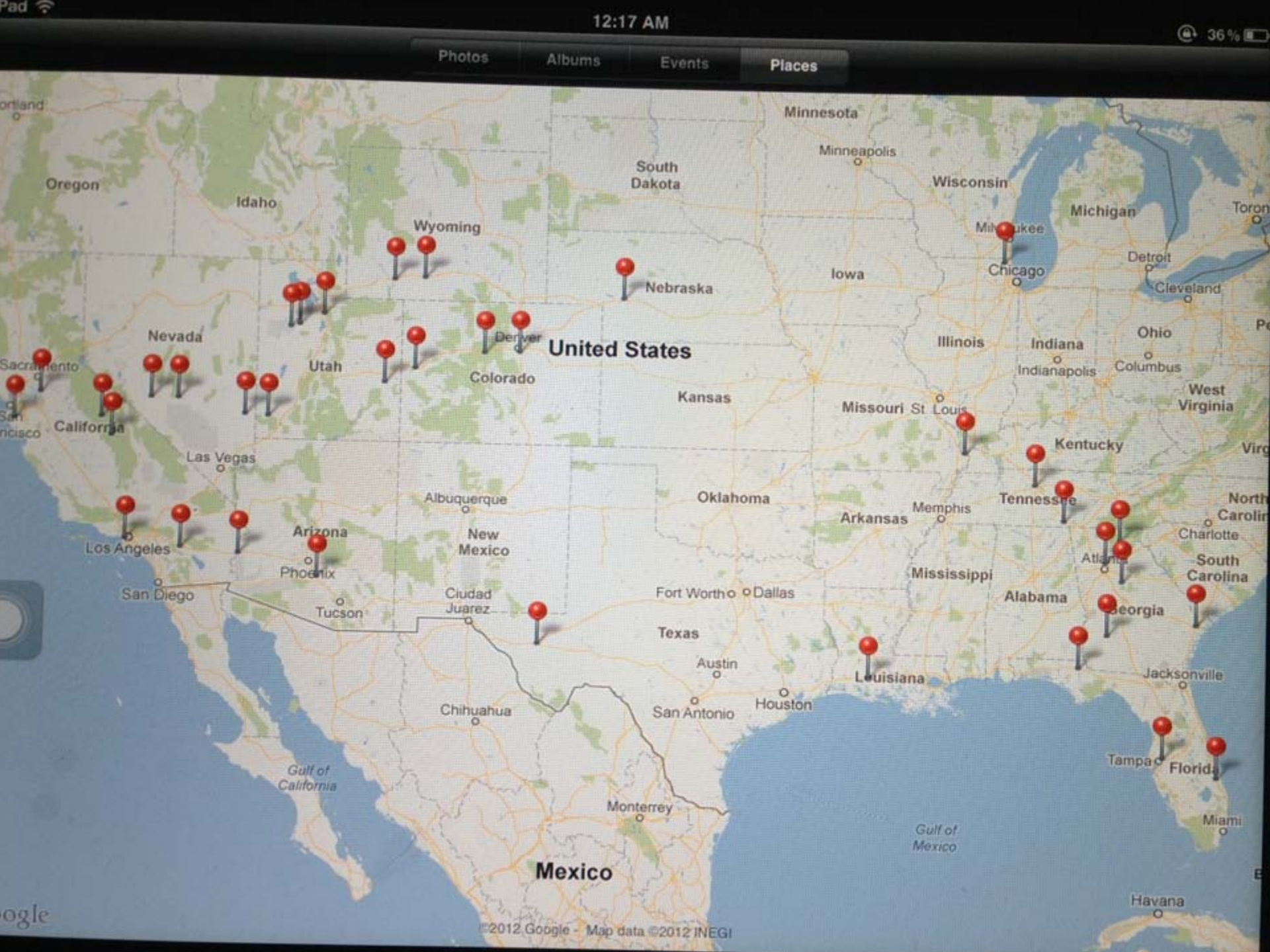
In Place Asphalt Recycling Techniques 2012

Innovation Snapshot

Blair J. Barnhardt, APM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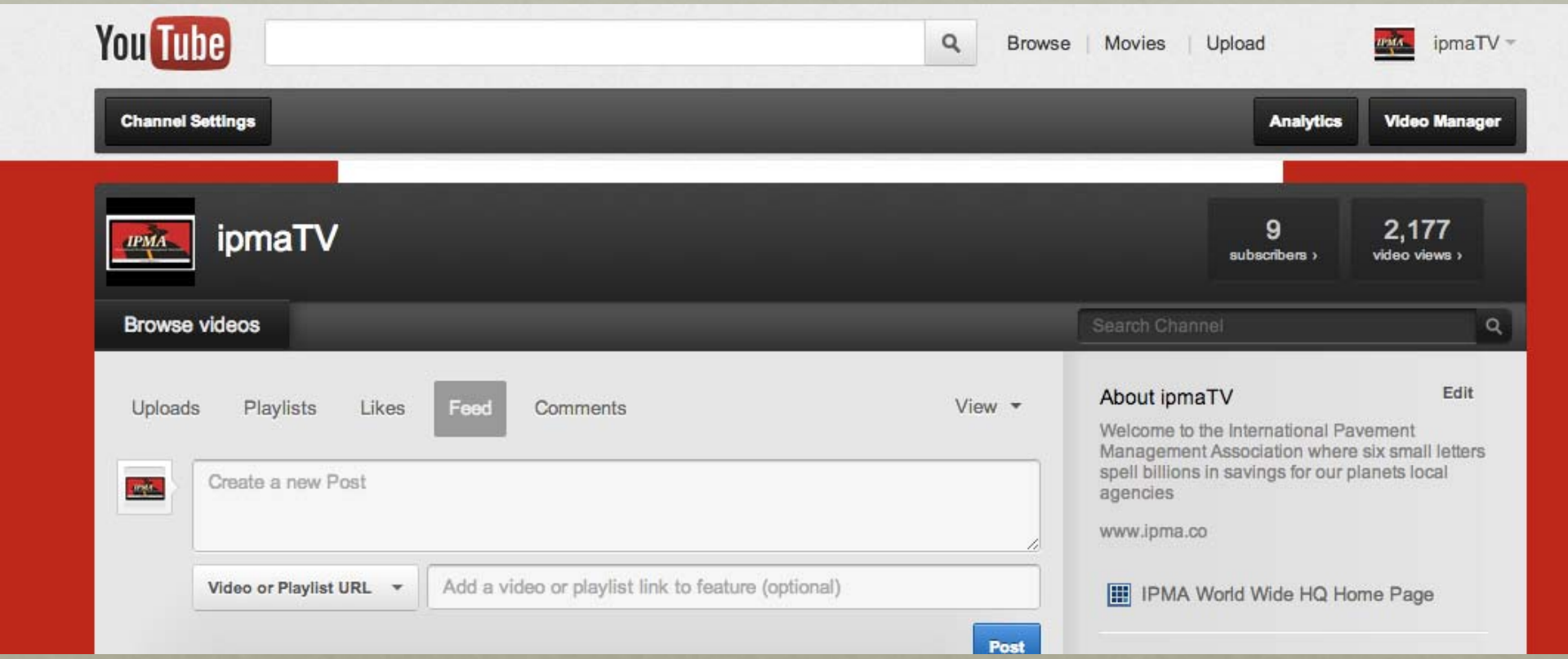
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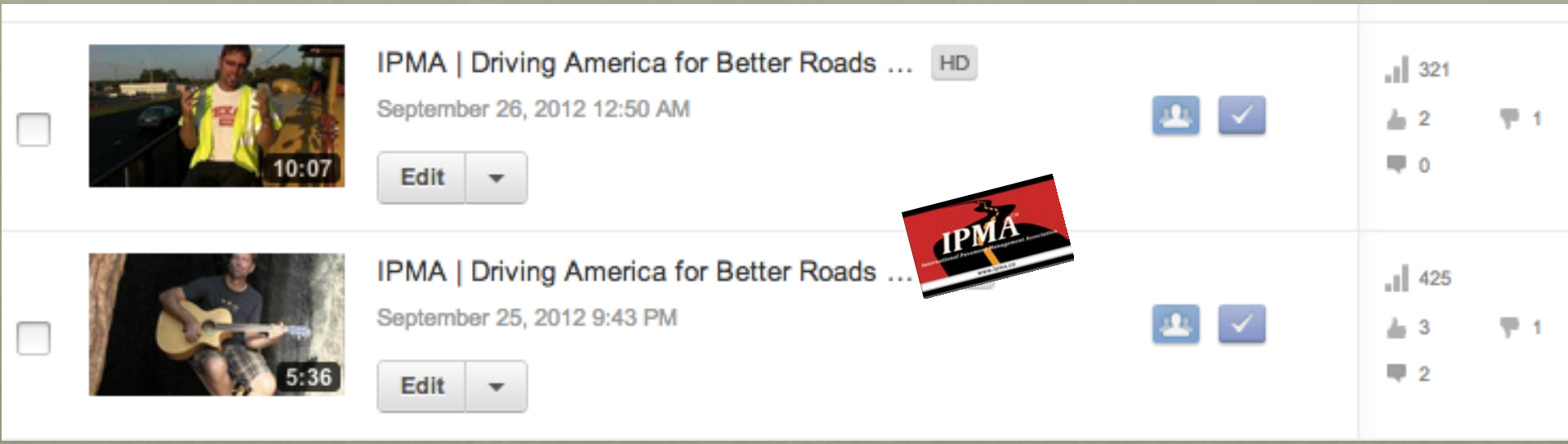
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Question One

- What do the following two slides have in common and what lesson can we learn from them?

Decision Tree

Printed: 07/12/2012

Treatment Type	Treatment	Cost/Sq Yd, except Seal Cracks in LF:	Yrs Between Crack Seals	Yrs Between Surface Seals	# of Surface Seals before Overlay
Crack Treatment	SEAL CRACKS	$0.50	6		
Surface Treatment	Reclamite Rejuvenator	$0.75		6	
Restoration Treatment	Micro with levling	$3.00			3
	Micro with levling	$3.00			
	ReHEAT HIR	$11.00			
	ReHEAT with Deep Patches 20%	$11.00			
	FDR Cement w/2" Overlay	$17.00			
Crack Treatment	SEAL CRACKS	$0.50	4		
Surface Treatment	Reclamite Rejuvenator	$0.75		6	
Restoration Treatment	Micro with levling	$3.00			3
	Cape Seal Chip and Micro	$4.50			
	ReHEAT HIR	$9.00			
	ReHEAT with Deep Patches 20%	$9.50			
	FDR Cement w/2" Overlay	$17.00			

Question Two

- We are living in a world where use modern technology routinely to benefit our lives ***except*** when it comes to rehabilitating our roadways and preserving them, why are we still rebuilding them like it is 1956?

Traditionally, highway agencies have allowed the ride quality and structural condition of a pavement to deteriorate to fair to poor condition before taking steps to rehabilitate the pavement. The aim of the rehabilitation is to repair structural damage and restore pavement conditions—a costly, time-consuming activity. This "worst-first" scenario came about for many reasons, including the requirements of Federal-aid funding and maximization of capital growth. But now, by applying a series of low-cost preventive maintenance treatments, each of which lasts a few years, highway agencies can extend the pavement's service life. This translates into a better investment and a better ride quality. The experience with pavement preservation in a number of States demonstrates this success: Each dollar spent now on pavement preservation could save up to six dollars in the future.

Pavement preservation strategies are not well suited for pavements requiring major rehabilitation or reconstruction. Furthermore, implementation varies with

U.S. Department of Transportation
Federal Highway Administration

Memorandum

Subject: INFORMATION: Formal Policy on the Use of Recycled Materials

Date: February 7, 2002

From: Frederick G. Wright, Jr.
Executive Director

Reply to Attn. of: HIPT

To: Core Business Unit Managers
Service Business Unit Directors
Directors of Field Services
Division Administrators Federal Lands Highway Division Engineers

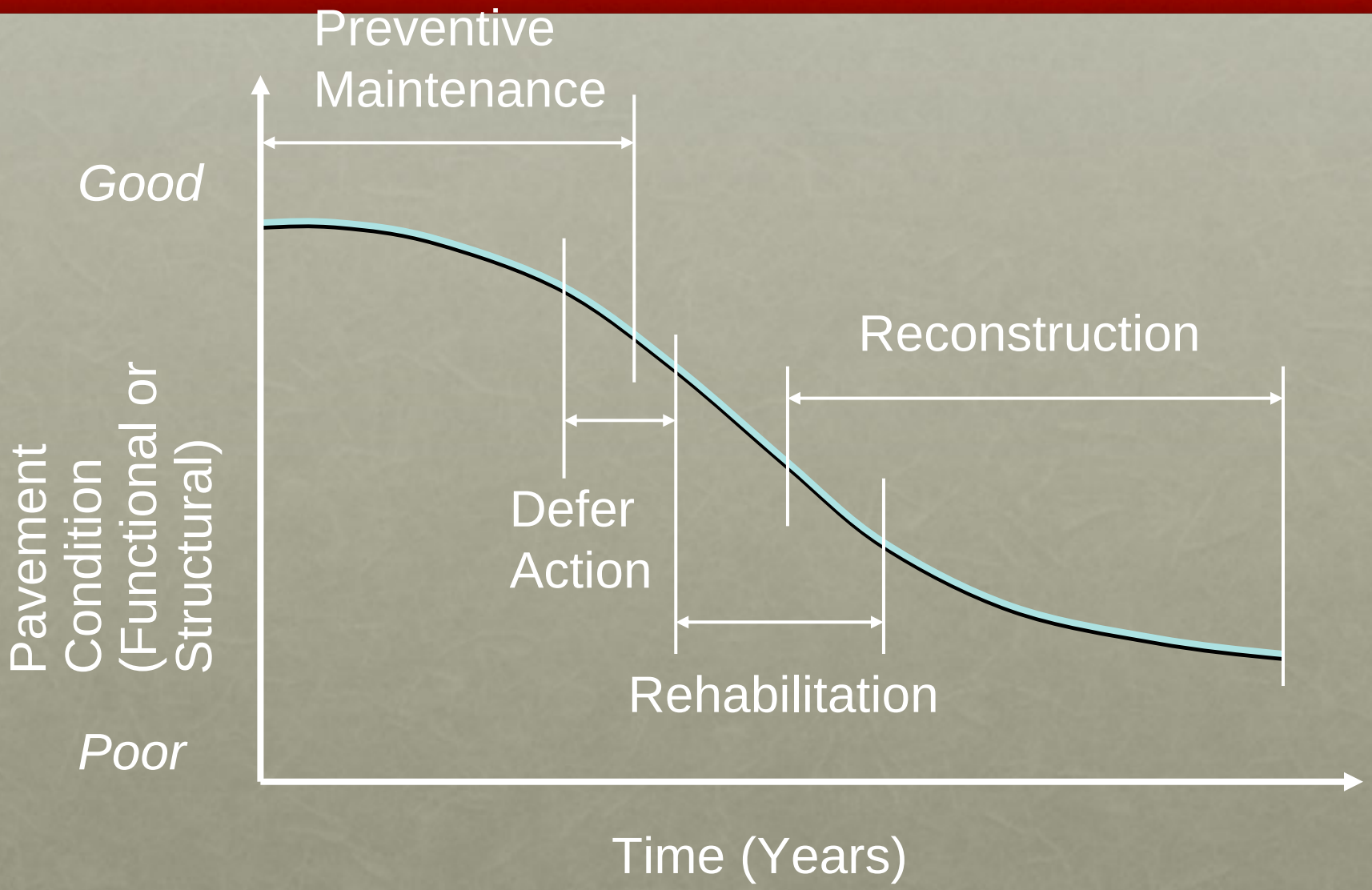
For your information and use, we have attached our formal policy on the use of recycled materials in highway applications. The policy outlines the importance of re-using materials previously used in constructing our Nation's highway system, and calls upon us, and the State transportation departments, to explicitly consider recycling as early as possible in the development of every project. In addition, the policy acknowledges that recycling will not be appropriate in all cases, and provides guidance for making that determination.

The implementation of this policy will support our strategic goals of preserving and enhancing the human and natural environment, increasing mobility, raising productivity, and improving safety. Moreover, the new policy has the potential to strengthen the relationship between FHWA and the Environmental Protection Agency, and to forge new partnerships among government, industry, and academia. By providing leadership and technical guidance to the transportation community, FHWA will stimulate advancements in recycling technology and the discovery of new opportunities for the appropriate use of recycled materials.

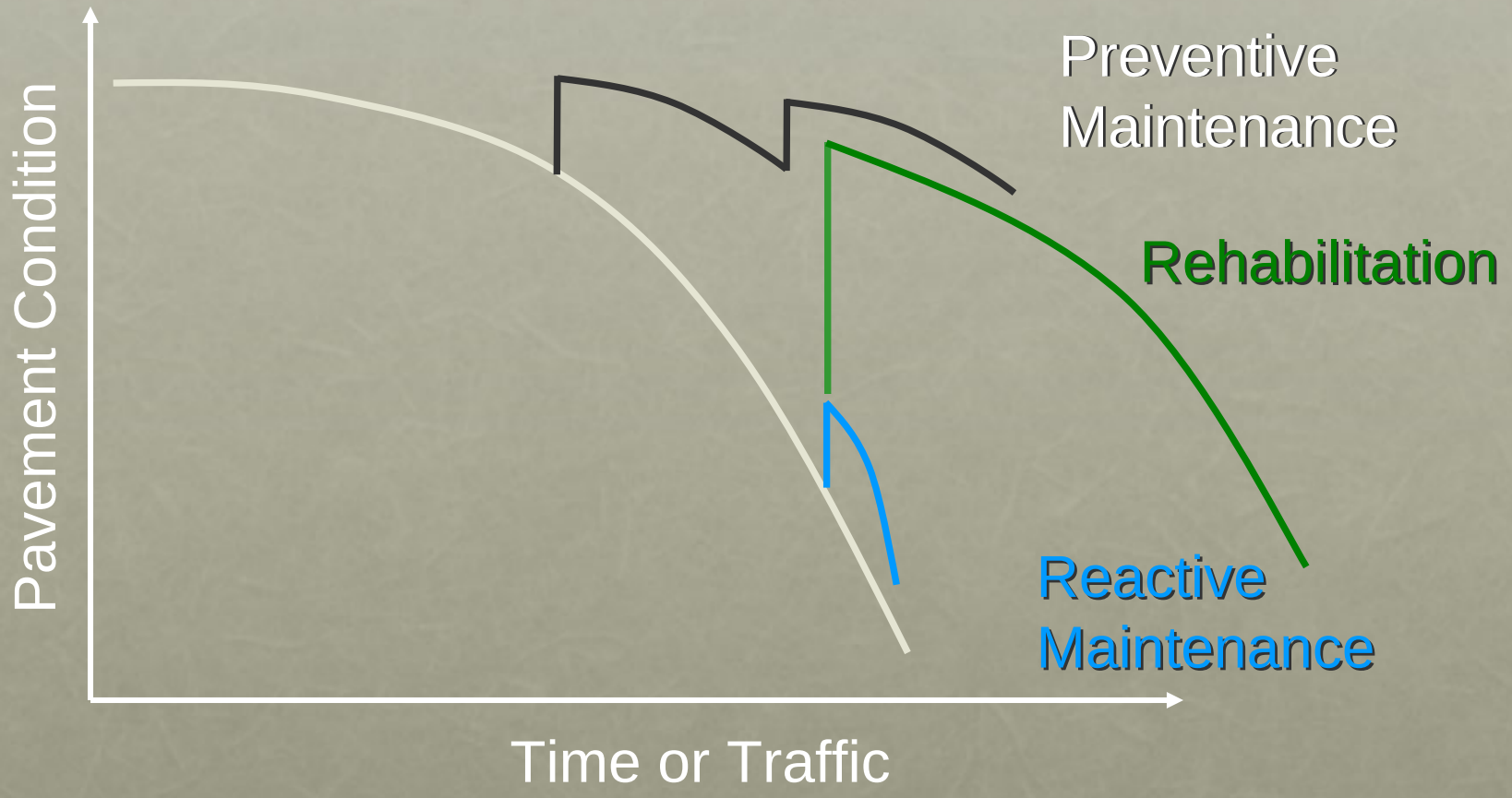
For additional information or clarification, please contact Byron Lord, in the Office of Pavement Technology at (202)366-1325.

Fg Wright

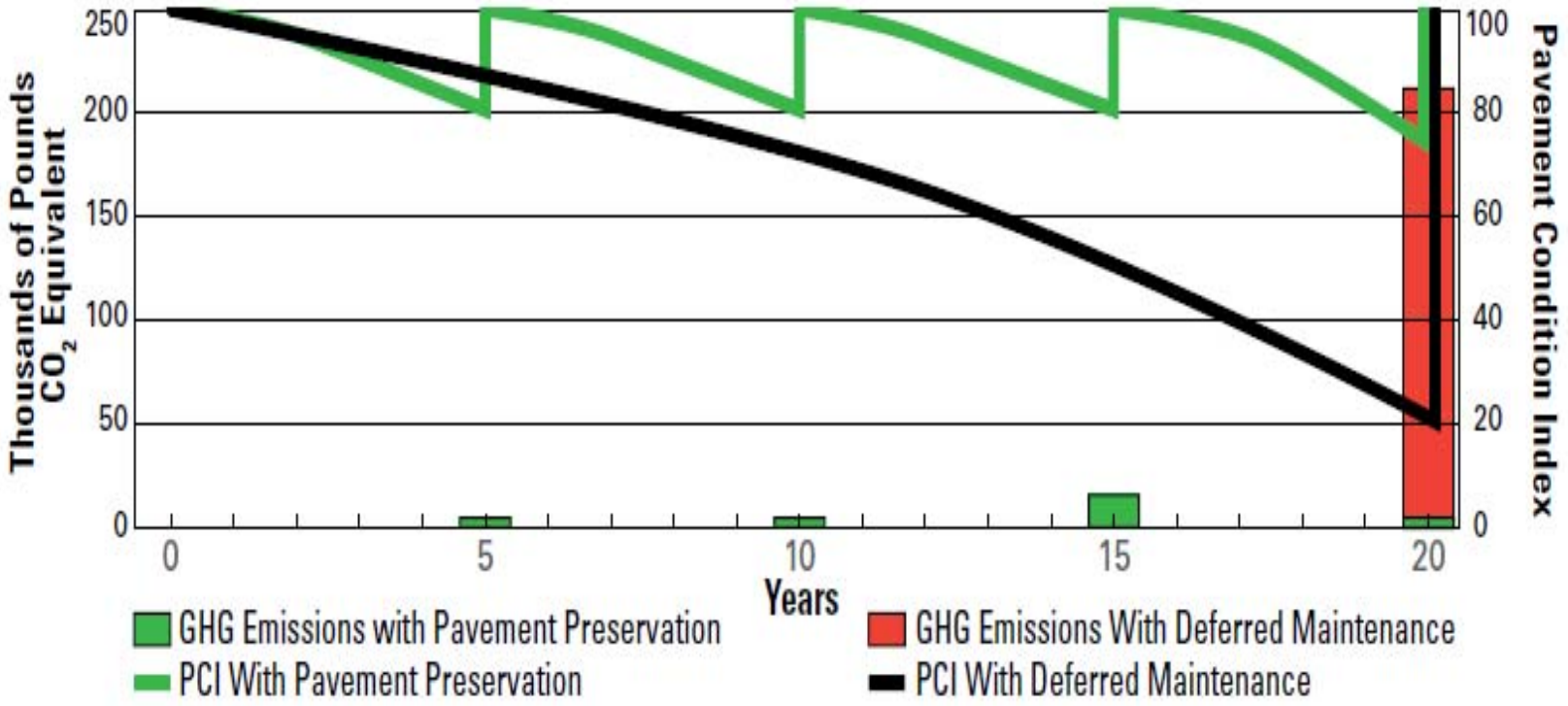
Preventive Maintenance Timing



Importance of Treatment Timing



GHG Emissions With Pavement Preservation vs. Deferred Maintenance[3]



No. of Sample Units in Section (*N*)	No. of Units to be Inspected (*n*)
1 to 5	1
6 to 10	2
11 to 15	3
16 to 40	4
over 40	10% (round up to next whole sample unit)

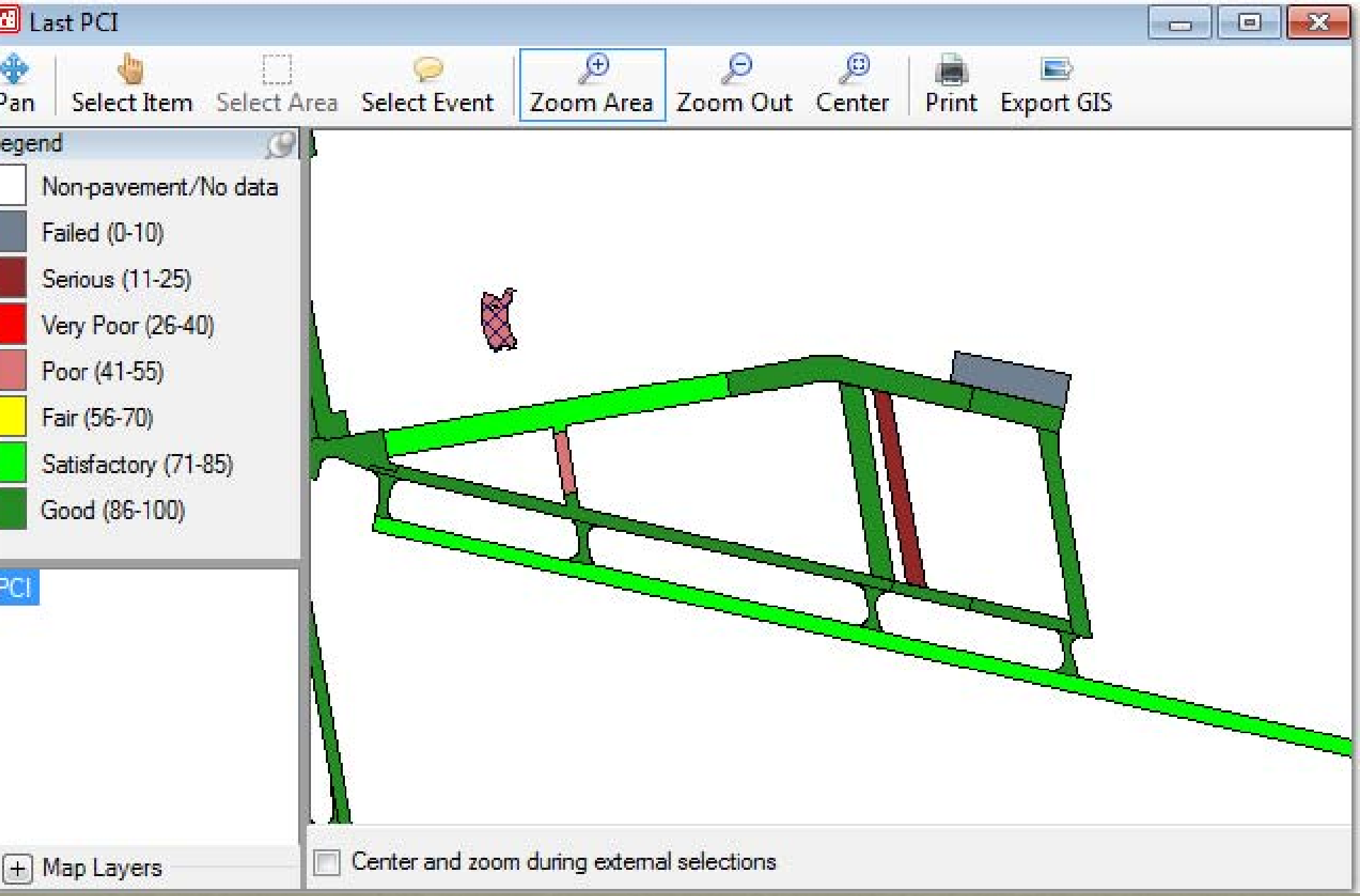
Figure 3-10. Example of Network Level Sampling Criteria Used by Some Agencies.

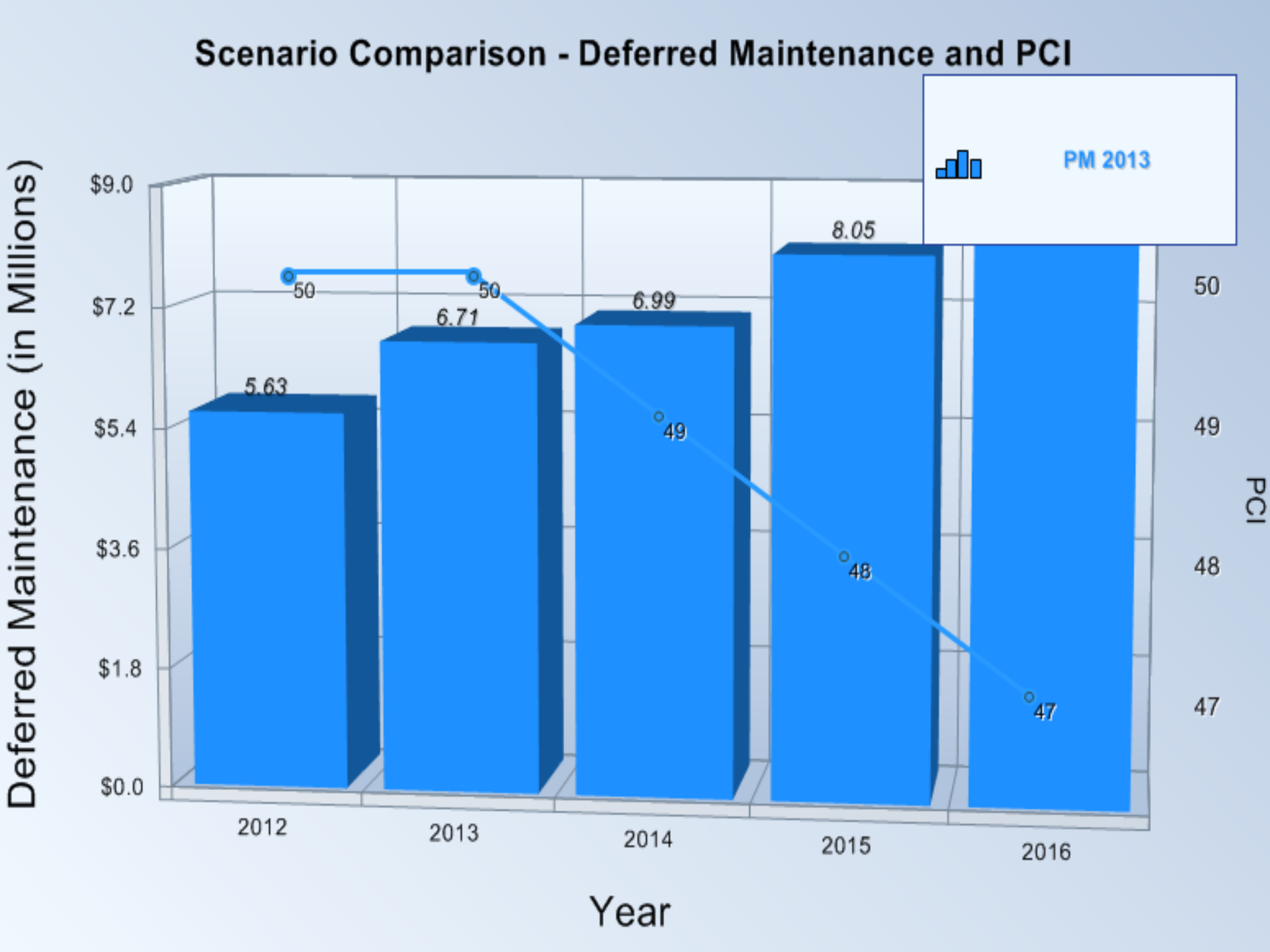
No. of Sample Units in Section (*N*)	No. of Units to be Inspected (*n*)
1	1
2 to 4	2
5 to 20	3
over 20	4

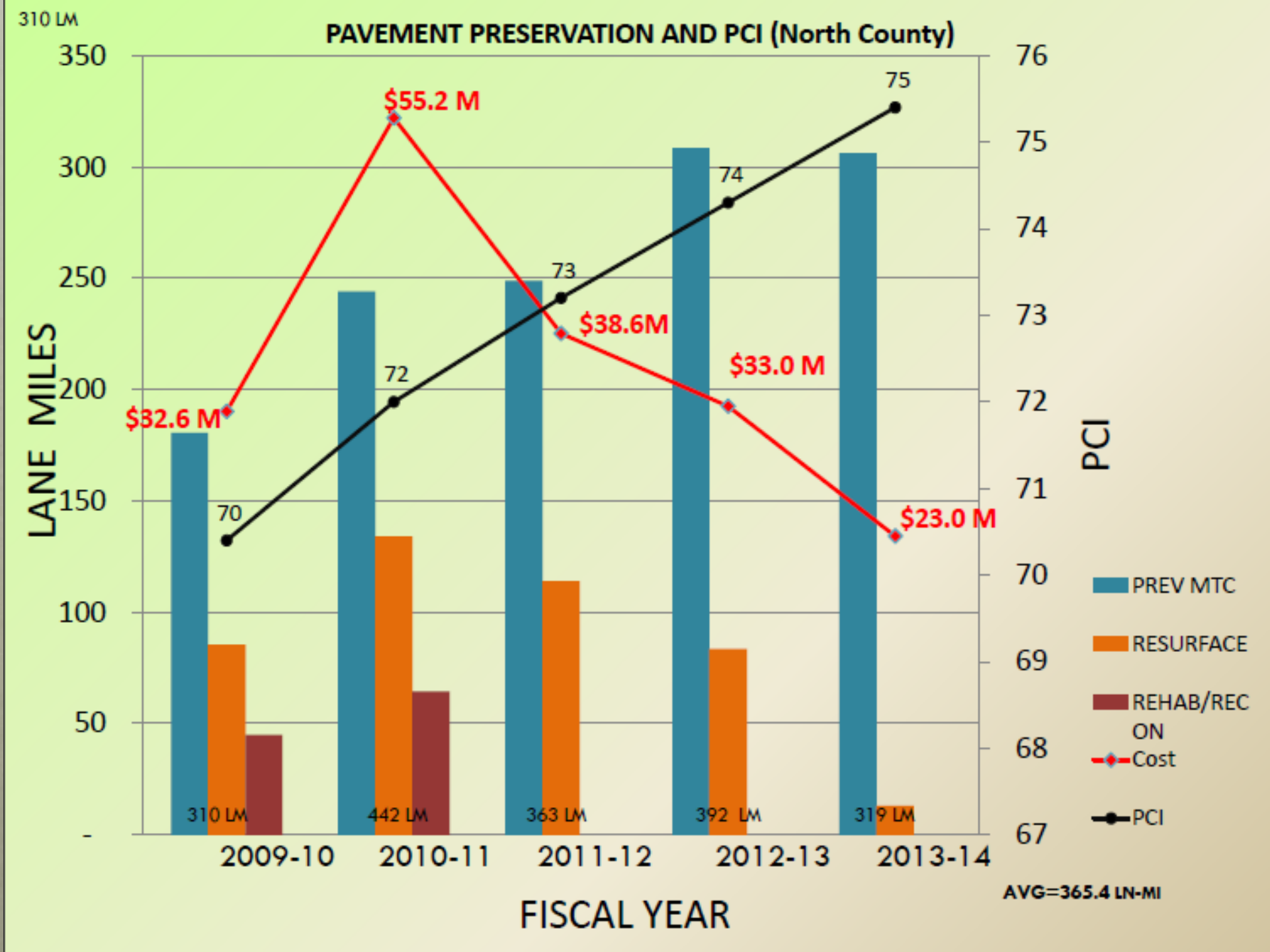
Figure 3-11. Network Level Sampling Based on Eq. 3-1 ($e = 5, s = 5$).

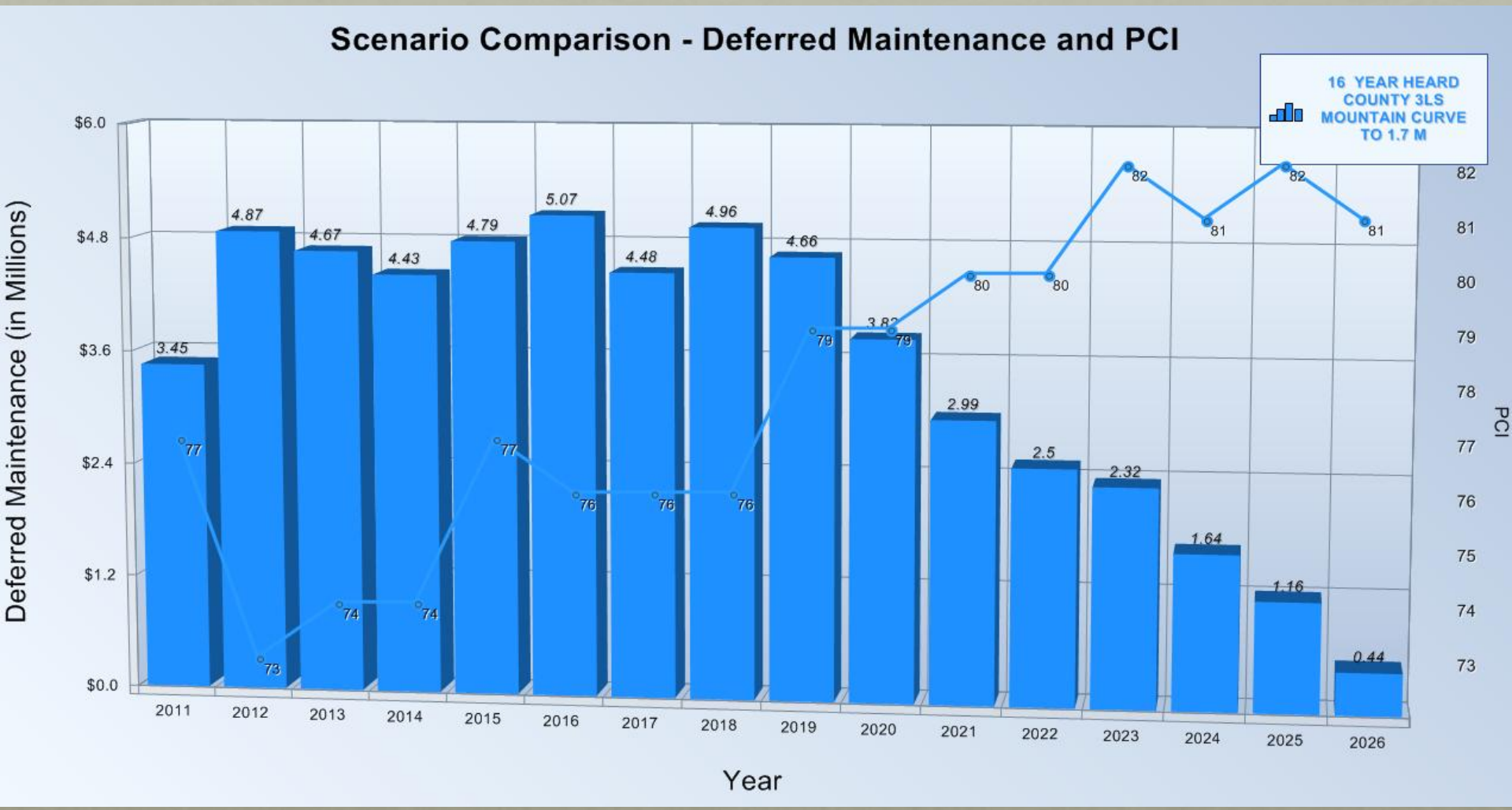

TBG
Mercedes-Benz


CAUTION


Last PCI
Pan
Select Item
Select Area
Select Event
Zoom Area
Zoom Out
Center
Print
Export GIS
egend
Non-pavement/No data
Failed (0-10)
Serious (11-25)
Very Poor (26-40)
Poor (41-55)
Fair (56-70)
Satisfactory (71-85)
Good (86-100)
PCI
Map Layers
Center and zoom during external selections


Scenario Comparison - Deferred Maintenance and PCI
PM 2013
Deferred Maintenance (in Millions)
$9.0
$7.2
$5.4
$3.6
$1.8
$0.0
5.63
6.71
6.99
8.05
50
50
49
48
47
PCI
50
49
48
47
2012
2013
2014
2015
2016
Year


310 LM
PAVEMENT PRESERVATION AND PCI (North County)
LANE MILES
PCI
FISCAL YEAR
350
300
250
200
150
100
50
-
76
75
74
73
72
71
70
69
68
67
$32.6 M
$55.2 M
$38.6M
$33.0 M
$23.0 M
70
72
73
74
75
310 LM
442 LM
363 LM
392 LM
319 LM
2009-10
2010-11
2011-12
2012-13
2013-14
PREV MTC
RESURFACE
REHAB/RECON
Cost
PCI
AVG=365.4 LN-MI


Scenario Comparison - Deferred Maintenance and PCI
16 YEAR HEARD COUNTY 3LS MOUNTAIN CURVE TO 1.7 M
Deferred Maintenance (in Millions)
$6.0
$4.8
$3.6
$2.4
$1.2
$0.0
PCI
82
81
80
79
78
77
76
75
74
73
3.45
4.87
4.67
4.43
4.79
5.07
4.48
4.96
4.66
3.82
2.99
2.5
2.32
1.64
1.16
0.44
77
73
74
74
77
76
76
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79
79
80
80
82
81
82
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2011
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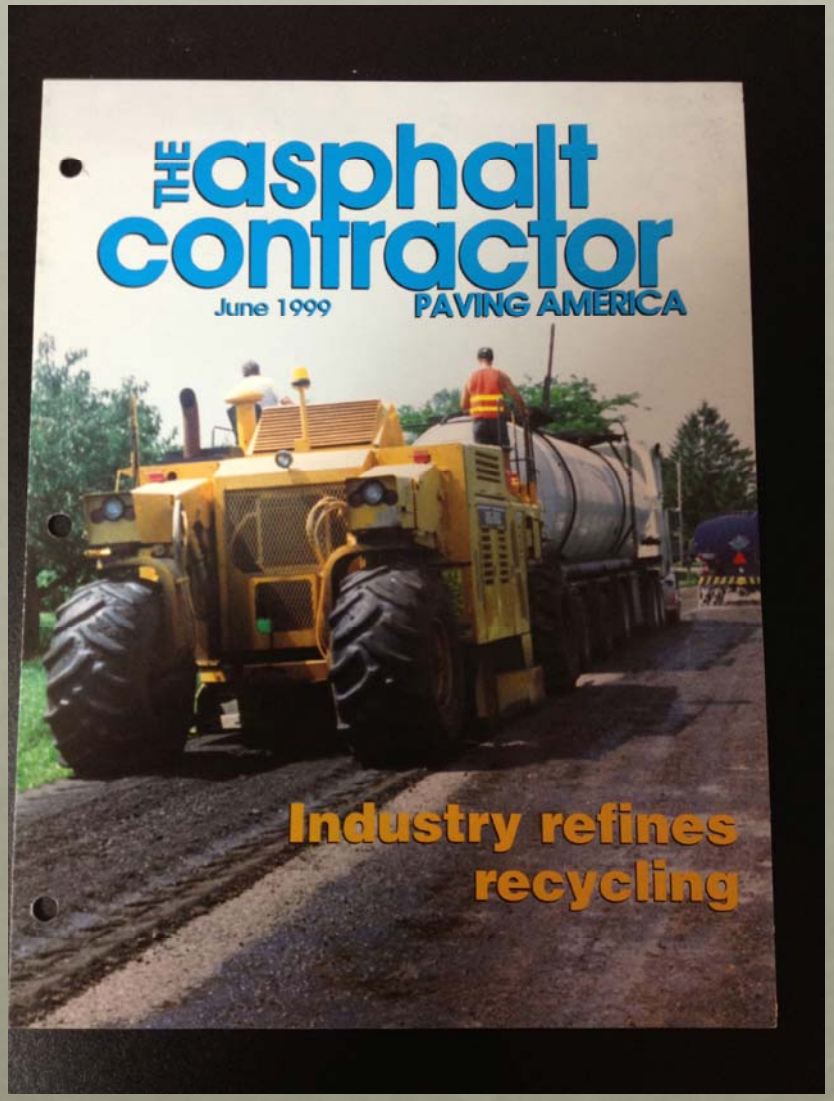
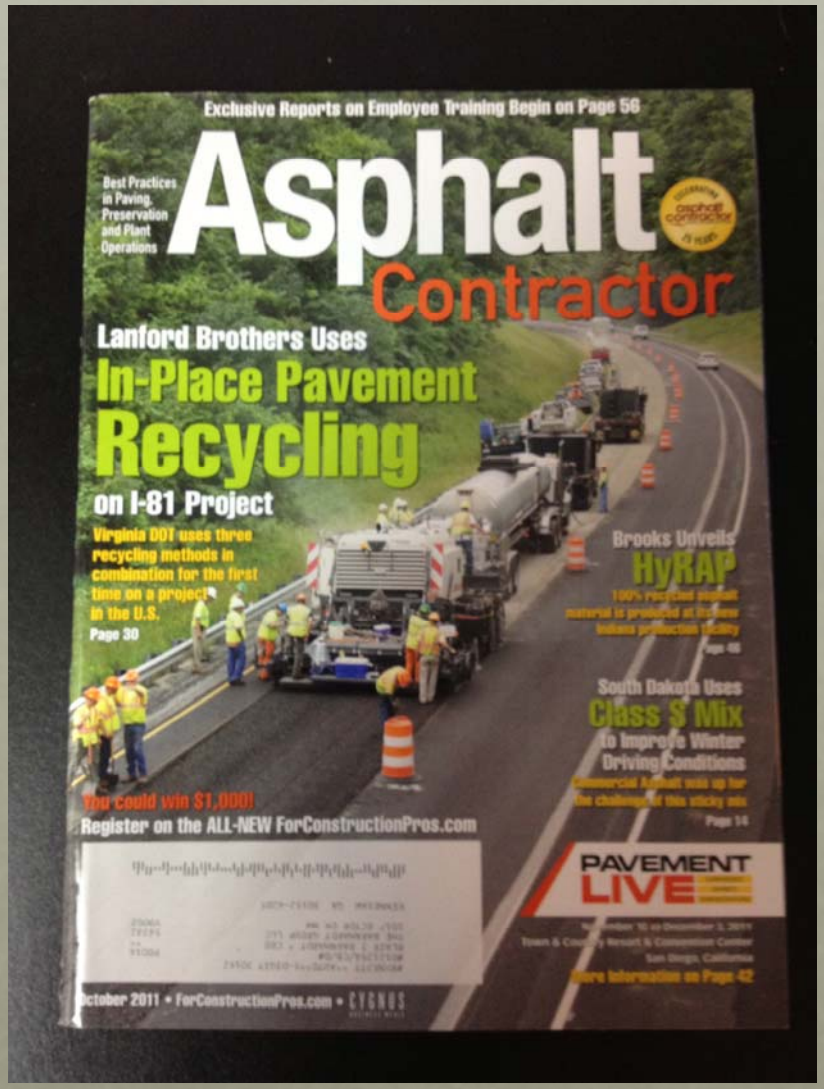
2024
2025
2026
Year


THE asphalt contractor
June 1999
PAVING AMERICA
Industry refines recycling


Exclusive Reports on Employee Training Begin on Page 56
Best Practices in Paving, Preservation and Plant Operations
Asphalt Contractor
Lanford Brothers Uses
In-Place Pavement Recycling
on I-81 Project
Virginia DOT uses three recycling methods in combination for the first time on a project in the U.S.
Page 30
Brooks Unveils HyRAP
South Dakota Uses Class S Mix
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Governor McDonnell Announces Pa
Save Time, Money and Materials Du

I-81 recycling project wins national award

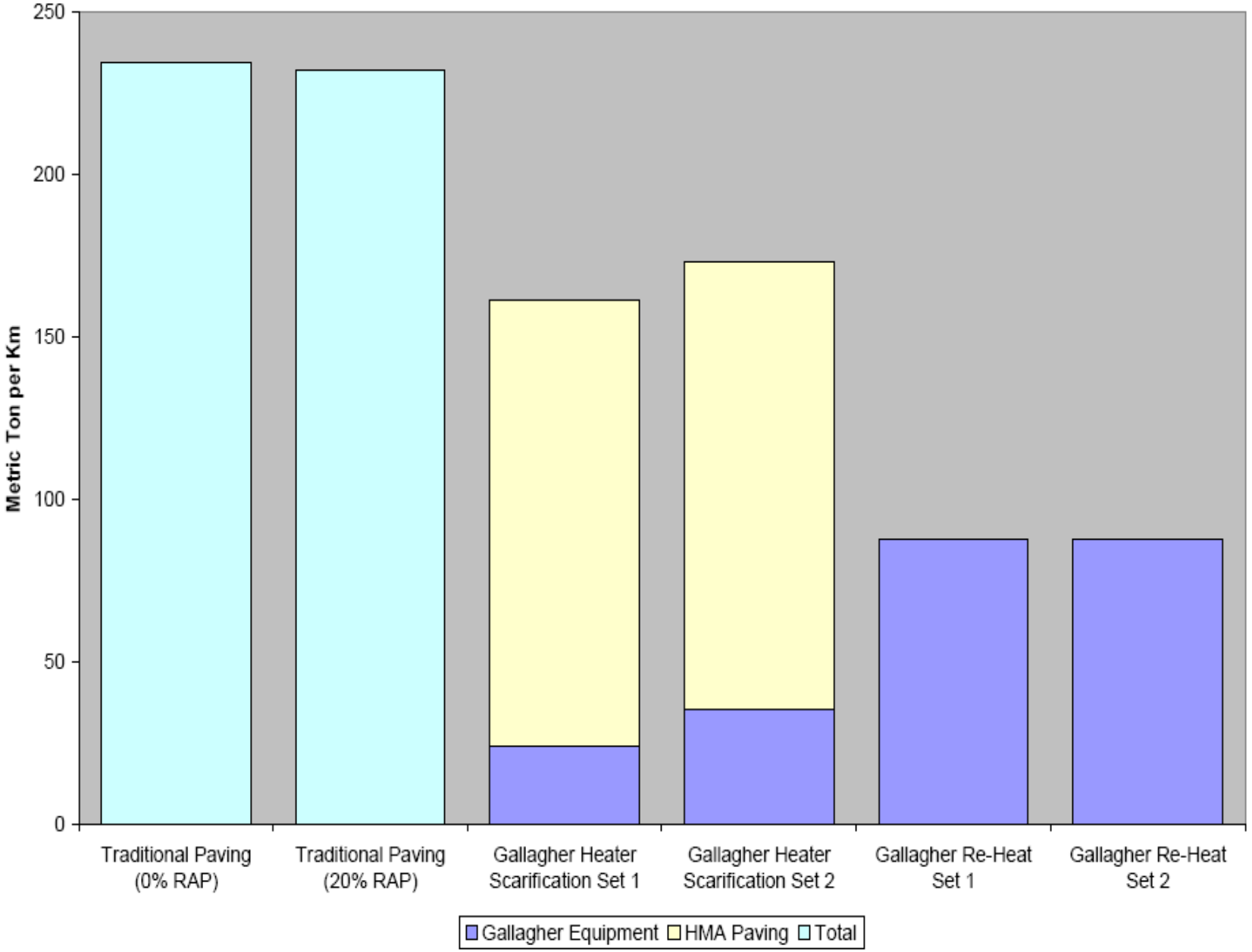
RICHMOND – Governor Bob McDonnell announced today that the Virginia Department of Transportation (VDOT) is gaining national recognition for using pavement recycling methods to rebuild aging roadways, saving significant time and money.

VDOT and its prime contractor Lanford Brothers Company, Inc. of Roanoke rebuilt a section of Interstate 81 in Augusta County by recycling existing road material back into the new pavement structure. This paving method reduced construction time by about two-thirds and saved millions of dollars, earning VDOT a national award by the asphalt recycling industry.

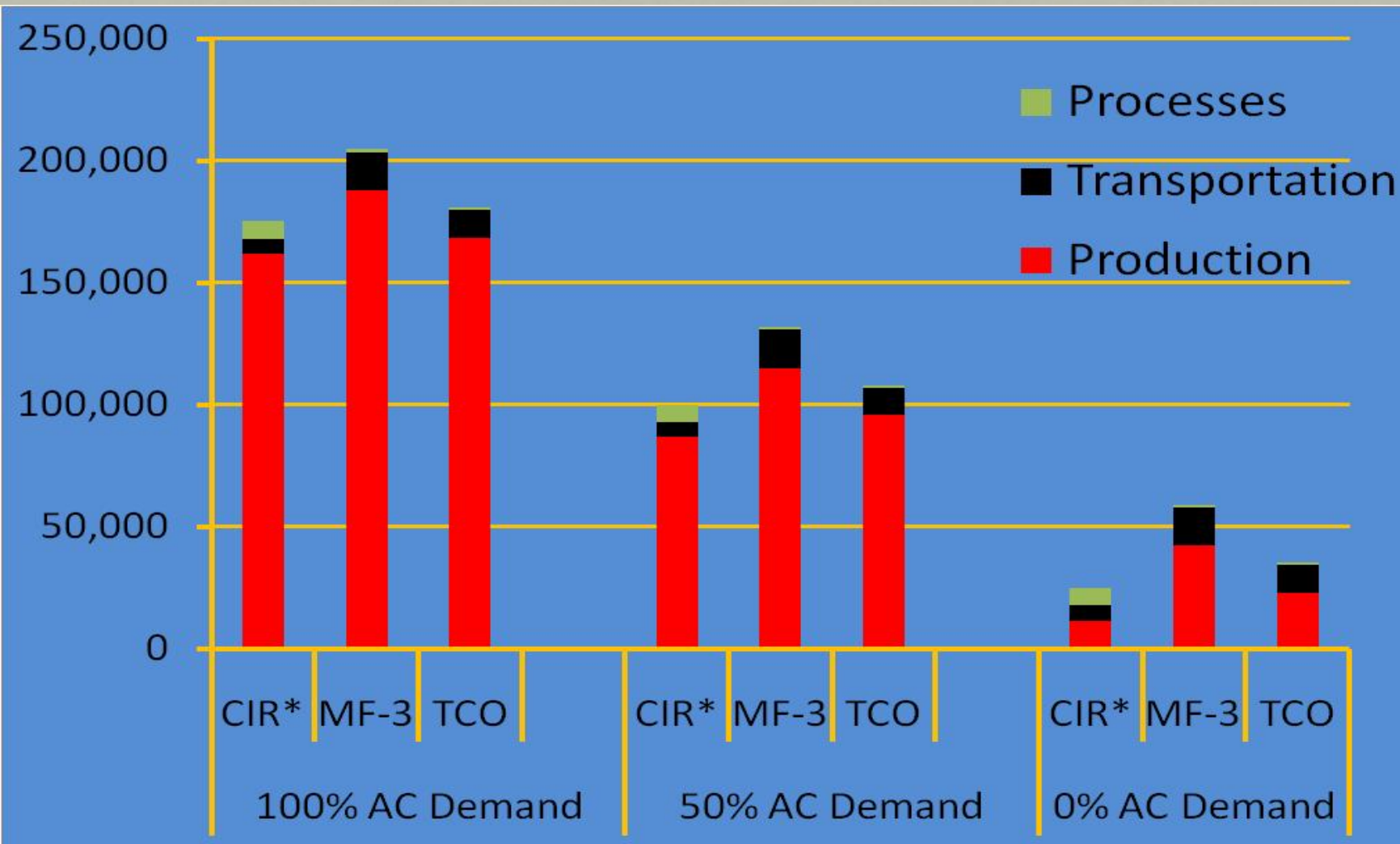
"Using these pavement recycling methods has the potential to revolutionize how we rehabilitate our aging roads, both in Virginia and nationally," said Governor McDonnell. "We


RONYAK
PAVING

Figure 1: Comparison of Global Warming Potentials



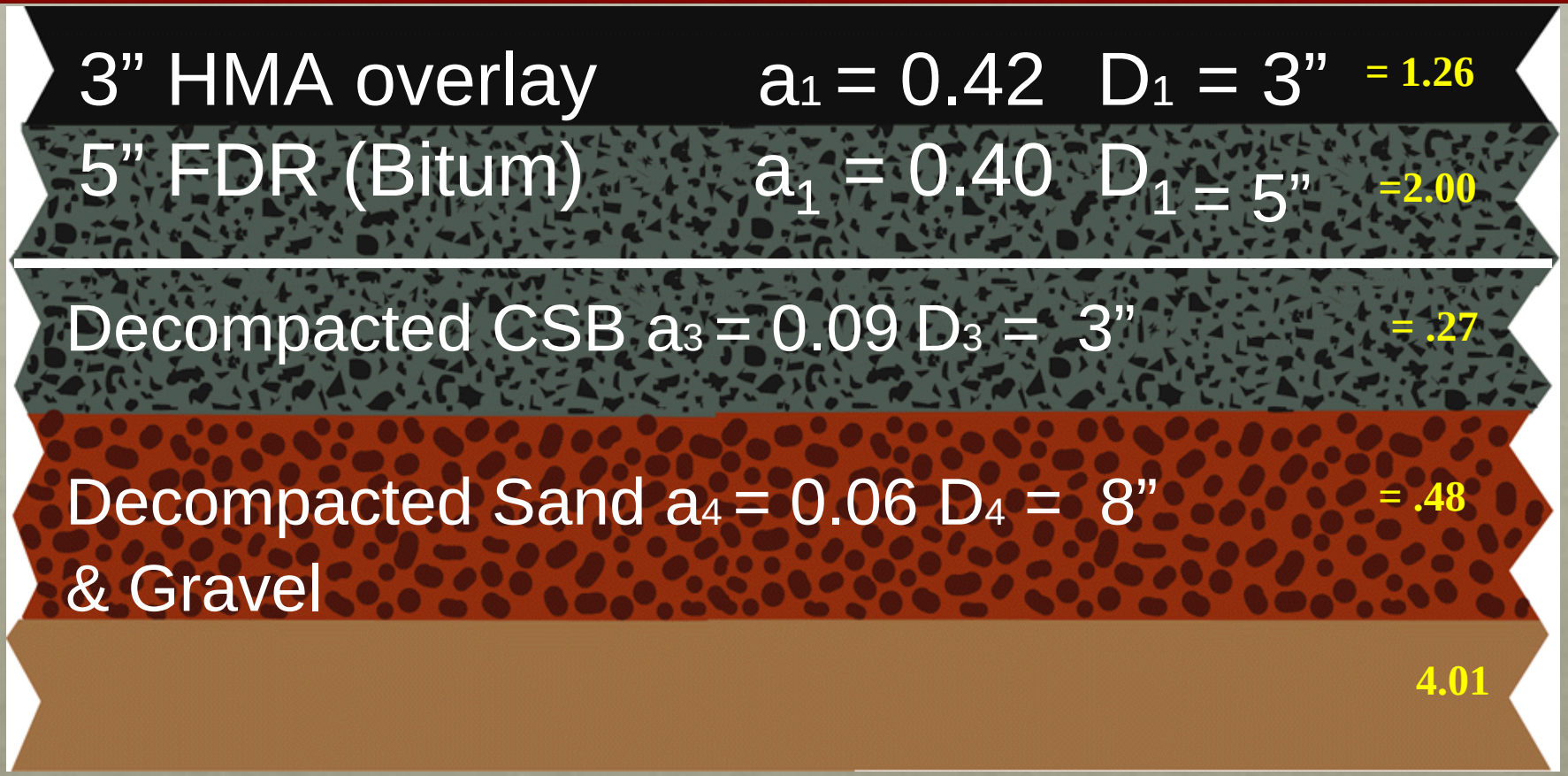

MIDLAND
MIX-PAVER



CIR* Includes 1.5" HMA wearing Surface


Asphalt Zipper
Asphalt Zipper
AZ-500B
Zip-It
JOHN DEERE
644G

Reclamation Alternative



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Conventional VS FDR Construction

Conventional Section

- 3 weeks to construct
- Re route Marta Bus Traffic
- 6,737 tons of surplus
- 3,850 tons of virgin aggregate
- 2,887 tons of HMA
- $336,000.00
- If sub base problems occurred, change orders

FDR Section

- 1 week to construct
- Two phases to minimize detour routing inconvenience
- No virgin aggregate used in base
- Original design was foam, done with Portland cement
- Left the College and DTAE with more


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Blair Barnhardt, APM
Founder & Executive Director
International Pavement Management Association