Tracking Pavement Preservation Efforts in North Carolina

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Outline of Presentation

- Background
- Pavement Preservation Program
- Pavement Condition Survey
- Procedure for our Study
- Results
- Conclusions.

Background

- North Carolina DOT manages a pavement system consisting of almost 80,000 miles.
- The state is divided into 100 counties and 14 Divisions.
- Field personnel select roadways for resurfacing and surface treatments.

Components of the NCDOT Pavement Preservation Effort

- Training of Central Office and Field Engineers in Pavement Preservation - began in 2000.
- Creation of State Pavement Preservation Engineer position.
- Increased funding for surface treatments and resurfacing and emphasis on quality.
- Monitoring and feedback.

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So what's the overall goal of Pavement Preservation?

We want to pave a road when it looks like this:

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Not like this:

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How do we monitor?

- Pavement Management System Databases:
  - Pavement Condition
  - Construction History

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Pavement Conditions

- Asphalt pavement condition survey is performed every two years.
- Pavement condition survey is for 100% coverage and variable section length.
- This is a windshield survey

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Pavement Conditions

- Distresses include alligator cracking, transverse cracking, rutting, raveling, oxidation, bleeding, patching and ride quality.
- Alligator includes both extent and severity.
- Others are none, low, moderate, severe. These are used to calculate Pavement Condition Rating (PCR).

What are we working with?

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The Vagaries of Funding…

Treatment	2000 Mileage	2003 Mileage	2005* Mileage	2006 Mileage
Surface Treatment	1884	2991	1985	2518
Plant Mix Resurface	1678	3046	920	1931

*Budget Crunch

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Surface Treatments in 2000

- Very basic chip seals:
  - 1200 miles Split Seals
  - 250 miles Triple Seals
  - 200 miles Mat and Seal

Surface Treatments in 2004 and Beyond

- A greatly expanded palette of options:
  - 700 miles of Split Seals
  - 700 miles of Split Seals-lightweight.
  - 220 miles of Split Seals with Screenings
  - 780 miles of Triple Seals including lightweight, screenings, and standard
  - 320 miles of Straight Seals.
  - Reduced use of Mat & Seal
- 2006 saw an increase in the use of polymer emulsions

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The Analysis: Who was paying attention in class?

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Analysis Methods

- The PCR at the nearest time before treatment was collected for 2000, 2003, 2004, 2005 and 2006
- If Pavement Preservation is being applied, an increasing portion of treated roads should be in fair or good condition.
- If PP ideas are valid, condition ratings should increase over time
- Data was evaluated for both surface treatments and hot mix overlays.

Notes on the Analysis

- This was not standard PMS functionality
- Substantial ad hoc SQL was generated to look at tables in non-standard ways
- Considering ways of adding this type of analysis to the PMS for quick field reporting.

PCR- Surface Treatments

Treatment Year	2000 PCR	2002 PCR	2004 PCR	2006 PCR
2000	64.6	87.6	83.9	81.3
2003	77.1	68.6	90.6	86.1
2005	81.3	75.8	69.1	92.6
2006	82	77.2	73	68.8

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PCR- Resurfacing

Treatment Year	2000 PCR	2002 PCR	2004 PCR	2006 PCR
2000	66.3	95.4	93.1	89.6
2003	71	62.1	96.2	95.6
2005	78.1	71.9	64.8	92.9
2006	79.1	71.7	64.9	66.1

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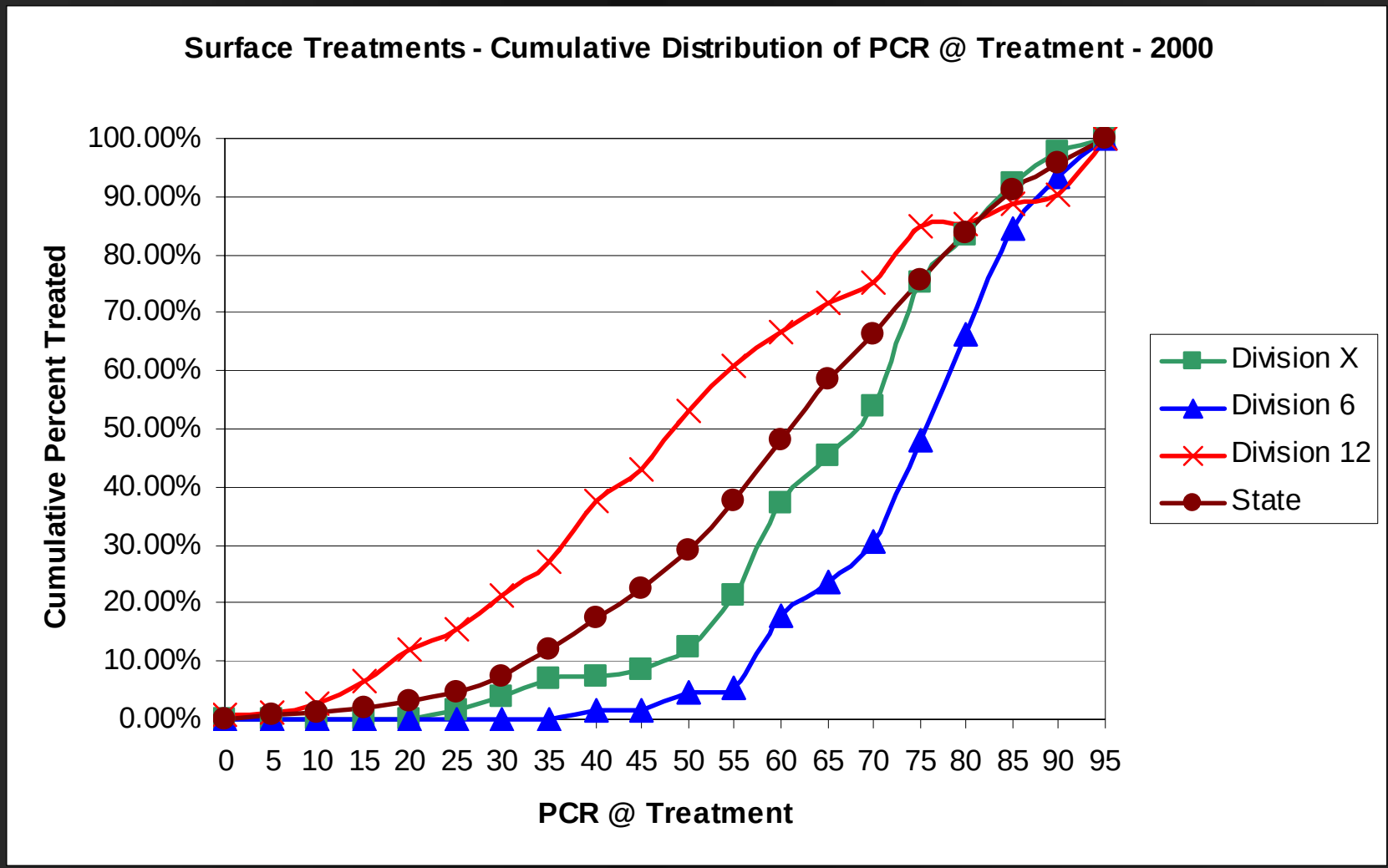
Let’s look at 3 sample Divisions and Statewide numbers:

Surface Treatments - 2000



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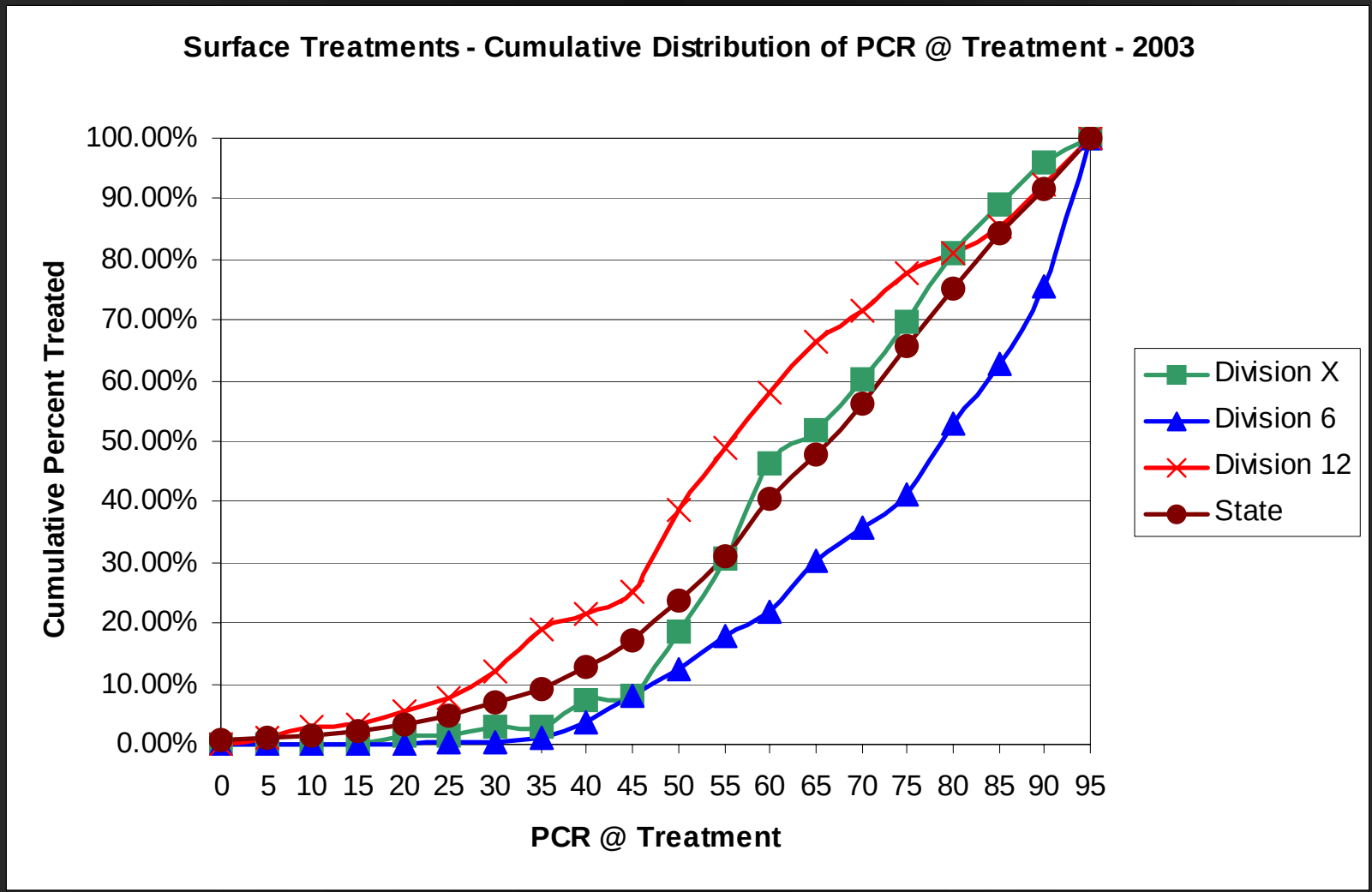
Surface Treatments - 2003



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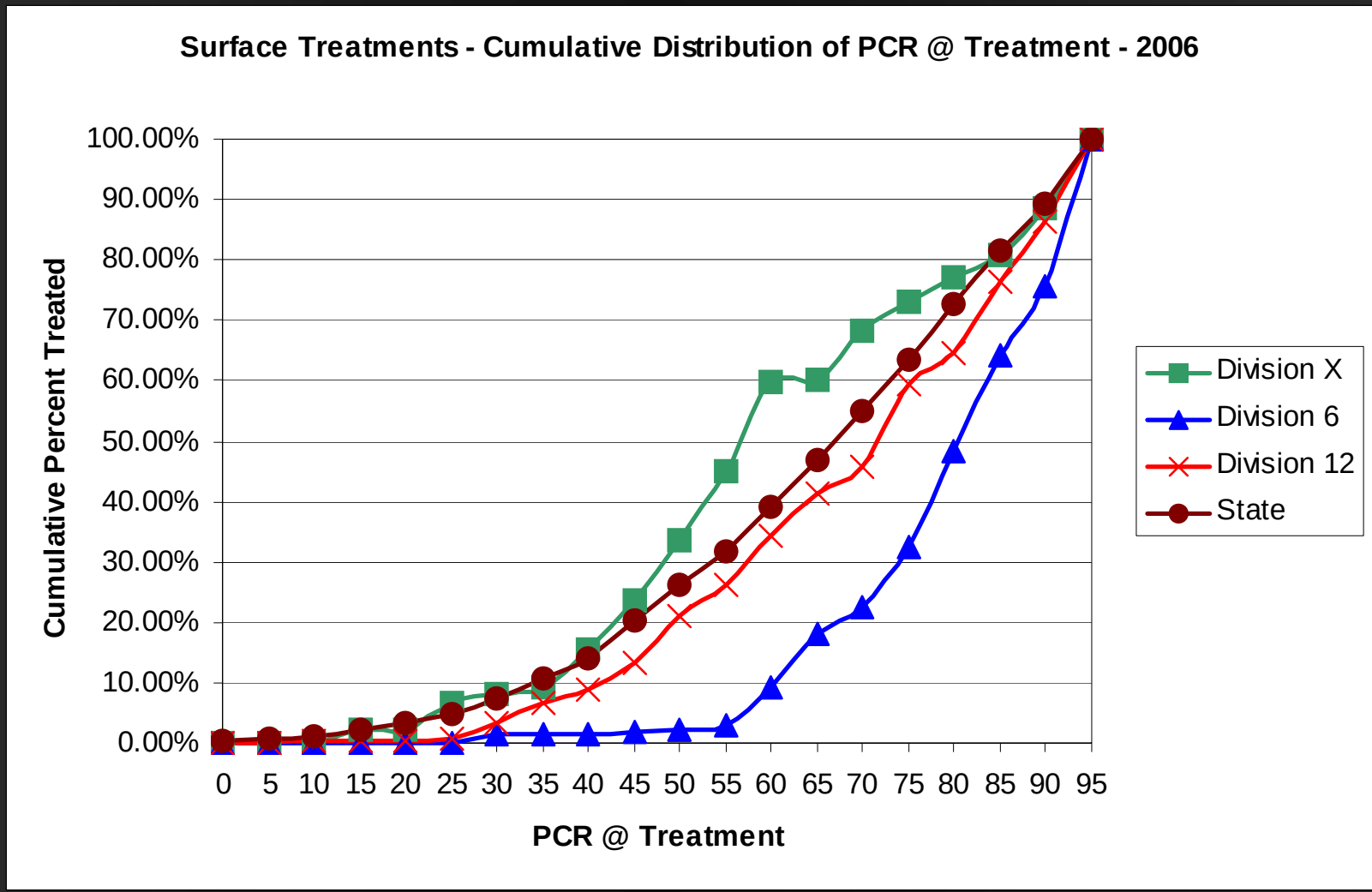
Surface Treatments - 2006



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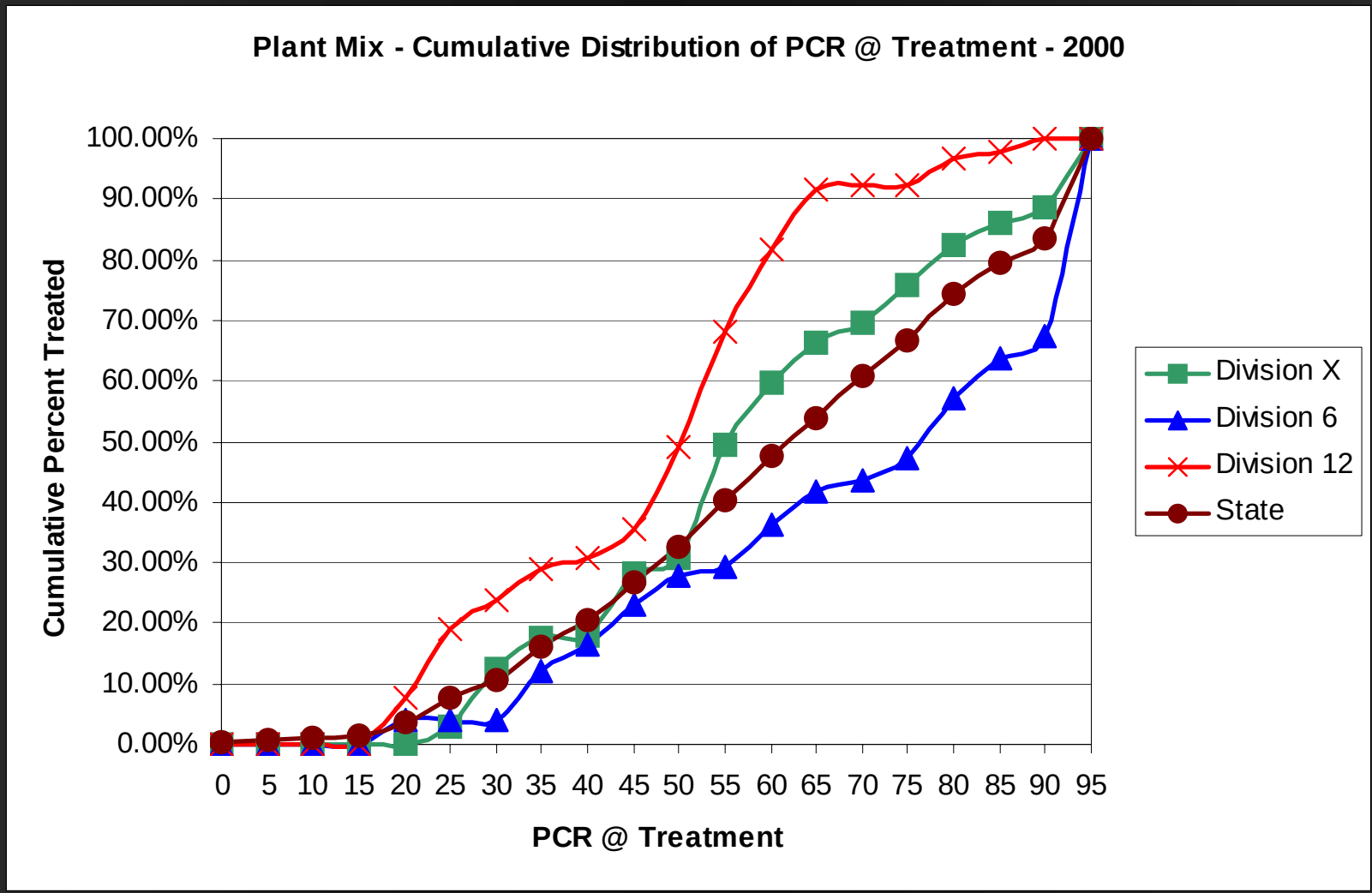
Plant Mix - 2000



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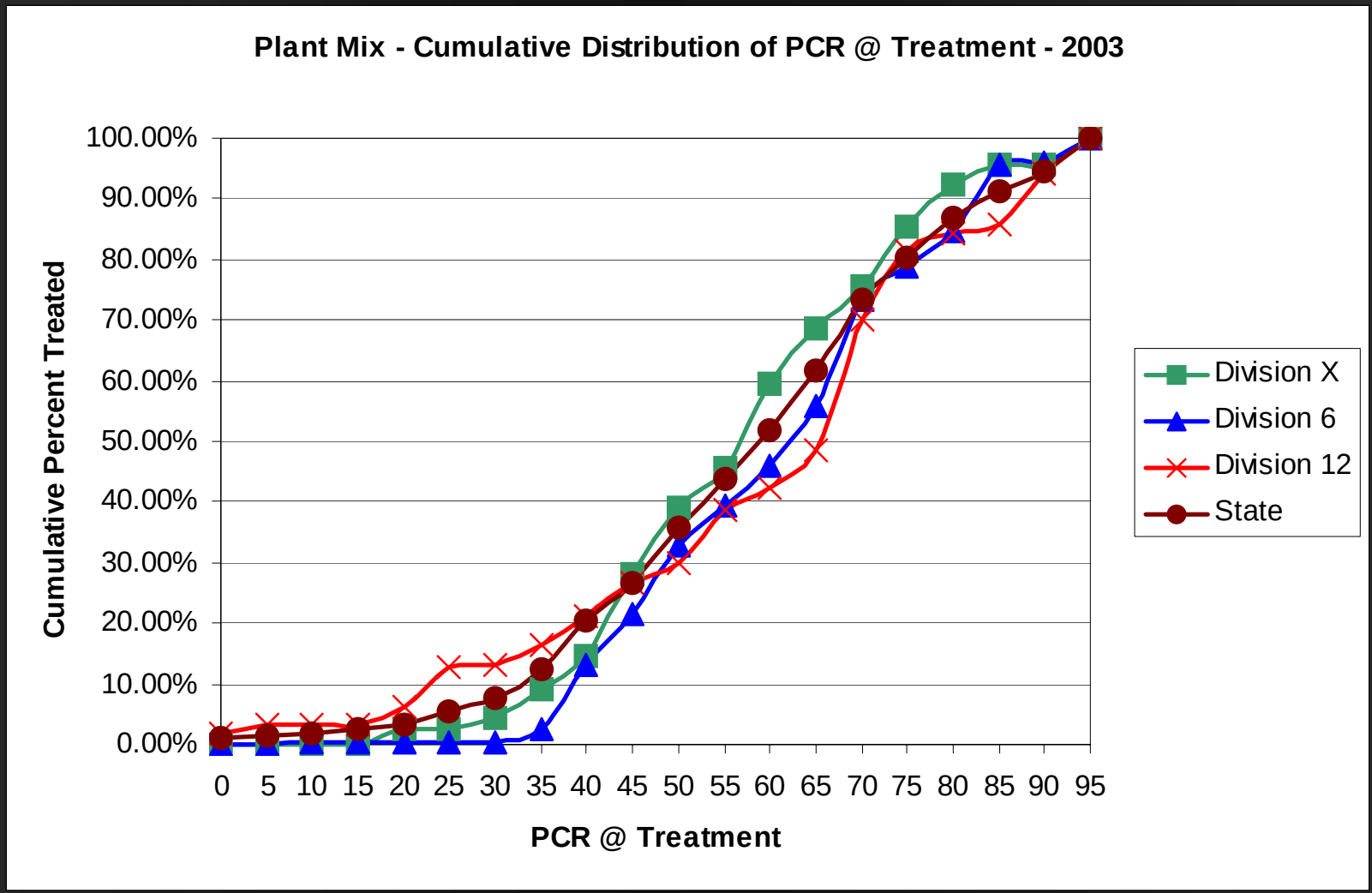
Plant Mix - 2003



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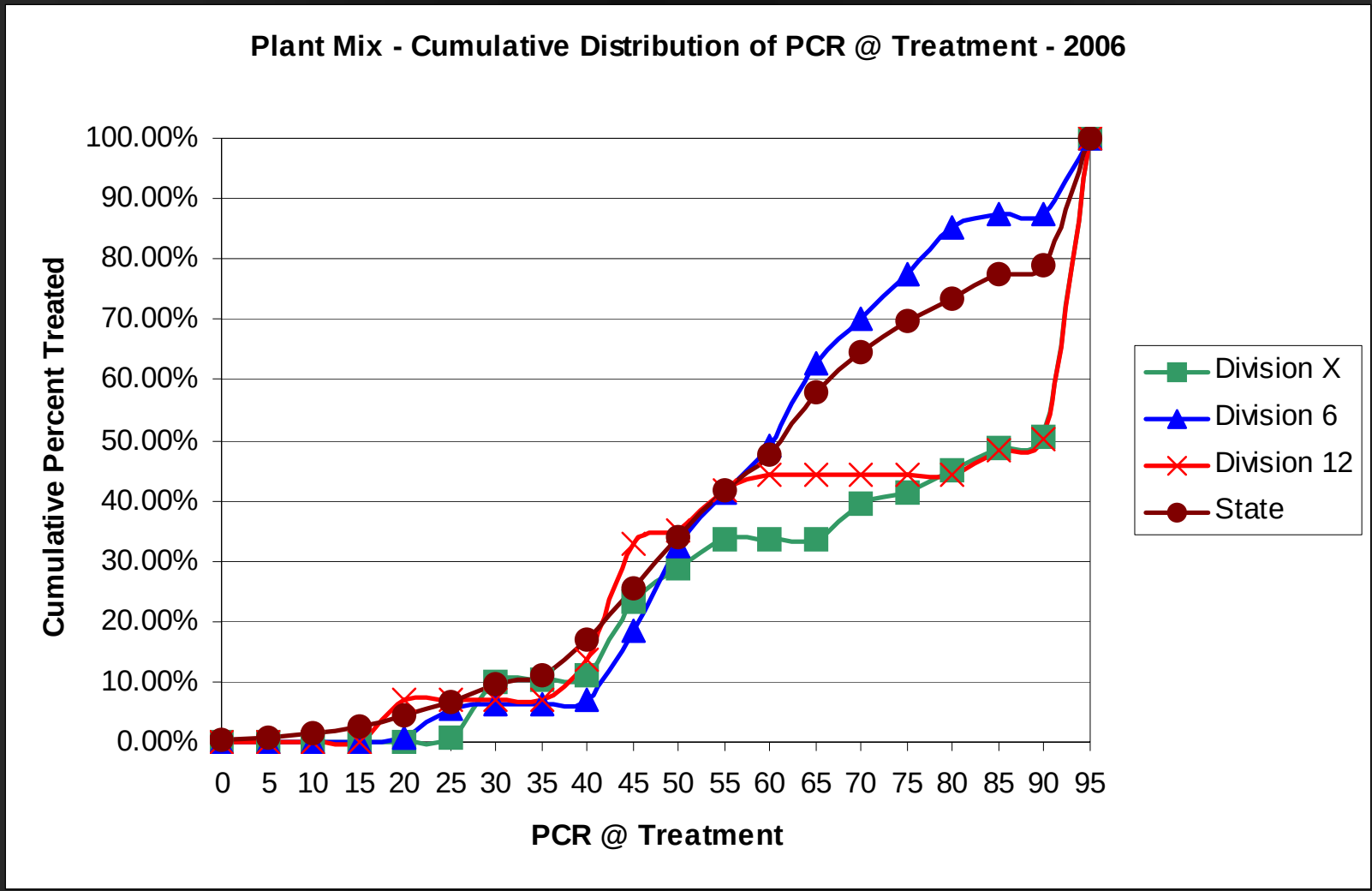
Plant Mix - 2006



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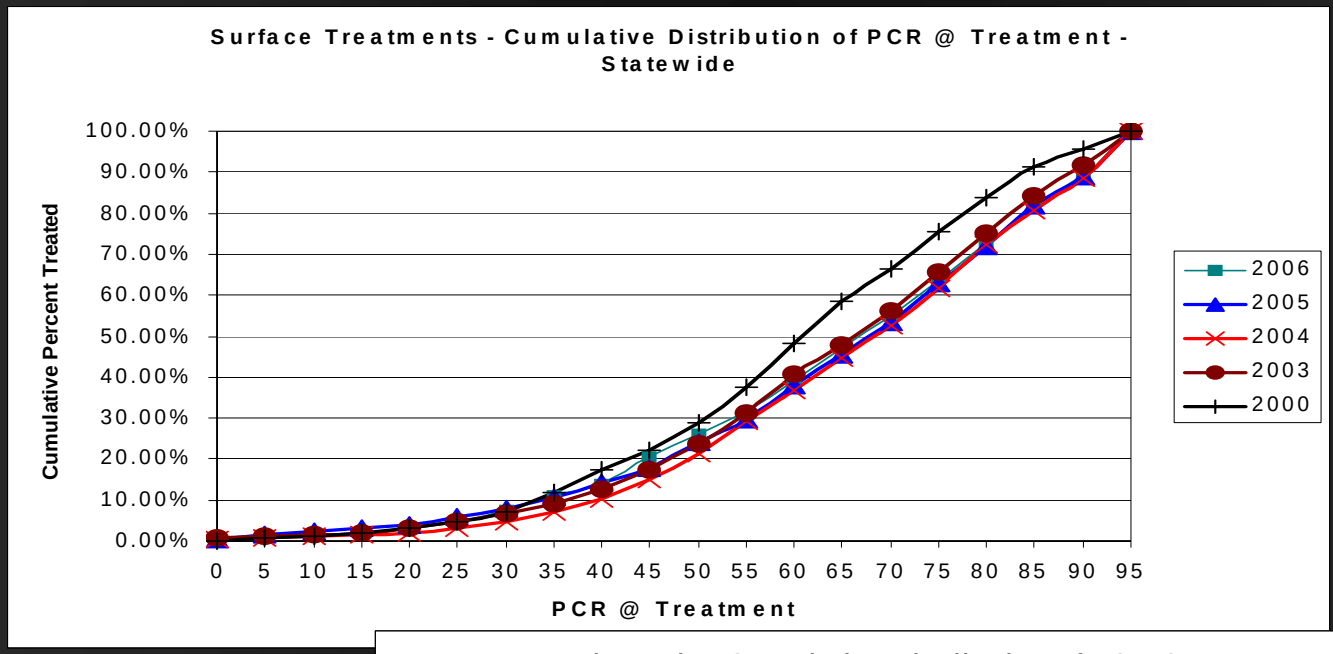
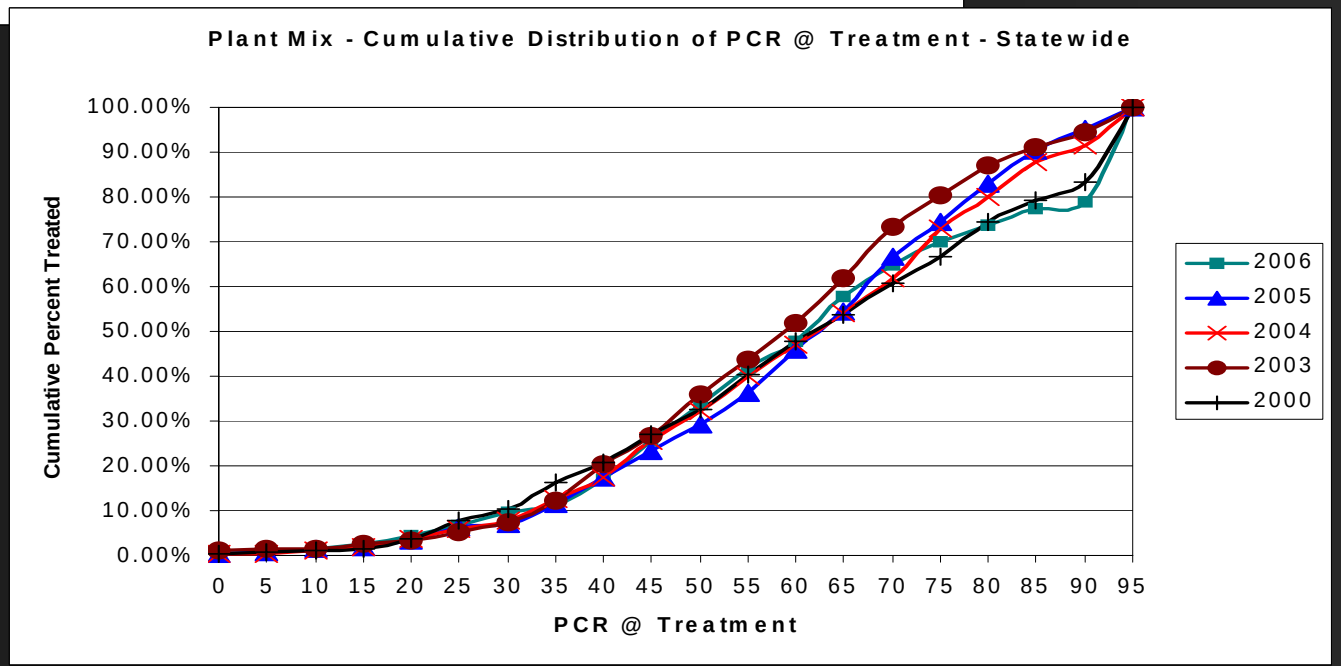
Statewide Distributions



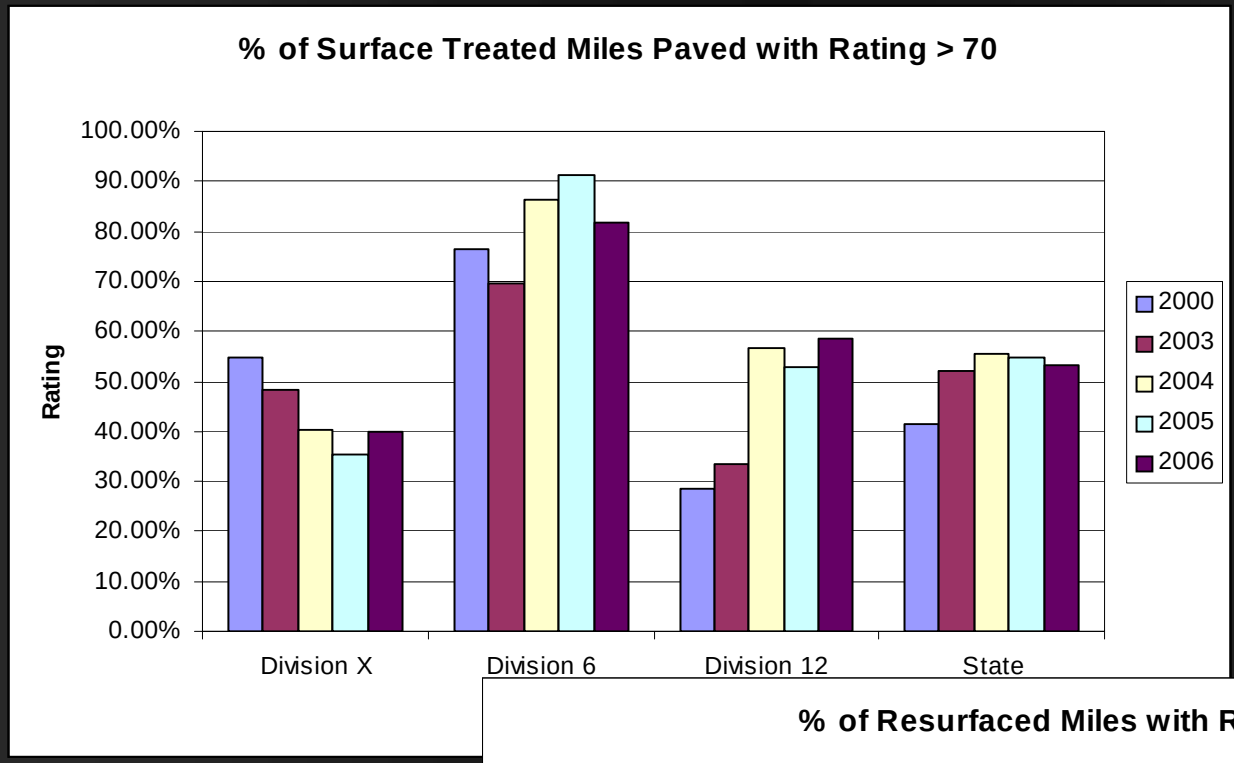


Summary of Findings

- Over the 6 years covered in the analysis since initial preservation training:
  - 9 of 14 Divisions have increased the average PCR of surface treated roads
  - The average improvement of those 9: 6.5
  - 3 have seen > 10 point gains
  - Overall statewide PCR for surface treated roads has increased 3.2 points.

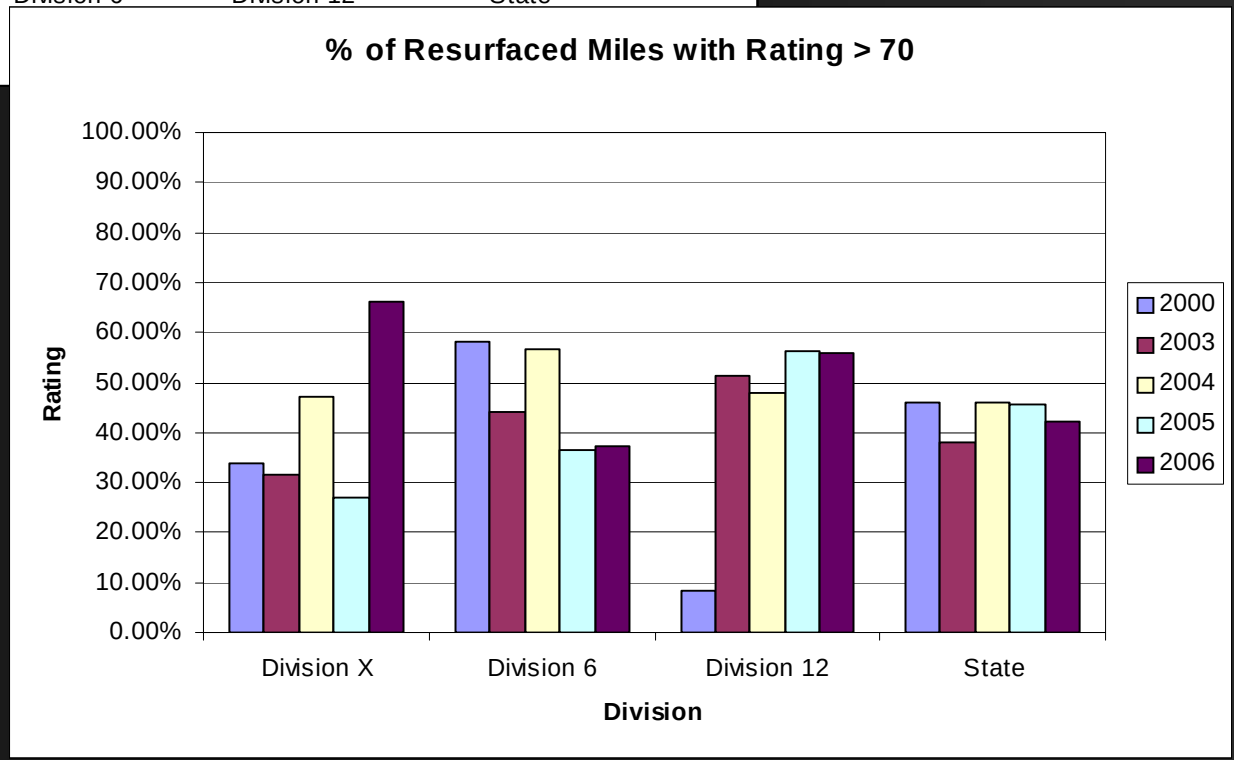
Findings (continued)

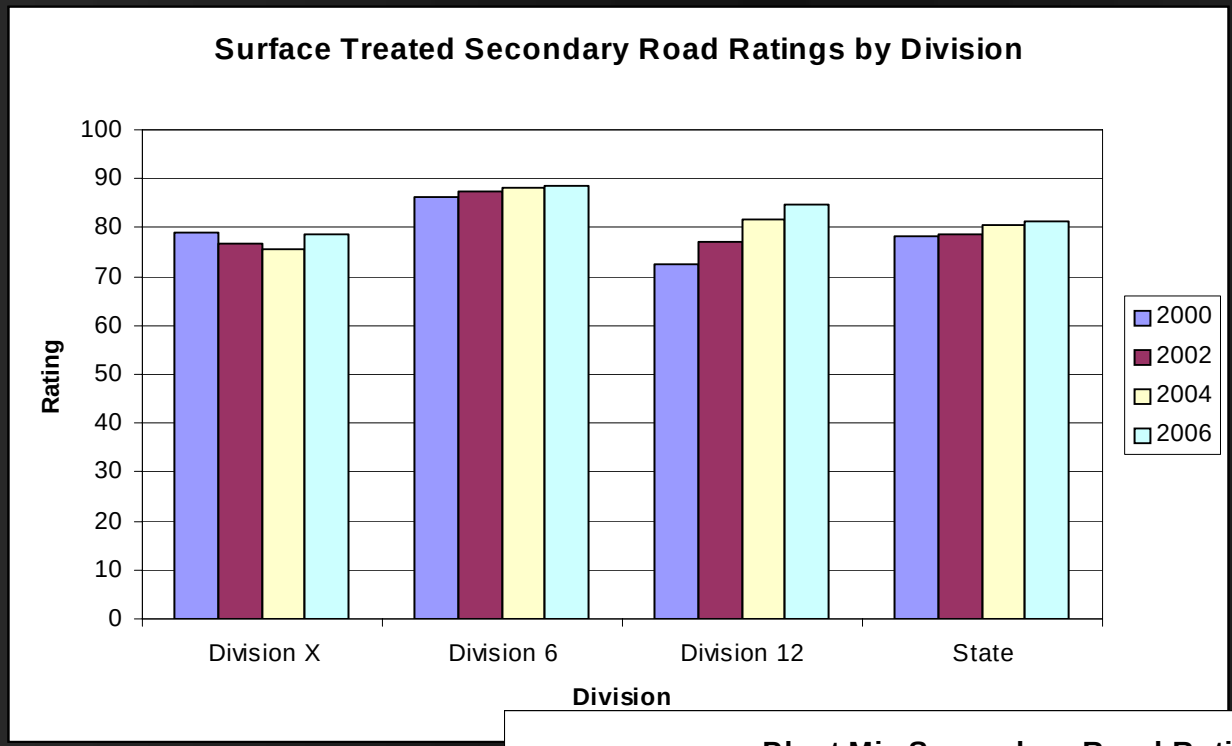
- Continued training and monitoring is necessary to demonstrate the successes and keep up with personnel changes.
- Most divisions (8 of 14) have had a decline in PCR for Plant Mix overlays from 2000 to 2006.
- It will be a challenge to maintain the program and momentum in the face of budget pressures.



Good efforts being made towards selection of appropriate projects for surface treatments

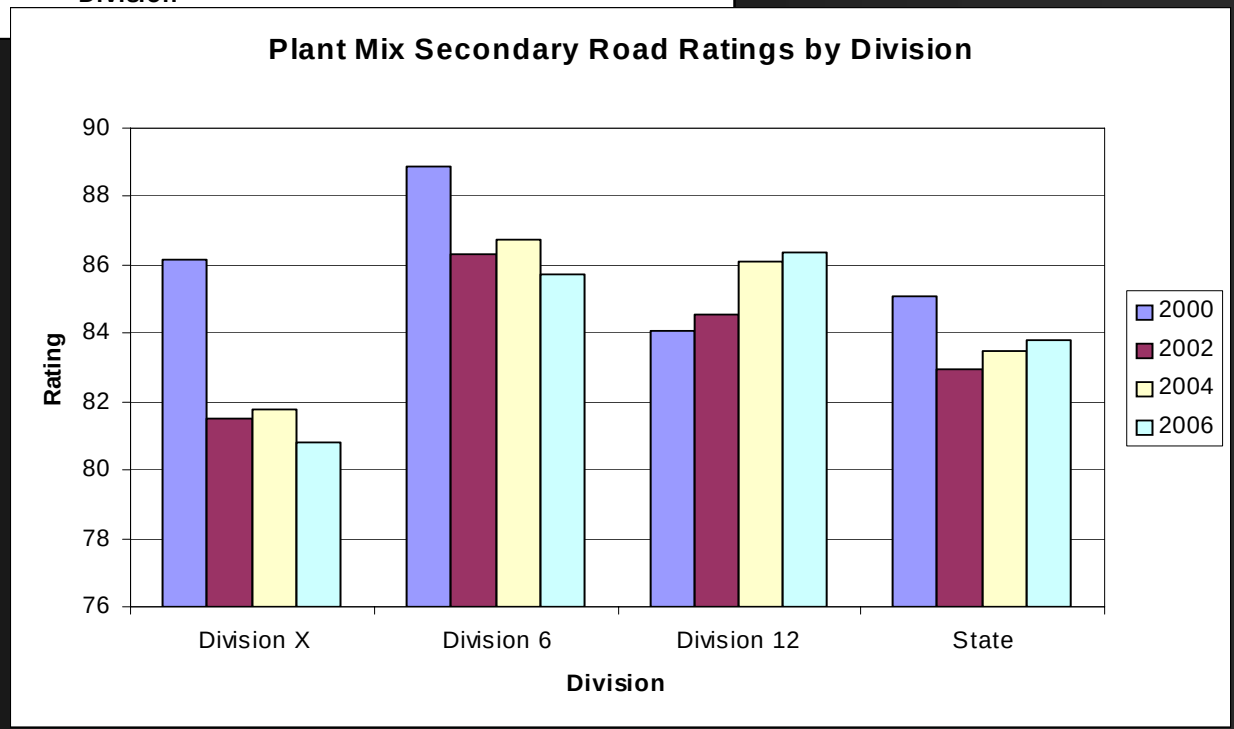
Plant Mix project selection needs improvement!





Chip Seal rating Improvement = ***Good***

Plant Mix Performance Drop = ***Bad***



Findings and Conclusion

- NC was able to demonstrate system-wide benefits from a limited pavement preservation program within 4-6 years of initial training.
- Some of us are walking the walk better than others.
- Emphasis needs to be placed on project selection for Plant Mix projects.
- It is possible that increased usage of chip seals has lead to greater use of Plant Mix on lower rated roads – a bias that will be hard to overcome.

Fin.

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