost
 - Easy to apply



Surface Treatments

- Protect pavement deck from intrusion of moisture
- Reduce corrosion potential (reinforced pavement)
- Increase skid resistance
- Easily maintained
- Low initial cost
- Long service life



Rigid & Flexible Pavement Surface Treatments (HFS)



- Epoxies
- Application Methods
 - Broom and Seed (1/8")
 - Specialized Mixing Equipment
 - Standard Labor and Tools



Rigid Pavement Surface Treatments

- **Very Thin (1/4" – 1/2")**

 - Methyl Methacrylate and Epoxy**

 - Dead load 3 – 4 lbs/ sq ft
 - Service life approx 20 years

- **Thin (3/4" – 1 1/2")**

 - Polyester and Latex Modified Concrete**

 - Dead load 17.5 lbs/ sq ft
 - Service life approx 20 years



Epoxies (1/8"-3/8") Application Methods



- Slurry/Broom & Seed
- Mechanical Mixing Machines
- Standard Labor and Tools
- 2-6 Hour Cure



Methyl Methacrylate (1/4"-3/8") Application Method



- Slurry Application
- Mechanical Mixing Machines
- Standard Labor and Hand Tools
- 1 Hour Cure



Polyester (3/4 - 1 1/4") Application Method

- Resin/Aggregate Mortar
- Special Mixing Equipment
- Vibratory Screed (Compaction)
- Tine Surface Profile
- 2 Hour Cure



Latex Modified Concrete (1 1/4" - 2") Application Method



- Cement/Aggregate/Liquids
- Special Mobile Mixer
- Finishing
Machines/Vibratory
Screed
- 3 Hours VESLMC
- 7 Days LMC



Good Preservation Program Expected Results

- Proactive Treatment Schedule
- Slow Pavement Deterioration
- Reduce Maintenance Cost
- Increase Service Life
- Treat More With Less Funds
- Predictable Results



Thank You!

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