



Draft 10-Year Road Repair & Preservation Plan

May 21, 2018

Purpose



- ▶ Repair within 10 years and preserve in at least fair condition, all paved roadways accepted for maintenance by Pima County

Scope

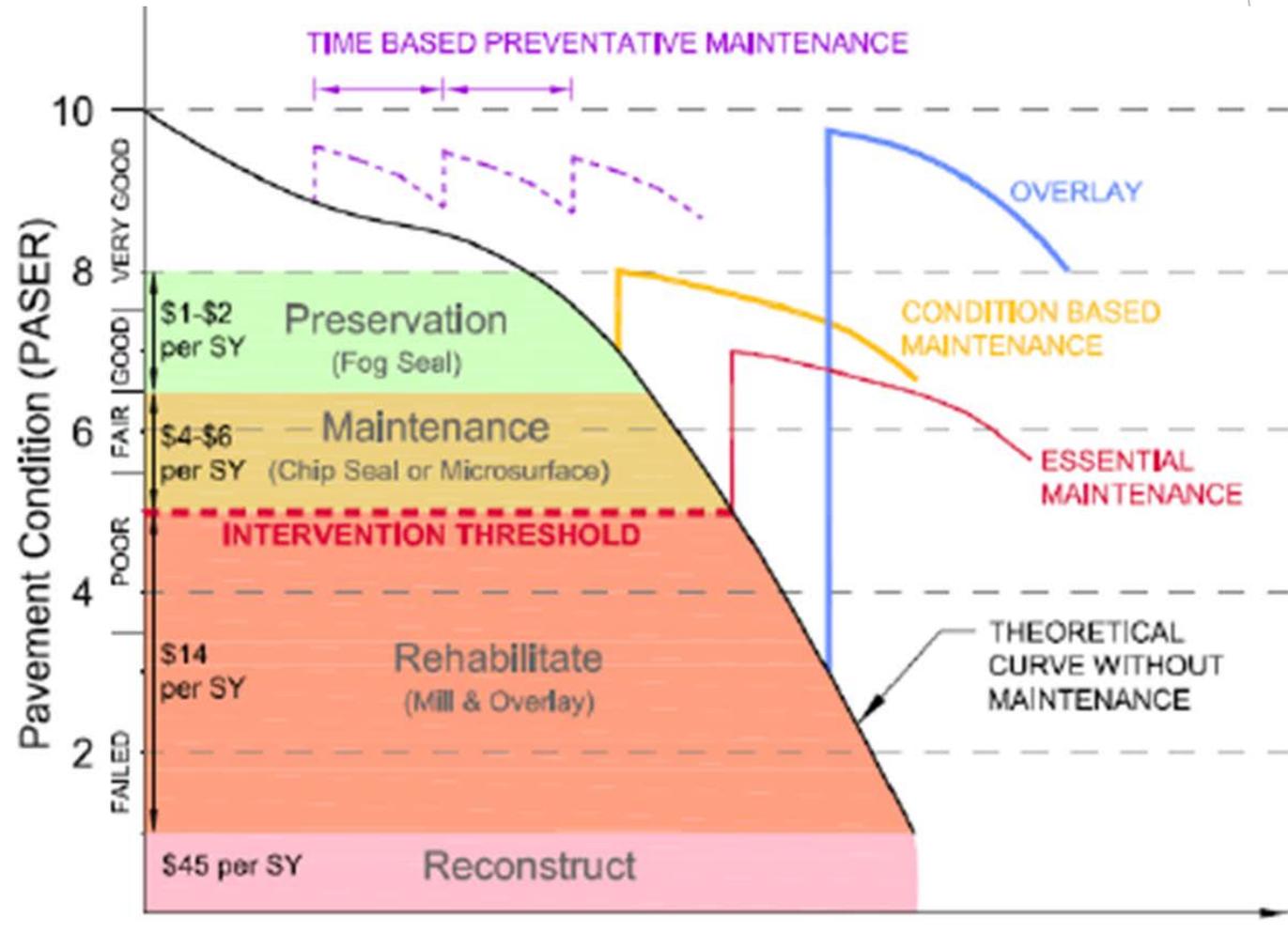


- ▶ Repair and preservation of public paved roadways to maximize PASER during the plan period
- ▶ Pavement and associated edge protection on uncurbed roadways to include shoulders or headers
- ▶ ADA infrastructure improvements required by the application of a particular repair or preservation treatment

Assumptions: Pavement Degradation

Treatments:

- ▶ PASER 8 & 9: FS
- ▶ PASER 6: MnS
- ▶ PASER 5: MjS
- ▶ PASER 1-4: M/F



Assumptions: Cost

- ▶ \$14/SY: mill & fill (2" PAG 2)
- ▶ \$6/SY: crack & major seal (cape or micro)
- ▶ \$4.5/SY: crack & minor seal (chip)
- ▶ \$1.5/SY: fog seal
- ▶ \$2,500 per curb ramp
- ▶ 4% Financing
- ▶ Approx. 2.5%/year or 12.7%/10 years inflation (Chained Price Index for State & Local Investment in Highways and Streets reported by the U.S. Bureau of Economic Analysis)

Assumptions: Budget Sources



1 Year	2 Estimated Sales Tax Revenue Allocated to Unincorporate d Pima Co. Roads	3 Additional HURF Available from 1997 Bond Debt Decreases	4 Projected growth in HURF from Additional State-Shared Revenues	5 Surplus 1997 HURF Bond Allocation	6 Department of Transportation Operational Savings	7 Total
1	\$ 41,892,034	\$ 174,900	\$ 3,681,330	\$ 6,000,000	\$ 1,000,000	\$ 52,748,264
2	\$ 31,752,782	\$ 704,900	\$ 5,605,233		\$ 3,000,000	\$ 41,062,915
3	\$ 32,992,193	\$ 751,533	\$ 7,586,853		\$ 4,000,000	\$ 45,330,579
4	\$ 34,173,926	\$ 5,631,033	\$ 9,627,922		\$ 6,000,000	\$ 55,432,881
5	\$ 35,381,690	\$ 5,619,483	\$ 11,730,222		\$ 7,000,000	\$ 59,731,395
6	\$ 36,584,667	\$ 8,659,808	\$ 13,895,592		\$ 9,000,000	\$ 68,140,067
7	\$ 37,755,376	\$ 8,656,208	\$ 16,125,923		\$ 10,000,000	\$ 72,537,507
8	\$ 38,850,282	\$ 8,659,921	\$ 18,423,163		\$ 11,000,000	\$ 76,933,366
9	\$ 39,976,940	\$ 10,262,283	\$ 20,789,321		\$ 11,000,000	\$ 82,028,545
10	\$ 23,879,194	\$ 11,767,889	\$ 23,226,464		\$ 11,000,000	\$ 69,873,548
TOTAL	\$ 353,239,086	\$ 60,887,958	\$ 130,692,023	\$ 6,000,000	\$ 73,000,000	\$ 623,819,067
Year 11 Pavement Preservation Budget	\$0	\$ 11,772,139	\$ 25,736,721	\$0	\$ 11,000,000	\$ 48,508,860

Assumptions: Budget Preservation Allocation



Year	Annual Cost Estimate for Full Pavement Preservation if All Roads in Fair to Good Condition	% Preservation allocation	Inflation rate	Pavement Preservation Cost Estimates for Roads in Fair & Good Condition
1	\$ 28,963,268	30%	2.46%	\$ 8,903,118
2	\$ 28,963,268	30%	4.71%	\$ 10,866,996
3	\$ 28,963,268	36%	7.17%	\$ 12,933,488
4	\$ 28,963,268	42%	9.33%	\$ 15,040,530
5	\$ 28,963,268	48%	11.45%	\$ 17,216,445
6	\$ 28,963,268	53%	13.77%	\$ 19,496,660
7	\$ 28,963,268	59%	16.13%	\$ 21,863,501
8	\$ 28,963,268	65%	18.47%	\$ 24,304,990
9	\$ 28,963,268	71%	20.82%	\$ 26,828,200
10	\$ 28,963,268	77%	23.16%	\$ 27,349,799
TOTAL				\$ 169,566,671

Assumptions: Budget Cost Split



Year	Road Repair Cost Estimates For Road in Poor & Failing Condition	Pavement Preservation Cost Estimates for Roads in Fair & Good Condition	Total
1	\$ 43,845,146	\$ 8,903,118	\$ 52,748,264
2	\$ 31,964,957	\$ 10,866,996	\$ 41,062,915
3	\$ 34,207,799	\$ 12,933,488	\$ 45,330,579
4	\$ 42,239,423	\$ 15,040,530	\$ 55,432,881
5	\$ 44,397,989	\$ 17,216,445	\$ 59,731,395
6	\$ 50,565,634	\$ 19,496,660	\$ 68,140,067
7	\$ 52,636,104	\$ 21,863,501	\$ 72,537,507
8	\$ 54,629,953	\$ 24,304,990	\$ 76,933,366
9	\$ 57,241,643	\$ 26,828,200	\$ 82,028,545
10	\$ 42,523,748	\$ 27,349,799	\$ 69,873,548
Total	\$ 454,252,396	\$ 169,566,671	\$ 623,819,067

Analysis Criteria

- ▶ Aggregate segments requiring similar treatment grouped by TRS, subdivision, street name & address range to create grouped work zones
- ▶ Enable logic based on functional class and zoning to determine the number and location of ADA curb ramps to be constructed
- ▶ Rank roads based on PASER level
- ▶ Create roadway pavement preservation schedule
- ▶ Allocate treatment types based on available annual repair and preservation budgets adjusted to maximize cost/benefit

Analysis Criteria (continued)

- ▶ PASER 1-4 roadways are scheduled for repair with priority from 1-4
- ▶ PASER 5-10 roadways are scheduled for preservation with priority from 10-5
- ▶ Work is scheduled based on PASER degradation curve
- ▶ Initial PASER of roadways is adjusted as anticipated for FY2020

Roadway Treatment Assignment

- ▶ Analysis decrements through road list based on treatment, PASER & budget
- ▶ Assigns treatments to collections over 15 years
- ▶ Manual adjustment of budget allocations to:
 - ▶ Maximize work per year
 - ▶ Better prioritize treatments based on PASER
 - ▶ Assign discount rate to repair all roads within 10 years
- ▶ “April 23 plan” generated with 88% discount rate

A Glimpse into the Analysis Tool



1	Collection	ROADID	STREET	MAPIPT	ActionYea	Action	ActionNa	FUNCL	LEFT	SUB	RIGHT	SUI	LEFTBO	RIGHTBO	PASER	REATMEN	COST	LENGTH	ADD_MIN	ADD_MAX	1 planYear	2 planYear	3 planYear	4 planYear	5 planYear	6 planYear	7 planYear	8 planYear	9 planYear	10 planYear
5584	1005582	213531,213532	E SANDS RANCH RD Total		7	3	M/F	0					4			4		2884.686	14300	14573								3		
5585	1005583	213535,213534	S SUNDOWN RANCH RD Total		7	3	M/F	0					4			4		2598.714	13344	13699							3			
5586	1005584	142032,241436,241437	S SONOITA RANCH CI Total		4	5	MJS	0					4			6		4024.178	13400	13673				4.6						
5587	1005585	34347	S WENTWORTH RD Total		4	2	M/F	8					4			2		13089.89	12574	14499				1.5				9		
5588	1005586	213877	E MOKES MILE TR Total		8	4	M/F	0					4			5		55.003	14290	14299							4.1			
5589	1005587	3100	N DAVIDSON RD Total		4	5	MJS	0					4			4		267.677	1900	1949				4.6						
5590	1005588	12234	E FARINO PL Total		1	1	M/F	0					4			1		630.962	3900	3975	1				9				6	
5591	1005589	3257	E MESCALERO DR Total		1	1	M/F	0					4			1		3346.18	3210	3673	1				9				6	
5592	1005590	15420	E NANA DR Total		4	2	M/F	0					4			2		2611.965	3700	3951				1.5			9		6	
5593	1005591	44480,55958	E RINCON VIEW DR Total		1	1	M/F	0					4			1		5301.67	3200	3899	1				9				6	
5594	1005592	12104,78091,487039,507073,507074,5	E ANDRADA RD Total		1	1	M/F	18					4			1		5317.696	3124	3899	1				9				6	
5595	1005593	32935,44872,30984	N CALLE RINCONADO Total		1	1	M/F	0					4			1		2453.785	1600	1849	1				9				6	
5596	1005594	31005,43961,51505	N DAVIDSON RD Total		6	2	M/F	0					4			3		2609.019	1600	1899						2			9	
5597	1005595	219220	E COSTELLO RANCH PL Total		4	5	MJS	0					4			6		442.523	14324	14373				4.6			2			
5598	1005596	155212,36193	E MARSH STATION RD Total		1	1	M/F	18					4			1		1539.427	14800	14999	1				9				6	
5599	1005597	39228	E MOKES MILE TR Total		8	4	M/F	0					4			5		679.391	14300	14389							4.1			
5600	1005598	219224	E WOOD CANYON PL Total		4	5	MJS	0					4			6		1092.339	14400	14549				4.6						
5601	1005599	212591,53182	S OLD SONOITA HY Total		6	2	M/F	0					4			3		6087.053	13800	14499						2			9	
5602	1005600	2476	E OLD SPANISH TR Total		4	9	FS	8					4			10		4487.031	16274	16723				9			6			
5603	1005601	53894	E COLOSSAL CAVE RD Total		1	1	M/F	8					4			1		4249.98	15900	16499	1				9				6	
5604	1005602	87046,17602,26281,87045,212599,116	E MARSH STATION RD Total		1	1	M/F	8					4			1		33102.21	15900	20023	1				9				6	
5605	1005603	42728,8449,37432,36748	W DIAMOND BELL RANCH RD Total		1	1	M/F	8					3			1		3364.424	14200	14699	1				9				6	
5606	1005604	16878,30803	S AVENIDA HALEY Total		1	1	M/F	0					3			1		2606.438	15700	16099	1				9				6	
5607	1005605	49914	W CALLE QUATRO Total		1	1	M/F	0					3			1		1326.25	7000	7199	1				9				6	
5608	1005606	47649	W CALLE UNO Total		1	1	M/F	0					3			1		1250.073	6799	6999	1				9				6	
5609	1005607	5720	S AVENIDA HALEY Total		1	1	M/F	0					3			1		671.521	15600	15699	1				9				6	
5610	1005608	117128	W CALLE UNO Total		1	1	M/F	0					3			1		57.228	0	0	1				9				6	
5611	1005609	2692,50789	W OCOTILLO RANCH RD Total		4	2	M/F	0					3			2		5804.435	6199	6699				1.5			9			
5612	1005610	6650,201014,201540,196320,201534	S MISSION RD Total		1	1	M/F	7					3			1		14797.17	15300	16949	1				9				6	
5613	1005611	19608	W HELMET PEAK RD Total		4	2	M/F	7					3			2		3713.501	4600	5199				1.5			9			
5614	1005612	53956	W CALLE QUATRO Total		1	1	M/F	0					3			1		1321.931	7200	7399	1				9				6	
5615	1005613	200972	S MISSION RD Total		1	1	M/F	7					3			1		1781.798	16950	17199	1				9				6	
5616	1005614	53944,200988,206330,24448,2606	W MCGEE RANCH RD Total		1	1	M/F	0					3			1		15352.45	5400	9173	1				9				6	

Roadways Repaired & Preserved



Year	Miles of Local Roads Repaired	Miles of Local Roads Preserved	Miles of Collector & Arterial Roads Repaired	Miles of Collector & Arterial Roads Preserved
1	128.33	21.56	63.45	39.65
2	112.51	37.10	3.89	56.17
3	102.17	44.01	20.12	54.78
4	43.26	18.92	99.85	83.31
5	139.95	127.98	46.07	41.75
6	163.09	112.51	48.40	3.89
7	164.74	102.17	47.33	20.12
8	136.55	50.66	55.11	152.42
9	71.95	267.93	83.26	87.82
10	51.44	312.70	22.10	108.45
TOTAL	1113.99	1095.54	489.58	648.36

Miles Treated per PASER per Year



Original PASER	Treatment	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
10	Fog Seal				37.92						
	Minor SC								37.92		
9	Fog Seal	10.82									
	Minor SC				10.82						
8	Fog Seal	50.39									
	Minor SC			50.39							
7	Minor SC		93.27	11.00							
	Major SC										93.27
6	Major SC			37.49	31.45						
	Mill/Fill								51.51	100.30	44.50
5	Mill/Fill								82.18	54.90	29.03
4	Mill/Fill							108.33	57.98		
3	Fog Seal										148.68
	Mill/Fill						148.68	103.73			
2	Fog Seal								136.13	186.02	62.80
	Mill/Fill				136.13	186.02	62.80				
1	Fog Seal				22.05	169.73	116.40	122.29	6.98		
	Minor SC								22.05	169.73	116.40
	Mill/Fill	191.78	116.40	122.29	6.98						
TOTAL	-	252.99	209.67	221.17	245.35	355.75	327.88	334.35	394.75	510.95	494.68

Other Considerations

- ▶ More cost effective pavement treatments (test project)
- ▶ Consideration for elimination of survey monuments
- ▶ Alternative plans should sales tax not be approved

Additional Information

www.pima.gov/RoadRepairPlan

