

# Maryland State Report: NEPPP 2011

## Maryland State Highway Administration



November 9, 2011

# Pavement Preservation Innovation

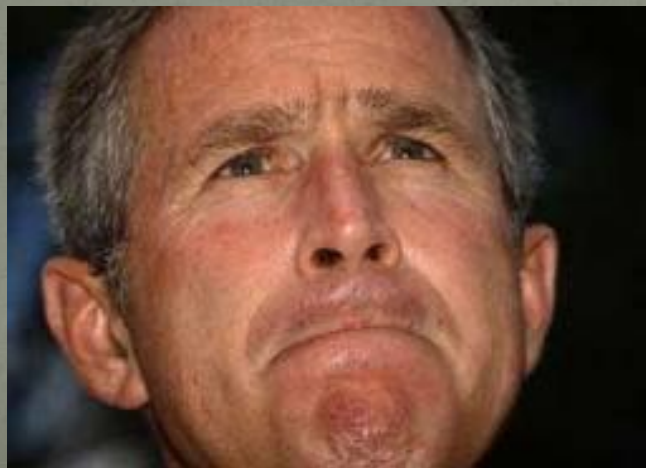
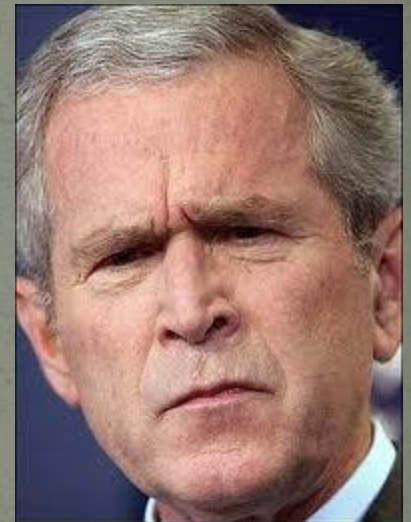
Innovation:

“...generally signifies a substantial positive change compared to incremental changes”

- Wikipedia



# Substantial Change....



# Pavement Preservation Innovation



Integration with Pavement  
Management & Design



# Previously...

- Had draft Pavement Preservation Guide awaiting FHWA approval

Integrating Pavement Preservation into Fund 77 March 2011

### Agreement for the Use of Federal Funds for Pavement Preservation

This agreement between the Maryland State Highway Administration (MDSHA) and the DelMar Division of the Federal Highway Administration (FHWA) is intended to implement the use of Federal-aid Highway Funding for Pavement Preservation activities on pavements selected under Fund 77 - System Preservation.


The criteria used to develop this agreement are based on the FHWA guidance issued by FHWA on September 12, 2005 (Pavement Preservation Definitions) and the Pavement Preservation Technical Appraisal issued for Maryland in May 2007 issued by the National Center for Pavement Preservation.


This agreement is limited to Fund 77 activities. Funds that are Federal-Aid Highway Funds do not cover the activities of the Fund 77 activities. Activities that are eligible for Pavement Fix Definitions. All activities listed under the Categories of "Structural Rehabilitation" and "Pavement Preservation" shall be eligible for federal funding.

By signing this agreement, MDSHA and the FHWA incorporate by reference the laws, regulations, policies, standards and procedures which govern or are applicable to Federal-Aid projects.

This agreement shall conform to the State's ultimate accountability for the expenditure of Federal-Aid highway funds. The State of Maryland, including those funds used for local government projects.

This agreement shall become effective on projects selected for the Maryland Fiscal Year 2012 program or later. This agreement may be cancelled or modified at any time by either MDSHA or the FHWA given 90 days notices.

Maryland State Highway Administration  
  
\_\_\_\_\_  
Gregory Welker, Deputy Administrator/  
Chief Engineer for Operations 7-28-16  
Date

Federal Highway Administration  
  
\_\_\_\_\_  
Hassan Raza, Division Administrator  
DelMar Division 5/5/2011  
Date

[1]

- But, made very little use of pavement preservation treatments

**Now:**

**It's implementation time!**

# PP Implementation

Obstacles:

- Pavement engineers can only “recommend”

District decision-makers are generally unaware of pavement preservation treatments

- Anything but HMA =





# PP Implementation

## Obstacles:

- MDSHA Business Plan focused on ride quality only
  - Thus, optimization based on ride quality only

Many PP treatments are not intended to improve ride quality



# PP Implementation

## Challenge:

- How do we persuade decision-makers to try something new, to try pavement preservation treatments?

# PP Implementation

## Strategies to overcome obstacles:



- Pavement Management provide suggested projects and treatments
- Pavement design engineers must demonstrate benefit of PP treatments



# PP Implementation

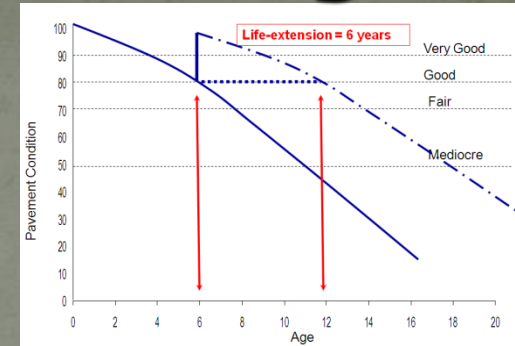
## Strategies to overcome obstacles:



- Decision-makers must be given clear targets, and be held accountable for meeting those targets

# Pavement Management Strategies

## Project Selection:



- Optimization must capture benefit of PP treatments
  - Performance models should account for all facets of pavement condition:
    - Ride Quality & rutting
    - Structural & Functional Cracking
    - Friction



# Pavement Management Strategies

## Treatment Selection (network-level):

- Optimization must provide Treatment Activity, i.e.

- Rehabilitation
- Pavement Preservation
- Maintenance

# Pavement Management Strategies

## Target Generation:

- Suggested projects (which have associated lane-mileage, functional class) coupled with suggested treatments, can be used to generate clear targets.



# Pavement Management Strategies

## Target Generation:

### FY 2013 Target Summary - Statewide

FY 2013 Target Summary - Statewide							
Targets:	Budget	Benefit (LMY)	Suggested Lane Miles	Estimated \$/LM	Average Life Extension	\$/LMY	
	<b>\$193,294,242</b>	<b>10017</b>					
Rehab (T12, T15)	\$150,288,573	6436	303	\$495,560.30	21	\$23,352	
Preservation (T5, T8)	\$41,398,648	3370	281	\$147,425.83	12	\$12,286	
Maintenance (T2, T4)	\$1,607,021	212	53	\$30,384.21	4	\$7,596	

# Pavement Management Strategies

## Target Generation:

RSL Categories:		Budget	Benefit	Suggested LM	\$/LM
0 to 9.6 years	A	\$ 98,355,123	4094	220	\$446,541.01
9.6 to 19.2 years	B	\$ 77,115,158	4393	296	\$260,286.76
19.2 to 28.8 years	C	\$ 15,652,734	1336	104	\$150,203.76
28.8 to 38.4 years	D	\$ 2,171,227	195	16	\$133,778.62
38.4 to 48 years	E	\$ -	0	0	



# Pavement Management Strategies

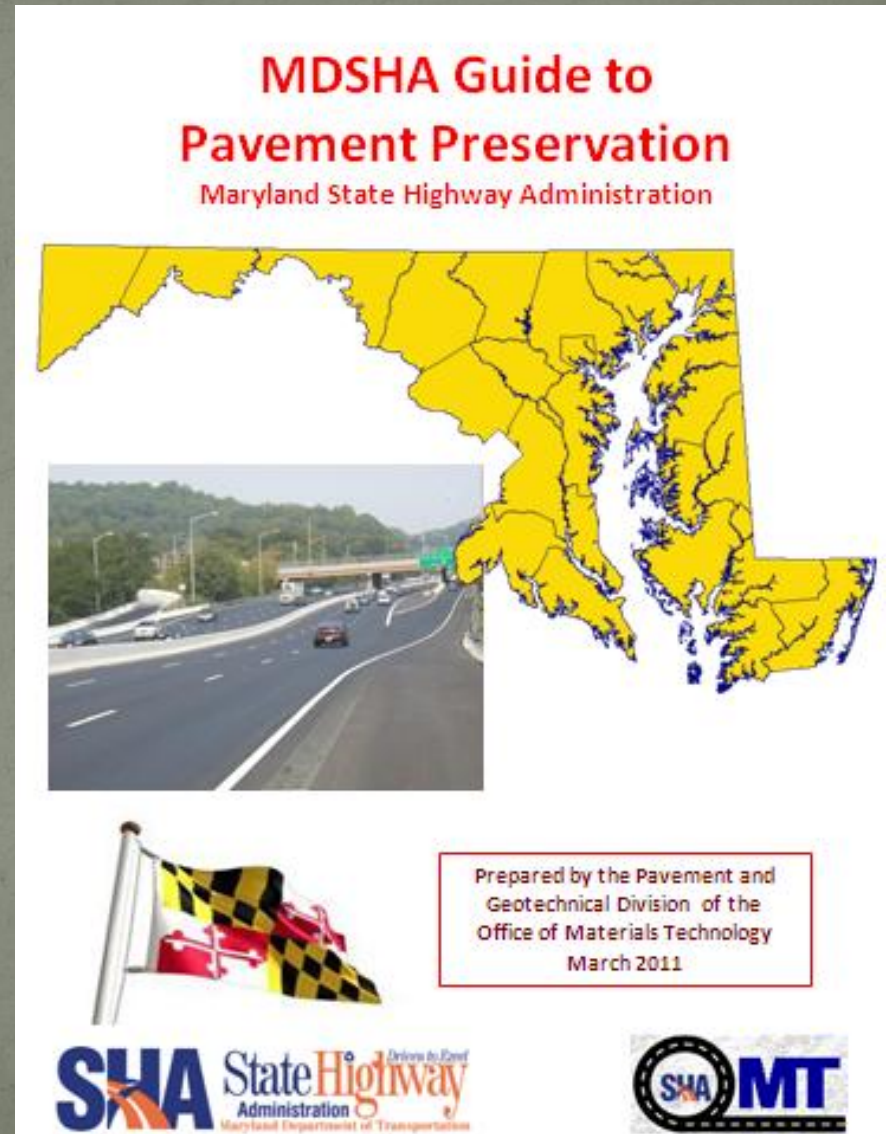
## Target Generation:

Functional Class		Budget	Benefit	Suggested LM	\$/LM
Rural Interstate	1	\$3,242,560	393	48	\$67,553.33
Rural Principal Arterial - Other	2	\$4,355,807	638	53	\$82,185.04
Rural Minor Arterial	6	\$28,459	2	0	
Rural Major Collector	7	\$4,169	1	0	
Rural Minor Collector	8	\$0	0	0	
Rural Local	9	\$0	0	0	
Urban Interstate	11	\$6,802,716	430	47	\$144,738.64
Urban Principal Arterial - Other Freeways	12	\$1,344,028	75	3	\$448,009.33
Urban Principal Arterial - Other	14	\$140,174,457	6,636	391	\$358,502.45
Urban Minor Arterial	16	\$26,841,441	1,539	74	\$362,722.18
Urban Collector	17	\$10,500,605	303	20	\$525,030.25
Urban Local	19	\$0	0	0	

# Pavement Management Strategies

## Treatment Selection (project-level):

- Pavement Design engineer should utilize Preservation Guide





# Project-level Treatment Selection

Table IV				Pavement ADT				
CI	Friction	Cracking	Rutting (in.)	A. Crack/Joint Seals	B. Asphalt Sealers / Rejuvenators	C. Aggregate Seals	D. Ultrathin HMA	E. Overlay
76-100	>40	Load-Related	M	A-1, A-2	B-1, B-2	C-3, C-7, C-8		E-5, E-8, E-15
			H	A-1, A-2	B-1, B-2	C-3, C-7, C-8		E-5, E-8, E-15
		Non Load-Related	L	A-1, A-2	B-1, B-2	C-3, C-7		E-5
			M	A-1, A-2	B-1, B-2	C-3, C-7, C-8		E-5, E-8, E-15
			H	A-1, A-2	B-1, B-2	C-3, C-7, C-8		E-5, E-8, E-15
	≤ 40	Load-Related	L	A-1, A-2	B-1, B-2	C-3, C-7	D-1	E-5
			M	A-1, A-2	B-1, B-2	C-3, C-7, C-8	D-1	E-5, E-8, E-15
			H	A-1, A-2	B-1, B-2	C-3, C-7, C-8	D-1	E-5, E-8, E-15
		Non Load-Related	L	A-1, A-2	B-1, B-2	C-3, C-7	D-1	E-5
			M	A-1, A-2	B-1, B-2	C-3, C-7, C-8	D-1	E-5, E-8, E-15
			H	A-1, A-2	B-1, B-2	C-3, C-7, C-8	D-1	E-5, E-8, E-15

Note: See Table E for Treatment Activities

# Project-level Treatment Selection

**Table E. List of Treatment Options**

Treatment Group	Treatment Number	Treatment	Compatible Areawide Contract
A. Crack/Joint Seals	A-1	Crack Filling	Crack and Joint Seals
	A-2	Crack Sealing	Crack and Joint Seals
	A-3	Joint Sealing (and Resealing)	Crack and Joint Seals
	A-4	Sawand Seal	Crack and Joint Seals
B. Asphalt Sealers / Rejuvenators	B-1	Asphalt Sealers	Asphalt Emulsion Seals
	B-2	Fog Seals / Rejuvenators	Asphalt Emulsion Seals
C. Aggregate Seals	C-1	Cape Seal	Asphalt Emulsion Seals
	C-2	Chip Seal (Modified)	Asphalt Emulsion Seals
	C-3	High Friction Surface	High Friction Surface
	C-4	Sand Seal	Asphalt Emulsion Seals
	C-5	Sandwich Seal	Asphalt Emulsion Seals
	C-6	Scrub Seal	Asphalt Emulsion Seals
	C-7	Slurry Seal	Asphalt Emulsion Seals
	C-8	Microsurfacing	Asphalt Emulsion Seals
D. Ultrathin HMA	D-1	Ultrathin Bonded Wearing Course (Asphalt)	Ultrathin Bonded Wearing Course
E. Overlay	E-1	HMA Overlay - Open Graded Friction Course	Grind, Patch and Resurface
	E-2	HMA Overlay - Ultrathin (<1.5")	Grind, Patch and Resurface
	E-3	HMA Overlay - Ultrathin (<1.5") (High Performance Thin Overlay)	Grind, Patch and Resurface
	E-4	Grind and HMA Overlay - 64-22/28, w or wo 8PV	Grind, Patch and Resurface
	E-5	Hot In Place HMA Recycling (HIR)	Hot In-Place Recycling
	E-6	Grind and HMA Overlay - GAP-SMA	Grind, Patch and Resurface
	E-7	Grind and HMA Overlay - 76-22, Dense, 8PV	Grind, Patch and Resurface
	E-8	HMA Overlay - 64-22/28, w or wo 8PV	Grind, Patch and Resurface
	E-9	HMA Overlay - GAP-SMA	Grind, Patch and Resurface



# Project-level Treatment Selection

## Consider treatments:

- Appropriate uses, advantages and disadvantages, time until open to traffic, **expected cost, expected life extension**

# Project-level Treatment Selection

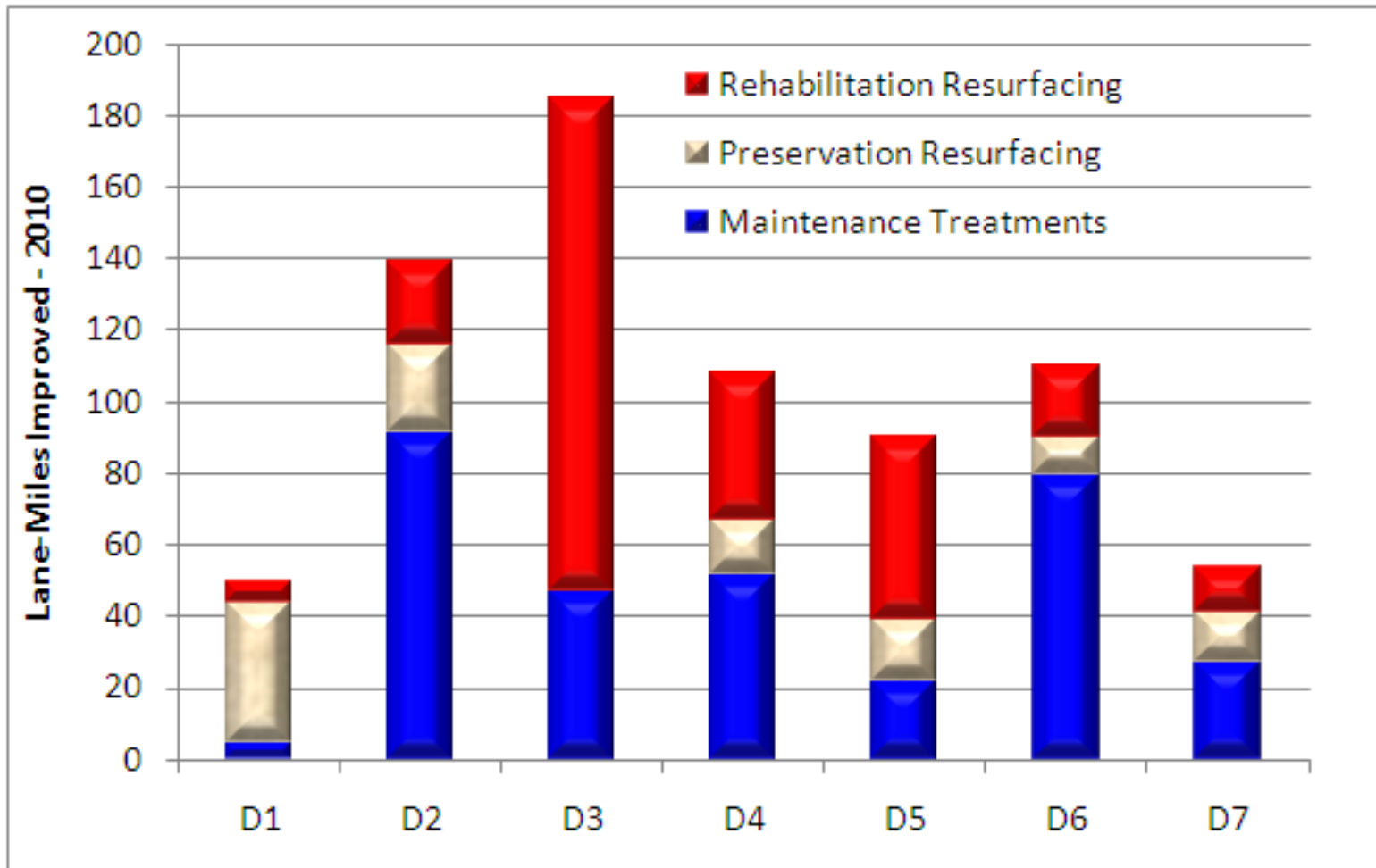
## Show Cost & Benefit:

### *Remaining Service Life Summary*

Option	Rehab	Preservation
Life Extension (Chosen)	10	8
Lane-Miles	3.7	3.7
LMY Benefit	37	30
Project Cost	\$1,220,000	\$600,000
\$/LMY	\$33,000	\$20,000 ✓

# Pavement Management Strategies

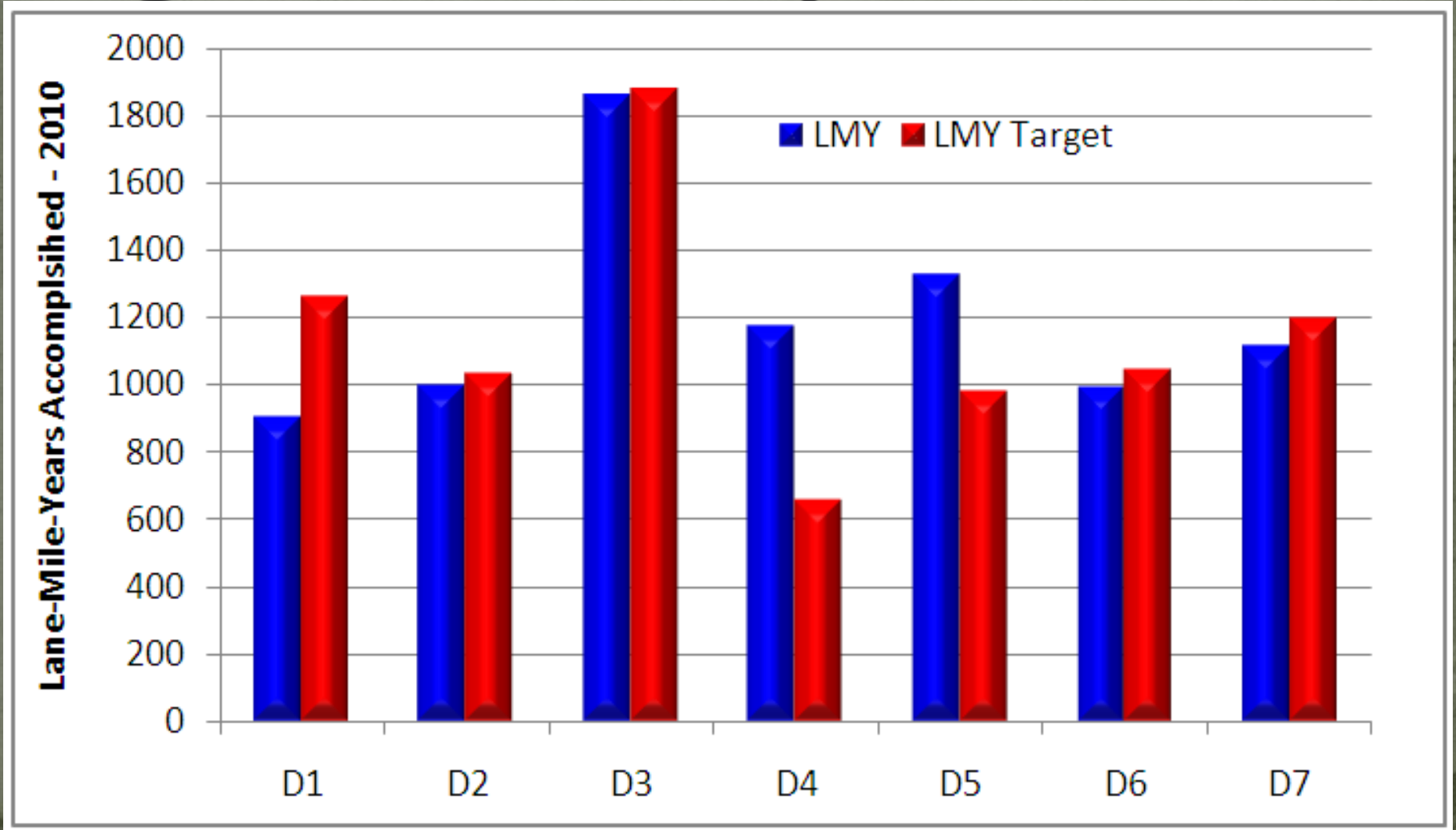
## Target Accountability





# Pavement Management Strategies

## Target Accountability



# Summary

Optimization must capture, and pavement engineers must demonstrate, benefit of PP treatments

- Provide clear targets, and hold decision-makers accountable, to ensure PP treatments are chosen.

# Questions?

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