

# ASSET MANAGEMENT USING PASER RATING AND ADT

Tim O'Rourke - Manager  
Roscommon County Road Commission



# RCRC 2012 PASER Rating Summary

## Primary Roads Only

### 2003 Ratings Breakdown

PASER Rating:      Mileage

1	0	
2	"POOR" 0	4.57% *(18%)
3	7.283	
4	8.785	23.88%
5	29.243	*(21%)
6	42.674	49.39%
7	35.973	*(42%)
8	18.966	
9	"V.GOOD" 4.547	22.17% *(19%)
10	11.752	

### 2007 Ratings Breakdown

PASER Rating:      Mileage

1	0.886	
2	4.867	9.09% *(19%)
3	9.139	
4	41.802	51.24%
5	42.317	*(45%)
6	24.741	29.23%
7	23.146	*(26%)
8	13.658	
9	3.267	10.34% *(9%)
10	0	

### 2010 Ratings Breakdown

PASER Rating:      Mileage

1	1.307	
2	2.341	15.16%
3	24.470	
4	33.193	38.53%
5	38.272	
6	39.375	39.49%
7	33.867	
8	9.542	
9	3.120	6.82%
10	0	

### 2012 Ratings Breakdown

PASER Rating:      Mileage

1	0	
2	0	0.87%
3	1.609	
4	41.515	35.95%
5	25.140	
6	26.849	
7	32.869	32.21%
8	42.159	
9	15.120	30.97%
10	0.146	

Tot. Paved Mi. 159.223  
Gravel/Comp. 35.497  
*\*26 mi. Poor Composite  
Pavement Not Listed*

Tot. Paved Mi. 163.823  
Gravel/Comp. 30.897  
*\*22 mi. Poor Composite  
Pavement Not Listed*

Tot. Paved Mi. 185.487  
Gravel Mi. 9.233

Tot. Paved Mi. 185.407  
Gravel Mi. 9.313

Tot. Primary Mi. 194.720  
Avg. Paser Rate 6.41

Tot. Primary Mi. 194.720  
Avg. Paser Rate 5.29

Tot. Primary Mi. 194.720  
Avg. Paser Rate 5.29

Tot. Primary Mi. 194.720  
Avg. Paser Rate 6.27

Funding Decrease Begins  
Health Insurance was cheap  
Labor Cost were low  
Fuel Cost were rising  
Asphalt Liquid was cheap  
Central Garage was open

Asset Management Begins  
Concentrate on the 4-5's  
Patch the 1-2-3's  
No more "Worst First"  
5yr Goal 70% Good/Fair  
Mix of Fixes A.M. Strategy

Asset Management Continues  
Move 4-5's to 6-7's  
P.M. Fixes on 1-2-3's  
ROI Calculations on Fixes  
3 yr Goal 90% Good/Fair  
New "Mix of Fixes"

Moving Forward?  
P.M. Focus on ALL Roads (4-5's)  
ADT Driven Planning  
Adjust "Mix of Fixes" PM only  
Leverage All Available Funds  
Project 2003 Ratings up by 2013

# 2008 – 2012 RCRC Primary Work

\$6,329,000 Total Value Added

\$1,642,000 RCRC Matching  
Funds (26%)

43.6 Miles Resurfaced (24%)

73.0 Miles Crack Sealed (39%)

60.0 Miles Dura Patched (32%)

186 Miles of Paved Primary Road  
125 Miles on the Federal Aid  
System

## Rating system

Surface Rating	Visible distress*	General condition/ treatment measures
10 Excellent	NONE	New Construction
9 Excellent	NONE	Recent overlay. Like New
8 Very Good	No longitudinal cracks except reflection of paving joints. Occasional transverse cracks, widely spaced (40' or greater). All cracks sealed or tight (open less than 1/4").	Recent sealcoat or new cold mix. Little or no maintenance required.
7 Good	Very slight or no raveling, surface shows some traffic wear. Longitudinal cracks (open 1/4") due to reflection or paving joints. Transverse cracks (open 1/4") spaced 10' or more apart, little or slight crack raveling. No patching or very few patches in excellent condition.	First signs of aging. Maintain with routine crack filling.
6 Good	Slight raveling (loss of fines) and traffic wear. Longitudinal cracks (open 1/4"-1/2"). Some spaced less than 10'. First sign of block cracking. Slight to moderate flushing or polishing. Occasional patching in good condition.	Shows signs of aging. Sound structural condition. Could extend life with sealcoat
5 Fair	Moderate to severe raveling (loss of fine and coarse aggregate). Longitudinal and transverse cracks (open 1/2") show first signs of slight raveling and secondary cracks. First signs of longitudinal cracks near pavement edge. Block cracking up to 50% of surface. Extensive to severe flushing or polishing. Some patching or edge wedging in good condition.	Surface aging. Sound structural condition. Needs sealcoat or thin non-structural overlay (less than 2")
4 Fair	Severe surface raveling. Multiple longitudinal and transverse cracking with slight raveling. Longitudinal cracking in wheel path. Block cracking (over 50% of surface). Patching in fair condition. Slight rutting or distortions (1/2" - 1" deep).	Significant aging and first signs of need for strengthening. Would benefit from a structural overlay (2" or more).
3 Poor	Closely spaced longitudinal and transverse cracks often showing raveling and crack erosion. Severe block cracking. Some alligator cracking (less than 25% of surface). Patches in fair to poor condition. Moderate rutting or distortion (1" or 2" deep). Occasional potholes.	Needs patching and repair prior to major overlay. Milling and removal of deterioration extends the life of overlay.
2 Very Poor	Alligator cracking (over 25% of surface). Severe distortions (over 2" deep). Extensive patching in poor condition. Potholes	Severe deterioration. Needs reconstruction with extensive base repair. Pulverization of old pavement is effective.
1 Failed	Severe distress with extensive loss of surface integrity.	Failed. Needs total reconstruction.

\* Individual pavements will not have all of the types of distress listed for any particular rating. They may have only one or two types.

# Mix of Fixes “Trigger Points”

## Approved Preventive Maintenance Treatments

Fix Type	Life Extension (in years)			PASER Rating
	Flexible	Composite	Rigid	
HMA Crack Treatment	1-3	1-3	N/A	6-7
Overband Crack Filling	1-2	1-2	N/A	6-7
One Course Non-Structural HMA Overlay	5-7	4-7	N/A	4-5 ****
Mill and One Course Non-Structural HMA Overlay	5-7	4-7	N/A	3-5
Single Course Chip Seal	3-6	N/A	N/A	5-7
Double Chip Seal	4-7	3-6	N/A	5-7
Single Course Micro-Surface	3-5	**	N/A	5-6
Multiple Course Micro-Surface	4-6	**	N/A	4-6 ****
Ultra-Thin HMA Overlay	3-6	3-6	N/A	4-6 ****
Paver Placed Surface Seal	4-6	**	N/A	5-7
Full Depth Concrete Repair	N/A	N/A	3-10	4-5 ***
Concrete Joint Resealing	N/A	N/A	1-3	5-8
Concrete Spall Repair	N/A	N/A	1-3	5-7
Concrete Crack Sealing	N/A	N/A	1-3	4-7
Diamond Grinding	N/A	N/A	3-5	4-6
Dowel Bar Retrofit	N/A	N/A	2-3	3-5 ***
Longitudinal HMA Wedge/Scratch Coat with Surface Treatment	3-7	N/A	N/A	3-5 ****

\* The time range is the expected life extending benefit given to the pavement, not the anticipated longevity of the treatment

\*\* Date is not available to quantify the life extension

\*\*\* The concrete slabs must be in fair to good condition

\*\*\*\* Can be used on a pavement rated a 3 when the sole reason for rating is rutting or severe raveling of the surface asphalt layer

## Roscommon County Mix of Fixes with Approx. Costs

<u>Fix Type</u>	<u>\$ Per Mile</u>	<u>\$ SYD</u>
Crack Sealing Light	\$4,200.00	\$0.35
Dura-Patching Medium	\$8,500.00	\$0.65
Wedging (quarter crown only) A*	\$27,500.00	\$2.15
Wedging (full width) B*	\$56,000.00	\$4.35
Wedging A* and Chip Sealing	\$50,000.00	\$3.85
Wedging A* and Ultrathin Overlay	\$80,000.00	\$6.25
Chip Sealing	\$22,500.00	\$1.75
Chipsealing (with fog seal)	\$25,000.00	\$1.95
Double Chip Sealing	\$47,500.00	\$3.70
Micro surfacing	\$53,000.00	\$4.10
Ultrathin Overlay 3/4"	\$51,600.00	\$4.00
Structural Overlay 1.5" Asphalt	\$83,000.00	\$6.45
Structural Overlay 1.75" Asphalt	\$95,000.00	\$7.35
Structural Overlay 2.0" Asphalt	\$107,000.00	\$8.30
Crush and Shape with 2.0" Asphalt	\$116,000.00	\$9.00
Crush and Shape with 2.0" Asphalt (including 2.0" of gravel base)	\$139,000.00	\$10.80
Crush and Shape with 3.0" Asphalt (including 2.0" of gravel base)	\$190,000.00	\$14.75

<b><u>RCRC 5 Year Plan (Primary's)</u></b>				<u>Revised</u>				<b><u>2013</u></b>
				<b>12/5/2012</b>				
<b><u>RCRC Projects:</u></b>							<b><u>Estimated</u></b>	<b><u>Value</u></b>
							<b><u>Costs</u></b>	<b><u>Added</u></b>
Misc. Countywide Forestry Repairs						\$40,000		<b>40K Forest\$</b>
Misc. Countywide Culverts/Ditching				*Replacement = 4/yr*		\$12,000		Routine
Misc. Countywide Sign Upgrades				*Replacement = 600*		\$25,000		Routine
Misc. Dura-Patch and Cracksealing (see below)							\$281,000	
							<b>\$281,000</b>	<b>\$281,000</b>
<b><u>Matching \$ Federal Aid Projects:</u></b>							<b><u>Share \$</u></b>	<b><u>Totals:</u></b>
CR 100, (CR 104 to Hillsdale) Ultra-thin, 2.5 miles					Shoulders+	\$50,000		\$250,000
Old 27 Mill and Ultra thin, (CR 300 Bradford to Ausable Rd.) 3.5 miles						\$50,000		\$250,000
CR303 Curves, HRRR/Safety Funds 1.2 Miles				(funded)		\$54,000		\$270,000
<b>Unnamed Safety Project(s)</b>				<b>(unfunded for now)</b>		<b>\$15,000</b>		<b>\$75,000</b>
							<b>\$169,000</b>	<b>\$845,000</b>
<b><u>Total RCRC Estimated Expenditures and Value Added:</u></b>							<b>\$450,000</b>	<b>\$1,126,000</b>

**Breakdown of Misc. Dura-patch and Cracksealing:**

Crackseal	F-97 (Old 76 to North Co. Line) 9.3 miles		\$60,000	<b>40K Forest\$</b>
Crackseal	Old 27 (CR305 to M-55) 2.1 miles		\$14,000	
Crackseal	CR 300 (Old 27 to Bayview Dr.) .9 miles		\$6,500	
Crackseal	CR 306 (CR400 to Nestel Rd.) 1 mile		\$6,500	
Crackseal	CR 306 (CR305 to Stone School Rd.) .4 miles		\$3,000	
Crackseal	CR 306 (M-55 to CR304) .4 miles		\$3,000	
Crackseal	CR 105 (all) 1.2 miles		\$8,000	
Crackseal	CR 103 (M-18 to Old 76) 2.6 miles		\$17,000	
<b>18 miles</b>			<b>\$118,000</b>	
Dura-Patch	CR 103 (E. Higgins Lake Drive), CR 100 to Federal, 4.5 miles		\$45,000	
Dura-Patch	CR 304 (M-55 to M-55) 1.2 miles		\$12,000	
Dura-Patch	CR 304 (Old 27 to M-55) 1.2 miles		\$12,000	
Dura-Patch	CR400 Snowbowl (US-127 west to end) .8 miles		\$8,000	
Dura-Patch	CR 301 (Ott Rd. to North Co. Line) 2.3 miles		\$33,000	
Dura-Patch	TBD Routes 5.3 miles (emergency or wedging)		\$53,000	
<b>16 miles</b>			<b>\$163,000</b>	
Local Available Miles: (50 miles/year)	Crackseal	<i>32 miles</i>		
	Dura-Patch	<i>34 miles</i>		



## COST COMPARISON

DURA-PATCHING  
VS  
COLD PATCHING

### COLD PATCHING COST

(Waste and Re-applications NOT Included)

<u>8 Hours</u>	<u>Unit Cost</u>	<u>Operating Cost</u>
1 1-Ton Dump	\$17.74/hour	\$141.92
2 Workers	\$33.10/hour (w/benefits)	\$529.60
1 Ton of Cold Mix	\$81.56/ton	\$81.56
	<u>COST PER TON</u>	<u>\$753.08</u>

### DURAPATCHING COST

<u>8 Hours</u>	<u>Unit Cost</u>	<u>Operating Cost</u>
1 Dump Truck	\$51.36/hour	\$410.88
1 1-Ton Dump	\$17.74/hour	\$141.92
3 Men	\$33.10/hour (w/benefits)	\$794.40
1 DuraPatcher	\$48.33/hour	\$386.64
10 Tons Stone	\$14.00/ton	\$140.00
200 Gallons Emulsion	\$1.95/gallon	\$390.00
	<u>Total Cost</u>	<u>\$2,263.84</u>
<u>COST PER TON</u>	Calculation: \$2,402.04 for 10.75 Tons	<u>\$210.59</u>
<u>Average Savings Per Ton</u>		<u>\$542.49</u>
<u>AVERAGE ANNUAL SAVINGS</u>	Based on 300 Tons Annually (50 ton Cold Patch Max. Usage Goal)	<u>\$135,622</u>

# How can You best use \$ Shifting Budget \$ from Winter Improving Efficiency Winter

## Winter Cost Comparison for Staff Meeting

1/19/2010

### November 1st through January 15th

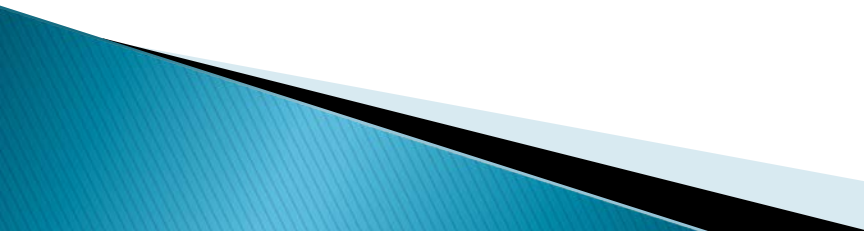
<u>Primary Roads</u>	<u>2006-7</u>	<u>2007-8</u>	<u>2008-9</u>	<u>2009-10</u>	<u>Average Cost</u>
Equipment	\$ 44,118.00	\$ 96,936.00	\$ 164,954.00	\$ 70,422.00	\$ 94,107.50
Materials	\$ 48,904.00	\$ 105,284.00	\$ 257,892.00	\$ 66,742.00	\$ 119,705.50
Payroll	\$ 18,269.00	\$ 35,450.00	\$ 52,066.00	\$ 22,093.00	\$ 31,969.50
Overhead (Approx.)	\$ 13,701.00	\$ 26,588.00	\$ 39,050.00	\$ 16,570.00	\$ 23,977.25
<b>Totals:</b>	<b>\$ 124,992.00</b>	<b>\$ 264,258.00</b>	<b>\$ 513,962.00</b>	<b>\$ 175,827.00</b>	<b>\$ 269,759.75</b>
% of Totals:	36.05%	35.05%	36.40%	29.09%	34.15%
<u>Local Roads</u>	<u>2006-7</u>	<u>2007-8</u>	<u>2008-9</u>	<u>2009-10</u>	
Equipment	\$ 33,788.00	\$ 115,735.00	\$ 185,185.00	\$ 97,402.00	\$ 108,027.50
Materials	\$ 4,327.00	\$ 11,264.00	\$ 14,559.00	\$ 8,230.00	\$ 9,595.00
Payroll	\$ 11,885.00	\$ 37,653.00	\$ 56,223.00	\$ 29,541.00	\$ 33,825.50
Overhead (Approx.)	\$ 8,914.00	\$ 28,240.00	\$ 42,167.00	\$ 22,156.00	\$ 25,369.25
<b>Totals:</b>	<b>\$ 58,914.00</b>	<b>\$ 192,892.00</b>	<b>\$ 298,134.00</b>	<b>\$ 157,329.00</b>	<b>\$ 176,817.25</b>
% of Totals:	16.99%	25.58%	21.12%	26.03%	22.43%
<u>State (MDOT)</u>	<u>2006-7</u>	<u>2007-8</u>	<u>2008-9</u>	<u>2009-10</u>	
Equipment	\$ 62,822.00	\$ 112,187.00	\$ 190,825.00	\$ 85,743.00	\$ 112,894.25
Materials	\$ 51,405.00	\$ 104,156.00	\$ 285,411.00	\$ 130,507.00	\$ 142,869.75
Payroll	\$ 27,750.00	\$ 45,991.00	\$ 70,617.00	\$ 31,430.00	\$ 43,947.00
Overhead (Approx.)	\$ 20,812.00	\$ 34,493.00	\$ 52,963.00	\$ 23,573.00	\$ 32,960.25
<b>Totals:</b>	<b>\$ 162,789.00</b>	<b>\$ 296,827.00</b>	<b>\$ 599,816.00</b>	<b>\$ 271,253.00</b>	<b>\$ 332,671.25</b>
% of Totals:	46.95%	39.37%	42.48%	44.88%	43.42%
<b>Yearly Totals:</b>	<b>\$ 346,695.00</b>	<b>\$ 753,977.00</b>	<b>\$ 1,411,912.00</b>	<b>\$ 604,409.00</b>	<b>\$ 779,248.25</b>
% of Totals:	100.00%	100.00%	100.00%	100.00%	100.00%

When if ever is a road “too far gone” for a Particular Fix?





# Using RAP/FRAP/RAS in Thin Overlays

- ▶ 1) I would recommend a higher asphalt content in the mix to assure minimum film thickness on all aggregates.
  - ▶ 2) I would not allow counting all the liquid tested as usable, activated virgin material
  - ▶ 3) I would recommend a thorough crack sealing of the pavement prior to resurfacing.
  - ▶ 4) I would recommend using a Polymer (not acid) modified asphalt binder with a low end temperature at least on step down from your standard material. Two steps down if using shingles.
  - ▶ 5) I would specify the medium volume ultra-thin not so much for the crush count but for the improved PG grading of the liquid.
- 

## Local Road PASER Rating Summary

### Local Roads 2007

Township Name	Average Paser Rating	Paser Ratings										Paved Miles	Gravel Grade Miles	Upgrade Grade Needed	
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>				
Ausable	4.31	0	0	1.926	0.730	0	0.634	0.588	0.024	0.004	0	3.906	27.325	6.889	
Backus	7.00	0	0	0	0	0	0	0.424	0	0	0	0.424	21.556	4.357	
Denton (M)	6.49	0.060	0.569	2.409	7.115	5.118	7.929	14.647	11.833	5.945	0.159	55.604	7.000	2.000	
Gerrish	5.26	0.100	1.547	4.812	4.568	5.126	5.612	6.461	2.559	0.429	0.046	31.327	33.342	2.900	
Higgins	5.78	0	0	0.439	2.057	0.067	2.028	1.194	1.352	0	0	7.134	59.930	2.000	
Lake (M)	4.10	0.790	1.883	5.557	2.657	0.683	2.148	0.201	0.533	1.172	0	15.683	7.147	2.363	
Lyon (M)	6.18	0	1.041	0.099	0.301	1.999	3.174	3.690	2.575	0.180	0	13.059	49.069	13.063	
Markey (M)	6.15	0.156	0.448	3.214	1.450	3.202	5.637	11.761	3.944	4.483	1.901	36.196	15.454	6.321	
Nester	6.31	0	0	0.090	0	0	0.469	0.616	0.013	0	0	1.188	28.278	2.509	
Richfield	4.89	0	3.452	5.899	2.386	7.707	3.108	3.991	2.221	0.528	0	28.972	39.334	14.005	
Rosco (M)	4.19	1.092	11.907	10.066	2.829	1.070	2.120	8.203	2.985	0.639	0	40.911	123.921	22.633	
S Totals	5.44	2.198	20.847	34.511	24.093	24.972	32.859	51.776	28.039	13.380	2.106	234.404	412.356	79.040	
		0.94%	8.89%	14.72%	10.28%	10.65%	14.02%	22.09%	11.96%	5.71%	0.90%	36.24%	63.76%	16.10%	
		Poor 1-3, 24.55%			Fair 4-5, 20.73%			Good 6-7, 36.11%			Very Good, 18.57%				

### Local Roads 2010

Township Name	Average Paser Rating	Paser Ratings										Paved Miles	Gravel Grade Miles	Upgrade Grade Needed	
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>				
Ausable	4.12	0	0	2.563	0.094	0.135	0.500	0.592	0.024	0	0	3.906	27.325	6.889	
Backus	7.00	0	0	0	0	0	0	0.424	0	0	0	0.424	21.556	4.357	
Denton (M)	6.23	0.269	0.309	5.464	3.630	4.978	10.856	17.843	11.110	1.327	0	55.786	7.000	2.000	
Gerrish	5.79	0.100	0.412	3.554	0.896	4.592	6.879	6.755	3.218	0.154	0	26.560	33.342	2.900	
Higgins	6.55	0	0	0	0	0.498	3.322	2.162	1.152	0	0	7.136	59.930	2.000	
Lake (M)	5.25	0.009	1.954	2.119	1.831	0.481	2.203	4.697	1.329	0	0	14.623	7.147	2.363	
Lyon (M)	7.23	0	0	0.038	0.028	0.626	1.926	5.683	1.158	2.478	0	11.937	49.069	13.063	
Markey (M)	6.16	0	0.069	1.581	2.247	3.969	11.744	13.010	3.104	0	0	35.722	15.454	6.321	
Nester	6.57	0	0	0.000	0	0	0.469	0.629	0	0	0	1.098	28.278	2.509	
Richfield	4.84	0	1.324	5.792	5.275	8.160	3.224	3.743	1.400	0.317	0	29.235	39.334	14.005	
Rosco. (M)	3.93	1.885	12.191	8.900	1.896	1.273	10.038	3.877	0.759	0	0	40.819	123.921	22.633	
S Totals	5.54	2.263	16.259	30.011	15.897	24.712	51.161	59.415	23.254	4.276	0	227.246	412.356	79.040	
		1.00%	7.15%	13.21%	7.00%	10.87%	22.51%	26.15%	10.23%	1.88%	0.00%	35.53%	64.47%	16.10%	
		Poor 1-3, 21.36%			Fair 4-5, 17.87%			Good 6-7, 48.66%			Very Good, 12.11%				

**Township Work**

<b>2011</b>	<b><u>Work Items</u></b>	<b><u>Miles</u></b>	<b><u>Total Cost</u></b>	<b><u>RCRC Work</u></b>
	Crack Sealing;	19.5 Miles	\$80,000	\$80,000
	Dura-Patching;	13.3 Miles	\$133,000	\$133,000
	HMA Wedging;	2.7 Miles	\$53,000	\$23,000
	Chip Sealing;	0.0 Miles	\$0	\$0
	HMA Ultra-Thin;	3.2 Miles	\$160,000	\$55,000
	HMA Overlay;	.1 Miles	\$7,000	\$2,000
	Reconstruct;	.7 Miles	\$87,000	\$27,000
	Drainage;	2.7 Miles	\$143,000	\$143,000
	Gravel Upgrade;	.8 Miles	\$25,000	\$25,000
	Signs	20	\$3,000	\$3,000
	Engineering;	(1 Location)	\$5,000	\$48,000
		43.0 Miles	\$696,000	\$539,000
			<b>RCRC Match</b>	\$120,000
<b>2012</b>	<b><u>Work Items</u></b>	<b><u>Miles</u></b>	<b><u>Total Cost</u></b>	<b><u>RCRC Work</u></b>
	Crack Sealing;	6.5 Miles	\$27,000	\$27,000
	Dura-Patching;	3.3 Miles	\$33,000	\$33,000
	HMA Wedging;	3.5 Miles	\$200,000	\$55,000
	Chip Sealing;	0.0 Miles	\$0	\$0
	HMA Ultra-Thin;	3.2 Miles	\$170,000	\$60,000
	HMA Overlay;	1.0 Miles	\$210,000	\$55,000
	Reconstruct;	0.3 Miles	\$90,000	\$30,000
	Drainage;	0.0 Miles	\$0	\$0
	Gravel Upgrade;	0.0 Miles	\$0	\$0
	Engineering;	(2 Locations)	\$14,000	\$64,000
		17.8 Miles	\$744,000	\$324,000
			<b>RCRC Match</b>	\$120,000





### **Breakdown of Misc. Dura-patch and Cracksealing:**

Crackseal	Old 76 (Village Limits to Moore Rd. Geels) 4 miles			\$26,000	
Crackseal	CR 305 (Old 27 to M-55) 1.9 miles			\$13,000	
Crackseal	CR 306 Nestel Rd. to CR 305) 1 mi.			\$6,000	
Crackseal	CR 306 (Stone School Rd to M-55) .8 miles			\$6,000	
Crackseal	CR 104 (West Pine north to Robinson Lake Rd) 2 miles			\$13,000	
Crackseal	CR 104 (Old 27 to CR202) 1.7 miles			\$11,000	<b>11K Forest\$</b>
Crackseal	CR 400 (Old 27 to Loxley Rd.) 1.2 miles	(crack/dura)		\$9,000	
Crackseal	CR 602 (Keno Rd. to F-97) 2 miles			\$13,000	<b>13K Forest\$</b>
Crackseal	CR 603 (M-18 to Sunset Rd.) 1.9 miles	(crack/dura)		\$8,000	<b>8K Forest\$</b>
Crackseal	CR 200 (CR 104 to Birch Rd.), 2.2 miles			\$15,000	
<b>19 miles</b>				<b>\$120,000</b>	
Dura-Patch	CR 102 (CR100 to M-18) 2.9 miles			\$29,000	
Dura-Patch	CR 104 (Old 27 west to Higgins Lake Rd.) 1.1 miles			\$11,000	
Dura-Patch	CR 200 (Old 27 to CR202) 1.9 miles			\$19,000	
Dura-Patch	CR 603 (M-18 to Sunset Rd.) 1.9 miles	(above 1/2 each)		\$8,000	<b>8K Forest\$</b>
Dura-Patch	F-97 (Artesia Beach Rd. to M-55) 3 miles			\$30,000	
Dura-Patch	CR 100 (M-18 to CR 300) 5.1 miles	(bar seal)		<u>\$25,000</u>	
<b>16 miles</b>				<b>\$122,000</b>	
Local Available Miles: (50 miles/year)	Crackseal	<i>31 Miles</i>			
	Dura-Patch	<i>34 Miles</i>			

<u>RCRC 5 Year Plan (Primary's)</u>				<u>Revised</u>				<u>2015</u>
				<u>12/5/2012</u>				
<u>RCRC Projects:</u>							<u>Estimated</u>	<u>Value</u>
							<u>Costs</u>	<u>Added</u>
Various CR402,CR303,CR103A, CR103W, F-97N,F-97S				Spot Wedge RCRC			\$107,000	
Misc. Countywide Forestry Repairs						\$40,000		40K Forest\$
Misc. Countywide Culverts/Ditching				*Replacement = 6/yr*		\$18,000		Routine
Misc. Countywide Sign Upgrades				*Replacement = 600*		\$25,000		Routine
Misc. Dura-Patch and Cracksealing (see below)							\$242,000	
							<b>\$349,000</b>	<b>\$349,000</b>
<u>Matching \$ Federal Aid Projects:</u>							<u>Share \$</u>	<u>Totals:</u>
Various Chipseals (wedging) CR303,CR602E,CR602N/S,CR103A 7.6 miles							\$46,000	\$230,000
CR 100 (Maplehurst to CR 106) Ultra-thin, 2.5 miles							\$40,000	\$200,000
Unnamed Safety Project(s)						(unfunded for now)	\$15,000	\$75,000
							<b>\$101,000</b>	<b>\$505,000</b>
Old 27 Urban Project if not in 2014				\$75,000	\$450,000			
<u>Total RCRC Estimated Expenditures and Value Added:</u>							<b>\$450,000</b>	<b>\$854,000</b>

**Breakdown of Misc. Dura-patch and Cracksealing:**

Crackseal	CR 200 (Old 27 to CR202) 1.9 miles			\$13,000	
Crackseal	CR 401 (Iroquois all) 3.5 miles		(light)	\$17,000	
Crackseal	CR 401 ((CR400 to M-55) 1.5 miles			\$10,000	
Crackseal	CR 300 (M-55 to Old 27), 4.8 miles			\$31,000	
Crackseal	CR 400 (CR401 to M-55) 3.0 miles			\$19,500	
Crackseal	Old 76 (Madison to Artesia Beach Rd.) 1.8 miles		(light)	\$10,000	
Crackseal	Old 76 (M-55 to Artesias Beach), 3.1 miles		(light)	\$16,000	
Crackseal	Old 76 (Madison to Moore Rd.) 7.8 miles			\$51,000	<b>40K Forest\$</b>
Crackseal	5th St. (M-18 to Ballanger Rd.) .7 miles			\$4,500	
<b>28 miles</b>				<b>\$172,000</b>	
Dura-Patch	CR 400 (Loxley Rd. to Towerhill Rd.) 1.0 miles			\$10,000	
Dura-Patch	CR 400 ( CR401 to M-18) 3.0 miles			\$30,000	
Dura-Patch	Old 27 (CR305 to M-55) 3.0 miles			\$30,000	
<b>7 miles</b>				<b>\$70,000</b>	
Local Available Miles: (50 miles/year)	Crackseal		<i>22 Miles</i>		
	Dura-Patch		<i>43 miles</i>		

<u>RCRC 5 Year Plan (Primary's)</u>	<u>Revised</u> 12/5/2012			<u>2016</u>
<u>RCRC Projects:</u>			<u>Estimated</u> <u>Costs</u>	<u>Value</u> <u>Added</u>
Misc. Countywide Forestry Repairs			\$40,000	40K Forest\$
Misc. Countywide Culverts/Ditching	*Replacement = 6/yr*		\$18,000	Routine
Misc. Countywide Sign Upgrades	*Replacement = 600*		\$25,000	Routine
Misc. Dura-Patch and Cracksealing (see below)			\$263,000	
			<b>\$263,000</b>	<b>\$263,000</b>
<u>Matching \$ Federal Aid Projects:</u>				
			<u>Share \$</u>	<u>Totals:</u>
Various Chipseals (wedge) CR103W,CR107,CR106,CR200W,CR301 10.2 mi.			\$51,000	\$255,000
F-97 (Old 76 north to Co. Line), Wedge and Chipseal 9.3 miles			\$46,000	\$230,000
CR400 Towerhill to CR401 Reserve, Reconstruct, 2.0 miles		Unfunded	\$75,000	\$450,000
Unnamed Safety Project(s)		Unfunded	\$15,000	\$75,000
			<b>\$187,000</b>	<b>\$1,010,000</b>
<b><u>Total RCRC Estimated Expenditures and Value Added:</u></b>			<b>\$450,000</b>	<b>\$1,273,000</b>

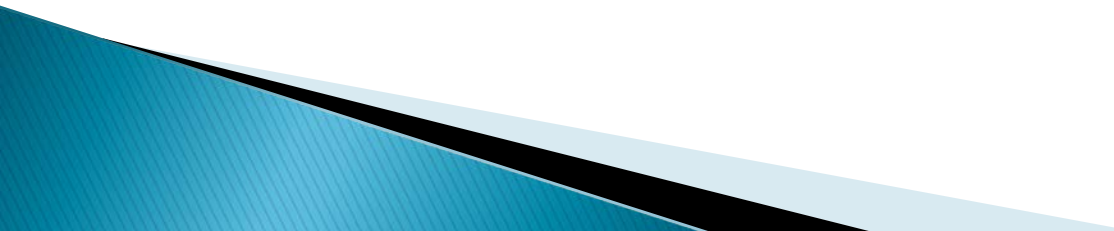
<b><u>Breakdown of Misc. Dura-patch and Cracksealing:</u></b>			
Crackseal	CR 101 (CR100 to Federal Highway) 1.4 miles		\$9,000
Crackseal	CR 300 (Bayview Rd. to Longpointe Rd.) 2.7 miles		\$18,000
Crackseal	CR 300 (Longpointe Rd. to CR100) 3.6 miles		\$23,000
Crackseal	CR 603 (Keno Rd. to F-97) 2.0 miles		\$13,000
Crackseal	CR 104 (CR202 to CR100) 3.6 miles		\$23,000
Crackseal	Old 27 (Ausable Rd. to No.Co. Line) 3.6 miles		\$23,000
Crackseal	Old 27 (Ausable Rd. to CR300 Bradford) 3.6 miles		\$23,000
<b>21 miles</b>			<b>\$132,000</b>
Dura-Patch	CR 401 (all) 1.1 miles		\$11,000
Dura-Patch	CR 201 (all) 1.7 miles		\$17,000
Dura-Patch	F-28 (all) 2.0 miles		\$20,000
Dura-Patch	F-97 (Artesia Beach Rd. E/W all) 4.0 miles		\$40,000
Dura-Patch	F-97 (Clear Lake Rd. to So. Co. Line) 4.3 miles		\$43,000
<b>13 miles</b>			<b>\$131,000</b>
Local Available Miles:	Crackseal	<i>29 miles</i>	
(50 miles/year)	Dura-Patch	<i>37 miles</i>	

**40K Forest\$**

<u>RCRC 5 Year Plan (Primary's)</u>			<u>Revised</u> 12/5/2012				<u>2017</u>
<u>RCRC Projects:</u>						<u>Estimated</u> <u>Costs</u>	<u>Value</u> <u>Added</u>
Misc. Countywide Forestry Repairs						\$40,000	40K Forest\$
Misc. Countywide Culverts/Ditching	*Replacement = 6/yr*					\$18,000	Routine
Misc. Countywide Sign Upgrades	*Replacement = 600*					\$25,000	Routine
Misc. Dura-Patch and Cracksealing (see below)						\$250,000	
						<b>\$250,000</b>	<b>\$250,000</b>
<u>Matching \$ Federal Aid Projects:</u>						<u>Share \$</u>	<u>Totals:</u>
Various Chipseals (wedge) F-28, CR102, F-97 MV 8.0 mi.						\$42,000	\$210,000
F-97 (South), F-18 Wedge and Chipseal 13.0 miles						\$68,000	\$340,000
CR400 Towerhill to CR401 Reserve, Reconstruct, 2.0 miles (if not in 2016)						\$75,000	\$450,000
Unnamed Safety Project(s)						Unfunded \$15,000	\$75,000
						<b>\$200,000</b>	<b>\$1,075,000</b>
<b><u>Total RCRC Estimated Expenditures and Value Added:</u></b>						<b>\$450,000</b>	<b>\$1,325,000</b>

**Breakdown of Misc. Dura-patch and Cracksealing:**

Crackseal	Misc. TBD 15 miles					\$100,000	
Crackseal							
Crackseal							
Crackseal							
Crackseal							
Crackseal							
Crackseal							
<b>15 miles</b>						<b>\$100,000</b>	
Dura-Patch	Misc. TBD 15 miles					\$150,000	<b>40K Forest\$</b>
Dura-Patch							
Dura-Patch							
Dura-Patch							
Dura-Patch							
<b>15 miles</b>						<b>\$150,000</b>	
Local Available Miles: (50 miles/year)	Crackseal		<i>35 miles</i>				
	Dura-Patch		<i>35 miles</i>				



# How do you fix a composite Pavement?





**QUESTIONS ???**

