ASPHALT

THE SMOOTH QUIET RIDE

2013 Local Roads Workshop

Novi

February 28, 2013

Asphalt Pavement Association of Michigan

MICHIGAN RIDES ON US

Asphalt.

Maximizing Your Pavement Dollars

ASPHALT PAVEMENT ASSOCIATION OF MICHIGAN

Presentation Outline

- Mix of Fixes
- Decision Making Process / Pavement Management System
- ASCRL (Asphalt Stabilized Crack Relief Layer)
- Cost Considerations

Mix of Fixes

Capital Preventive

Rehabilitation

Reconstruction

Mix of Fixes

Capital Preventive maintenance: Shorter Term Fixes

- 1 ½” HMA Overlay
- Milling and 1 ½” HMA Overlay
- Crack Treatment
- Overband Crack Filling
- Chip Seal
- Micro-Surfacing
- Ultra-Thin HMA Overlay

Mix of Fixes

Rehabilitation: Medium Term Fixes

- Structural HMA Overlay (Multiple Course)
- Mill and Structural HMA Overlay
- Crush and Shape
- Rubblization
- ASCRL

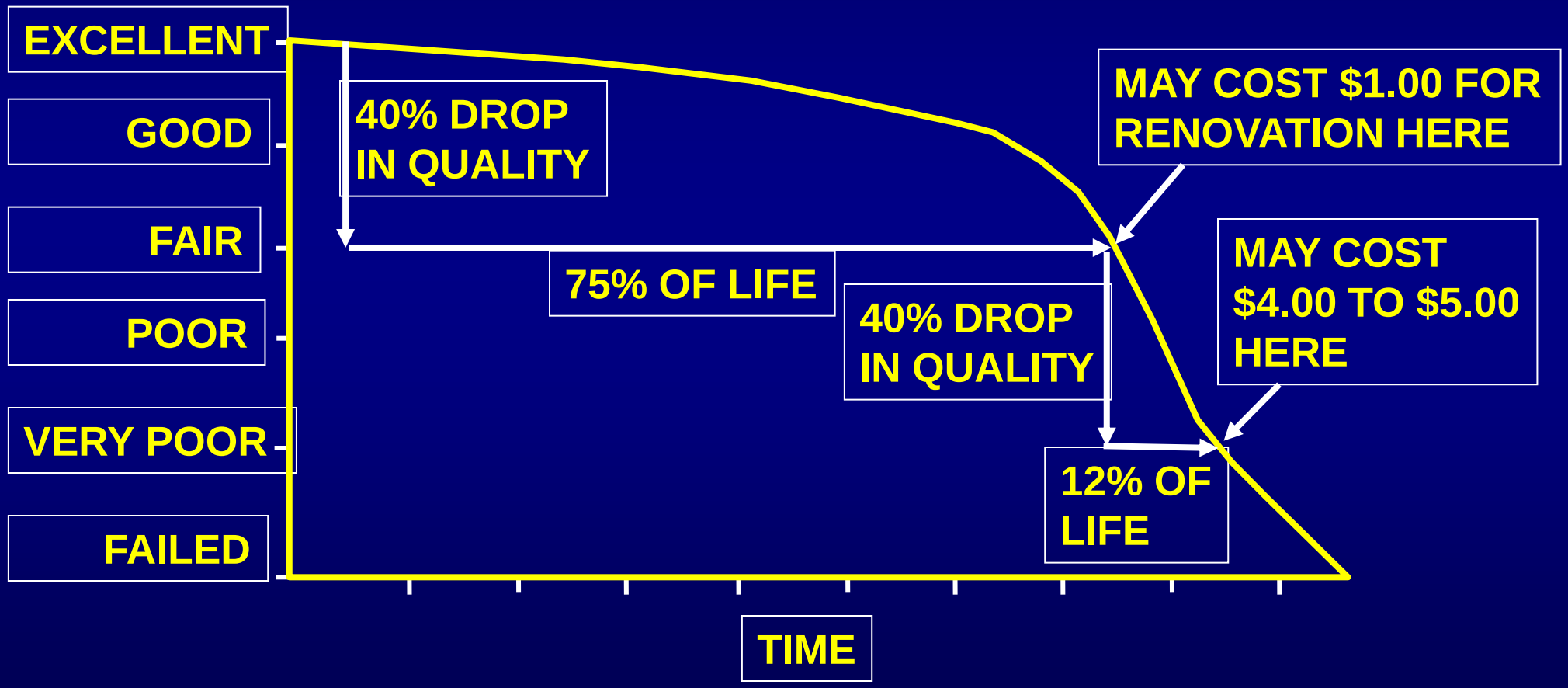
Mix of Fixes

Reconstruction: Long Term Fixes

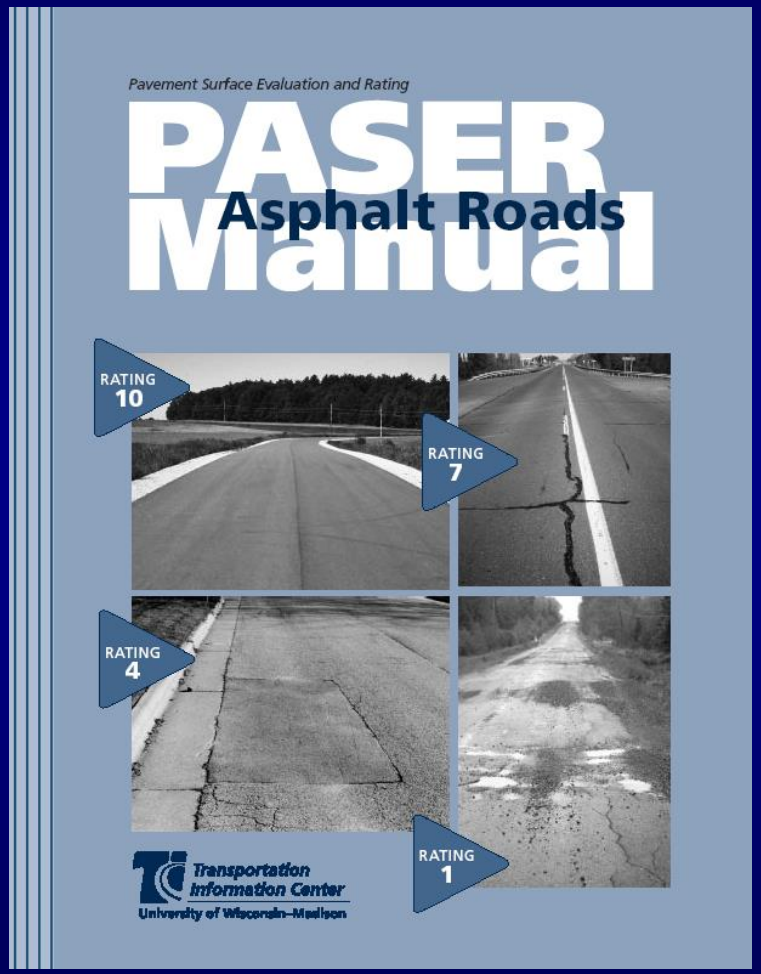
- Full depth pavement removal and replacement (10 – 13 inches)
- New Construction

Mix of Fixes

Asset Management Strategy



Decision Making Process



Pavement Management

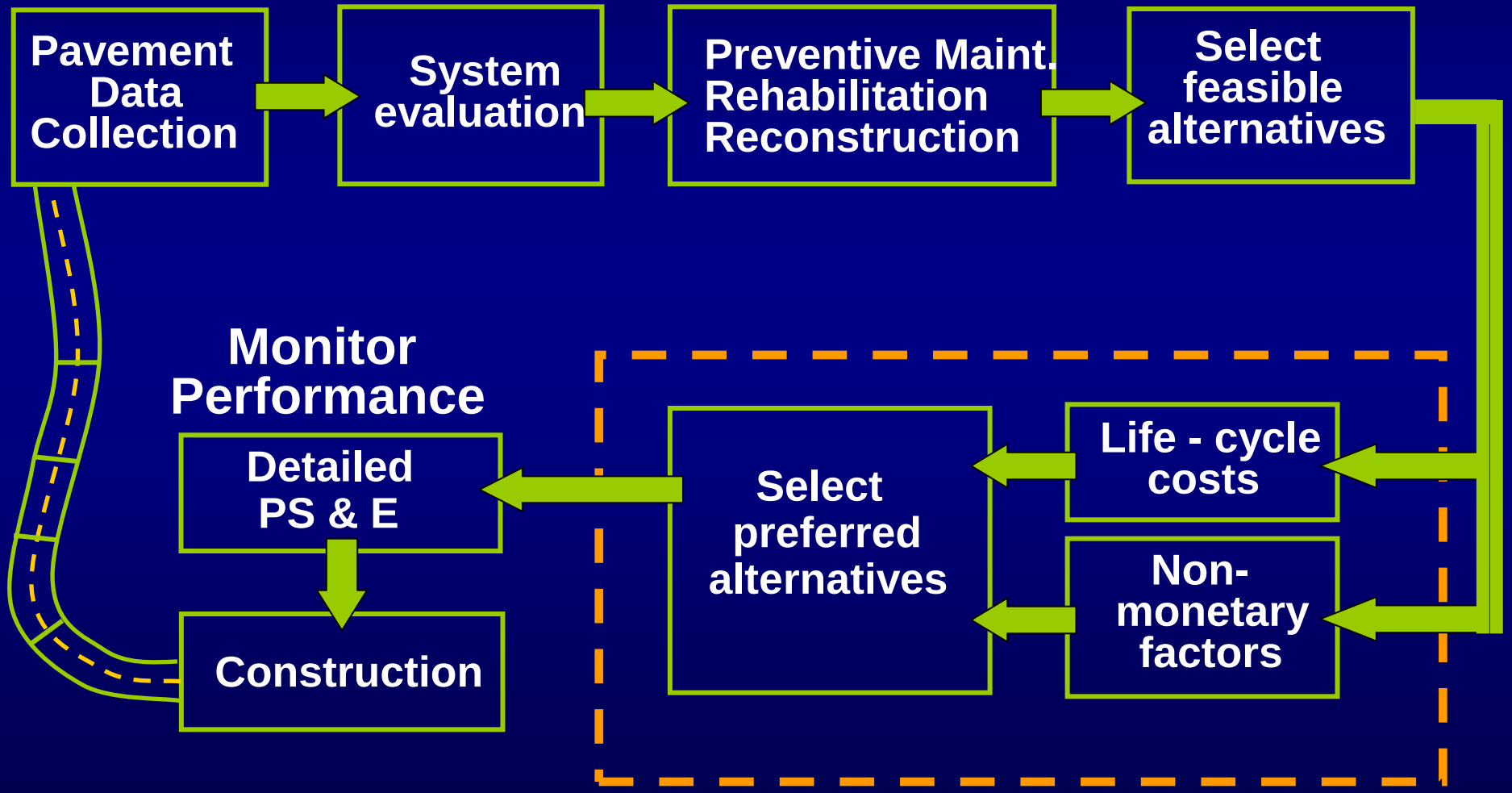
Decision Making Process

Purpose of Pavement Management System (PMS)

- Determine current pavement condition
- Predict future pavement condition with and without work
- Determine where, when and what work to do
- Justify budget needs
- Determine what works and what doesn't (e.g., feedback loop)

Decision Making Process

PMS Process



Decision Making Process

Components of PMS

- Pavement Inventory
- Inspection
- Condition Assessment based on inspection results (e.g., PASER rating, PCI, RSL, etc.)
- Prediction Modeling technology for developing deterioration trends
- Network Condition Analysis
- Annual and long Range Work Planning

Decision Making Process

Pavement Inventory

- Type of Data to be Collected
  - Physical characteristics
  - Construction and maintenance history
  - Traffic levels
  - Climate information
  - Soils information

Decision Making Process

Condition Assessment

The assessment of current condition MUST be objective and repeatable

BUT, it must also match available resources

Decision Making Process

Approaches to Collecting Pavement Condition Data

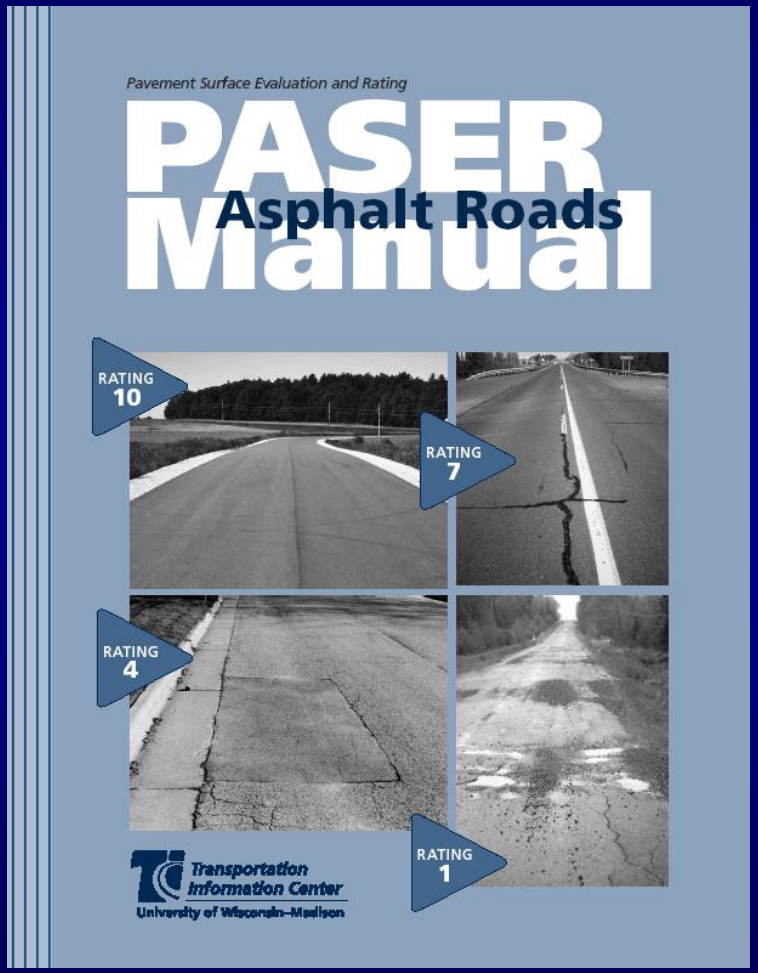
- Manual
- Semi-automated
- Automated

Decision Making Process

PASER – Pavement Surface Evaluation and Rating System

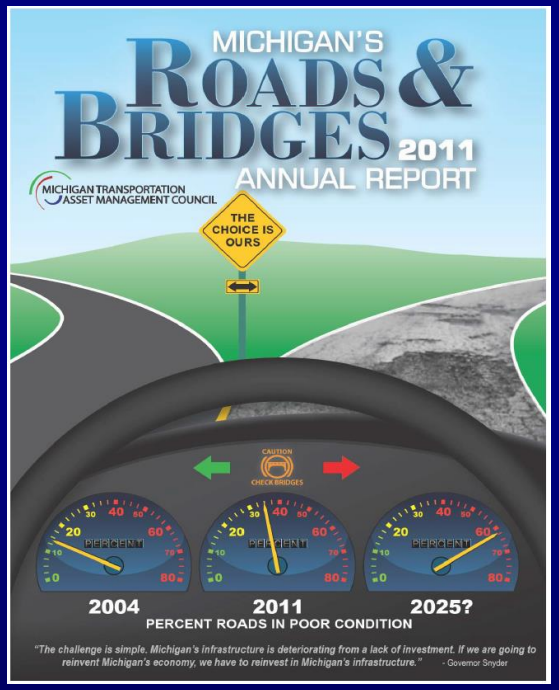
- Rating Scale 1 - 10
  - Rating of 1 represents a condition needing total replacement.
  - Rating of 10 represents the best, or new construction.

- Surface Condition
  - Important to public
  - Simplified PMS system



Decision Making Process

Michigan Transportation Asset Management Council



http://www.mcgi.state.mi.us/mitrp/Council/Default_Council.aspx

Presentation Outline

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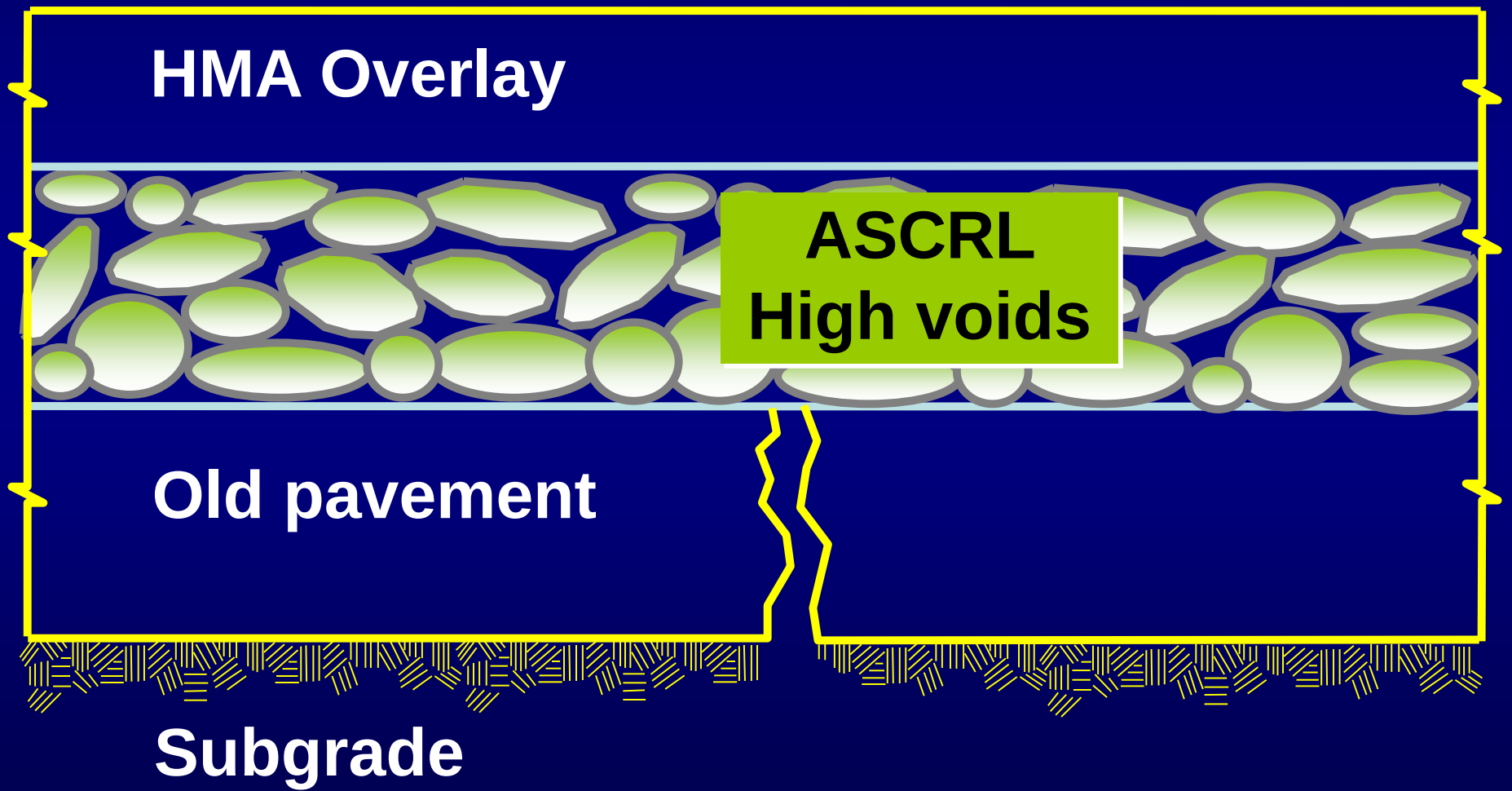
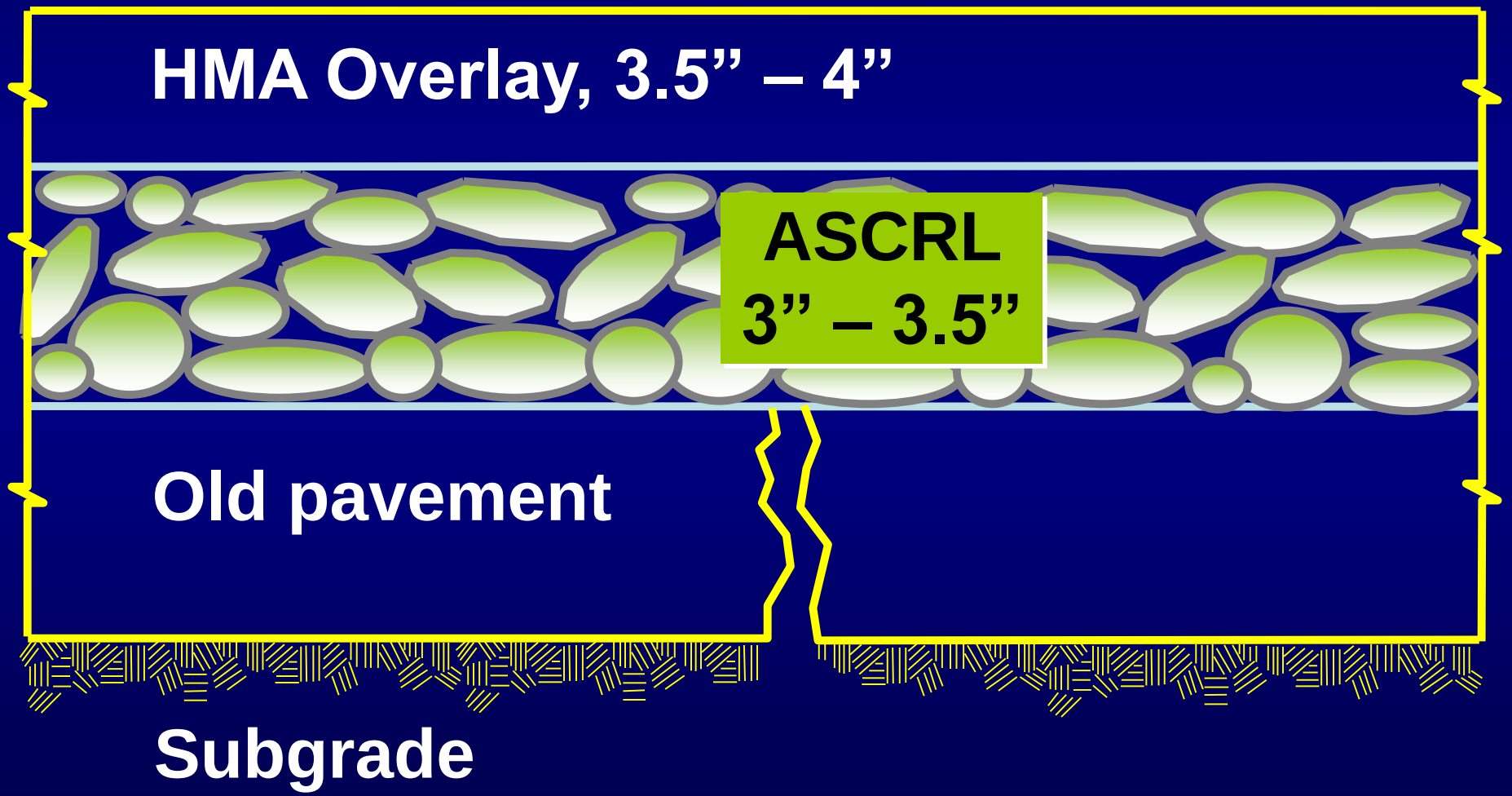
- Cost Considerations

Asphalt Stabilized Crack-Relief Layer (ASCRL)



Asphalt Stabilized Crack-Relief Layer (ASCRL)

Asphalt Stabilized Crack-Relief Layer (ASCRL)



Asphalt Stabilized Crack-Relief Layer (ASCRL)

MICHIGAN
DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION
FOR
ASPHALT STABILIZED CRACK RELIEF LAYER

C&T:GMM 1 of 4 C&T:APPR:JB:CJB:04-03-04

a. Description. Furnish, place and compact an asphalt stabilized crack relief layer (ASCRL) on a prepared pavement base according to the details shown on the plans or as directed by the Engineer. The HMA mixture will be provided according to the requirements of the 2003 Standard Specifications for Construction, except where modified herein.

b. Materials. The aggregate materials used to prepare the ASCRL shall meet the following requirements.

The coarse aggregate shall originate geologically only from natural sources. Crushed concrete or reclaimed asphalt pavement cannot be used in the ASCRL mixture.

Table 1 Aggregate Specifications

Gradation Requirements						
Sieve Size (inch)	1 1/2	1	1/2	No. 4	No. 30	No. 200 (LBW) (a)
Percent Passing	100	90-100	30-60	10-25	5-15	3-5
Physical Requirements						
Crushed Material, Min. (MTM 117) % (b)	95					
Loss, max., Los Angeles Abrasion (AASHTO T96) %	35					
Soft Particle (max) % (c)	5.0					

a. Loss by Washing shall be by MTM 108. Mineral filler may used to meet the required percentage.
b. The percentage of crushed material will be determined on that portion of the sample retained on all sieves down to and including the No. 4 sieve.
c. The sum of aggregate particles retain on the No. 4 sieve identified as shale, siltstone, clay ironstone and particles which are structurally weak or are found to non-durable in service.

c. Mix Design. The Contractor shall provide a mix design in accordance with the criteria herein. The following are the requirements for the testing, documentation, and material samples for a mix design verification. Submittal of the Mix Design and samples shall be made to MDOT,

Asphalt Stabilized Crack-Relief Layer (ASCRL)

Asphalt Pavement Association of Michigan

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Asphalt Stabilized Crack-Relief Layer (ASCRL)

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Asphalt Stabilized Crack-Relief Layer (ASCRL)

Mix Design

- Asphalt Binder – PG 64-28 with 0.5% liquid antistrip additive
- Asphalt content – 3 to 4 %
- Surface Coating – 100 % without excessive draindown (max 0.30 %)
- Minimum Asphalt film thickness - 9.0 microns
- Moisture sensitivity (AASHTO T283)

Asphalt Stabilized Crack-Relief Layer (ASCRL)

Construction

- Placed in a single layer
- Compaction – steel – wheeled tandem roller (1.0 ton per foot of drum length)
  - Static mode only
  - Minimum of three passes (down and back)
  - Compaction test strip may be required (minimize breakage of Agg.)

Asphalt Stabilized Crack-Relief Layer (ASCRL)

MDOT Projects to Date

Project	# of Jobs	Length (miles)
ASCRL	25	130

Started in 2001

- All are performing very well

Asphalt Stabilized Crack-Relief Layer (ASCRL)

MDOT Projects to Date

Region	# of Jobs	Length (miles)
Superior	3	10
North	6	18
Grand	5	14
Bay	1	8
University	5	28
Metro	5	52

Asphalt Stabilized Crack-Relief Layer (ASCRL)

M-21, Before Construction

Asphalt Stabilized Crack-Relief Layer (ASCRL)

M-21, 3 years old

Presentation Outline

- Mix of Fixes
- Decision Making Process
- ASCRL (Asphalt Stabilized Crack Relief Layer)
- Cost Considerations

Cost Considerations

Rubblization vs ASCRL (1 mile x 24 feet wide):

Rubblization option :

1.5 in wearing	5E10	1161 tons @ 64.05	
2.0 in leveling	4E10	1548 tons @ 62.16	
3.0 in base	3E10	2323 tons @ $ 55.53	
		Total mix	$ 299,581
Rubblization	14080 syd @ $2.50		$35,200
Total			$ 334,781

Cost Considerations

Rubblization vs ASCRL (1 mile x 24 feet wide):

ASCRL option :

1.5 in wearing	5E10	1161 tons @ 64.05	
2.0 in leveling	4E10	1548 tons @ 62.16	
3.0 in ASCRL		2323 tons @ $48.00	
		Total mix	$ 286,099
Joint Repairs (25 % of all joints) (75 % Det 7's , 25 % Det 8's , hand patching)			$6,844
Total			$292, 943

Cost Considerations

Rubblization vs ASCRL (1 mile x 24 feet wide):

Rubblization option: $ 334,781

ASCRL option: $ 292,943

- Difference: 14%
- Very competitive
- Very good performance to date

Maximizing Your Pavement Dollars

Questions?