

# STATE OF FLORIDA



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**2004  
FLEXIBLE PAVEMENT  
CONDITION SURVEY  
FACTS & FIGURES**

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**FL/DOT/SMO/04-470  
May 2004**

**STATE MATERIALS OFFICE**



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# Executive Summary

Since 1985, the Pavement Condition Unit of the Pavement Systems Evaluation Section has been annually collecting, processing and analyzing the information on the condition and performance of the State Roadway System. The information provided by such a Pavement Condition Survey (PCS) program has been critical to the Department's effort to support informed highway planning, policy and decision making at State and local levels. This includes the apportionment and allocation of funding needs as well as the determination of appropriate cost-effective strategies to rehabilitate and preserve existing highway transportation infrastructure.

The PCS is traditionally performed on the pavement lane that has deteriorated the most in each direction. The beginning and ending of pavement sections to be rated are determined by construction limits or uniformity of conditions. All the sections rated are rated in terms of varying levels and amounts of specific distresses, namely, (1) ride quality, (2) rutting, and (3) cracking.

The Survey data is collected, reviewed, processed, and analyzed by the Pavement Systems Evaluation Section of the State Materials Office. The survey data for each county is forwarded to the appropriate District responsible for review and any concerns are addressed prior to the data collection being finalized. Once the data collection process is complete, the Central Pavement Management Office is responsible for the processing, analysis and making the data available for use by the Department, consultants and others. Thereafter, the Central Program Development Office becomes responsible for reporting the condition of the State Highway System for Pavement Management purposes.

The present report provides essential information on the current condition of the Florida roadway system collected as part of the PCS program. It also includes a summary of the historical condition rating data.



# SECTION I

## Introduction

The Pavement Systems Evaluation Section of the State Materials Office is responsible for the Department's Annual Pavement Condition Survey. The Survey is conducted on the entire State-maintained Highway System, on an annual basis.

The Survey is conducted by a highly trained and experienced staff, and requires each of the four area staff specialists about 25 weeks of travel each year to complete. Since its inception the PCS program has seen over 20 percent increase in surveyed lane miles (refer to Chart on page 5).

The annual PCS is used to accomplish the following main objectives

- ☞ Determine the present condition of the State Roadway System
- ☞ Compare the present with past conditions
- ☞ Predict deterioration rates
- ☞ Predict rehabilitation funding needs
- ☞ Provide justification for annual rehabilitation budget
- ☞ Provide justification for project rehabilitation, and
- ☞ Provide justification for distribution of rehabilitation funds to Districts.

The condition survey is conducted in accordance to three (3) specific distress criteria, namely, (1) ride quality, (2) rutting, and (3) cracking. For each distress type, the pavement sections are rated on a 0 to 10 scale, where a rating of 10 indicates a section in excellent condition. Currently, any section with a rating of 6 or less becomes eligible for rehabilitation.

Cracking is a subjective rating conducted visually either from windshield survey or from the shoulder. Rut and Ride are measured using an automated vehicle-mounted instrument called a Profiler that measures the longitudinal profile of the roadway. The ride quality is quantified in terms of Ride Number (RN). Ride Number is a mathematical processing of longitudinal profile measurements to produce an estimate of ride quality or user perception in accordance with ASTM Standard E1489.

In order to ensure a maximum accuracy and repeatability of the data collected, the testing equipment must be well maintained and routinely calibrated. In addition, over 150 edit checks are currently implemented to test both the data accuracy and compliance with other parameters of the Pavement Management System. Comparisons of annual survey data to that of earlier years to review trends and identify potential errors are also performed. Furthermore, team members (raters) annually complete a comparative distress rating evaluation on selected pavement sections to enhance uniformity of the subjective crack rating. When necessary, and as appropriate, efforts have been made to upgrade the survey equipment and to improve the data analysis software resulting in increased speed of data collection and substantially improved accuracy of the survey results. These types of improvements now allow in-depth analysis of any segment of the highway system and on-time completion of the PCS while maintaining a high level of accuracy. For more detailed information about the Pavement Condition Surveys, please refer to the latest edition of the Rigid and Flexible Pavement Condition Survey Handbooks, which can be accessed online at:

<http://www.dot.state.fl.us/statematerialsoffice/PavementEvaluation/reports.htm>

Since the mileage of flexible pavements represents approximately 98% of the entire System, the facts and figures contained in this report are for flexible pavements only unless otherwise noted.



# Observations

The review and analysis of PCS data have resulted into the following observations:

1. Crack ratings have remained stable for the past thirteen years with a mean rating of approximately 8.11 (range of 8.02 to 8.21).
2. Rut ratings have improved from an average rating of 8.35 in 1992 to 8.90 in 2004.
3. Ride ratings show a 6% change compared to the 2003 pavement condition survey with a mean rating of approximately 7.63 in 2004. This is mainly due to the change in sampling rate which was conducted in 2004 at 6-inch intervals compared to 12-inch for previous years.
4. 92.9% of the pavement sections rated this year for Cracking were within one point compared to the previous year's ratings. (\*)
5. 99.9% of the pavement sections rated this year for Rutting were within one point compared to the previous year's ratings. (\*)
6. 98.1% of the pavement sections rated this year for Ride were within one point compared to the previous year's ratings. (\*)

Note: Laser sensors were implemented beginning with the 1999 survey, along with the use of Ride Number as a method for calculating Ride Ratings. This may explain the increase in serviceability observed thereafter.

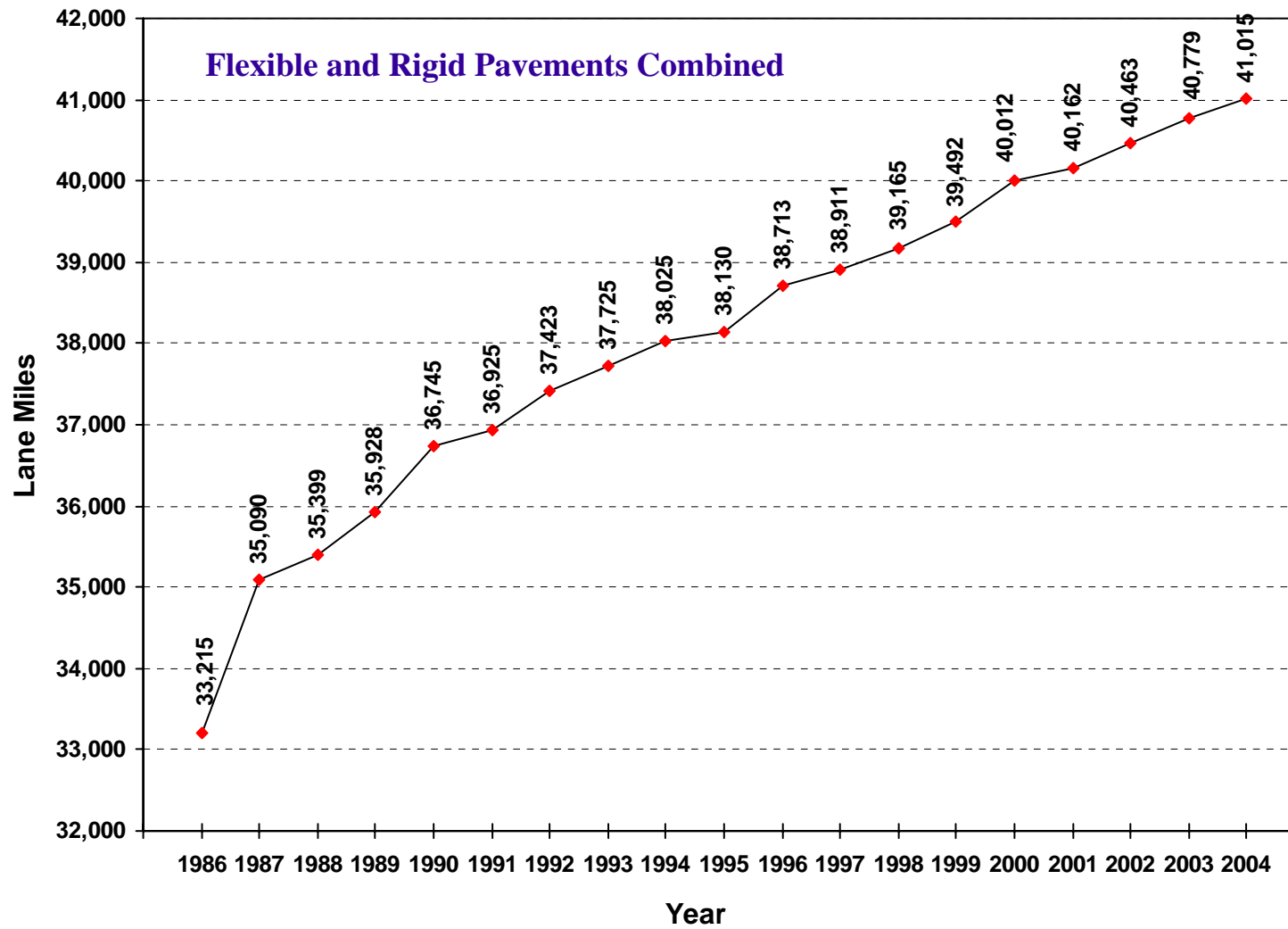
- \* Note: Sections that had undergone notable changes such as new construction, or total rehabilitation were excluded from the analysis.

# General Notes

1. For multi-lane roadways: The worst lane in each direction is rated (normally the outermost traffic lane).
2. For two lane roadways: The worst lane is rated (normally the same lane tested the previous year).
3. Rated sections are determined by construction limits or significant changes in visual condition of the pavement.
4. Ride rating and Rut rating data are collected using four identical inertial laser units.
5. Crack rating is subjective and collected visually (performed from windshield or roadway shoulder).
6. Cracking is rated based on the severity and extent of the distress for area inside and outside the wheel paths.

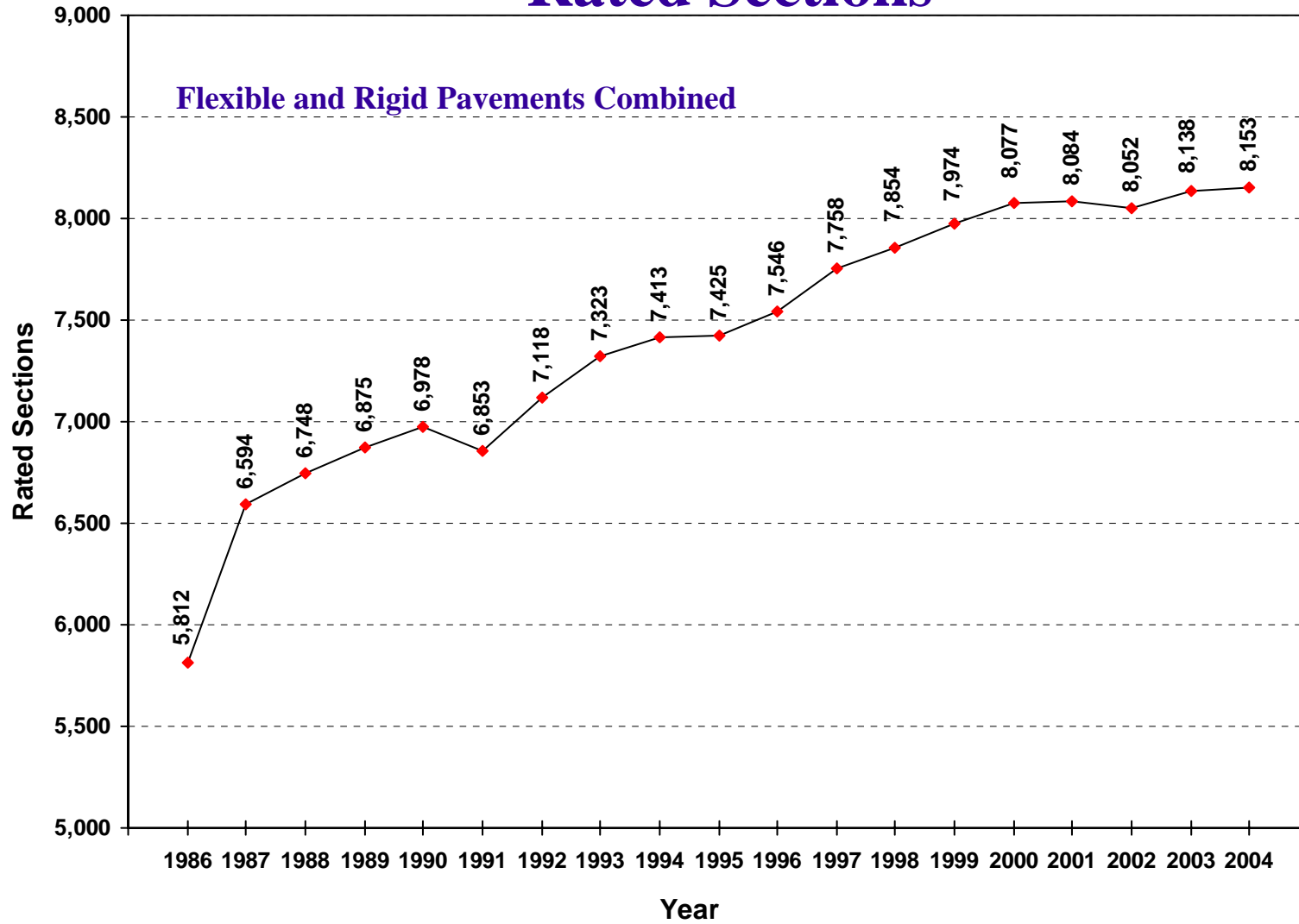
# Production History

## Lane Miles



# Production History

## Rated Sections



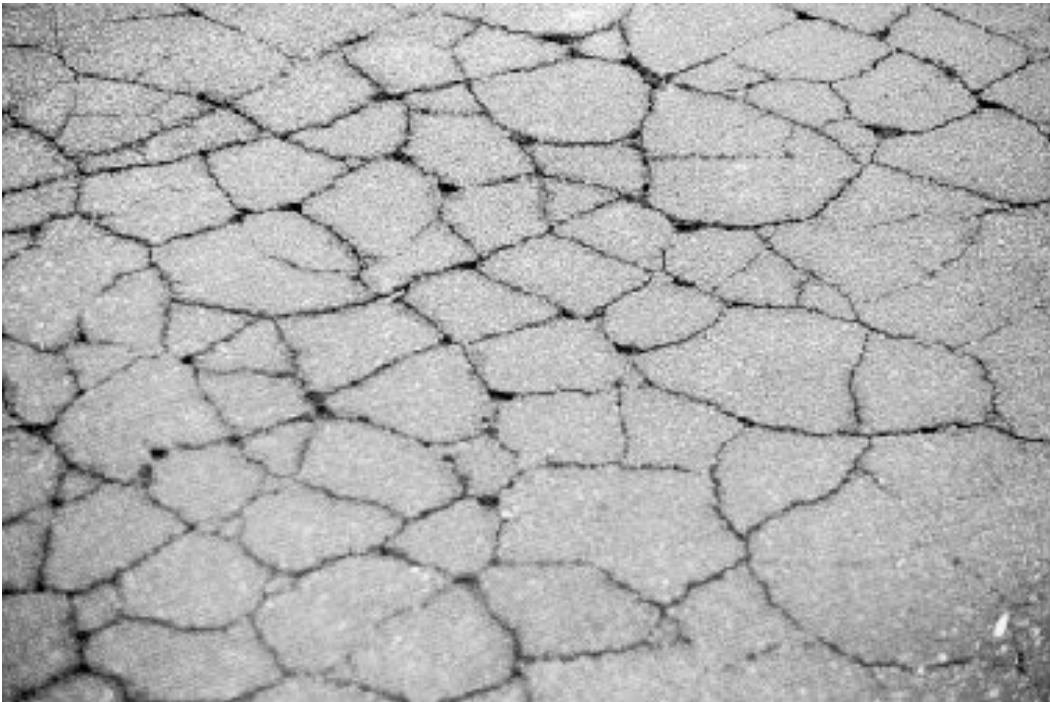


# **SECTION II**

## **CRACK RATING**

**BY**

**SYSTEM AND DISTRICT**



## SECTION II

### Crack Rating by System and District

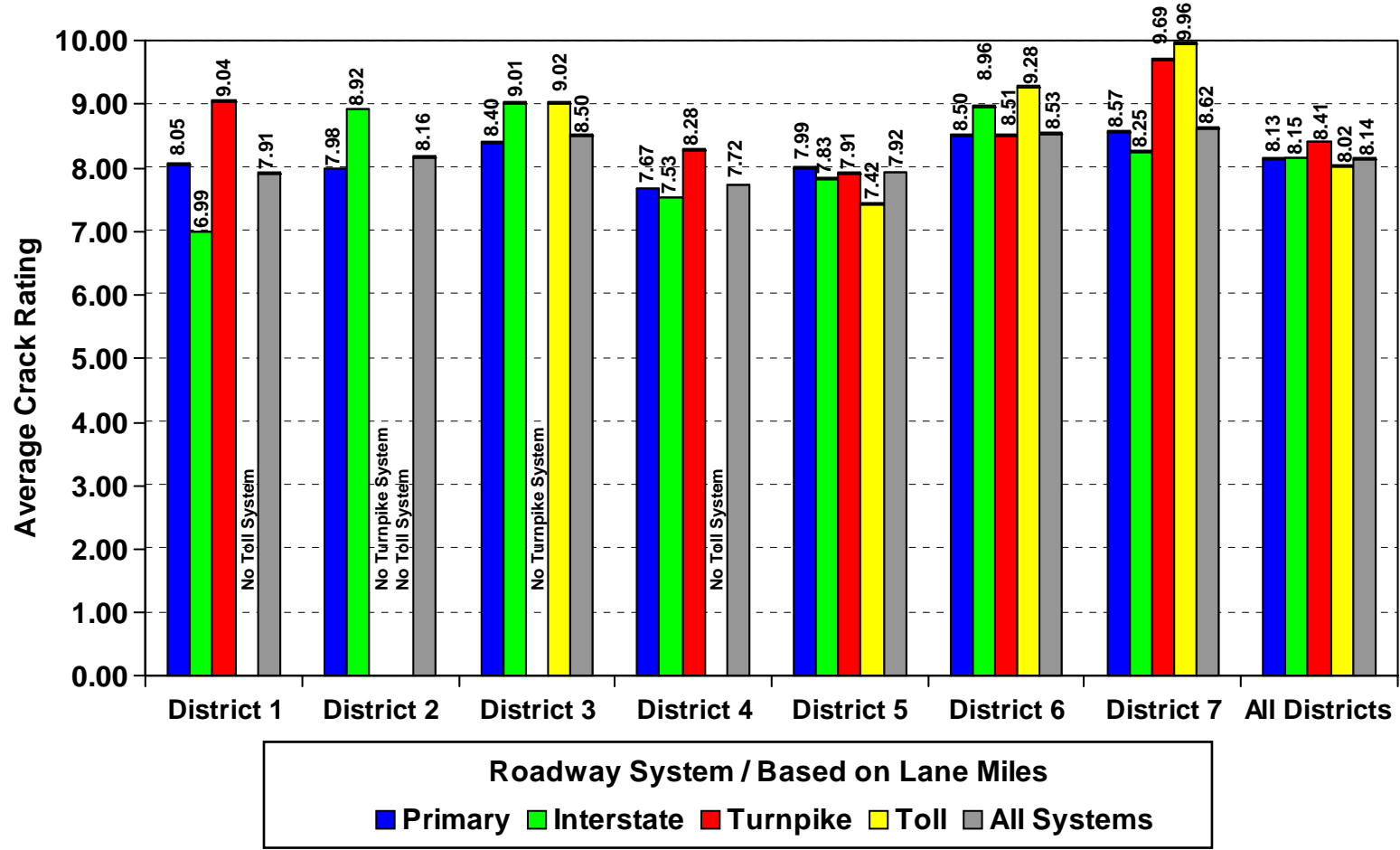
#### Crack Rating Criteria

- Cracking is estimated as percentages of distressed areas within the wheel paths (CW) and outside of the wheel paths (CO). These percentages are estimated separately for each of the two areas.
- There are three classes of cracking which are based on the severity level (1B, II and III).
- Only predominate type of cracking is used to establish the crack rating. However, the percentages of all types of cracking are used to calculate the overall percentage of cracked pavement.
- Cracking deficiency is rated on a 0 to 10 scale, where a rating of 10 represents a pavement in perfect condition. Currently, a rating of 6 or less makes pavement segments eligible for rehabilitation.
- The Crack Rating is subtracted from a perfect score of 10.

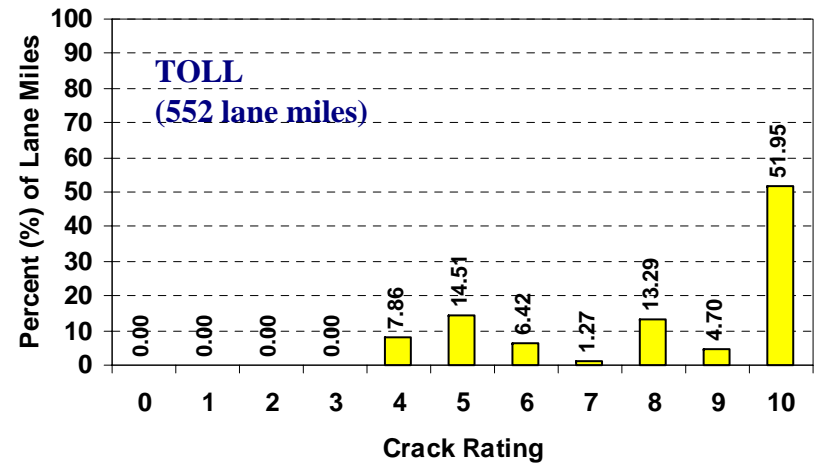
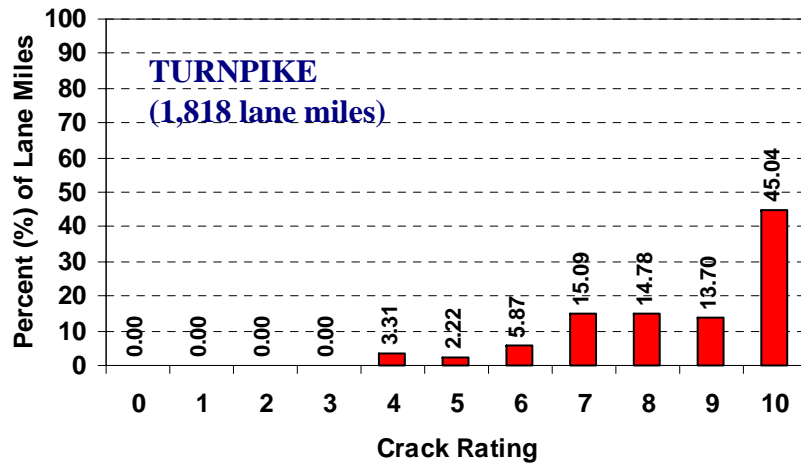
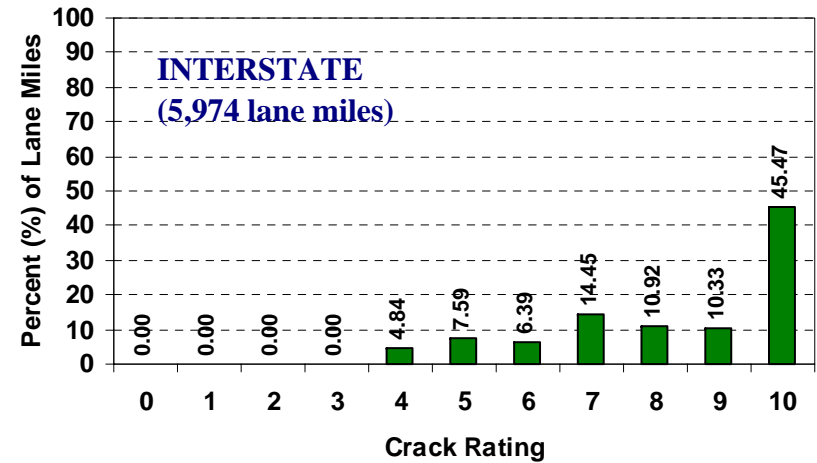
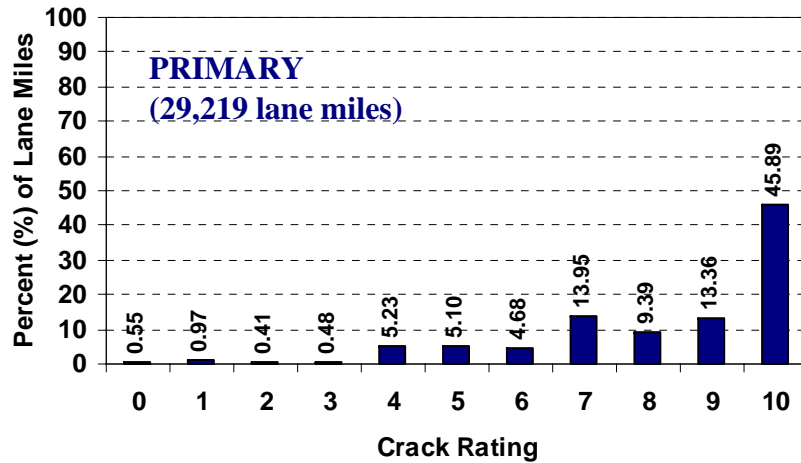
$$\text{Crack Rating} = 10 - (\text{CW} + \text{CO})$$

Where: CW and CO are numerical factors for Cracking within the wheel paths (CW) and outside of the wheel paths (CO). These factors are based on the severity and extent of the type of cracking.

# 2004 Crack Rating by System and District



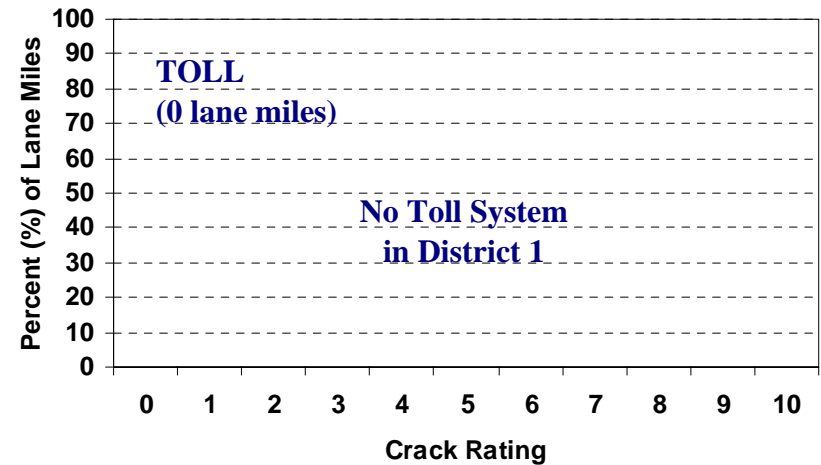
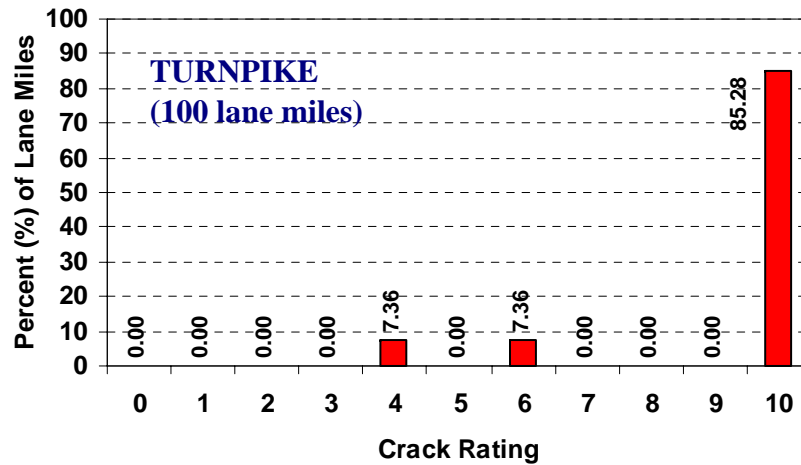
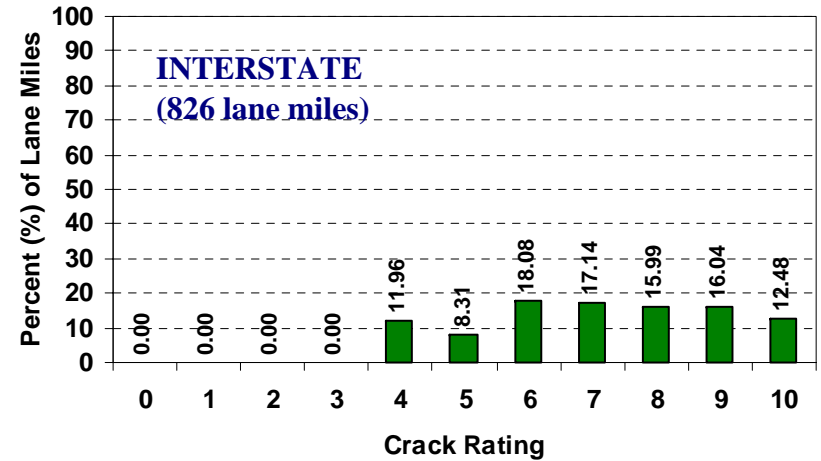
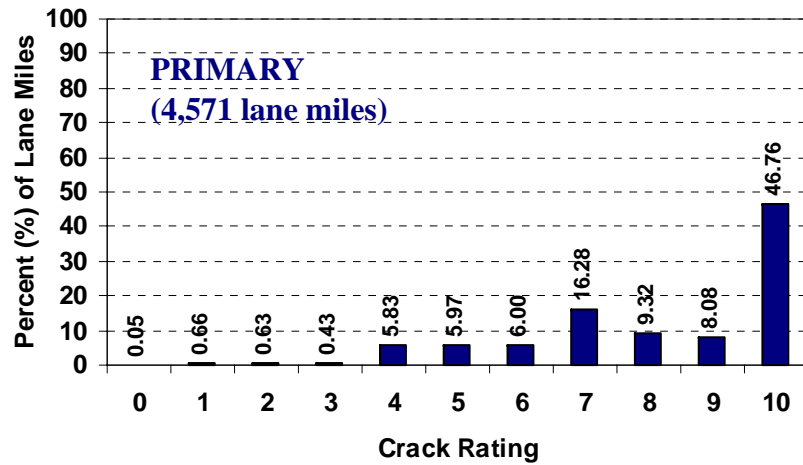
# 2004 Crack Distribution by System Statewide





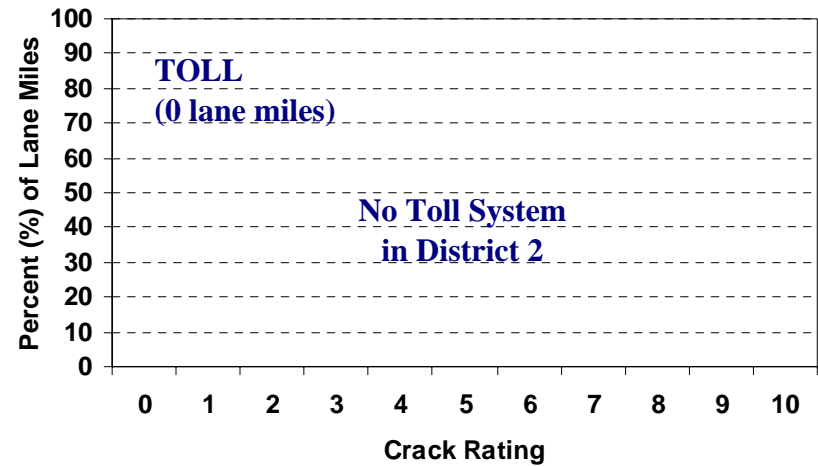
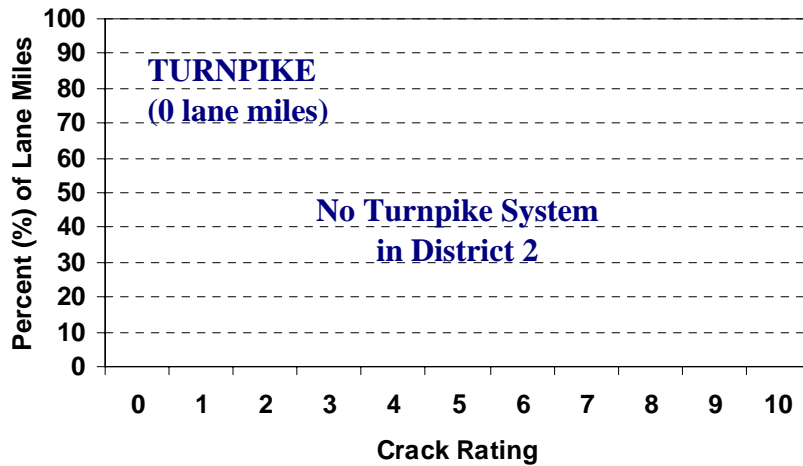
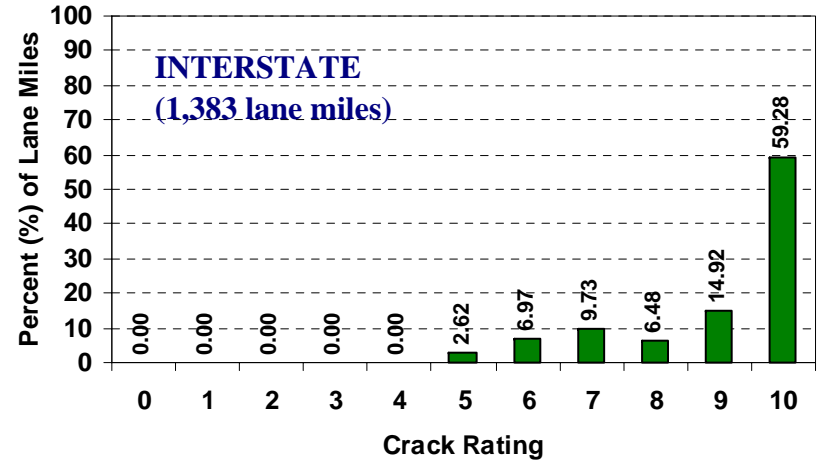
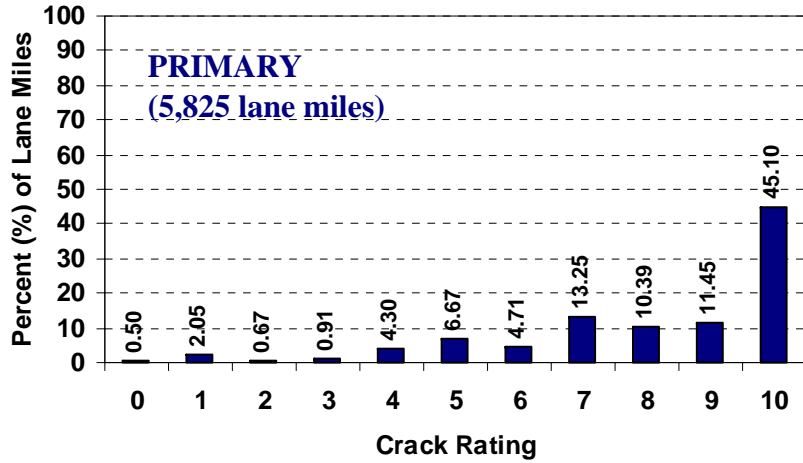
# 2004 Crack Distribution by System

## District 1



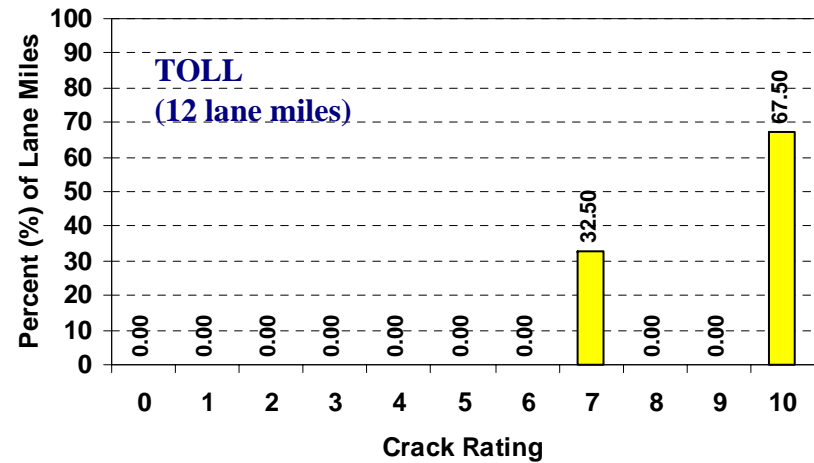
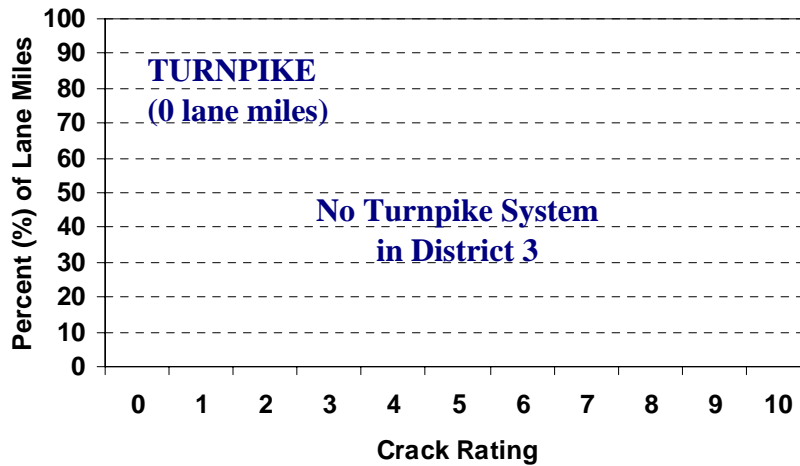
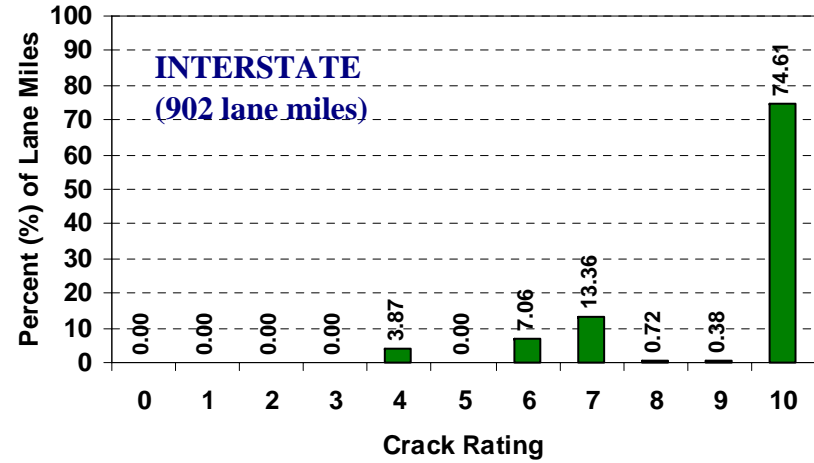
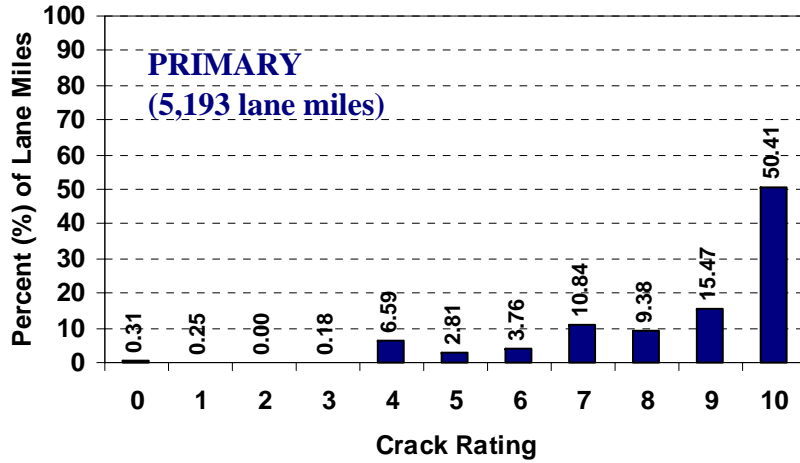
# 2004 Crack Distribution by System

## District 2



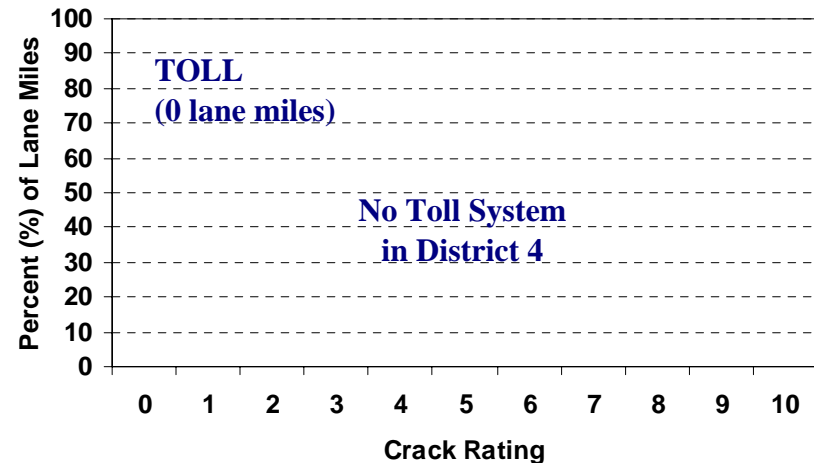
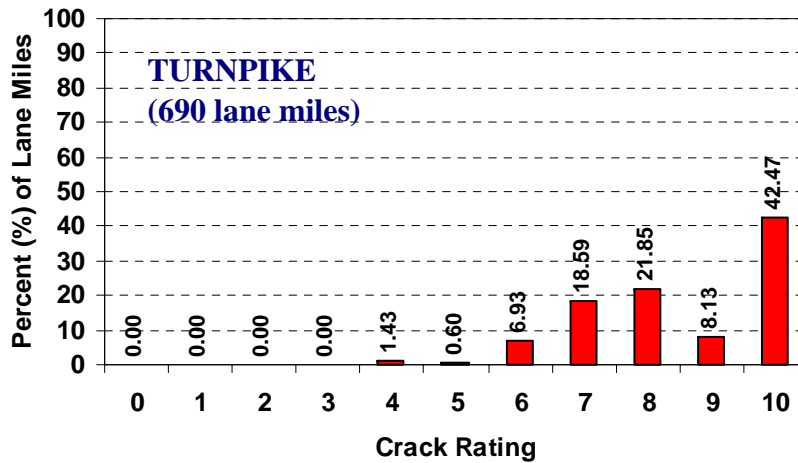
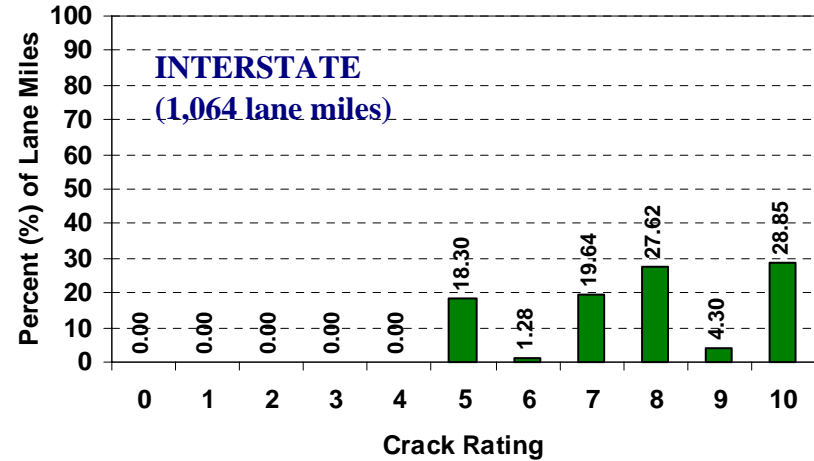
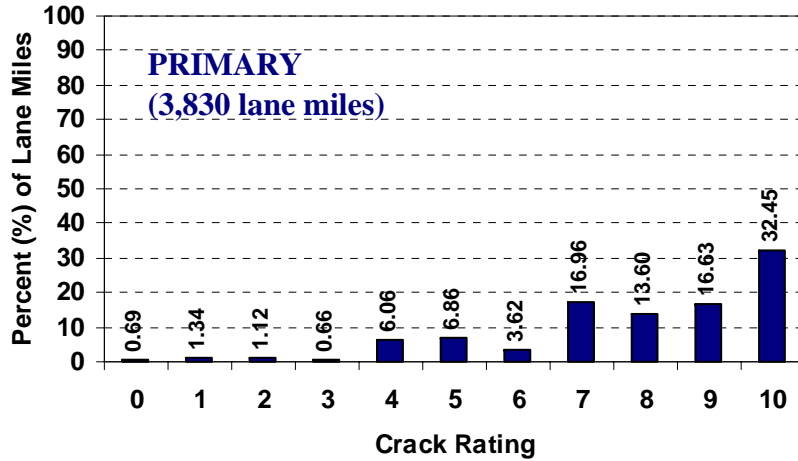
# 2004 Crack Distribution by System

## District 3



# 2004 Crack Distribution by System

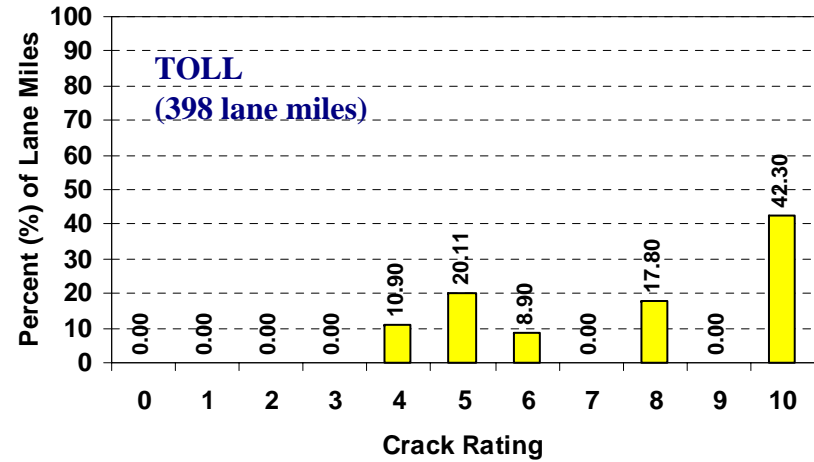
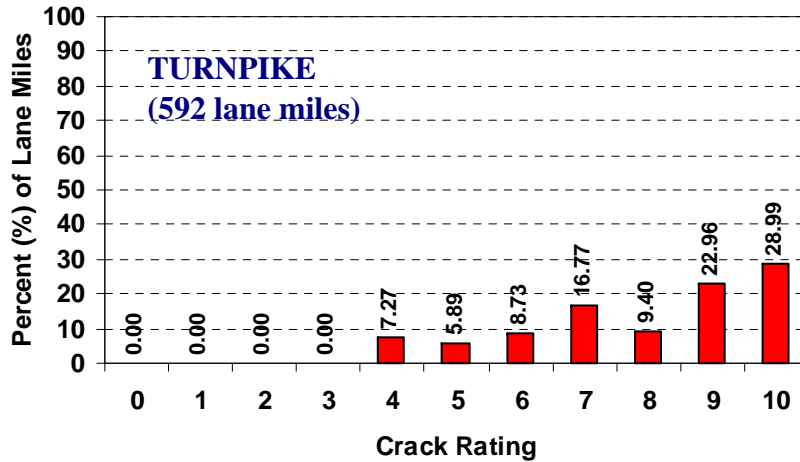
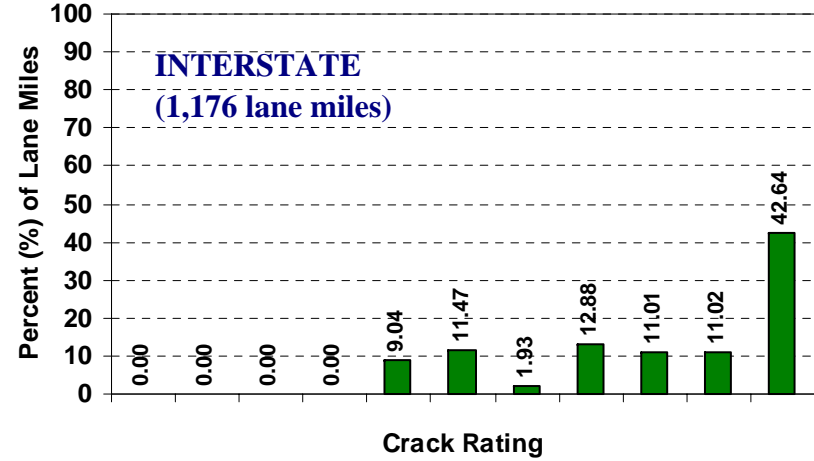
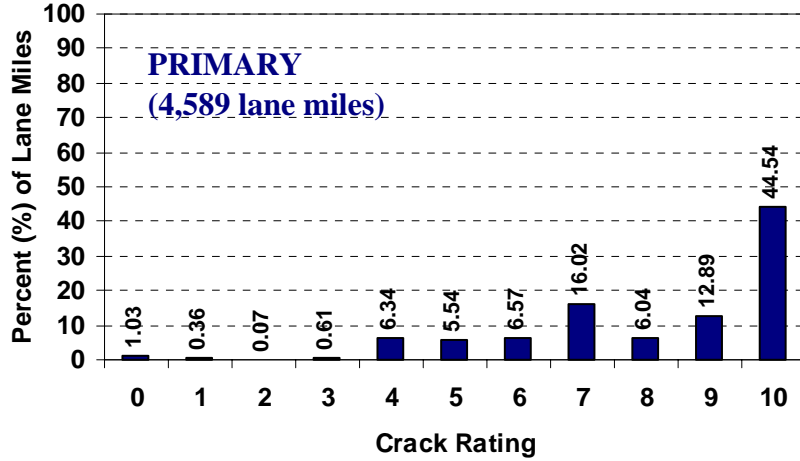
## District 4



# 2004 Crack Distribution by System

## District 5

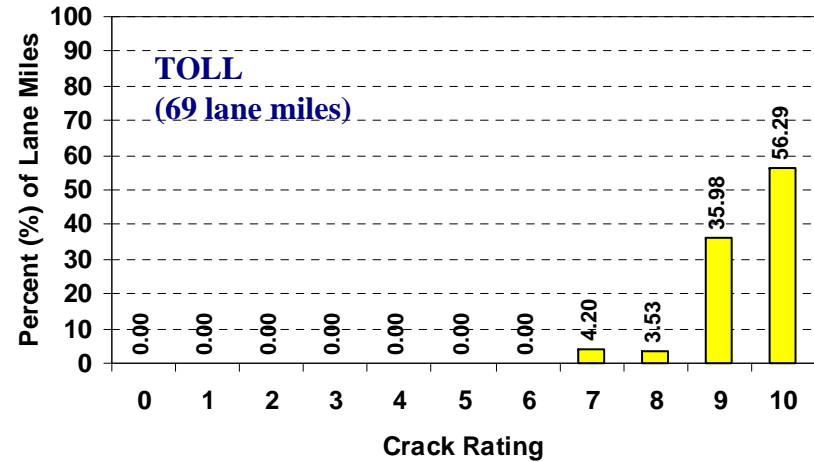
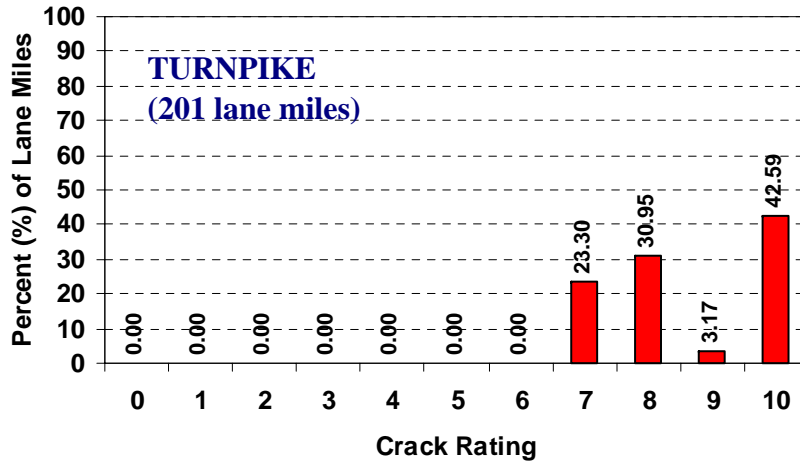
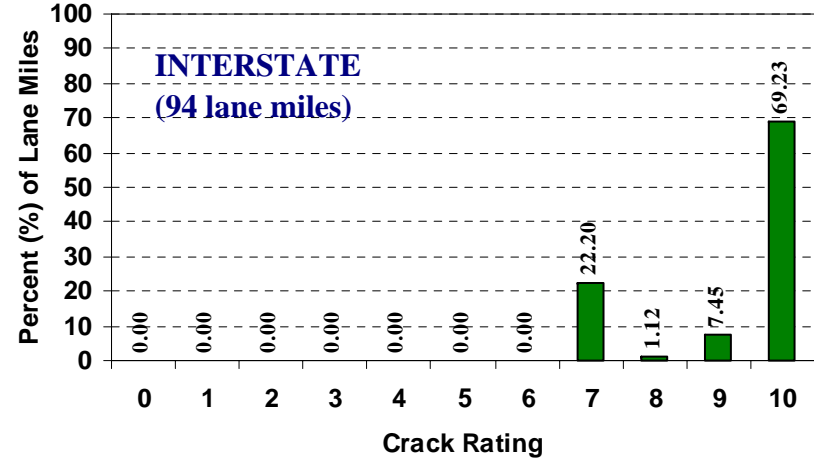
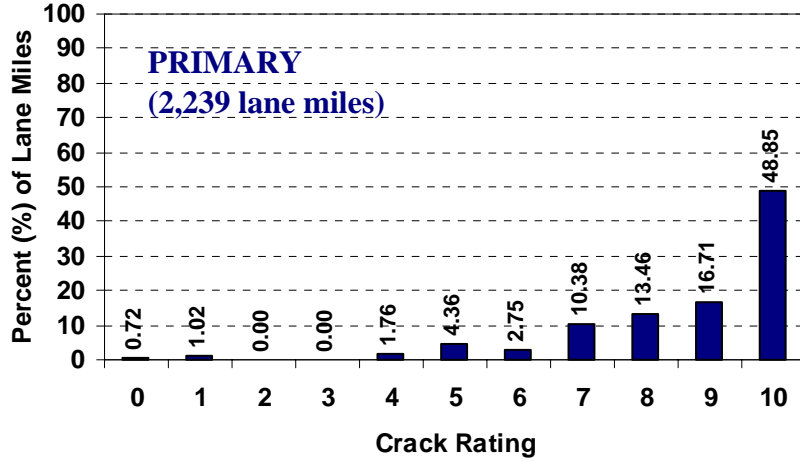
51



# 2004 Crack Distribution by System

## District 6

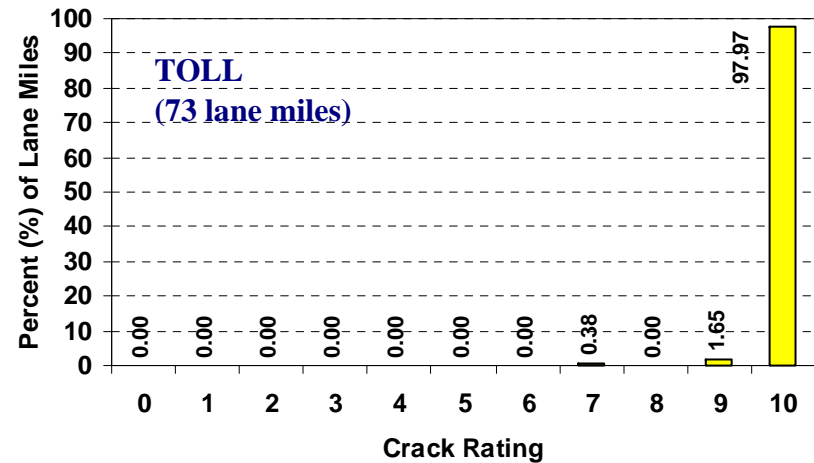
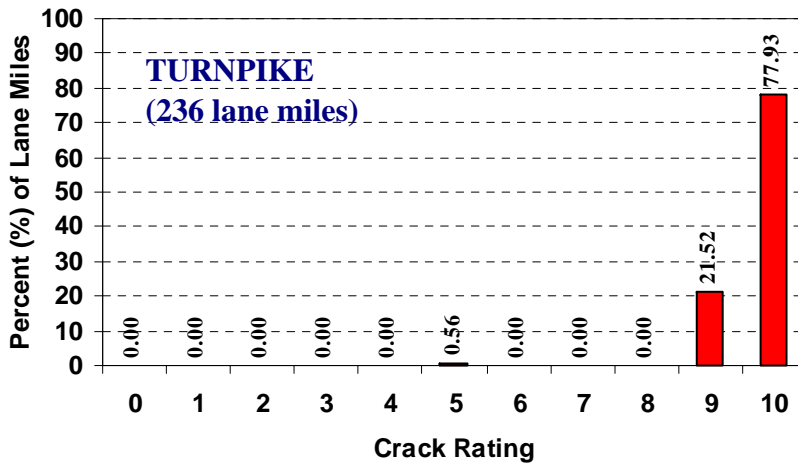
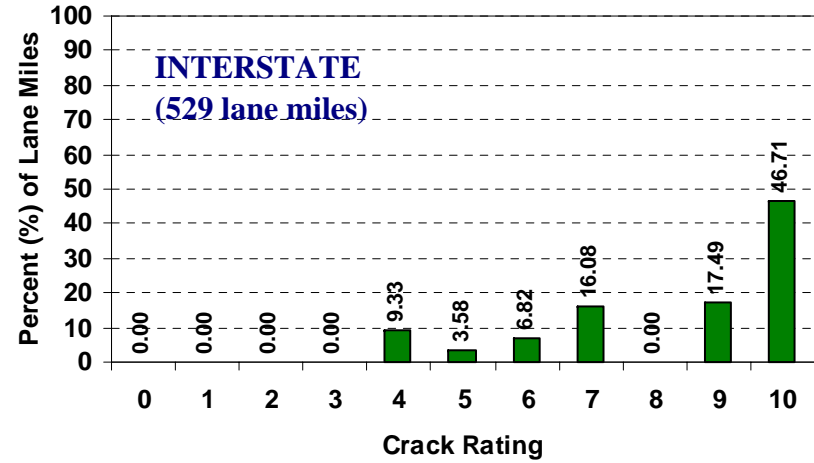
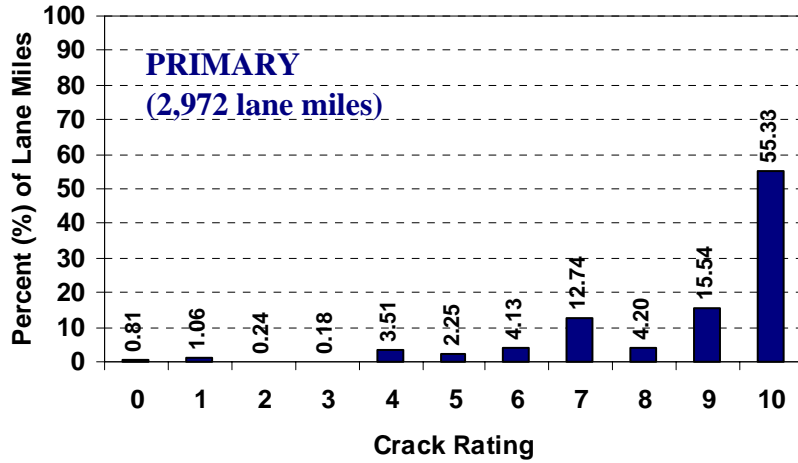
91



# 2004 Crack Distribution by System

## District 7

L1







# **SECTION III**

## **RUT RATING**

**BY**

**SYSTEM AND DISTRICT**



## SECTION III

### Rut Rating by System and District

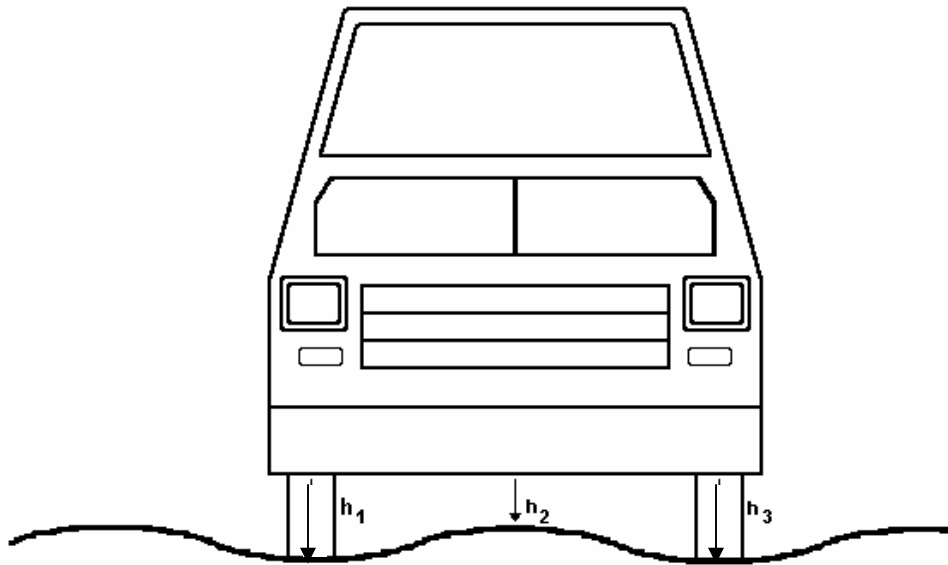
#### Rut Rating Criteria

- A Rut is a continuous longitudinal depression deviating from a surface plane defined by transverse cross slope and longitudinal profile. This depression normally occurs in the wheel path.
- A Rut Depth is defined herein as the difference in elevations between the center of the wheel path and the center of the travel lane.
- Rut Depth is measured simultaneously with the Ride values using a roadway profiler. See illustration on next page.
- The profiler measures Rut Depth at a frequency of 30 readings per inch when traveling at 60 mph. The measurements are then stored on 6 inch intervals for the survey.
- The average Rut Depth for both wheel paths is recorded and then converted to a one point deduct for every eighth (1/8) of an inch.
- Rut Depth is rated on a 0 to 10 scale, where a 10 represents a pavement with no rutting, while a 6 indicates 1/2 inch of rutting. Currently, pavement sections with ratings of 6 or less are eligible for rehabilitation.
- Rut Depth for each measurement is calculated using the following equation:

$$\text{Rut Depth} = \frac{(h_1 - h_2) + (h_3 - h_2)}{2}$$

Where:  $h_1$ ,  $h_2$ , and  $h_3$ , are the respective distances between the sensor locations and the roadway surface directly below each sensor. See diagram on next page.

# ROAD PROFILER

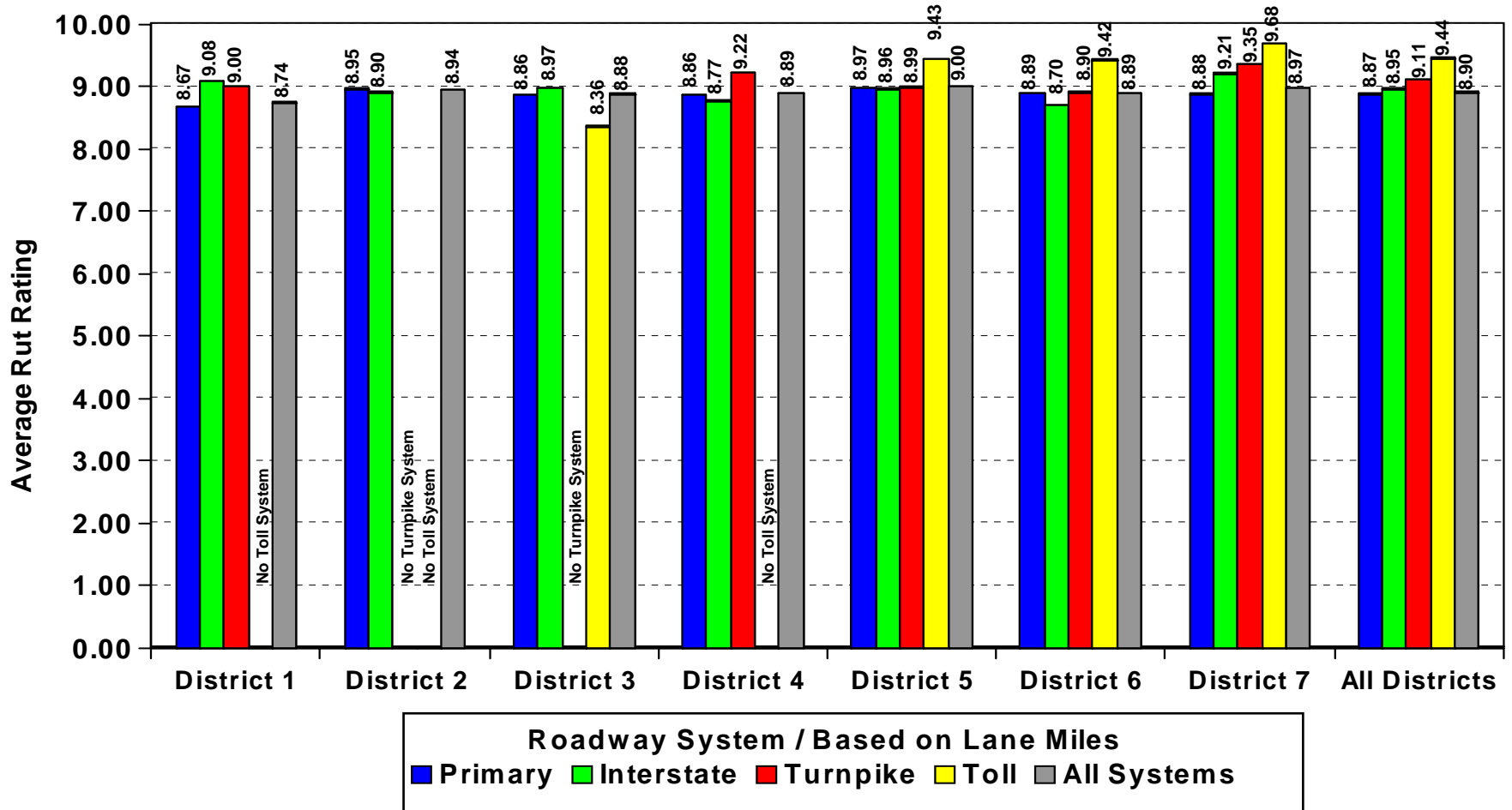


**FRONT VIEW**

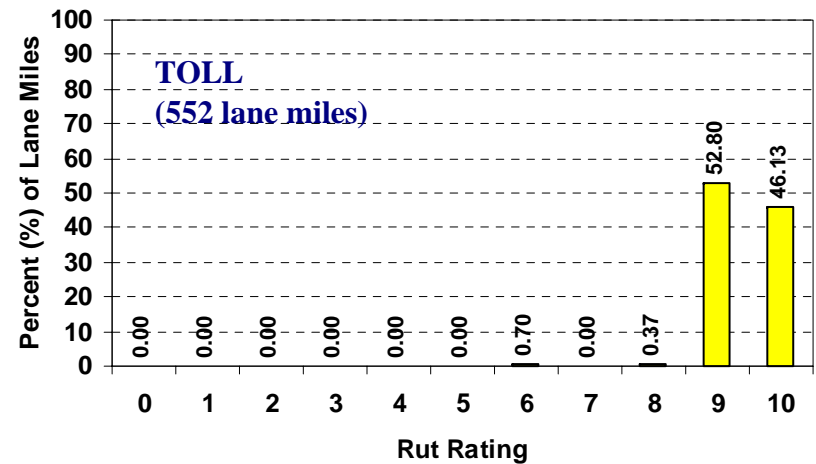
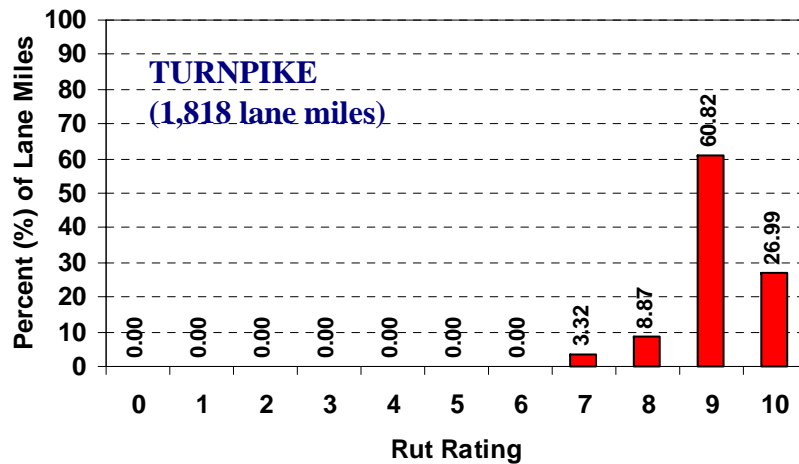
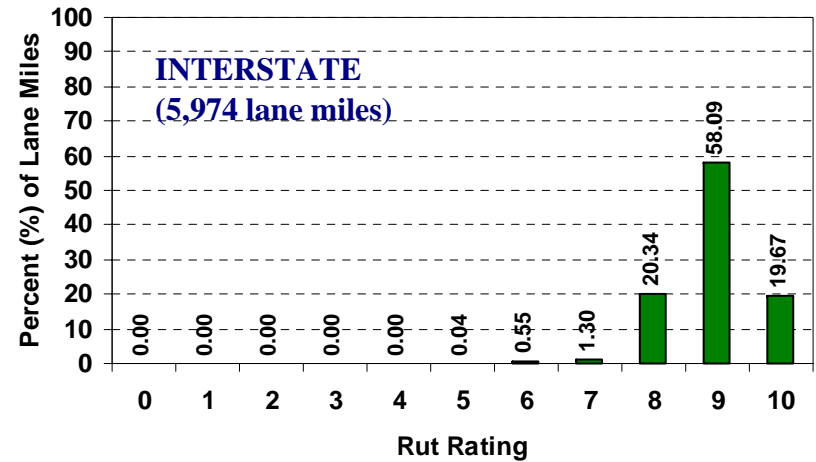
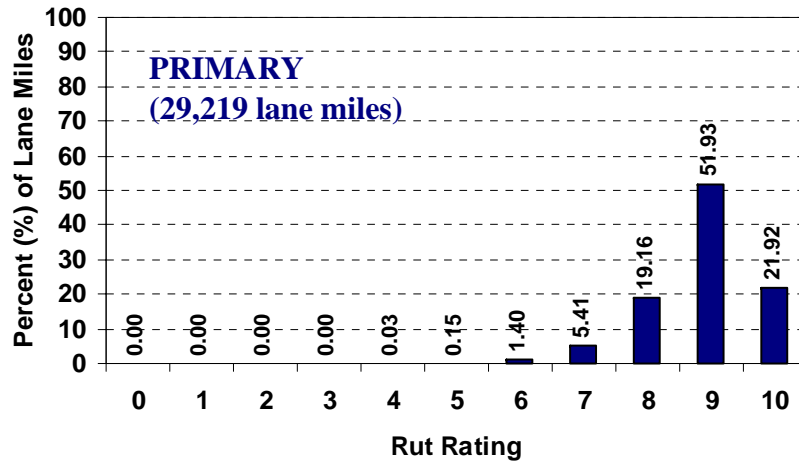
$$\text{Rut Depth} = \frac{(h_1 - h_2) + (h_3 - h_2)}{2}$$

The Profiler has three sensors (to measure ride and rut), combined with two accelerometers and a data acquisition system (computer) that monitors the pavement's longitudinal and transverse profiles while in motion.

# 2004 Rut Rating by System and District

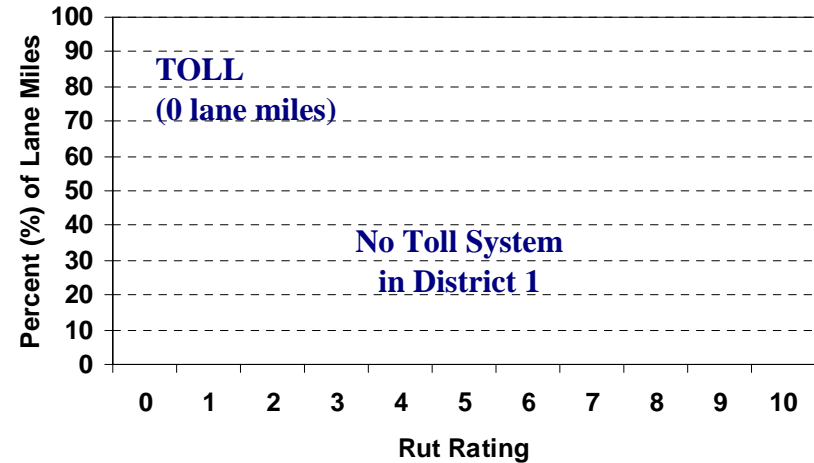
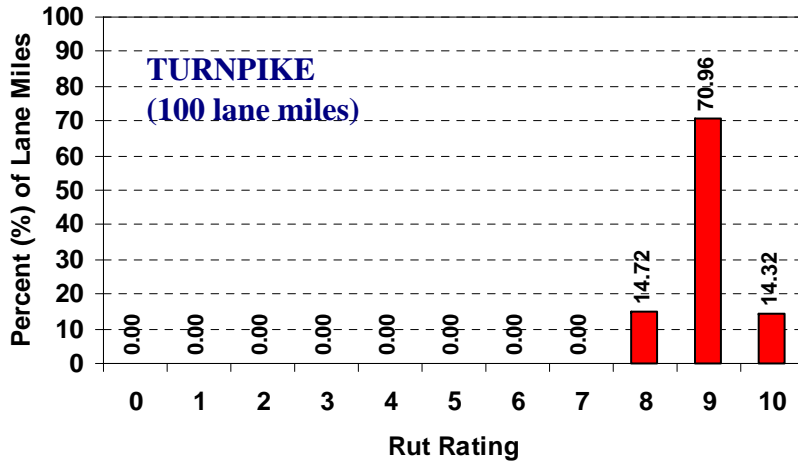
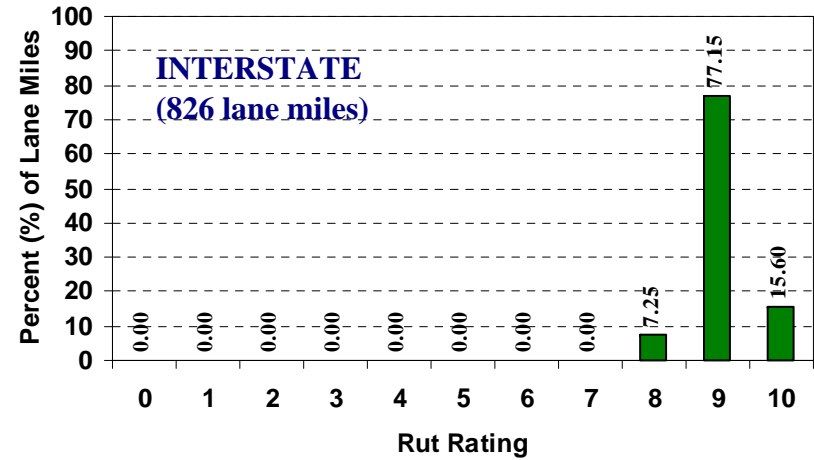
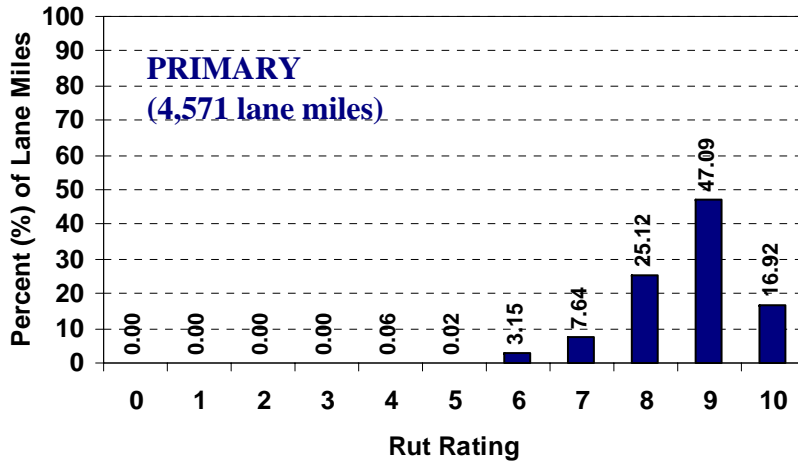


# 2004 Rut Distribution by System Statewide



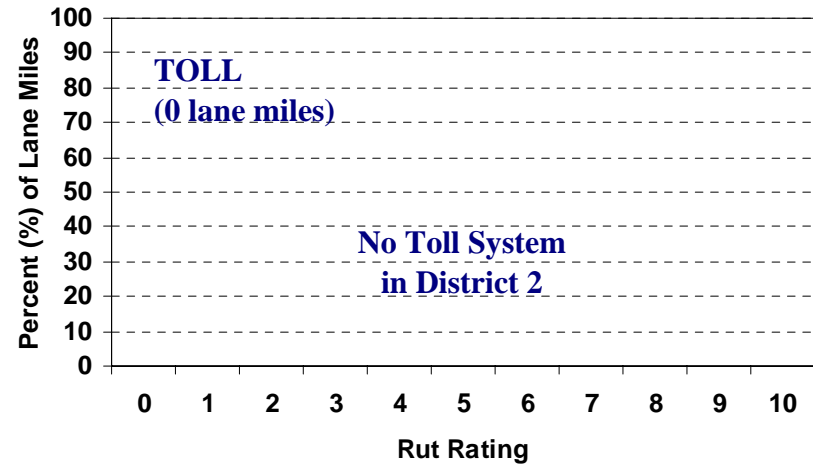
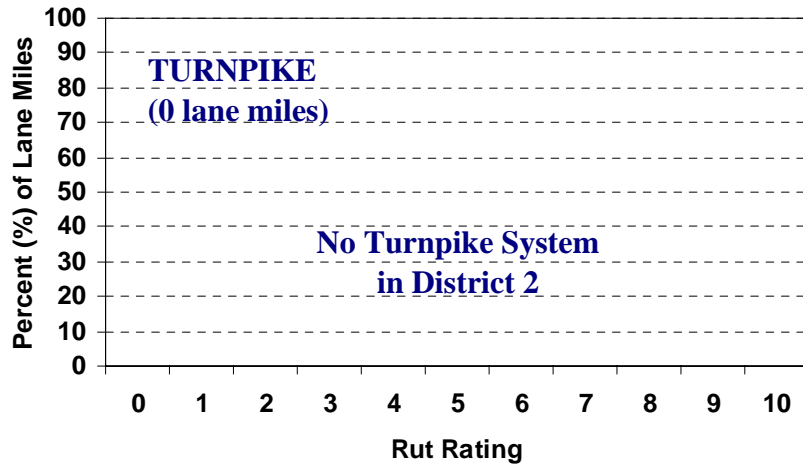
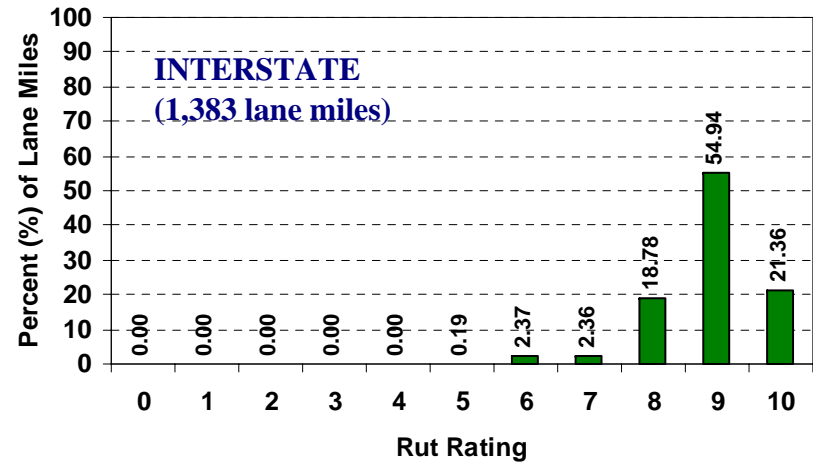
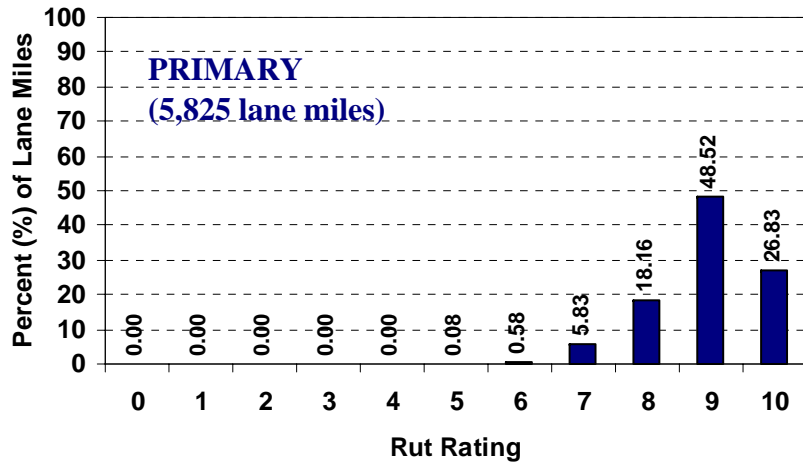
# 2004 Rut Distribution by System

## District 1



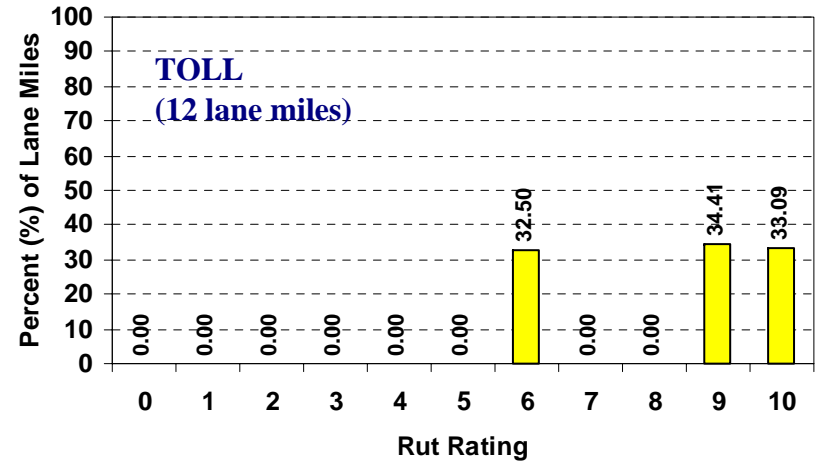
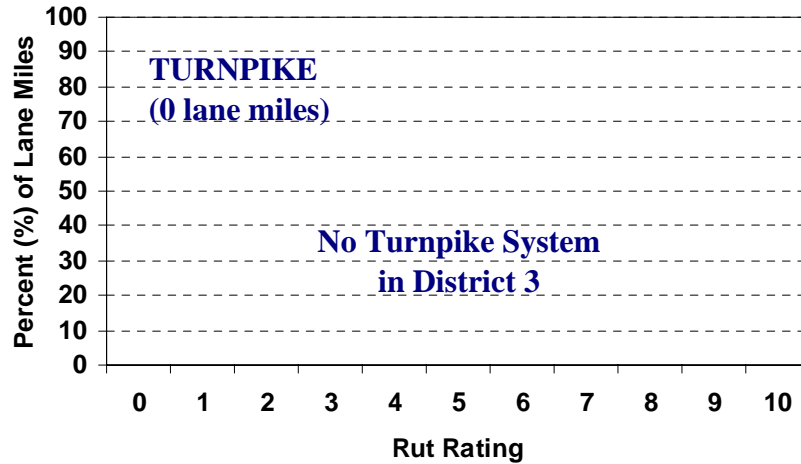
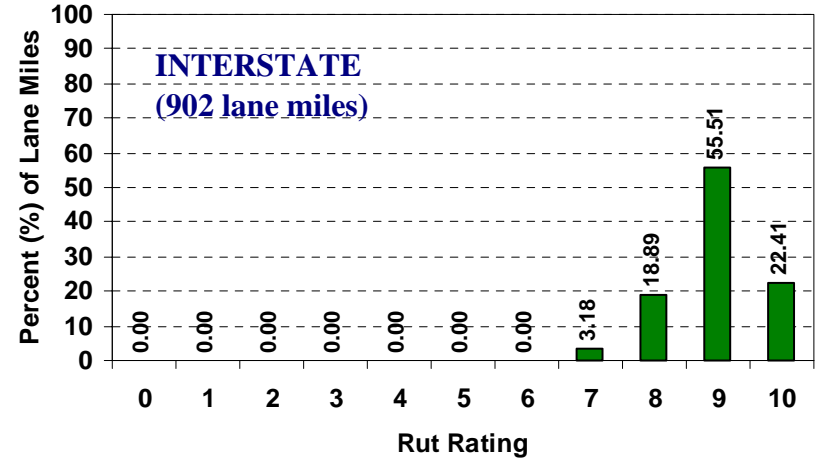
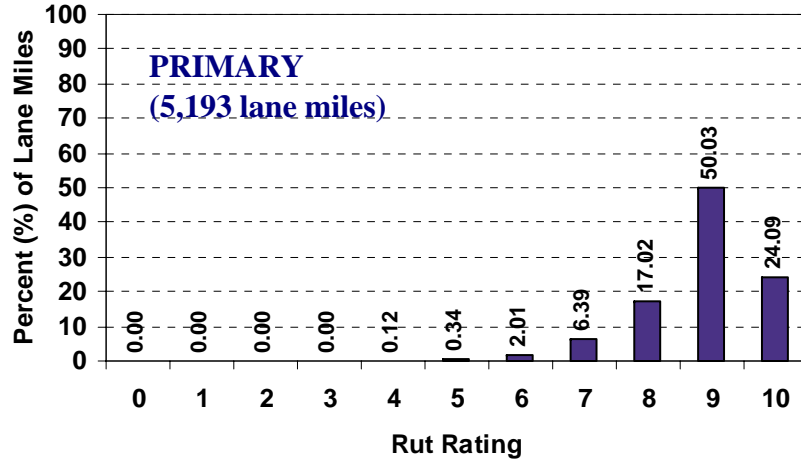
# 2004 Rut Distribution by System

## District 2



# 2004 Rut Distribution by System

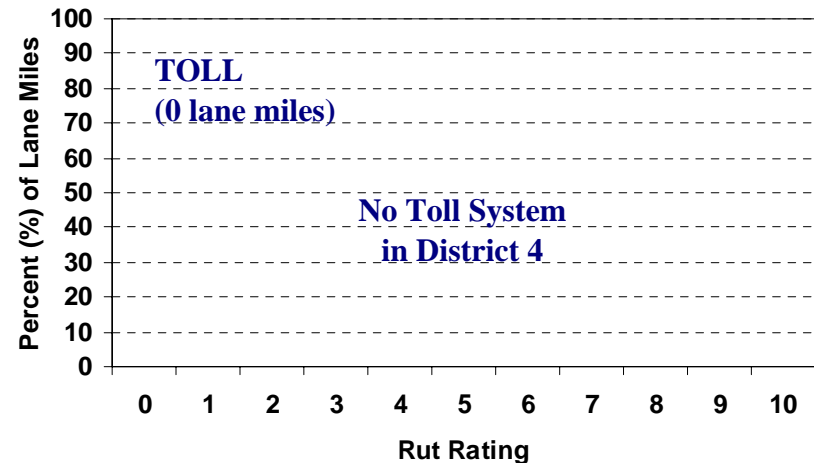
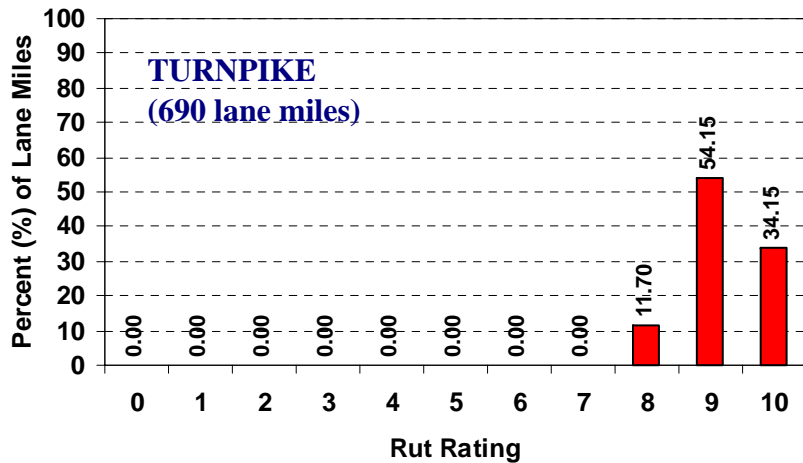
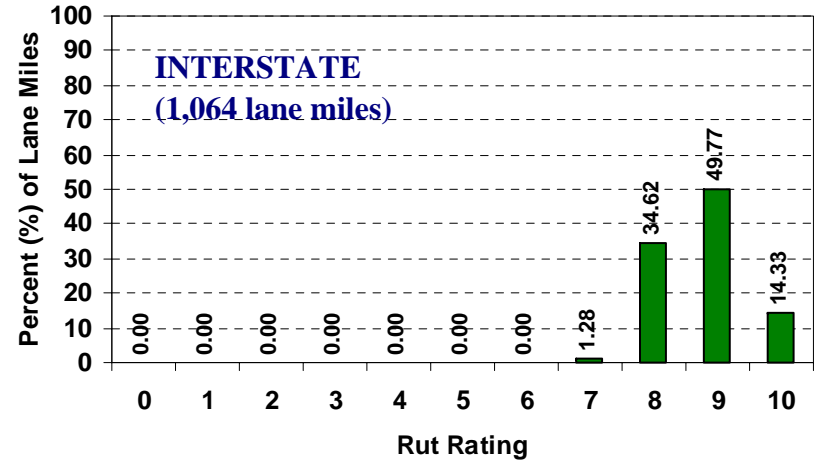
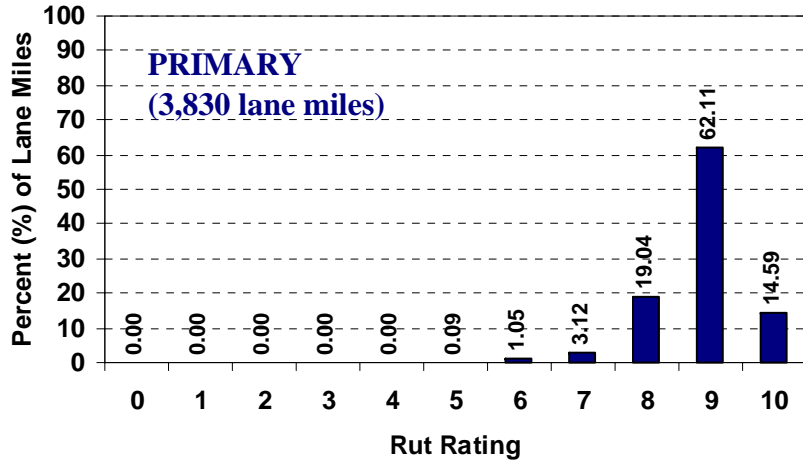
## District 3





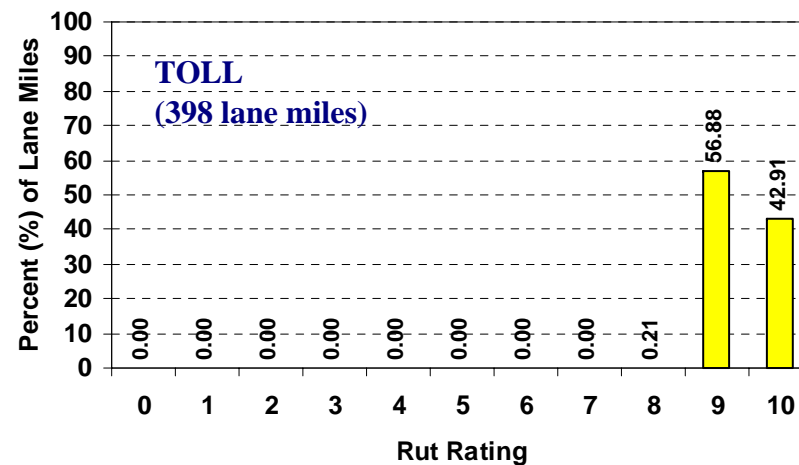
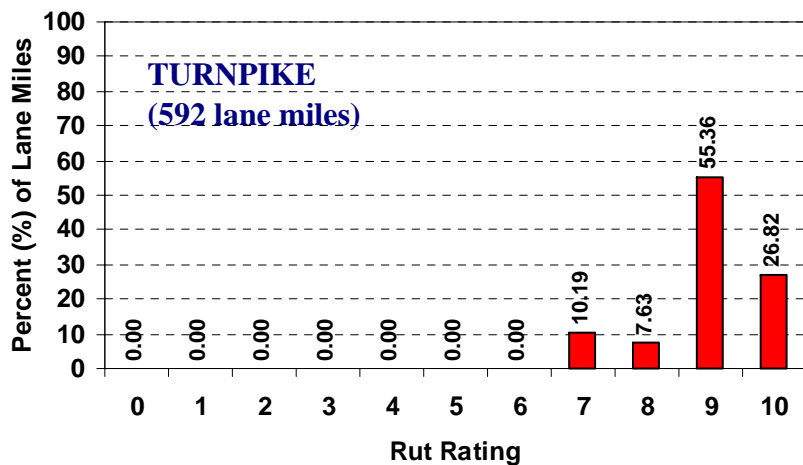
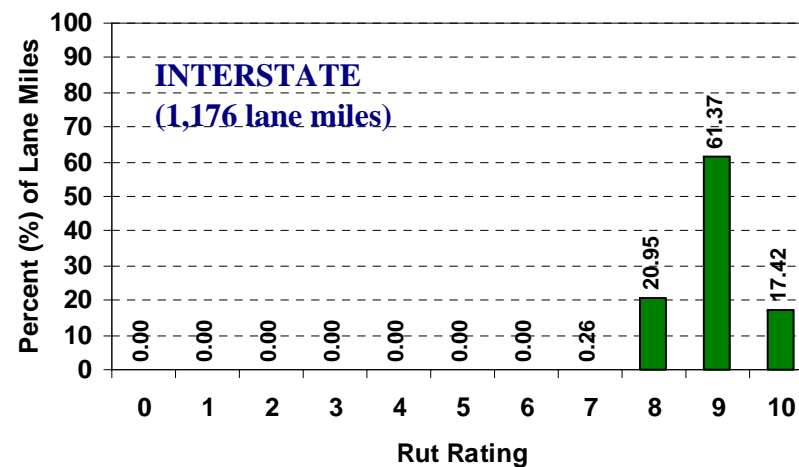
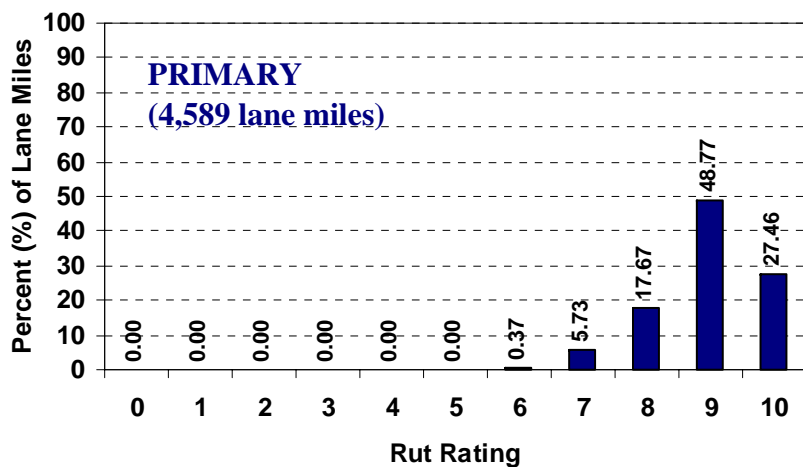
# 2004 Rut Distribution by System

## District 4



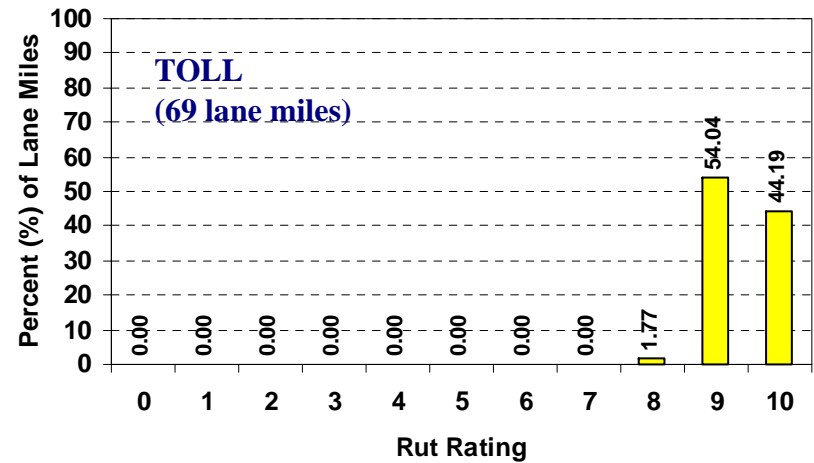
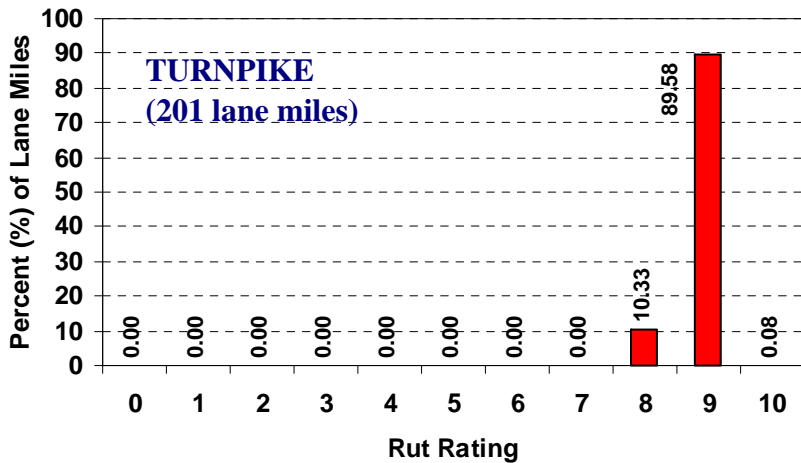
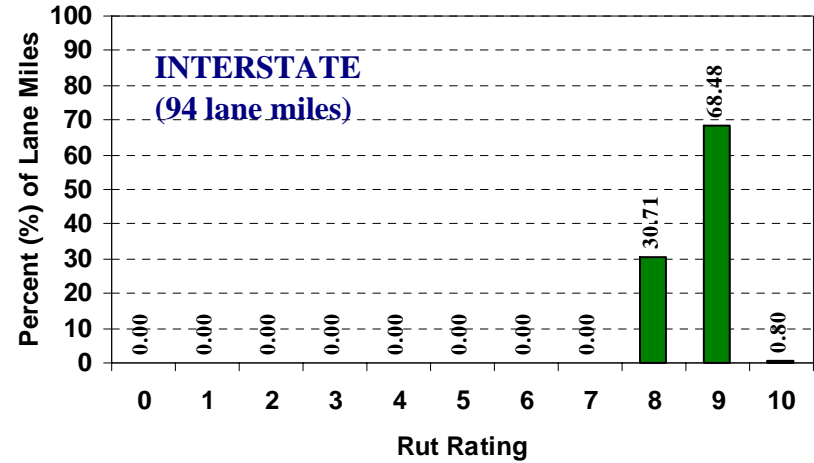
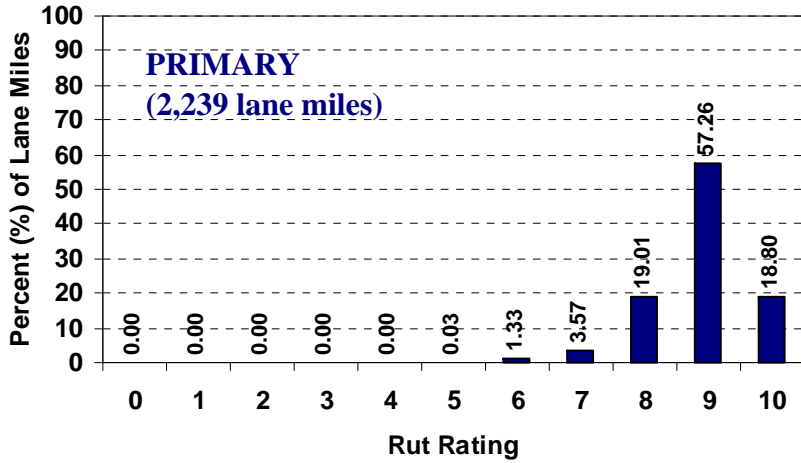
# 2004 Rut Distribution by System

## District 5



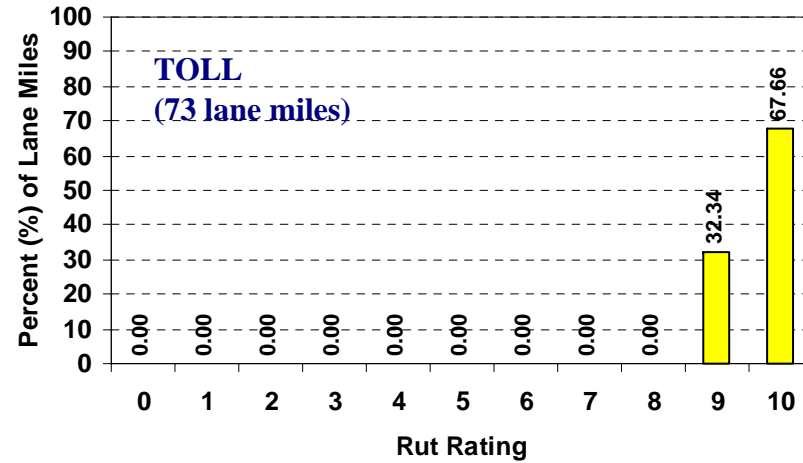
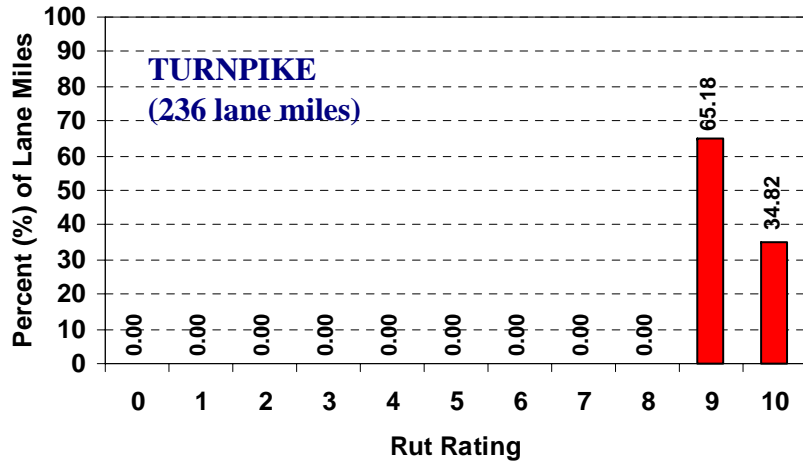
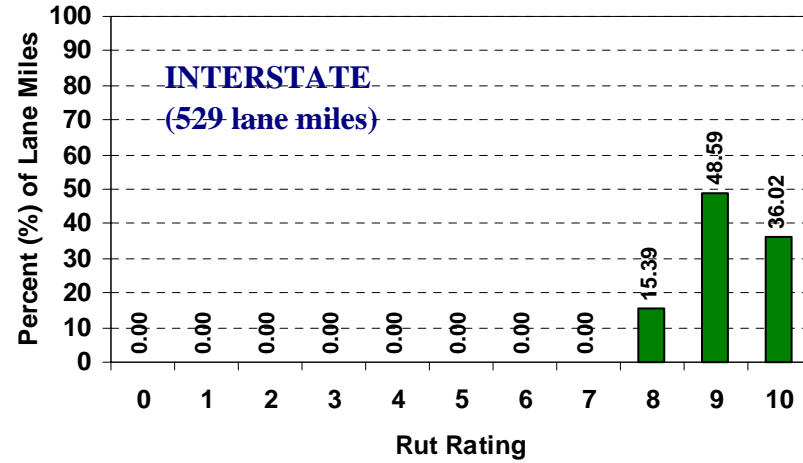
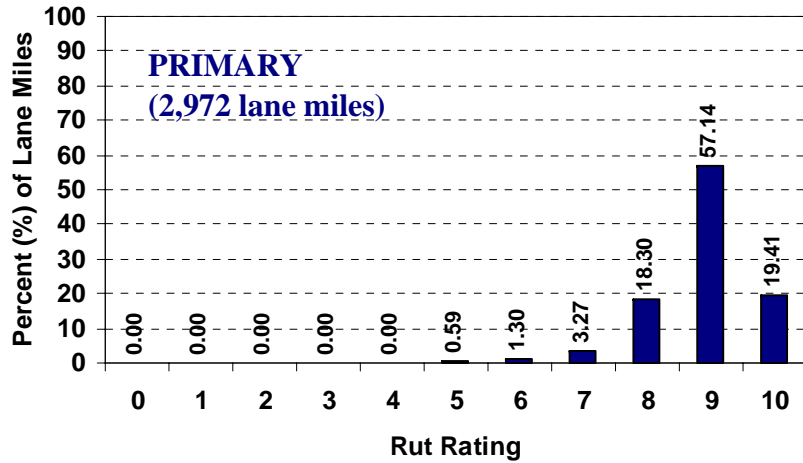
# 2004 Rut Distribution by System

## District 6



# 2004 Rut Distribution by System

## District 7



# SECTION IV

## RIDE RATING

BY

SYSTEM AND DISTRICT



## SECTION IV

### Ride Rating by System and District

#### Ride Rating Criteria

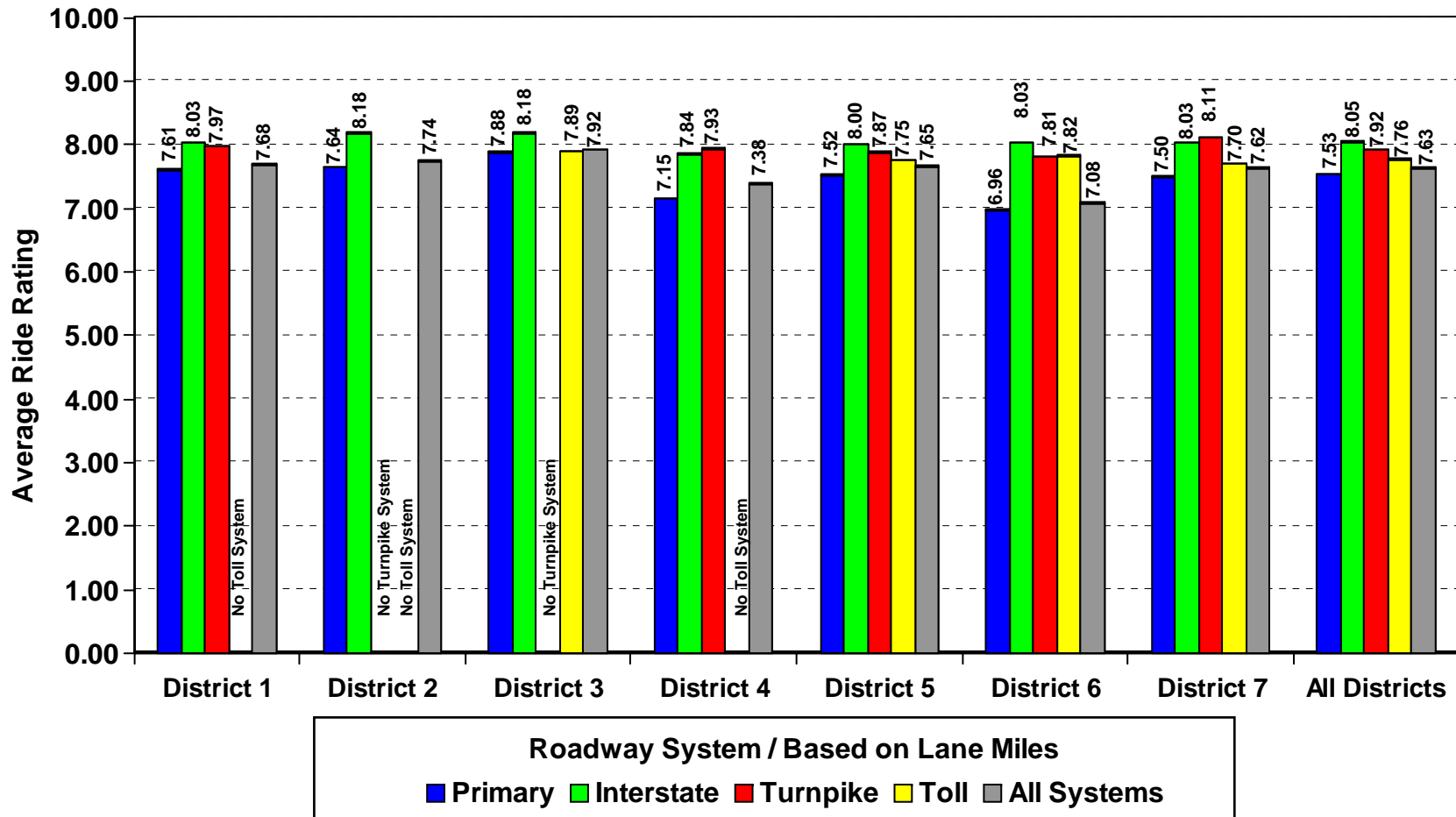
- Ride Ratings measure the ride quality of a pavement section. It is an indication of the degree of smoothness or roughness of the wearing surface.
- Ride Ratings are calculated from Ride Number (ASTM E-1489).

Ride Number x 2 = Ride Rating

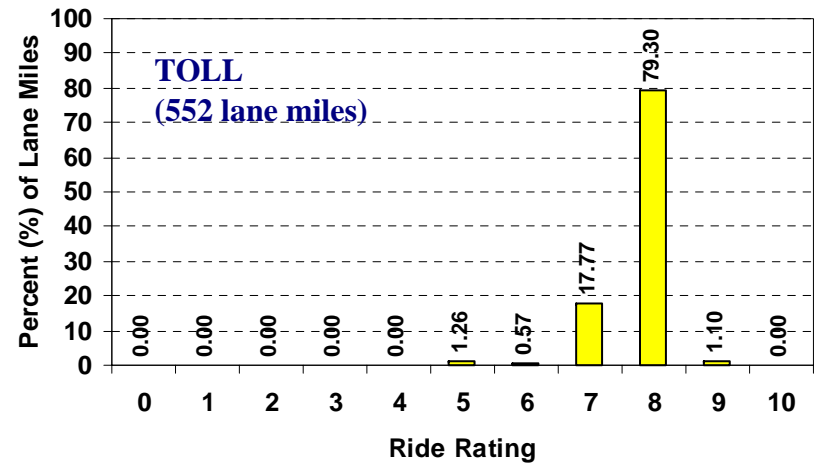
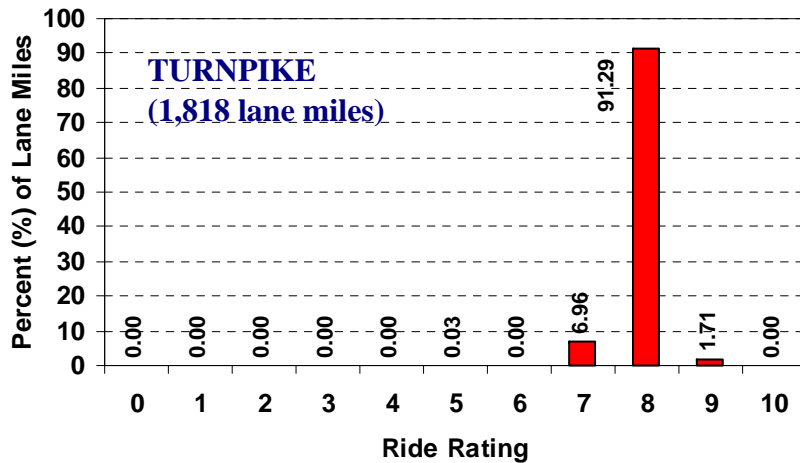
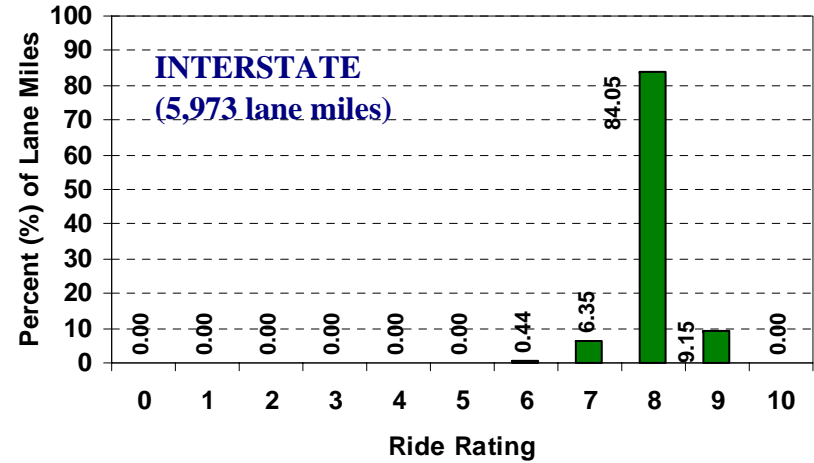
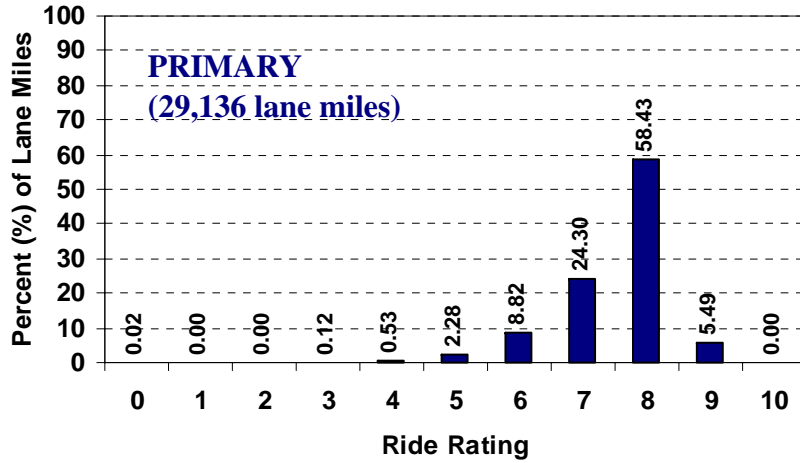
Ride Number is a mathematical processing of longitudinal profile measurements to produce an estimate of a drivers subjective perception of the ride quality of a roadway. The Ride Number is based on an algorithm published in National Cooperative Highway Research Project (NCHRP) 1-23. Ride Number is defined in ASTM Standard E-1489.

- Rideability is greatly affected by factors that include the following:
  - ▶ Original pavement profile
  - ▶ Profiles from intersecting roads
  - ▶ Utility patches and manhole covers, and
  - ▶ Surface and structural deterioration
- Ride deficiency is rated on a 0 to 10 scale, where 10 represents a pavement with no roughness while ratings of 6 or less represent a pavement with an undesirable ride quality.
- Please note that with the start of the 2004 PCS the profile data was collected using a new sampling rate of 6 inch intervals.

# 2004 Ride Rating by System and District



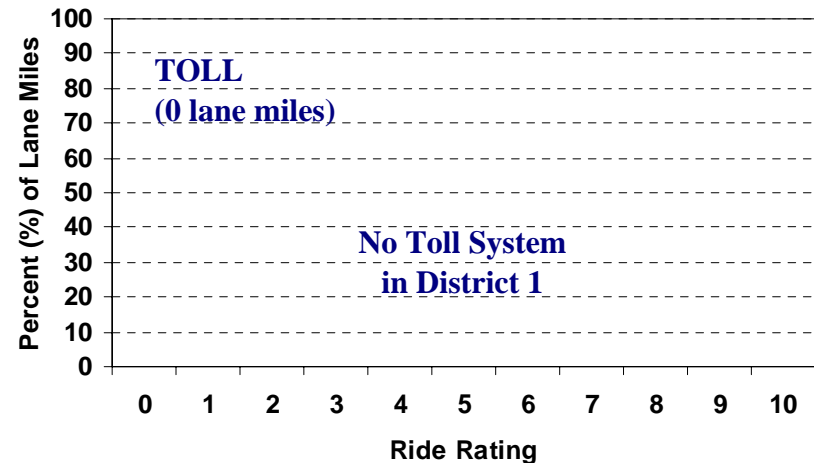
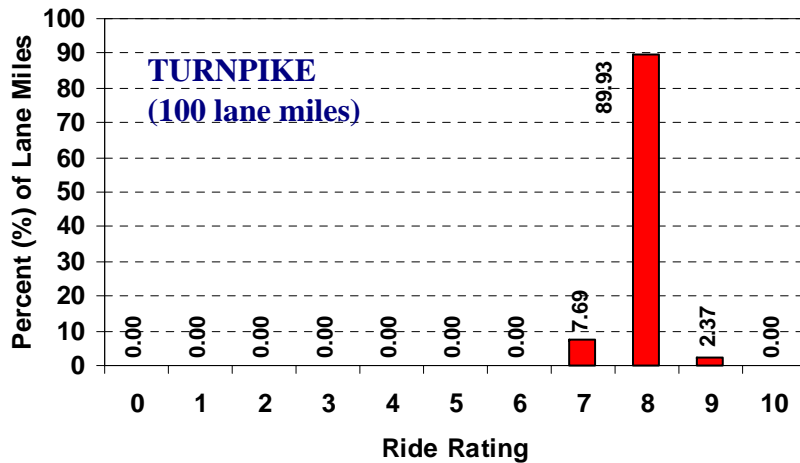
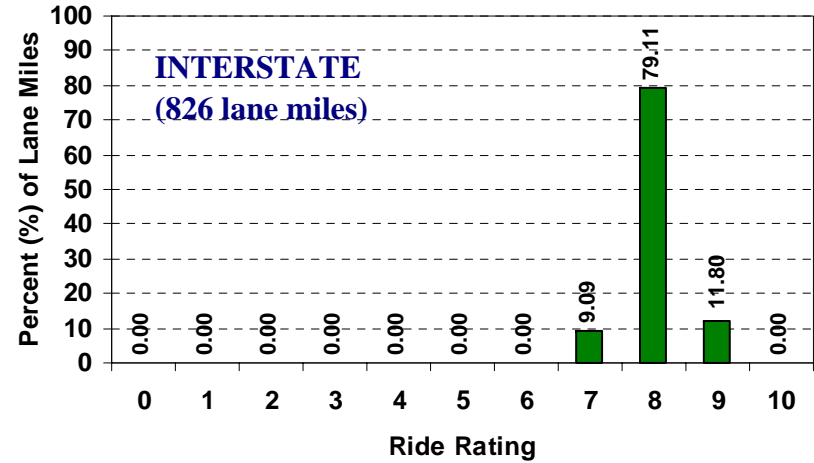
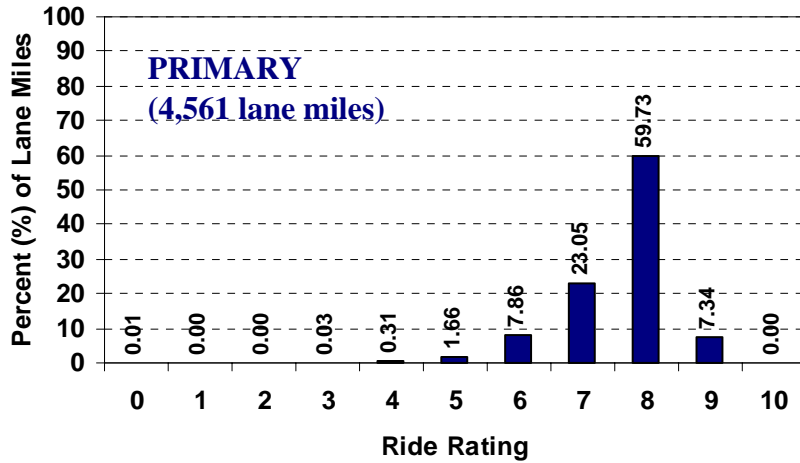
# 2004 Ride Distribution by System Statewide





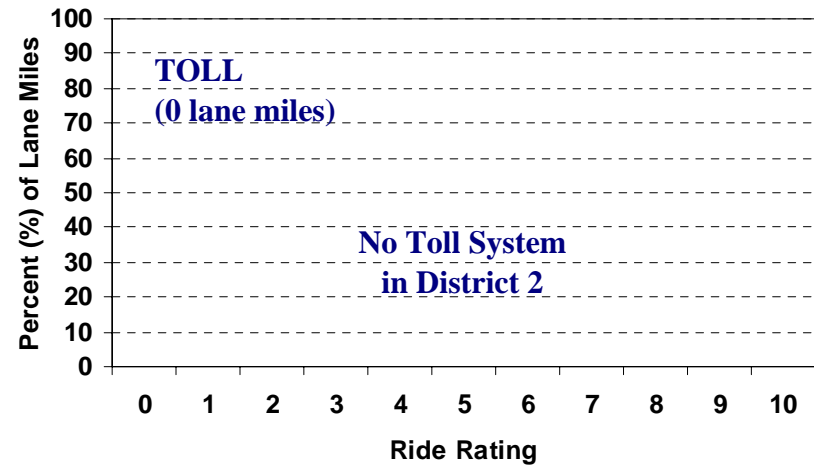
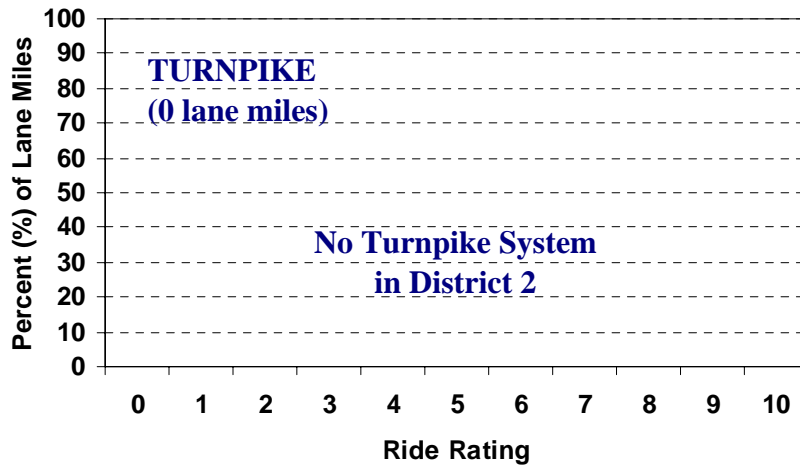
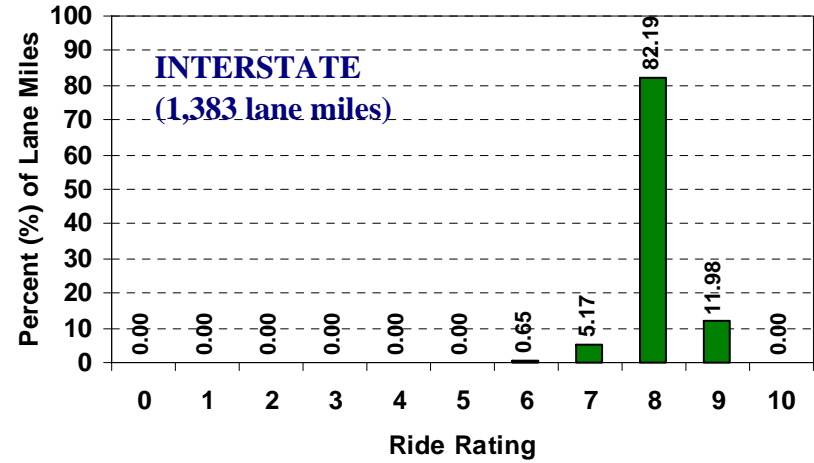
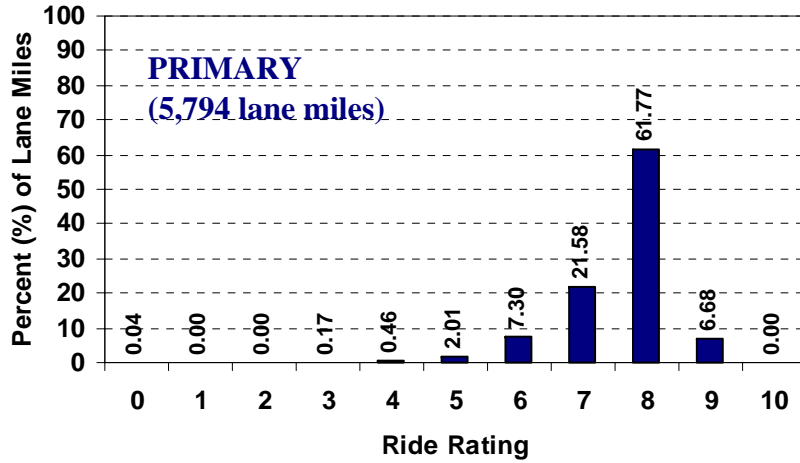
# 2004 Ride Distribution by System

## District 1



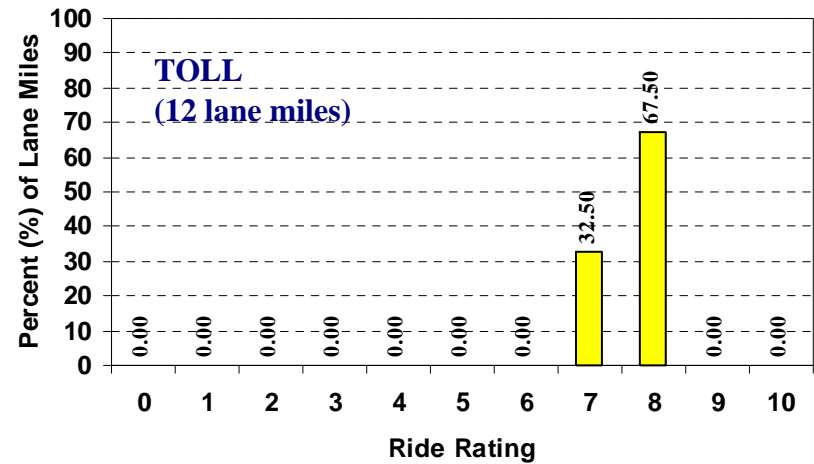
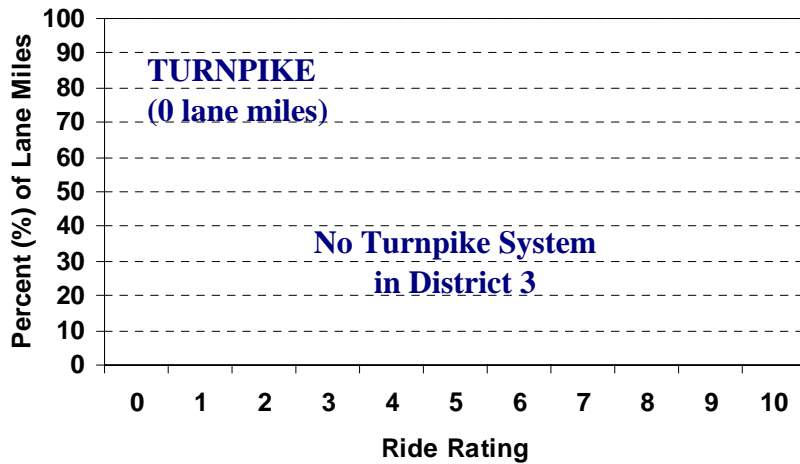
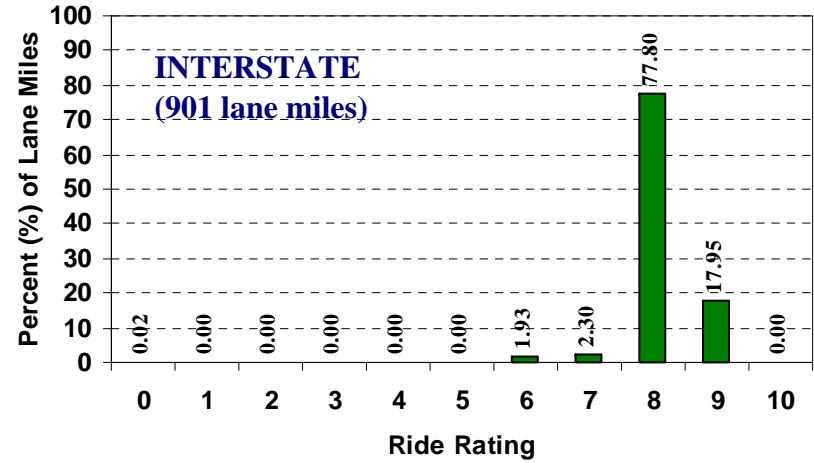
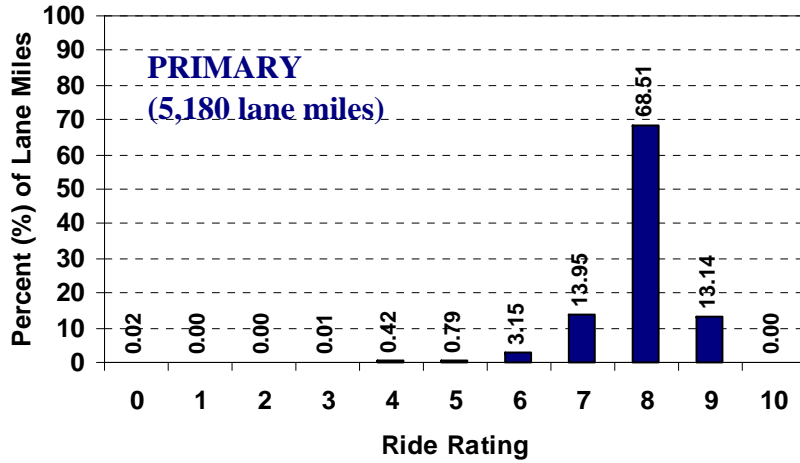
# 2004 Ride Distribution by System

## District 2



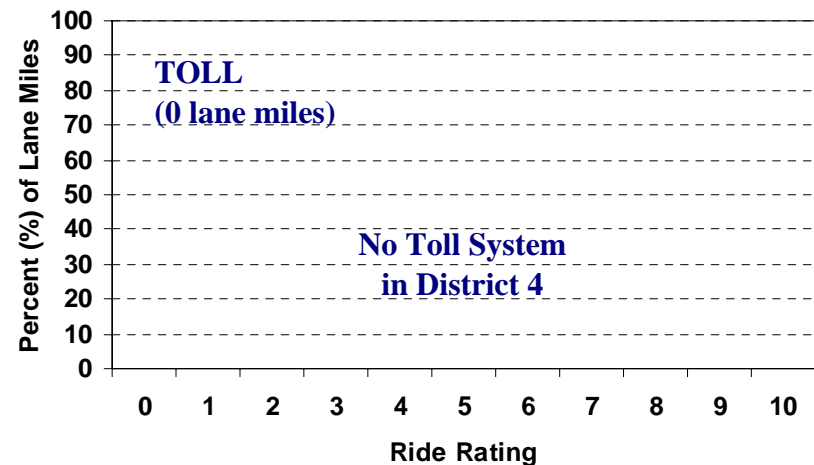
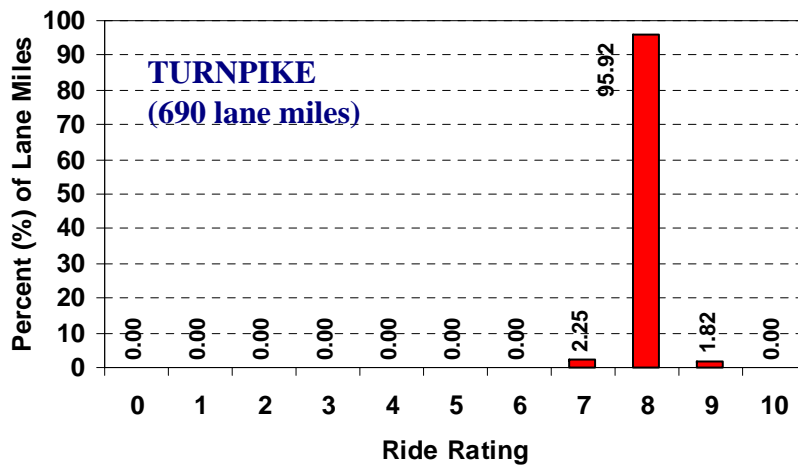
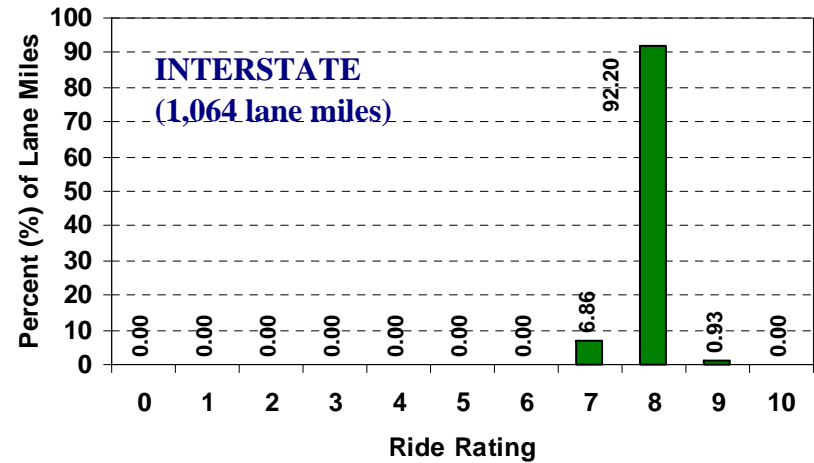
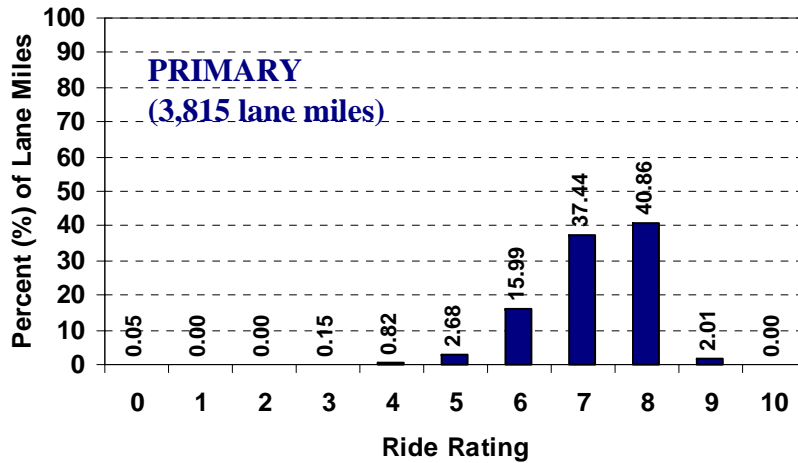
# 2004 Ride Distribution by System

## District 3



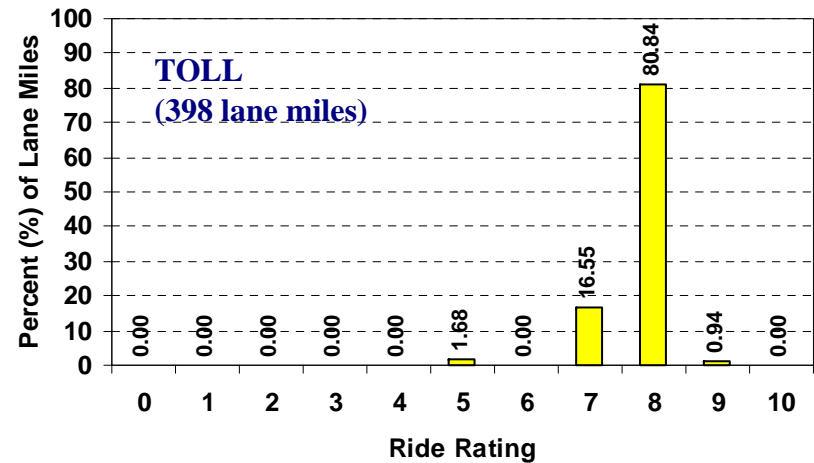
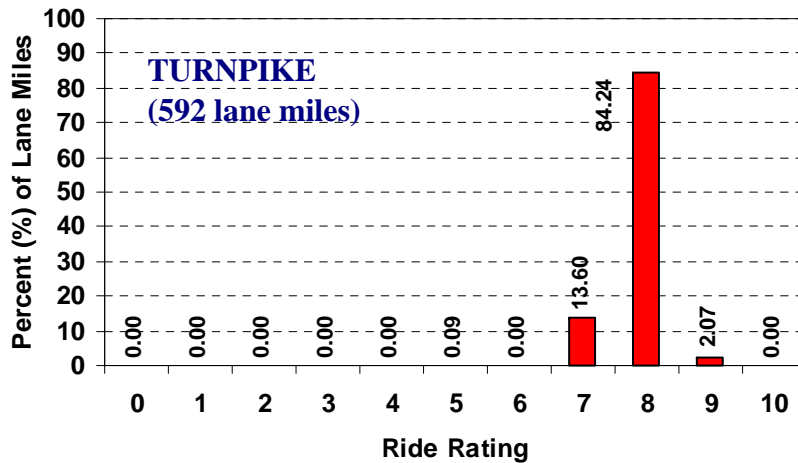
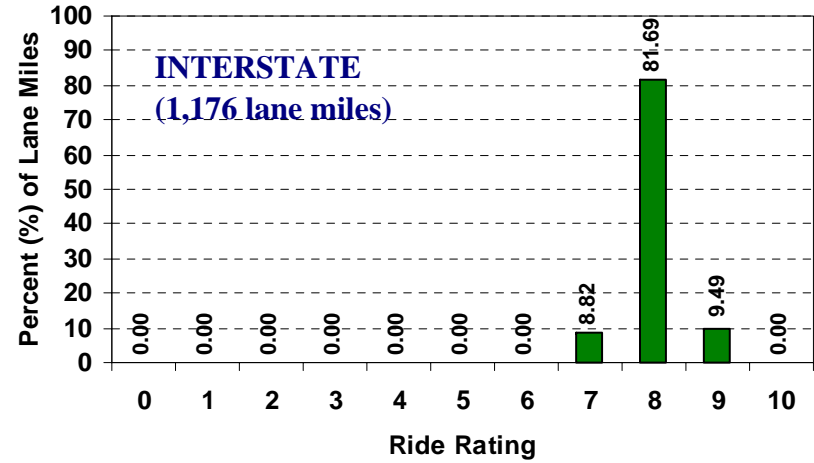
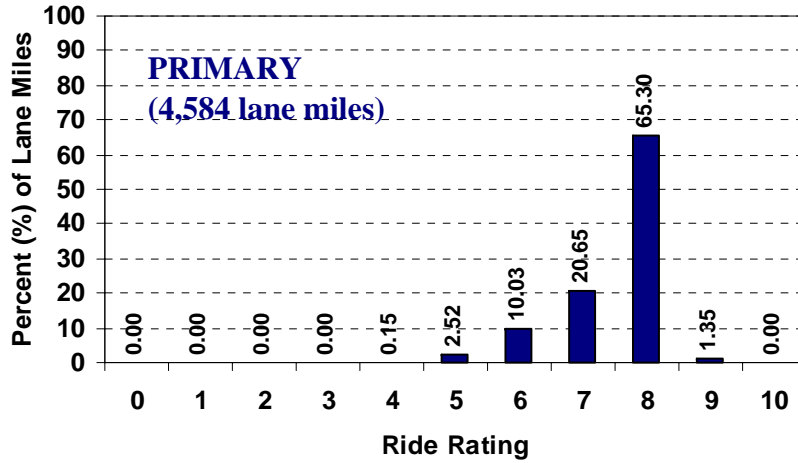
# 2004 Ride Distribution by System

## District 4



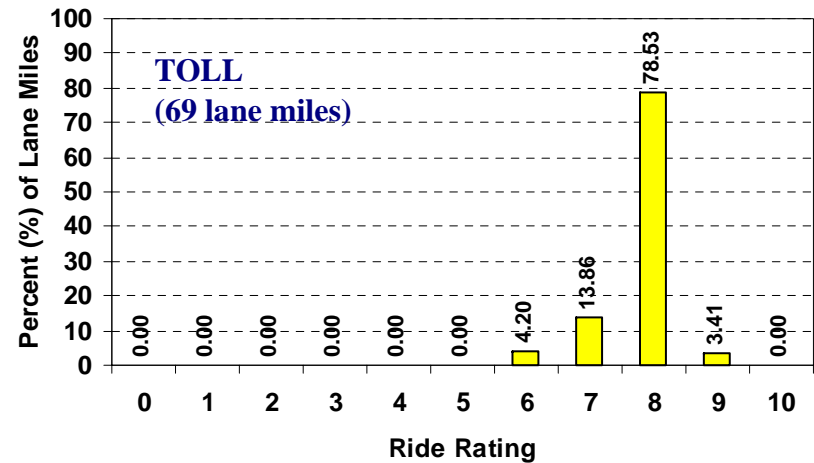
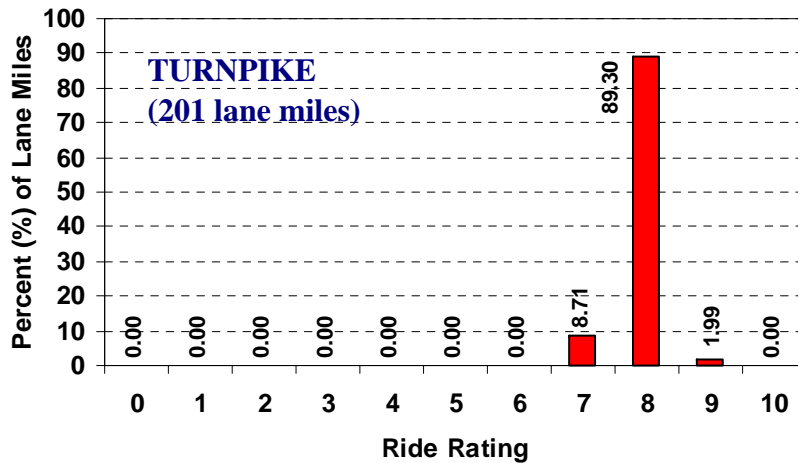
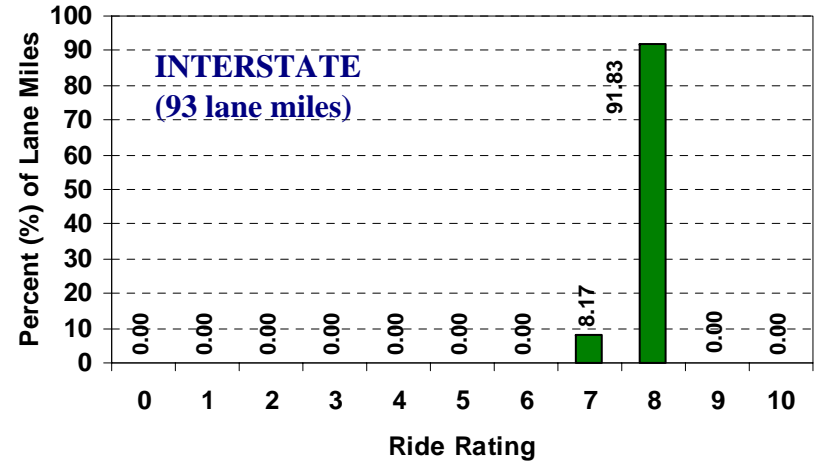
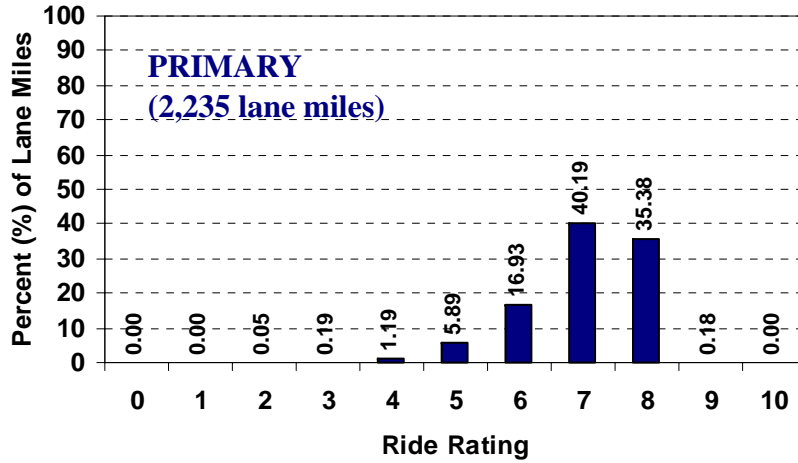
# 2004 Ride Distribution by System

## District 5



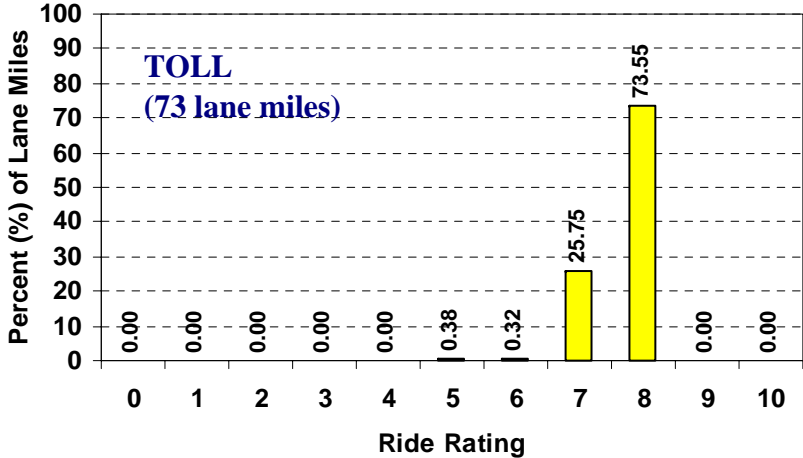
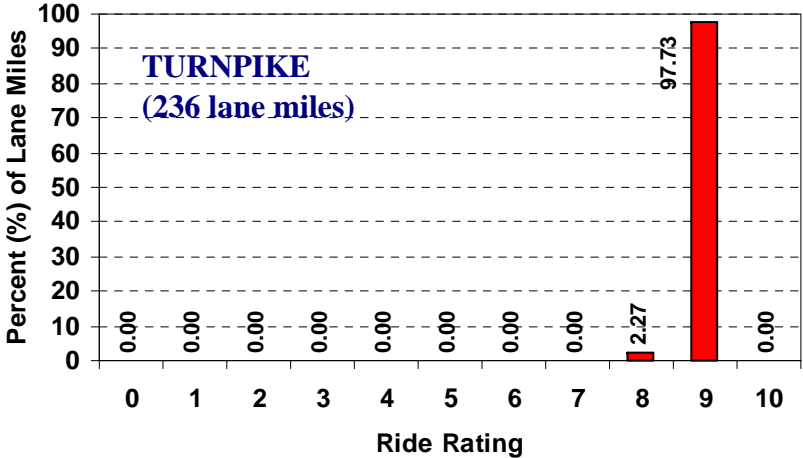
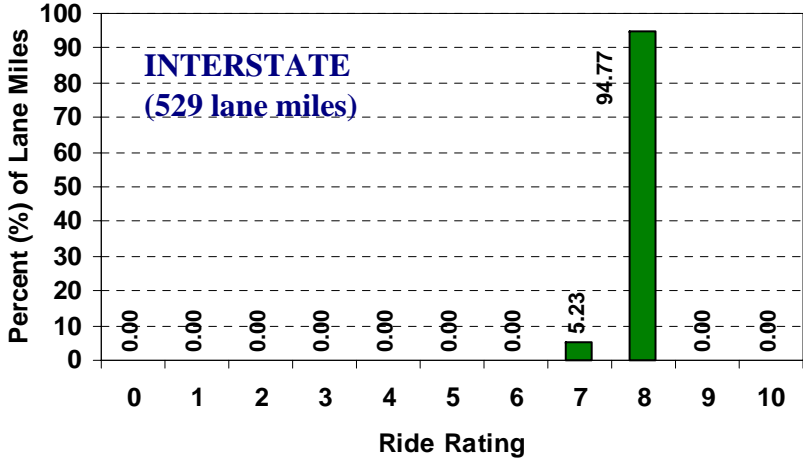
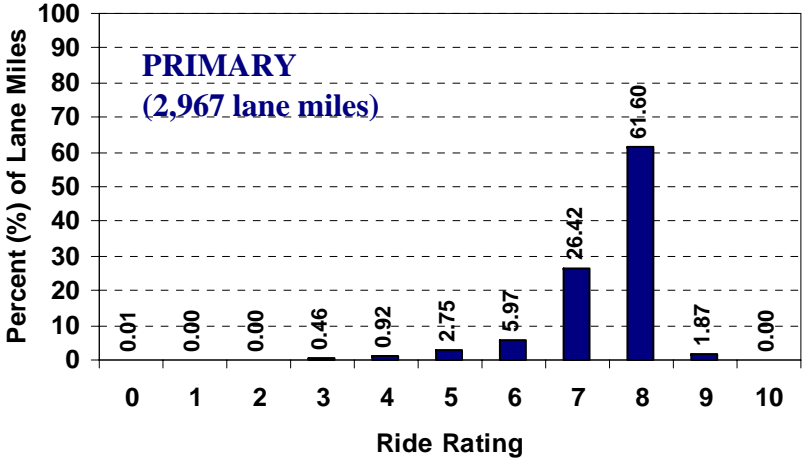
# 2004 Ride Distribution by System

## District 6



# 2004 Ride Distribution by System

## District 7







**SECTION V**

**CRACK, RUT AND RIDE**

**DISTRIBUTIONS**

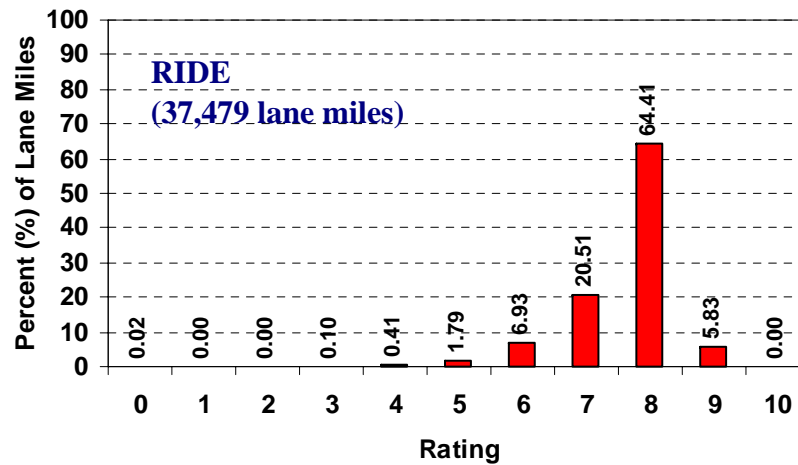
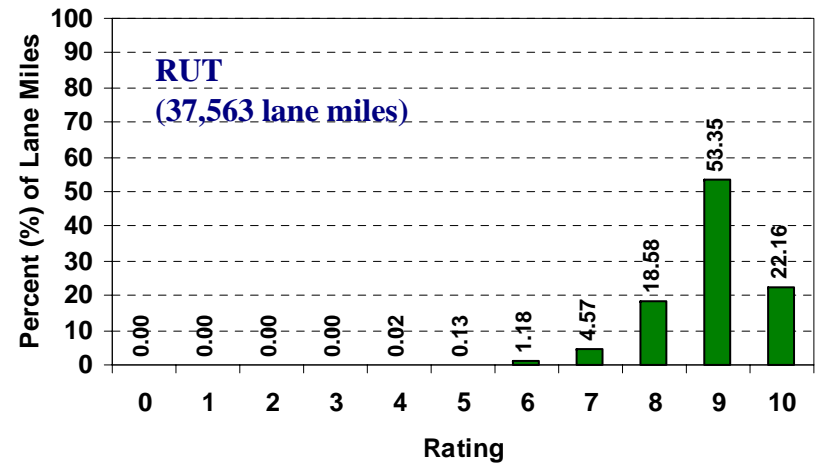
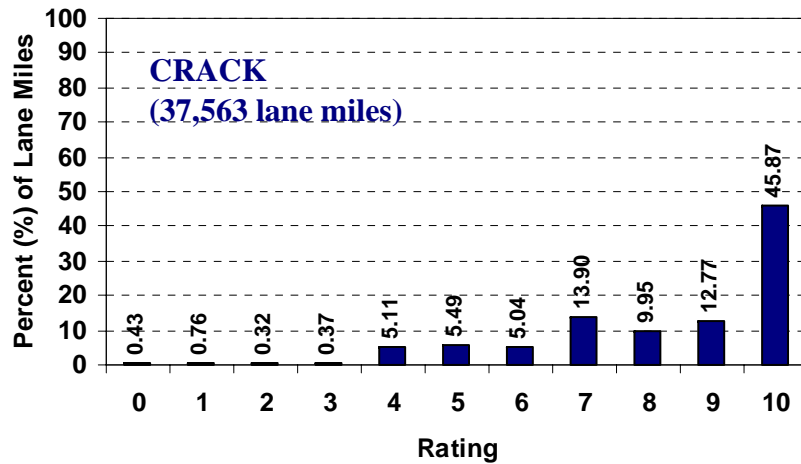
**BY**

**DISTRICT**

**(ALL SYSTEMS COMBINED)**

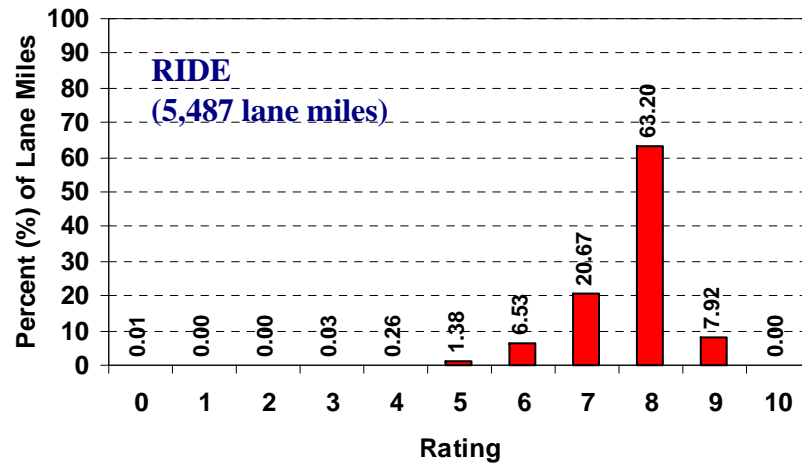
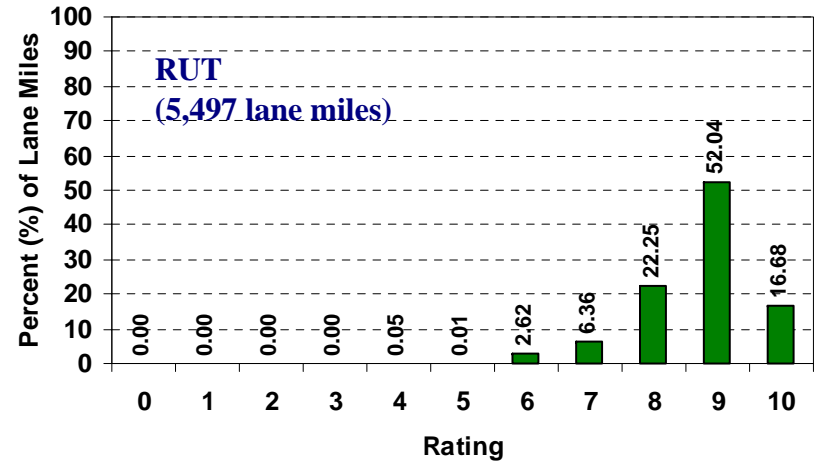
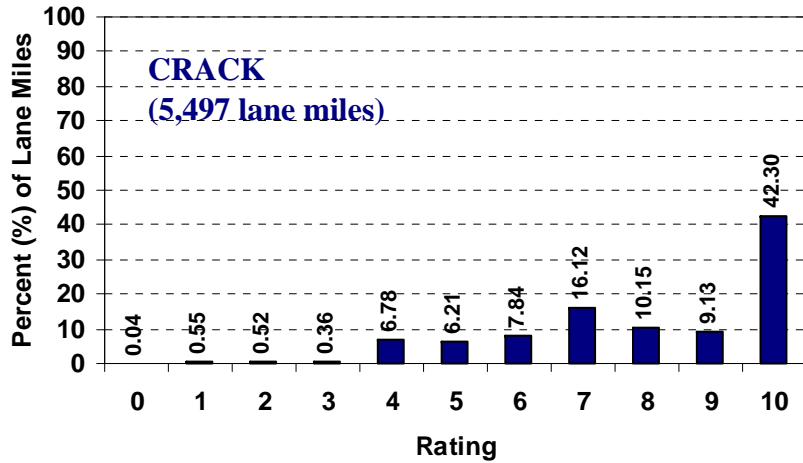


# 2004 Crack, Rut and Ride Distribution Statewide (All Systems)



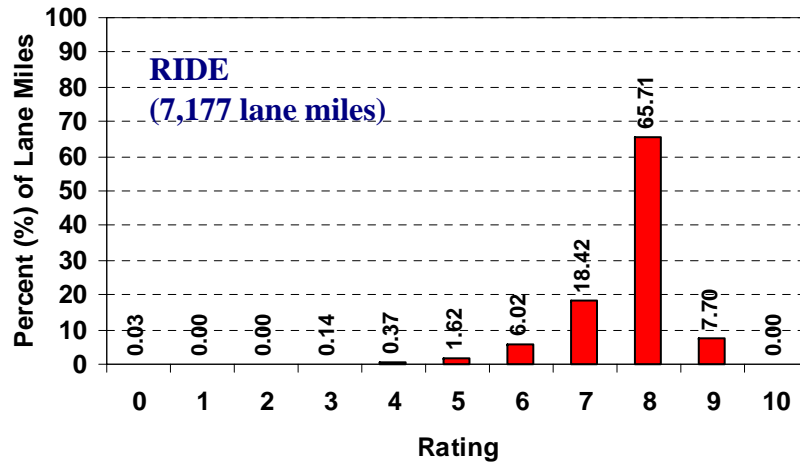
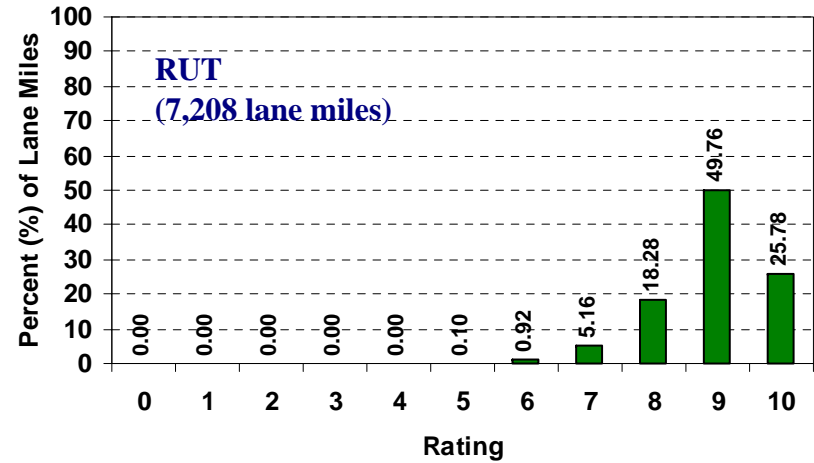
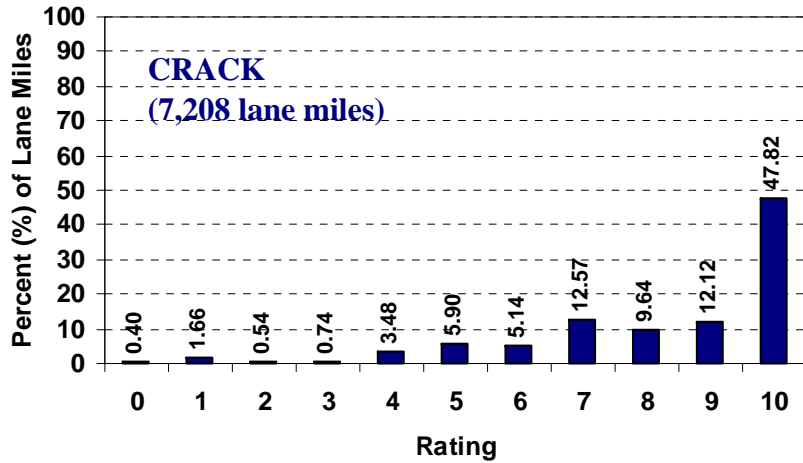
# 2004 Crack, Rut and Ride Distribution

## District 1 (All Systems)



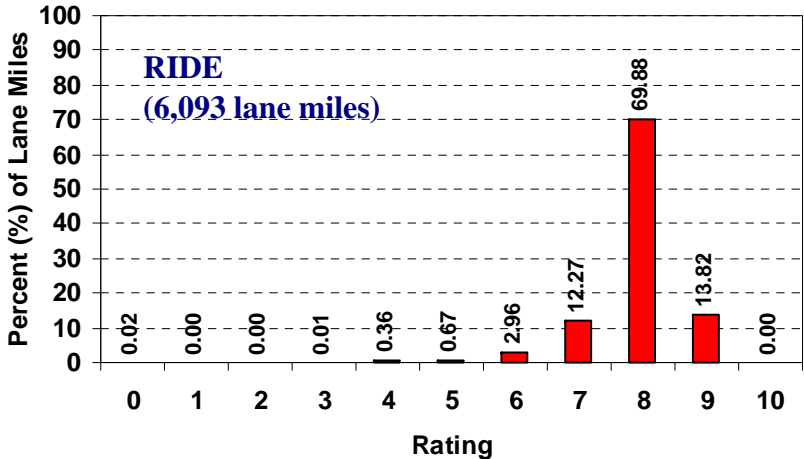
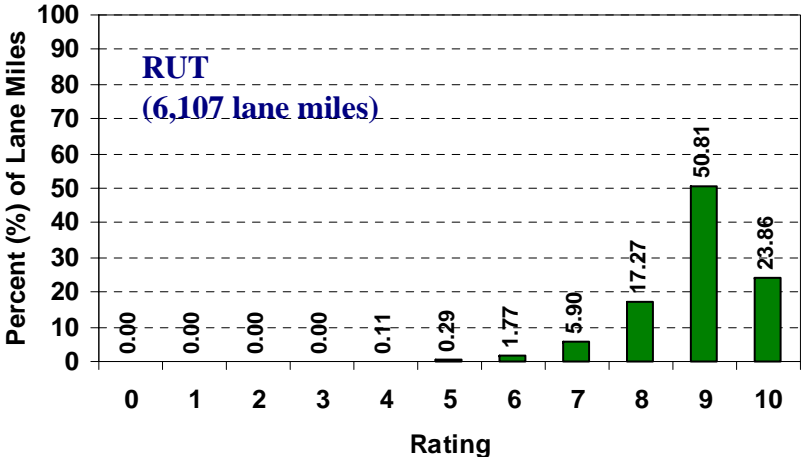
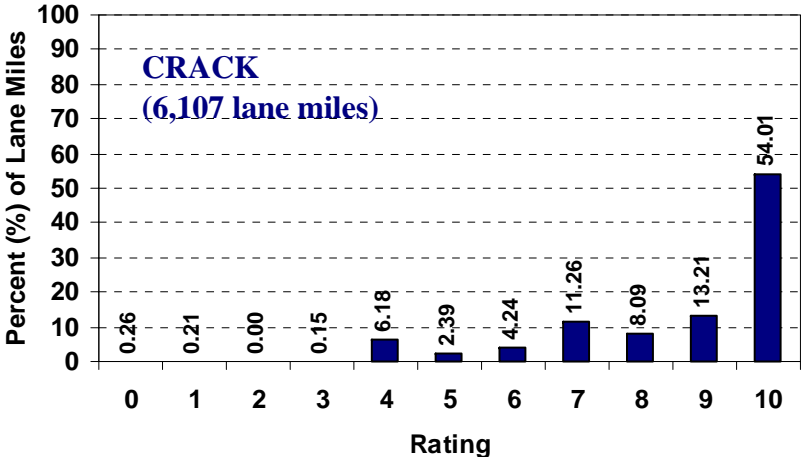
# 2004 Crack, Rut and Ride Distribution

## District 2 (All Systems)



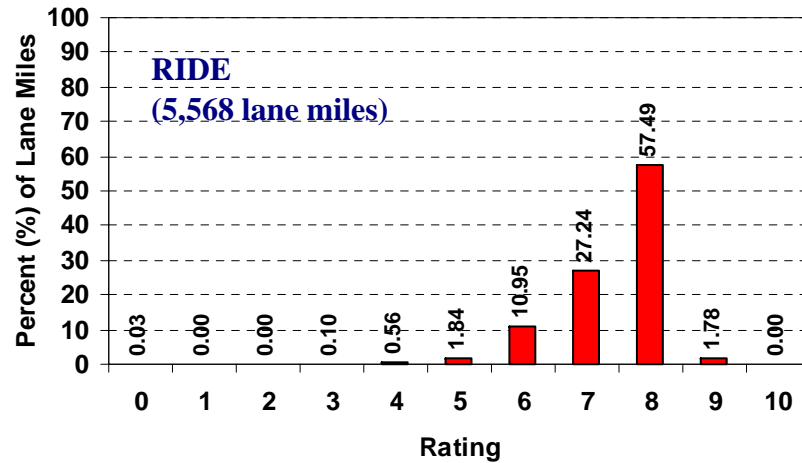
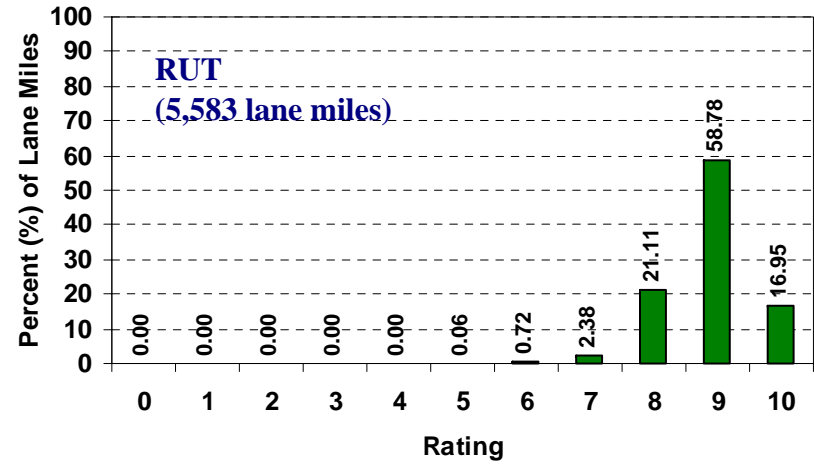
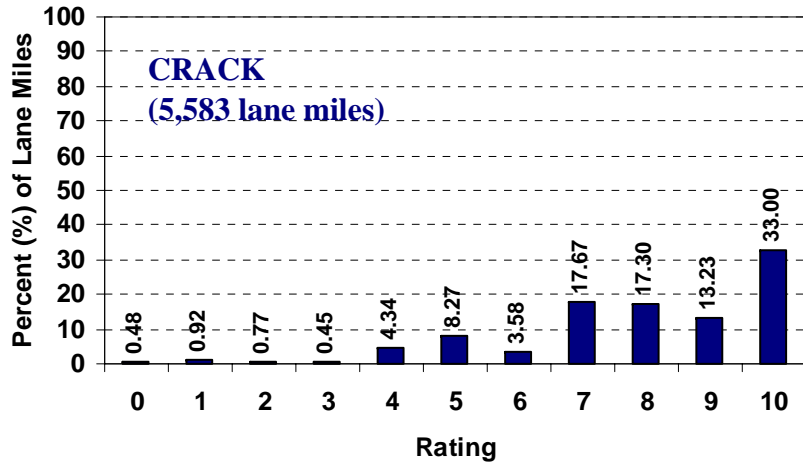
# 2004 Crack, Rut and Ride Distribution

## District 3 (All Systems)



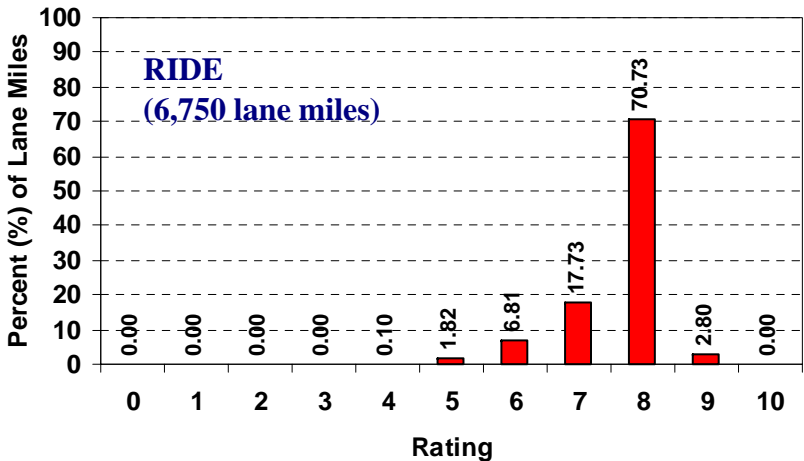
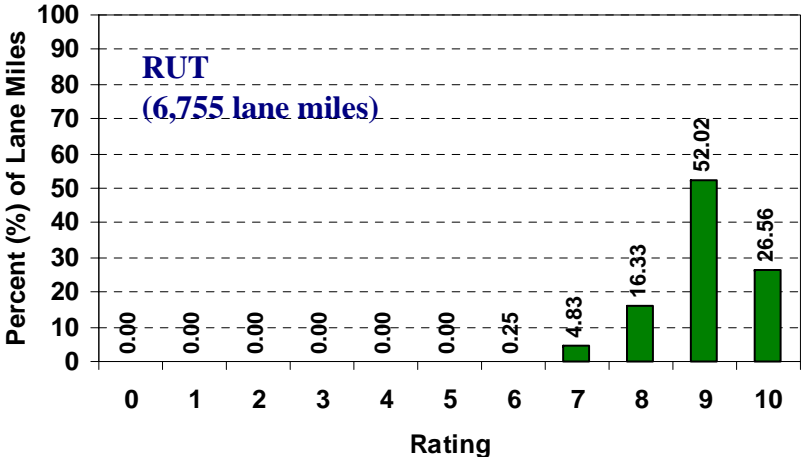
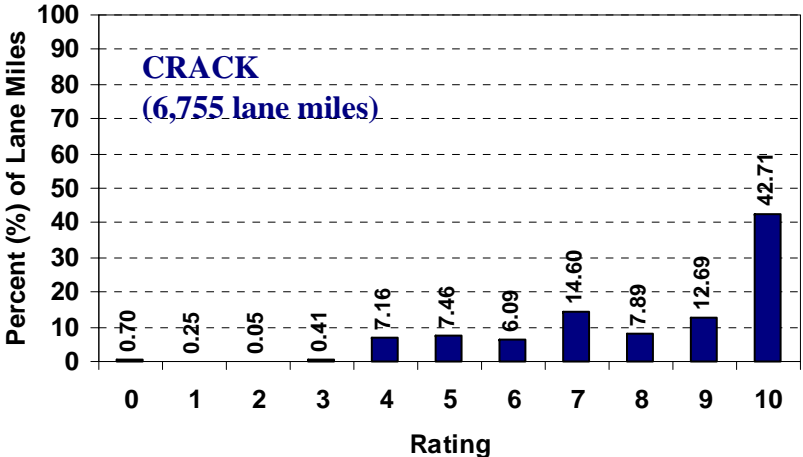
# 2004 Crack, Rut and Ride Distribution

## District 4 (All Systems)



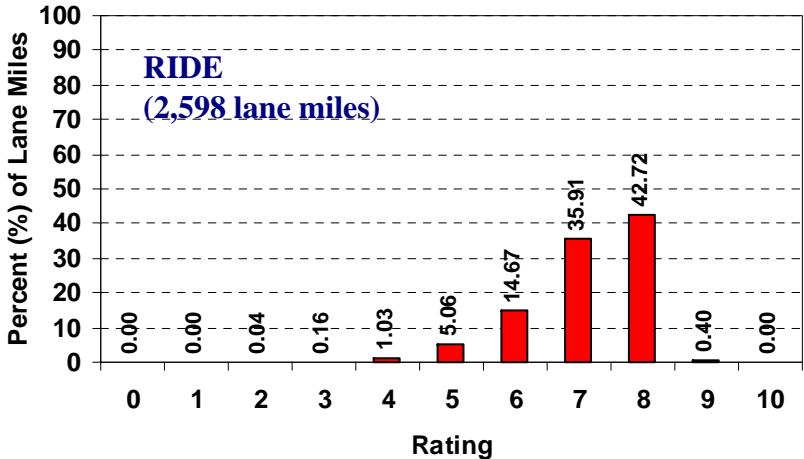
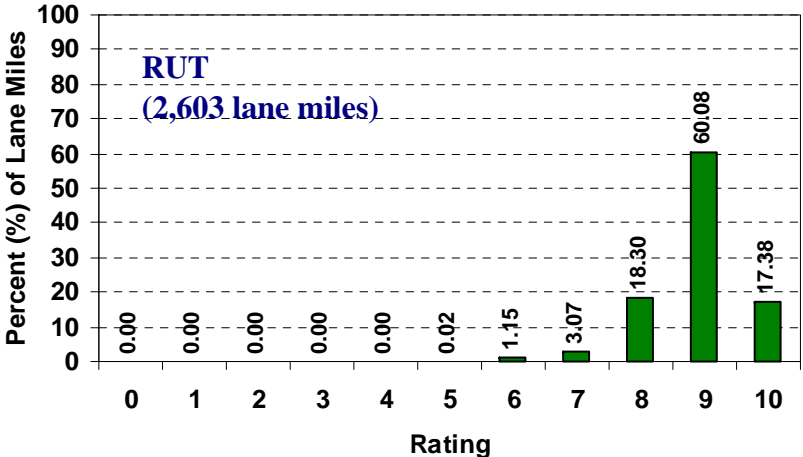
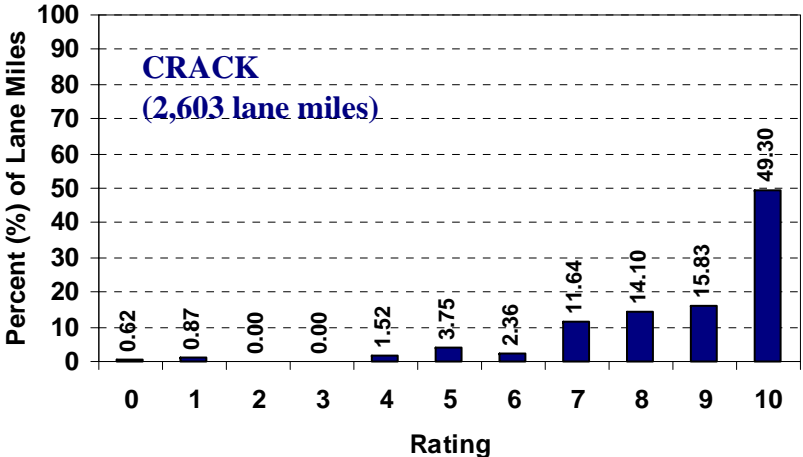
# 2004 Crack, Rut and Ride Distribution

## District 5 (All Systems)



# 2004 Crack, Rut and Ride Distribution

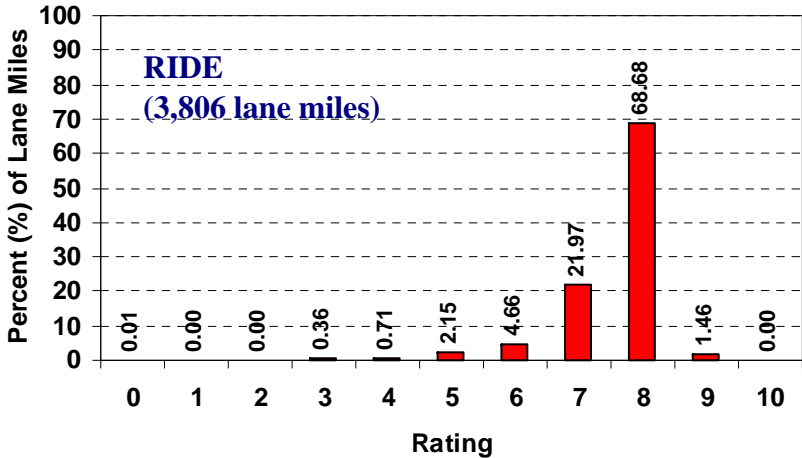
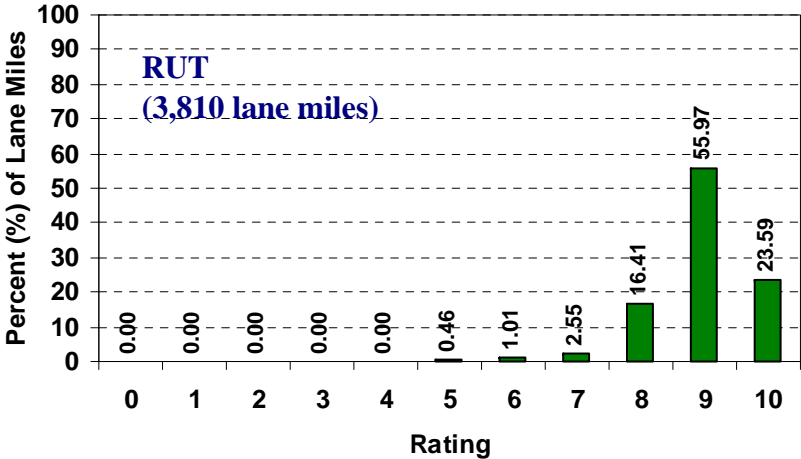
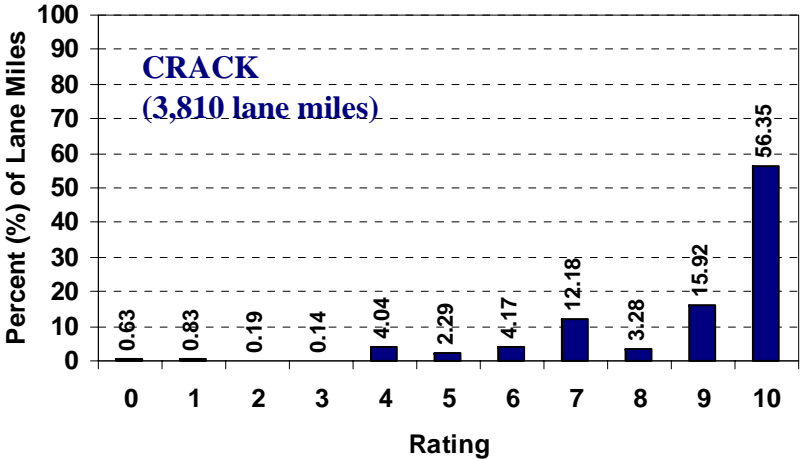
## District 6 (All Systems)





# 2004 Crack, Rut and Ride Distribution

## District 7 (All Systems)





**SECTION VI**

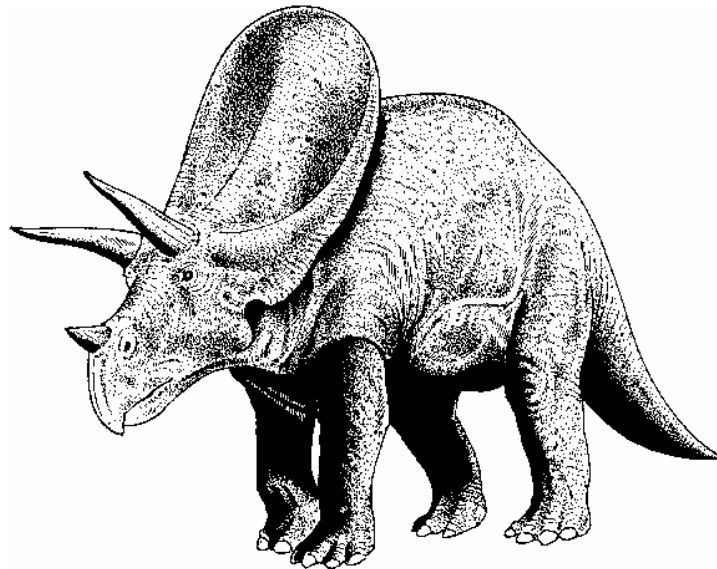
**HISTORICAL**

**DISTRESS RATINGS**

**BY**

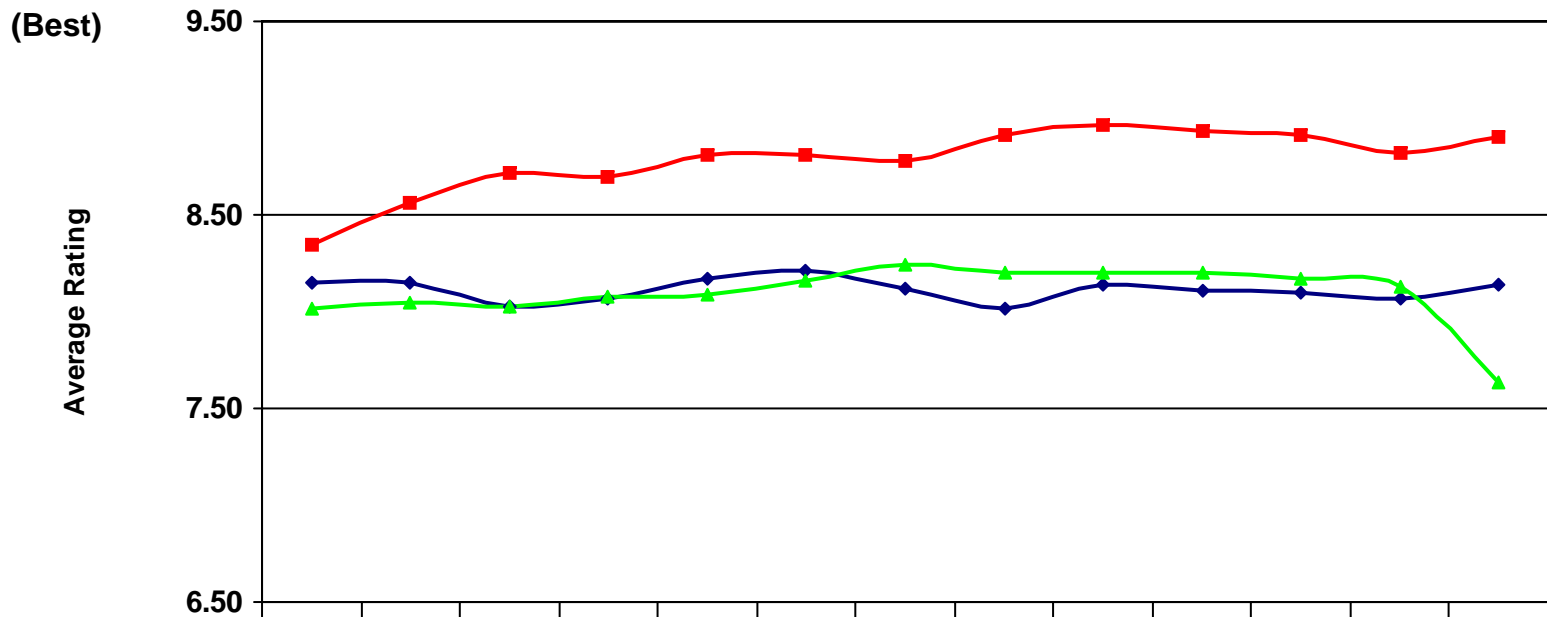
**DISTRICT**

**(ALL SYSTEMS COMBINED)**



# Historical Distress Ratings

## Statewide (All Systems)

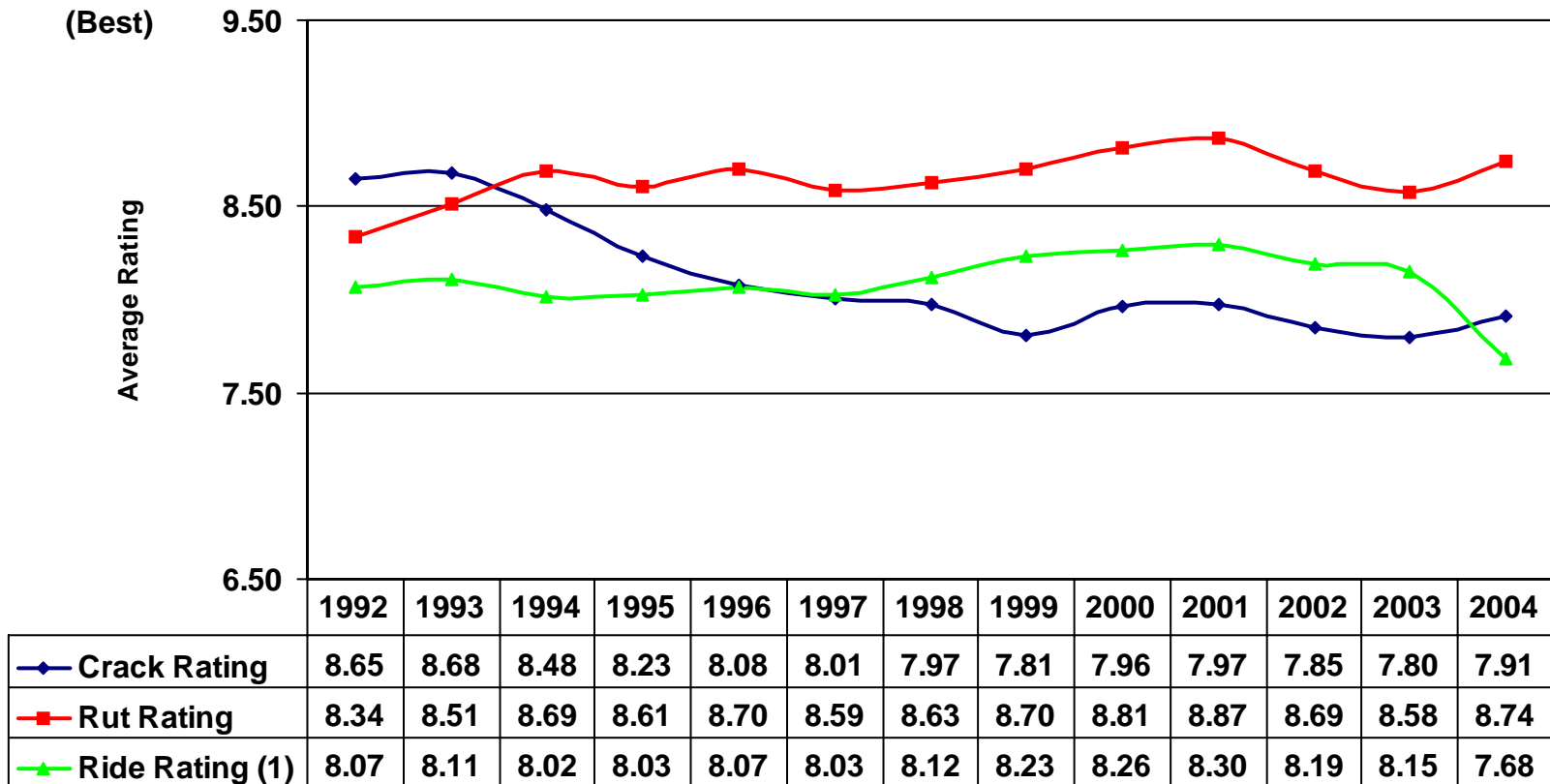


	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
—◆— Crack Rating	8.15	8.15	8.03	8.07	8.17	8.21	8.12	8.02	8.14	8.11	8.10	8.07	8.14
—■— Rut Rating	8.35	8.56	8.72	8.70	8.81	8.81	8.78	8.91	8.96	8.93	8.91	8.82	8.90
—▲— Ride Rating (1)	8.02	8.05	8.03	8.08	8.09	8.16	8.24	8.20	8.20	8.20	8.17	8.13	7.63

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

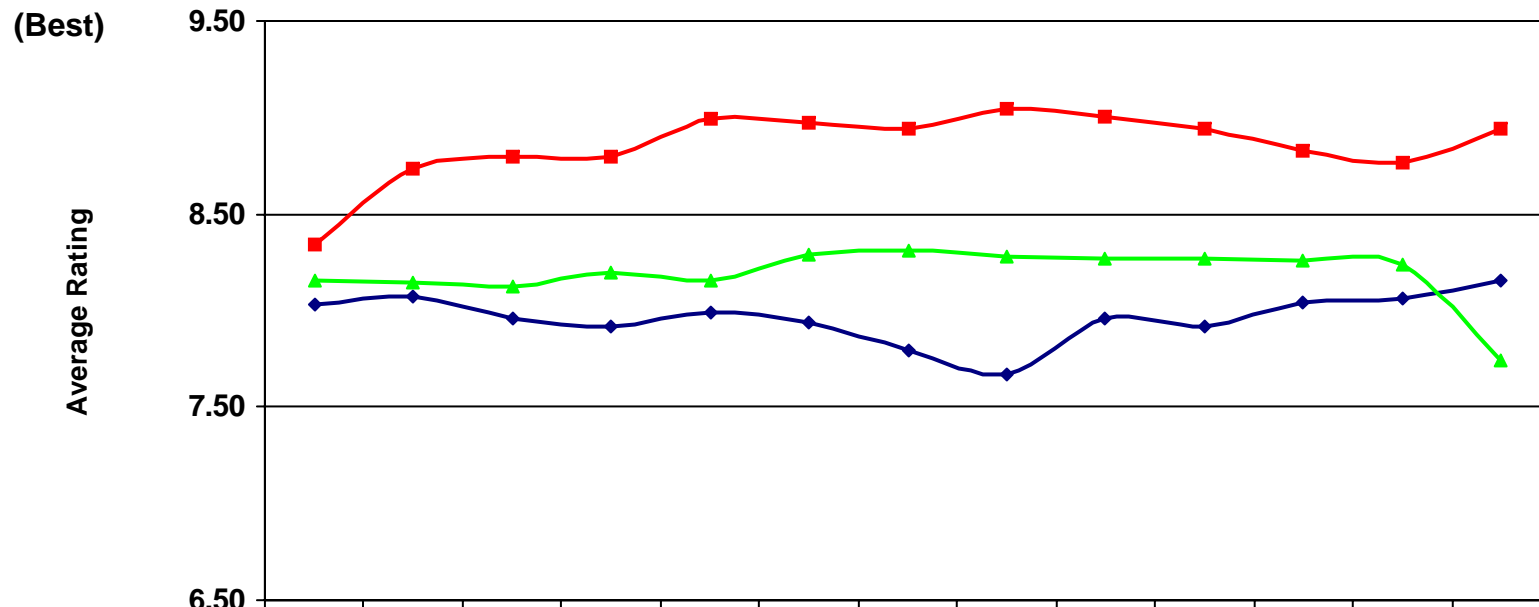
## District 1 (All Systems)



(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

## District 2 (All Systems)

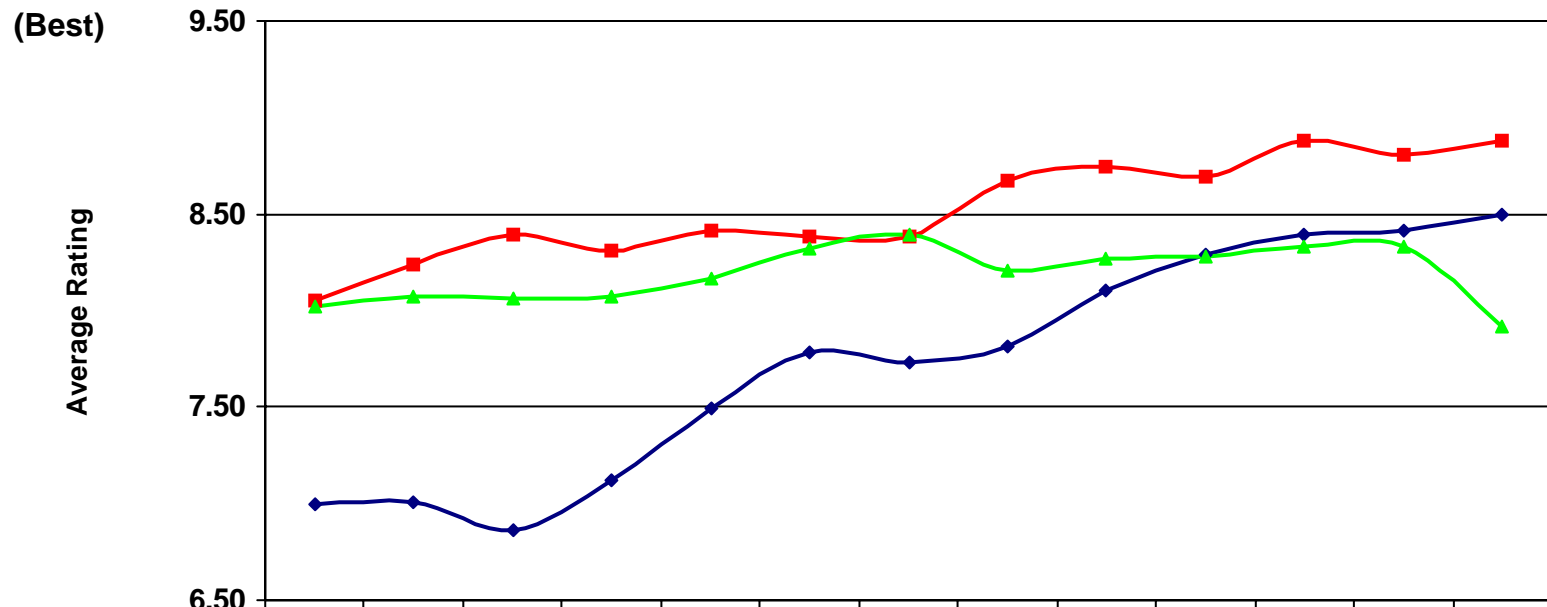


	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
◆ Crack Rating	8.03	8.07	7.96	7.92	7.99	7.94	7.79	7.67	7.96	7.92	8.04	8.06	8.16
■ Rut Rating	8.34	8.73	8.80	8.80	8.99	8.97	8.94	9.04	9.00	8.94	8.83	8.77	8.94
▲ Ride Rating (1)	8.15	8.14	8.12	8.20	8.16	8.29	8.31	8.28	8.27	8.27	8.26	8.24	7.74

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

## District 3 (All Systems)

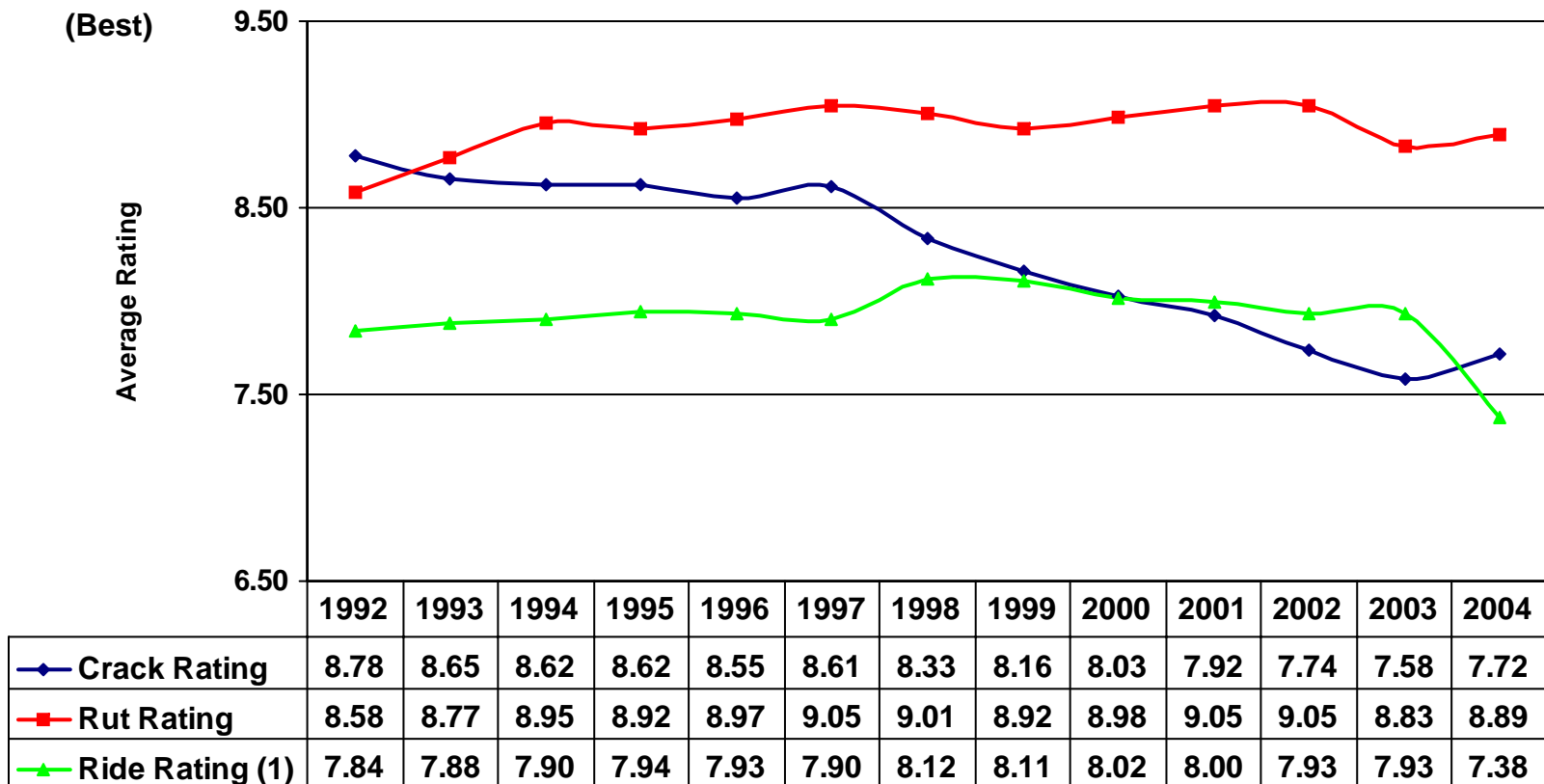


	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
◆ Crack Rating	7.00	7.01	6.86	7.12	7.49	7.78	7.73	7.81	8.10	8.29	8.39	8.41	8.50
■ Rut Rating	8.05	8.24	8.39	8.31	8.41	8.38	8.38	8.67	8.75	8.69	8.88	8.81	8.88
▲ Ride Rating (1)	8.02	8.07	8.06	8.07	8.17	8.32	8.39	8.21	8.27	8.28	8.33	8.33	7.92

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

## District 4 (All Systems)

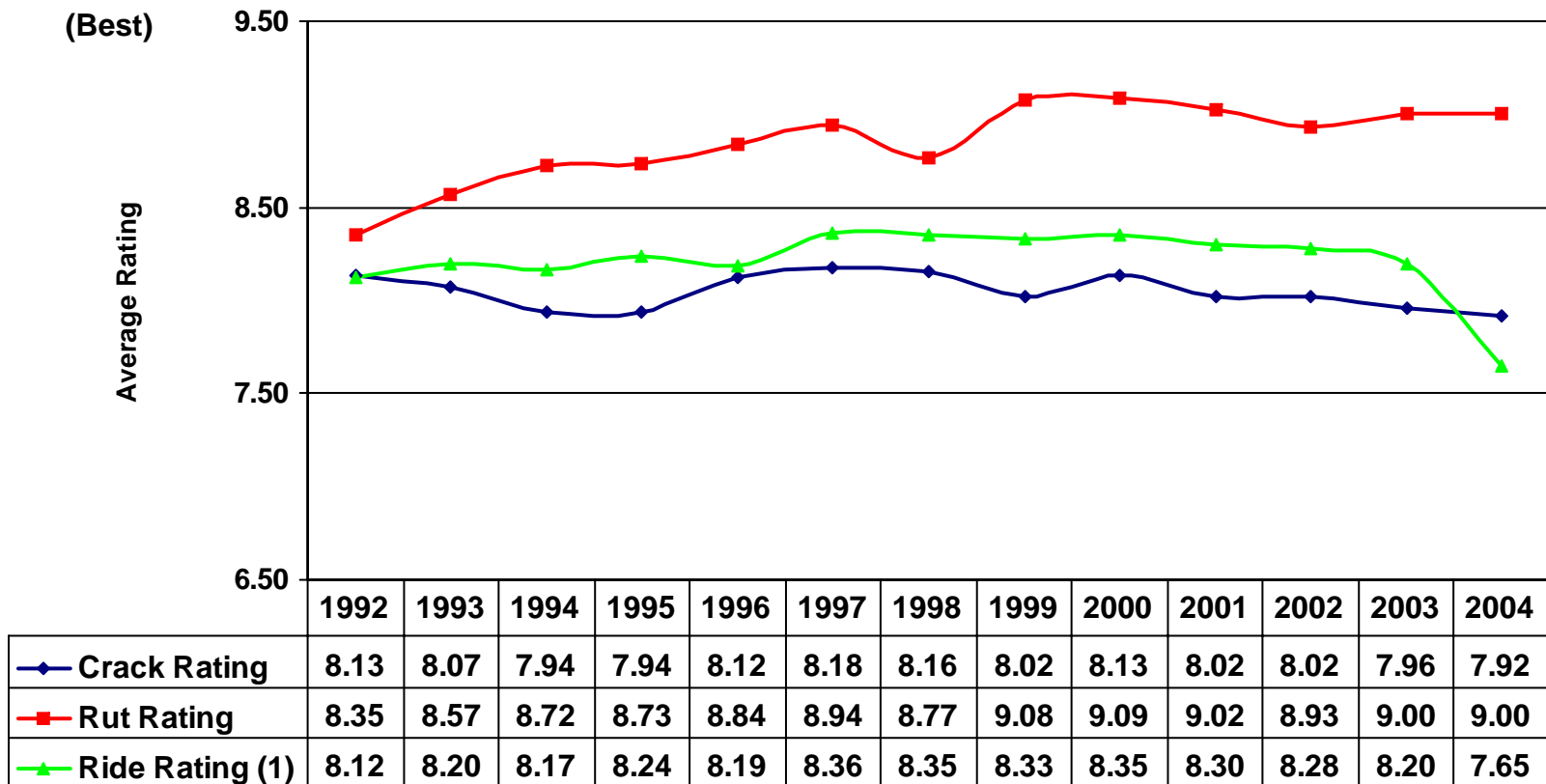


(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)



# Historical Distress Ratings

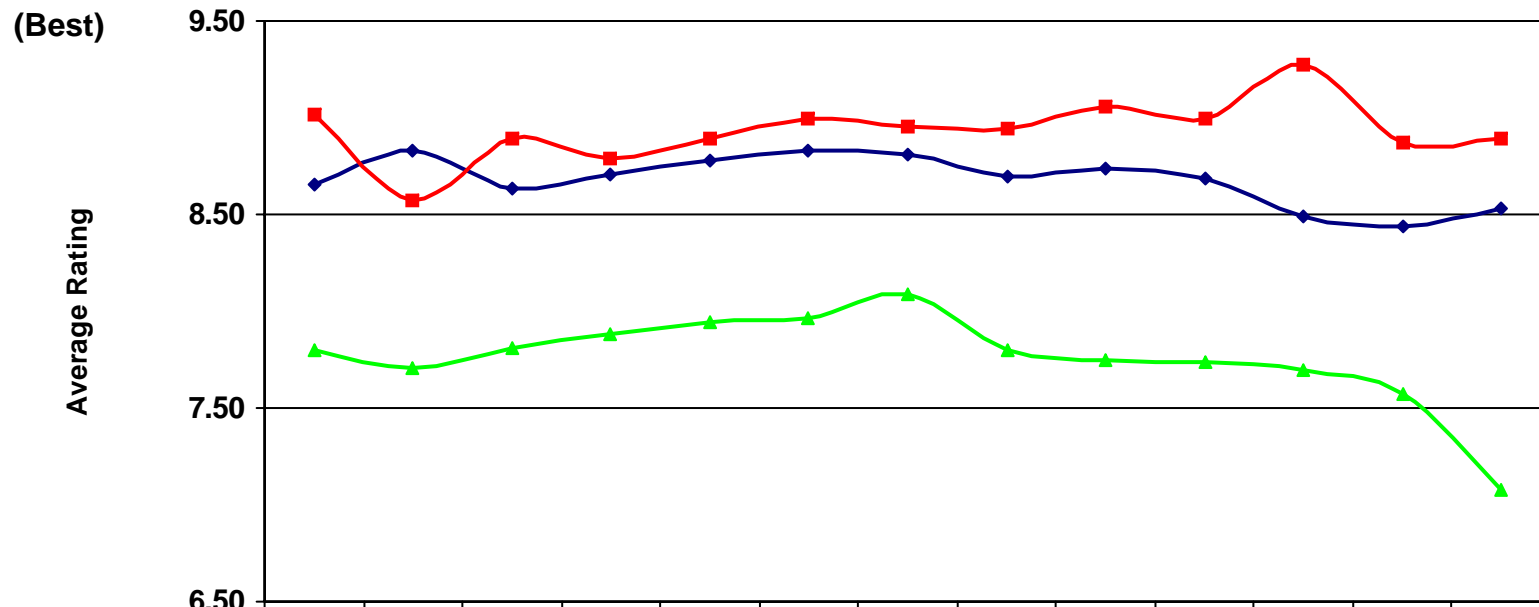
## District 5 (All Systems)



(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

## District 6 (All Systems)

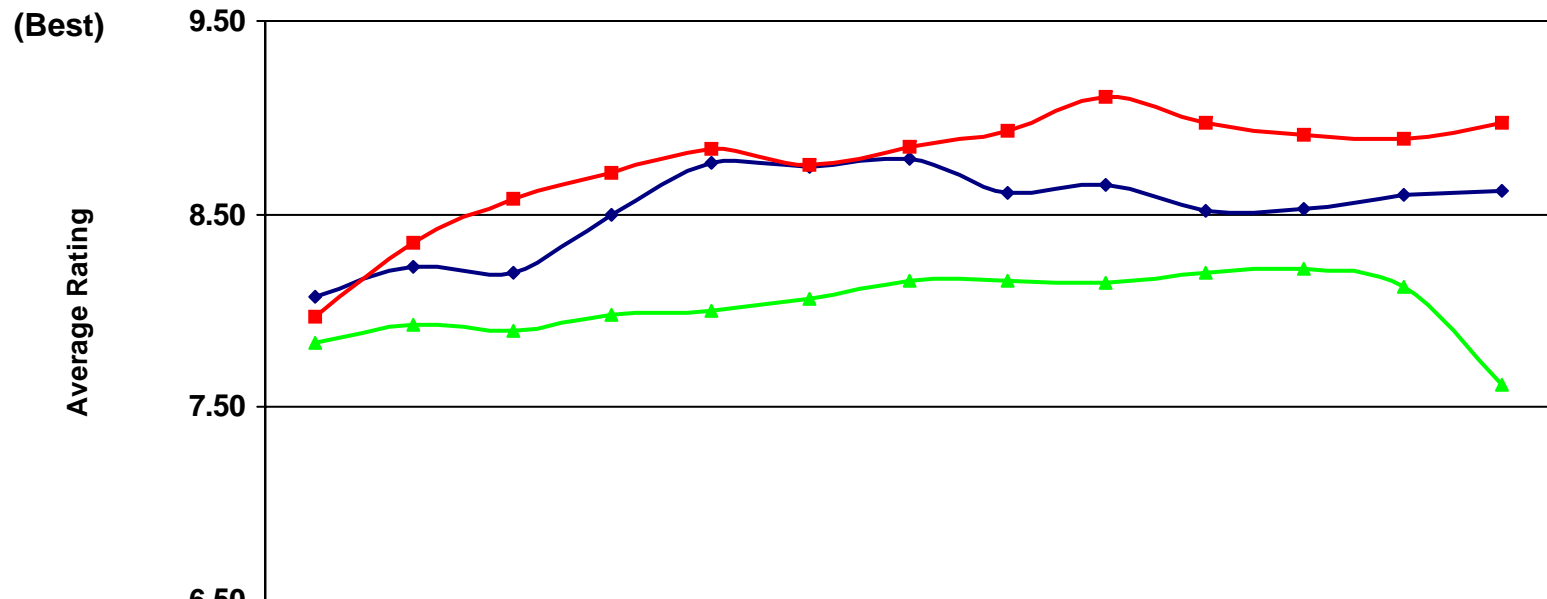


	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
◆ Crack Rating	8.65	8.83	8.63	8.71	8.78	8.83	8.81	8.70	8.74	8.69	8.49	8.44	8.53
■ Rut Rating	9.02	8.57	8.89	8.79	8.89	8.99	8.95	8.94	9.06	9.00	9.27	8.87	8.89
▲ Ride Rating (1)	7.80	7.71	7.81	7.88	7.94	7.96	8.09	7.80	7.75	7.74	7.70	7.57	7.08

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

## District 7 (All Systems)



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
◆ Crack Rating	8.07	8.23	8.20	8.50	8.77	8.74	8.79	8.61	8.65	8.52	8.53	8.60	8.62
■ Rut Rating	7.97	8.35	8.58	8.71	8.84	8.76	8.85	8.93	9.11	8.97	8.91	8.89	8.97
▲ Ride Rating (1)	7.83	7.93	7.90	7.98	8.00	8.06	8.16	8.16	8.14	8.20	8.22	8.12	7.62

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)



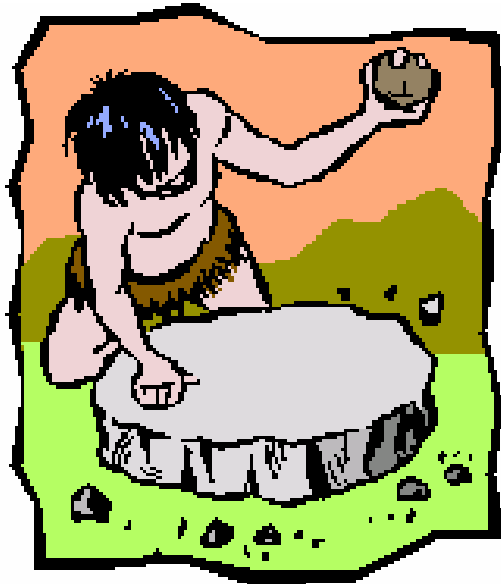
**SECTION VII**

**HISTORICAL  
DISTRESS RATINGS**

**BY**

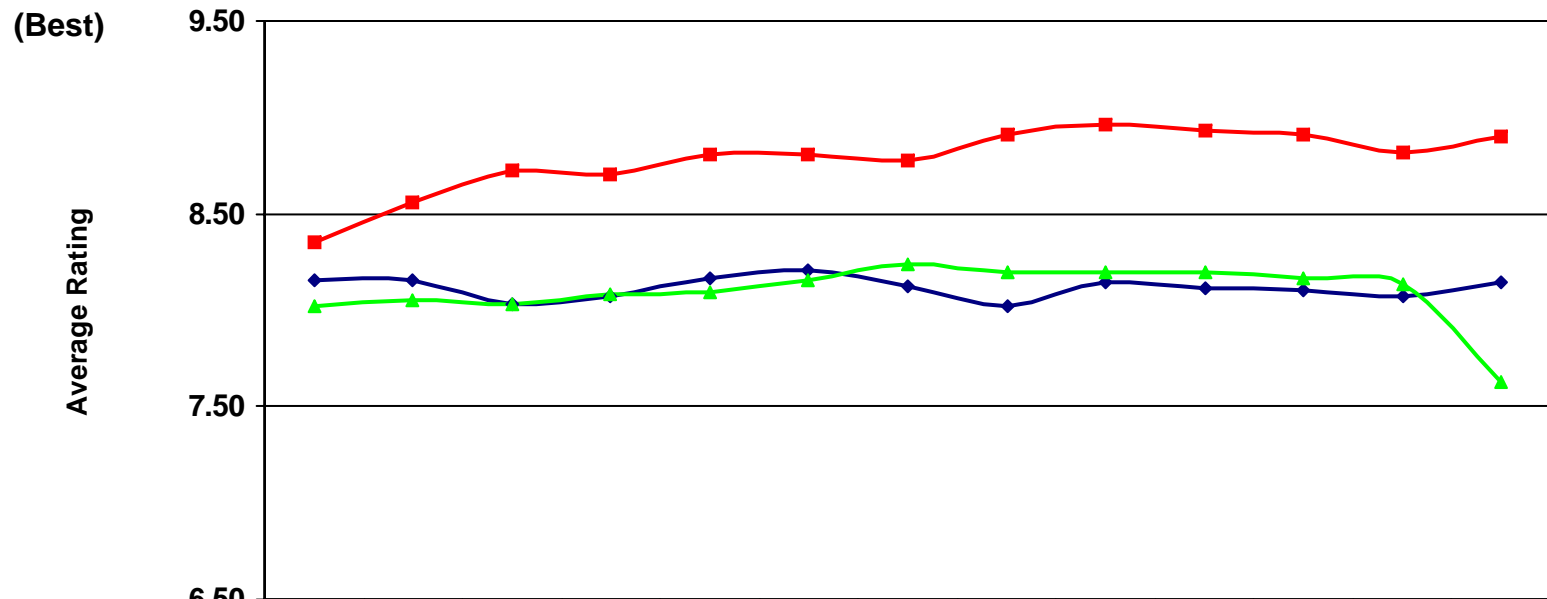
**SYSTEM**

**(ALL DISTRICTS COMBINED)**



# Historical Distress Ratings

## All Systems (All Districts)

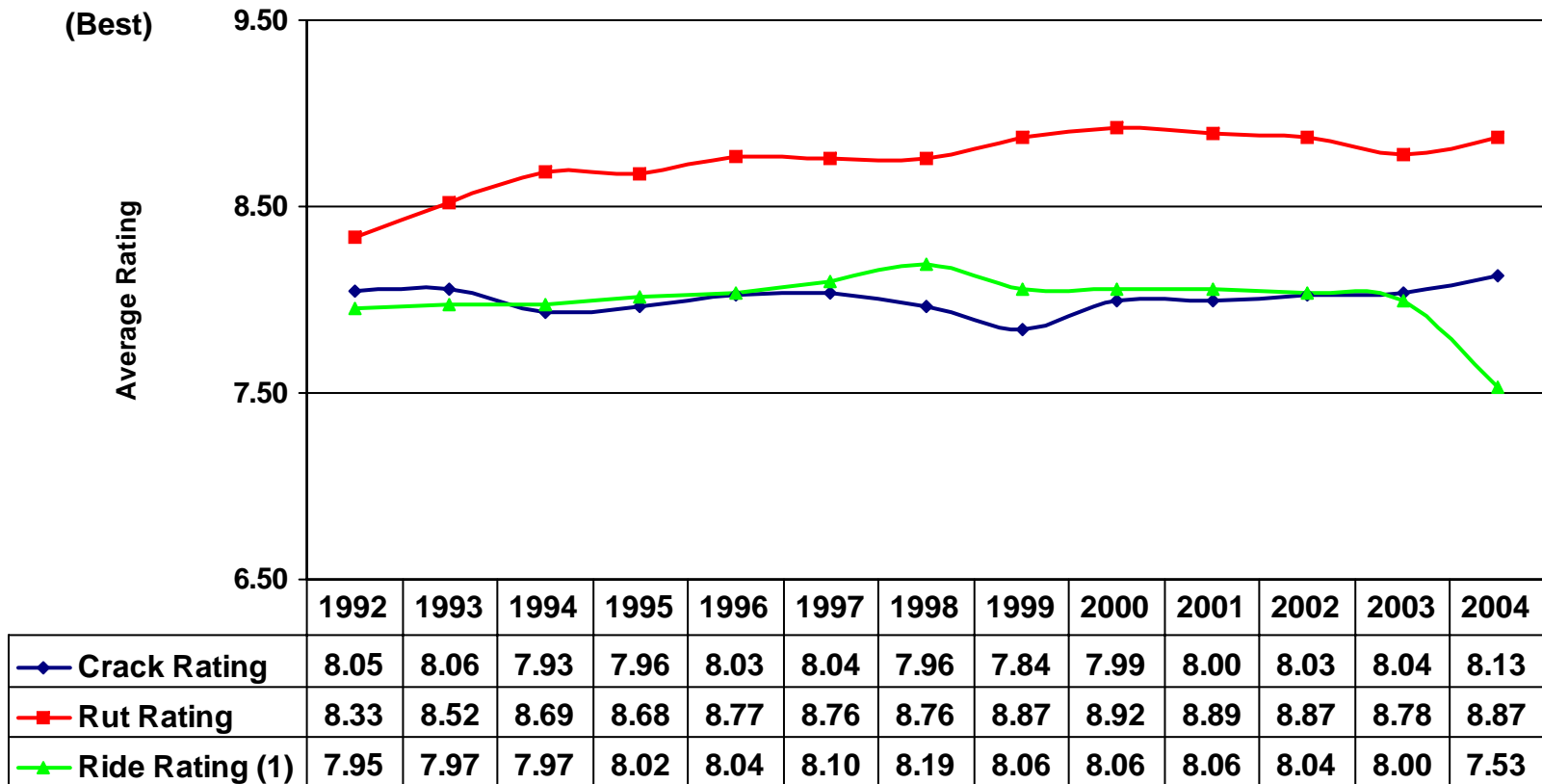


	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
◆ Crack Rating	8.15	8.15	8.03	8.07	8.17	8.21	8.12	8.02	8.14	8.11	8.10	8.07	8.14
■ Rut Rating	8.35	8.56	8.72	8.70	8.81	8.81	8.78	8.91	8.96	8.93	8.91	8.82	8.90
▲ Ride Rating (1)	8.02	8.05	8.03	8.08	8.09	8.16	8.24	8.20	8.20	8.20	8.17	8.13	7.63

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

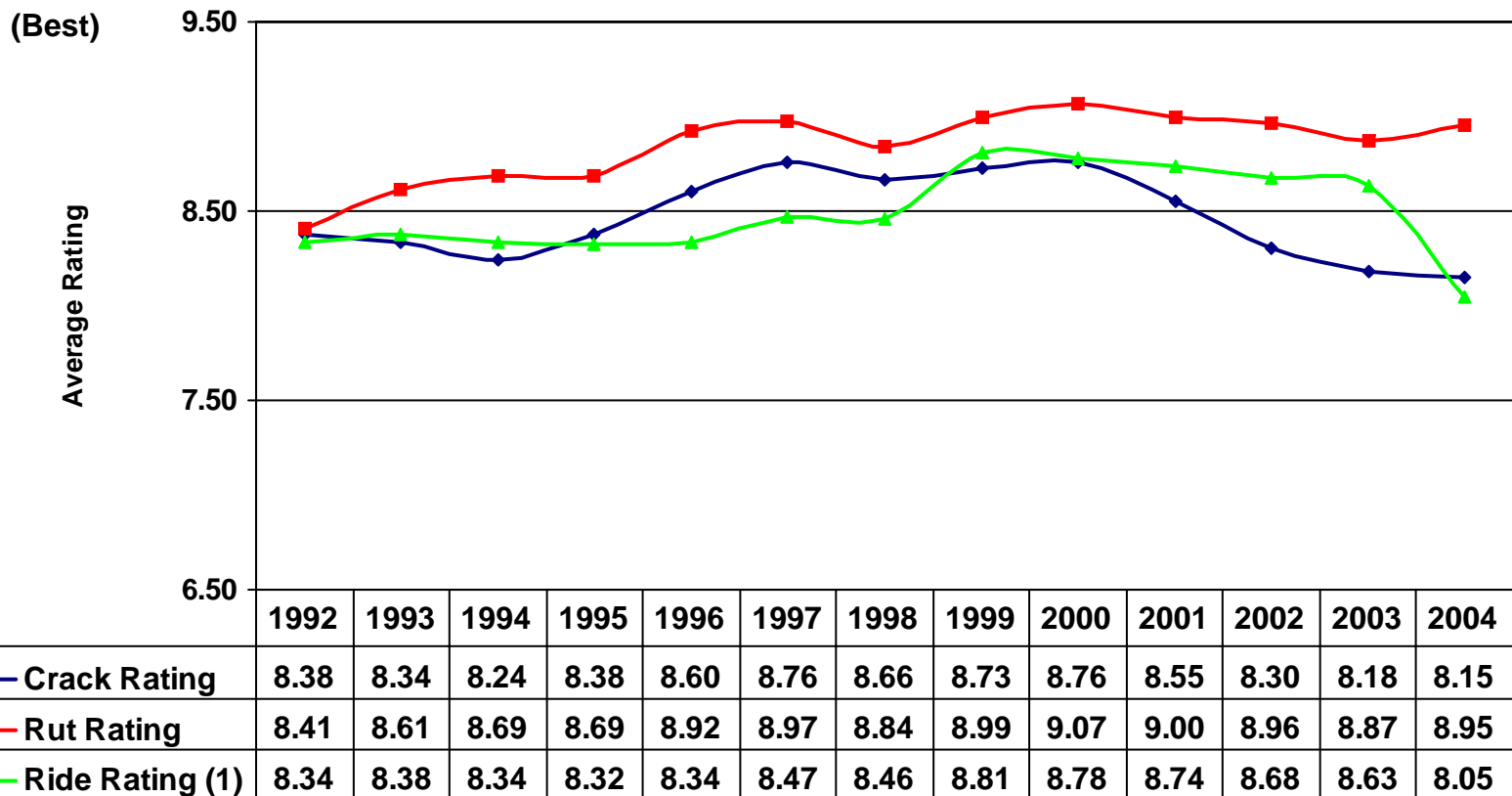
# Historical Distress Ratings

## Primary System (All Districts)



(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

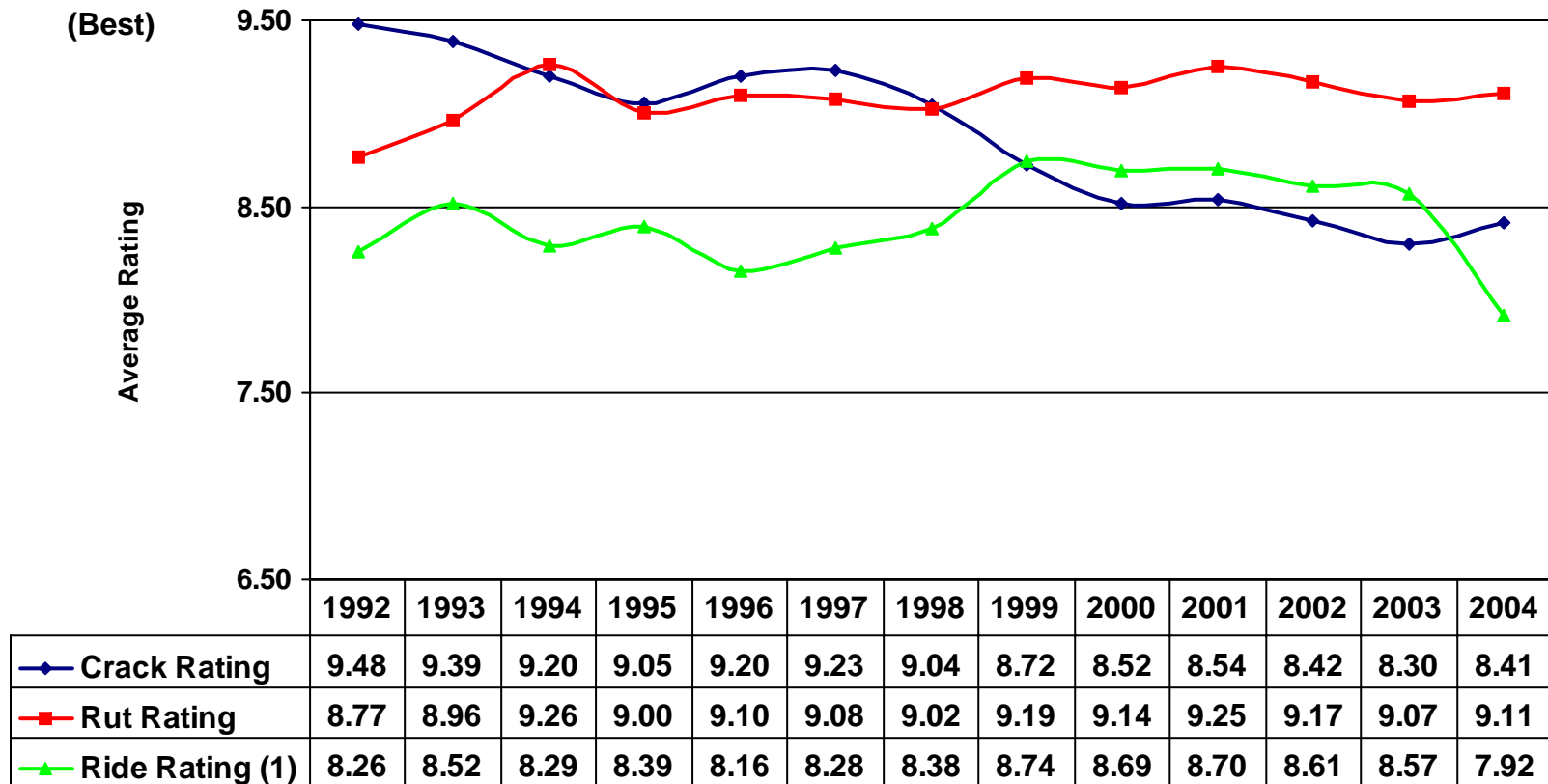
# Historical Distress Ratings Interstate System (All Districts)



(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)



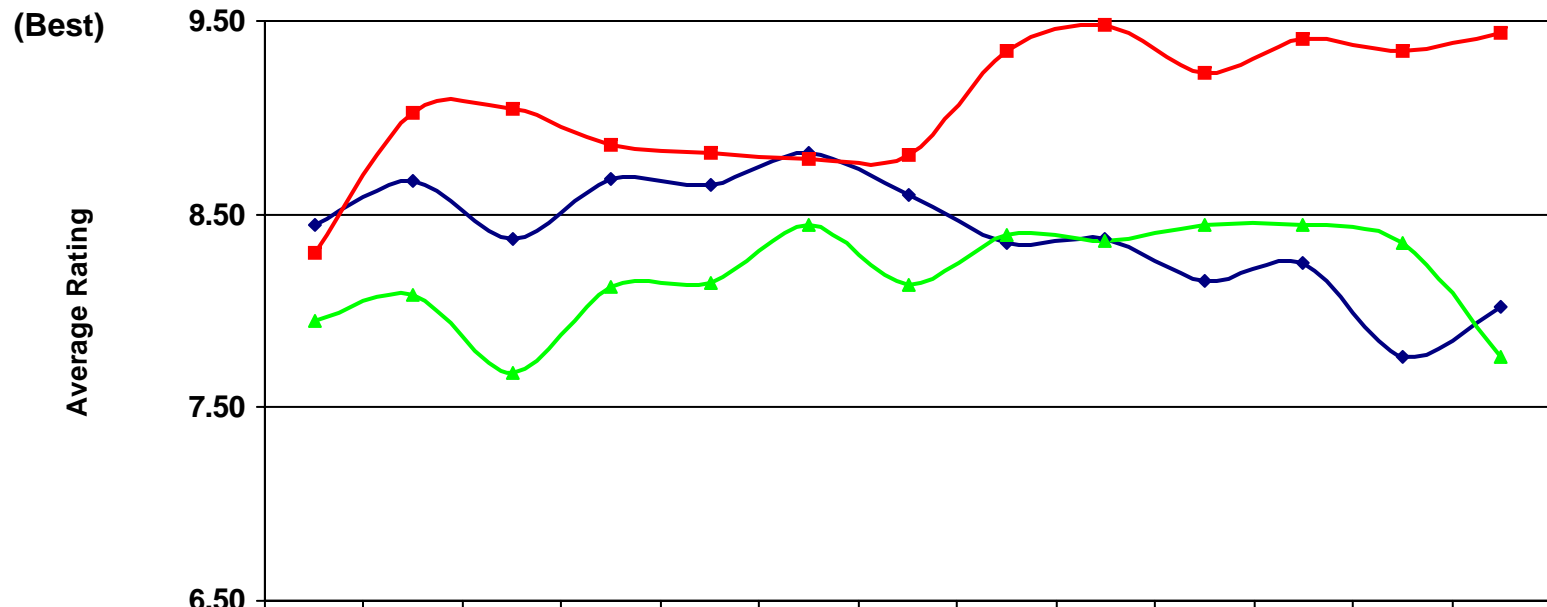
# Historical Distress Ratings Turnpike System (All Districts)



(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# Historical Distress Ratings

## Toll System (All Districts)



	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
◆ Crack Rating	8.44	8.67	8.37	8.68	8.65	8.82	8.60	8.35	8.37	8.15	8.25	7.76	8.02
■ Rut Rating	8.30	9.02	9.04	8.86	8.82	8.79	8.81	9.35	9.48	9.23	9.41	9.35	9.44
▲ Ride Rating (1)	7.95	8.08	7.68	8.12	8.14	8.45	8.13	8.39	8.36	8.45	8.44	8.35	7.76

(1) Please note that for the 2004 PCS, the profile data was collected using a sampling rate of 6 inch intervals. (Refer to item 3 under Observations, on page 4.)

# **SECTION VIII**

## **RAVELING INFORMATION**



# SECTION VIII

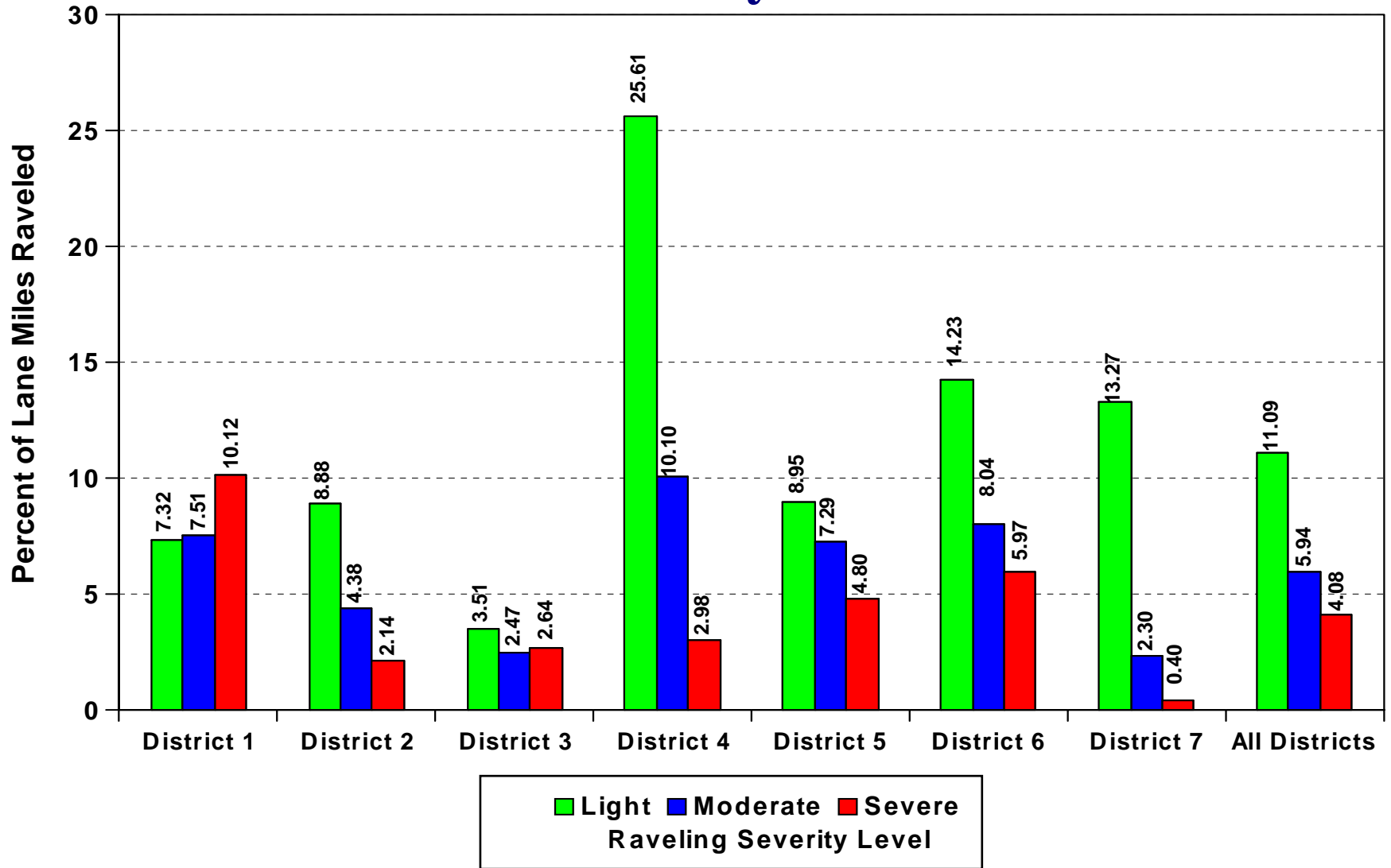
## Raveling

### Raveling Rating Criteria

- Raveling is the wearing away of the pavement surface caused by the dislodging of aggregate particles and the loss of asphalt binder due to weathering.
- Raveling for the rated section is accumulated in the crack ratings.
- Raveling and weathering may be caused by:
  - ▶ Hardening of the asphalt binder
  - ▶ Low adhesion of the asphalt binder
  - ▶ Low wear resistant aggregate in the mix or poor asphalt mix (dirty aggregate in the mix)
  - ▶ Water sensitive asphalt-aggregate mixture
  - ▶ Any combination of the above items
- Raveling became a noticeable defect by raters and was required to be listed in their comments as of 1992.
- Beginning in 1995, Raveling was rated by severity level (light, moderate, and severe) and percent of affected area, where only the predominate severity level was recorded.
  - ▶ Light Raveling occurs when the aggregate and/or binder has begun to wear away but has not progressed significantly. Some loss of fine aggregate is present.
  - ▶ Moderate Raveling occurs when the aggregate and/or binder has worn away and the surface texture is becoming rough and pitted; loose particles generally exist; loss of fine aggregate and some loss of coarse aggregate exists.
  - ▶ Severe Raveling occurs when the aggregate and/or binder has worn away and the surface texture is very rough and pitted; loss of coarse aggregate is very noticeable.

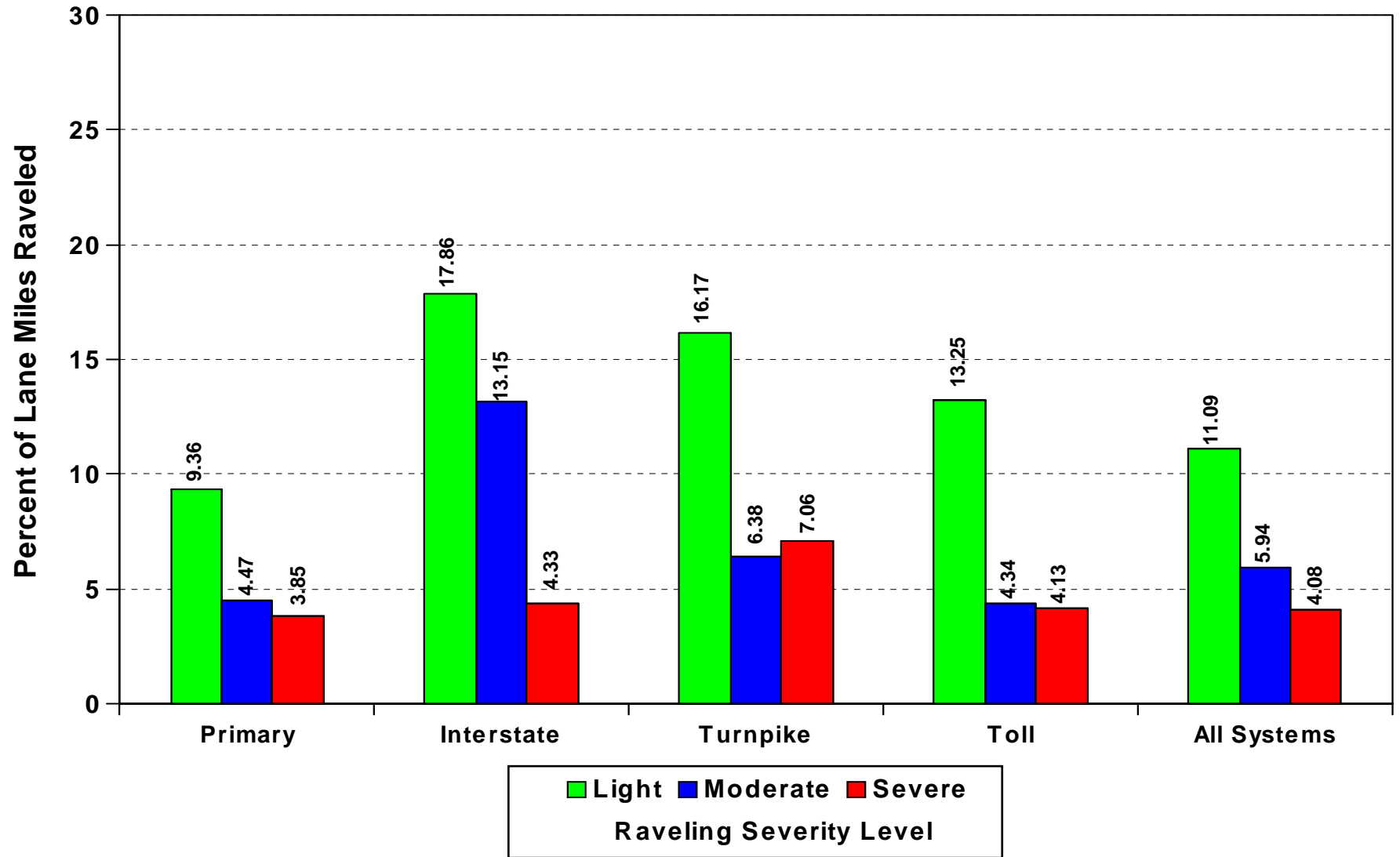
# 2004 Raveling Survey by District

## All Systems



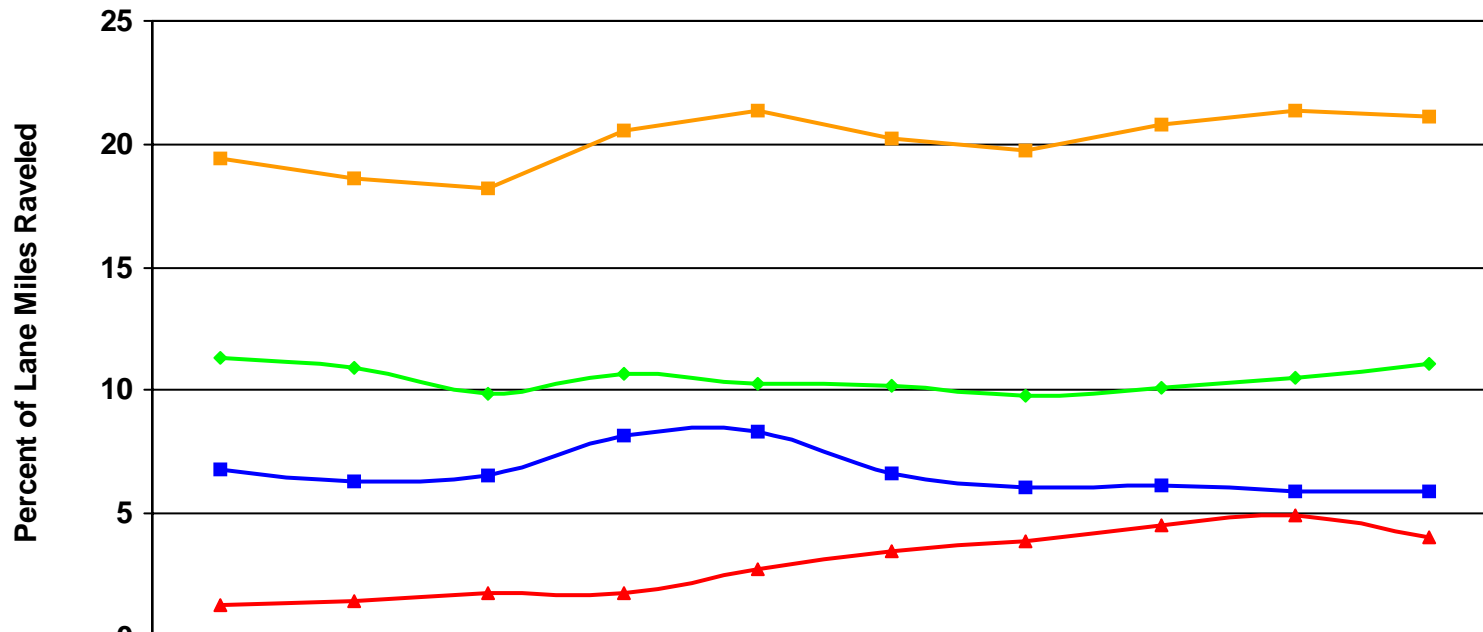
# 2004 Raveling Survey by System

## All Districts



# Raveling Survey History

## All Systems Combined (All Districts)



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
—■— Combined	19.42	18.62	18.22	20.59	21.33	20.21	19.74	20.76	21.34	21.11
—◆— Light	11.34	10.89	9.85	10.65	10.26	10.17	9.78	10.12	10.53	11.09
—■— Moderate	6.79	6.28	6.59	8.14	8.34	6.60	6.08	6.11	5.90	5.94
—▲— Severe	1.29	1.45	1.78	1.80	2.73	3.44	3.88	4.53	4.91	4.08





**SECTION IX**

**CRACK, RUT AND RIDE  
RATINGS COMPARISON  
BETWEEN  
2004 AND 2003**



# SECTION IX

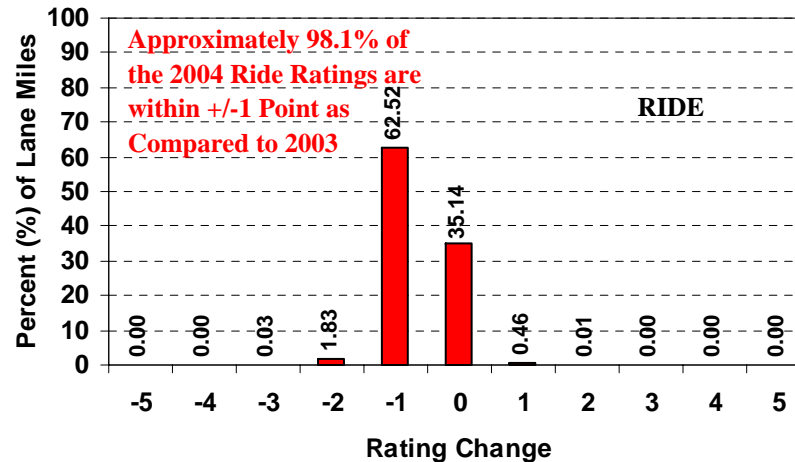
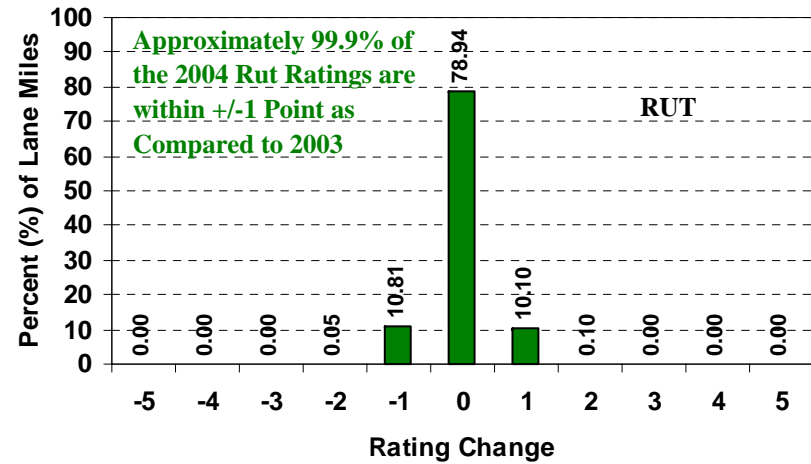
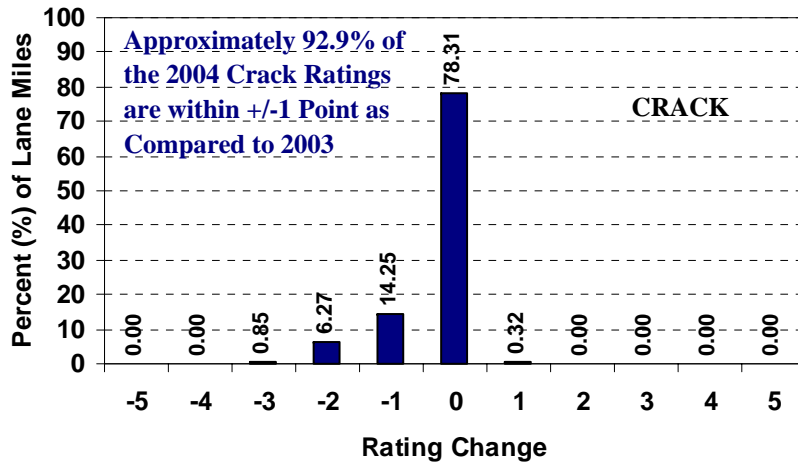
## Crack, Rut, and Ride Ratings Comparison

### Rating Comparison Criteria

The following pavement types have been omitted from this comparison since they exhibit notable changes to the pavement surface as indicated below:

- Type 0 - Pavement sections not State-maintained, duplicated under another county section number, or added under the rigid pavement condition survey.
- Type 2 - Surface Treatment or pavement improvement without new construction, such as intersection improvements, wheel path leveling, bridge approach or area resurfacing.
- Type 4 - Rigid Pavements
- Type 5 - New Construction
- Type 6 - No Ride taken for this section (normally because of length constraint)
- Type 7 - New Pavement (Overlays)
- Type 8 - Under Construction
- Type 9 - Structures or exceptions that are State-maintained

# Crack, Rut and Ride Changes 2004 as Compared to 2003



NEGATIVE VALUES COULD INDICATE DETERIORATION IN THE PAVEMENT AND/OR VARIABILITY IN THE DATA COLLECTION PROCESS

POSITIVE VALUES COULD INDICATE VARIABILITY IN THE DATA COLLECTION PROCESS



# Customer Service Form

In an effort to continue providing useful documentation to our customers, and to further improve documentation such as this, the FDOT Pavement Systems Evaluation Team would like your input.

*(Optional)*

Your name: \_\_\_\_\_ Title: \_\_\_\_\_

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Address: \_\_\_\_\_ City/State/Zip: \_\_\_\_\_

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*Please rate each of the following on the scale provided. **One** corresponds to **Very Poor** while **Five** corresponds to **Excellent**.*

Usefulness of Content .....	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organization of Data.....	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clarity of Graphical Data.....	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Format of Tables .....	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall Value of This Report.....	1	2	3	4	5
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*Please provide a short answer to the questions below.*

What was the most useful or informative part of this report? \_\_\_\_\_

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What other general comments might benefit the generators of this report? \_\_\_\_\_

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**Attn: Abdenour Nazef**  
**5007 NE 39<sup>th</sup> Ave.**  
**Gainesville, FL 32609**

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[Abdenour.Nazef@dot.state.fl.us](mailto:Abdenour.Nazef@dot.state.fl.us)