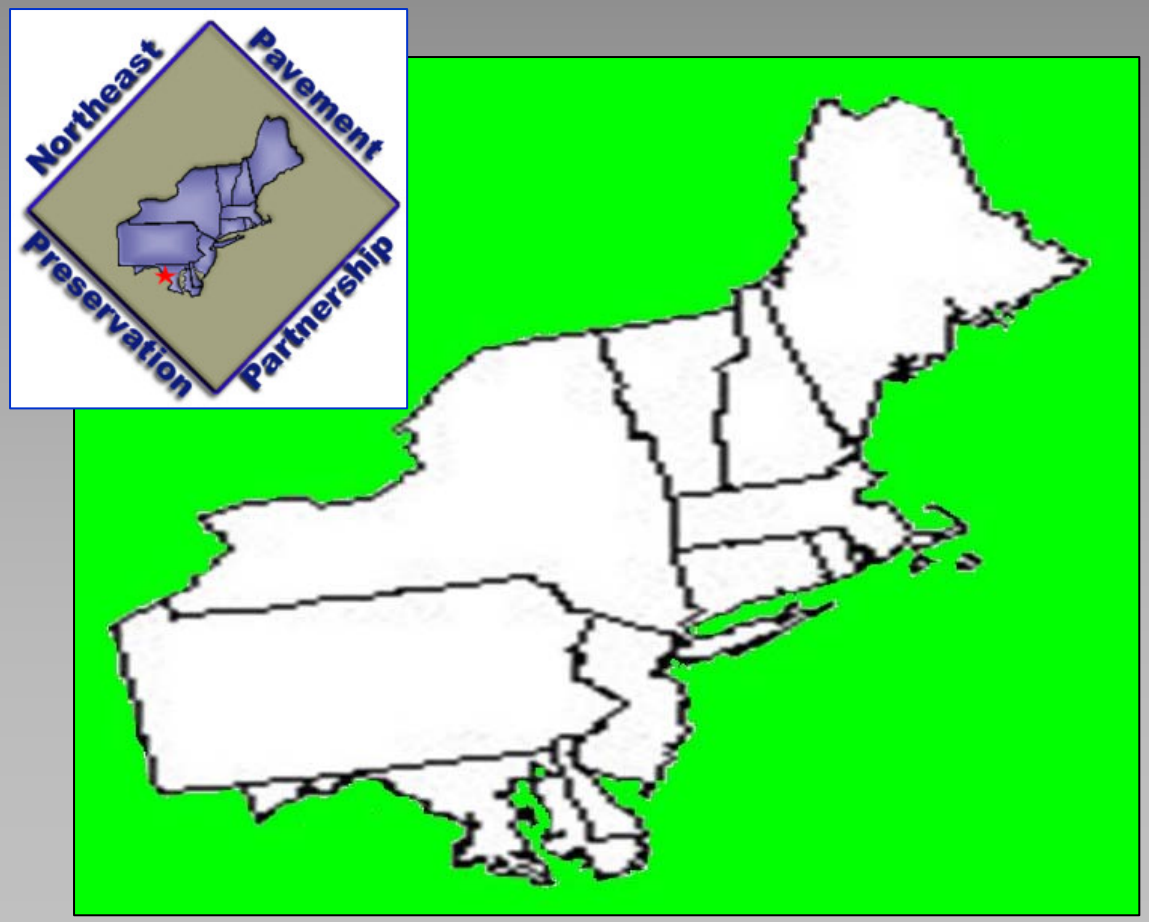
National Center for Pavement Preservation
Report of Activities
for



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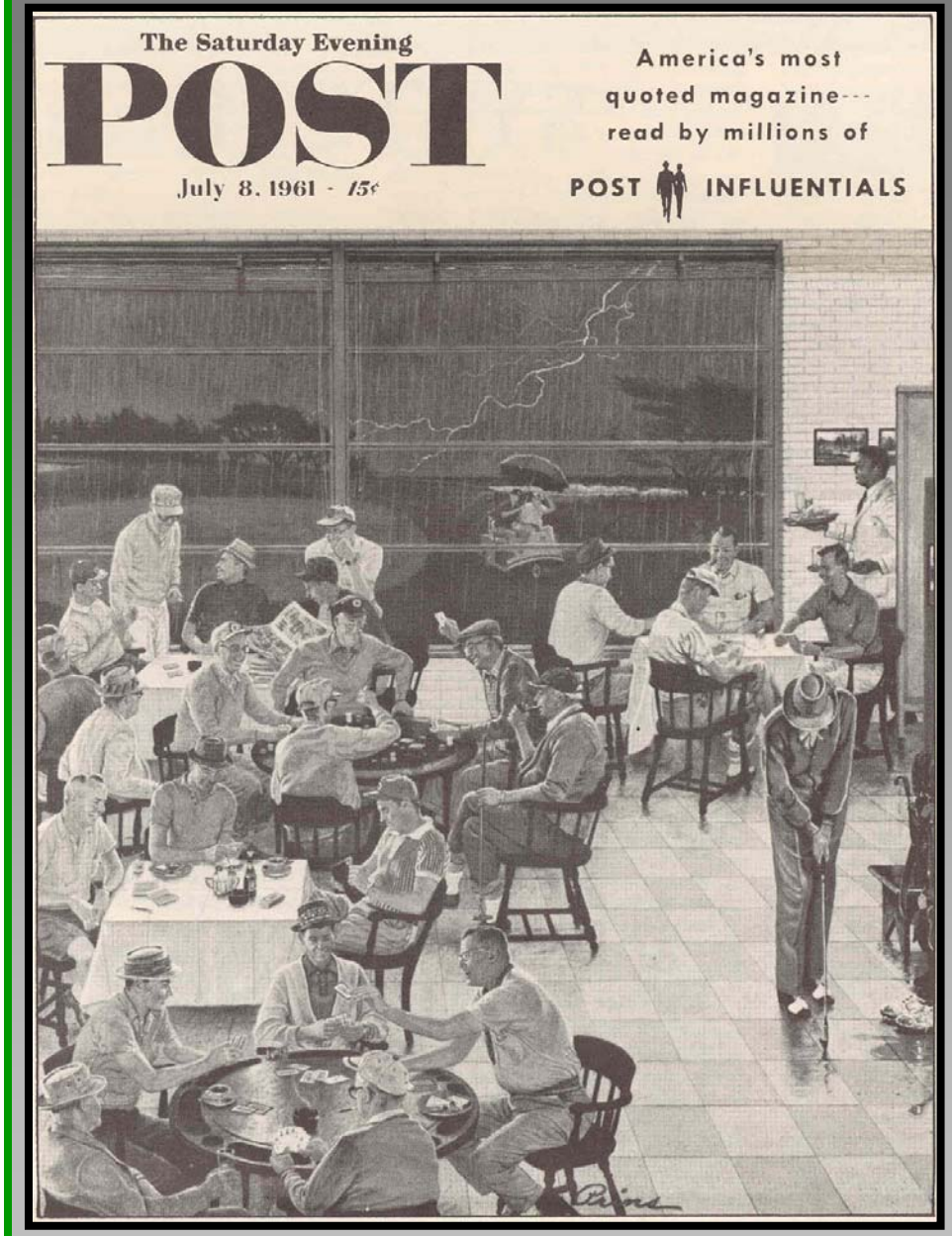

OUR NEW SUPER-ROAD SYSTEM

By ARTHUR W. BAUM

A *Post* editor reports on the controversial 41,000-mile Interstate Highway System—where it goes, how fast it is being built, and how it will change the lives and habits of countless Americans.

The largest single construction project that man has ever undertaken can hardly fail to alter, in some degree, all of our lives. The big task is building a National System of Interstate and Defense Highways, now in its fifth year of a sixteen-year schedule. Eleven years from now all parts of our forty-eight conterminous states will have been placed on what amounts to a single high-speed ultrasafe road. Any American anywhere will be able to reach this road quickly and thereafter drive to any other area with hitherto unknown speed and comfort.

With rare exceptions the future traveler will progress along one-way strips of pavement three or more lanes wide, separated from opposing traffic by medians as wide as a normal street. He will meet no traffic lights, cross no intersections, and by far the greater part of his travel will be free of tolls.

The National System of Interstate and Defense Highways, roughly a quarter of which is already in use, is a nationwide network of 41,000 miles. It will connect Houlton, Maine, with the Mexican border below San Diego, California. It will bring together Miami and the Canadian border above Bellingham, Washington. It will stop and perhaps reverse the rotting of cities, change and enlarge recreational patterns and induce business and industrial migrations. It will generate new businesses and communities by the hundreds. It will damage others temporarily, and it will permanently shrink one roadside form of small-business opportunity.

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PROCEEDINGS OF THE
THIRTY-NINTH ANNUAL

HIGHWAY

CONFERENC

Held at Grand Rapids, Michiga

March 16, 17, 18, 1954

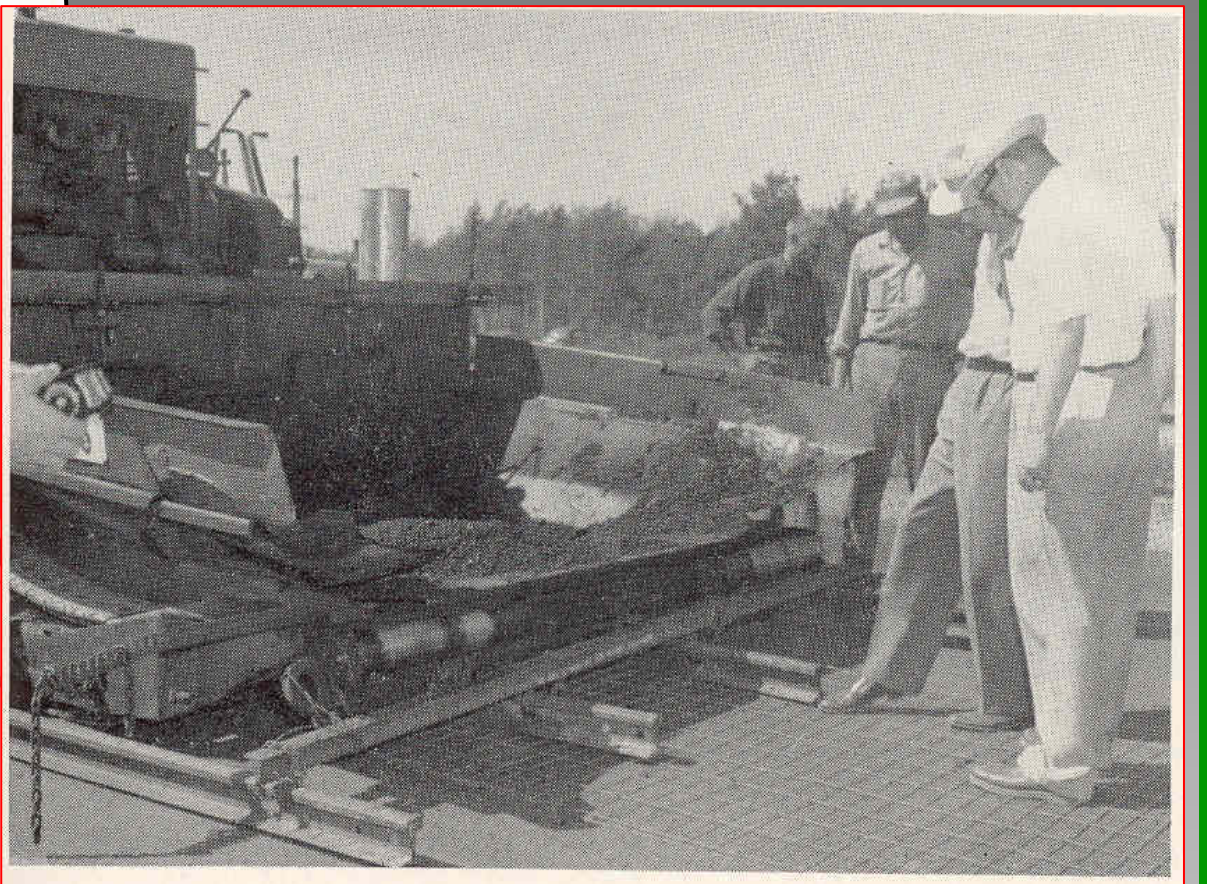

FIG. 3. Moose Lake, Minn. Man indicates with toe one of four 60-pound railroad rails attached to paver. Rails "iron out" the welded wire fabric, keep it flat as the hot mix is paved over it.

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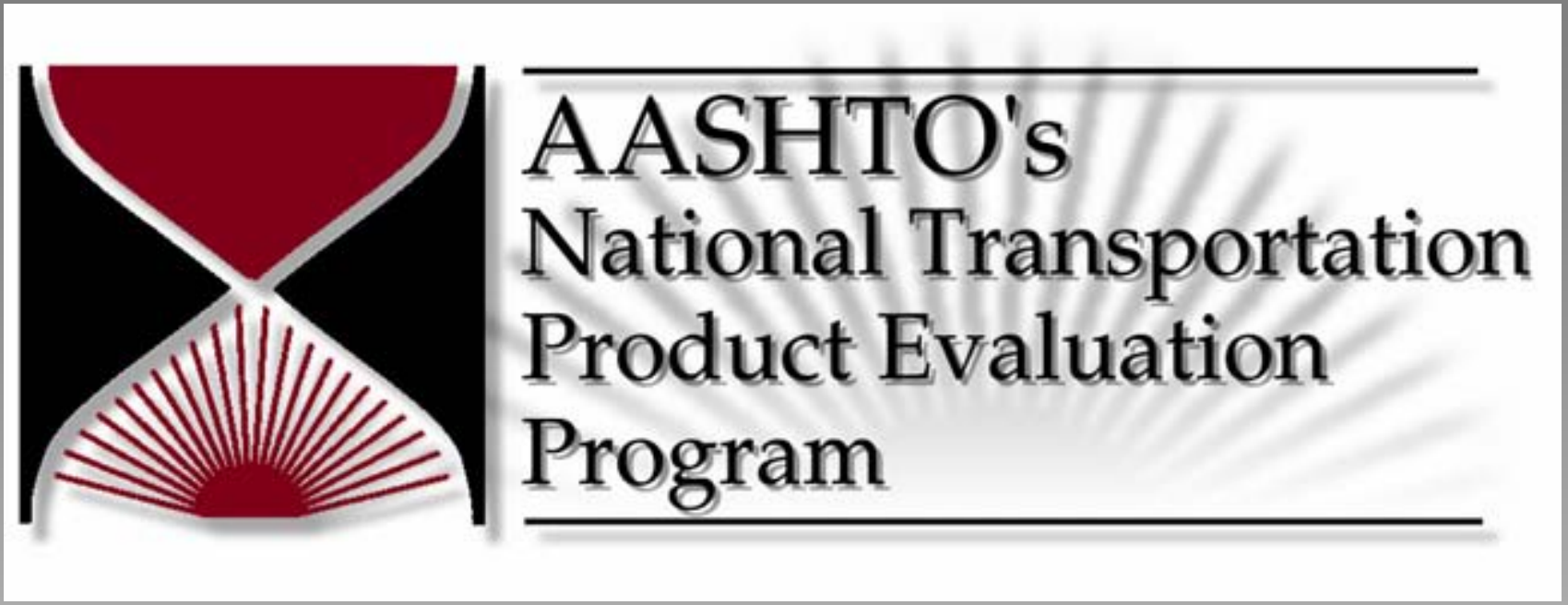

NTPEP CRACK SEALANT PROJECT

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Purpose of NTPEP...

"NTPEP pools the physical and professional resources of State DOTs to coordinate national evaluation on proprietary, engineered products of common interest, including a wide array of highway safety products, construction and maintenance materials."

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TSP²

Transportation System Preservation Technical Services Program

Resolution PR-10-05

Approved by the Board of Directors

May 8, 2005

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Phases of TSP^2

1. Establish Pavement Preservation Technical Services Program.
2. Form Regional Pavement Preservation Partnerships.
3. Rollout Bridge Preservation Technical Services Program.

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Technology Deployment Study – Modifiers for Asphalt Emulsions, Synthesis of Best Practices

FHWA, Central Federal Lands Highway Division

FHWA, Office of Asset Management

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Purpose of Study

1. Develop new specifications for Polymer Modified Asphalt Emulsions (PME) used in the applications of chip seals, slurry seals, micro-surfacing, and other typical uses.
2. Published in a field guide to be used by pavement practitioners of the FHWA.

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Pavement Preservation Technical Assistance Review and Evaluation

FHWA, Office of Asset Management

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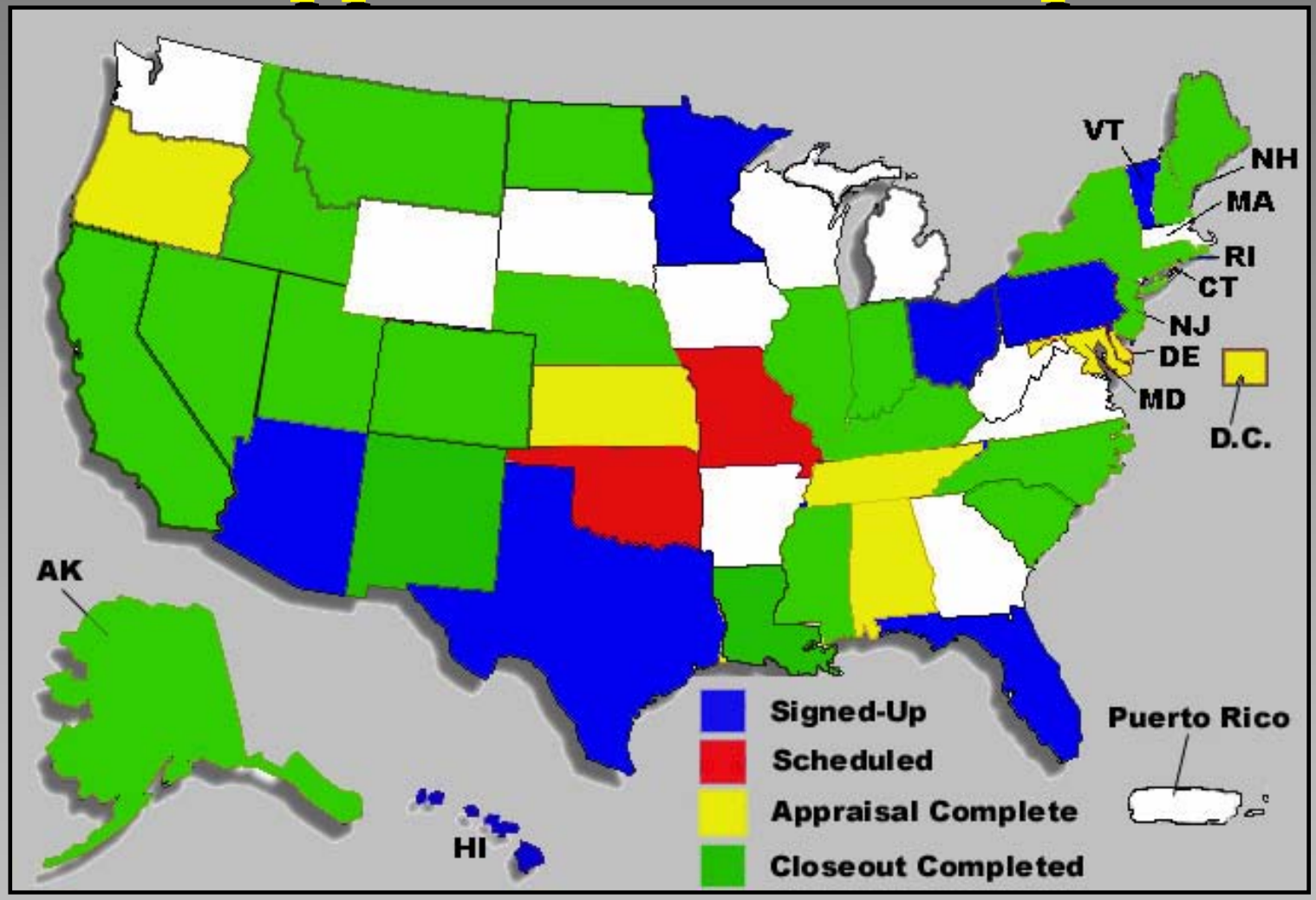
Appraisal Status Map



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U.S. Department of Transportation Federal Highway Administration

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What is it ?

- ✓Develop guidelines for improvement
- ✓Agency self-assessment
- ✓Provide state appraisal results
- ✓Identify national trends
- ✓Comparisons of agency results to national or regional trends

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Training

Pavement Preservation:
Applied Asset Management

Chip Seal Best Practice

Slurry/Micro-Surfacing Best Practice

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Michigan State University
&
National Center for Pavement Preservation

Partnership

South China University of Technology

China Center for Pavement Preservation

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Guangzhou, China

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2008 Pavement Preservation Workshop

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- Routine Maintenance
- Preventive Maintenance
- Rehabilitation

- Sustainable Financing
- Long-Term Network Planning
- Cost-Effective Decision Making
- Pavement Management System
- Optimization

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"Definition"

Pavement preservation is a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations.

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Flexible Surface Treatments

- ✓ Crack Filling
- ✓ Chip Seals
- ✓ Fog Seals *
- ✓ Slurry Seals
- ✓ Micro-surfacing
- ✓ Ultra-thin Overlays
- ✓ Profile Milling
- ✓ HIR
- ✓ Crack Sealing
- ✓ Cape Seals
- ✓ Sand Seals
- ✓ Scrub Seals
- ✓ Bonded Wearing Course
- ✓ Thin Overlays
- ✓ Mill & Resurface
- ✓ CIR

….and many others!

Pavement Preservation is *NOT* about Maintenance as Usual

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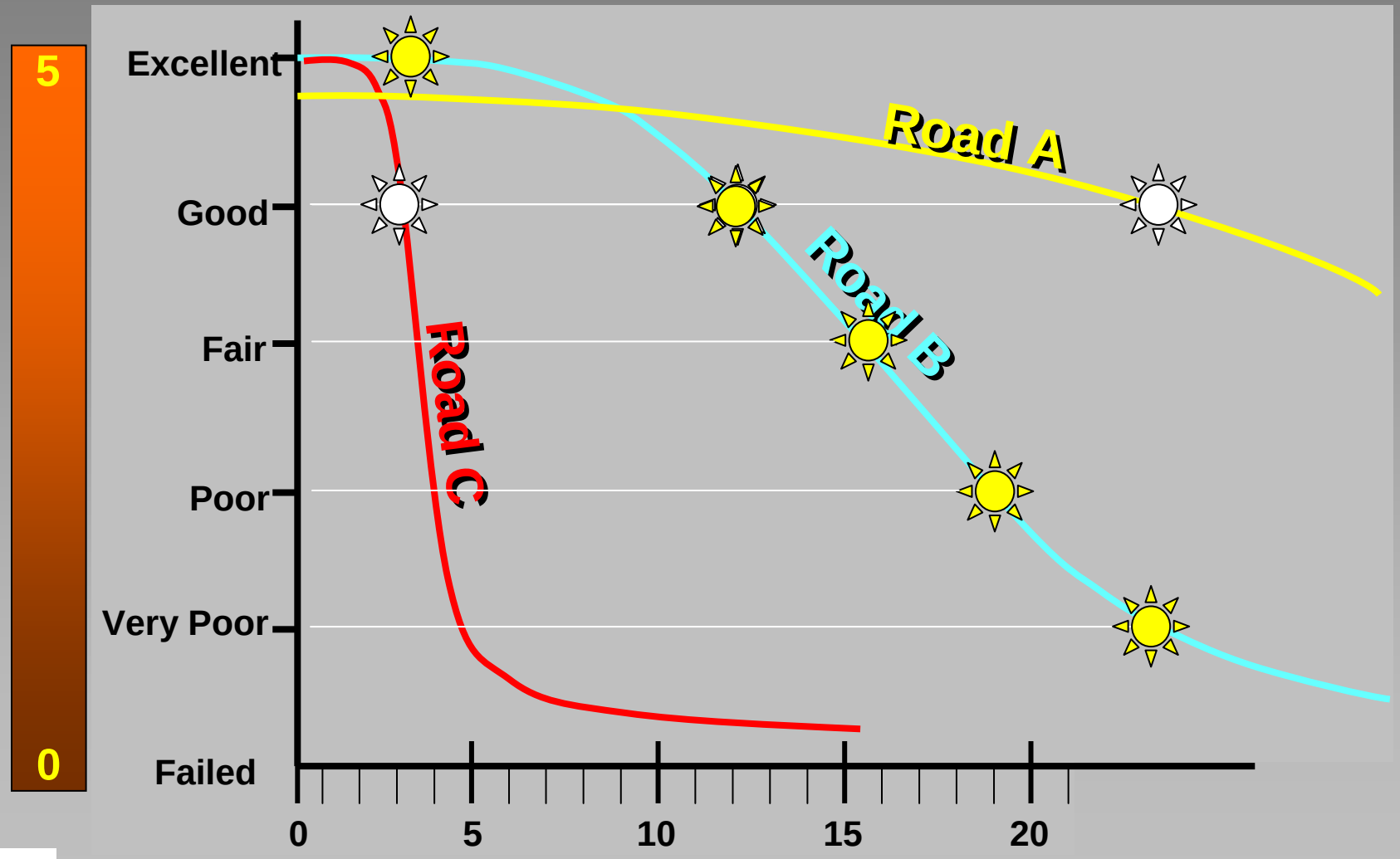
Remaining Service Life Concept

Present Serviceability Index



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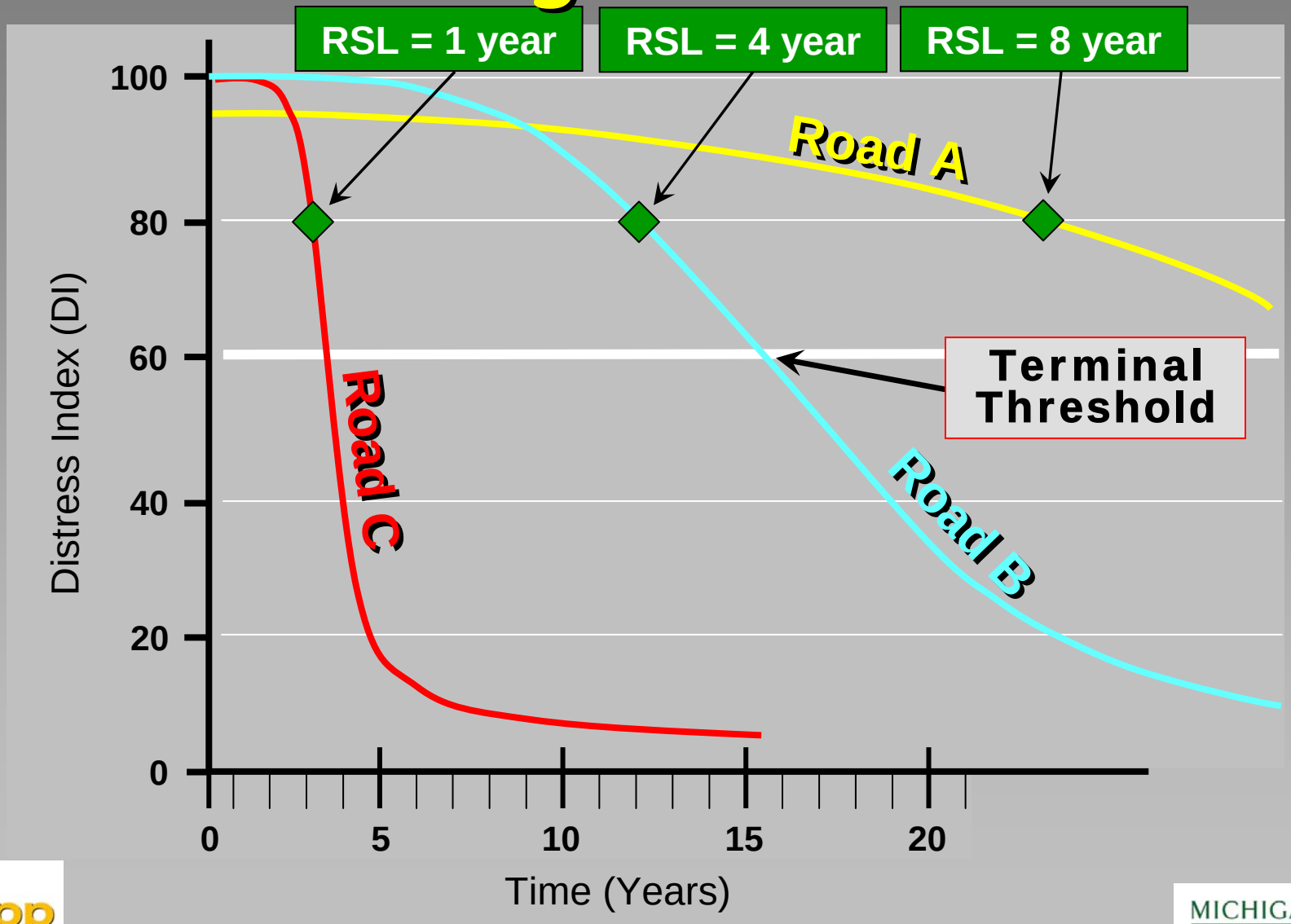
Remaining Service Life

Remaining Service Life (RSL) is the estimated number of years, from a specified date, until a pavement section reaches the threshold distress index. RSL is a function of the distress level and rate of deterioration.

Remaining Service Life



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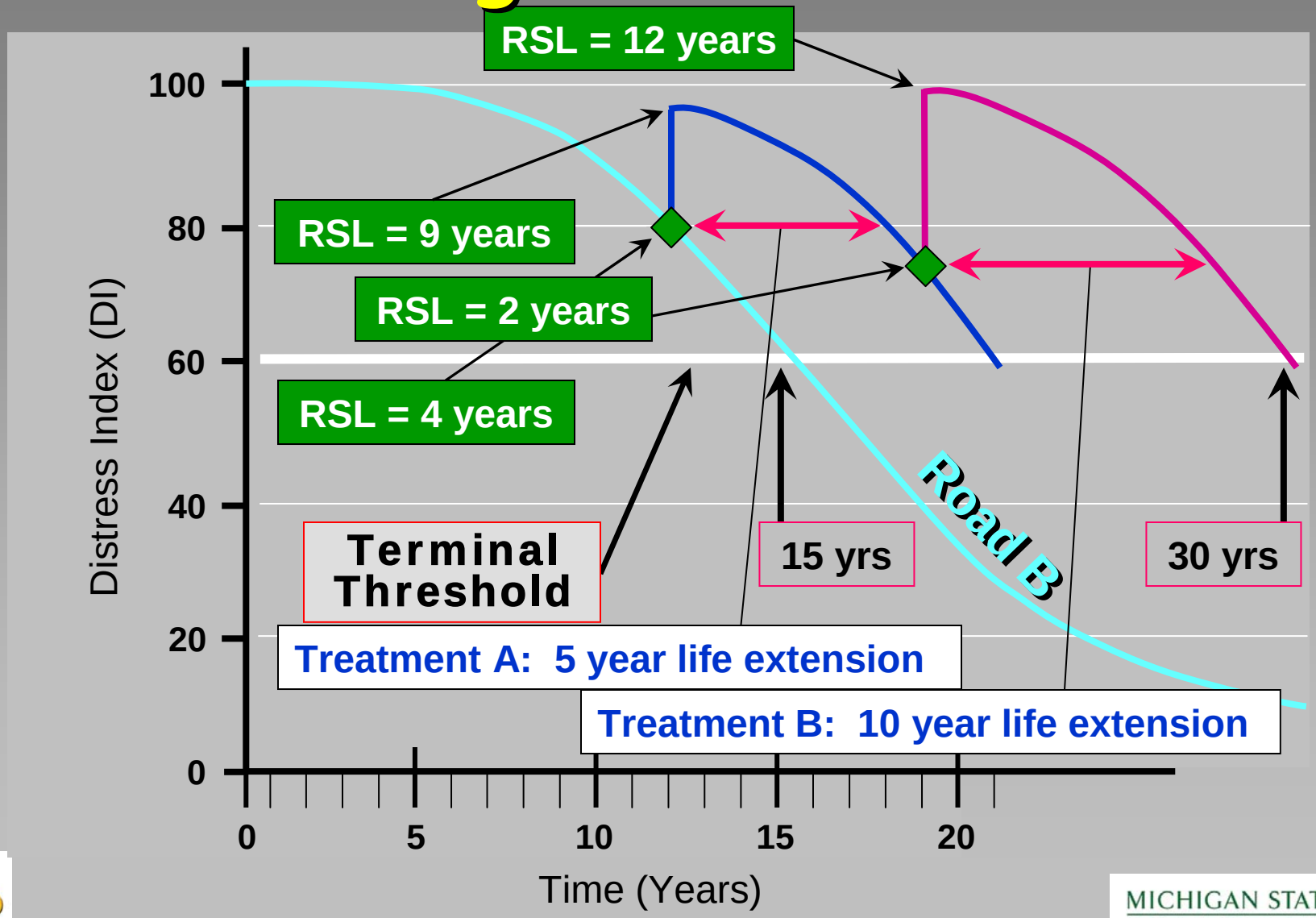
Remaining Service Life



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Typical Life Extensions
(Years)

Treatment	Good Condition (PCI=80)	Fair Condition (PCI=60)	Poor Condition (PCI=40)
Fog Seal	1 - 3	0 - 1	0
Chip Seal	4 - 10	3 - 5	0 - 3
Slurry Seal	3 – 5	1 - 3	0 - 1
Micro-Surfacing	4 – 8	3 - 5	1 - 4
Thin HMA	4 - 10	3 - 7	2 - 4

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Network Evaluation

Quick Assessment Method

Example:

Department Network

Network Size = 4,356 lane miles

Current Condition

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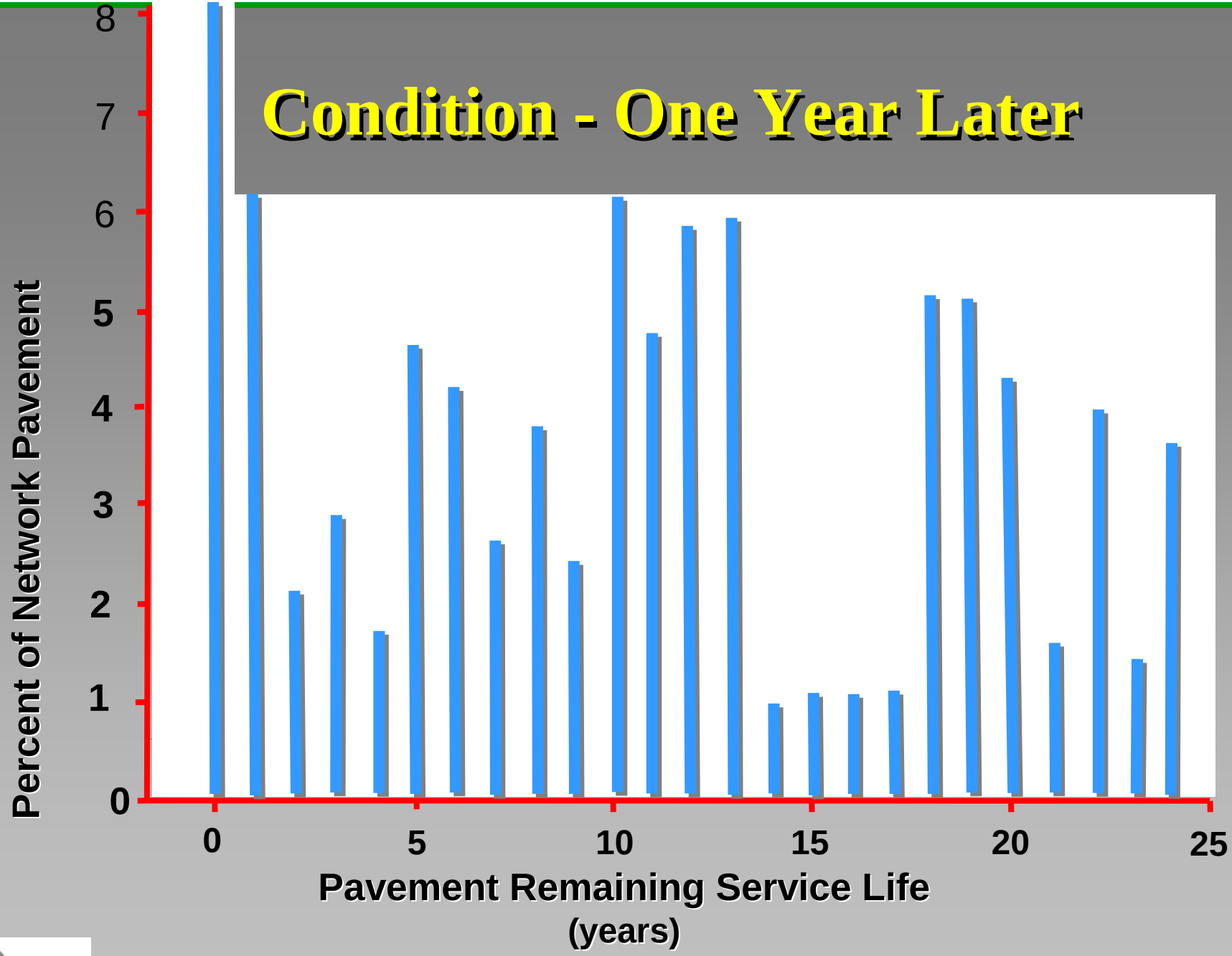
Condition - One Year Later



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Highway Department =
4,356 lane miles

Each year the network will lose

4,356 lane mile years

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Reconstruction Evaluation

Project	Lane Miles	Design Life	Lane Mile Years	Lane Mile Costs	Total Cost
#1	22	25 yrs	550	$463,425	$10,195,350
#2	18	30 yrs	540	$556,110	$10,009,980
	Total	=	1,090		$20,205,330

Step 2

Rehabilitation Evaluation

Project	Lane Miles	Design Life	Lane Mile Years	Lane Mile Costs	Total Cost
#3	22	18 yrs	396	$263,268	$5,791,896
#4	28	15 yrs	420	$219,390	$6,142,920
#5	32	12 yrs	384	$115,848	$3,707,136
Total	=		1,200		$15,641,952

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Step 3

Pavement Preservation Evaluation

Project	Lane Miles	Life Ext.	Lane Mile Years	Lane Mile Costs	Total Cost
#101	12	2 yrs	24	$2,562	$30,744
#102	22	3 yrs	66	$7,743	$170,346
#103	26	5 yrs	130	$13,980	$363,480
#104	16	7 yrs	112	$29,750	$476,000
#105	8	10 yrs	80	$54,410	$435,280
Total	=		412		$798,760

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Network Needs Summary

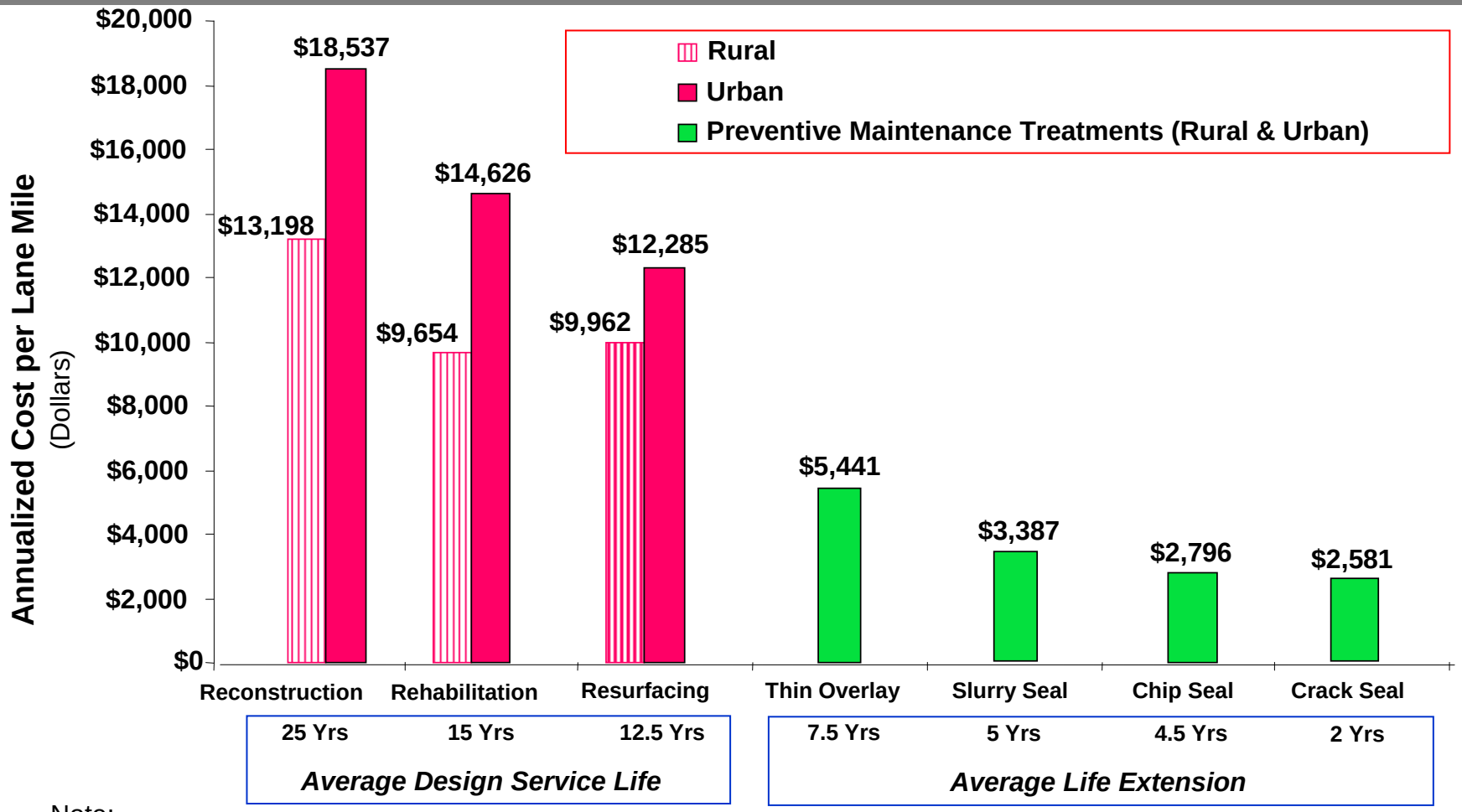
Required: 4,356 lane mile years

Programmed Activity		Lane Mile Years	Total Cost
Reconstruction *(40 lane miles)*	$$$$	1,090	$20,205,330
Rehabilitation *(82 lane miles)*	$$$	1,200	$15,641,952
Pavement Preservation *(84 lane miles)*	$	412	$798,760
Total	=	2,702	$36,646,042

Evaluation Conclusion

Network Size *(needs)*	4,356 *(lane mile years)*
Programmed Activity	2,703 *(lane mile years)*
Deficit =	1,653 *(lane mile years)*

Network Costs



Note:

Reconstruction, Rehabilitation & Resurfacing costs from Highway Statistics -2001, FHWA

Preventive Maintenance treatment costs from 2001 data, Michigan DOT

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Steps to Address Minimal Needs

Required: 4,356 lane mile years

Programmed Activity	Lane Mile Years
Reconstruction (lane miles)	~~1,090~~ *820*
Reh (lane miles) ~~lane miles)~~	~~1,200~~ *1,125*
Pavement Preservation *(84 lane miles)*	412
Total =	~~2,702~~ *2,357*

Savings = $ 6.1 M

Step 1

Steps to Address Minimal Needs

Savings = $ 6,101,940 Needs = 1,999 LMY

Preservation Treatment	*Life Ext*	*Lane Miles*	*Lane Mile Years*	*Total Cost*
Concrete Reseal	4 yrs	31	124	$979,600
Thin HMA Overlay	10 yrs	16	160	$870,560
Micro-surfacing	7 yrs	44	308	$1,309,000
Chip Seal	5 yrs	79	395	$1,104,420
Crack Seal	2 yrs	506	1,012	$1,296,372
			1,999	$5,559,952

Steps to Address Minimal Needs

Required: 4,356 lane mile years

Programmed Activity	Lane Mile Years
Reconstruction *(31 lane miles)*	*820*
Rehabilitation *(77 lane miles)*	*1,125*
Pavement Preservation *(2,083 lane miles)*	*2,411*
Total =	**4,356**

Net Savings = $ 541,988

Step 3

Quick Assessment Method

- Establishes Network Need
- Evaluates
  - Reconstruction
  - Rehabilitation
  - Preventive Maintenance
- Incorporates
  - Design Life
  - Life Extensions

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Summary

Conclusions

- Pavement Preservation is a "decision" that will improve highway network condition at lower cost.
- Failure to adopt Pavement Preservation has financial consequences.

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State of the Practice
Pavement Preservation

- **Improved Resources**
  - ✓ National Center for Pavement Preservation
  - ✓ Michigan State University

Engineering Building

National Center Building

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National Center for Pavement Preservation

at Michigan State University

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Questions ?

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Thank You !

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