



# BUREAU OF LOCAL ROADS & STREETS IN-PLACE RECYCLING POLICIES

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# IN-PLACE RECYCLING POLICIES



- BLRS Manual Section 46-6
- Hot In-place Recycling issued with PM2011-01
- Cold In-place Recycling/Full Depth Reclamation issued with PM2012-02
- ARRA Basic Asphalt Recycling Manual Used in Development

Pavement Distress	In-Place Recycling Process		
	HIR	CIR	FDR
Raveling	Green	Yellow	Red
Potholes	Yellow	Green	Orange
Bleeding	Yellow	Yellow	Yellow
Skid Resistance	Yellow	Yellow	Orange
Rutting	Yellow	Green	Orange
Corrugations	Yellow	Green	Orange
Shoving	Yellow	Yellow	Orange
Fatigue Cracking	Red	Green	Green
Edge Cracking	Red	Orange	Green
Slippage Cracking	Yellow	Green	Yellow
Block Cracking	Red	Green	Green
Longitudinal Cracking	Yellow	Green	Yellow
Traverse Cracking	Yellow	Green	Green
Reflective Cracking	Yellow	Green	Green
Discontinuity Cracking	Red	Green	Green
Ride Quality	Green	Green	Red
Structural Improvement	Orange	Yellow	Green



IN-PLACE RECYCLING PAVEMENT DISTRESS SELECTION

Figure 46-6A



# HOT IN-PLACE RECYCLING



- Recycling Depth Maximum 2”
- Surface Recycling
  - Use LR400-3
- Surface Remixing
  - Experimental Feature Required
- Surface Repaving
  - Experimental Feature Required



# CIR-FDR POLICY DEVELOPMENT



- Many Counties Using under Experimental Features
- Illinois Center for Transportation Funded Research Project (R27-012)
  - <http://ict.illinois.edu/index.aspx>
- Research Project Documented Performance and Cost Savings (Completed March 2009)
- Implementation Group (IDOT, Counties, Researchers, Consultants, ARRA Members) to Develop Final Specifications and Policy



# CIR WITH ASPHALT



- Recycling Depth 3” to 5”
- Stay within Bituminous Layer(s)
- Requires Surface Treatment/Overlay
- Eligible for Federal, State & MFT Funds
- Use LR400-5 for CIR with Emulsified Asphalt
- Use LR400-6 for CIR with Foamed Asphalt



# FDR WITH ASPHALT



- Recycling Depth Maximum 10”
- Requires Surface Treatment/Overlay
- Eligible for Federal, State, or MFT Funds
- May Not Allow as Preservation/Maintenance Treatment
- Use LR400-4 for FDR with Emulsified Asphalt
- Use LR400-7 for FDR with Foamed Asphalt



# LR400-4 AND LR400-5 EMULSIFIED ASPHALT



- Special Provisions Based on Road Science (SemMaterials) Construction and Design Requirements
- Mix Design Parameters Included
- Use LR1000-1 for Mix Design Procedures



# LR400-6 AND LR400-7 FOAMED ASPHALT



- Special Provisions Based on Wirtgen and South African Construction and Design Requirements
- Mix Design Parameters Included
- Use LR1000-2 for Mix Design Procedures





# CIR/FDR ISSUES



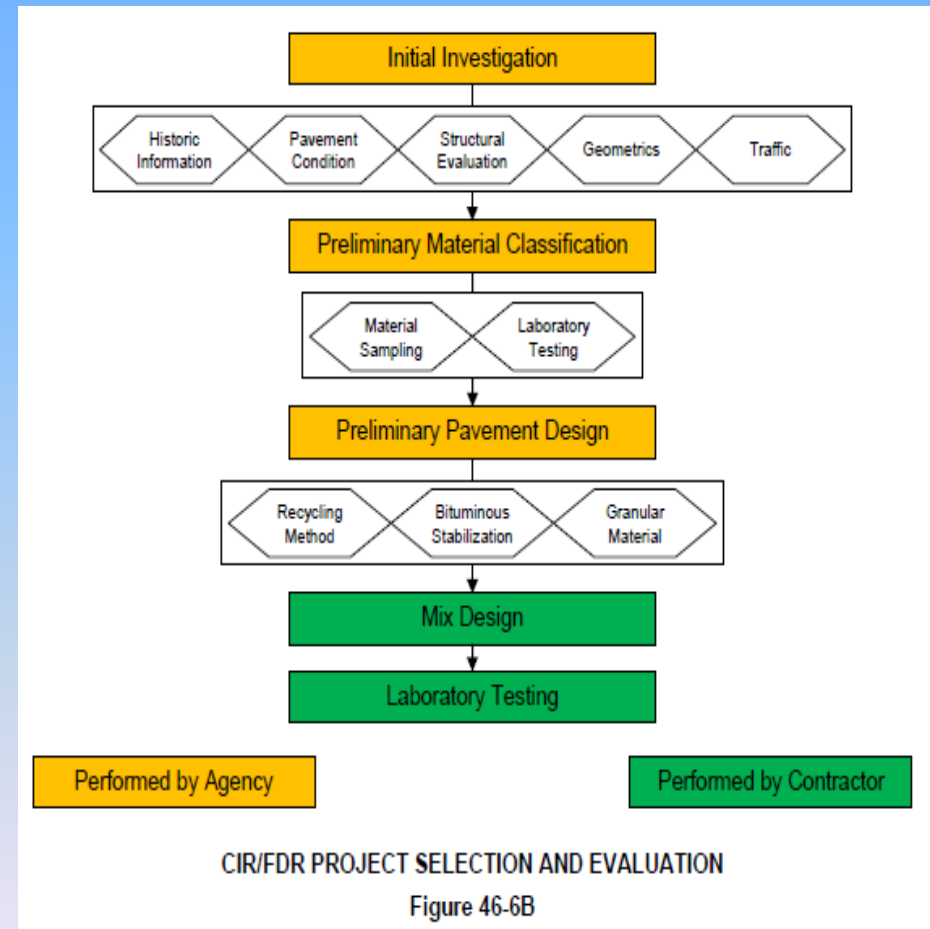
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- Project Selection
  - Mix Design
  - QC/QA
  - Prequalification (Engineer/Contractor)
  - Smoothness



# CIR-FDR PROJECT SELECTION



- Performed by Agency
  - Initial Investigation
  - Preliminary Material Classification
  - Preliminary Pavement Design
- Performed by Contractor
  - Mix Design
  - Laboratory Testing





# CIR-FDR MIX DESIGNS



- Test Procedures
  - ASTM, AASHTO, IL Modifications
- Equipment Availability
  - Hveem Cohesimeter
- Additional Performance Tests
  - Research/Innovations/ARRA Typical Specs
- Contractor v. Owner
  - Project Delays



# QC/QA



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- Field Tests
  - Density Control
  - Frequency of Tests
  - Independent Assurance



# PREQUALIFICATION



- Consultants
  - AASHTO Accredited Laboratories
  - Design and Construction
- Contractors
  - Specialized Equipment
  - Knowledgeable Staff
  - Field Adjustments



# CIR-FDR SMOOTHNESS



- Maximum 3/8" Surface Variation
  - Tested using 16' straight edge
  - Surface profile milling required to correct surface variations exceeding maximum (No Extra Pay)
- LR403-1 Issued to Reduce to 1/4"
  - Recommended for Thin Overlays ( $\leq 1.5$ " ) or Surface Treatments
  - Contractor Paid by Square Yard



# FDR WITH CEMENT



- Concept used frequently
- Not well documented (specs, procedures, etc)
- Follow experimental feature process
- Different mix design
- Cement percentage
  - Too much = rigid pavement shrinkage cracks
  - Too little = poor durability structural failure
- Freeze-Thaw testing



# QUESTIONS?

