

Project Management & Construction Division

Pavement Management Program
Maintenance & Rehabilitation



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Pavement Management Program Supervisor

Pavement Management Program

- MCDOT has operated Pavement Management Database since 1980's
 - MCDOT utilized Pavement Preservation Program starting in 2008
 - It is a systematic process to plan pavement preservation activities
 - It provides, analyzes and summarizes roadway and pavement information
 - Identifies optimum strategies, selects cost-effective preservation methods
 - Create roadway statistical reports
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Pavement Evaluation

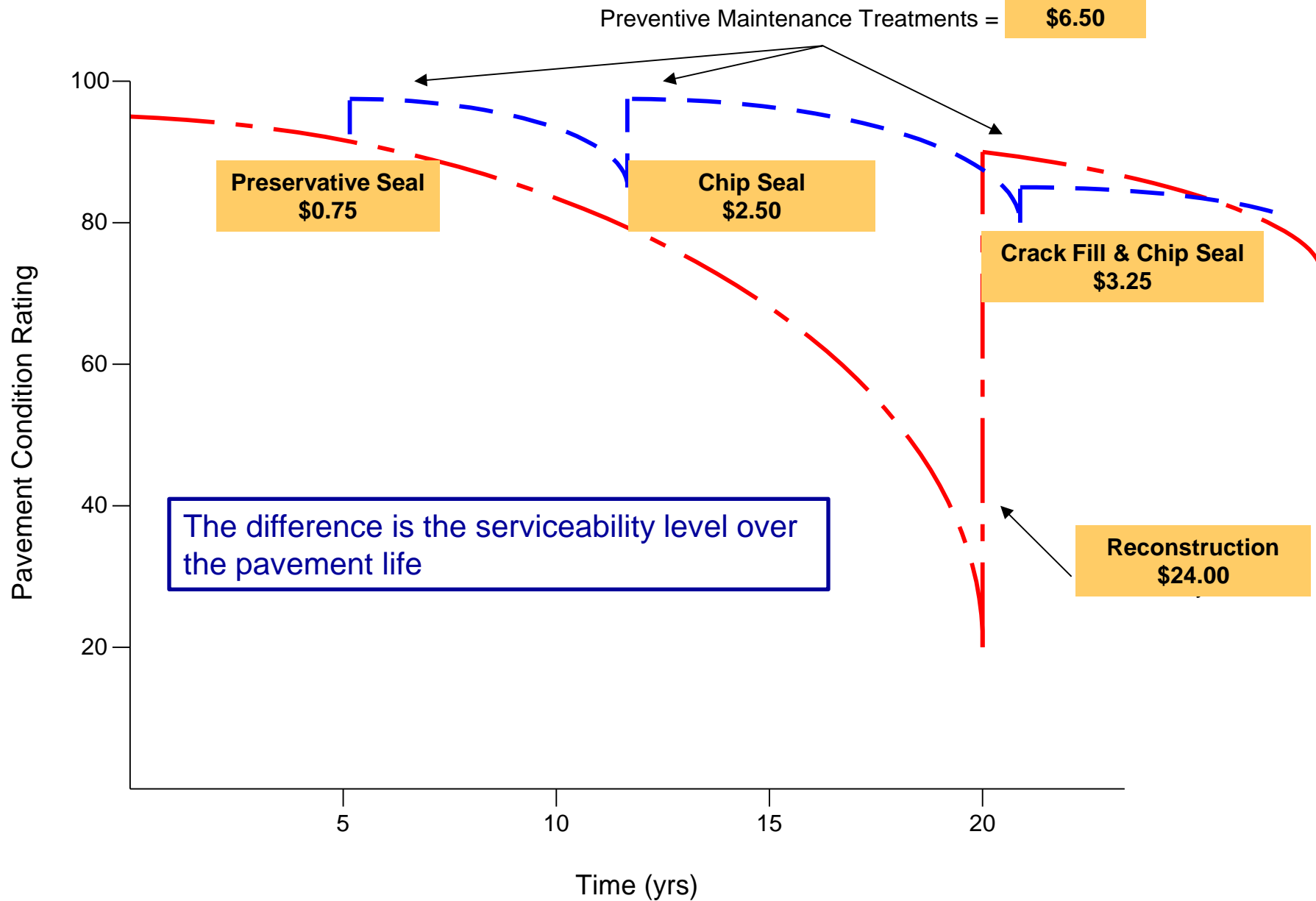
- 1200 miles of Arterial road evaluation annually for Pavement Condition Rating (PCR) and International Roughness Index (IRI)
- 800 miles total of Local road PCR evaluation, 400 miles per year
- Nine Distress criteria are evaluated for extent and severity; transverse, longitudinal, block and fatigue cracks, raveling, rutting, IRI, patching and excess asphalt

Figure 1: Asphalt Pavement Surface Distress Rating System

ASPHALT PAVEMENT SURFACE DISTRESS (PCR DEDUCTIONS – 100 POINT SYSTEM)											
Transverse Cracks					Longitudinal Cracks						
Extent Spacing	Severity/Width				Extent	Severity/Width					
	< 3/8"		> 3/8"			< 3/8"		> 3/8"			
> 50 ft	1	(3)	4	(6)	Centerline Single	1	(3)	4	(6)		
12 ft to 50 ft	2	(5)	5	(8)	Wheel Path Single	2	(5)	5	(8)		
< 12 ft	3	(7)	6	(10)T	Multiples	3	(7)	6	(10)T		
D-76					D-70						
Fatigue Cracking					Block Cracks						
Extent	Severity/Width				Extent Block Size	Severity/Width					
	< 1/8"		> 1/8"			< 3/8"		> 3/8"			
One or two < 50 sf	1	(4)	5	(5)	9	(9)	> 50 sf	1	(3)	4	(6)
Three or more < 50 sf	2	(6)	6	(7)	10	(11)	50 to 6 sf	2	(5)	5	(8)
One of two > 50 sf	3	(8)	7	(12)	11	(14)	< 6 sf	3	(7)	6	(10)T
Three or more > 50 sf	4	(10)	8	(13)	12	(15)T					
D-40					D-50						
Rutting					Raveling						
Extent	Severity				Extent	Severity/Width					
						Minor		Major			
Laser Average 0.00-0.12	0		(0)		Wheel Paths < 50% length	1	(2)	5	(3)		
Laser Average 0.13-0.25	1		(4)		Wheel Paths > 50% length	2	(4)	6	(5)		
Laser Average 0.26-0.38	2		(6)		Entire Width < 50% length	3	(6)	7	(9)		
Laser Average 0.39-0.50	3		(12)		Entire Width > 50% length	4	(8)	8	(10)		
Laser Average > 0.50	4		(15)T								
D-60					D-60						
Shoving/Pushing/Corr.					Patching						
Extent	Severity				Extent/Number	Severity/Quality of Repair					
						Good	Fair	Poor			
Laser Avg. IRI 0-59	0		(0)		< 5 Repairs	1 (01)	4 (04)	7 (07)			
Laser Avg. IRI 60-94	1		(3)		5 to 15 Repairs	2 (02)	5 (05)	8 (09)			
Laser Avg. IRI 95-170	2		(5)		> 15 Repairs	3 (03)	6 (06)	9 (10)T			
Laser Avg. IRI 171-220	3		(8)								
Laser Avg. IRI > 220	4		(10)T								
D-60					D-50						
Excess Asphalt					Notes: 1. All numbers in parentheses are deduction points. 2. D = Default. 3. Trigger is activated when the rating is applied if the "T" value results in a lower Pavement Condition Rating (PCR) than the sum total of the deductions.						
Extent	Severity/Film										
	Thin		Thick								
Wheel Paths < 50% length	1	(3)	5	(4)							
Wheel Paths > 50% length	2	(5)	6	(6)							
Entire Width < 50% length	3	(7)	7	(8)							
Entire Width > 50% length	4	(9)	8	(10)T							
D-60											



Pavement Preservation Strategies



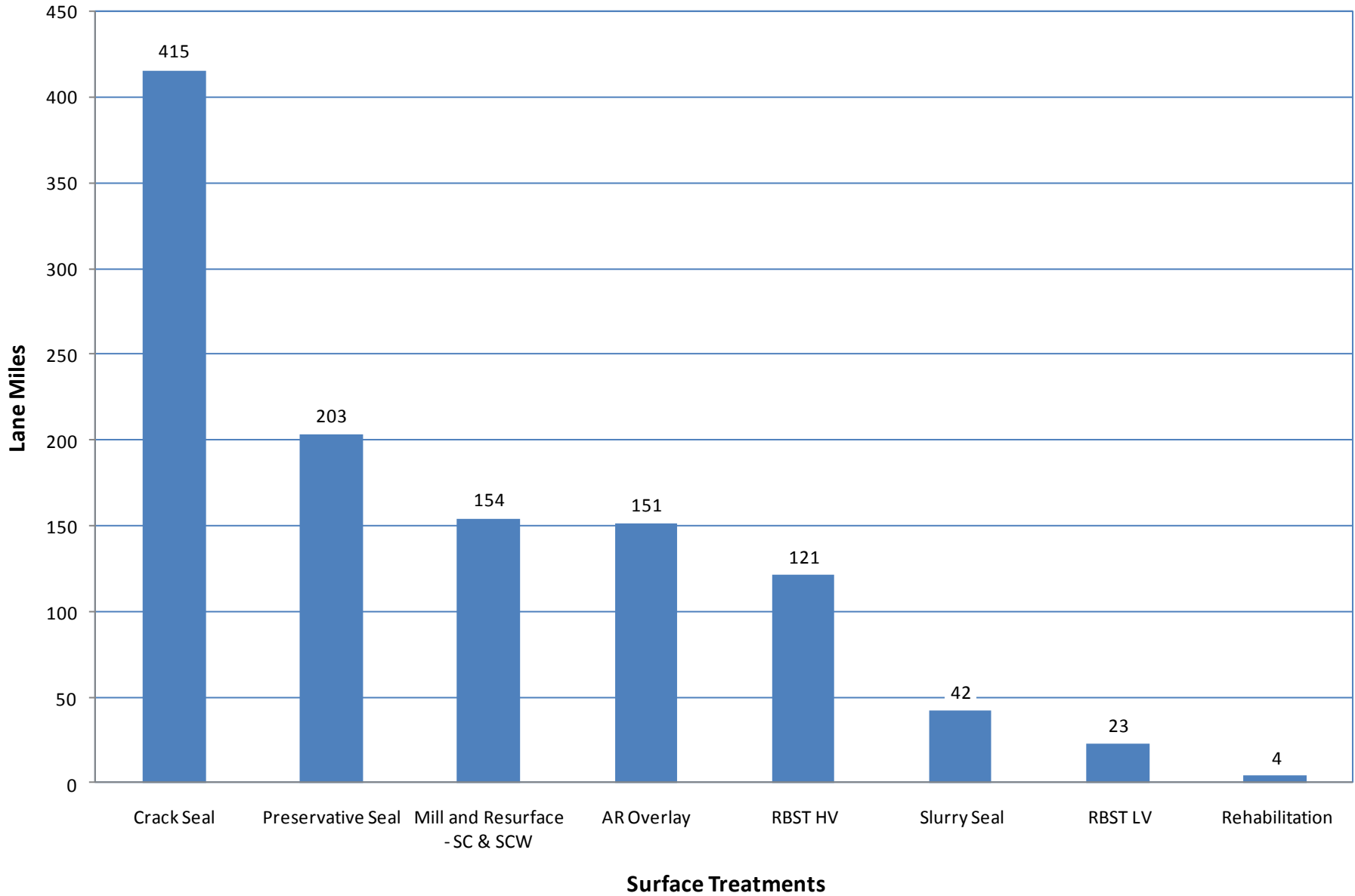
Pavement Preservation Plan FY2011

Preservation	Quantity (LM)	Cost (\$K)	Unit Cost (\$/SY)
Crack Seal	391	\$2,086	\$0.65
Mill & Resurface, SC/SCW	171	\$11,817	\$8.39
Preservative Seal	205	\$1,488	\$0.88
RBST HV	128	\$2,104	\$2.00
RBST LV	33	\$533	\$2.00
Slurry Seal	48	\$879	\$2.25
AR Overlay	28	\$2,020	\$9.75
ARRA AR Overlay	118	\$7,521	\$7.75
Rehabilitation	2	\$525	\$25.35
Totals:	1124	\$28,973	

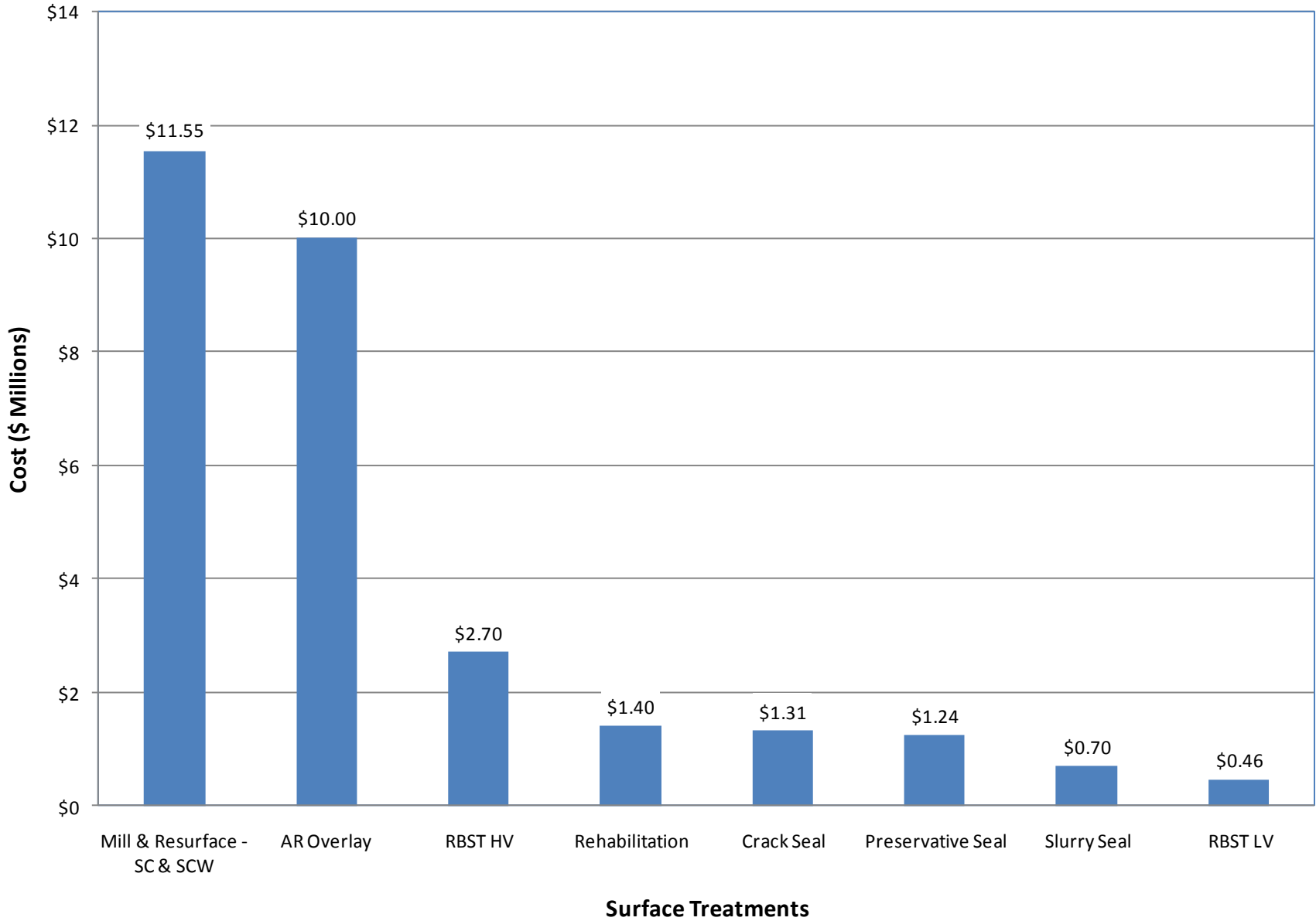
Pavement Preservation Completed FY2011

Preservation	Quantity (LM)	Cost (\$K)	Unit Cost (\$/SY)
Crack Seal	415	\$1,313	\$0.39
Mill & Resurface, SC/SCW	154	\$11,558	\$9.13
Preservative Seal	203	\$1,238	\$0.74
RBST HV	121	\$2,692	\$2.72
RBST LV	23	\$461	\$2.50
Slurry Seal	42	\$696	\$2.04
AR Overlay	151	\$10,020	\$8.08
Rehabilitation	4	\$1,367	\$43.87
Totals:	1113	\$29,345	

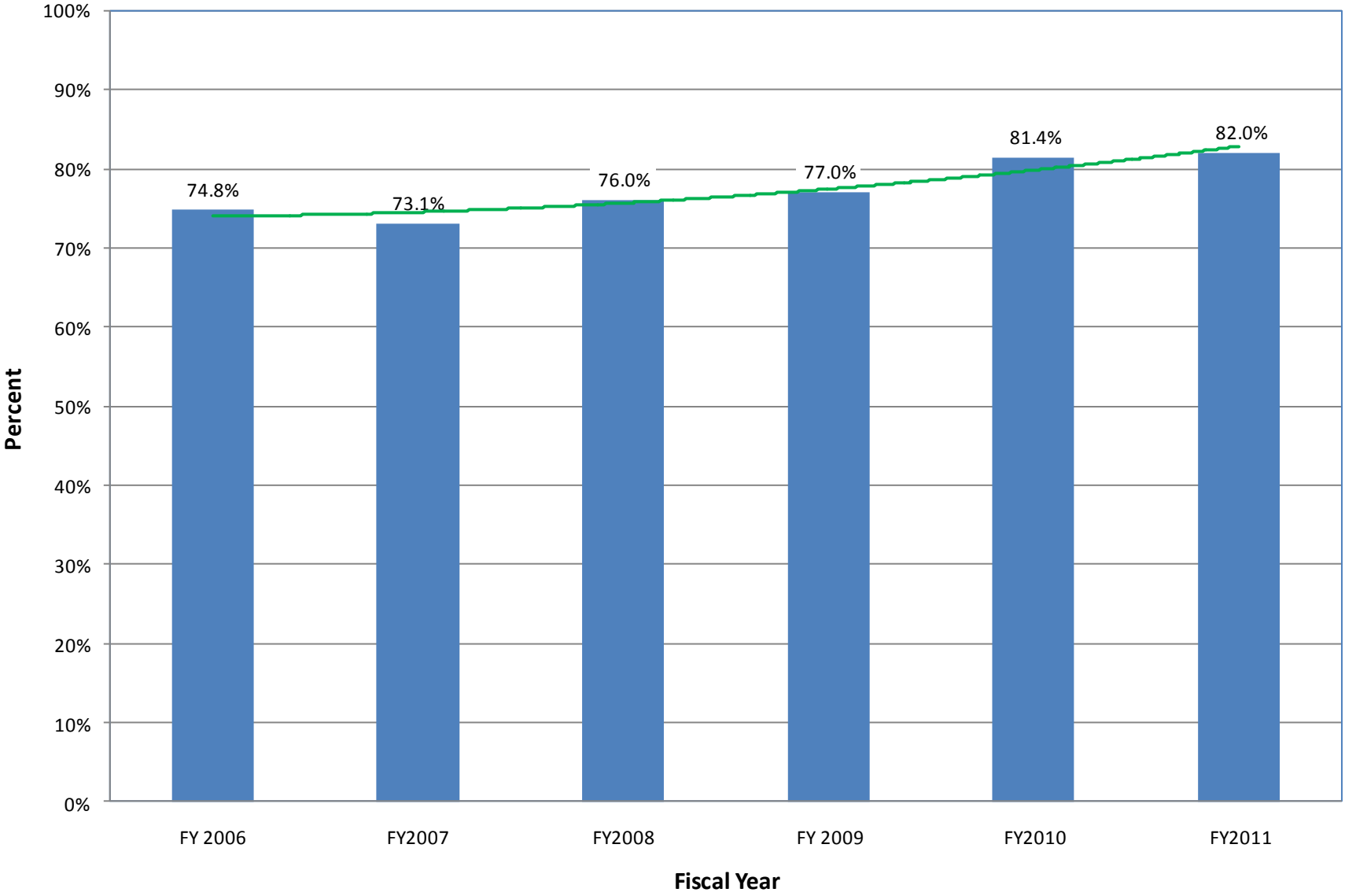
FY 2011 Completed Maintenance Mileage



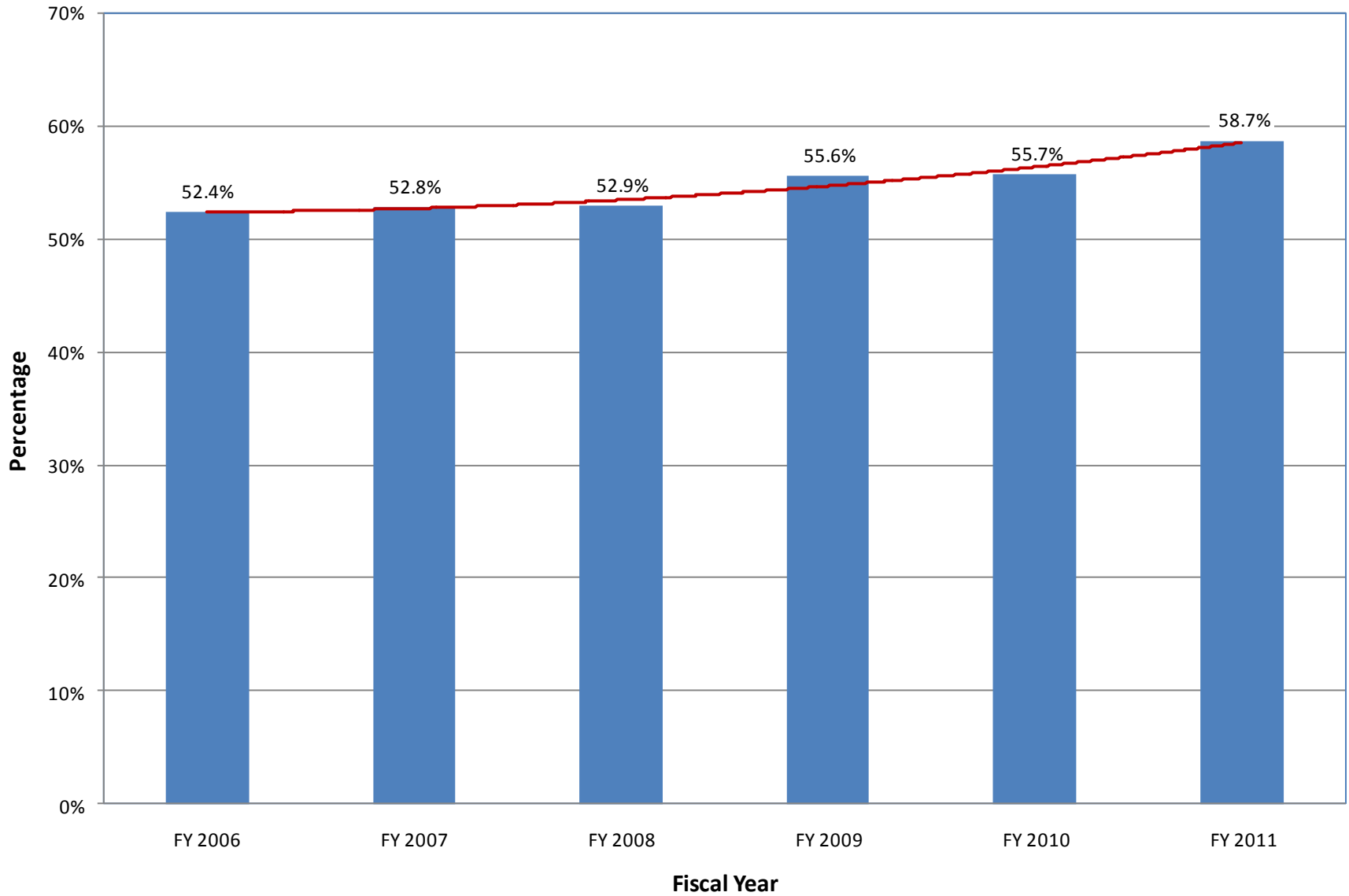
FY 2011 Actual Maintenance Costs



Percent of MCDOT Roadway Rated Excellent and Very Good Pavement Condition Rating (PCR) Higher Than 70



Percent of MCDOT Roadway Smoothness Rated Average to Very Smooth International Roughness Index Rating (IRI) Lower Than 170



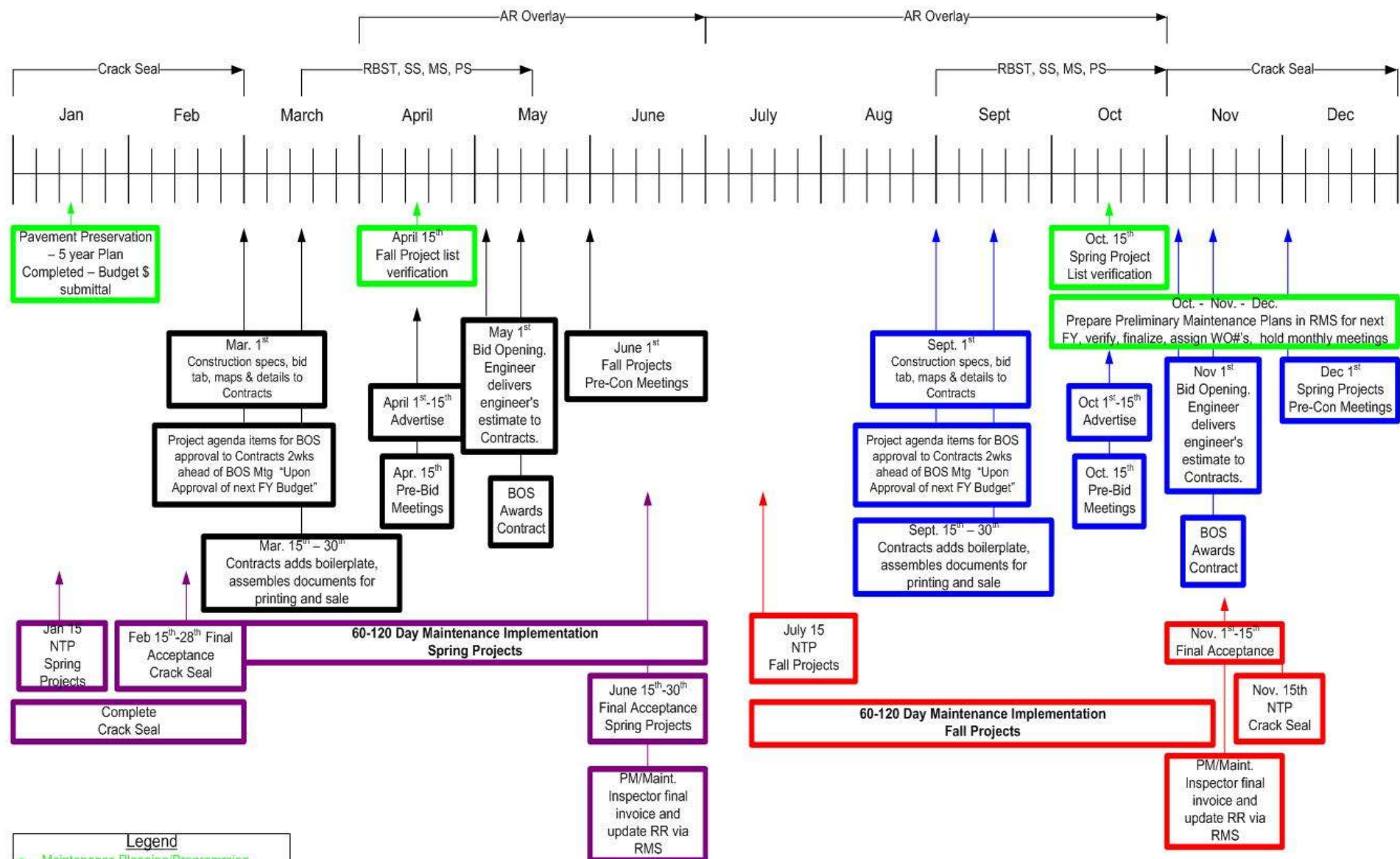
Pavement Smoothness

- MCDOT goal is to provide smoother, longer lasting, safer and more cost effective pavements
- MCDOT has used a Smoothness specification since 2000
- The Specification has an incentive for excellent paving and a penalty for poor paving
- Smoother pavement correlates to a more comfortable ride with less noise and vibration
- Improved fuel efficiency and reduced vehicle wear and tear
- Smoother roads require less maintenance and last longer
- In 2005 MCDOT won the AQA Showcase in Excellence Award for “Asphalt Pavement Smoothness”

Pavement Preservation Plan for FY2012

Preservation	Quantity (LM)	Cost (\$K)	Unit Cost (\$/SY)
HIP 99 ^h Ave & Del Webb*	40	\$3,270	\$10.00
Mill & Resurface, SCW*	10	\$1,100	\$8.5
RBST HV	100	\$2,050	\$2.50
RBST LV	37	\$762	\$2.50
Slurry Seal	46	\$855	\$2.25
Slurry Seal-Sun Valley Pk*	134	\$3,302	\$3.00
AR Overlay SCW Arterial*	71+28	\$4,927	\$8.50
AR Overlay Utery Pass*	14	\$2,000	\$15.00
Crack Seal	361	\$1,926	\$0.65
Preservative Seal	134	\$827	\$0.75
Recon Desert Sage Subd.*	12	\$1,750	\$17.00
* TIP funded	987	\$22,769	

Yearly Pavement Management Program - Timeline



Pavement Preservation
- 5 year Plan
Completed - Budget \$
submittal

April 15th
Fall Project list
verification

Oct. 15th
Spring Project
List verification

Oct. - Nov. - Dec.
Prepare Preliminary Maintenance Plans in RMS for next
FY, verify, finalize, assign WO#'s, hold monthly meetings

Jan 15
NTP
Spring
Projects

Feb 15th-28th Final
Acceptance
Crack Seal

60-120 Day Maintenance Implementation
Spring Projects

Complete
Crack Seal

June 15th-30th
Final Acceptance
Spring Projects

PM/Maint.
Inspector final
invoice and
update RR via
RMS

July 15
NTP
Fall Projects

60-120 Day Maintenance Implementation
Fall Projects

Nov. 1st-15th
Final Acceptance

Nov. 15th
NTP
Crack Seal

PM/Maint.
Inspector final
invoice and
update RR via
RMS

- Legend**
- Maintenance Planning/Programming
 - Procurement/Contracts - Fall Projects
 - Procurement/Contracts - Spring Projects
 - Implementation - Fall Projects
 - Implementation - Spring Projects

*** IMPORTANT NOTE:**
RBST projects: Start chip production 2 MONTHS
ahead of placement

Preventive Maintenance Performance

Preventive maintenance extends the life of the pavement and provides for better performance. The majority of treatments for flexible pavements involves sealing the existing surface and providing a new wearing surface for traffic. Two of the primary factors leading to the deterioration and premature failure of flexible pavements are oxidization and water environmental damage.

MCDOT has used preventive maintenance practices for decades with excellent results. Table 1 shows the break down of each treatment that is typically used, the frequency of application and the observed increase in pavement life per application.

Table 1: Preventive Maintenance Treatment Longevity

Treatment	Pavement age at time of first application (yr.)	Frequency of application (yr.)	Observed increase in pavement life (yr.)
Fog Seal/ Rejuvenate	3 to 4	3 to 4	3 to 4
Crack Filling/Sealing	8 to 10	4 to 5	4 to 5
Single Chip Seal	10 to 12	5 to 6	5 to 6
Double Chip Seal	10 to 12	5 to 6	5 to 6
Micro Surfacing	10 to 12	5 to 6	5 to 6
Slurry Seal	10 to 12	5 to 6	5 to 6
Arterial—Thin Overlay— 1.5" - 2" ARHM	12 to 15	12 to 15	12+
Local—Mill & Resurface 1.5" ARHM	35+	TBD*	TBD*
* TBD—To be determined			

Pavement Preservation Plans

- Fog Seal / Preservative Seal
 - Crack Fill
 - Chip Seals
 - Slurry Seal
 - AR Overlay Arterials
 - Mill and Resurface Locals
 - Rehabilitation Locals
- 





















LV Chip Seal 1/4" Aggregate



HV Chip Seal 3/8" Aggregate













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Heritage County
Field Center District
Transportation Dept.
Energy & Sustainable Devt.
Animal Care & Control





Thank You!
Questions?

