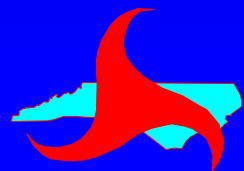


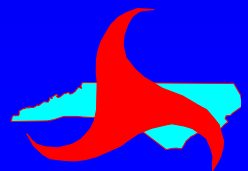
# Monitoring Project Selection and Program Progress in Pavement Preservation

Judith Corley-Lay, PE  
NCDOT, Pavement Management



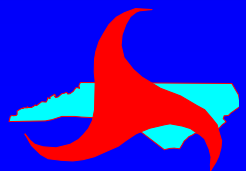
# Outline

- Goals
- Preservation Selection Criteria
- Monitoring methods and results
- Components of Preservation Program
- Touching 10% and results
- Approach to reach 10% goal
- Conclusions



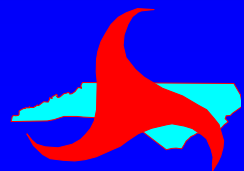
# Project Selection for Preservation Projects

- Want PMS to be a tool for Division and County selection of preservation treatments.
- Avoid “worst first” and treat roads in fair+ to good condition.
- Poor choice is road in poor condition (we defined this as a road with a PCR of 50 or less)
- Good choice is a road with PCR of 70 to 90.



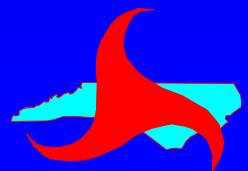
# Evaluation of project selections

- Each division submitted a list of roadways by county treated with chip seals in 2010.
- For each treated road, looked in PMS to get the pavement condition rating prior to treatment.
- Each road choice was categorized as good, fair or poor from a preservation point of view.
- % of good, fair, and poor selections were calculated for each county and each division.



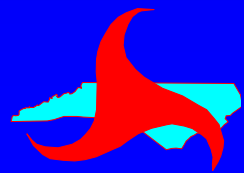
# Reporting

- Individual reports were prepared for each division and results were reported at the Operations Staff Meeting.
- Senior leadership is interested in having this report on a recurring basis, so report was developed and is available in the PMS.



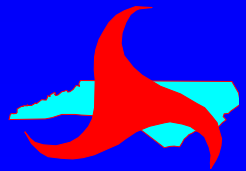
# What do the reports look like?

- Division Summary Report: Summary table of all counties within a division over multiple years.



# Division Report content

- Each county on separate line.
- Each year in separate column.
- For each year: Total # of poor selections, Total # of projects, % poor selections.
- Can track movement toward preservation by reading across years.



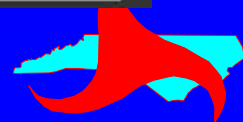
## Division 7



### 5 Year History of Poor Chip Seal Project Selection

\*Poor is defined by having a PCS weighted average rating less than 50.

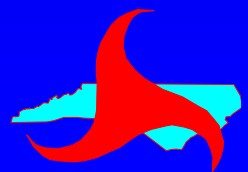
		2006		2007		2008		2009		2010		County Totals	
Alamance County	Total Poor Project Selections	3	16.7 %	5	33.3 %	1	5.9 %	4	16.7 %	2	6.9 %	15	14.6 %
	Total Chip Seal Projects	18		15		17		24		29		103	
Caswell County	Total Poor Project Selections	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %	0	0.0 %
	Total Chip Seal Projects	8		6		12		5		23		54	
Guilford County	Total Poor Project Selections	9	18.4 %	1	5.0 %	0	0.0 %	3	5.8 %	1	1.8 %	14	6.2 %
	Total Chip Seal Projects	49		20		50		52		55		226	
Orange County	Total Poor Project Selections	4	23.5 %	2	11.1 %	1	3.7 %	0	0.0 %	2	14.3 %	9	10.2 %
	Total Chip Seal Projects	17		18		27		12		14		88	
Rockingham County	Total Poor Project Selections	0	0.0 %	4	28.6 %	3	8.6 %	3	12.5 %	0	0.0 %	10	7.4 %
	Total Chip Seal Projects	13		14		35		24		50		136	
Division Totals	Total Poor Project Selections	16	15.2 %	12	16.4 %	5	3.5 %	10	8.5 %	5	2.9 %	48	7.9 %
	Total Chip Seal Projects	105		73		141		117		171		607	





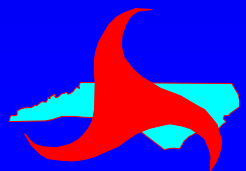
## From Division 7 Summary:

- Caswell County is doing preservation: none of their 54 roadways were poor choices.
- Alamance County has room for improvement: 15% of their roadway choices were poor.



# County Reports

- Color coded (red for poor choices, green for good choices) so very visual. Road by road evaluation within each county.
- # of good, fair and poor choices.
- This is a single year county report.

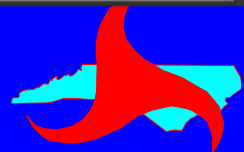


## Orange County

Project / WBS	Material	Route	Begin MP	Begin Description	End MP	End Description	Pavement Condition Survey Ratings		
							Highest	Lowest	Weighted Average
7S9.20684.40	Drag Seal	40001119	0.000	SR 1117	2.840	END MAINT	100.0	100.0	100.0
7SP.20684.40	Drag Seal	40001113	1.880	SR 1115	2.870	SR 1177	16.7	16.7	16.7
7SP.20684.40	Drag Seal	40001118	0.000	SR 1117	0.730	SR 1115	44.2	44.2	44.2
7SP.20684.40	Drag Seal	40001125	0.000	SR 1120	4.430	SR 1114	57.6	46.7	53.4
7SP.20684.40	Drag Seal	40001128	0.000	SR 1006	0.810	SR 1127	89.7	89.7	89.7
7SP.20684.40	Drag Seal	40001129	0.000	SR 1009	2.950	SR 1006	98.0	78.0	83.5
7SP.20684.40	Drag Seal	40001130	0.000	SR 1006	1.540	SR 1129	95.0	95.0	95.0
7SP.20684.40	Drag Seal	40001131	0.000	SR 1006	0.560	Cul-De-Sac	96.7	96.7	96.7
7SP.20684.40	Drag Seal	40001134	0.000	SR 1144	2.820	SR 1006	100.0	100.0	100.0
7SP.20684.40	Drag Seal	40001135	0.000	SR 1134	1.850	SR 1134	96.7	82.6	85.6
7SP.20684.40	Drag Seal	40001137	0.000	SR 1146	2.230	SR 1114	98.0	98.0	98.0
7SP.20684.40	Drag Seal	40001199	0.000	SR 1006	0.650	END MAINT	70.0	70.0	70.0
7SP.20684.40	Drag Seal	40001959	0.000	SR 1956	1.820	SR 1958	82.2	82.2	82.2
7SP.20684.40	Drag Seal	40001960	0.000	SR 1961	1.886	END MAINT	83.0	83.0	83.0

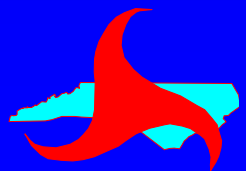
Project Counts for Orange County:

5	6	1	2
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# Typical County

- Mostly good choices.
- One marginal choice.
- A few poor choices.
- So...room for improvement but no cause for despair.

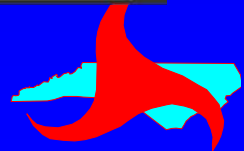


# The Ugly

## Ashe County

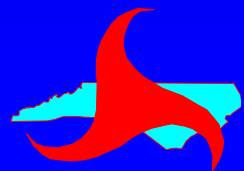
Project / WBS	Material	Route	Begin MP	Begin Description	End MP	End Description	Pavement Condition Survey Ratings		
							Highest	Lowest	Weighted Average
11SP.20054.01	Drag Seal	40001168	0.000	BEG MAINT	2.080	SR 1003	14.2	14.2	14.2
11SP.20054.01	Triple Seal	40001169	2.920	SR 1171 + 1.71 MI	4.570	SR 1003	30.0	30.0	30.0
11SP.20054.01	Drag Seal	40001350	0.000	SR 1347	1.080	NC 194	30.9	30.9	30.9
11SP.20054.01	Triple Seal	40001500	2.320	SR 15123	4.210	SR 1516	20.0	20.0	20.0
11SP.20054.01	Triple Seal	40001539	4.040	SR 1541 + 0.44 MI	5.520	SR 1523	30.0	30.0	30.0
11SP.20054.01	Drag Seal	40001575	0.000	SR 1574	1.200	SR 1576	73.4	23.0	41.0
11SP.20054.01	Drag Seal	40001575	1.830	SR 1576 + 0.63 MI	1.940	SR 1573	88.4	88.4	88.4

Project Counts for Ashe County: 0 1 0 6



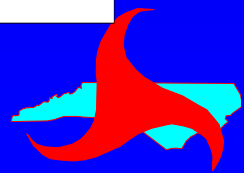
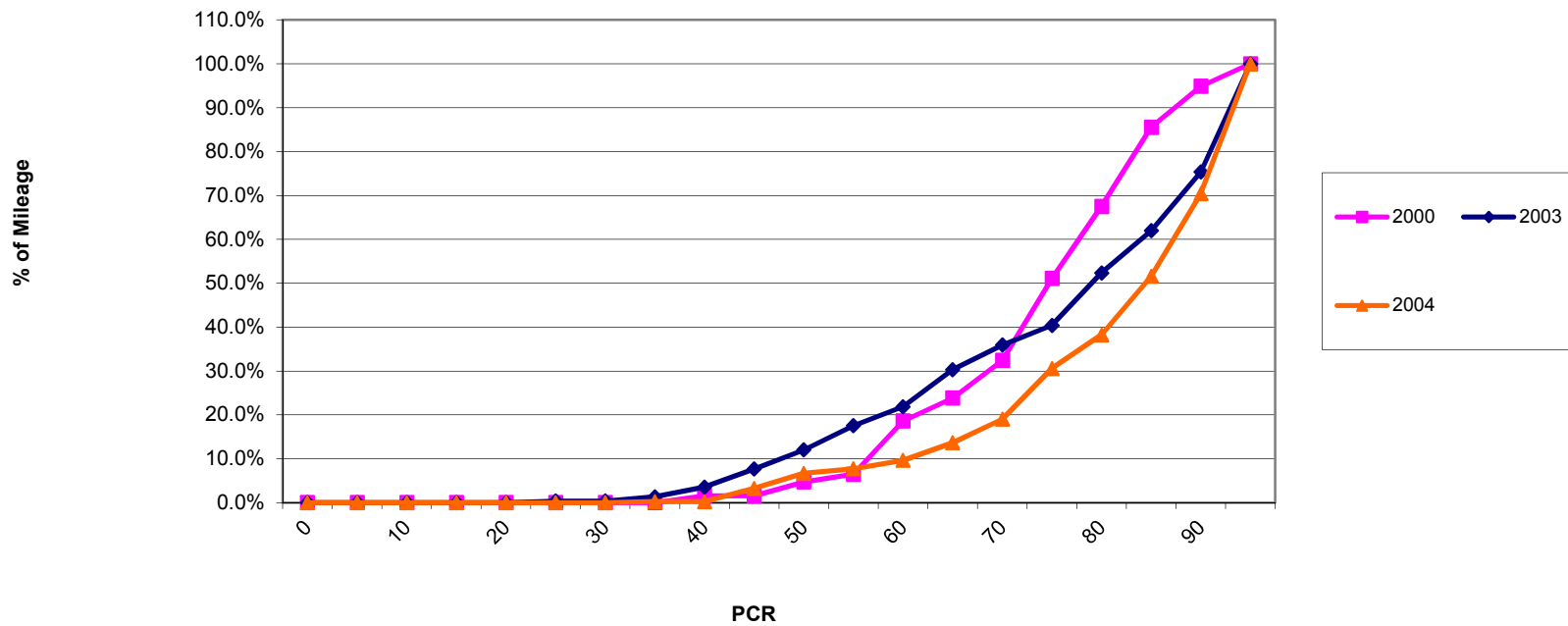
# Another Approach

- Use Pavement Condition Ratings for each road selected for treatment. Put in bins to create histogram. Then calculate cumulative distribution function.
- Want graph to move downward and to the right (indicating that roads are treated at higher PCR).



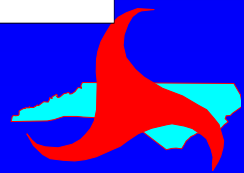
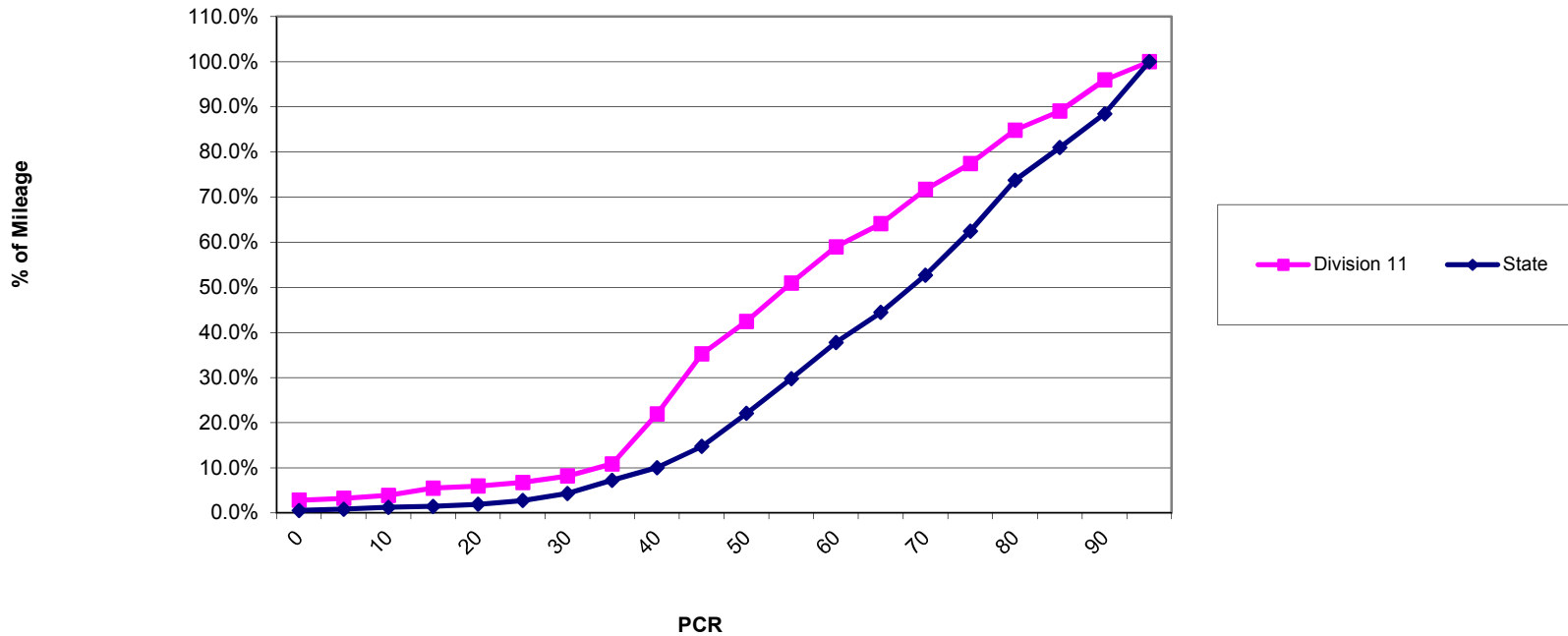
# Our Best Division

Cumulative Distribution of Surface Treatments - Division 6



# Non-preservation versus State average

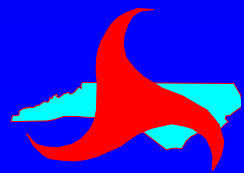
Cumulative Distribution of Surface Treatments - Division 11 - 2004





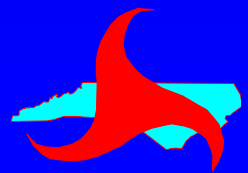
# A Third Approach

- Kansas DOT very successfully implemented pavement preservation more than 15 years ago using the 10% rule:
- “Touch 10% of your system every year using a mix of fixes.”
- Include crack sealing, chip seals, resurfacing, rehab and reconstruction.



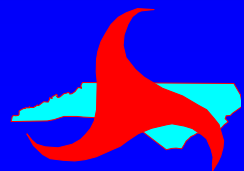
# Seems So Simple!

- PMS has never tracked crack sealing and most is done by Division let Purchase Order Contracts that are not centrally tracked. Units are variable.
- Need all activities tracked in same units. I used lane miles.

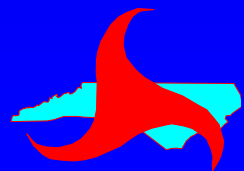


# Used simple spreadsheet

- Need row for each division.
- Columns for lane miles, lane miles treated with each type of treatment, total miles treated.
- % treated for each division.

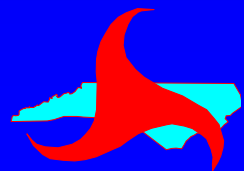


Division	Total Lane Miles	Treatment Year	Crack Seal Lane Miles	Chip Seal Lane Miles	Resurf and Rehab Lane Miles	Reconstructed Lane Miles	Sum of Treatments	Percent
1	10200.522	2010	453	342.77	51.69		847.46	8.3%
2	10239.658	2010	147.2	369.614	59.6	0.978	577.392	5.6%
3	11555.471	2010	295	467.368	388		1150.368	10.0%
4	13223.336	2010	510	711	221.014	0.24	1442.254	10.9%
5	13950.016	2010	78.7	383.754	530	21.706	1014.16	7.3%
6	12709.009	2010	650	638	107.15	1.98	1397.13	11.0%
7	11344.235	2010	52.75	322.284	322.61		697.644	6.1%
8	13625.414	2010	388.6	293.4	190.584	4.09	876.674	6.4%
9	10506.539	2010	30	382	137	0.38	549.38	5.2%
10	10848.761	2010	20.3	364.73	222.61	0.5	608.14	5.6%
11	10759.54	2010	93	328	257.3		678.3	6.3%
12	12497.349	2010	0	333.2	387.1	2.9	723.2	5.8%
13	10099.95	2010	204.1	260.4	387.9	0.48	852.88	8.4%
14	9305.164	2010	67.5	267.9	202.7	0.64	538.74	5.8%
Statewide	160864.964	2010	2990.15	5464.42	3465.258	33.894	11953.722	7.4%



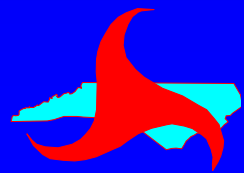
# 2010 Results

- Three of 14 divisions are currently treating 10% or more each year. All of these do a significant amount of crack sealing and chip seals.
- Those doing the worst have poor crack seal programs and/or weak chip seal programs.



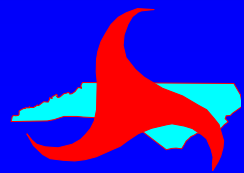
# Benefit of this Approach

- Can develop “what ifs” to see what it would take to get to 10%. Clear that cannot get there by rehab and reconstruction. Must use less expensive methods.



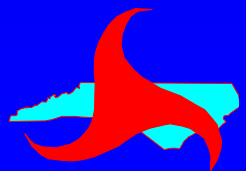
# Can set goals and track progress

- Set goal for each division to crack seal at least 300 lane miles in 2011. This doesn't increase the number of divisions touching 10%, but does increase our statewide % by more than 1.5.



# Performance Management

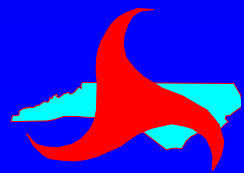
- NCDOT has moved to performance management.
- The tools presented here are being used to report performance of some key activities that have previously gone unreported or underreported.
- Divisions are now tracking their activities.





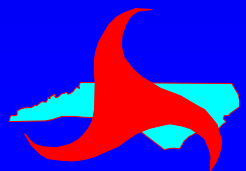
# Conclusions

- Three methods of tracking pavement preservation have been presented: % poor project selections, cumulative distribution function of Pavement Condition Ratings, and % lane miles treated.
- All point out areas where preservation is in place and working, and areas where there is work left to be done.



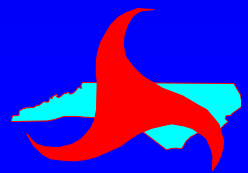
# Conclusions

- Division Engineers have found the color coded county reports helpful in managing their networks and coaching their county maintenance engineers.
- Central Office leadership liked the simplicity and “what if” capabilities of the 10% approach and used it to set goals.



# Conclusions

- Pavement Preservation Programs can be monitored and tracked as part of an agencies performance management program.



Questions??

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