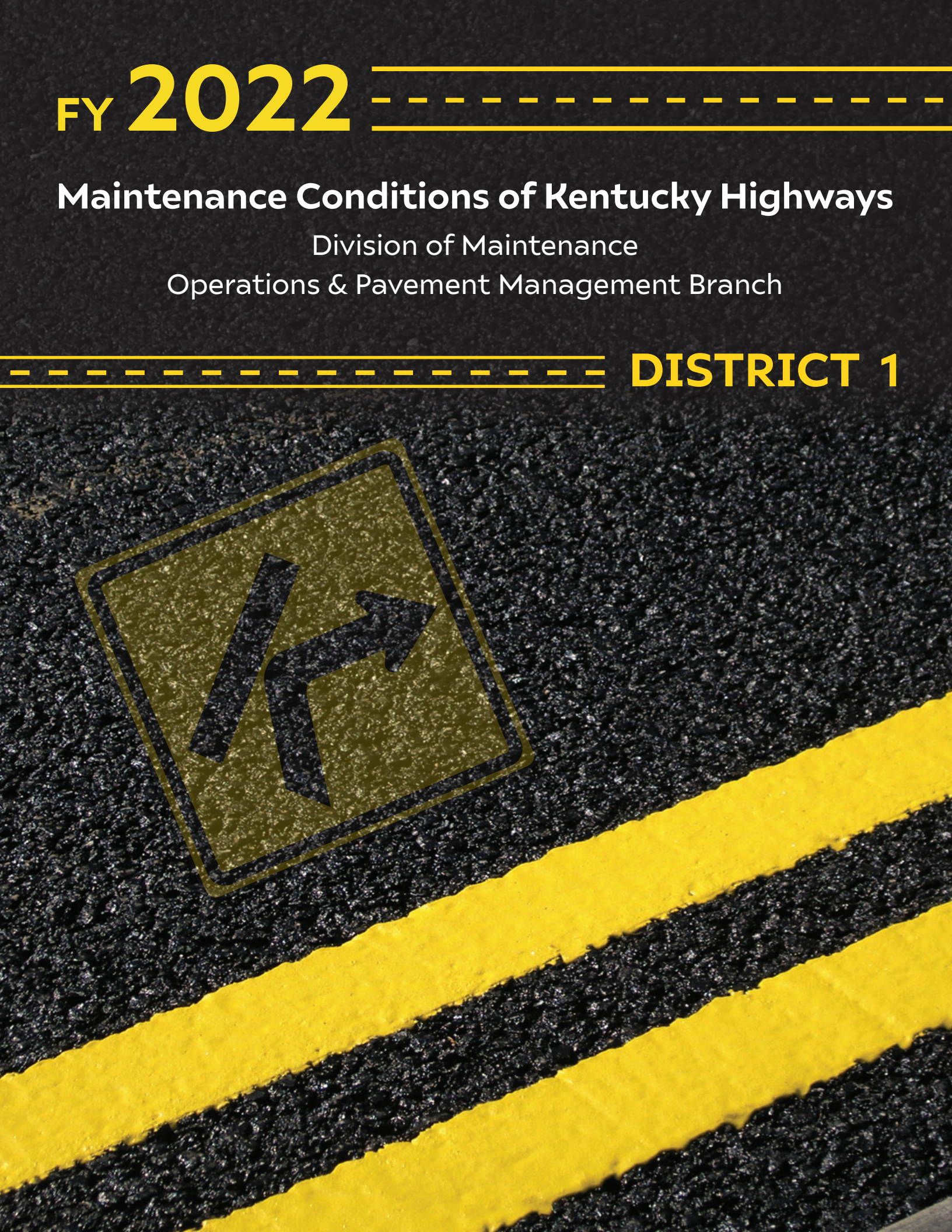
FY 2022

Maintenance Conditions of Kentucky Highways

Division of Maintenance

Operations & Pavement Management Branch

DISTRICT 1



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2022 MAINTENANCE RATING PROGRAM REPORT

EXECUTIVE SUMMARY

Introduction

The Kentucky Transportation Cabinet (KYTC) has surveyed the state's roadside conditions in order to estimate the needs for routine maintenance. The 2022 Maintenance Rating Program (MRP) inspections were completed statewide during summer 2021. The purpose of this report is to provide the results of the inspections and assess the current condition of the highway infrastructure maintenance activities. The report is broken into two parts – a statewide report used for higher level analysis; and individual district reports used on a local level for management decisions.

Background

The KYTC Maintenance Rating Program (MRP) is a systematic measurement process that uses annual performance measurements of highway infrastructure data to support planning and management decisions regarding maintenance activities and resources. Data collected from the MRP is used in conjunction with the cabinet's Operations Management System (OMS) to calculate the maintenance budget for each of the twelve highway districts.

Target for Sustained Performance

The **target performance level** score was set at **80** (service level B-good) for each highway district and for the statewide score for all highways.

The target serves as a benchmark for districts to help identify best practices among high performers and opportunities for improvement. The statewide target may be increased in the future as the districts reach higher levels of performance.

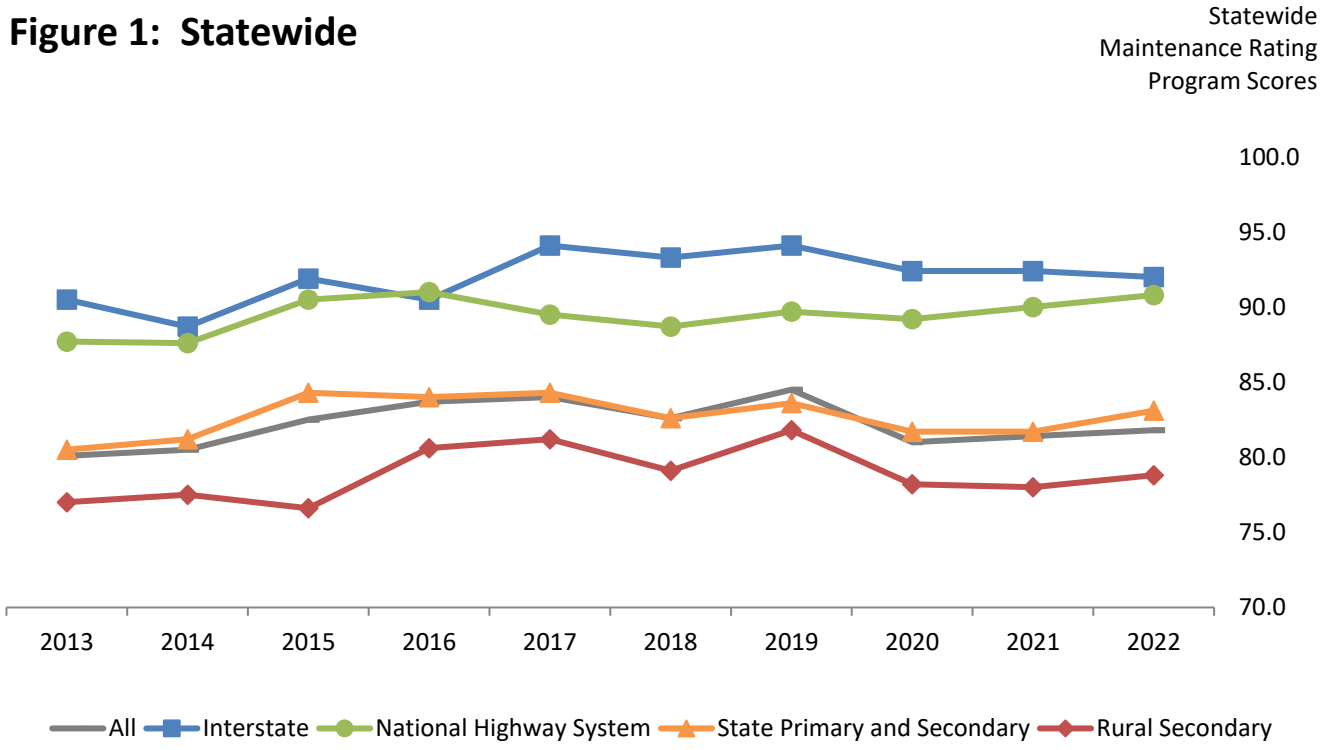
It is generally recognized that the level of service provided on the four road types for all features will not be the same. Interstate highways with higher traffic volumes and higher speed limits need to be maintained at a higher level of service than Rural Secondary roads. It is the responsibility of each district to set target values for every feature for each of the four road types to achieve the target score of 80.

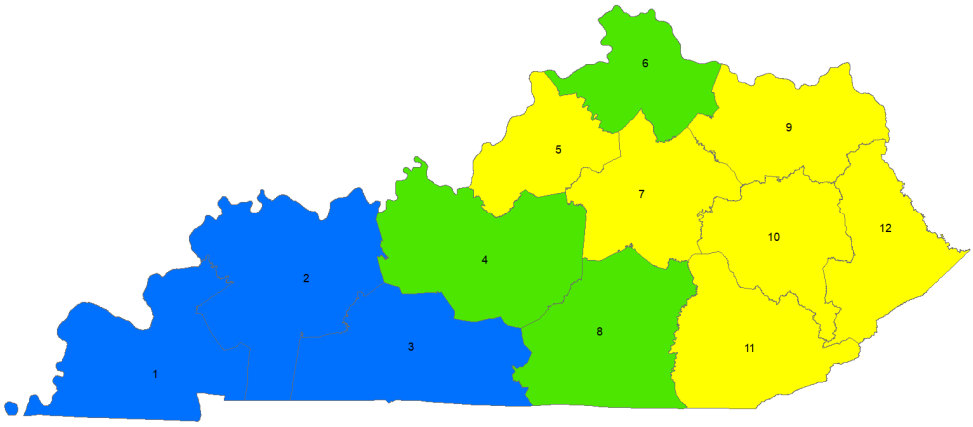
Results

Table 1: Statewide Maintenance Levels of Service

FY 2020 KYTC MAINTENANCE STATEWIDE SCORES			
CLASSIFICATION	SCORE	GRADE	COMMENTS
Interstates	92.8	A	Slight Increase
National Highway System	91.9	A	Slight Increase
State Primary and Secondary	84.3	B	Slight Increase
Rural Secondary	81.4	B	Slight Increase
All Roads	**84.0**	**B**	**Slight Increase**

Figure 1: Statewide





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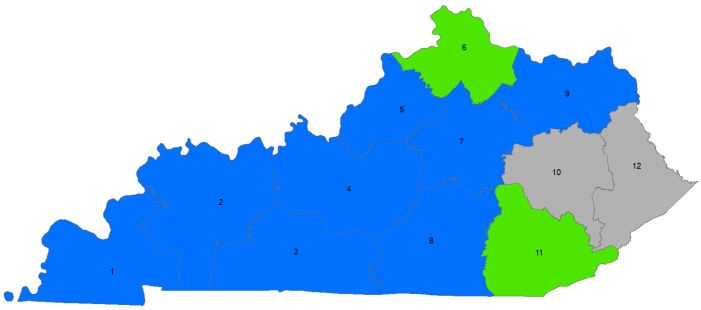
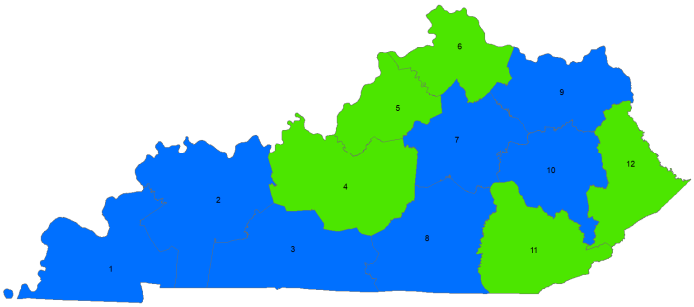
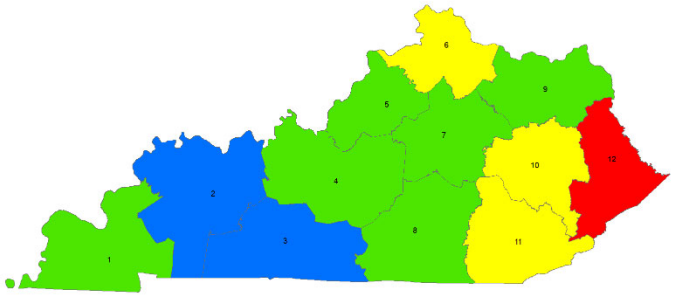


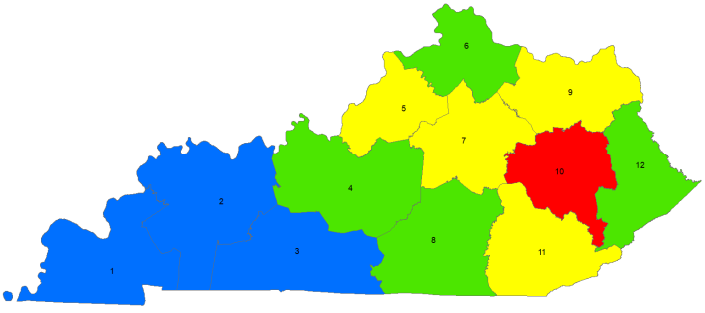
INTERSTATES



NATIONAL HIGHWAY SYSTEM



STATE PRIMARY AND SECONDARY



RURAL SECONDARY

A B (TARGET) C D

Figure 2: District Maintenance Levels of Service

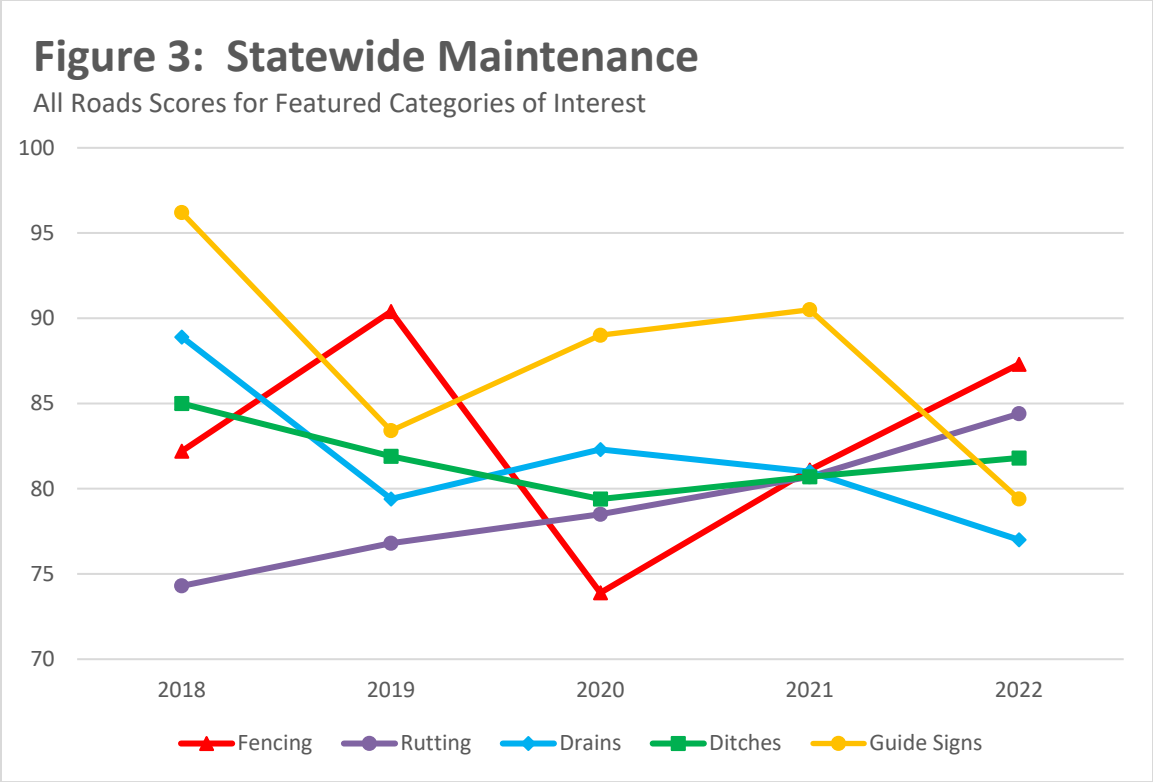
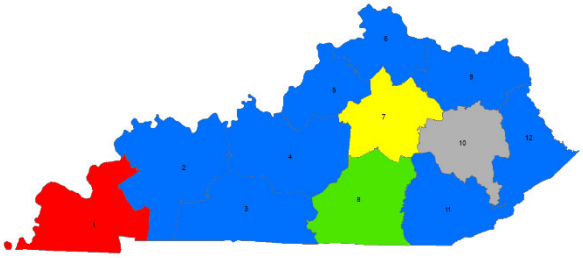
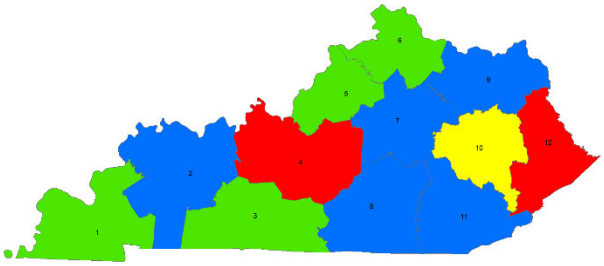


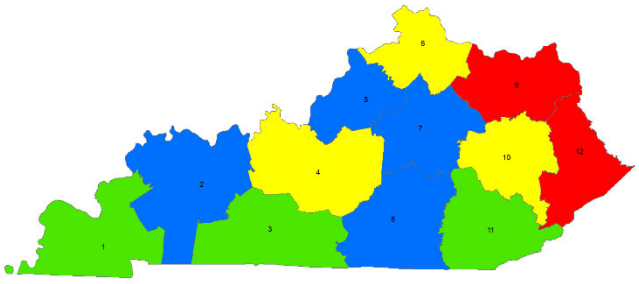
Figure 3 shows in recent years the categories that have seen the most significant drops in level of service over a five (5) year period. Fencing scores have remained above the recommended level of 70 and are showing an upward trend the last two years. A 6% increase in Level of Service from the 2018 MRP Scores. Rutting has shown the most consistent rise in Level of Service for the last five years. Showing a 14% increase in Level of Service from the 2018 MRP Scores. Drains has shown a decrease in the Level of Service from five years ago. There was a 13% decrease to Drains Level of Service from the 2018 MRP Scores. Ditches had shown a dip in Level of Service but has had slight increase year-to-year for the last two years. Ending with only a 4% decrease in Level of Service from the 2018 MRP Scores. Guide Signs Level of Service has shown the most volatility over the last five years. Overall, it has had a 17% decrease from the 2018 MRP Scores. As of the 2022 MRP Scores; none of these Road Scores Categories have score of less than 70; some are showing improvement but many of these Categories of Interest show Level of Service lower than their scores five years prior.



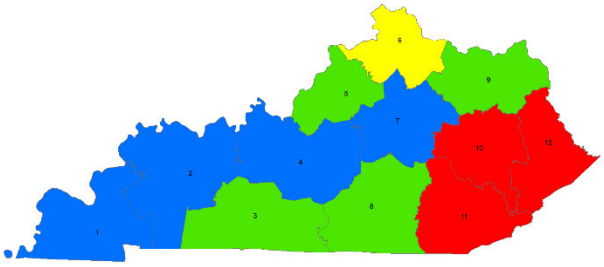
FENCING



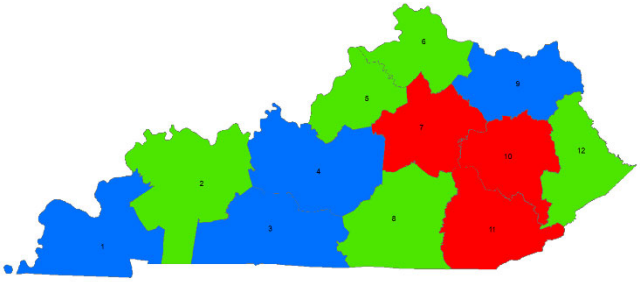
RUTTING



DRAINS

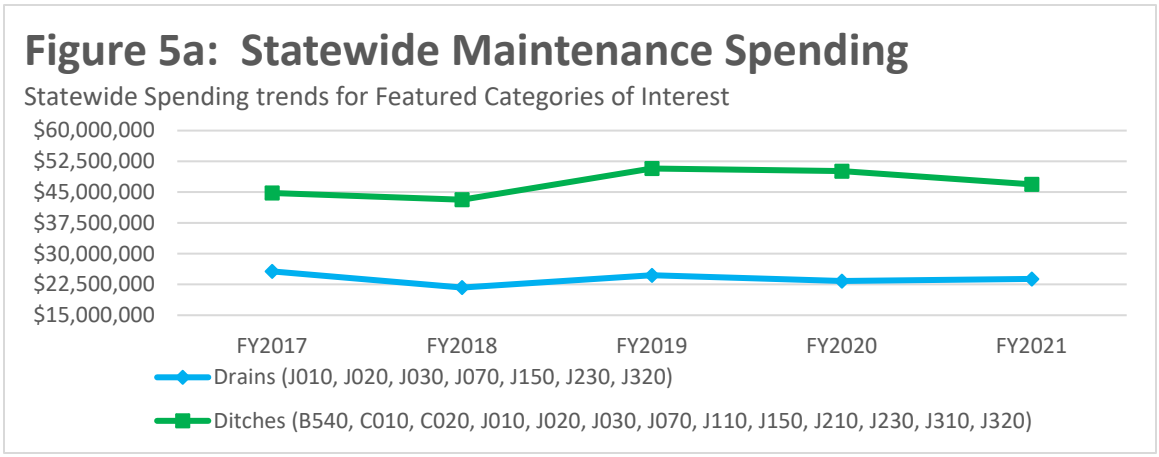


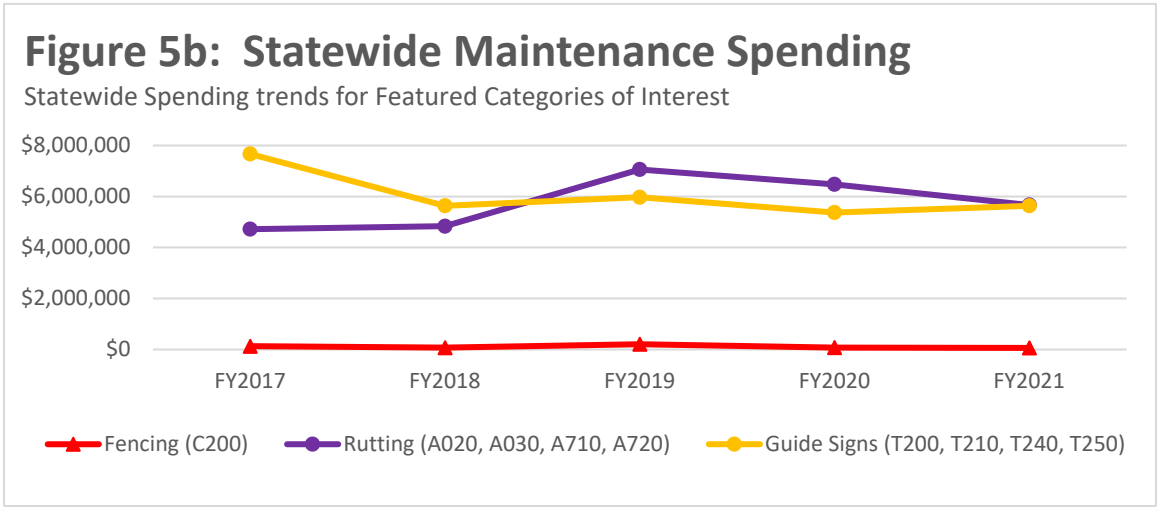
DITCHES



GUIDE SIGNS

Figure 4: District Maintenance Levels of Service for Featured Categories of Interest (FY2022)





The Figure 5a and 5b charts show the yearly statewide expenditures for the last five (5) fiscal years broken out for spending classifications related to the featured categories of interest.

Fencing ("5b") expenses pertain to the construction and maintenance of roadside fencing for maintaining limited access to the right-of-way. Rutting ("5b") expenses include surface maintenance from pothole and abnormality repair to surface milling to maintain level. Drains ("5a") contains expense for clearing and repairing drainage pipes and culverts. Ditches ("5a") contains expenses to remove vegetation and debris from ditches as well as vegetation maintenance and mowing to maintain ditch flow. Guide Signs ("5b") expenses are for placement and repair of roadside Guide Signs.

Many of the expenses associated with these categories of interest have shown either consistent increase or relative plateau in spending. While there has been a decrease in Level of Service for these Categories of Interest; the spending is still maintaining, in some cases well above, the recommended minimum Level of Service of 70.

TABLE 2 - DISTRICT MAINTENANCE FEATURE SCORES
All State Roads - Fiscal Year 2022

District:	1	2	3	4	5	6	7	8	9	10	11	12
Rideability Index	77.5	75.2	79.9	78.6	65.7	70.4	66.5	75.1	79.5	68.4	77.5	75.7
Appearance	94.3	100.0	93.7	85.6	95.0	83.0	91.1	77.6	86.1	86.9	90.1	92.7
Vertical Clearance	92.0	99.6	88.8	53.1	88.9	74.1	83.6	83.5	99.2	60.8	63.9	51.2
Visual Obstructions	99.0	100.0	88.7	95.4	83.4	88.3	94.4	88.5	99.6	57.4	90.7	90.3
Fencing	59.2	100.0	100.0	99.6	99.1	98.9	77.8	90.0	98.4	N/A	100.0	99.0
Guardrail Out of Specifications	51.6	100.0	99.0	52.4	85.4	60.9	79.1	69.5	82.4	55.2	76.9	66.5
Guardrail Damaged	100.0	98.4	87.2	52.4	66.0	80.8	79.9	92.3	64.6	97.5	85.4	89.7
Attenuators/Rail Ends Damaged	99.0	98.7	99.8	99.5	68.9	97.1	82.5	100.0	85.1	96.3	98.9	85.6
Pavement Potholes	98.0	96.0	90.6	62.0	76.3	77.7	77.7	61.7	73.6	90.1	87.3	57.2
Rutting	87.6	99.4	86.4	56.8	83.4	80.7	92.7	91.0	96.6	75.6	99.6	61.9
Pavement Dropoff	87.9	100.0	84.4	58.0	74.7	81.2	94.1	92.4	97.1	81.2	98.0	70.0
Shoulder Dropoff	95.3	98.8	73.1	59.1	54.0	62.6	72.7	85.5	95.7	77.7	57.2	53.0
High Shoulder	100.0	100.0	97.7	92.2	92.2	86.7	95.6	94.8	98.2	96.8	29.8	78.7
Shoulder Potholes	97.4	99.7	93.4	80.9	81.6	84.8	82.2	89.9	78.2	82.3	88.8	76.9
Drains	85.9	100.0	89.1	77.5	92.5	75.7	91.9	95.1	55.3	77.4	81.9	58.5
Ditches	98.0	97.8	89.9	91.7	81.9	77.7	93.3	88.3	86.0	52.0	45.3	51.3
Curbs and Gutters	100.0	100.0	99.9	98.2	77.3	95.6	94.3	N/A	N/A	N/A	N/A	99.3
White Striping	97.6	99.5	89.6	88.9	93.8	N/A	79.4	75.5	71.5	73.5	N/A	74.5
Yellow Striping	85.1	100.0	96.1	93.6	95.9	N/A	86.2	81.6	55.4	63.4	N/A	41.9
Guide Sign Faces	100.0	93.7	93.9	99.3	85.0	86.3	41.9	89.4	96.6	35.7	52.5	88.8
Guide Sign Assemblies	100.0	75.5	89.2	99.6	82.4	86.0	78.2	85.4	79.6	82.1	91.8	88.5
Warning/Reg Sign Faces	89.0	97.8	85.8	91.3	82.7	80.0	71.9	86.7	89.6	51.8	40.1	89.4
W/R Sign Assemblies	99.9	91.8	98.2	100.0	85.8	83.1	80.4	85.6	68.8	84.4	63.2	82.4

Strength - A feature scored at 90 or higher across the district.

Within Acceptable Limits - A feature scored between 70 and 90 points across the district.

Failing - A feature scored below 70 across the district.

Features did not have a sample size large enough to produce statistically valid data

*Some values may appear to be shaded incorrectly due to rounding

A. GOALS AND REQUIREMENTS

Assess the maintenance activities of the Kentucky Transportation Cabinet.

The MRP allows the cabinet to assess the effectiveness of infrastructure maintenance activities and compare the outcomes to customer expectations.

Make informed policy and management decisions.

The results of the MRP provide guidance for investment decisions and resource allocation. In addition, the MRP findings also offer a means to assess effectiveness of prior decisions and resource allocations. MRP findings also reveal where additional resources are needed to bring performance to targeted levels.

The MRP supports the cabinet goal of delivering a consistent level of customer service across the state by providing the necessary data to identify differences in performance across districts, road types, and roadway features. The results of the MRP demonstrate how each district is performing in comparison to targeted levels in specific categories. The MRP can thereby help district management determine how district resources should be allocated to achieve a consistent level of service. The MRP can also help district and cabinet management formulate the budget request necessary to achieve targeted levels of performance.

Similarly, the MRP communicates targeted performance levels, along with the policy and budget decisions that drive them, to policy makers as well as citizens. The MRP thus aids the Commonwealth's Executive and Legislative branches in determining acceptable levels of performance for their constituents.

The MRP is designed to support "management by fact" at all levels and provides a means to identify best practices among the districts by identifying districts exceeding target levels. These practices can then be shared with districts that may be falling short of their goals.

Promote alignment with the Transportation Cabinet's Strategic Plan.

The Maintenance Rating Program is vital to two of the cabinet's four strategic goals. These goals are as follows:

Strategic Goal Number 1: "Ensure Mobility & Access" to preserve the transportation system infrastructure.

Strategic Goal Number 3: "Continually Improve Organizational Performance" of Operational and Support Processes.

The MRP is a direct assessment tool for maintenance activities related to infrastructure preservation, as defined in *Strategic Goal Number 1.* The MRP is also the principal

performance measure for assessing maintenance process improvement, thereby facilitating *Strategic Goal Number 3.*

Provide Data for GASB-34.

MRP data can be used to satisfy the Governmental Accounting Standards Board Statement 34 (GASB-34) condition of highway assets requirement. This requirement obligates state governments to report all capital assets, including infrastructure, in a *statement of net assets* and to report depreciation expense associated with these assets. Infrastructure assets are not required to be depreciated if (1) the government manages the assets using an asset management system that has certain defined characteristics and (2) the government can document that the assets are being preserved approximately at (or above) a condition level established and disclosed by the government.

KYTC's Operations Management System (OMS) satisfies the first requirement listed above. The MRP fulfills the second requirement.

B. METHODOLOGY

Sampling and Data Collection

Data is collected during one wave each year, June through October.

For this wave, between 300 and 400 roadway segments are randomly selected in each district among the following four road types:

Interstates - Those routes designated as part of the Eisenhower National System of Interstate and Defense Highways. These include three north-south interstates (I-65, I-71, I-75); two east-west interstates (I-24 and I-64); and smaller loop routes in Louisville Metro and Northern Kentucky.

Other NHS - Non-interstate routes that are part of the National Highway System. This category includes most of the state's parkways and major US routes. Some state routes (roads designated with a "KY" prefix) are also components of this system.

Other SP/Sec - State Primary and Secondary roads include all "KY" routes which do not carry an NHS or Rural Secondary designation.

Rural Secondary – The system of roads in Kentucky that are usually considered “farm to market” roads.

Each roadway segment is 500 feet in length and includes all adjacent right-of-way. Two-person teams from each district inspect the selected roadway segments and complete the MRP inspection for each segment. The KYTC GIS department and ESRI developed a mobile ArcGIS application for field use in 2015. This application allowed inspections to be completed with an Apple iOS unit with the ESRI Collector App installed. The mobile application gave Central Office access to a SDE layer that was updated daily with inspection results. All districts have utilized the new devices and software since the 2017 data collection.

The MRP collection splits performance measures into five main categories: roadway general, pavement, shoulders, drainage, and traffic. The following are some of the inspected features: general aesthetics, visual obstructions, potholes, rutting, drop off, ditches, and guide sign faces. These measures are then used in the calculation of statewide and district MRP scores.

Quality Assurance

The Field Data Collection Manual was revised in May 2006 to reflect the recording changes for some features. The training manual contains an introduction of the Maintenance Rating Program and its purposes, as well as definitions and guidelines for recording measurements and observations on the inspection form. Additionally, the manual establishes safety procedures for both the inspection team and the public. This manual along with a training power point presentation is available on the website: http://transportation.ky.gov/maintenance/

Statewide training was available prior to the summer 2009 data collection to ensure new employees are properly trained and to address any additional questions regarding the program. All districts requested and received training with the exception of districts three and eight during this time. District three requested and received training prior to the summer 2010 data collection. All districts were trained for mobile device collection in 2011 and additional training was offered in 2012. In 2016 the new iOS Application and devices were provided to All Districts. All districts were provided Training with the new iOS devices in 2016.

A quality assurance procedure was established to assess the accuracy of MRP data collection, and indirectly, the consistency of training. Two teams from the central office in Frankfort re-inspected approximately 10% of the segments surveyed in each district. The results of the quality assurance inspections will be compared to that of the original inspections and will be used to determine additional needs for training of the field data collection teams.

A committee of stakeholders, including Maintenance and Traffic Engineers in the MRP will periodically meet to review the data collection procedures, features and weight factors to make further improvements to align the MRP with the Strategic Goals of the cabinet.

C. ANALYSIS

The inspection results for each of the sample sets were analyzed using the Operations Management System MRP module. Most of the information reported is statistical summaries of the data. Rideability indices were provided by the Pavement Management Branch within the Division of Maintenance. Each road type score was weighted according to the proportion of centerline miles for each of the four road types to produce district and statewide road type totals and a state total score. Spending data was taken from OMS and EMARS according to fiscal year. Spending data from the previous fiscal year is paired with MRP data collected during the current fiscal year.

Each of the roadway features measured was evaluated and given an "importance weight" with respect to the other features so that the sum of all weights is 100. These importance weights were determined through a consensus of approximately 100 key KYTC managers and staff. They are based on the customer requirements identified and prioritized in the 1998 Voice of the Customer research conducted by the cabinet. These requirements include safety, protection of the infrastructure, comfort and convenience, and aesthetics. Importance weights were revised in 2011 to reflect results of the 2010 Maintenance Customer Survey performed by KTC.

The targeted confidence levels and intervals are based on the size of the samples. The target confidence interval for the smallest sample, road type by district, is set as 90% +/- 10%. District totals and road type totals have a confidence interval of 90% +/- 5%, while the statewide total target confidence interval is set as 99% +/- 3%. For a feature where the number of occurrences is less than nineteen in the sample segments, no data is reported, as the data may lack statistical validity.

If no data was present for a particular feature in a district, the scores were adjusted for missing values so that the potential value remained 100. This allows for calculation of overall district and road type scores in the absence of specific feature data.

APPENDIX I

Statewide Scores

Appendix I charts show the MRP score by road type for each feature measured. Boxes are color coded according to scores:

Green – a strength, score at 90 or higher
Yellow – within acceptable limits, score between 70 and 90
Red – failing, score below 70

In some cases, a score of "N/A" is listed. In these instances, there were not enough occurrences in order to achieve the desired confidence level. This may be due to the absence of a particular feature in the sample segments (such as guardrail, curb, etc.). It also may indicate that inspection crews were unable to measure certain items due to safety concerns (as with striping on interstates). Rideability scores for Rural Secondary are “Blank” as IRI data is not currently collected for Rural Secondary routes.

Statewide Scores

FEATURE DESCRIPTION	INTERSTATE	NATIONAL HIGHWAY SYSTEM	STATE PRIMARY AND SECONDARY	RURAL SECONDARY	ALL ROADS
Rideability	88.1	84.4	74.6		73.7
Appearance	95.7	95.2	93.3	85.8	89.9
Vertical Clearance	97.8	93.9	80.5	73.7	79.0
Visual Obstructions	97.8	97.1	92.0	88.2	90.8
Fencing	98.1	92.9	76.0	87.8	87.3
Guardrail Specifications	90.2	83.3	76.9	75.8	76.2
Guardrail Damage	91.9	94.5	88.4	81.6	82.5
Attenuators	92.7	94.8	86.8	95.4	94.9
Potholes	88.4	88.5	86.9	71.3	79.5
Rutting	81.0	85.9	86.1	83.0	84.4
Pavement Drop Off	98.7	96.5	84.9	82.0	85.0
Shoulder Drop Off	93.2	91.2	74.7	71.0	75.0
High Shoulder	96.9	95.4	89.9	87.8	89.6
Shoulder Potholes	92.0	88.5	89.6	84.8	87.2
Drains	94.2	93.3	86.4	71.4	77.0
Ditches	94.8	91.6	81.9	78.9	81.8
Curb and Gutter	73.7	92.4	78.6		96.5
White Stripe	100.0	93.1	86.9	91.0	90.1
Yellow Stripe	100.0	96.3	81.4	84.4	84.4
Guide Signs	93.3	94.8	88.7	78.1	79.4
Guide Sign Assemblies	97.0	94.6	89.0	88.2	88.4
Warning and Reg. Signs	87.7	90.3	83.4	77.6	81.2
Warning and Reg. Sign	98.4	94.2	90.1	89.7	89.8
Total Score	**92.8**	**91.9**	**84.3**	**81.4**	**84.0**

District One Scores

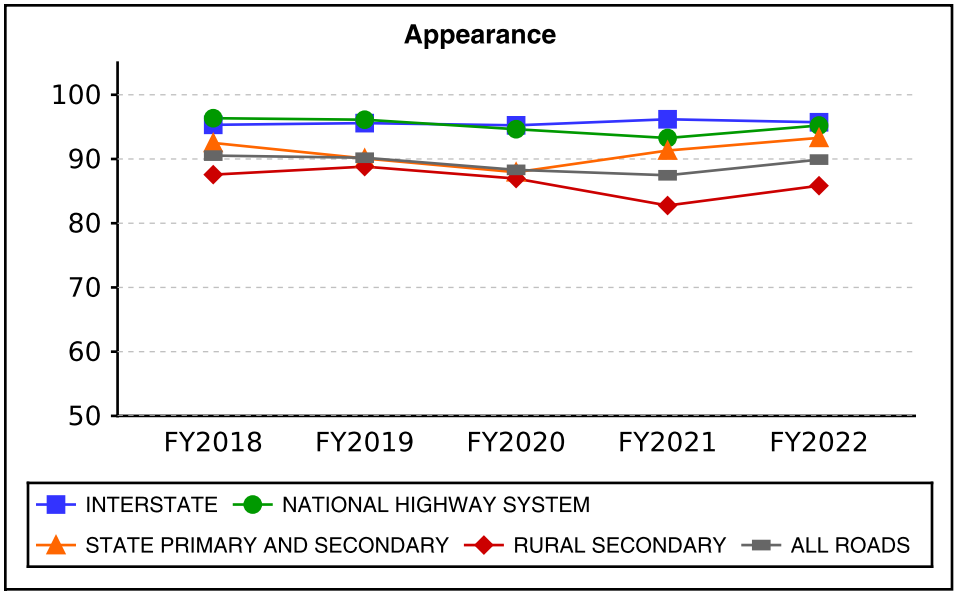
FEATURE DESCRIPTION	INTERSTATE	NATIONAL HIGHWAY SYSTEM	STATE PRIMARY AND SECONDARY	RURAL SECONDARY	ALL ROADS
Rideability		81.8	75.2		77.5
Appearance	100.0	90.5	97.2	92.7	94.3
Vertical Clearance	100.0	87.8	90.7	92.7	92.0
Visual Obstructions	100.0	100.0	100.0	98.2	99.0
Fencing		74.4	70.8	48.2	59.2
Guardrail Specifications		60.0			51.6
Guardrail Damage		100.0			100.0
Attenuators					99.0
Potholes	100.0	100.0	97.7	97.7	98.0
Rutting	21.4	76.8	94.4	89.1	87.6
Pavement Drop Off	100.0	95.1	90.7	84.6	87.9
Shoulder Drop Off	100.0	100.0	93.5	95.4	95.3
High Shoulder	100.0	100.0	100.0	100.0	100.0
Shoulder Potholes	100.0	100.0	100.0	95.4	97.4
Drains		100.0	92.4	80.0	85.9
Ditches		96.7	98.0	98.0	98.0
Curb and Gutter					100.0
White Stripe		90.0	83.3		97.6
Yellow Stripe		100.0	79.2	86.6	85.1
Guide Signs		100.0	100.0		100.0
Guide Sign Assemblies		100.0	100.0		100.0
Warning and Reg. Signs		100.0	82.6	91.1	89.0
Warning and Reg. Sign					99.9
Total Score	**91.2**	**92.6**	**90.0**	**95.7**	**94.4**

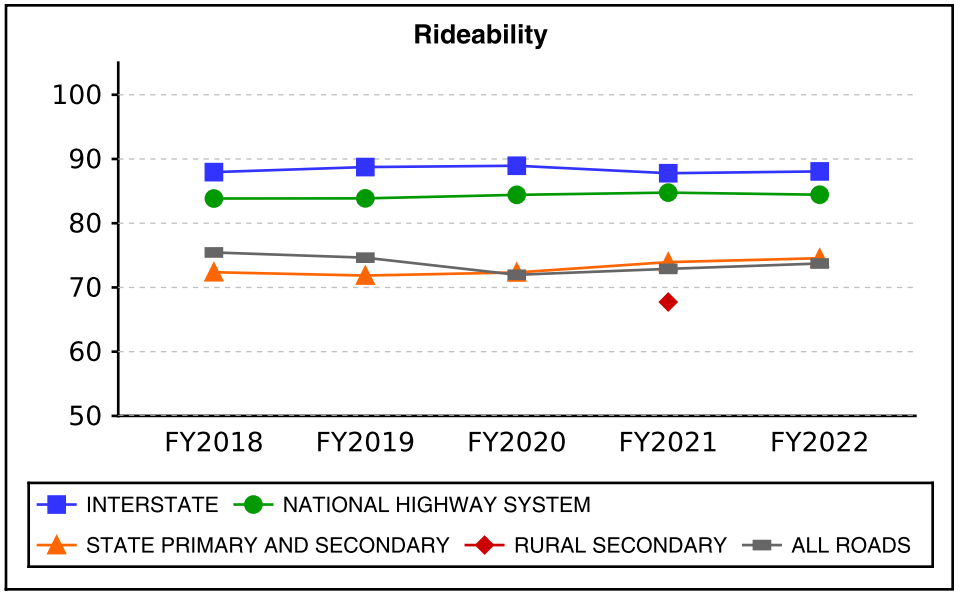
APPENDIX II

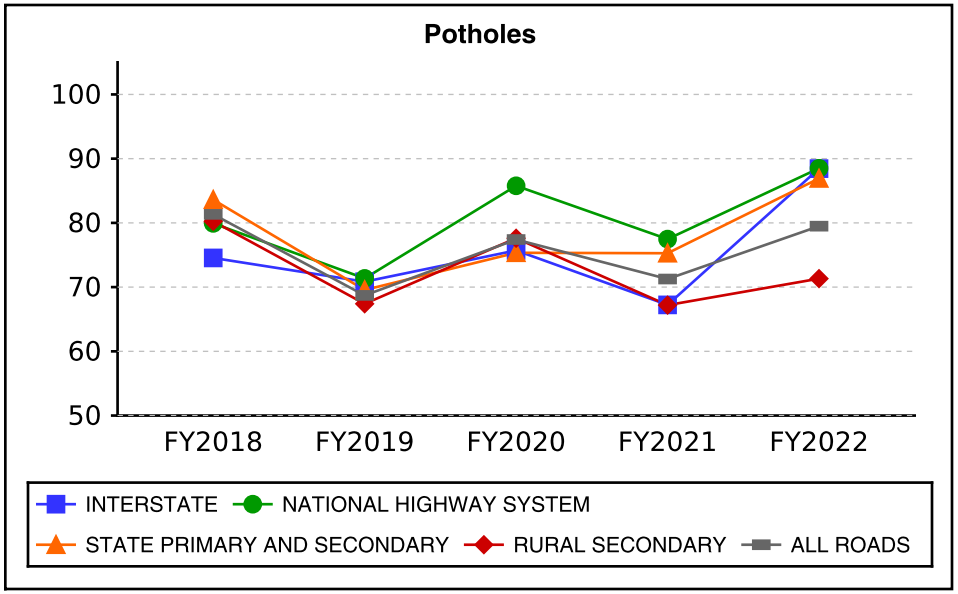
Statewide Scores by Element Type

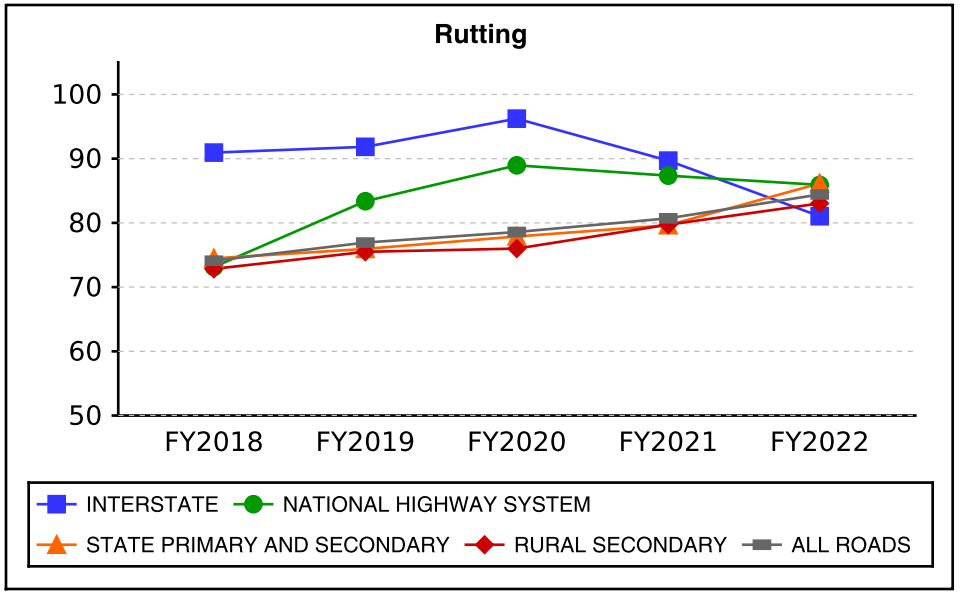
Appendix II is a graphical representation of historical scores on a statewide basis. Scores for the current and previous four years are represented in the graphs for each of the four road types. The gray shaded area represents the weighted average of all roads for the given feature. This weighting is based on the number of miles present for each road type. For this reason, the shaded area may not appear to be a true average of the individual lines. In general, the weighted average will tend to gravitate toward the RS and Other SP/SS scores as these have the majority of centerline miles.

In some instances, there may be insufficient data available to analyze a specific road type. In these cases, individual lines may be broken or may not appear at all. Where possible, the overall average score is still displayed.



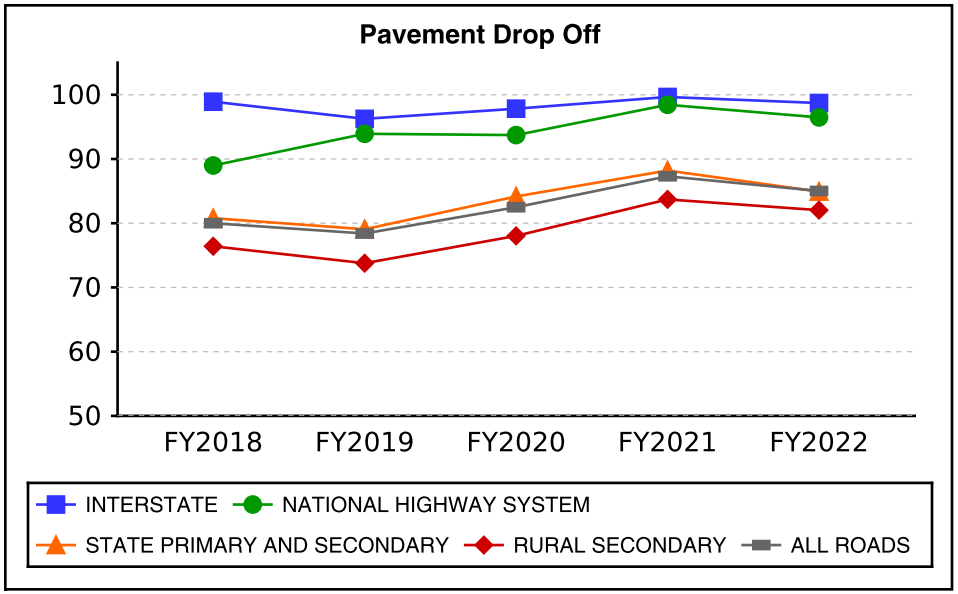


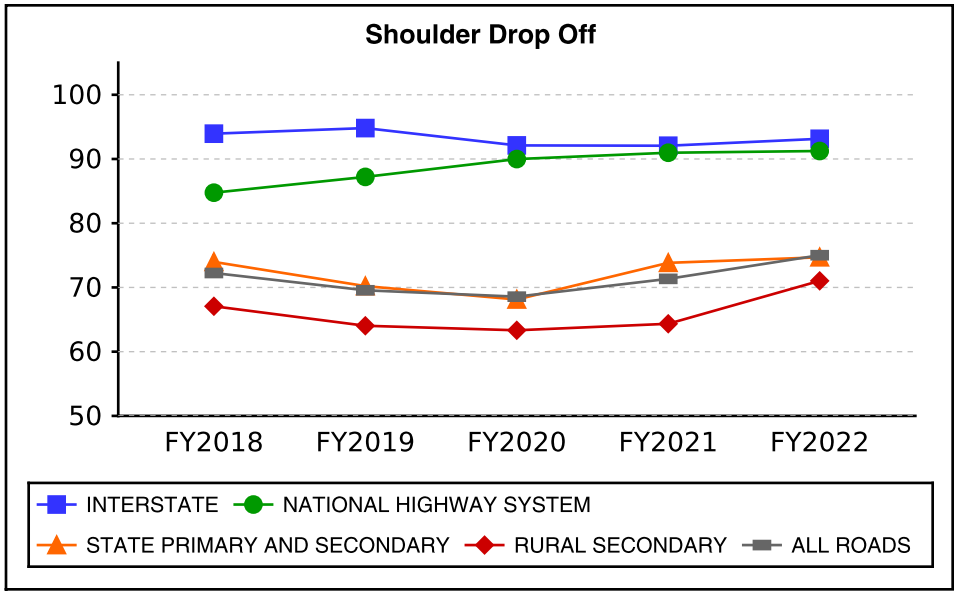


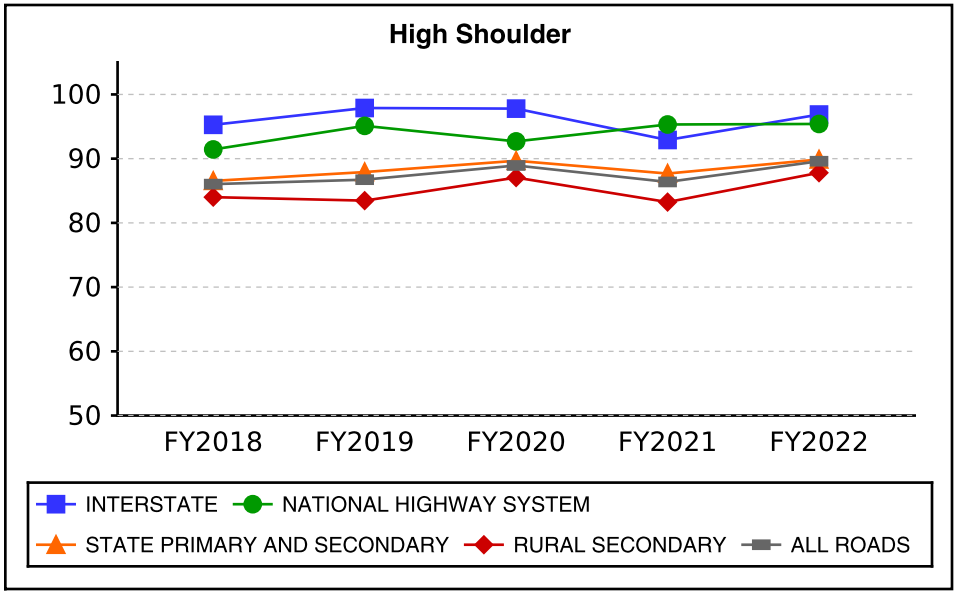


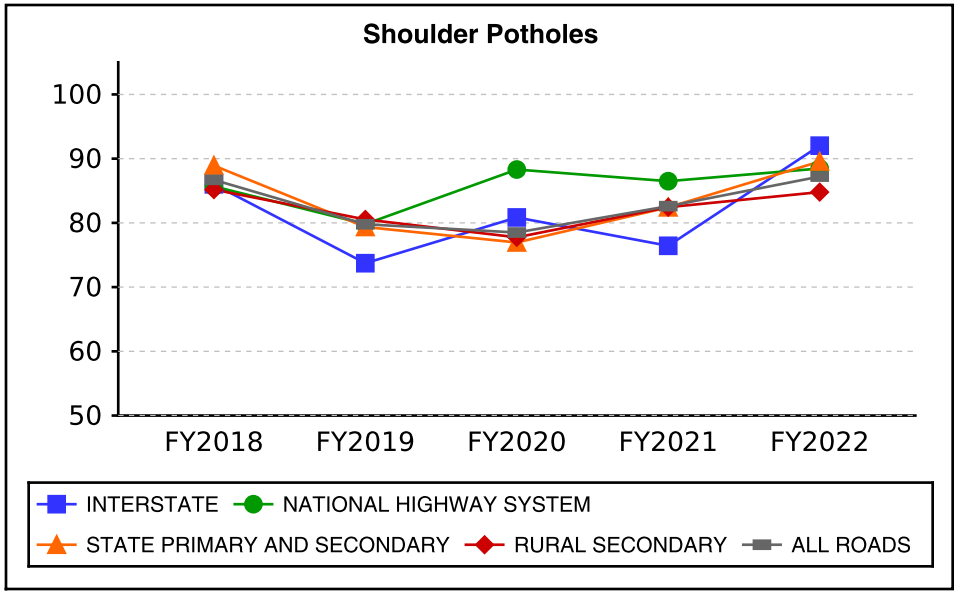
Statewide

Appendix II.1



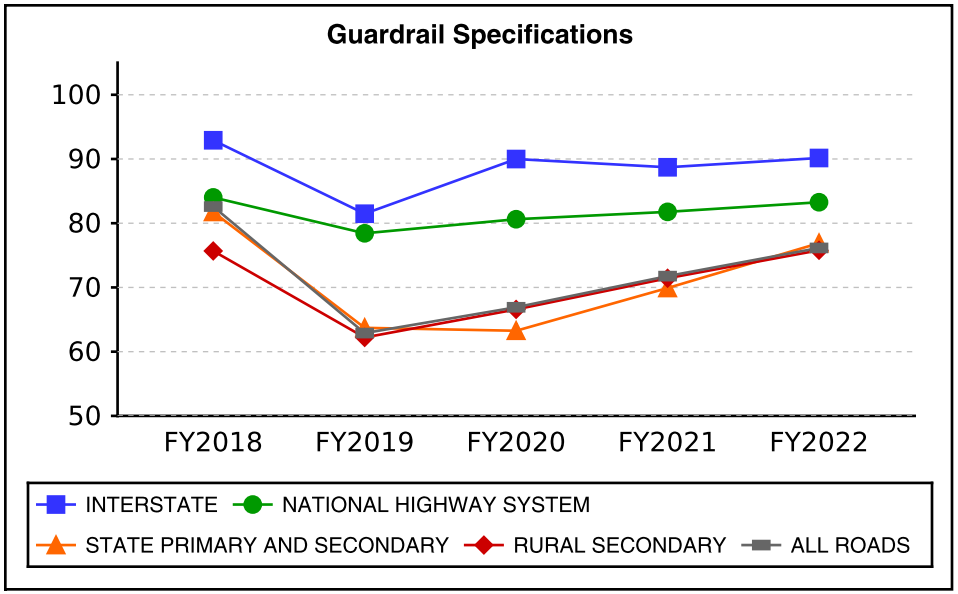


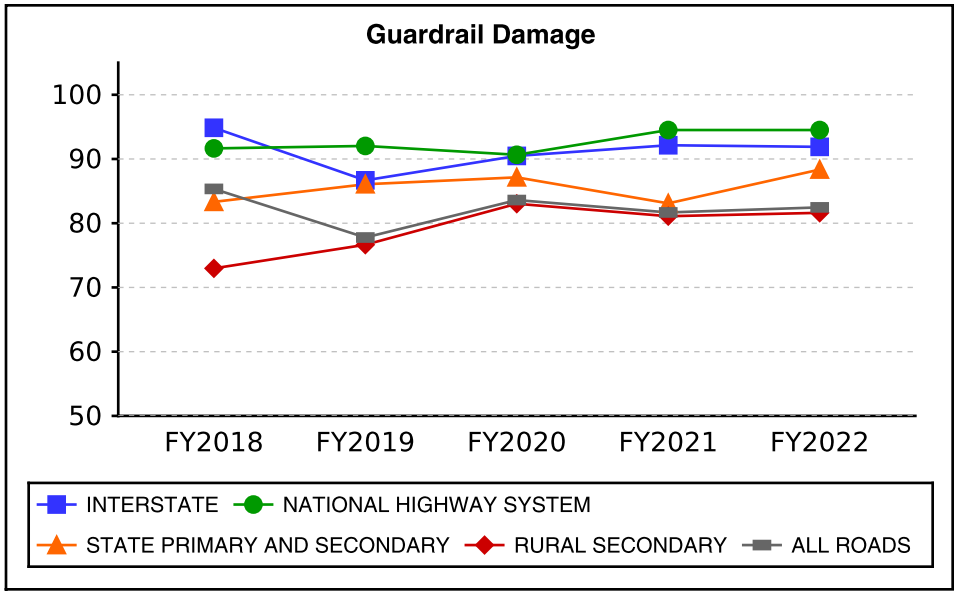


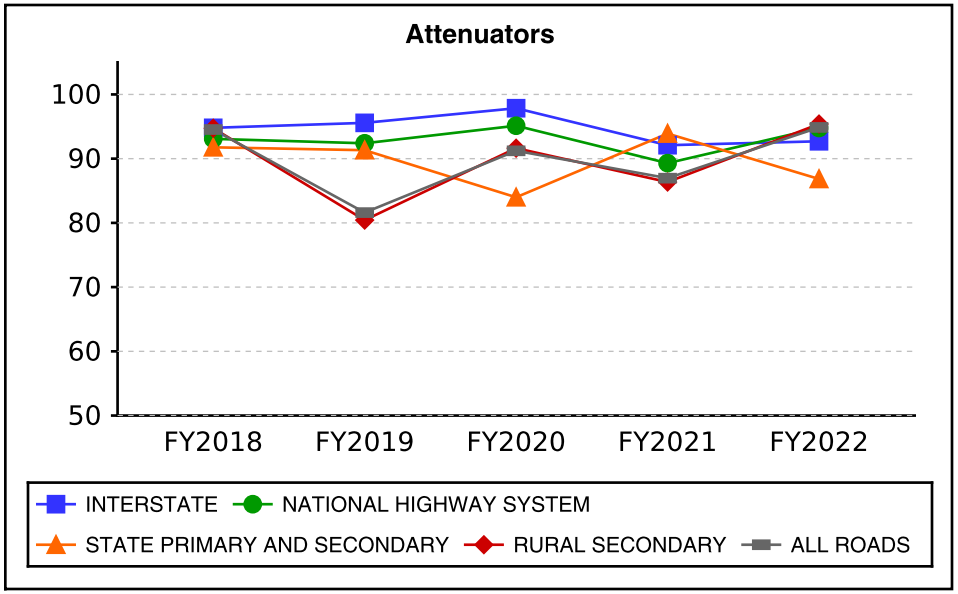


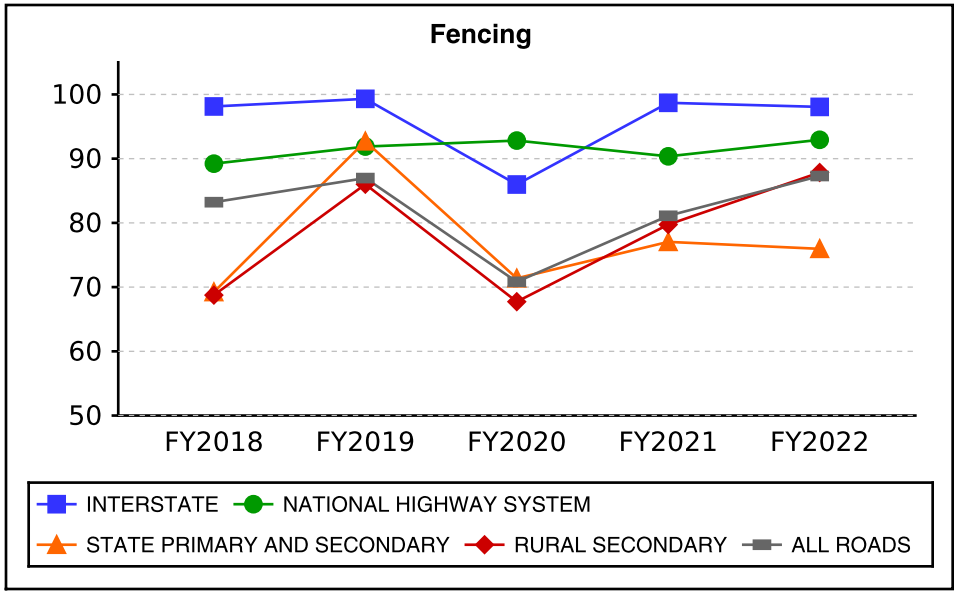
Statewide

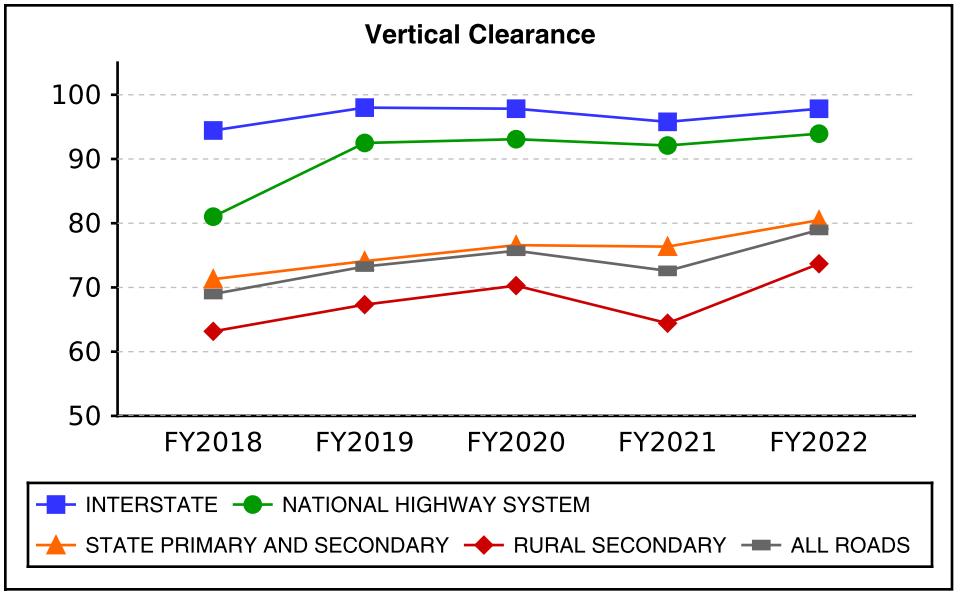
Appendix II.2

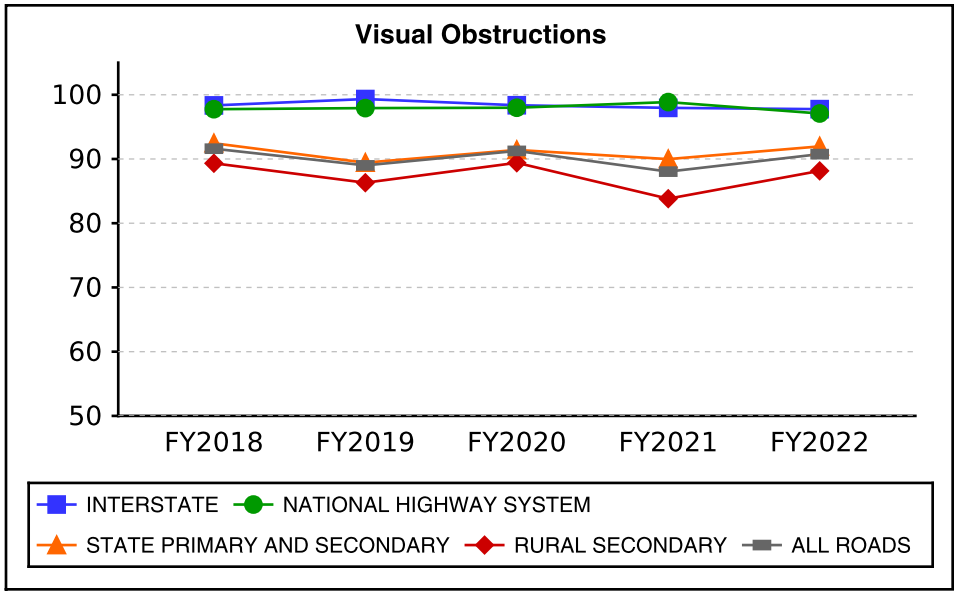

Guardrail Specifications
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

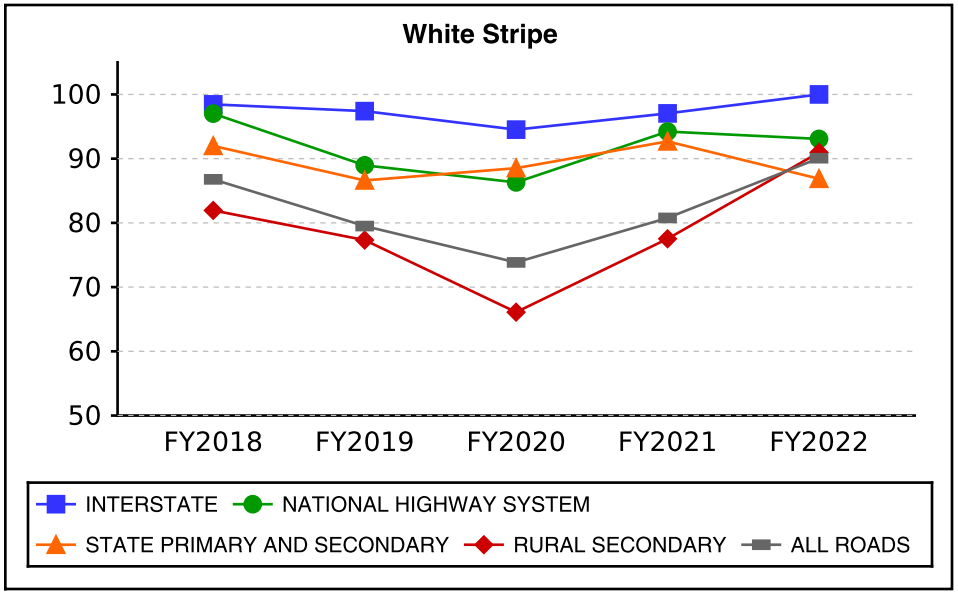

Guardrail Damage
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

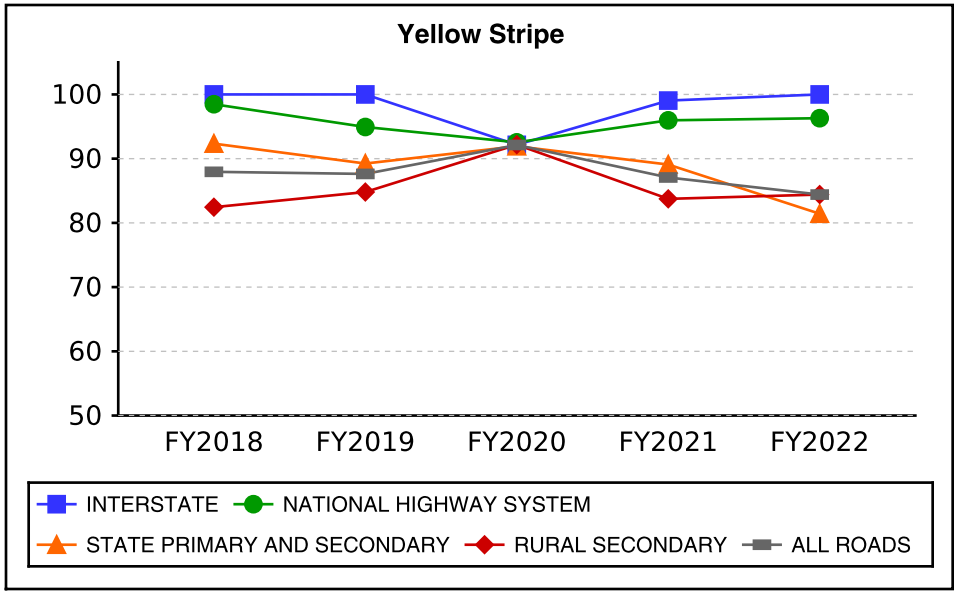

Attenuators
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

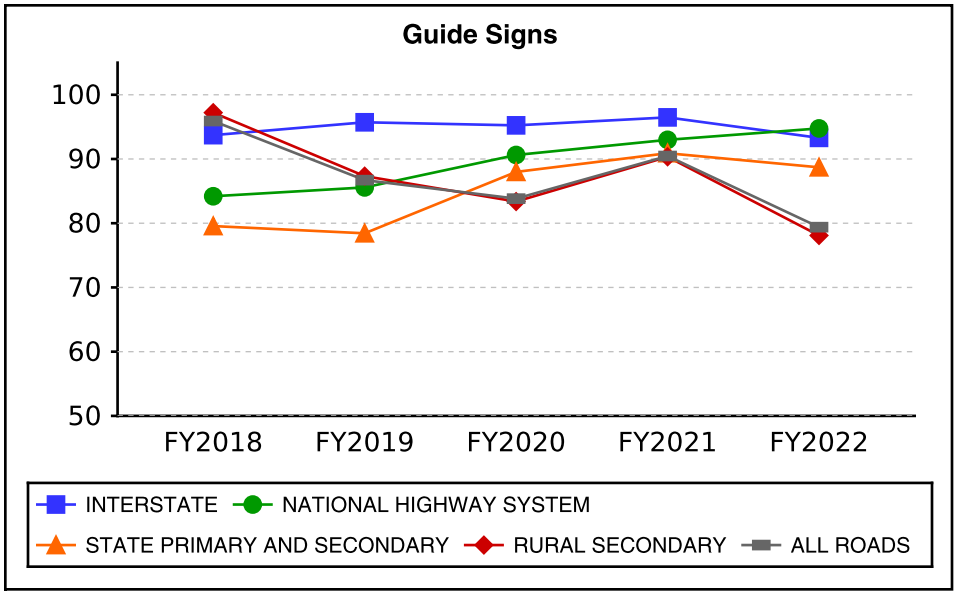

Fencing
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

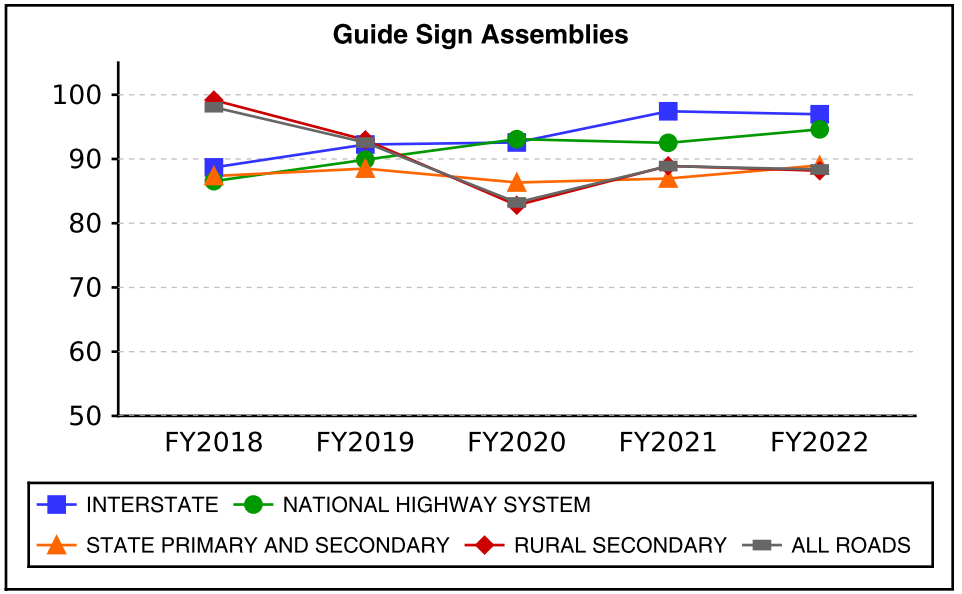

Vertical Clearance
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

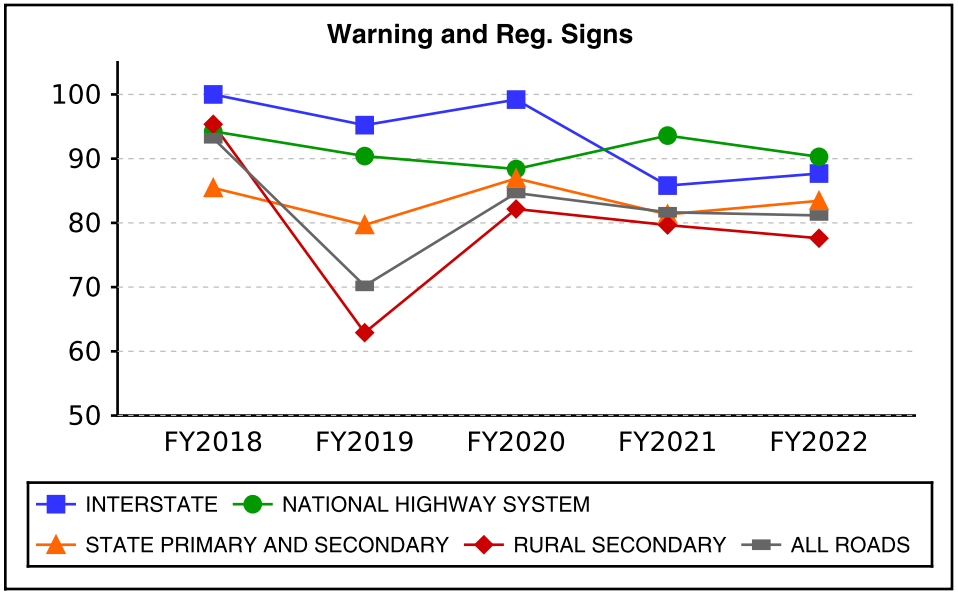

Visual Obstructions
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

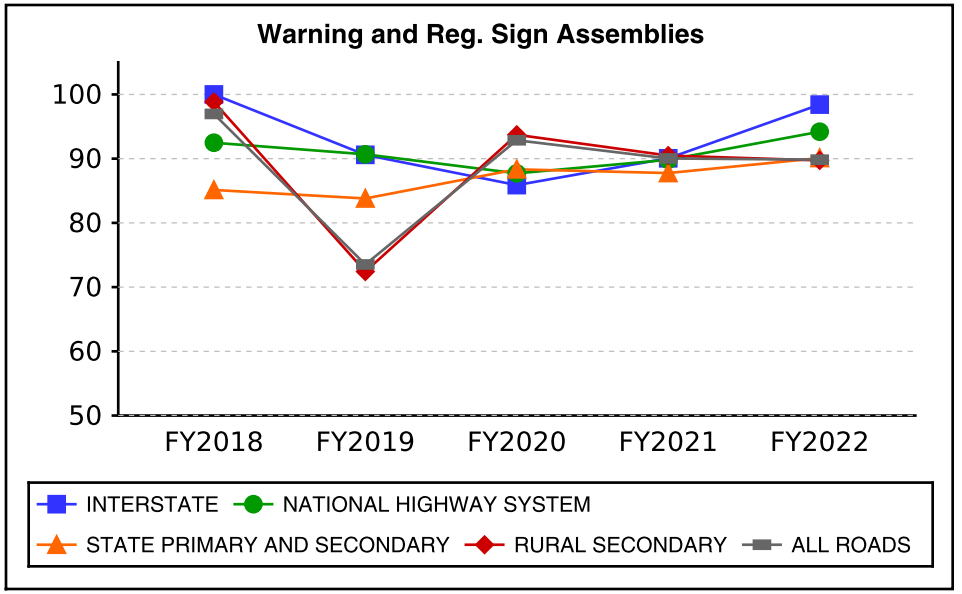

White Stripe
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

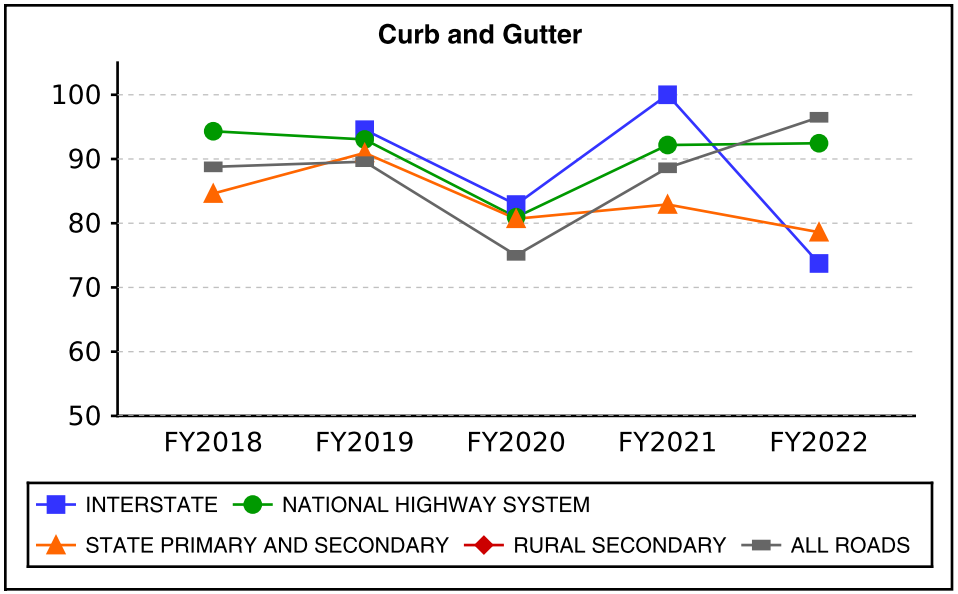

Yellow Stripe
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

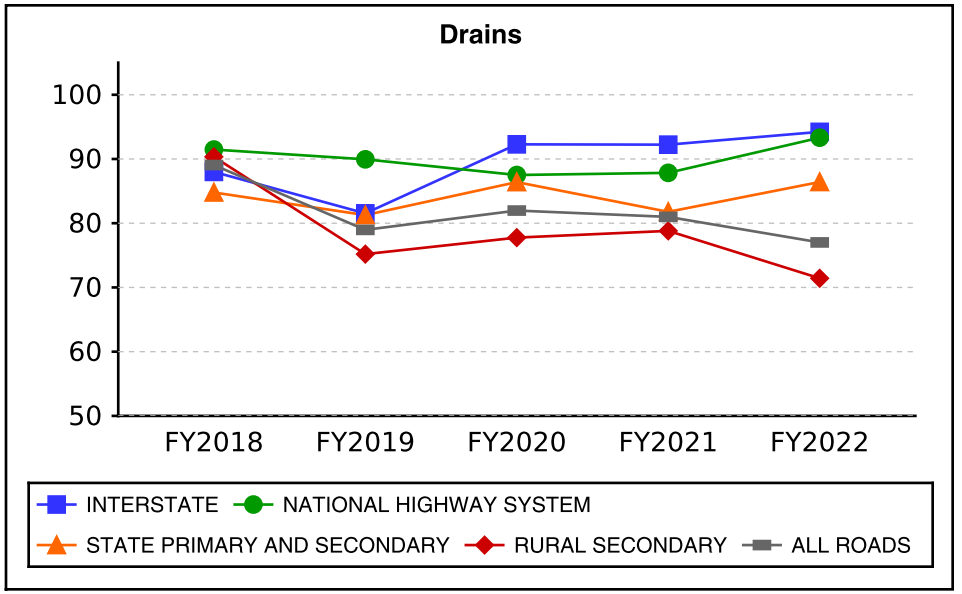

Guide Signs
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

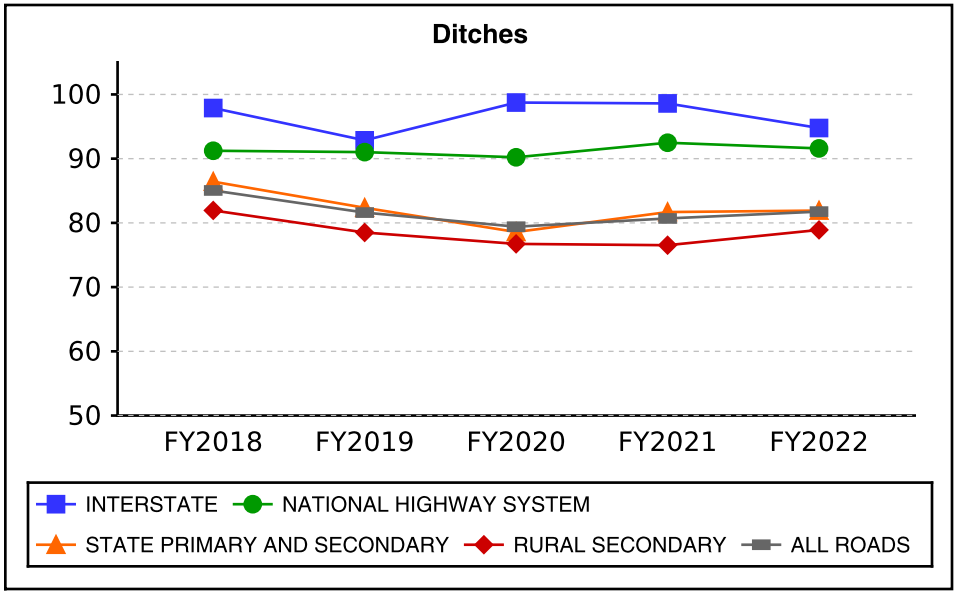

Guide Sign Assemblies
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Warning and Reg. Signs
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Warning and Reg. Sign Assemblies
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Curb and Gutter
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Drains
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

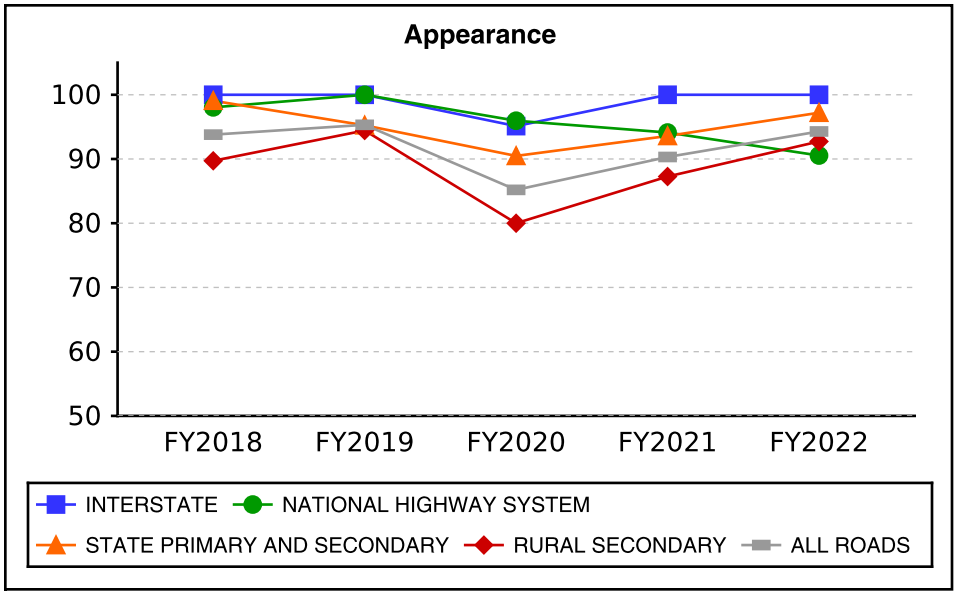

Ditches
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

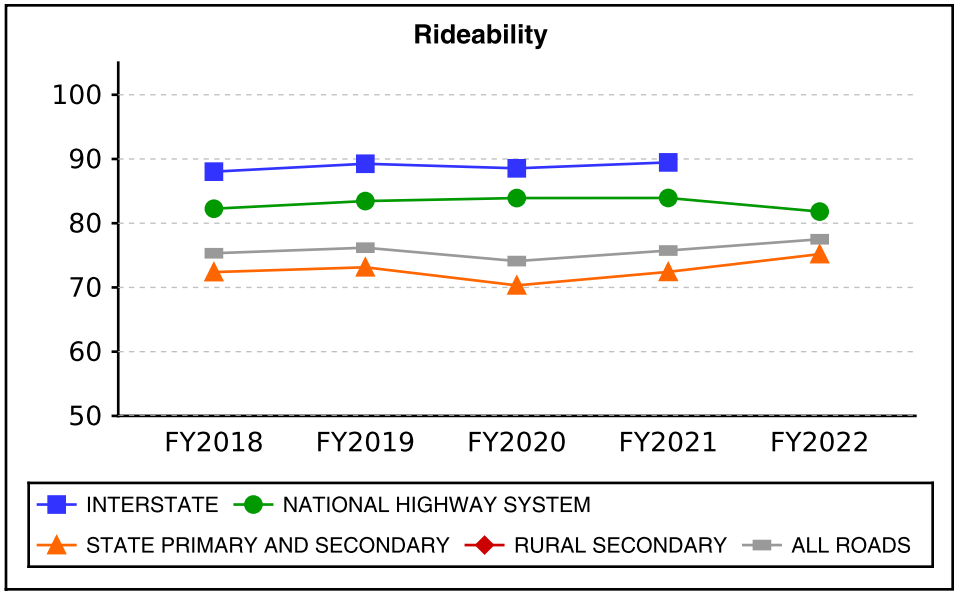
APPENDIX III

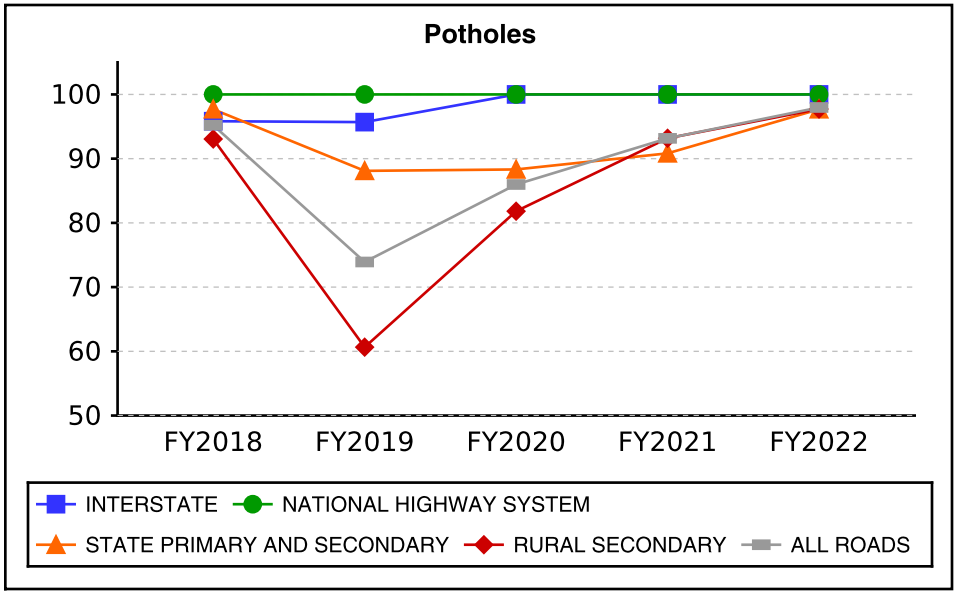
District Scores by Element Type

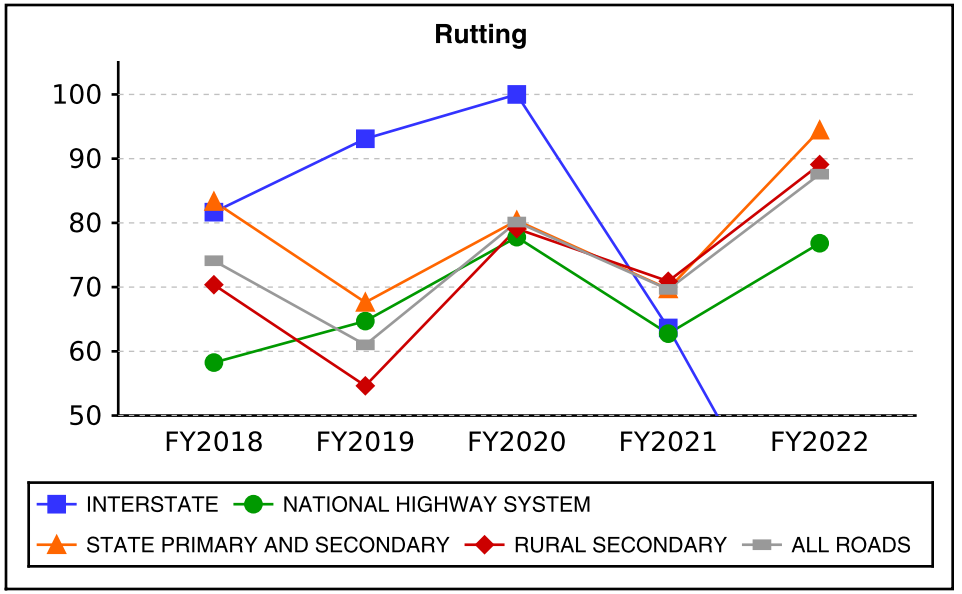
Similar to Appendix II, the District Scores by Element Type have scores for the current and previous four years represented in the graphs for each of the four road types. The gray shaded area represents the weighted average of all roads for the given feature.

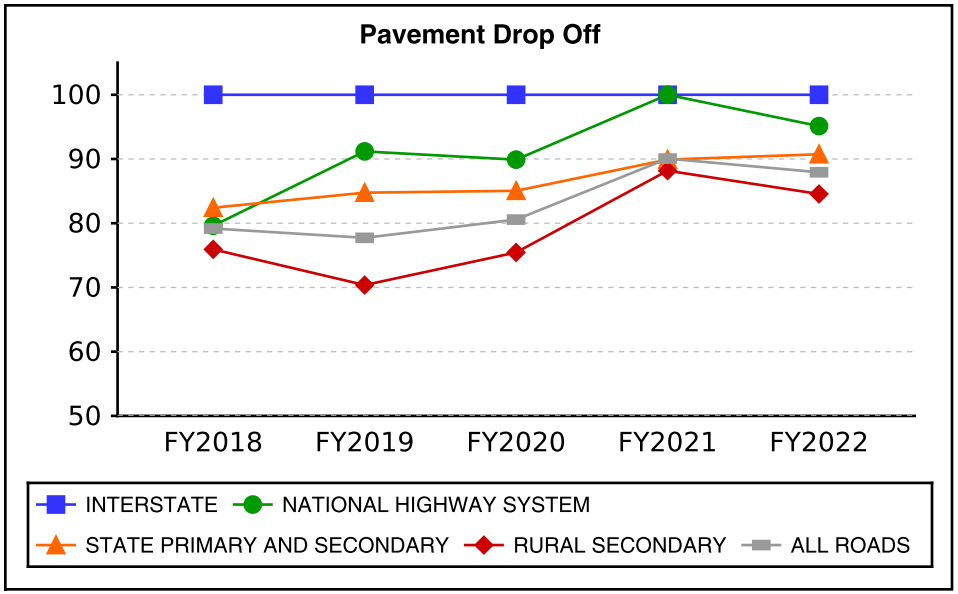
Due to the much smaller sample size in district evaluations, there are many more instances where there was insufficient data for analysis. These graphs are still shown, but will be marked accordingly. In some cases, the line representing a specific road type may be missing or broken due to insufficient data for a specific year or road type, but the district-wide average for all road types is still shown where possible.

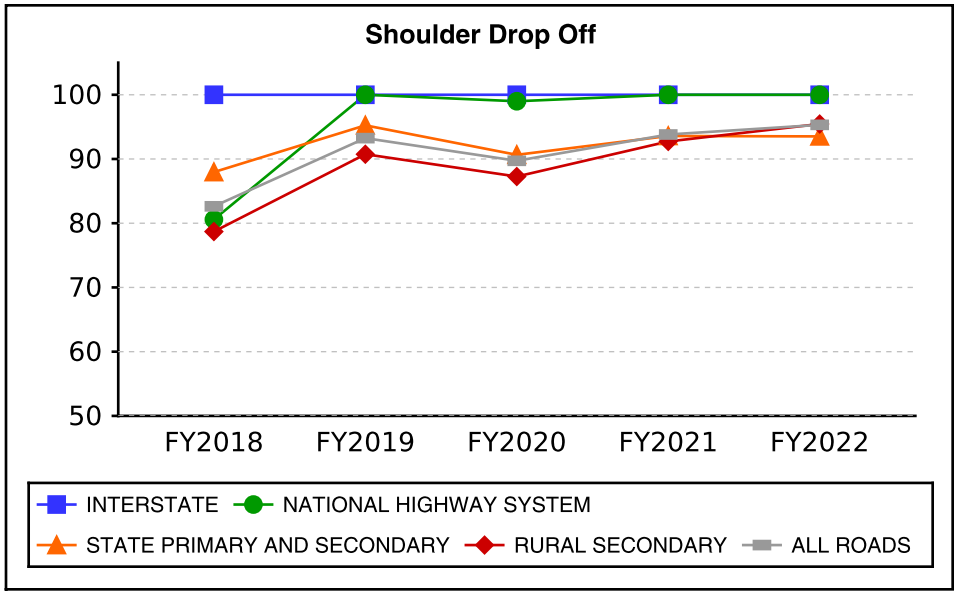

Appearance
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

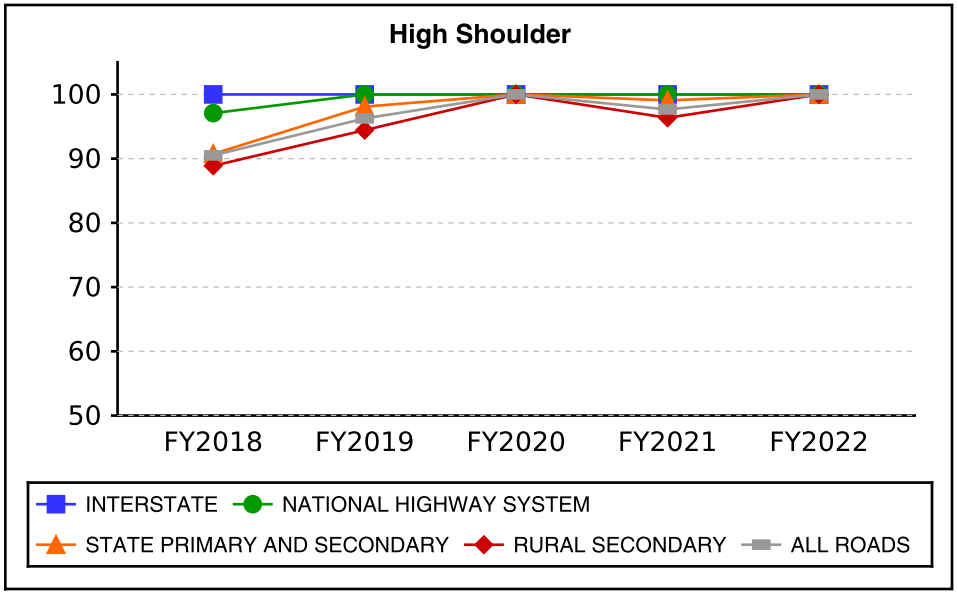

Rideability
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

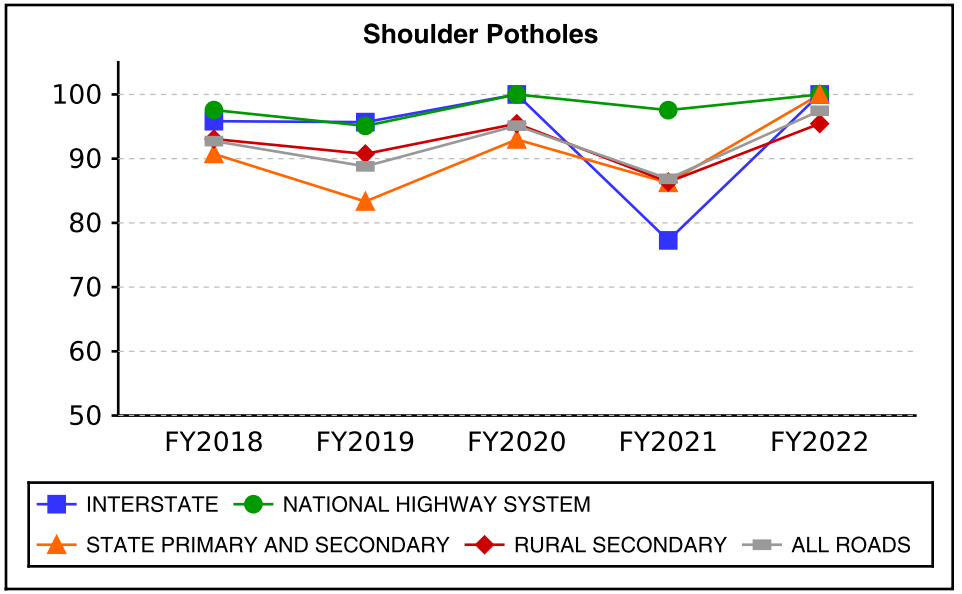

Potholes
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

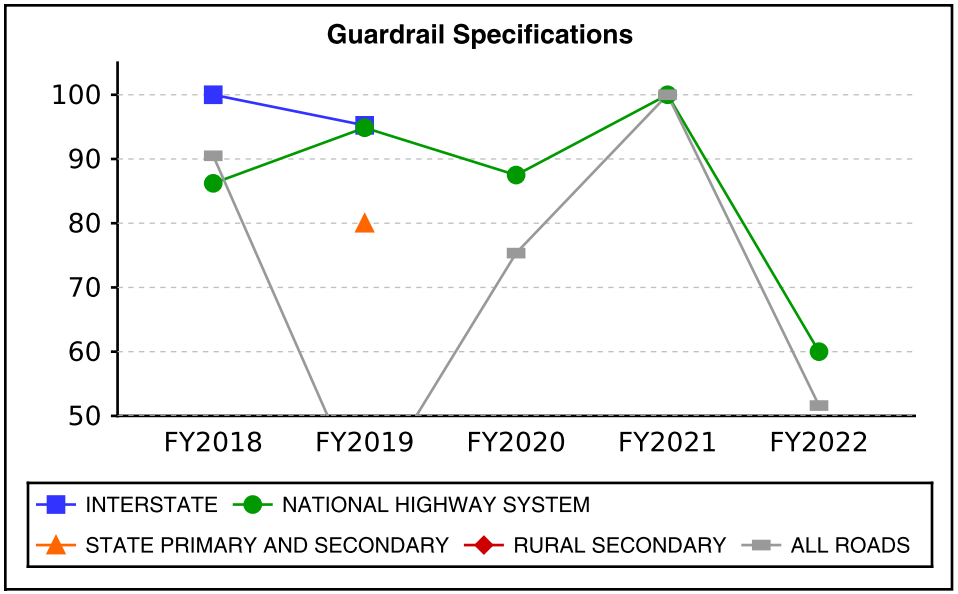

Rutting
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

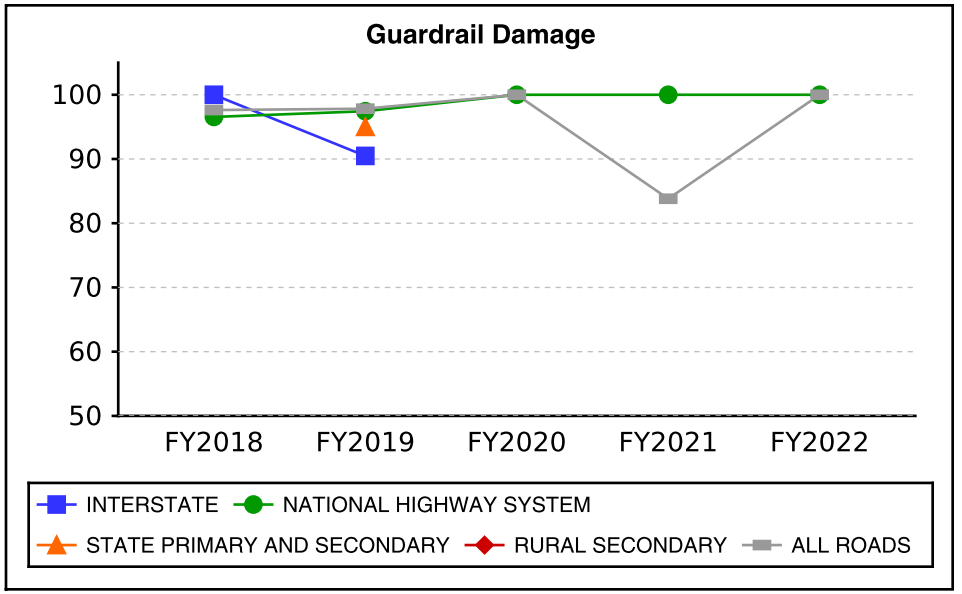

Pavement Drop Off
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

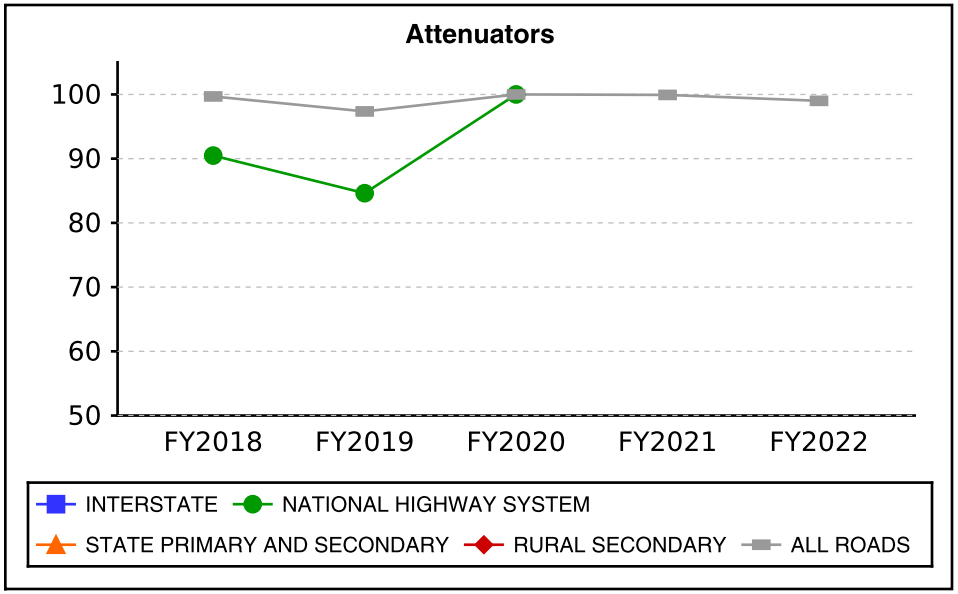

Shoulder Drop Off
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

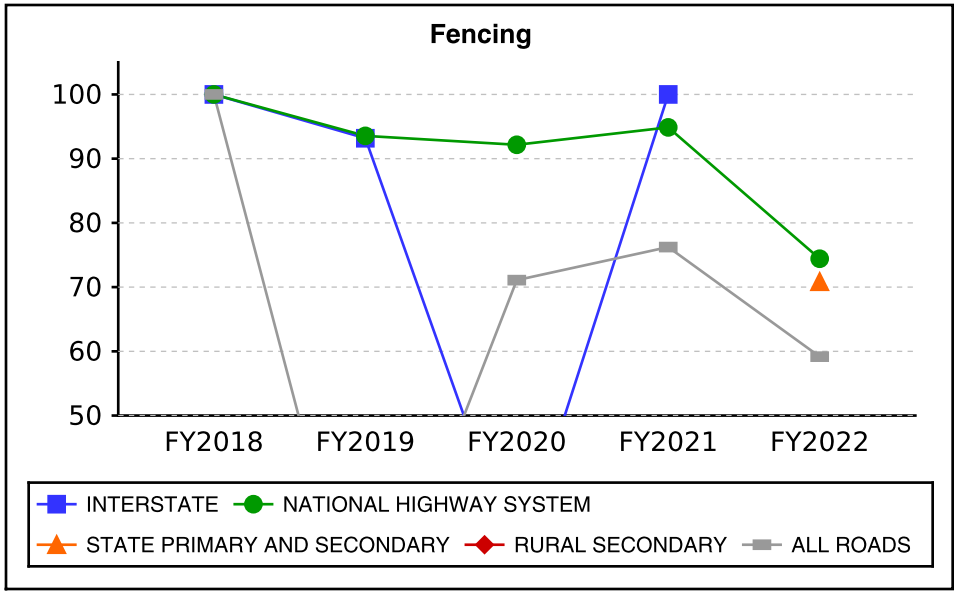

High Shoulder
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

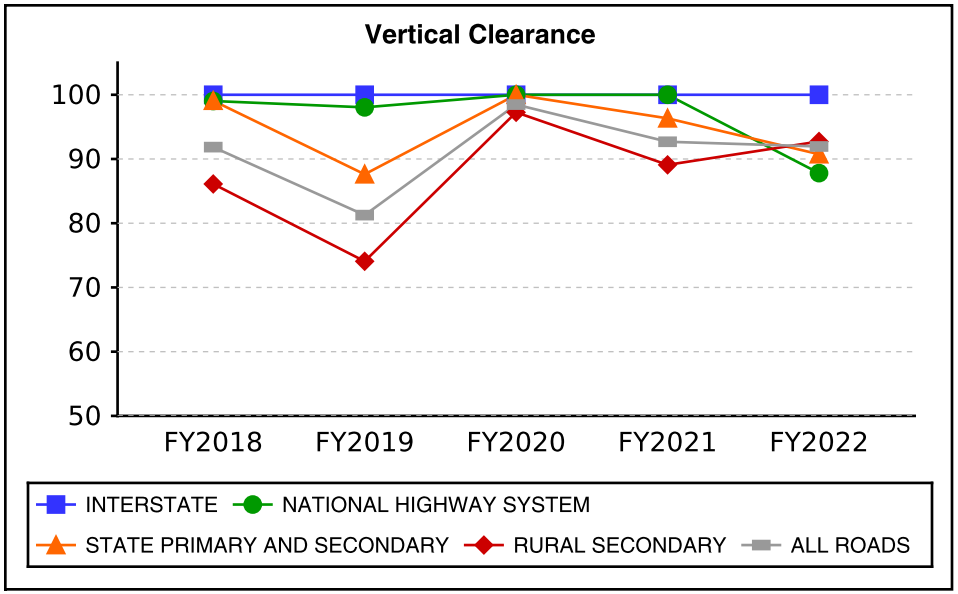

Shoulder Potholes
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

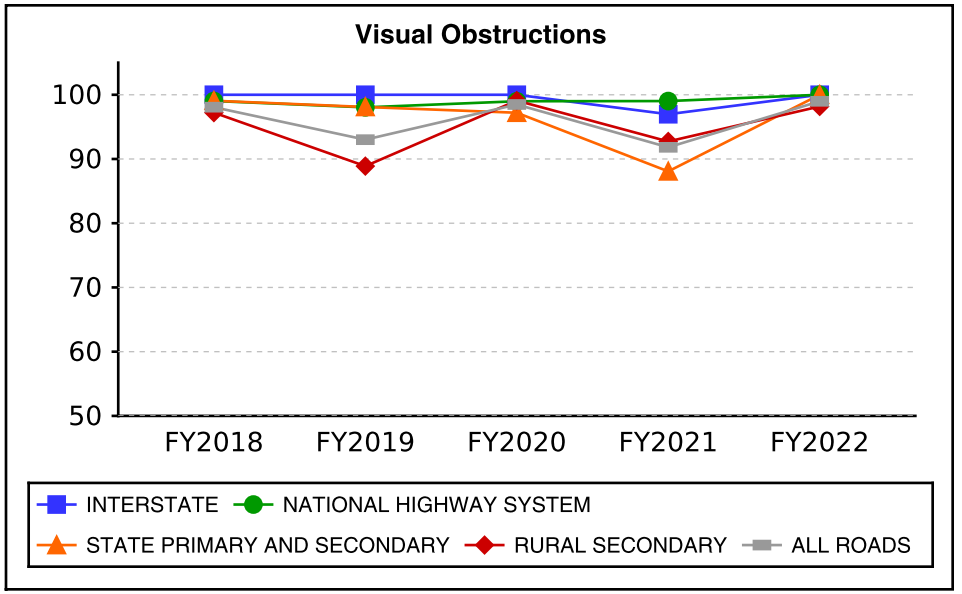

Guardrail Specifications
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

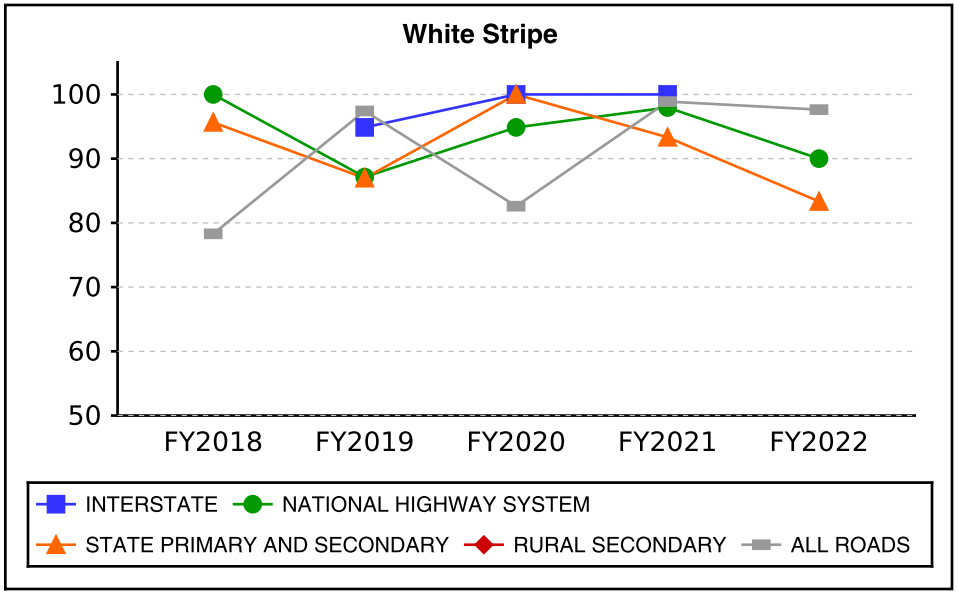

Guardrail Damage
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

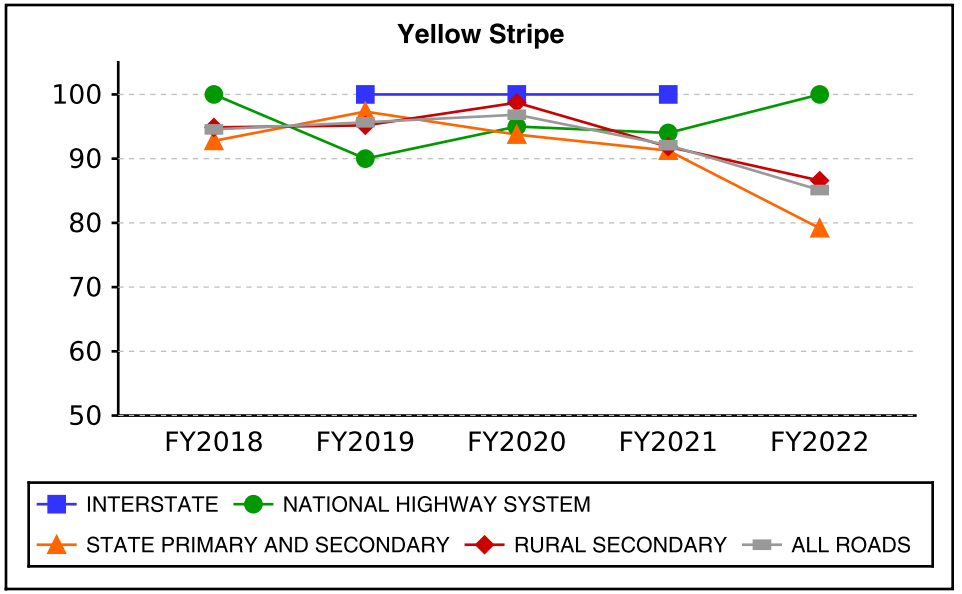

Attenuators
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

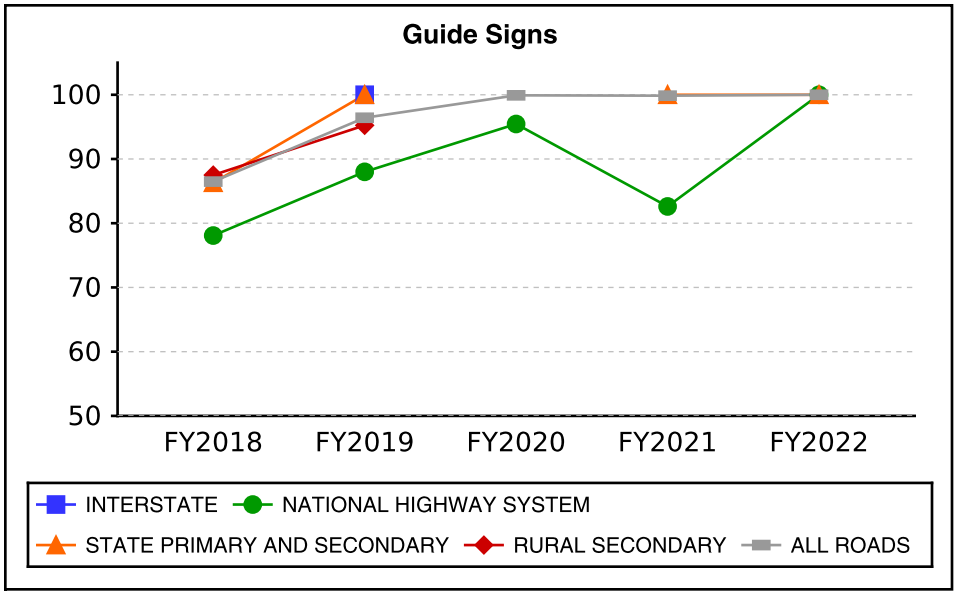

Fencing
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

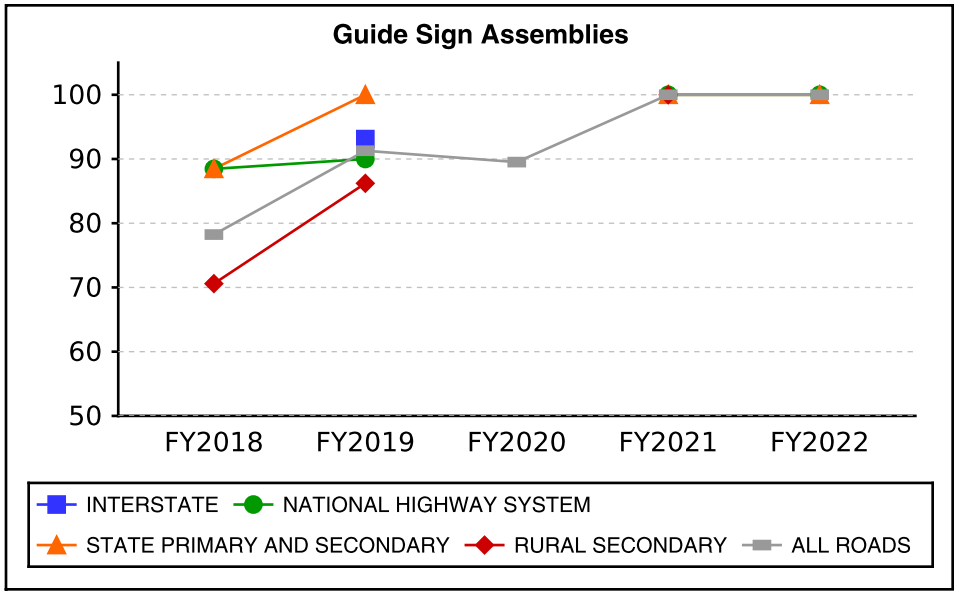

Vertical Clearance
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

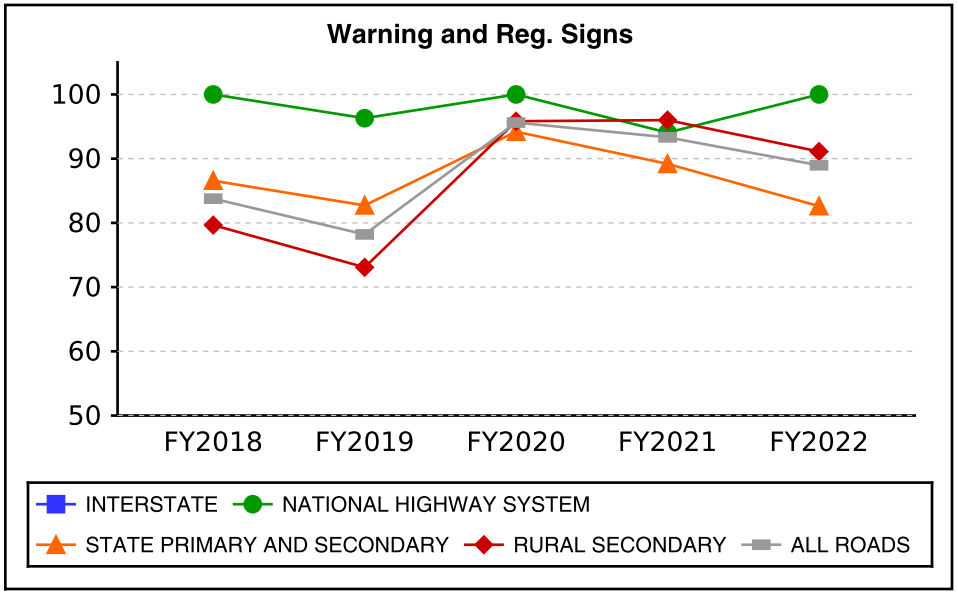

Visual Obstructions
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

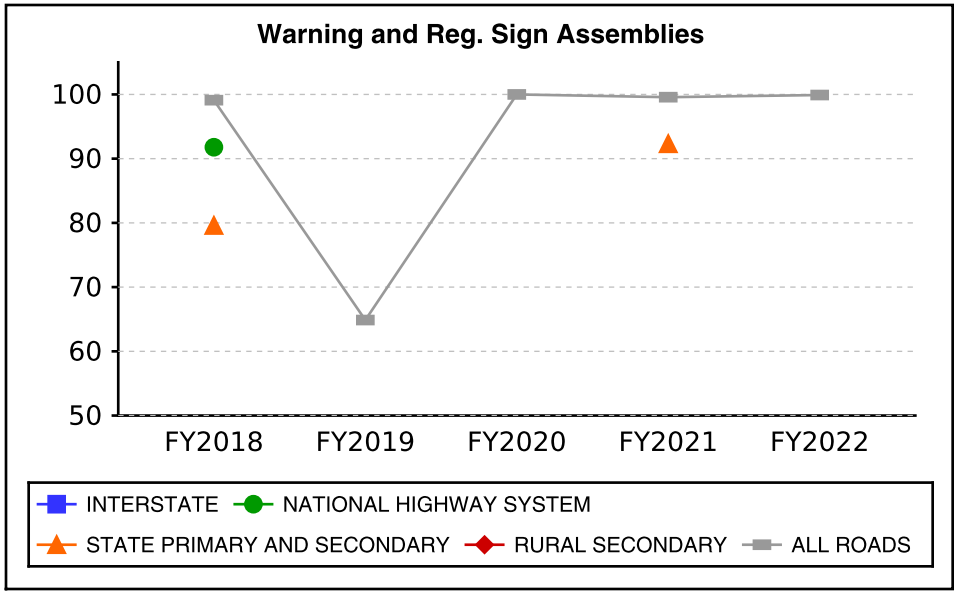

White Stripe
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

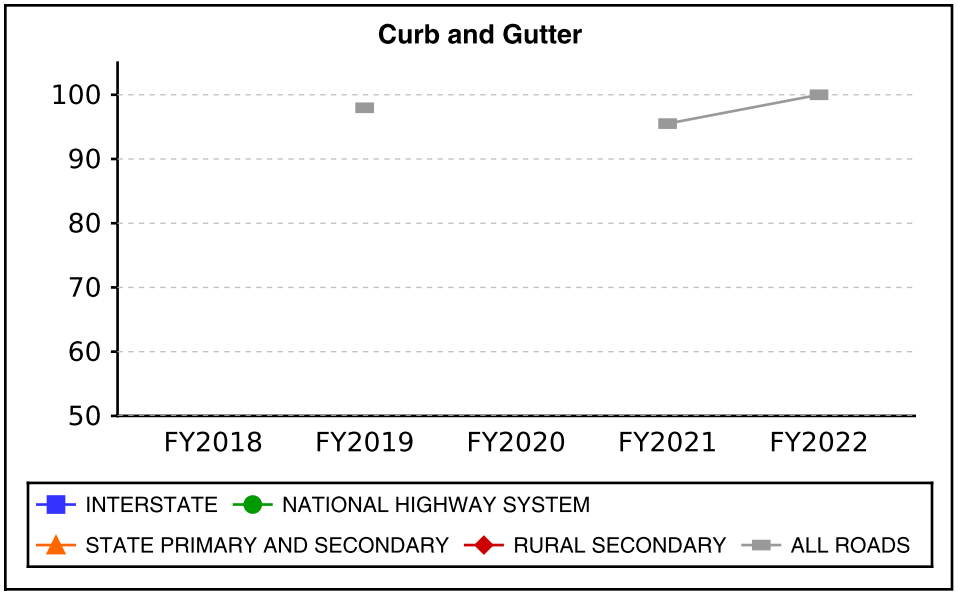

Yellow Stripe
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

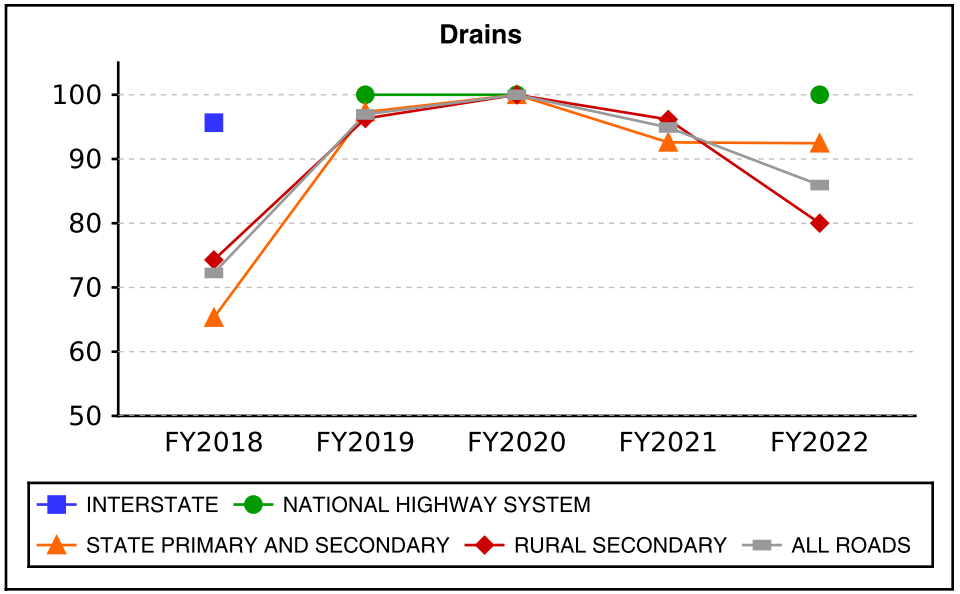

Guide Signs
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

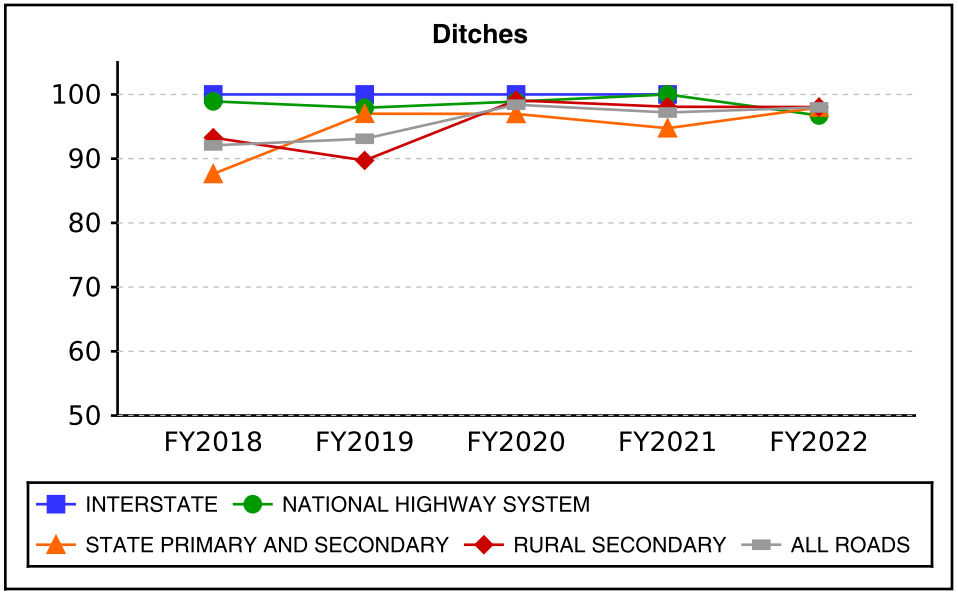

Guide Sign Assemblies
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Warning and Reg. Signs
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Warning and Reg. Sign Assemblies
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Curb and Gutter
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


Drains
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

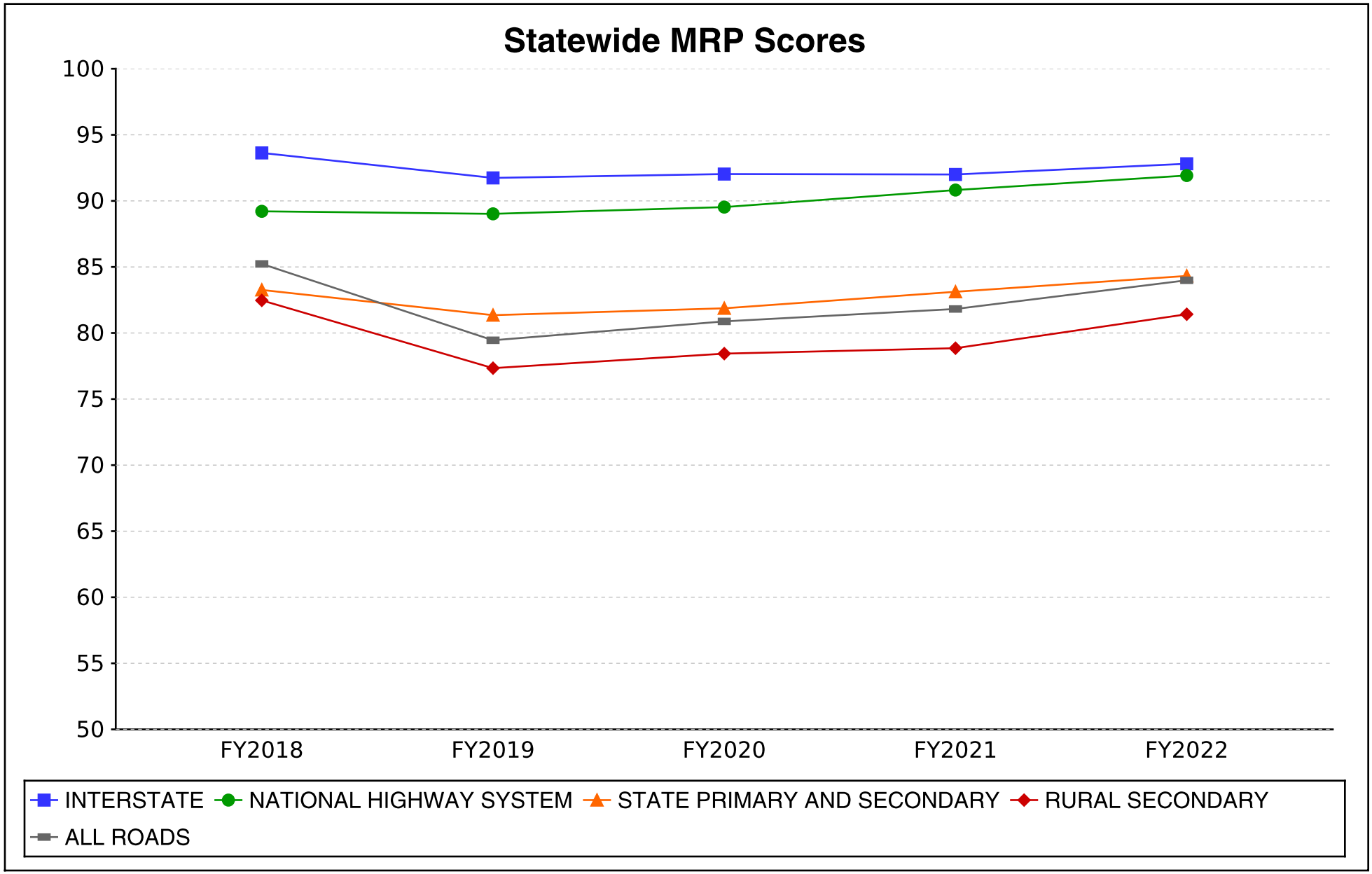

Ditches
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

APPENDIX IV

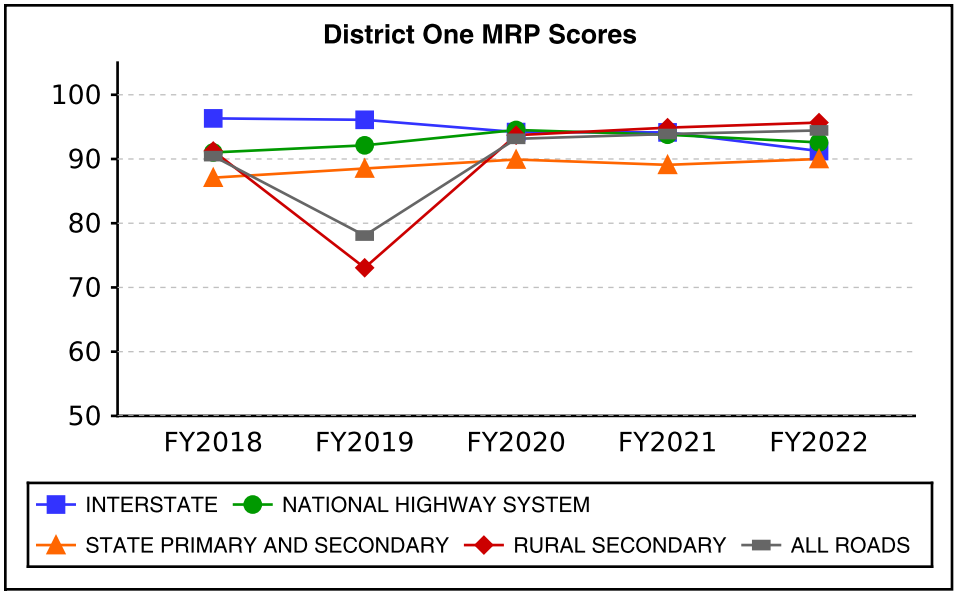
Total Scores by Road Type

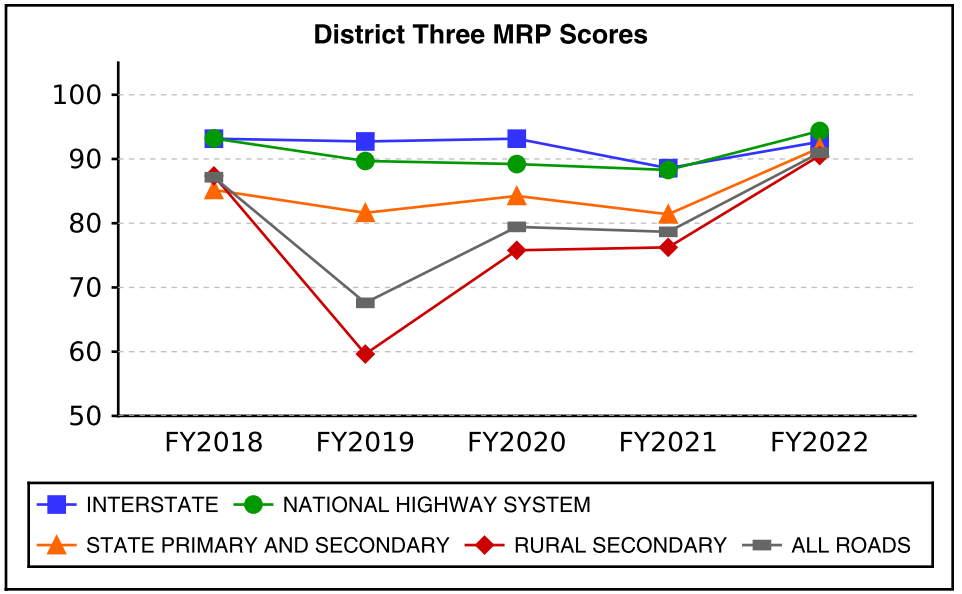
The graphs in Appendix IV illustrate the total MRP scores for each district and statewide. These are the combined scores for all roadway features. Included are the most recent MRP data and historical data for all previous four years.

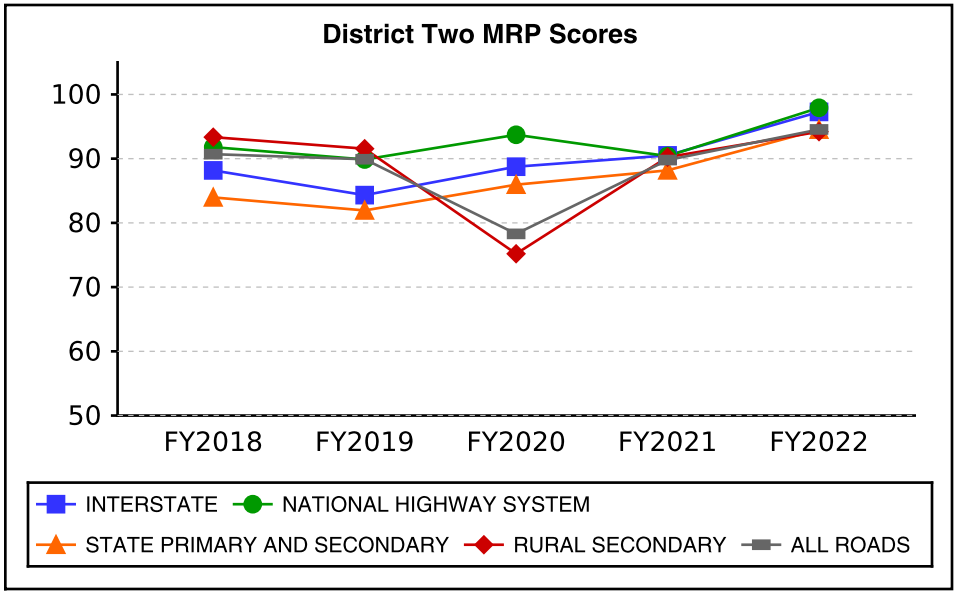
As in previous graphs, the four road types are represented by colored lines, while the overall weighted average is shown as a gray shaded area.

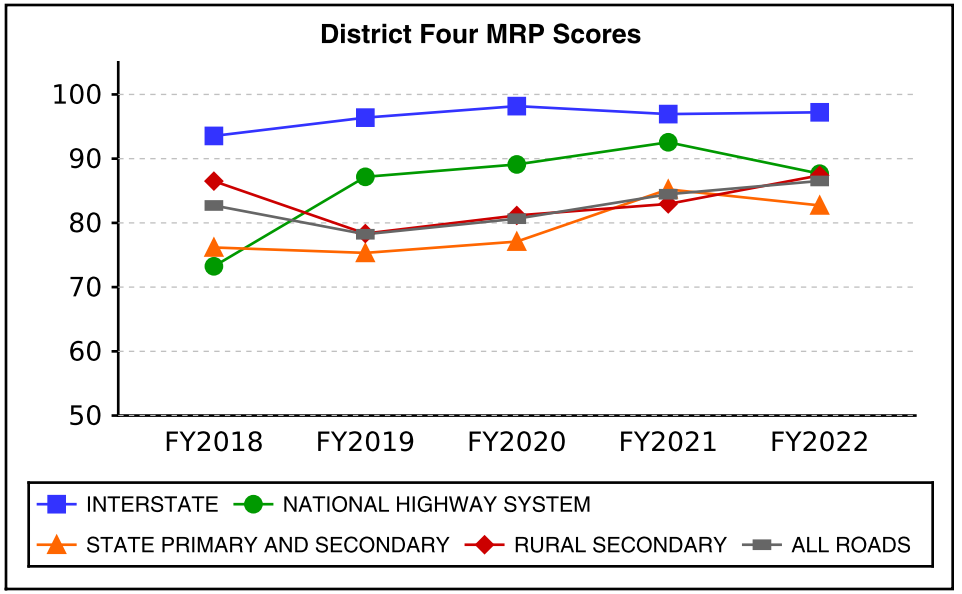


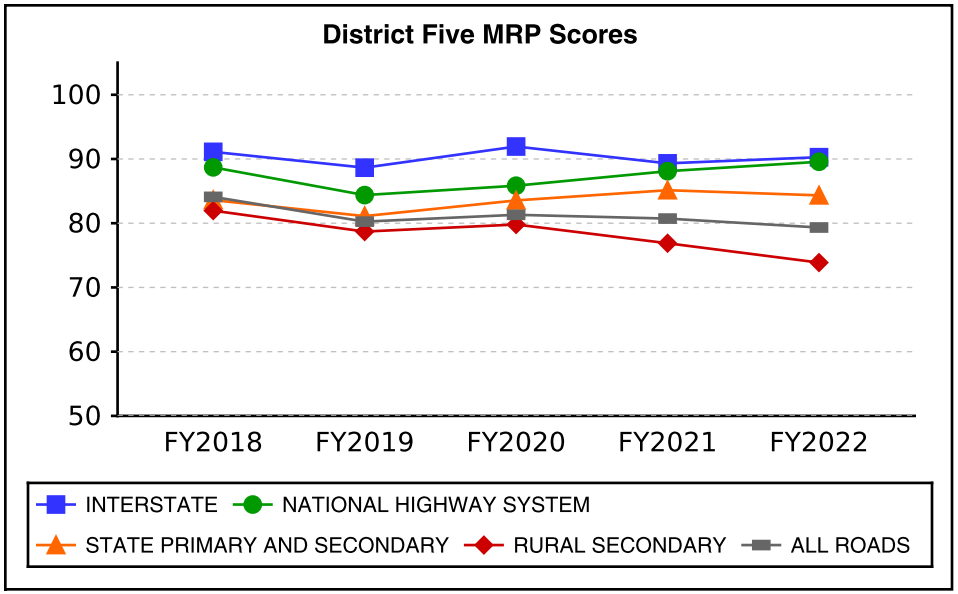
Appendix IV.1

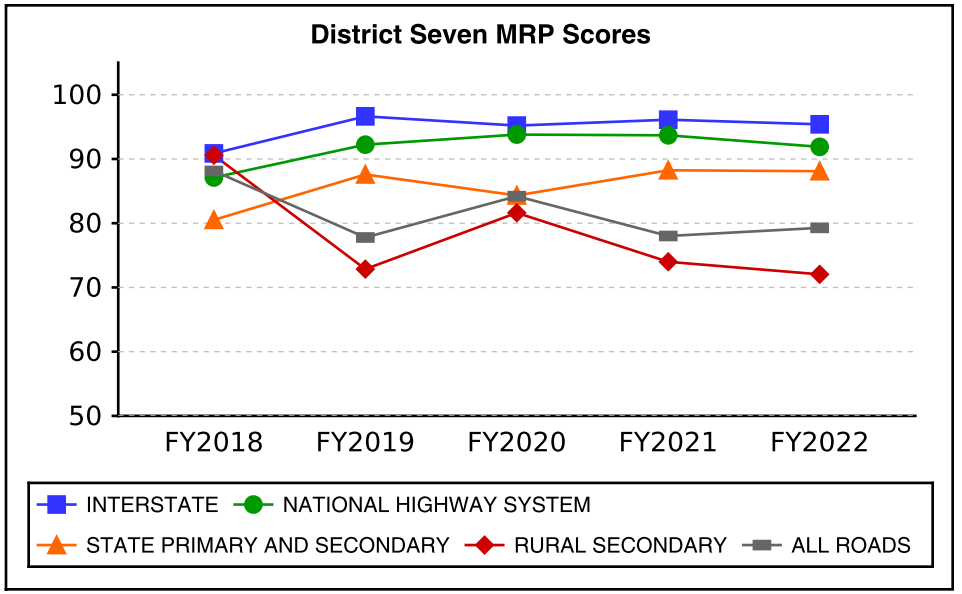

District One MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

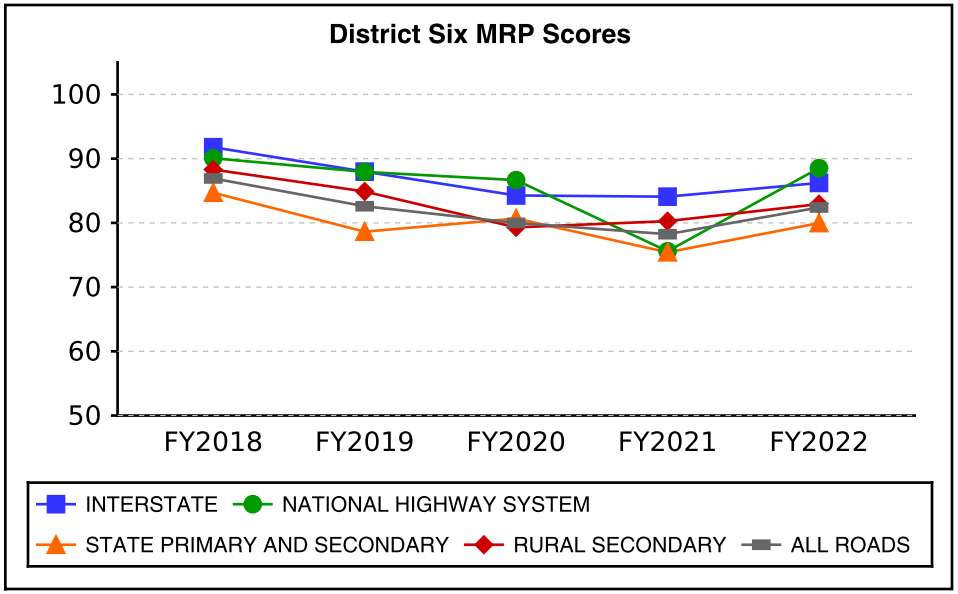

District Three MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

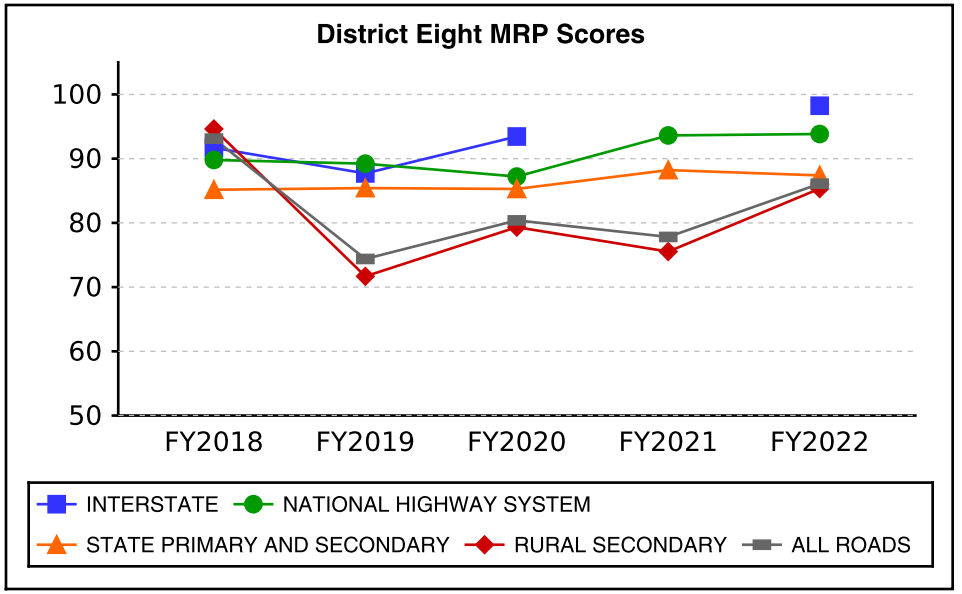

District Two MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

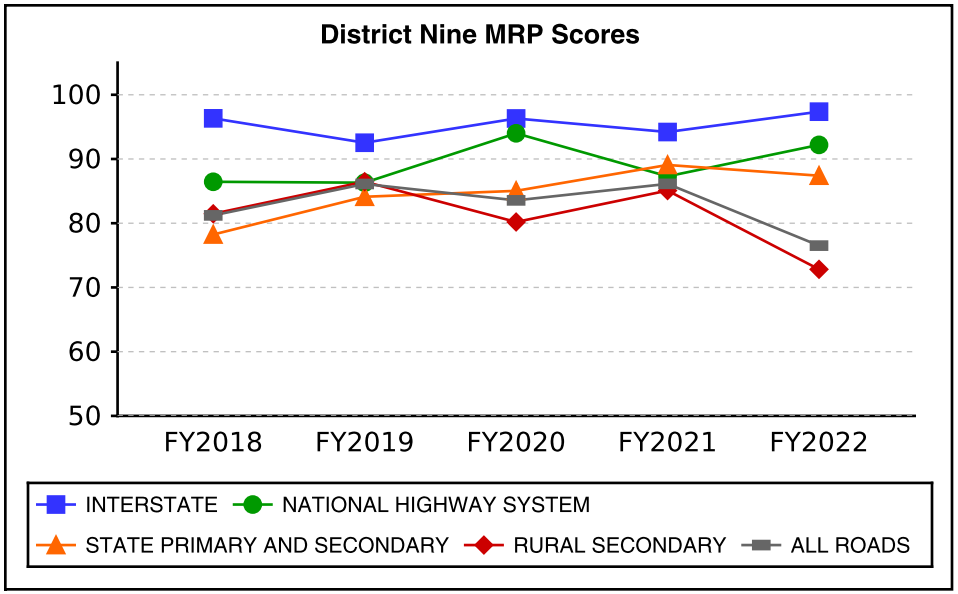

District Four MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

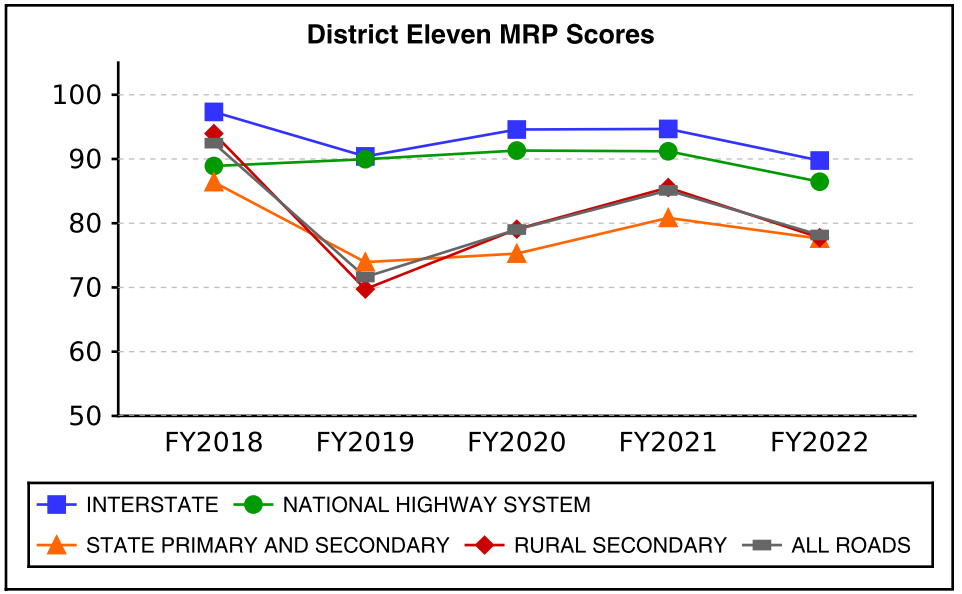

District Five MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

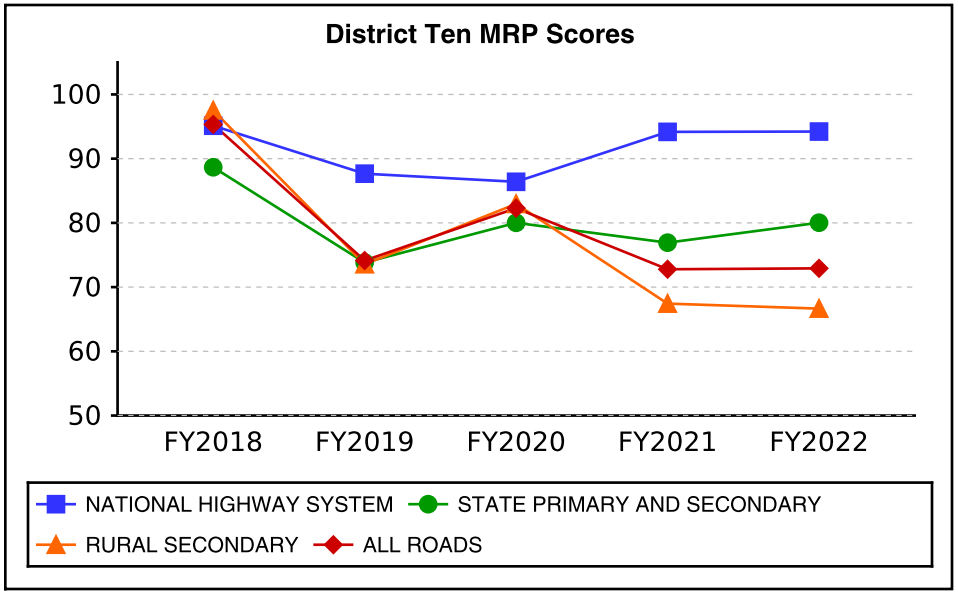

District Seven MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

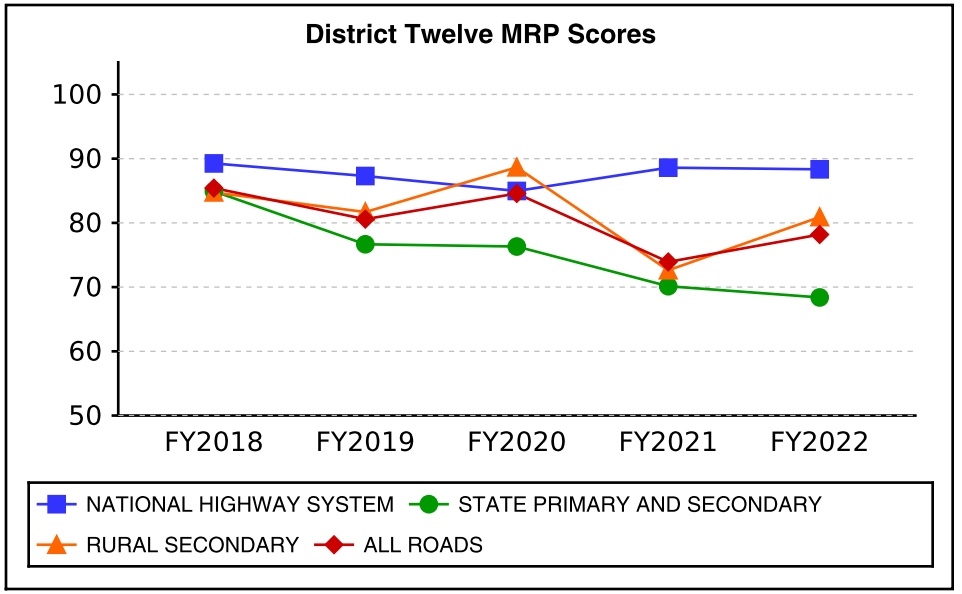

District Six MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


District Eight MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


District Nine MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


District Eleven MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
INTERSTATE
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


District Ten MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS


District Twelve MRP Scores
100
90
80
70
60
50
FY2018
FY2019
FY2020
FY2021
FY2022
NATIONAL HIGHWAY SYSTEM
STATE PRIMARY AND SECONDARY
RURAL SECONDARY
ALL ROADS

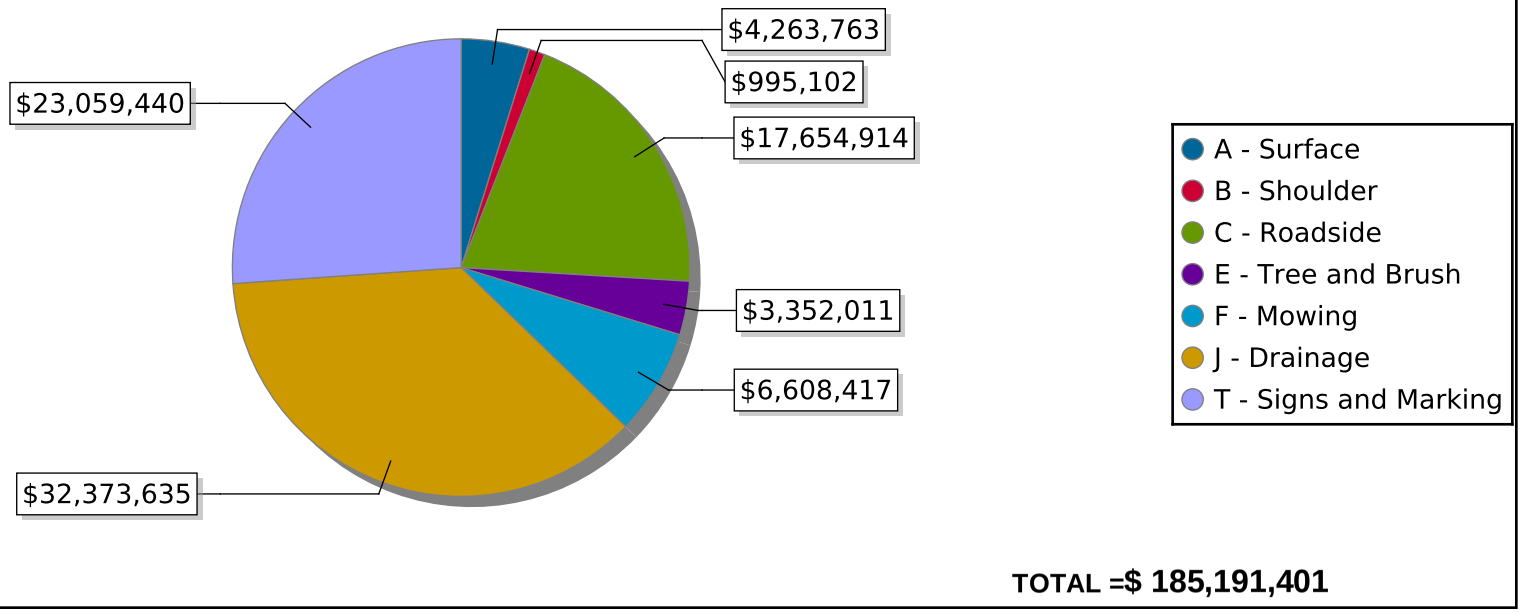
APPENDIX V

Activity Spending

Appendix V tables and graphs are a summary of previous fiscal year district spending impacting current MRP scores. Spending is pulled from a combination of OMS and EMARS reports in order to include state force and contract spending.

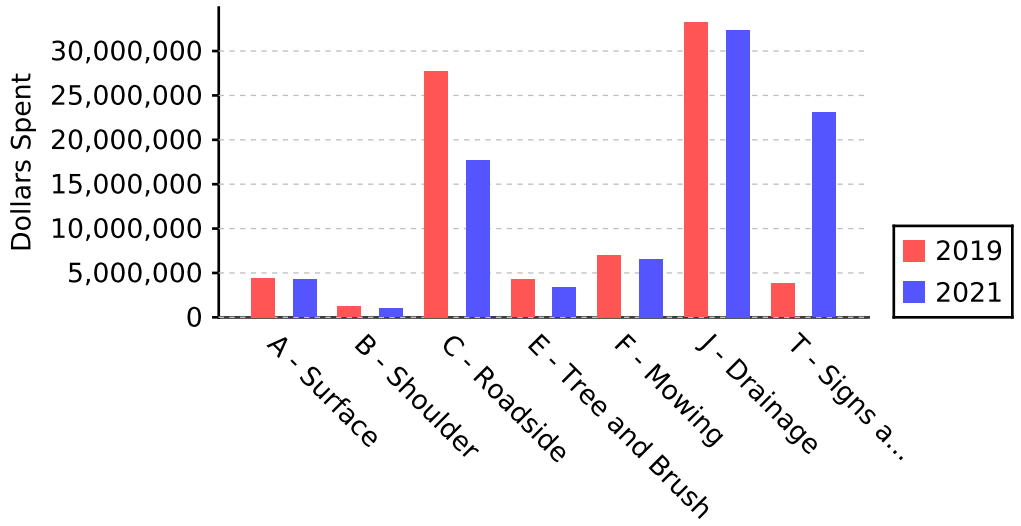
Appendix V also contains a complete list of activities that impact features inspected by the MRP.

Statewide Maintenance Spending FY2021



TOTAL =$ 185,191,401

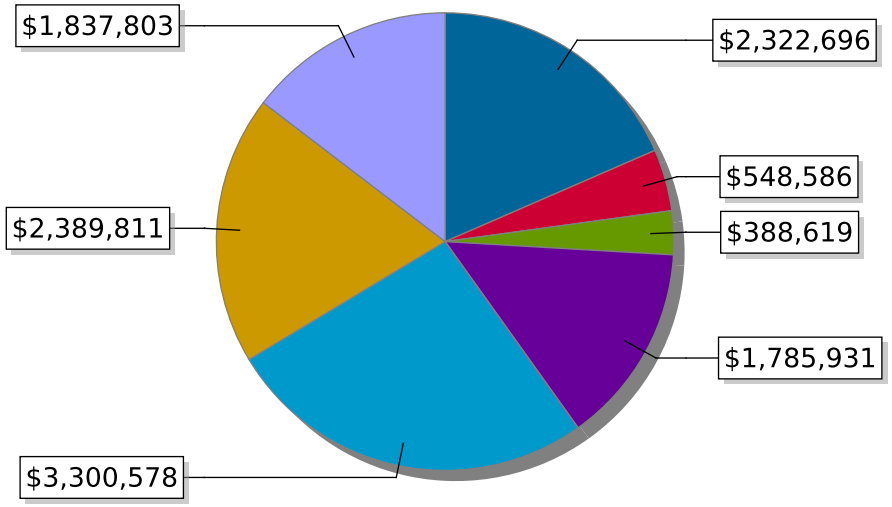
Statewide Maintenance Spending



Statewide Scores Comparison

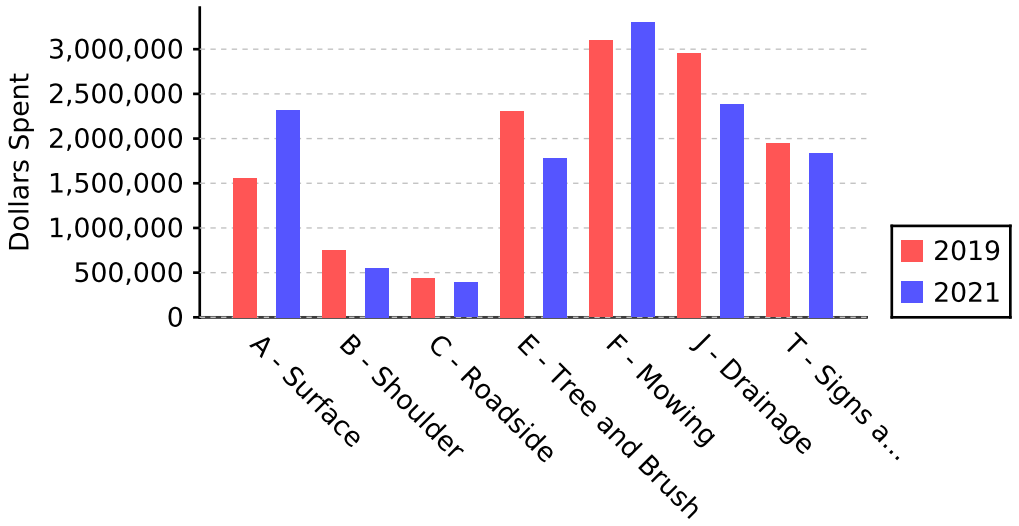
Classification	FY2020	FY2022
ALL ROADS	80.9	84.0
INTERSTATE	92.0	92.8
NATIONAL HIGHWAY SYSTEM	89.5	91.9
STATE PRIMARY AND SECONDARY	81.9	84.3
RURAL SECONDARY	78.4	81.4

District One Maintenance Spending FY2021



TOTAL =$ 12,574,024

District One Maintenance Spending



District One Scores Comparison

Classification	FY2020	FY2022
ALL ROADS	93.1	94.4
INTERSTATE	94.2	91.2
NATIONAL HIGHWAY SYSTEM	94.5	92.6
STATE PRIMARY AND SECONDARY	89.9	90.0
RURAL SECONDARY	93.7	95.7

ACTIVITY	Roadway General	Rideability	Appearance	Vertical Clearance	Visual Obstructions	Fencing	Guardrail Out of Specifications	Guardrail Damage	Attenuators/Rail Ends	Pavement	Potholes	Rutting
A010 SUR-POT HOLE PATCH (tons)		x	x								x	
A020 MACHINE PATCH (tons)		x	x								x	x
A030 SURF-ABNORM REP (tons)		x	x								x	x
A040 SURF-REPAIR PCC (sq. ft.)		x	x								x	
A050 SURFACE-SPOT SEAL COAT (tons)		x	x									
A140 TOTAL CONTRA PATCH (tons)		x	x								x	
A150 VENDOR AIDED PATCH (tons)		x	x								x	
A710 MILLING-STATE MACH (sq. yds.)		x	x									x
A720 MILLING-VENDOR (sq. yds.)		x	x									x
B010 SHR-POT HOLE HOT (tons)			x									
B040 SHOULDER-SEAL COAT (tons)			x									
B020 SHR-MACH PATCH HOT (tons)			x									
B050 SHR - ABNORM REP (tons)			x									
B110 WEDG PAVE SHR HOT (tons)												
B120 BIT EDGE SHDL (tons)												
B130 GRADE SHRS-GRASS (Ln. Mile)												
B140 SHR TBM MAINT (tons)			x									
B150 CONTRA SHLD MAINT (tons)			x									
B210 GRADE SHOULDERS (miles)												
B220 GRADE SHR ADD MAT (tons)												
B230 GRADE SHLD UNDR GR (linear foot)												
B540 EDGE UNPAVED SHDLS (tons)												
B990 MISC SHR MAINT (hours)												
C010 ROCK FALLS AND DEBRIS (hours)			x									
C020 SLIDES/SINKHOLES & DEBRIS (hours)		x	x									
C100 LITTER CLNUP EX (hours)			x									
C110 LITTER CLEANUP (hours)			x									
C130 DEAD ANIMAL (hours)			x									
C140 SWEEP (hours)			x									
C150 CONT-MECH SWEEP (miles)			x									
C190 CRASH CUSHIONS (each)									x			
C200 REPAIR FENCES (linear foot)						x						
C300 REP ST BM GRL (linear foot)							x	x				

ACTIVITY	**Roadway General**	Rideability	Appearance	Vertical Clearance	Visual Obstructions	Fencing	Guardrail Out of Specifications	Guardrail Damage	Attenuators/Rail Ends	**Pavement**	Potholes	Rutting
C330 REP GR END TR (each)									x			
C390 CNTRCT GRAIL (hours)							x	x	x			
C400 CNTRCT GRAIL EN (hours)							x	x	x			
E010 TREE&BRUSH RMVL (hours)			x	x	x							
E020 GRADER			x	x	x							
E030 CONTR TREE-BRSH (hours)			x	x	x							
E110 TREE&SHRUB MNT (hours)			x	x	x							
E290 HERB GRAIL (miles)			x		x							
E300 SPOT SPRAY HERB (acres)			x		x							
E310 MECH SPRAY OF H (acres)			x		x							
F050 SLOPE MOWING (hours)			x	x	x							
F080 MOWER SUPPORT (hours)												
F090 HAND TRIM/LAWN MOW (hours)			x		x							
F310 MOW-STATE FORCE (acres)			x		x							
F320 MOW-CONTRACT (hours)			x		x							
J010 HAND CLN CULVRT (each)												
J020 MACH CLN CULVRT (each)												
J030 RPR CULV/PIPE (each)												
J070 PVT ENT MAINT (each)												
J110 SLOPE PROTECT (tons)												
J150 CONTRACT DRNGE (hours)												
J210 DITCH W/ GRADE (miles)												
J230 SPT DCH BOOM EQ (miles)												
J310 PAV/ ROCK DTCH (linear foot)												
J320 CLN DRAIN CHNL (hours)												
T010 CONTRACT 4" YELLOW STRIP (linear foot)			x									
T020 S.F. 4" YELLOW STRIPING (linear foot)			x									
T030 S.F. 4" WHITE STRIPING (linear foot)			x									
T040 HAND PVMT MARK (hours)			x									
T050 HAND PVMT PAINT (hours)			x									
T060 RAISED PVMT MRK (each)			x									
T110 PNT LNE&EDG LNE (miles)			x									
T200 PLCMNT SHT SIG (each)			x									
T210 RPLC SIGN & DEL (each)			x									
T240 SIGN MNT (each)			x									
T250 MNT PANEL SIGNS (each)			x									

ACTIVITY	Shoulders	Pavement Drop-Off to Shoulder	Shoulder Drop-Off to Ground	High Shoulder	Shoulder Potholes	Drainage	Drainage Structures	Ditches	Curb and Gutter	Traffic	White Stripe Reflectivity	Yellow Stripe Reflectivity	Guide Signs	Guide Sign Assemblies	Warning Signs	Warning Sign Assemblies
A010 SUR-POT HOLE PATCH (tons)																
A020 MACHINE PATCH (tons)																
A030 SURF-ABNORM REP (tons)																
A040 SURF-REPAIR PCC (sq. ft.)																
A050 SURFACE-SPOT SEAL COAT (tons)																
A140 TOTAL CONTRA PATCH (tons)																
A150 VENDOR AIDED PATCH (tons)																
A710 MILLING-STATE MACH (sq. yds.)																
A720 MILLING-VENDOR (sq. yds.)																
B010 SHR-POT HOLE HOT (tons)					x											
B040 SHOULDER-SEAL COAT (tons)																
B020 SHR-MACH PATCH HOT (tons)		x	x		x											
B050 SHR - ABNORM REP (tons)		x	x		x											
B110 WEDG PAVE SHR HOT (tons)		x														
B120 BIT EDGE SHDL (tons)		x														
B130 GRADE SHRS-GRASS (Ln. Mile)				x												
B140 SHR TBM MAINT (tons)		x	x													
B150 CONTRA SHLD MAINT (tons)		x	x	x	x											
B210 GRADE SHOULDERS (miles)		x	x	x												
B220 GRADE SHR ADD MAT (tons)		x	x	x												
B230 GRADE SHLD UNDR GR (linear foot)		x		x												
B540 EDGE UNPAVED SHDLS (tons)		x						x								
B990 MISC SHR MAINT (hours)		x	x	x	x											
C010 ROCK FALLS AND DEBRIS (hours)								x								
C020 SLIDES/SINKHOLES & DEBRIS (hours)			x					x								
C100 LITTER CLNUP EX (hours)																
C110 LITTER CLEANUP (hours)																
C130 DEAD ANIMAL (hours)																
C140 SWEEP (hours)																
C150 CONT-MECH SWEEP (miles)																
C190 CRASH CUSHIONS (each)																
C200 REPAIR FENCES (linear foot)																
C300 REP ST BM GRL (linear foot)																

ACTIVITY	Shoulders	Pavement Drop-Off to Shoulder	Shoulder Drop-Off to Ground	High Shoulder	Shoulder Potholes	Drainage	Drainage Structures	Ditches	Curb and Gutter	Traffic	White Stripe Reflectivity	Yellow Stripe Reflectivity	Guide Signs	Guide Sign Assemblies	Warning Signs	Warning Sign Assemblies
C330 REP GR END TR (each)																
C390 CNTRCT GRAIL (hours)																
C400 CNTRCT GRAIL EN (hours)																
E010 TREE&BRUSH RMVL (hours)																
E020 GRADER																
E030 CONTR TREE-BRSH (hours)																
E110 TREE&SHRUB MNT (hours)																
E290 HERB GRAIL (miles)																
E300 SPOT SPRAY HERB (acres)																
E310 MECH SPRAY OF H (acres)																
F050 SLOPE MOWING (hours)																
F080 MOWER SUPPORT (hours)																
F090 HAND TRIM/LAWN MOW (hours)																
F310 MOW-STATE FORCE (acres)																
F320 MOW-CONTRACT (hours)																
J010 HAND CLN CULVRT (each)							x	x								
J020 MACH CLN CULVRT (each)							x	x								
J030 RPR CULV/PIPE (each)							x	x								
J070 PVT ENT MAINT (each)							x	x								
J110 SLOPE PROTECT (tons)								x								
J150 CONTRACT DRNGE (hours)							x	x	x							
J210 DITCH W/ GRADE (miles)								x								
J230 SPT DCH BOOM EQ (miles)							x	x								
J310 PAV/ ROCK DTCH (linear foot)								x								
J320 CLN DRAIN CHNL (hours)							x	x								
T010 CONTRACT 4" YELLOW STRIP (linear foot)												x				
T020 S.F. 4" YELLOW STRIPING (linear foot)												x				
T030 S.F. 4" WHITE STRIPING (linear foot)											x					
T040 HAND PVMT MARK (hours)											x	x				
T050 HAND PVMT PAINT (hours)											x	x				
T060 RAISED PVMT MRK (each)											x	x				
T110 PNT LNE&EDG LNE (miles)											x	x				
T200 PLCMNT SHT SIG (each)													x	x	x	x
T210 RPLC SIGN & DEL (each)													x	x	x	x
T240 SIGN MNT (each)													x	x	x	x
T250 MNT PANEL SIGNS (each)													x	x		

APPENDIX VI

Inspection Features

Appendix VI includes an example of the current inspection form used in data collection.

The table in Appendix VI explains the data collection of each inspection feature of the Maintenance Rating Program and how that data is converted into scoring for the report.

Inspection Date: _____

Maintenance Rating Program
Inspection Form

Evaluation Team: _____

01-0001

Wave 19 Summer 2009

District 01	County: **LIVINGSTON**	Route: **I -24**	Mile Point: **030.563**	Dir: **E**

Number of Lanes: **4** Surface: **AC** AADT: **28500** Median: **Earth** Shoulder:**AC**
Lane Width: **12** Category: **Interstates/Expressways** Median Width: **48** Shoulder Width: **10**

r1 - General Aesthetics (Grass, Vegetation, Litter & Surface) **1=Excellent 2=Good 3=Acceptable 4=Poor 5=Unacceptable**			
r2 – Is there roadway or shoulder with less than 15' vertical clearance?	**(2)**	**Y**	**N**
r3 – Are there visual obstructions of intersections, curves or signs, etc.?	**(3)**	**Y**	**N**
r4 – Is there right-of-way fencing?	**(4)**	**Y**	**N**
r5 – Is there fence not providing a positive barrier?	**(5)**	**Y**	**N**
r6 – Is there guardrail?	**(6)**	**Y**	**N**
r7 – Is there guardrail outside height specifications (25" to 29")?	**(7)**	**Y**	**N**
r8 – Is there guardrail with post or accident damage?	**(8)**	**Y**	**N**
r9 - Number of guardrail attenuators/rail ends	**(9)**	_____	
r10 - Number of attenuators/rail ends damaged	**(10)**	_____	
p1 - Number of pavement potholes 6" long, 6" wide and 1" deep or larger *(maximum = 20)*	**(11)**	_____	
p2 - Rutting - Outside wheel path at 0 feet **(circle one)** **Greater than ¼"** **Less than or equal to ¼"**			
p3 - Rutting - Outside wheel path at 100 feet **(circle one)** **Greater than ¼"** **Less than or equal to ¼"**			
s1 – Is there pavement dropoff to shoulder greater than or equal to 1.5"?	**(14)**	**Y**	**N**
s2 – Is there shoulder dropoff to ground greater than or equal to 3.0"?	**(15)**	**Y**	**N**
s3 – Is there high shoulder?	**(16)**	**Y**	**N**
s4 - Number of shoulder potholes 6" x 6" x 1" or larger *(maximum = 20)*	**(17)**	_____	
d1 - Number of drainage structures *(do not include entrance pipes)*	**(18)**	_____	
d2 – Number of drainage structures with 25% or greater flow inhibited	**(19)**	_____	
d3 – Are there ditches?	**(20)**	**Y**	**N**
d4 – Are there ditches with flow inhibited? *(include any blocked entrance pipes here)*	**(21)**	**Y**	**N**
d5 – Are there curbs and gutters?	**(22)**	**Y**	**N**
d6 – Are there curbs and gutters with flow inhibited?	**(23)**	**Y**	**N**
Striping reflectivity measurements taken 10 paces apart (Priorities: 1=Edge Line, 2=Center Line, 3=Skip Line)			
t1 - White reading #1 **(24)** _____ t2- White reading #2 **(25)** _____ t3- White reading #3	**(26)**	_____	
t4 - Yellow reading #1 **(27)** _____ t5- Yellow reading #3 **(28)** _____ t6- Yellow reading #3	**(29)**	_____	
t7 - Number of guide signs	**(30)**	_____	
t8 - Number of guide signs not conforming with sign face specifications *(damaged sign face, faded, vandalized, etc)*	**(31)**	_____	
t9 - Number of guide sign assemblies	**(32)**	_____	
t10 - Number of guide sign assemblies not conforming with specifications	**(33)**	_____	
t11 - Number of warning and regulatory signs	**(34)**	_____	
t12 - Number of warning and regulatory signs not conforming with sign face specifications *(damaged sign face, faded, vandalized, etc.)*	**(35)**	_____	
t13 - Number of warning and regulatory sign assemblies	**(36)**	_____	
t14 - Number of warning and regulatory sign assemblies not conforming with specifications	**(37)**	_____	

Comments:

Explanation and Score Equivalence of Inspection Features

Inspection Features	Explanation	Score	MRP Score
International Roughness Index	A measure that indicates smoothness and ride quality for the highway user. Note: Weighting used in sampling scheme may create variances between the MRP rideability indices and those reported for the entire population.	51 or less 52 - 90 91-129 130 – 167 168+	90 + 80 – 89.9 70 – 79.9 60 – 69.9 59.9 and below
Appearance	The general visual character (height of grass, litter, unsightly patching, etc.) of the roadway and roadside as it would be seen by the public.	100% acceptable 80% 60%	100 80 60
Vertical Clearance	Roadways and shoulders are free of any canopy (trees or other vegetation) or other obstructions for a minimum height of 15 feet.	0% obstructed 20% 40%	100 80 60
Visual Obstructions	Vegetation, structures, signage etc. cause horizontal or vertical visual obstructions of intersections, curves, signs, oncoming lanes, etc.	0% obstructed 20% 40%	100 80 60
Fencing Providing Effective Barriers	Fencing provides an effective barrier on limited access highways (Interstate, Parkways, or other highways) to deny access to people or animals. Segments with no fencing are not included in the sample.	100% effective 80% 60%	100 80 60
Guardrail Within Height Specifications	The height is at least 25 inches and not more than 29 inches.	100% in spec 80% 60%	100 80 60
Guardrail Fully Functional	Guardrails have not been damaged due to vehicular hits or other factors.	100% in spec 80% 60%	100 80 60

Inspection Features	Explanation	Score	MRP Score
Attenuators/End Treatments Undamaged	Attenuators / End Treatments have not been damaged due to vehicular hits or other factors.	100% undamaged 80% 60%	100 80 60
Pavement Potholes	A bowl shaped hole of various sizes in the pavement surface. The surface may have broken into small pieces due to cracking or localized disintegration and the material removed by traffic. A pothole has a minimum size of 6"x6"x1".	0 failed sections 10% 20% 40%	100 75 50 0
Rutting	A surface depression of pavement in the wheel paths. Ruts may be more noticeable after a rainfall when wheel paths are full with water.	0% have ruts larger than ¼" 20% 40%	100 80 60
Pavement Drop-off to Shoulder	Occurs whenever there is a decrease in elevation between the traffic lane and the shoulder. It may be due to consolidation, displacement or settlement of underlying material.	0% have drop-off larger than 1.5" 20% 40%	100 80 60
Shoulder Drop-off to Ground	An elevation difference between the improved shoulder and adjacent ground at the outside edge of the shoulder. It could be due to consolidation of material, erosion, run off or other factors.	0% have drop-off larger than 3" 20% 40%	100 80 60
High Shoulder	The opposite of pavement drop-off to shoulder. Frost heave, swelling soils or other factors can cause it. High shoulder creates ponding of water on pavement.	0% unacceptable 20% 40%	100 80 60
Shoulder Potholes	A bowl shaped hole or depression in the shoulder surface. The surface may have broken into small pieces due to the cracking or localized disintegration and the material removed by traffic. A shoulder pothole has a minimum size of 6"x6"x1".	0% failed sections 10% 20% 40%	100 75 50 0

Inspection Features	Explanation	Score	MRP Score
Drainage Structures	Drainage structures like pipes and culverts that are free of any degree of obstruction and are in good working order. Drainage structures obstructed more than 25% fail.	100% acceptable 80% 60%	100 80 60
Ditches	Ditches on the side of the road with water flow not obstructed by dirt, rock, debris, or other items or by structural damage.	0% blockage 20% 40%	100 80 60
Curbs and Gutters	Curbs and gutters with water flow not obstructed by blockage or damage.	0% blockage 20% 40%	100 80 60
White Striping Reflectivity	Measures night reflectivity of striping that provides positive guidance to motorists. Measurements equal to or exceeding 125 from retro-reflectometer pass.	100% acceptable 80% 60%	100 80 60
Yellow Striping Reflectivity	Measures night reflectivity of striping that provides positive guidance to motorists. Measurements equal to or exceeding 80 from retro-reflectometer pass.	100% acceptable 80% 60%	100 80 60
Guide Sign Faces	Includes route markers (cardinal directions, route numbers, arrows), distance/destination signs, and directions signs. (Green, brown or blue backgrounds). The standard is no visible defects that detract from effectiveness under nighttime conditions.	100% in spec 90% 80%	100 80 60
Guide Sign Assemblies	Guide signs mounted according to specifications including: not leaning more than 22.5 degrees in either direction, no bolts or rivets missing, not turned more than 45 degrees from the line of sight, etc.	100% in spec 90% 80%	100 80 60

Inspection Features	Explanation	Score	MRP Score
Warning and Regulatory Sign Faces Meeting Specifications	No visible defects that detract from sign face effectiveness under nighttime conditions. Includes red and white backgrounds (STOP, WRONG WAY, DO NOT ENTER, speed limit, etc.) and yellow backgrounds (STOP AHEAD, curve warning signs, chevrons, etc).	100% in spec 90% 80%	100 80 60
Warning and Regulatory Sign Assemblies	Warning and regulatory signs mounted according to specifications, including: not leaning more than 22.5 degrees in any direction, no bolts or rivets missing, not turned more than 45 degrees from the line of sight, etc.	100% in spec 90% 80%	100 80 60

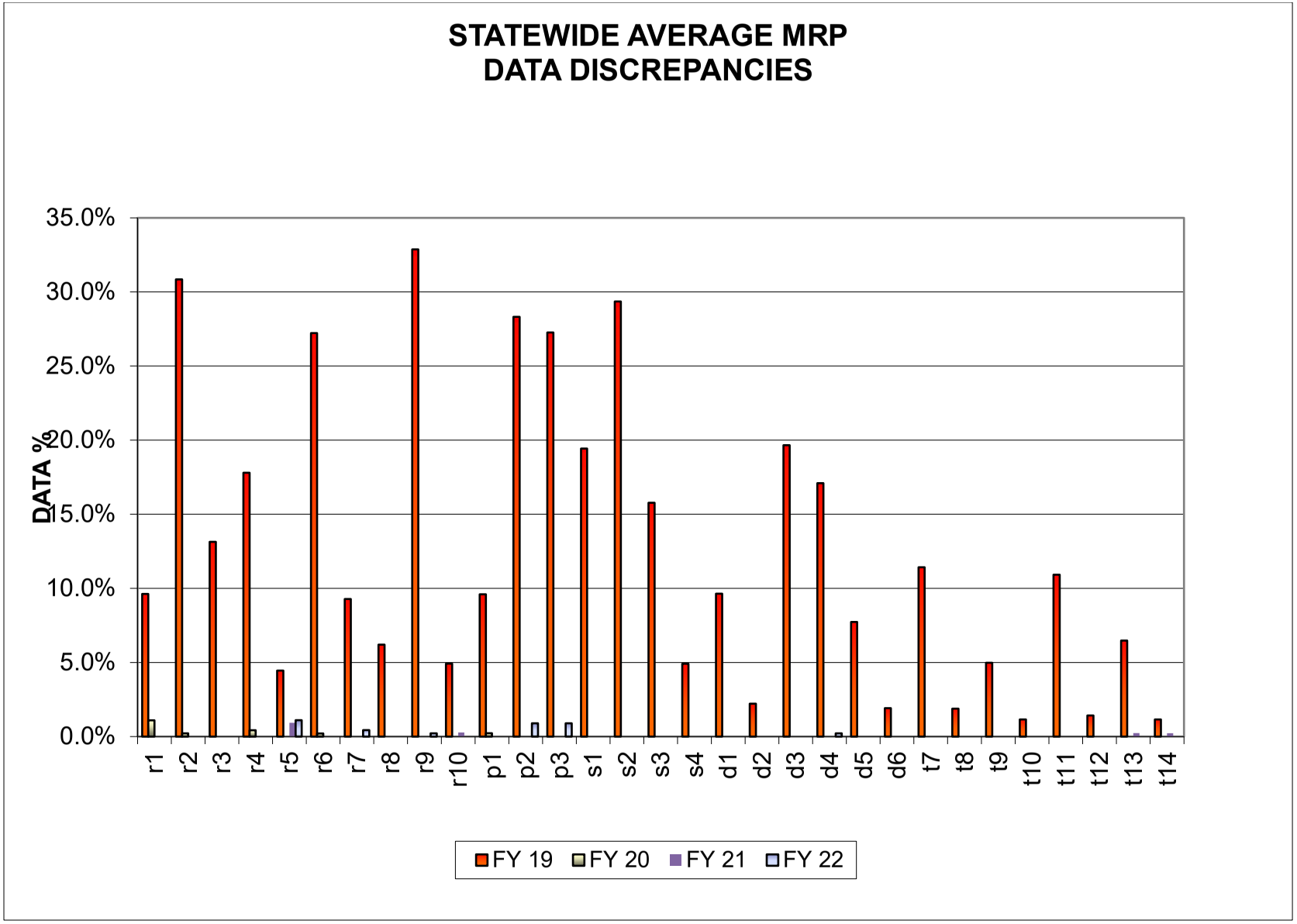
Note: Scores for features were calculated only in segments where features were present at least nineteen times to give statistically valid results. If the feature occurred less than nineteen times, "N/A" was entered. However, it was still used for calculating weighted totals such as District Totals (including all road types), Road Type Totals (including all districts), and State Totals (including all road types and all districts).

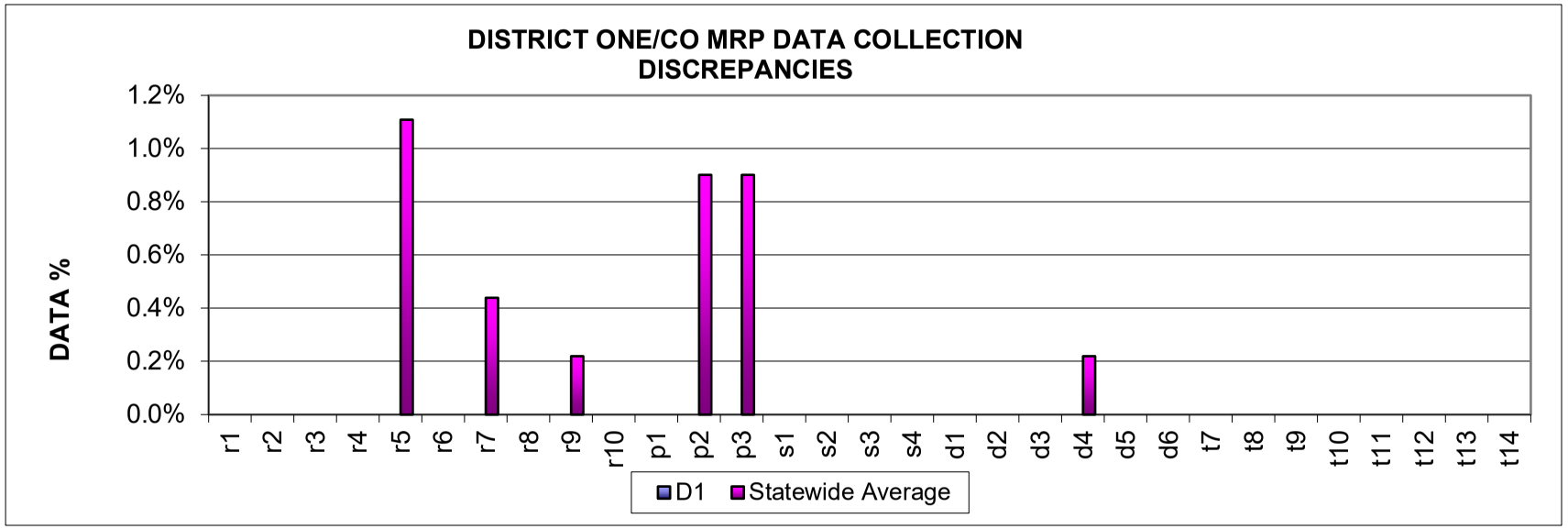
APPENDIX VII

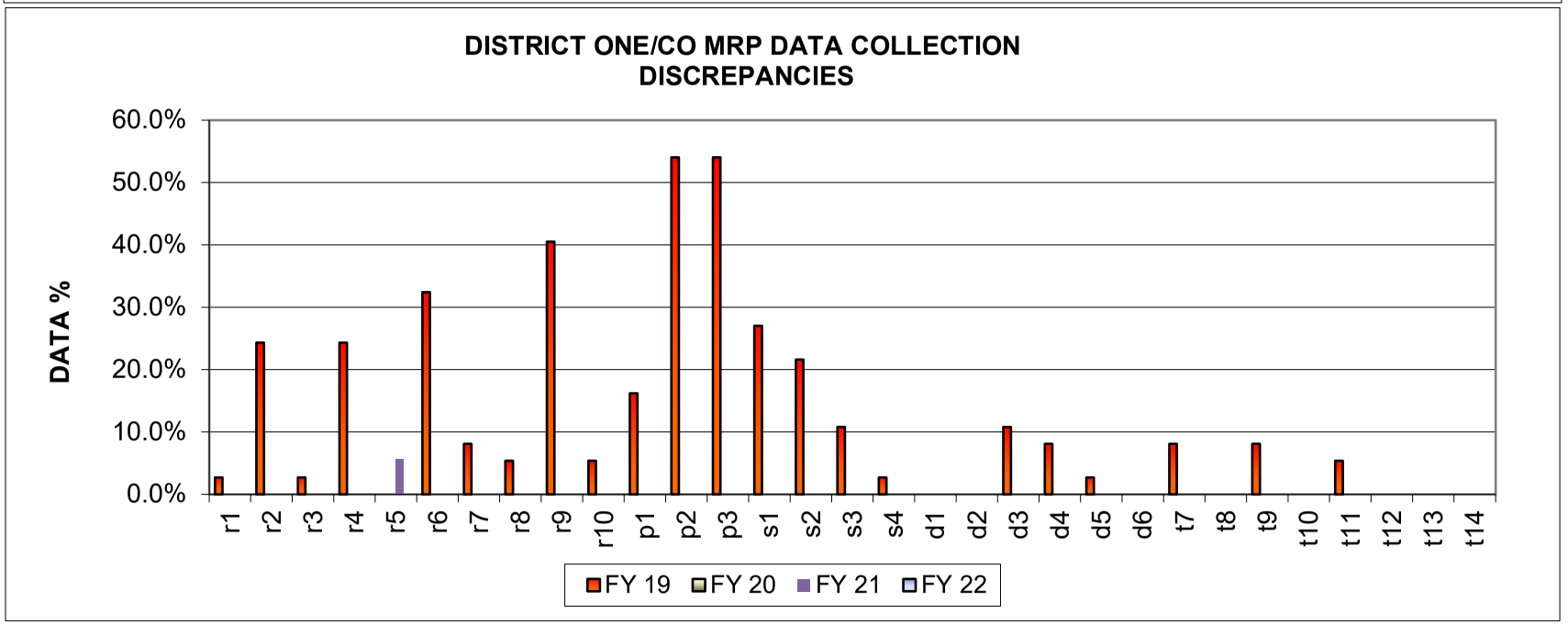
Discrepancies

The graphs in Appendix VII illustrate the data collection discrepancies between central office and the districts. Approximately 10% of all MRP sections are re-inspected by central office. The discrepancy tolerances are based on the MRP scoring system and are as follows:

r1	both sections must either pass or fail
r2	both sections must be either Yes or No
r3	both sections must be either Yes or No
r4	both sections must be either Yes or No
r5	both sections must be either Yes or No
r6	both sections must be either Yes or No
r7	both sections must be either Yes or No
r8	both sections must be either Yes or No
r9	exact match required
r10	exact match required
p1	the difference between the sections must not exceed 2
p3	both sections must either pass or fail
p4	both sections must either pass or fail
s1	both sections must be either Yes or No
s2	both sections must be either Yes or No
s3	both sections must be either Yes or No
s4	the difference between the sections must not exceed 2
d1	the difference between the sections must not exceed 1
d2	the difference between the sections must not exceed 1
d3	both sections must be either Yes or No
d4	both sections must be either Yes or No
d5	both sections must be either Yes or No
d6	both sections must be either Yes or No
t7	the difference between the sections must not exceed 2
t8	the difference between the sections must not exceed 2
t9	the difference between the sections must not exceed 2
t10	the difference between the sections must not exceed 2
t11	the difference between the sections must not exceed 2
t12	the difference between the sections must not exceed 2
t13	the difference between the sections must not exceed 2
t14	the difference between the sections must not exceed 2


STATEWIDE AVERAGE MRP
DATA DISCREPANCIES
DATA %
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
r1
r2
r3
r4
r5
r6
r7
r8
r9
r10
p1
p2
p3
s1
s2
s3
s4
d1
d2
d3
d4
d5
d6
t7
t8
t9
t10
t11
t12
t13
t14
FY 19
FY 20
FY 21
FY 22


DISTRICT ONE/CO MRP DATA COLLECTION
DISCREPANCIES
DATA %
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
r1 r2 r3 r4 r5 r6 r7 r8 r9 r10 p1 p2 p3 s1 s2 s3 s4 d1 d2 d3 d4 d5 d6 t7 t8 t9 t10 t11 t12 t13 t14
D1
Statewide Average


DISTRICT ONE/CO MRP DATA COLLECTION
DISCREPANCIES
DATA %
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
r1 r2 r3 r4 r5 r6 r7 r8 r9 r10 p1 p2 p3 s1 s2 s3 s4 d1 d2 d3 d4 d5 d6 t7 t8 t9 t10 t11 t12 t13 t14
FY 19
FY 20
FY 21
FY 22