

# Preventive Maintenance in Georgia

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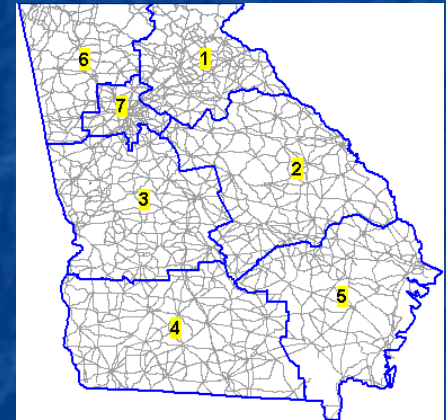
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# **GDOT Pavement Management Practices**

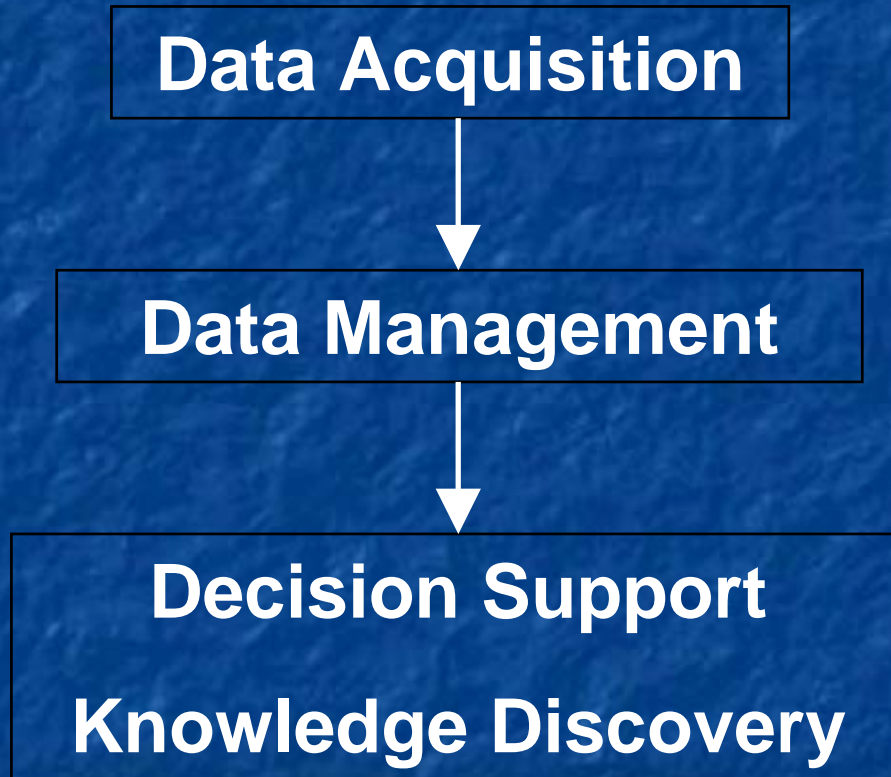
# PMM Practices in GDOT

- 18, 000 mile centerline highway.
- 7 working districts.
- Pavement surveyed annually with about 60 engineers.
- 10 different types of distresses surveyed (i.g. load cracking)
- Project rating is between 0 and 100.
- More than 17 years of survey data (1986 – 2004)
- Survey data used to determine suitable maintenance and rehabilitation strategies.
- Total miles of projects treated are subject to budget availability.
- 13 Congressional districts in Georgia and the budget for each district should be balanced.





# Components in Pavement Maintenance Management



# **Benefits of Implementing IT-based Pavement Management System**

# Benefits

- Data acquisition efficiency was improved
- Data quality was enhanced.
- Data can be utilized more often and more effectively.
- Treatment decisions were made more accurately and consistently.
- Provided the ability to manage more effectively the pavement preservation Program
- Other benefits



***PAVEMENT CONDITION  
EVALUATION SYSTEM  
(P.A.C.E.S.)***

# **P.A.C.E.S. RATING SYSTEM**

- ***RATING SYSTEM FROM 0 TO 100***
- ***RATINGS BASED ON ROADWAY DEFICIENCIES***
- ***RATINGS PERFORMED YEARLY BETWEEN OCTOBER 1<sup>ST</sup> AND DECEMBER 31<sup>ST</sup> BY AREA ASSISTANT FOR ENTIRE STATE HIGHWAY SYSTEM***



## *P.A.C.E.S. (cont.)*

- *ROADWAY SECTIONS WITH RATINGS OF 75 AND BELOW BY THE AREA WILL BE RATED BY THE DISTRICT AND GENERAL OFFICE*
- *RATINGS OF 70 AND BELOW WARRANT RESURFACING*
- *RATINGS ABOVE 70 MAY WARRANT OTHER TYPES OF TREATMENTS*

## *P.A.C.E.S. (cont.)*

- *SAFETY CONCERNS, SUCH AS, ACCIDENT HISTORY OR SKID RESISTANCE CAN OVERRIDE ROADWAY RATING AS JUSTIFICATION FOR RESURFACING*

# **DEFICIENCIES CONSIDERED**

- *Load Cracking*
- *Block Cracking*
- *Rutting*
- *Raveling*
- *Reflective Cracking*
- *Loss of Section*
- *Bleeding*
- *Corrugation*
- *Edge Distress*
- *Patched Areas*



# Field Data Acquisition

Field data acquisition is performed through COPACES module in GPAM.



# Project-level Location Information

**Project Information---1\_0002\_00\_A1\_241\_00000\_00200\_000\_00000\_00000\_000\_00000\_00000\_02\_12\_2002\_1...**

**Project Location**

Status:

Date:

Rater:

Office:

Route Type:

District Number:

Route Number:

Route Suffix:

County Name:

Milepost From:

Milepost To:

Additional Counties:

County 2		County 3	
Name:	<input type="text"/>	<input type="text"/>	<input type="text"/>
From:	<input type="text"/>	<input type="text"/>	<input type="text"/>
To:	<input type="text"/>	<input type="text"/>	<input type="text"/>

Project Limits:

Save

Cancel

Segment Info

Exit

**Road Information**

Min.  Max.

Min.  Max.

Unpaved Sholder Width:

Is this STAA?

Does the project contain the curb and gutter and require milling ?

Estimated centerline miles with curb and gutter:

Divided Highway:

Direction:

Surface Type:

No. of Bridges:

Bridge Width (ft):

Project Remarks:

# Segment-level Distress Information

Field Data Entry			
<b>Project Information</b>			
Trip Date:	<input type="text" value="2/12/2002 10:40:07"/>	County 1:	<input type="text"/>
Route Type:	<input type="text" value="1"/>	County 2:	<input type="text"/>
Route Number:	<input type="text" value="0002"/>	County 3:	<input type="text"/>
Route Suffix:	<input type="text" value="00"/>	Milepost From:	<input type="text" value="0"/>
		Milepost To:	<input type="text" value="2"/>
<b>Segment Information</b>		<b>Distress Information</b>	
County:	<input type="text" value="RABUN"/>	<b>Rut Depth</b>	
Segment From:	<input type="text" value="0"/>	Outside W.P.:	<input type="text" value="2"/>
Segment To:	<input type="text" value="1"/>	Inside W.P.:	<input type="text" value="3"/>
Lane Direction:	<input type="text" value="POS."/>	<b>Load Cracking</b>	
Lane No. (1,2...):	<input type="text" value="2"/>	Severity Level 1:	<input type="text" value="12"/>
Sample Location:	<input type="text" value="2"/>	Severity Level 2:	<input type="text" value="20"/>
Project Limit:	<input type="text" value="1"/>	Severity Level 3:	<input type="text" value="20"/>
Is Crack Width greater than 1/4 inch?	<input type="text" value="NO"/>	Severity Level 4:	<input type="text"/>
Cracks have been Sealed?	<input type="text"/>	<b>Reflection Cracking</b>	
Cross Slopes		No. of cracks:	<input type="text"/>
Left <input type="text"/>	Right <input type="text"/>	Total Length:	<input type="text"/>
Remarks:	<input type="text"/>	Severity (1,2,3):	<input type="text"/>
		<b>Block Cracking</b>	
		% <input type="text"/>	Severity <input type="text"/>
		<b>Patches and Potholes</b>	<input type="text"/>
		<b>Raveling</b>	
		% <input type="text"/>	Severity <input type="text"/>
		<b>Edge Distress</b>	
		% <input type="text"/>	Severity <input type="text"/>
		<b>Bleeding/Flushing</b>	
		% <input type="text"/>	Severity <input type="text"/>
		<b>Corrugation/Pushing</b>	
		% <input type="text"/>	Severity <input type="text"/>
		<b>Loss Pavement Section</b>	
		% <input type="text"/>	Severity <input type="text"/>
<b>Segment</b>			
<input type="button" value="Previous"/>			
<input type="button" value="Next"/>			
<input type="button" value="Add"/>			
<input type="button" value="Delete"/>			
<input type="button" value="Save"/>			
<input type="button" value="Cancel"/>			
<input type="button" value="Exit"/>			
<input type="button" value="Back to Project Info"/>			



# *LOAD CRACKING*





# Load Cracking

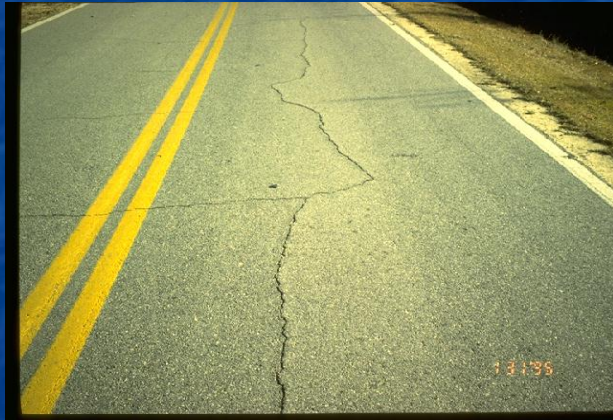
Clockwise from left: level 1, level 2, level 3, level 4





# Block/Transverse Cracking

Clockwise from left: Level 1, level 2, level 3





# Reflective Cracking

From left to right: level 1, level 2, level 3



# Other Distresses

- Other distresses considered during the survey are Patches, Potholes, Base Failures, Edge Distress, Rutting, Corrugations/Pushing, Bleeding/Flushing, Loss of section, and Raveling



# *RUTTING*





# *RAVELING*



# Project Rating Calculation

- **Determining Project Average for Each Distress**
- Simple numeric averages for each distress are used instead of prorating in this rating system. The averages are computed by totaling the values for each type of distress and dividing by the number of rating segments.
- After the average values are computed for each distress for the project, deduct points are determined for each distress extent and severity. These deduct points are totaled and subtracted from 100 to determine the project rating.
- The following charts, used when PACES was performed manually, are representative of the deduct point values used in COPACES.



**Flexible Pavement Condition  
Survey Deduct values**

Rutting Extent (inches)							
	0	1/8	1/4	3/8	1/2	5/8	3/4
Deducts	0	2	5	12	16	20	24

Patches and Potholes Extent (# per mile)					
	1-2	3-6	7-10	11-15	>15
Deducts	2	5	10	17	25

Corrugations/Pushing Extent (%)				
	1-10	11-25	>25	
Severity	1	1	2	4
	2	2	4	7
	3	3	6	10

Reflective Cracking (%)					
	5-15	16-30	31-45	>45	
Severity	1	3	5	6	8
	2	6	8	11	14
	3	8	12	16	20

Edge Cracking Extent (%)					
	5-25	26-50	51-75	>75	
Severity	1	1	2	3	4
	2	2	4	6	7
	3	3	6	8	10

Raveling Extent (%)							
	1-5	6-15	16-25	26-35	36-45	>45	
Severity	1	2	5	6	8	10	13
	2	4	8	11	14	17	21
	3	6	12	16	20	25	30

Loss of Pavement (%)					
	0-25	25-50	50-75	75-100	
Severity	1	0	1	2	3
	2	2	4	6	8
	3	6	5	10	12

Bleeding or Flushing Extent (%)				
	1-10	11-30	>30	
Severity	1	2	5	8
	2	5	10	15





# **ESTABLISHING YEARLY ROADWAY REHABILITATION PROGRAM**

- ***EACH DISTRICT SUBMITS PRIORITIES TO STATE MAINTENANCE OFFICE***
  - *Priorities are based on PACES Rating, AADT, Safety History and Skid Test*
  - *District Maintenance Assistant and State Maintenance Liaison establishes the District's priorities*
- ***STATE MAINTNENANCE OFFICE REVIEWS EACH DISTRICT'S PRIORITY LISTING AND ESTABLISHES A STATE WIDE PRIORITY LISTING***
  - *Priorities are based on available funding as well as the items used at the district level*

# **ESTABLISHING YEARLY ROADWAY REHABILITATION PROGRAM (cont.)**

- ***FOR INTERSTATES OR OTHER STATE ROUTES WITH MAJOR DISTRESSES***
  - ***The State Maintenance Office requests detailed pavement and/or base evaluation from the Office of Materials and Research – Pavement Design Section***



# Patching



# Crack Filling





# Strip Sealing





# Deep Base Repair



# Resurfacing

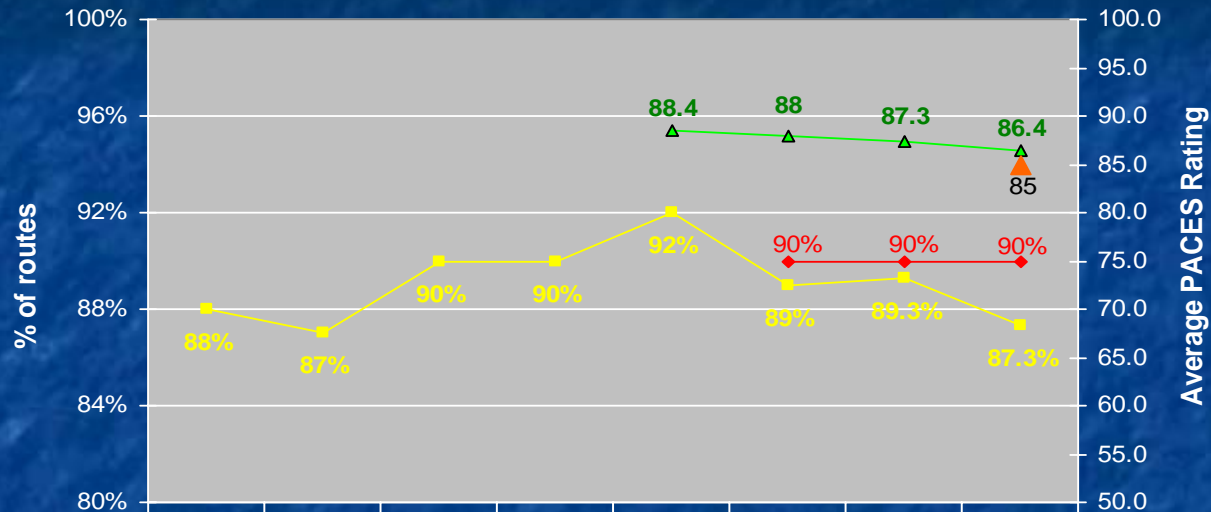


# FY2005 End of Year Strategic Objective Update



Yellow

Objective 2: Maintain 90% of State Routes at a minimum PACES rating of 70 with an average overall system rating of 85.



	1998	1999	2000	2001	2002	2003	2004	2005
■ Percent routes PACES >70	88%	87%	90%	90%	92%	89%	89.3%	87.3%
◆ Goal (% of system)						90%	90%	90%
▲ Overall Avg. PACES rating					88.4	88	87.3	86.4
▲ Goal (Average)								85

## FY05 YTD Results

## FY05 Initiatives

## FY05 YTD Accomplishments

## Issues / Next Steps

- Not available until PACES evaluation is complete. PACES evaluations were conducted October 1 through December 2004.

- Utilize GPAMS projections for resurfacing needs

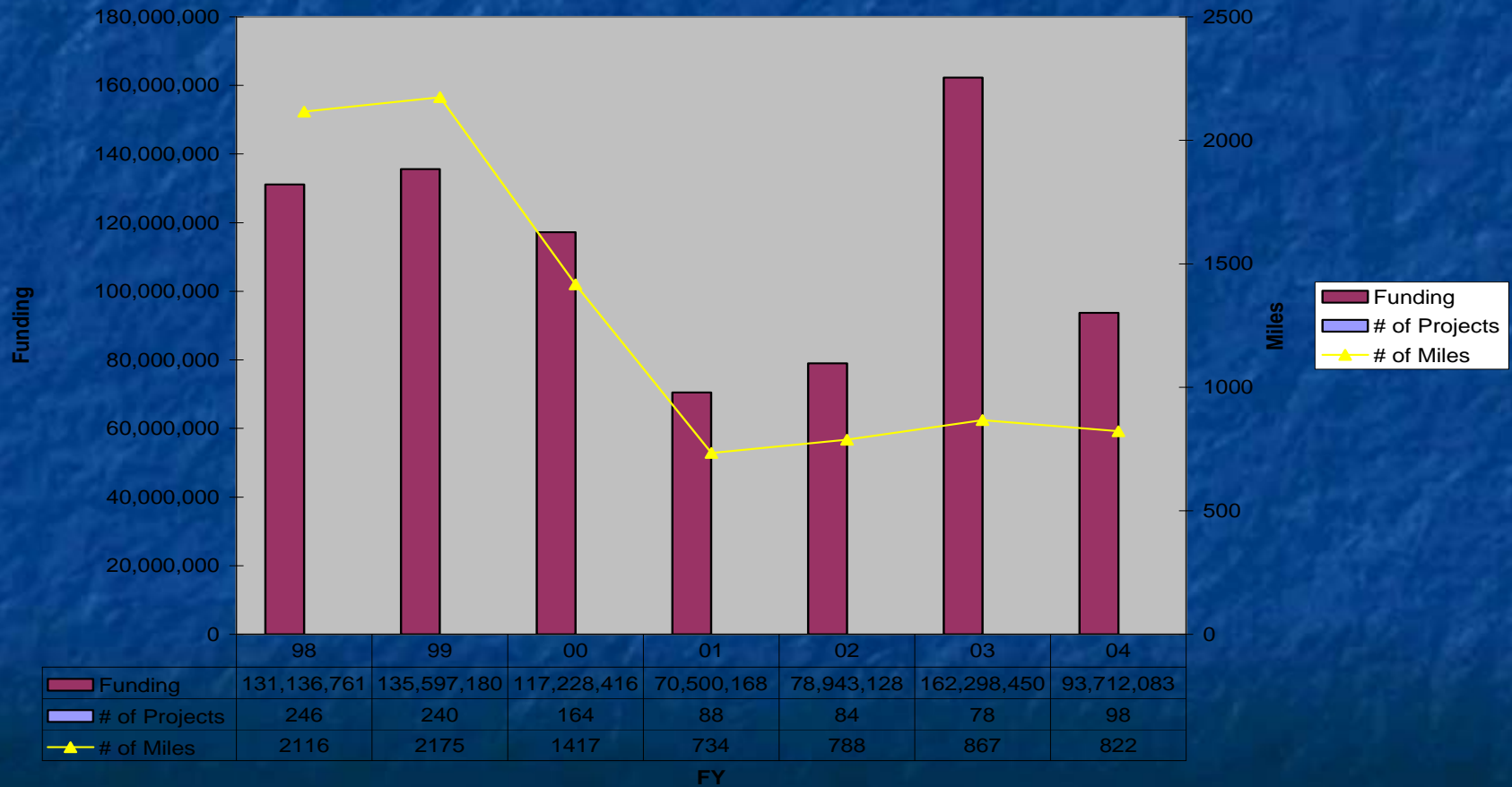
- 1004 centerline miles of roadway let for resurfacing.

- Objective wording change; now includes average for system.
- 7% of GA roadways need to be resurfaced, but funding is only available for 3.3%.



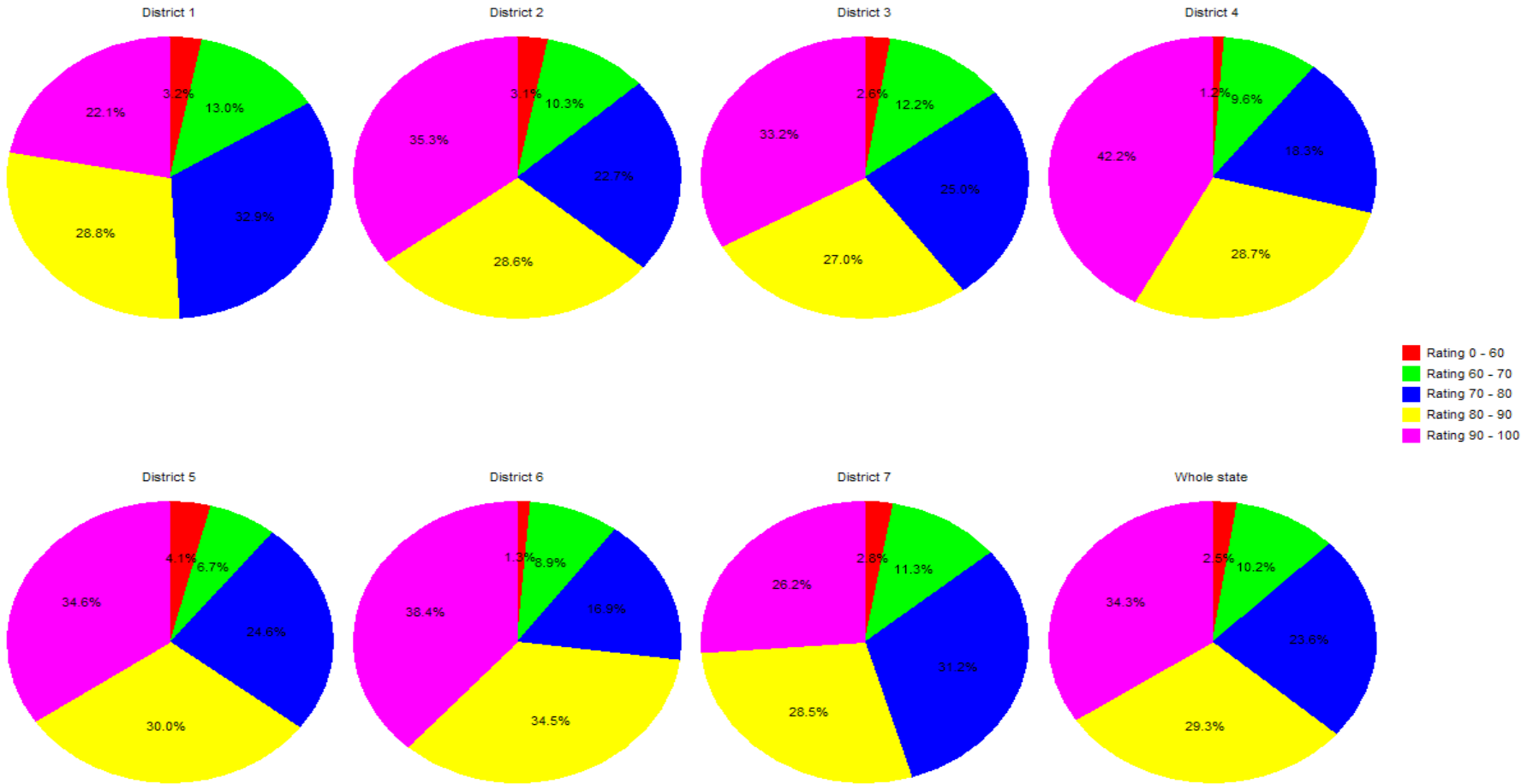
# Non Interstate Resurfacing History

Resurfacing ( Non Interstate)



# Rating Distribution By Districts

Yearly Rating Distribution By District (Fiscal Year = 2005)



# Questions?

