



Federal Lands Highway Road Inventory Program

Road Inventory and Condition Assessment

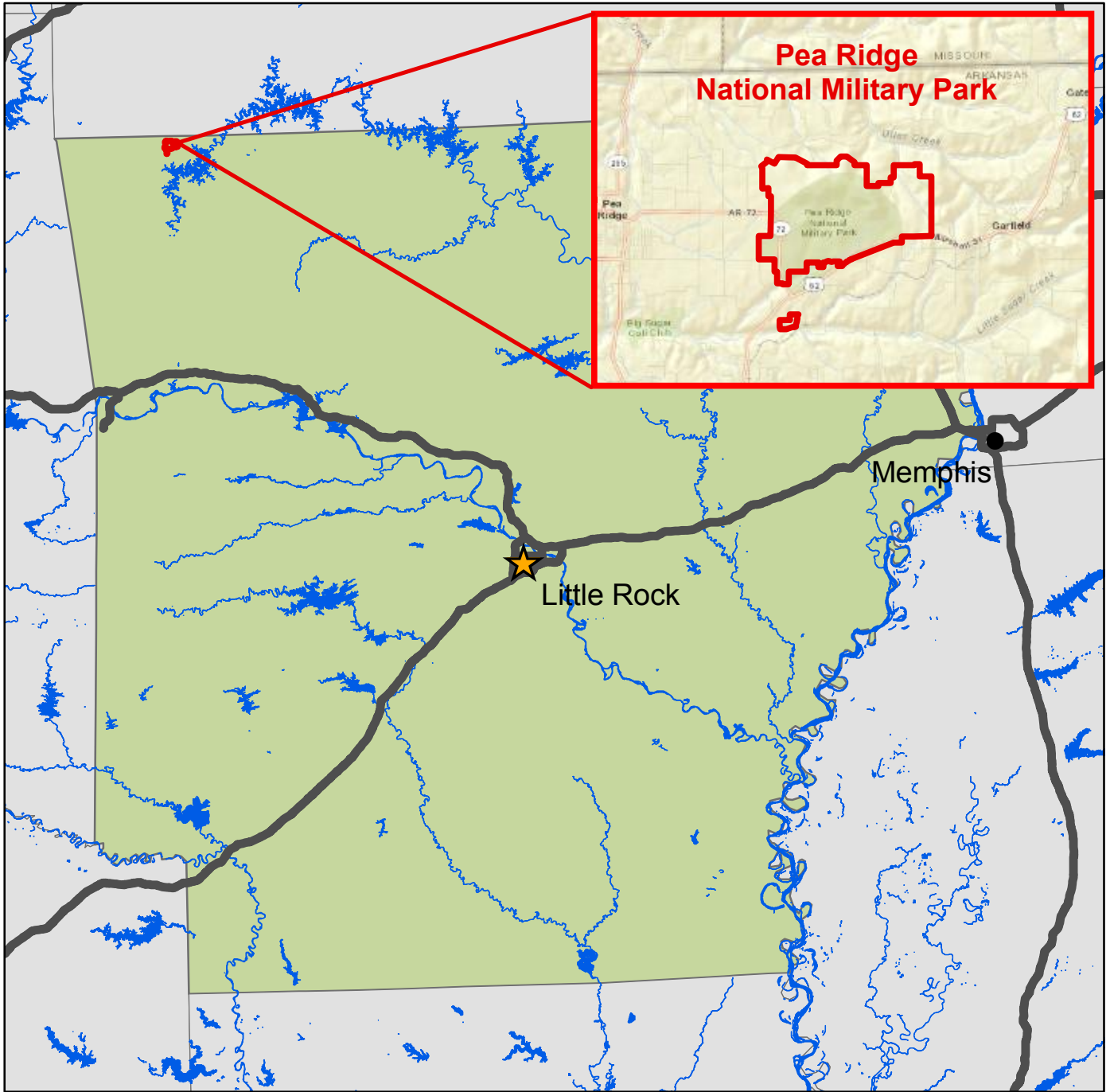


Pea Ridge National Military Park PERI - 7330

Cycle 5 Report

Prepared By: Federal Highway Administration
Road Inventory Program (RIP)
Data Collected: 12/2011
Report Date: 08/2012

Pea Ridge National Military Park in Arkansas





DCV = Data Collection Vehicle

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Section 1 Introduction



Pea Ridge National Military Park



Federal Lands Highway
Road Inventory Program

INTRODUCTION

The Federal Highway Administration, (FHWA), in the mid 1970s, was charged with the task of identifying surface condition deficiencies and corrective priorities on National Park Service (NPS) roads and parkways. Additionally, FHWA was tasked with establishing an integrated maintenance features inventory, locating features such as culverts, guardrails, and signs, among others, along NPS roads and parkways. As a result, in 1976 the NPS and FHWA entered into an MOA (Memorandum Of Agreement) which established the RIP (Road Inventory Program). This MOA was terminated and revised in 1980 to establish a new MOA aiming to update RIP data and develop a long-range program to improve and maintain NPS roads to designated condition standards and establish a maintenance management program.

The FHWA completed this initial phase of the RIP in the early 1980s. As a result of this effort, each NPS site included in the study received a RIP Report known as the “Brown Book” which included the information collected during this first RIP phase.

In the 1990s, the effort was again renewed to update and maintain the RIP data. By this time the computer age was upon us and a process was employed that relied heavily on electronic data collection and computer technology. A cyclical program was developed and the RIP completed two cycles of data collection from 1994 to 2001. Cycle 1, starting in 1994, was conducted in 44 “large parks” (parks containing 10 or more paved route miles). Cycle 2 began in 1997 and comprised 79 large parks and 5 small parks totaling 4,874 paved route miles. Each of these parks received a RIP Report known as the “Blue Book”. Cycle 3, from 2001 to 2004, was conducted in all parks, large and small, that contained any paved routes, including parking areas and, again, each park received a RIP Report and associated electronic files.

Cycle 4 was initiated in the spring of 2006 covering 86 large parks and several associated small parks consisting of 5,553 paved route miles and 6,232 paved parking areas. Data collection has been completed for Cycle 4 and all data has been delivered to the NPS.

In 2005, the FHWA began implementing the use of a Pavement Management System (PMS) to assist the NPS in prioritizing Pavement Maintenance and Rehabilitation activities. The PMS used by FHWA is the Highway Pavement Management Application (HPMA) and this software has the ability to store inventory and condition data from RIP and forecast future performance using prediction models. Outputs include performance and condition reports at the National, Regional, Park, or Route level. A regional prioritized list and optimization have been produced for most regions and the Federal Highway Deferred Maintenance is calculated via the HPMA.

In an effort to improve the accuracy of treatment recommendations and pavement condition descriptions, an extensive study was completed throughout 2010 that has resulted in changes to the RIP condition reporting method, specifically the distresses and indexes that comprise the Pavement Condition Rating (PCR). It was determined that a better representation of PCR could

be achieved by modifying the relative impact certain distresses would have on the overall rating. The changes that were implemented were endorsed by management at both the FHWA and NPS in October 2010. These changes will allow greater use of RIP and HPMA data for not simply condition data reporting, but also as a reliable tool for project identification and selection. Because of these changes, the PCR Condition ratings reported in Cycle 5 do not directly relate to the condition ratings reported in previous cycle RIP Reports. For more detailed information about the changes, see Section 3 and Section 10 in this RIP Report.

Cycle 5 has launched in the summer of 2010 and will again comprise all parks, large and small, that are served by paved roads and/or parking areas. For Cycle 5, the decision was made to collect condition data in large parks on Functional Class 1, 2, and 7 paved routes only, as well as any new routes that were previously not collected. In small parks, all paved routes and parking areas will be collected. As a result, this will include 81 large parks with 4,459 paved route miles and 168 small parks with 529 paved route miles and associated paved parking areas.

Since 1984, the Road Inventory Program has been funded through the Federal Lands Highway Park Roads and Parkways (PRP) Program. Currently, coordination of the RIP with FLH is under the NPS Washington Headquarters Park Facility Management Division. The FLH Washington office coordinates policy and prepares national reports and needs assessment studies for Congress.

In 1998, the Transportation Equity Act for the 21st Century (TEA-21) amended Title 23 U.S.C., and inserted Section 204(a)(6) requiring the FHWA and NPS, to develop by rule, a Pavement Management System (PMS) applied to park roads and parkways serving the National Park System.

FLH is responsible for the accuracy of all data presented in this report. Any questions or comments concerning the contents of this report should be directed to the national RIP Coordinator located in Sterling, Virginia.

Respectfully,

FHWA RIP Team

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Section 2 Park Route Inventory



Pea Ridge National Military Park



Federal Lands Highway
Road Inventory Program

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:

Red text denotes approx. mileage

White = Paved Routes, DCV Driven

Yellow = Unpaved Routes, DCV not Driven

Blue = All Paved Parking Areas

Green = All Unpaved Parking Areas

Grey = Paved Routes, DCV not Driven

Black = State, Local or Private non-NPS Routes



= Concession Route Flag ON

*Unpaved route data was obtained from NPS and was not inventoried by the Road Inventory Program (RIP).

** DCV - Data Collection Vehicle NC - Not Collected

PERI

PEA RIDGE NATIONAL MILITARY PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From To		Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0911	5	77892		ELKHORN TAVERN PARKING	FROM ROUTE 0300ZZ (TOUR ROADS)	TO ROUTE 0300ZZ (TOUR ROADS)	N/A	0.00	0.00	0.00		8,227	AS	1
0912	5	77976		FEDERAL EARTHWORK	FROM ROUTE 5002 (LITTLE SUGAR CREEK ROAD)	TO ROUTE 5002 (LITTLE SUGAR CREEK ROAD)	N/A	0.00	0.00	0.00		5,523	AS	1
0913	5	78011		ADMINISTRATIVE PARKING	FROM ROUTE 0402 (ADMINISTRATIVE ROAD)	TO PARKING	N/A	0.00	0.00	0.00		1,553	AS	1
5001	5			STATE HIGHWAY 72	FROM SOUTH PARK BOUNDARY	TO NORTH PARK BOUNDARY	N/A	1.66	0.00	1.66			AS	1
5002	5			LITTLE SUGAR CREEK ROAD	FROM WEST PARK BOUNDARY	TO EAST PARK BOUNDARY	N/A	0.35	0.00	0.35			AS	1

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

White = Paved Routes, DCV Driven
Grey = Paved Routes, DCV not Driven

Yellow = Unpaved Routes, DCV not Driven
Black = State, Local or Private non-NPS Routes

Blue = All Paved Parking Areas
■ = Concession Route Flag ON

Green = All Unpaved Parking Areas

*Unpaved route data was obtained from NPS and was not inventoried by the Road Inventory Program (RIP).

** DCV - Data Collection Vehicle NC - Not Collected

CYCLE 5 SUMMARY TOTALS FOR PEA RIDGE NATIONAL MILITARY PARK

<u>CYCLE 5 ROUTE TOTALS</u>	
DCV Driven Route Miles	10.03
Manually Rated Route Miles	0.00
TOTAL PARK ROUTE MILES COLLECTED IN CYCLE 5	10.03
Manually Rated Routes (SQFT)	0
TOTAL UNPAVED PARK ROUTE MILES	7.48

<u>CYCLE 5 CONCESSION TOTALS</u>	
Concession Paved Route Miles	0.00
Concession Unpaved Route Miles	0.00
TOTAL CONCESSION ROUTE MILES	0.00
Concession Paved Parking Area SQFT	0
Concession Unpaved Parking Area SQFT	0
TOTAL CONCESSION PARKING AREA SQFT	0
Concession Manually Rated Rotes SQFT	0

<u>* CYCLE 5 PARKING AREA TOTALS</u>	
Paved Parking (SQFT)	97,416
Unpaved Parking (SQFT)	45,000
TOTAL PARKING (SQFT)	142,416

<u>CYCLE 5 WEIGHTED AVERAGE PARK VALUES</u>	
DCV Driven PCR	89
**Manually Rated Routes PCR	N/A
**Parking PCR	77
***Total Equivalent Lane Miles	19.67

* - The Parking Area Totals SQFT value represents **all** parking areas collected in Cycle 5, both park and concessionaire.

** - Parking and Manually Rated Routes are assigned the following PCR values based on their observed condition: Construction=-1, Excellent=97, Good=90, Fair=73, and Poor=45.

*** - Equivalent Lane Miles are calculated by route using the following equations : DCV and Manually Rated Lines Routes=(PAVE_WIDTHxPAVED_MI)/11 foot lane. Parking Areas=SQ_FEET/5280/11. Manually Rated Polygons=SQ_FEET/5280/11.

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:

White = Paved Routes, DCV Driven

Yellow = Unpaved Routes, DCV not Driven

Blue = All Paved Parking Areas

Green = All Unpaved Parking Areas

Red text denotes approx. mileage

Grey = Paved Routes, DCV not Driven

Black = State, Local or Private non-NPS Routes

■ = Concession Route Flag ON

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General Park Road Functional Classification Table

- Class 1 Principal Park Road/Rural Parkway (Public Roads) - Roads which constitute the main access route, circulatory tour, or thoroughfare for park visitors. Route Numbers 1 - 99. Note: Rural parkways (e.g. Natchez Trace) are numbered 1 - 9. State Routes Inventoried for Park. Route Numbers 5000-5999
- Class 2 Connector Park Road (Public Roads) - Roads which provide access within a park to areas of scenic, scientific, recreational or cultural interest, such as overlooks, campgrounds, etc. Route Numbers 100-199.
- Class 3 Special Purpose Park Road (Public Roads) - Roads which provide circulation within public areas, such as campgrounds, picnic areas, visitor center complexes, concessionaire facilities, etc. These roads generally serve low-speed traffic and are often designed for one-way circulation. Route Numbers 200-299.
- Class 4 Primitive Park Roads (Public Roads) - Roads which provide circulation through remote areas and/or access to primitive campgrounds and undeveloped areas. These roads frequently have no minimum design standards and their use may be limited to specially equipped vehicles. Route Numbers 200-299. Note: Functional Classes 3 and 4 have the same route numbers because, historically, they were numbered similarly.
- Class 5 Administrative Access Road (Administrative Roads) - All public roads intended for access to administrative developments or structures such as park offices, employee quarters, or utility areas. Route Numbers 400-499.
- Class 6 Restricted Road (Administrative Roads) - All roads normally closed to the public, including patrol roads, truck trails, and other similar roads. Route Numbers 400-499. Note: Functional Classes 5 and 6 have the same route numbers because historically they were numbered similarly and often there is little distinction between these routes. For example, because utility areas and employee housing are often closed to the public, this restriction would result in classification of FC 6 rather than FC 5.
- Class 7 Urban Parkway (Urban Parkways and City Streets) - These facilities serve high volumes of park and non-park related traffic and are restricted, limited-access facilities in an urban area. This category of roads primarily encompasses the major parkways which serve as gateways to our nation's capital. Other major park roads or portions thereof, however, may be included in this category. Route Numbers 1-9.
- Class 8 City Streets (Urban Parkways and City Streets) - City streets are usually extensions of the adjoining street system that are owned and maintained by the National Park Service. The construction and/or reconstruction should conform with accepted local engineering practice and local conditions. Route Numbers 600-699.

 A park road system contains those roads within or giving access to a park or other unit of the NPS which are administered by the NPS, or by the Service in cooperation with other agencies. The assignment of a functional classification (FC) to a park road is not based on traffic volumes or design speed, but on the intended use or function of that road or route.

The historic route numbering system also included a 300 number series for interpretive roads, and a 500 series for one-way roads. There are approximately 250 roads nationwide which are designated by the 300 and 500 series. The numbers for these roads will be maintained for reporting consistency. However, since these interpretive and one-way routes are not as clearly tied to a specific functional class, the 300 and 500 series will be discontinued for future use.

5000 route numbers are assigned to Non-NPS Routes that are State, County or City owned which border, traverse, or provide access to Park Facilities or Assets. 5000 Routes are driven for GPS and Video Log only.

Surface Type Abbreviations:

- AS - Asphaltic Concrete Pavement
- CO - Portland Cement Concrete Pavement
- BR - Brick or Pavers Road Bed
- CB - Cobble Stone Road Bed
- GR - Gravel Road Bed
- SA - Sand Road Bed
- NV - Native or Dirt Material Road Bed
- OT - Other Materials Road Bed

NPS/RIP Subcomponent Details for PERI

Road Inventory Program 08/22/2012

(Numerical By Subcomponent #)

Page 1 of 1

Shading Color Key:

White = Paved Routes, DCV Driven

Yellow = Unpaved Routes, DCV not Driven

Blue = All Paved Parking Areas

Green = All Unpaved Parking Areas

Red text denotes approx. mileage

Grey = Paved Routes, DCV not Driven

Black = State, Local or Private non-NPS Routes

■ = Concession Route Flag ON

*Unpaved route data was obtained from NPS and was not inventoried by the Road Inventory Program (RIP).

PERI

PEA RIDGE NATIONAL MILITARY PARK

Asset Entered in FMSS System

Rte. No.	FMSS No.	Cycle Collected	Route Name	From	To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0300ZZ	77808	5	TOUR ROADS	FROM ROUTE 0010 (U.S. HIGHWAY 62)	TO END OF LOOP		1	6.60	0.00	6.60	
0900ZZ	78006	5	VISITOR CENTER PARKING AREAS	ADJACENT TO ROUTE 0300ZZ (TOUR ROADS) ON LEFT AND RIGHT				0.00	0.00	0.00	12,127

Asset PERI -0300ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	From	To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0300AZ	77808	5	TOUR ROAD A	FROM ROUTE 0010 (U.S. HIGHWAY 62)	TO END OF LOOP		1	6.50	0.00	6.50	
0300BZ	77808	5	TOUR ROAD B	FROM ROUTE 0300AZ (TOUR ROAD A) AT MP 0.13	TO ROUTE 0300AZ (TOUR ROAD A) AT MP 0.04		1	0.10	0.00	0.10	

Asset PERI -0900ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	From	To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0900AZ	78006	5	VISITOR CENTER PARKING A	ADJACENT TO ROUTE 0300AZ (TOUR ROAD A) ON RIGHT				0.00	0.00	0.00	5,374
0900BZ	78006	5	VISITOR CENTER PARKING B	ADJACENT TO ROUTE 0300AZ (TOUR ROAD A) ON LEFT				0.00	0.00	0.00	4,969
0900CZ	78006	5	VISITOR CENTER PARKING C	ADJACENT TO ROUTE 0300BZ (TOUR ROAD B) ON LEFT				0.00	0.00	0.00	1,784

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - PERI

ROUTES ADDED FROM PREVIOUS INVENTORY:			
Route #	Route Name	Reason for Addition	Comments
5002	LITTLE SUGAR CREEK ROAD	OTHER	NEW 5000 SERIES ROUTE ADDED DURING THE CYCLE 5 WEB ROUTE ID MEETING PER THE PARK'S REQUEST.
ROUTES MODIFIED FROM PREVIOUS INVENTORY:			
Route #	Route Name	Type of Modification	Comments
0010	U.S. HIGHWAY 62	OTHER	ROUTE WAS CHANGED FROM A 5000 SERIES ROUTE TO A PARK OWNED ROUTE BECAUSE THE PARK EXPECTS TO ACQUIRE THIS ROUTE BY 2014. ROUTE LENGTH INCREASED FROM 2.10 MILES IN CYCLE 3 TO 3.18 MILES IN CYCLE 5.
0300ZZ	TOUR ROADS	OTHER	ROUTE 0900 (AS COLLECTED IN CYCLE 3) WAS SPLIT IN CYCLE 5 TO EXCLUDE THE ROAD SECTION. THE ROAD SECTION IS NOW PART OF 0300ZZ.
0402	ADMINISTRATIVE ROAD	OTHER	ROUTE 0901 WAS SPLIT IN CYCLE 5 TO EXCLUDE THE ACCESS ROAD SECTION. THE ACCESS ROAD SECTION THAT WAS PART OF ROUTE 0901 IS NOW INCLUDED IN ROUTE 0402 INSTEAD.
0900ZZ	VISITOR CENTER PARKING AREAS	ROUTE SPLIT	ROUTE 0900 (AS COLLECTED IN CYCLE 3) WAS SPLIT IN CYCLE 5 TO EXCLUDE THE ROAD SECTION. THE ROAD SECTION IS NOW PART OF 0300ZZ.
0901	MAINTENANCE COMPLEX PARKING	ROUTE SPLIT	ROUTE 0901 WAS SPLIT IN CYCLE 5 TO EXCLUDE THE ACCESS ROAD SECTION. THE ACCESS ROAD SECTION THAT WAS PART OF ROUTE 0901 IS NOW INCLUDED IN ROUTE 0402 INSTEAD.
0910	EAST OVERLOOK PARKING	ROUTES COMBINED	CYCLE 3 ROUTES 0200, 0909, AND 0910 WERE COMBINED INTO ROUTE 0910 DURING THE CYCLE 5 WEB ROUTE ID MEETING PER THE PARK'S REQUEST.

Section 3

Park Summary Information



Pea Ridge National Military Park



Federal Lands Highway
Road Inventory Program

PERI: PAVED ROUTE MILES AND PERCENTAGES BY FUNCTIONAL CLASS AND PCR

F.C.	Pavement Condition Rating (PCR)								TOTAL MILES
	Poor (0-60)		Fair (61-84)		Good (85-94)		Excellent (95-100)		
	MILES	%	MILES	%	MILES	%	MILES	%	
1	0.78	7.78%	1.28	12.76%	2.96	29.51%	4.76	47.46%	9.78
2									
3					0.03	0.30%	0.08	0.80%	0.11
4									
5					0.06	0.60%	0.08	0.80%	0.14
6									
7									
8									
Totals	0.78	7.78%	1.28	12.76%	3.05	30.41%	4.92	49.05%	10.03

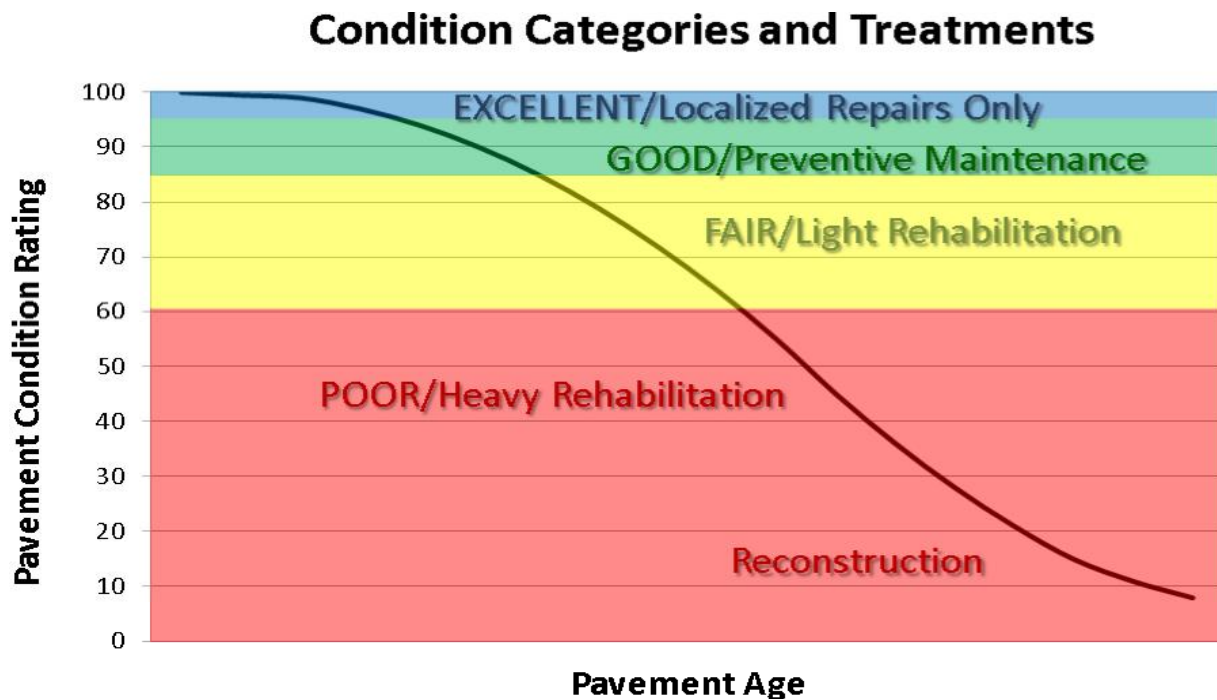
Note: The information in this table is derived from the PMS_20 table in the Park database, which only contains processed data from routes collected with the Data Collection Vehicle (DCV). Information for Manually Rated Routes (MRR) and Parking Areas is not reported in this table. Only Functional Class 1, 2, & 7 routes, and any new routes not previously collected by RIP, are collected in Large Parks.

Explanation of the Excellent, Good, Fair and Poor Condition Descriptions

In addition to the RIP Index changes that have been implemented in Cycle 5, we will also aim to provide greater assistance in translating excellent/good/fair/poor categories into pavement needs categories. The PCR can be used to indicate the place in the Pavement Life Cycle and the types of treatments that should be considered now and into the future.

- Excellent/New: PCR of 95-100. Pavements in this range will require only spot repairs
- Good: PCR of 85-94. Pavements in this range will likely be candidates for Preventive Maintenance. Examples include Chip and Slurry Seals, Micro Surfacing and Thin Overlays.
- Fair: PCR of 61-84. Pavements in this range will likely be candidates of Light Rehabilitation (L3R). Examples include single-lift overlays up to 2.5 inches in total thickness, milling and overlays.
- Poor: PCR of 0-60. Pavements in this range will likely be candidates of Heavy Rehabilitation or Reconstruction (H3R or 4R). Examples include Pulverization, Multiple Lift Overlays, and Reconstruction.

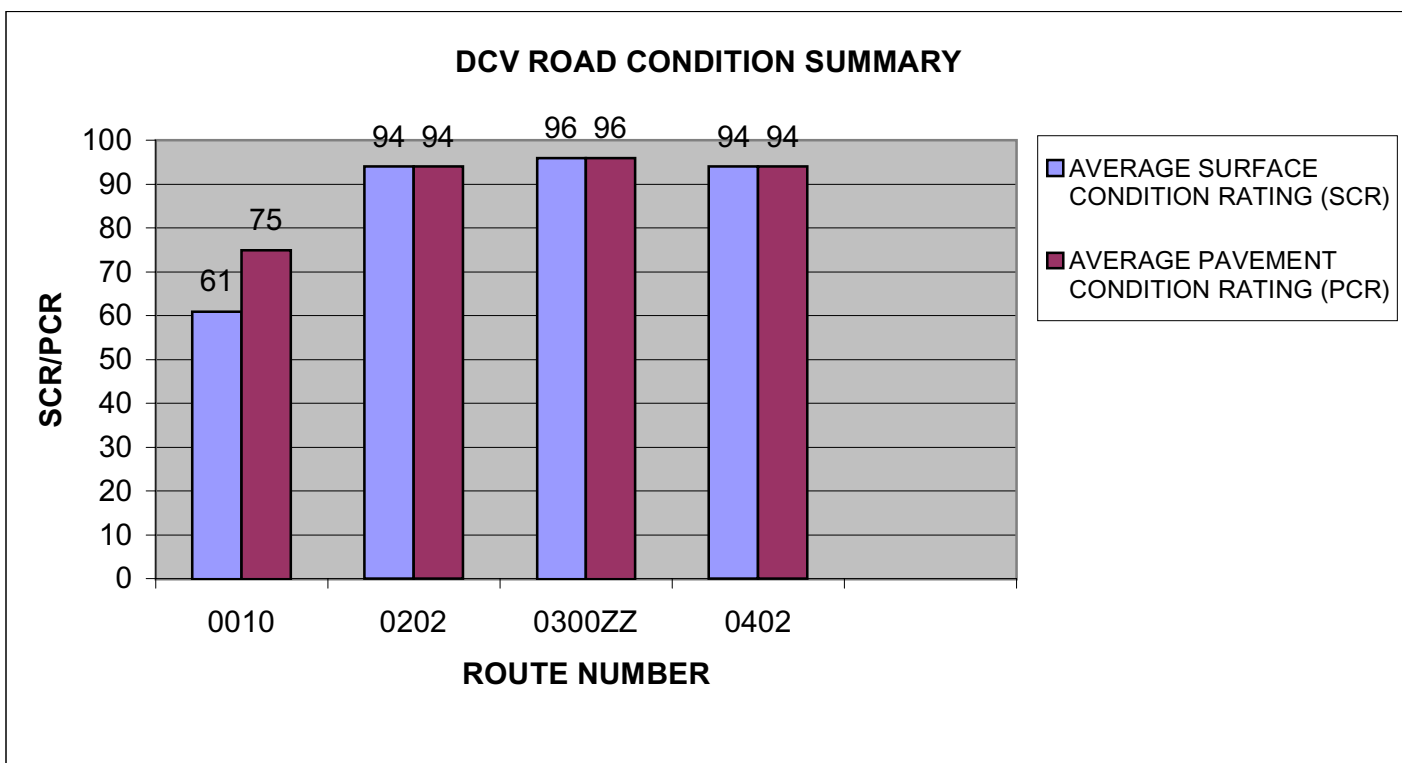
At this time, specific Maintenance and Rehabilitation activities should be evaluated and recommended at the project level. Site-specific conditions that influence treatment type should be determined based on performing a subsurface investigation and/or pavement condition survey, and not be based solely on RIP data. Additionally, RIP produces a snapshot of conditions the year in which the data was collected. For further information or to obtain additional Pavement Management System's data from our Highway Pavement Management Application (HPMA) please contact the Eastern Federal Lands pavement team.



PERI: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

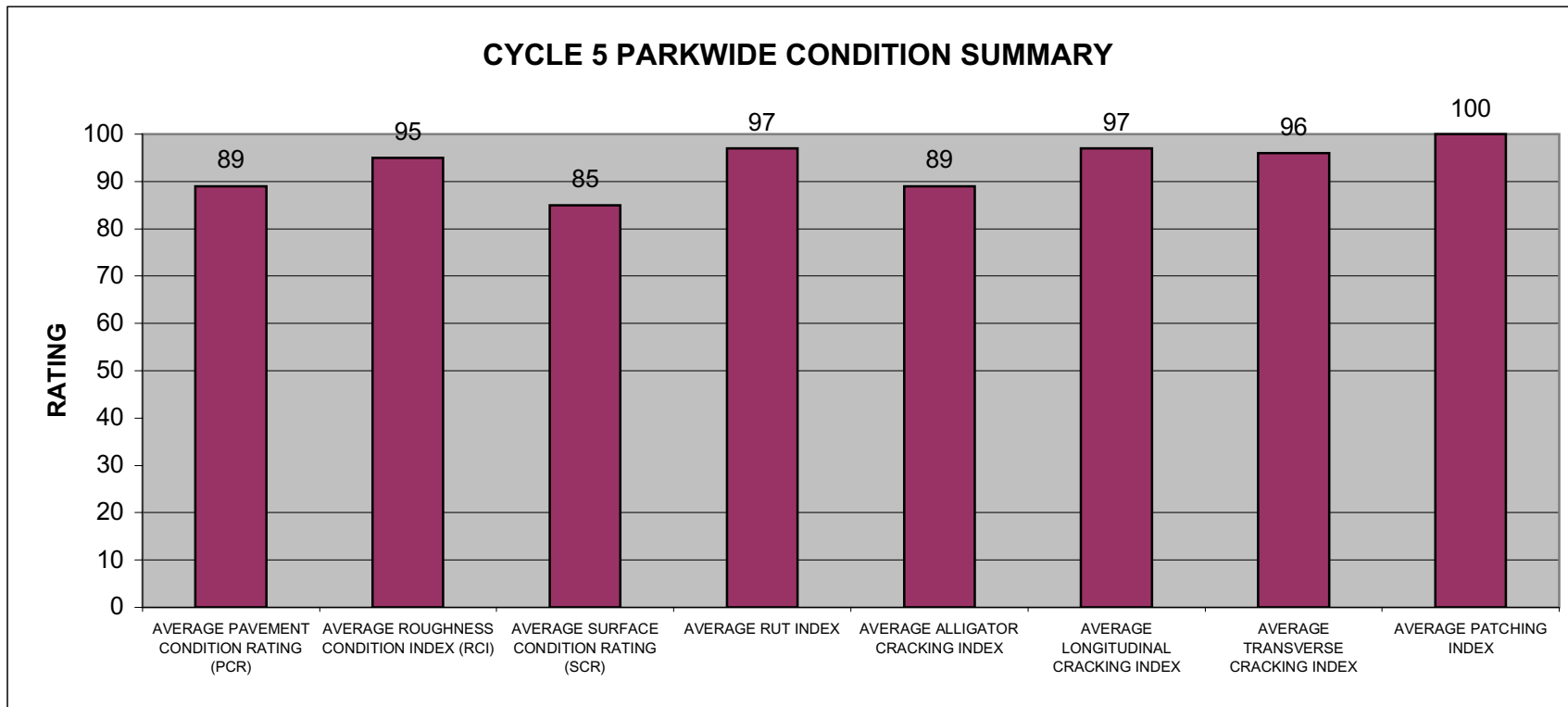
ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	PAVED LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0010	U.S. HIGHWAY 62	1	3.18	ASPHALT	61	75
0202	WINTON SPRINGS ROAD	3	0.11	ASPHALT	94	94
0300ZZ	TOUR ROADS	1	6.60	ASPHALT	96	96
0402	ADMINISTRATIVE ROAD	5	0.14	ASPHALT	94	94



PERI: PARKWIDE DCV CONDITION SUMMARY

AVERAGE PAVEMENT CONDITION RATING (PCR)	AVERAGE ROUGHNESS CONDITION INDEX (RCI)	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE RUT INDEX	AVERAGE ALLIGATOR CRACKING INDEX	AVERAGE LONGITUDINAL CRACKING INDEX	AVERAGE TRANSVERSE CRACKING INDEX	AVERAGE PATCHING INDEX
89	95	85	97	89	97	96	100

All Index values are based on Data Collection Vehicle (DCV) driven roads that were collected in Cycle-5.
 Roughness data is only collected on routes with lengths greater than 0.5 miles and a posted speed limit of 25 MPH or greater.



Section 4

Park Route Location Maps

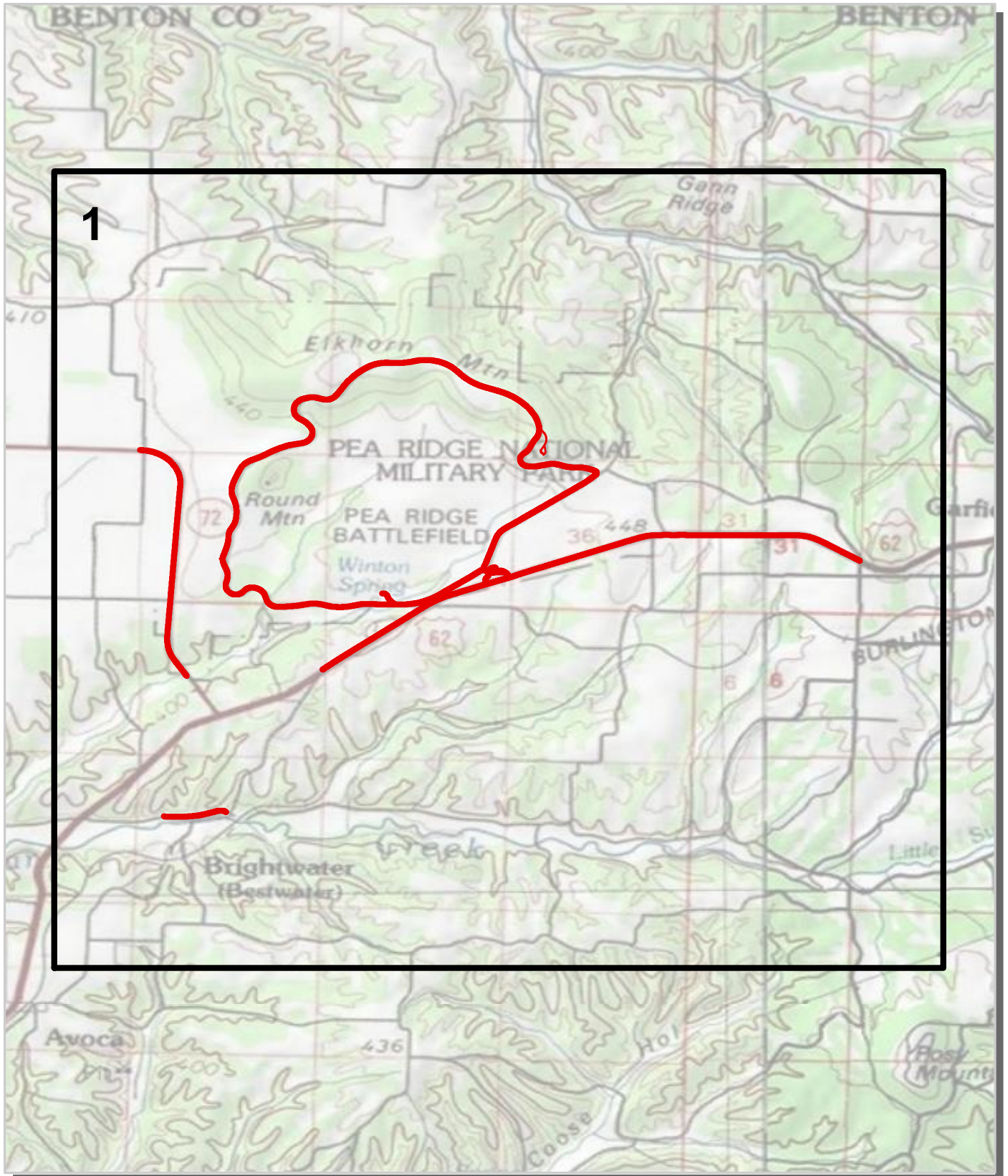



Pea Ridge National Military Park

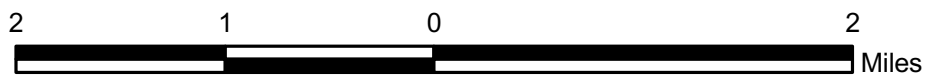


Federal Lands Highway
Road Inventory Program

Pea Ridge National Military Park
Route Location Map
Key Map

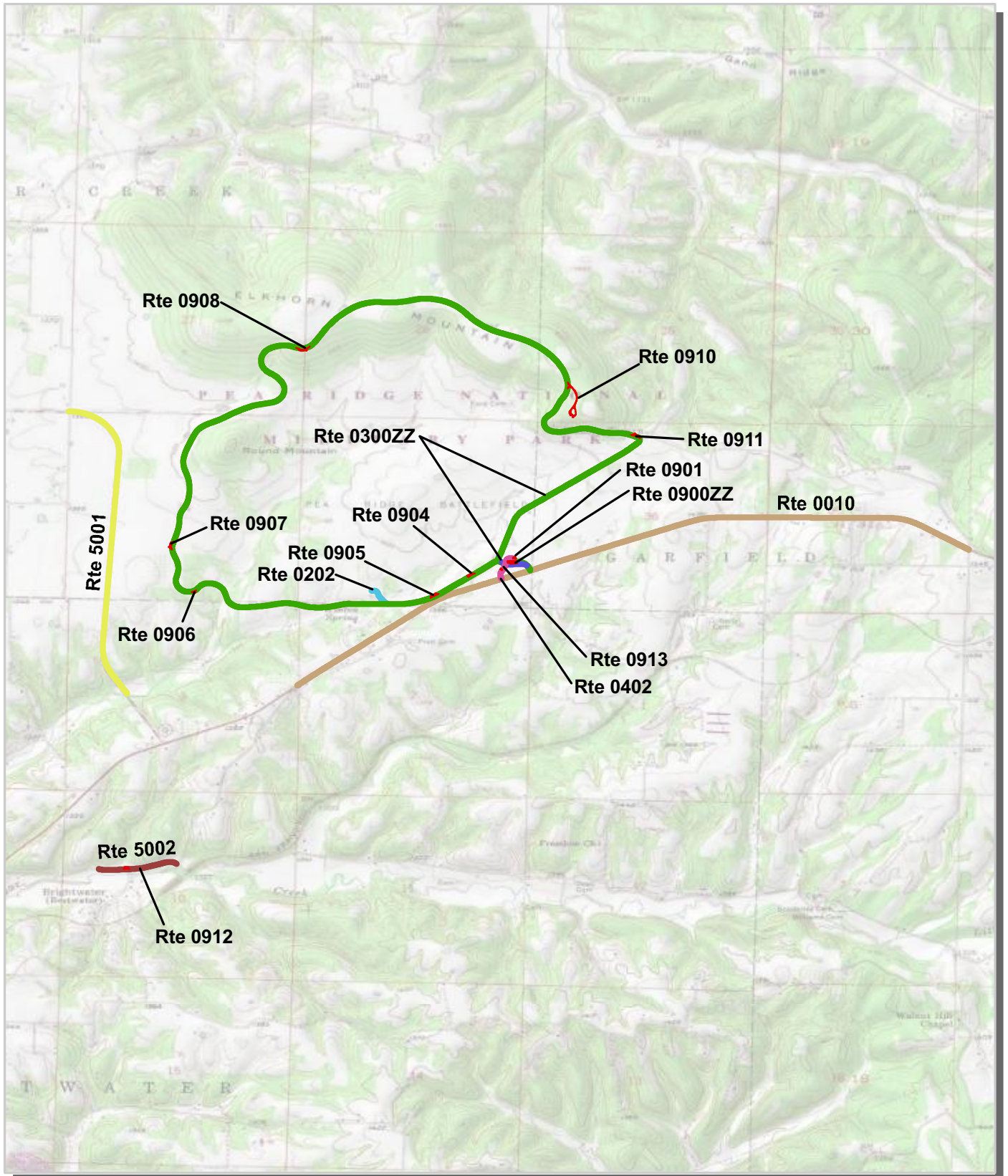


 Cycle 5 Collected Routes

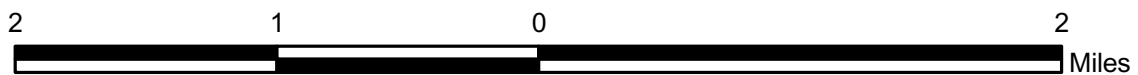


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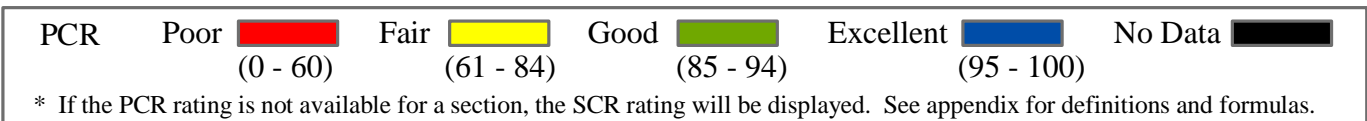
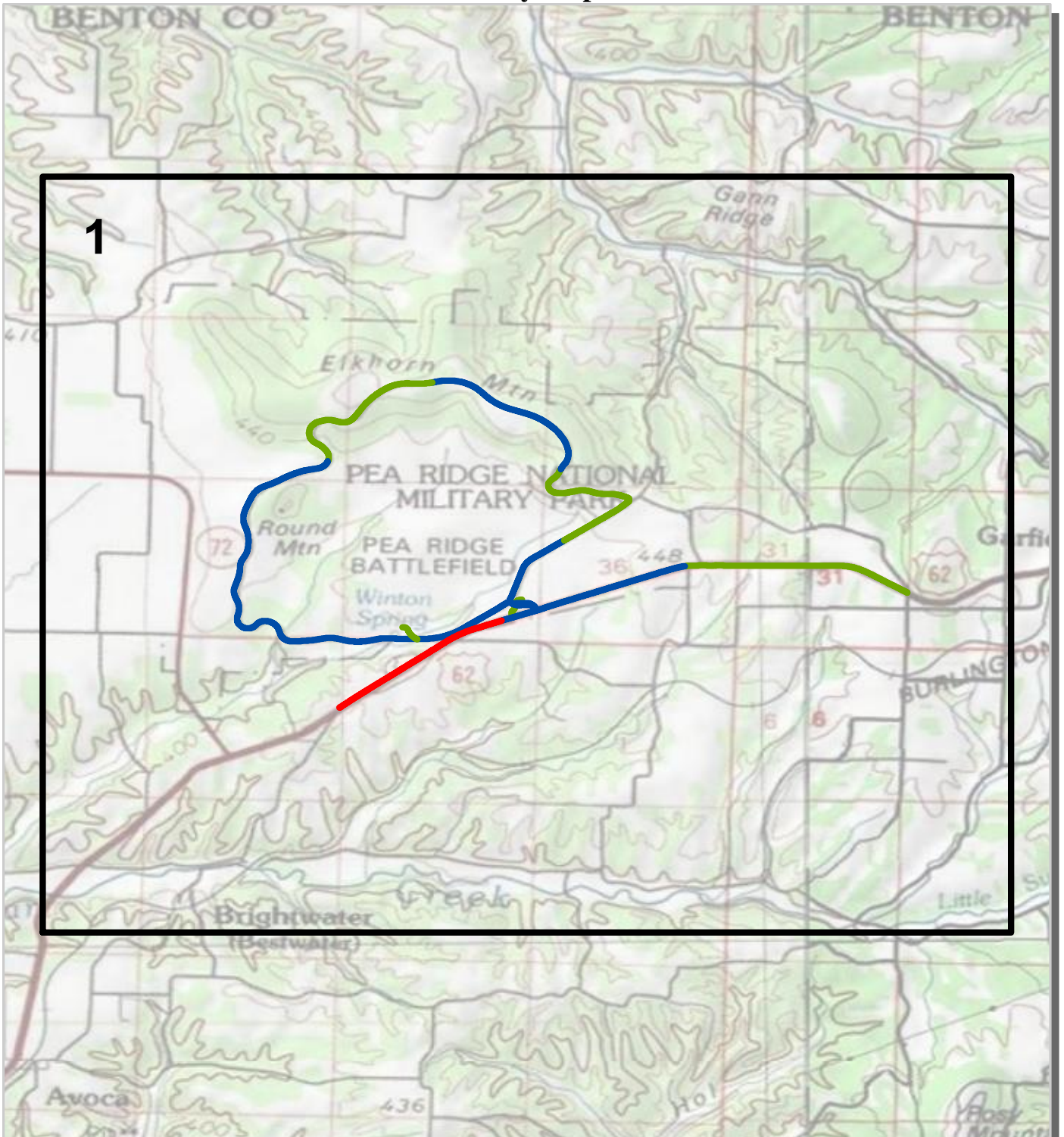
Pea Ridge National Military Park Route Location Map Area 1



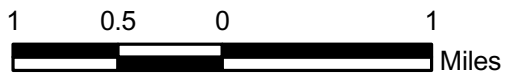
Unique colors used to differentiate routes



**Pea Ridge National Military Park
Route Condition Map
PCR - Mile by Mile
Key Map**

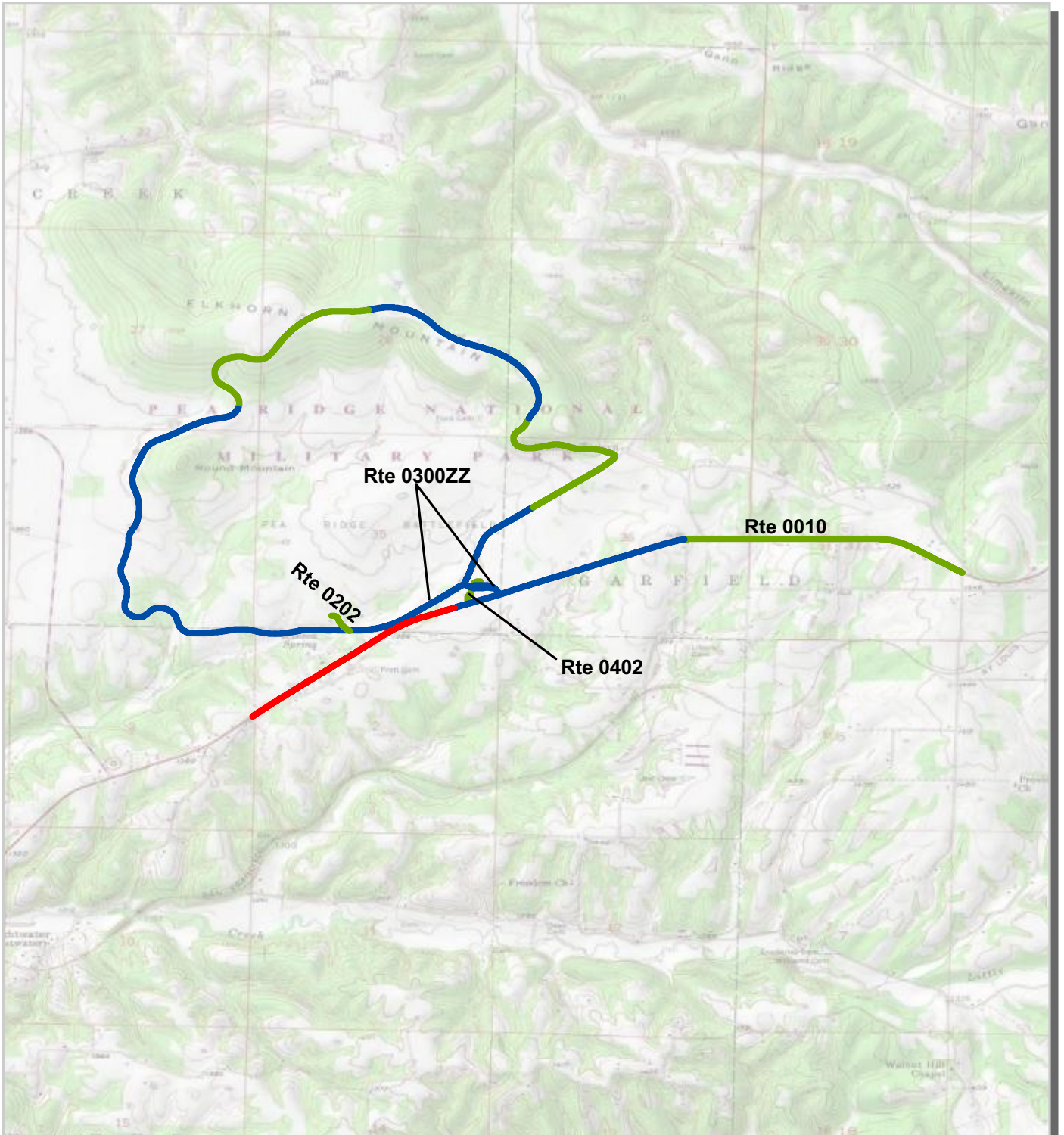


Note: Only routes collected by the DCV in Cycle-5 are displayed.



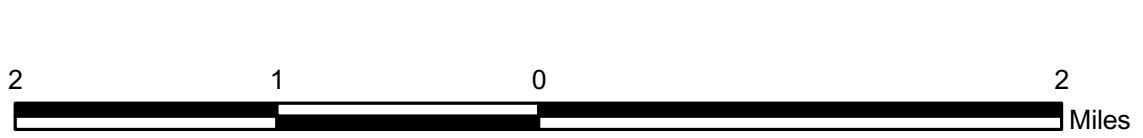
0

**Pea Ridge National Military Park
Route Condition Map
PCR - Mile by Mile
Area 1**



PCR	Poor	Fair	Good	Excellent	No Data
	(0 - 60)	(61 - 84)	(85 - 94)	(95 - 100)	

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.



Section 5

Paved Route

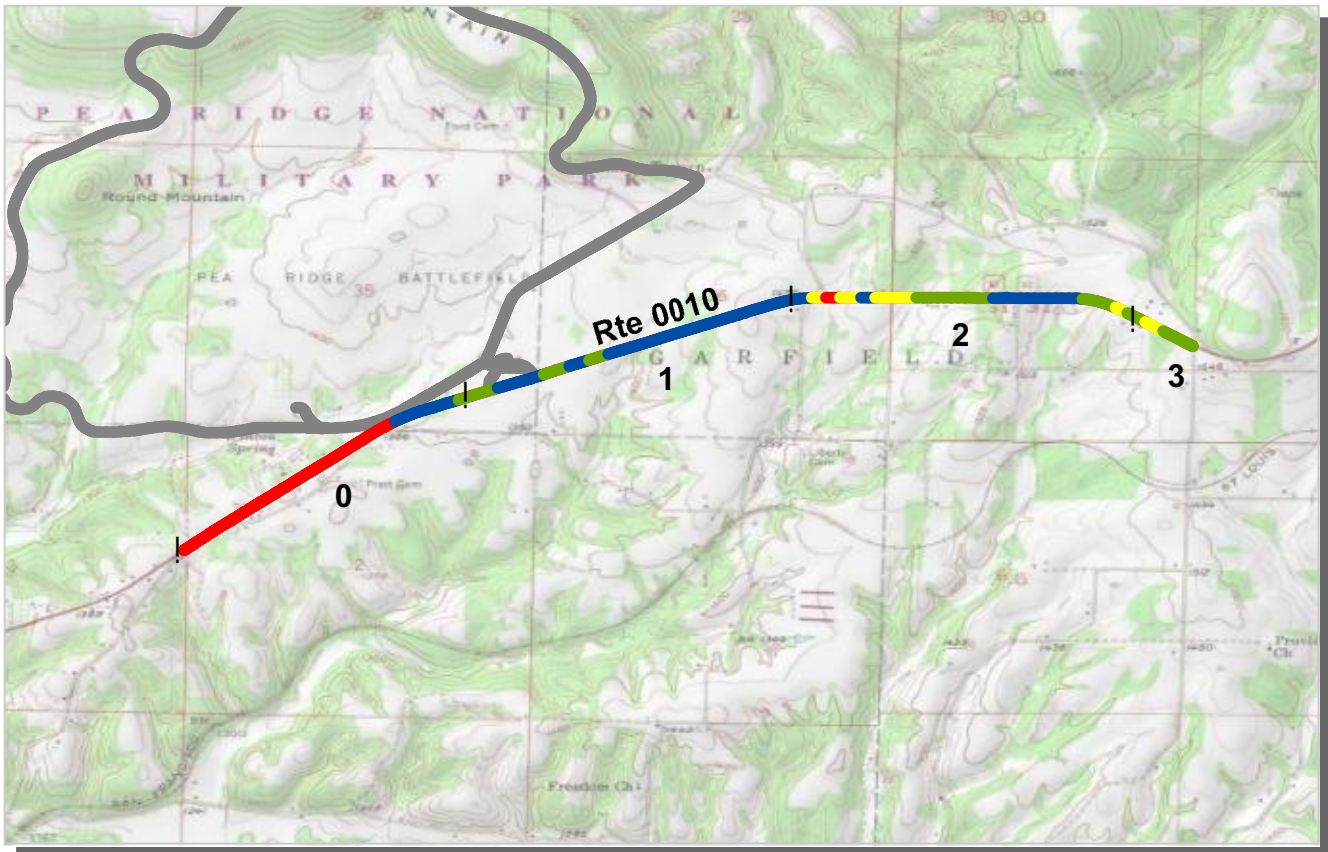
Condition Rating Sheets



Pea Ridge National Military Park



Federal Lands Highway
Road Inventory Program



0

PCR	Poor (0 - 60)	Fair (61 - 84)	Good (85 - 94)	Excellent (95 - 100)	No Data

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0010 U.S. HIGHWAY 62
PERI : PEA RIDGE NATIONAL MILITARY PARK

COLLECTED: 12/9/2011
TOTAL LENGTH: 3.18 Miles

MIDWEST REGION

Section Number	0	1	2	3
Section Length (mi)	1.00	1.00	1.00	0.18
Cross Section Information				
Number of Lanes	2	2	3	3
Paved Width (ft)	33	32	33	33
Lane Width (ft)	11	11	11	11
Roadway Condition Information				
SCR (Surface Condition Rating)	0	95	84	87
PCR (Pavement Condition Rating)	40	97	86	89
Distress Index Values				
Structural Crack Index	0	96	84	87
Transverse Cracking Index	93	95	92	93
Patching Index	100	100	100	100
Rutting Index	97	99	98	94
Roughness Condition Index (RCI)	100	100	90	91

NOTES:

Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.
 See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected N/A - Not Applicable

ROUTE: 0010 U.S. HIGHWAY 62



PCR Poor ■ Fair ■ Good ■ Excellent ■ No Data ■
 (0 - 60) (61 - 84) (85 - 94) (95 - 100)

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0202 WINTON SPRINGS ROAD
PERI : PEA RIDGE NATIONAL MILITARY PARK

COLLECTED: 12/9/2011
TOTAL LENGTH: 0.11 Miles

MIDWEST REGION

Section Number	0				
Section Length (mi)	0.11				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	13				
Lane Width (ft)	13				
Roadway Condition Information					
SCR (Surface Condition Rating)	94				
PCR (Pavement Condition Rating)	94				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	99				
Patching Index	100				
Rutting Index	94				
Roughness Condition Index (RCI)	NC				

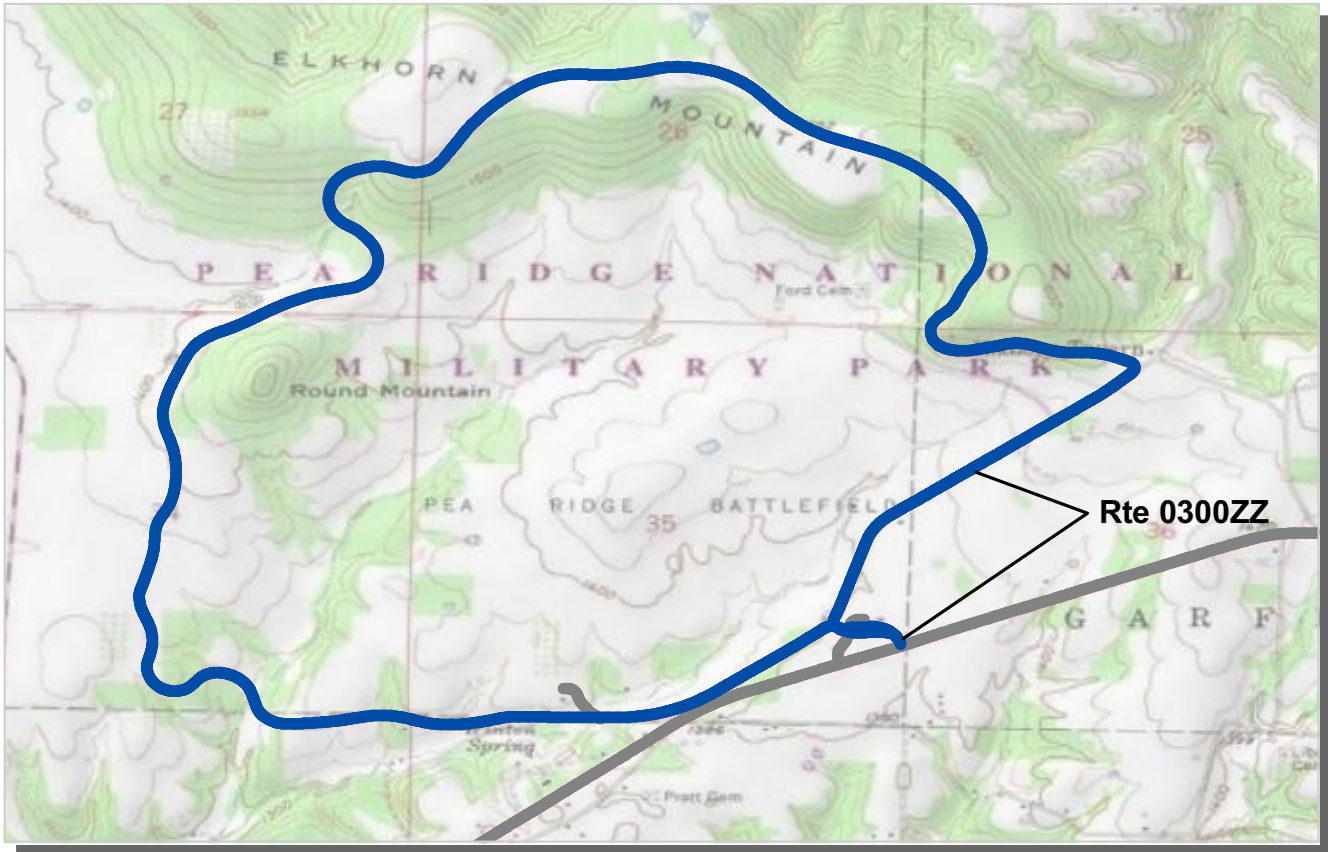
NOTES:

Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.
 See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected N/A - Not Applicable

0

ROUTE: 0202 WINTON SPRINGS ROAD



0

PCR	Poor (0 - 60)	Fair (61 - 84)	Good (85 - 94)	Excellent (95 - 100)	No Data

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

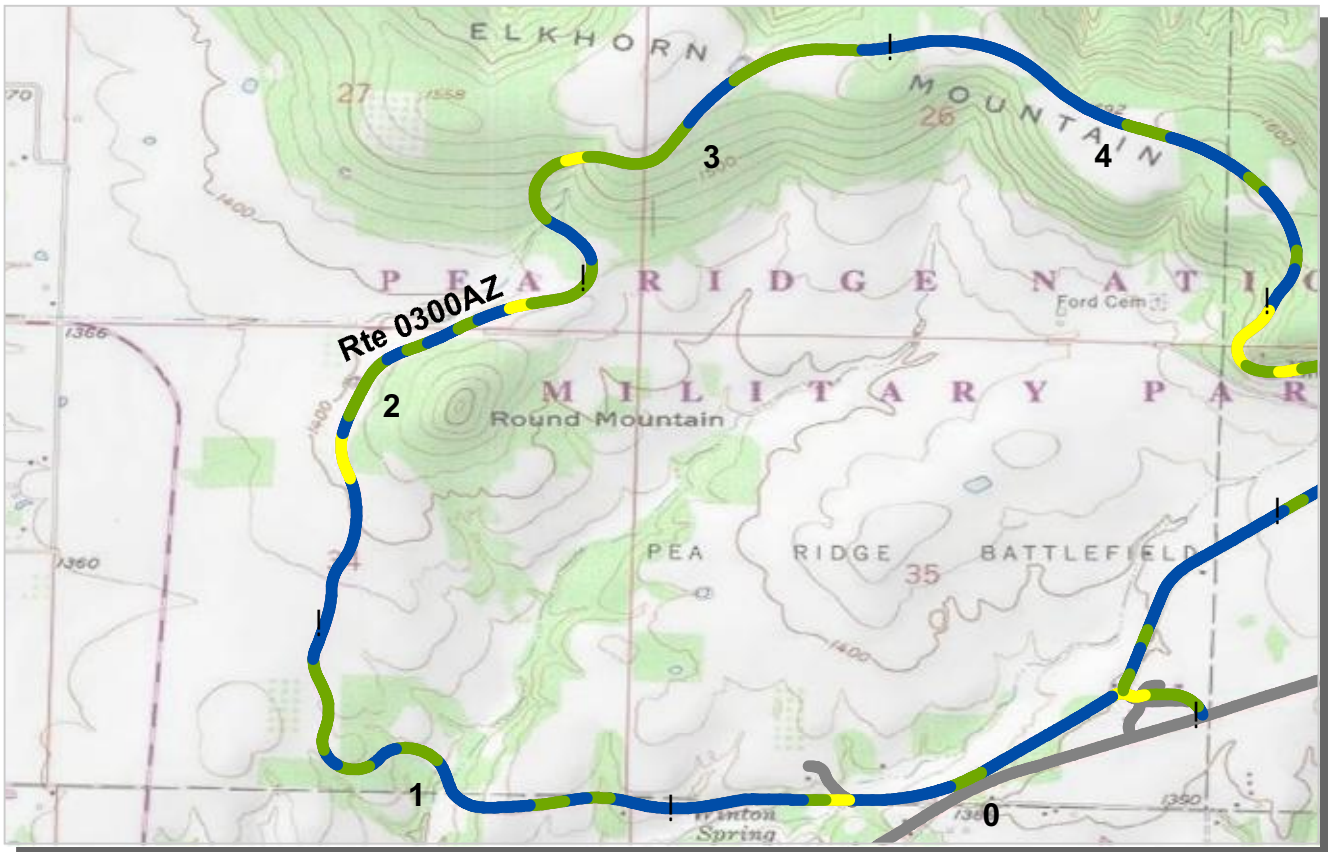
ROUTE: 0300ZZ TOUR ROADS
PERI : PEA RIDGE NATIONAL MILITARY PARK

Summary Record
MIDWEST REGION COLLECTED: 12/9/2011
TOTAL LENGTH: 6.60 Miles

Section Number					
Section Length (mi)					
Cross Section Information					
Number of Lanes	N/A				
Paved Width (ft)	N/A				
Lane Width (ft)	N/A				
Roadway Condition Information					
SCR (Surface Condition Rating)	96				
PCR (Pavement Condition Rating)	96				
Distress Index Values					
Structural Crack Index	N/A				
Transverse Cracking Index	N/A				
Patching Index	N/A				
Rutting Index	N/A				
Roughness Condition Index (RCI)	N/A				

NOTES:
 Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.
 See Section 10 for explanation of SCR, PCR, & all Distress Index Values.
 NC - Not Collected N/A - Not Applicable

ROUTE: 0300ZZ TOUR ROADS



PCR Poor ■ Fair ■ Good ■ Excellent ■ No Data ■
 (0 - 60) (61 - 84) (85 - 94) (95 - 100)

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0300AZ TOUR ROAD A
PERI : PEA RIDGE NATIONAL MILITARY PARK

Subcomponent Record
MIDWEST REGION

COLLECTED: 12/9/2011
TOTAL LENGTH: 6.50 Miles

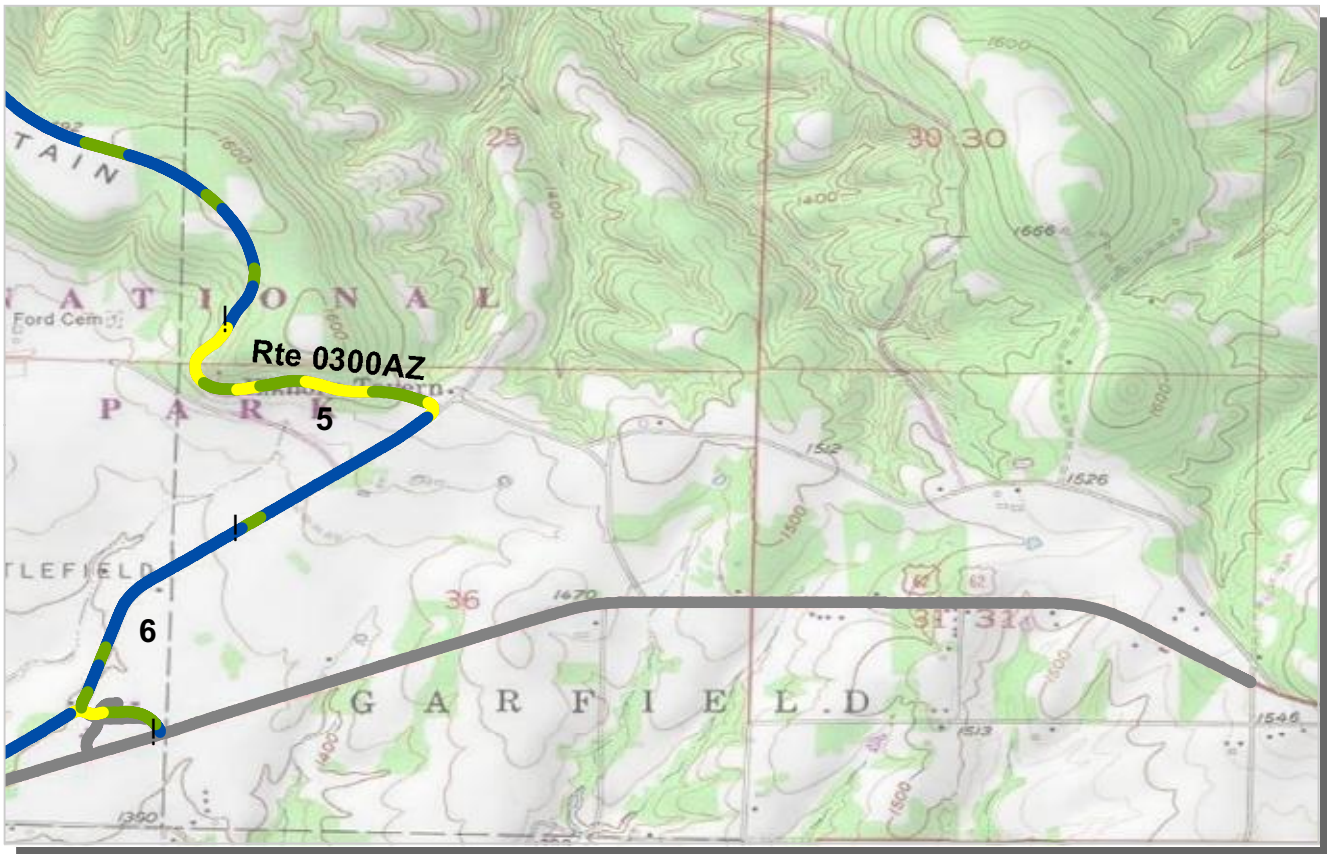
<i>Section Number</i>	0	1	2	3	4
<i>Section Length (mi)</i>	1.00	1.00	1.00	1.00	1.00
<i>Cross Section Information</i>					
Number of Lanes	2	1	1	1	1
Paved Width (ft)	17	12	13	13	13
Lane Width (ft)	11	12	13	13	13
<i>Roadway Condition Information</i>					
SCR (Surface Condition Rating)	98	96	97	94	98
PCR (Pavement Condition Rating)	96	98	95	94	99
<i>Distress Index Values</i>					
Structural Crack Index	99	97	97	97	99
Transverse Cracking Index	99	96	97	98	98
Patching Index	100	100	100	100	100
Rutting Index	98	98	97	94	98
Roughness Condition Index (RCI)	93	100	91	94	100

NOTES:

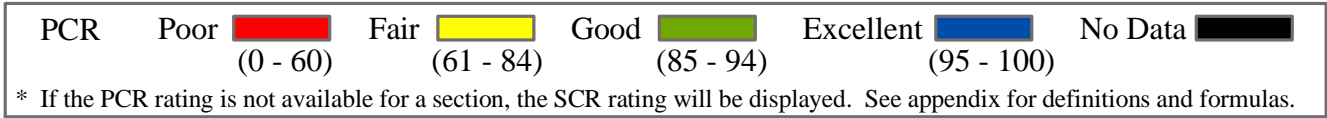
Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.
 See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected N/A - Not Applicable

ROUTE: 0300AZ TOUR ROAD A



0



ROUTE: 0300AZ TOUR ROAD A
PERI : PEA RIDGE NATIONAL MILITARY PARK

Subcomponent Record
 MIDWEST REGION

COLLECTED: 12/9/2011
TOTAL LENGTH: 6.50 Miles

Section Number	5	6			
Section Length (mi)	1.00	0.50			
Cross Section Information					
Number of Lanes	1	1			
Paved Width (ft)	13	13			
Lane Width (ft)	13	13			
Roadway Condition Information					
SCR (Surface Condition Rating)	95	95			
PCR (Pavement Condition Rating)	91	97			
Distress Index Values					
Structural Crack Index	100	100			
Transverse Cracking Index	99	95			
Patching Index	100	100			
Rutting Index	95	99			
Roughness Condition Index (RCI)	84	100			

NOTES:

Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.
 See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected N/A - Not Applicable

ROUTE: 0300AZ TOUR ROAD A



PCR	Poor (0 - 60)	Fair (61 - 84)	Good (85 - 94)	Excellent (95 - 100)	No Data
-----	---------------	----------------	----------------	----------------------	---------

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0300BZ TOUR ROAD B
PERI : PEA RIDGE NATIONAL MILITARY PARK

Subcomponent Record
MIDWEST REGION

COLLECTED: 12/9/2011
TOTAL LENGTH: 0.10 Miles

<i>Section Number</i>	0			
<i>Section Length (mi)</i>	0.10			
Cross Section Information				
Number of Lanes	1			
Paved Width (ft)	16			
Lane Width (ft)	16			
Roadway Condition Information				
SCR (Surface Condition Rating)	98			
PCR (Pavement Condition Rating)	98			
Distress Index Values				
Structural Crack Index	98			
Transverse Cracking Index	99			
Patching Index	100			
Rutting Index	98			
Roughness Condition Index (RCI)	NC			

NOTES:

Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.

See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected N/A - Not Applicable

ROUTE: 0300BZ TOUR ROAD B



PCR Poor ■ Fair ■ Good ■ Excellent ■ No Data ■
 (0 - 60) (61 - 84) (85 - 94) (95 - 100)

* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0402 ADMINISTRATIVE ROAD
PERI : PEA RIDGE NATIONAL MILITARY PARK

COLLECTED: 12/9/2011
TOTAL LENGTH: 0.14 Miles

MIDWEST REGION

Section Number	0				
Section Length (mi)	0.14				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	18				
Lane Width (ft)	9				
Roadway Condition Information					
SCR (Surface Condition Rating)	94				
PCR (Pavement Condition Rating)	94				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	98				
Patching Index	100				
Rutting Index	94				
Roughness Condition Index (RCI)	NC				

NOTES:

Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.
 See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected N/A - Not Applicable

ROUTE: 0402 ADMINISTRATIVE ROAD

Section 6
Manually Rated Paved Route
Condition Rating Sheets



Pea Ridge National Military Park



Federal Lands Highway
Road Inventory Program

MANUALLY RATED ROUTE CONDITION RATING SHEETS

No data available for this section.

Section 7
Parking Area
Condition Rating Sheets



Pea Ridge National Military Park



**Federal Lands Highway
Road Inventory Program**

PEA RIDGE NATIONAL MILITARY PARK

Route 0900ZZ

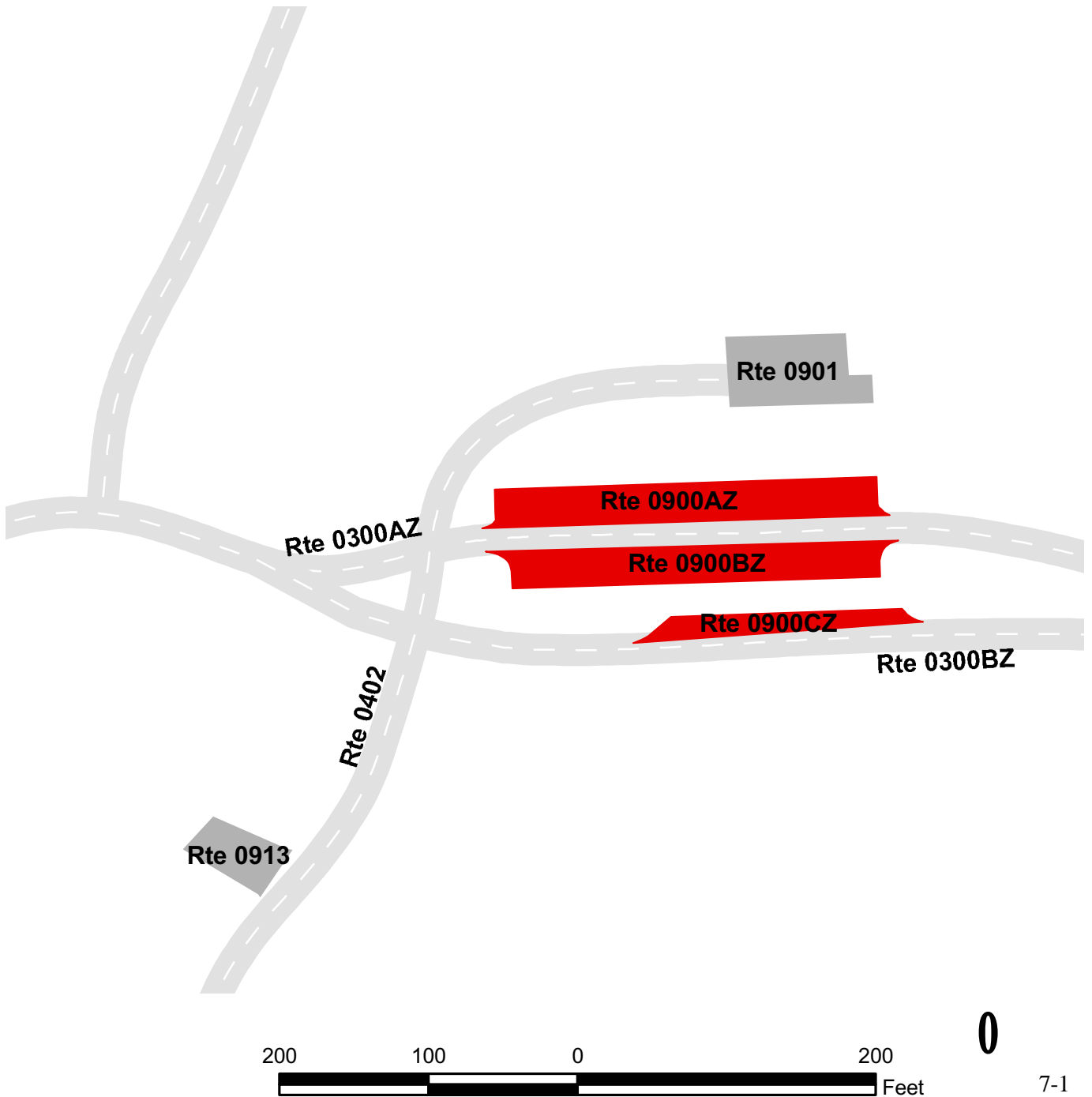
VISITOR CENTER PARKING AREAS

ADJACENT TO ROUTE 0300ZZ (TOUR ROADS) ON LEFT AND RIGHT

Summary Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900ZZ	PUBLIC	3/17/2011	12,127	0.21	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	1	0	NO CURB AND GUTTER	CONCRETE CURB	SUMMARY/73

* Lane miles are based on 11' lane widths



0

PEA RIDGE NATIONAL MILITARY PARK

Route 0900AZ

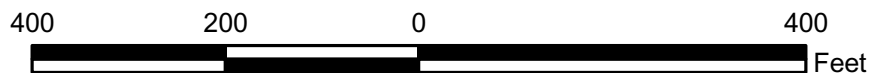
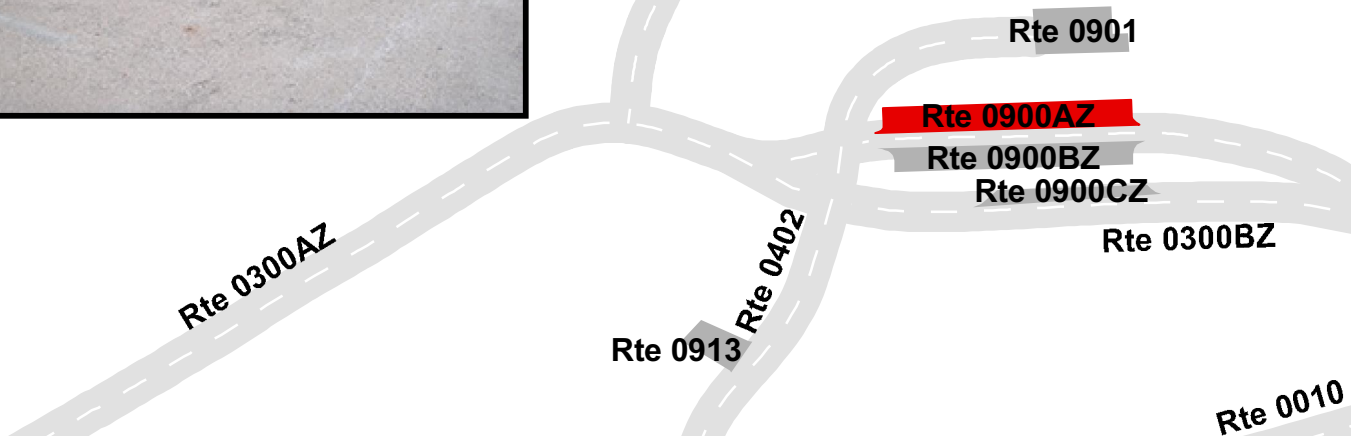
VISITOR CENTER PARKING A

ADJACENT TO ROUTE 0300AZ (TOUR ROAD A) ON RIGHT

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900AZ	PUBLIC	3/17/2011	5,374	0.09	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



Rte 0010
0

PEA RIDGE NATIONAL MILITARY PARK

Route 0900BZ

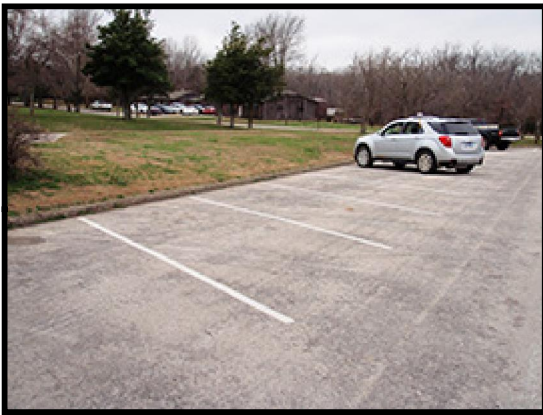
VISITOR CENTER PARKING B

ADJACENT TO ROUTE 0300AZ (TOUR ROAD A) ON LEFT

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900BZ	PUBLIC	3/17/2011	4,969	0.09	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	1	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

PEA RIDGE NATIONAL MILITARY PARK

Route 0900CZ

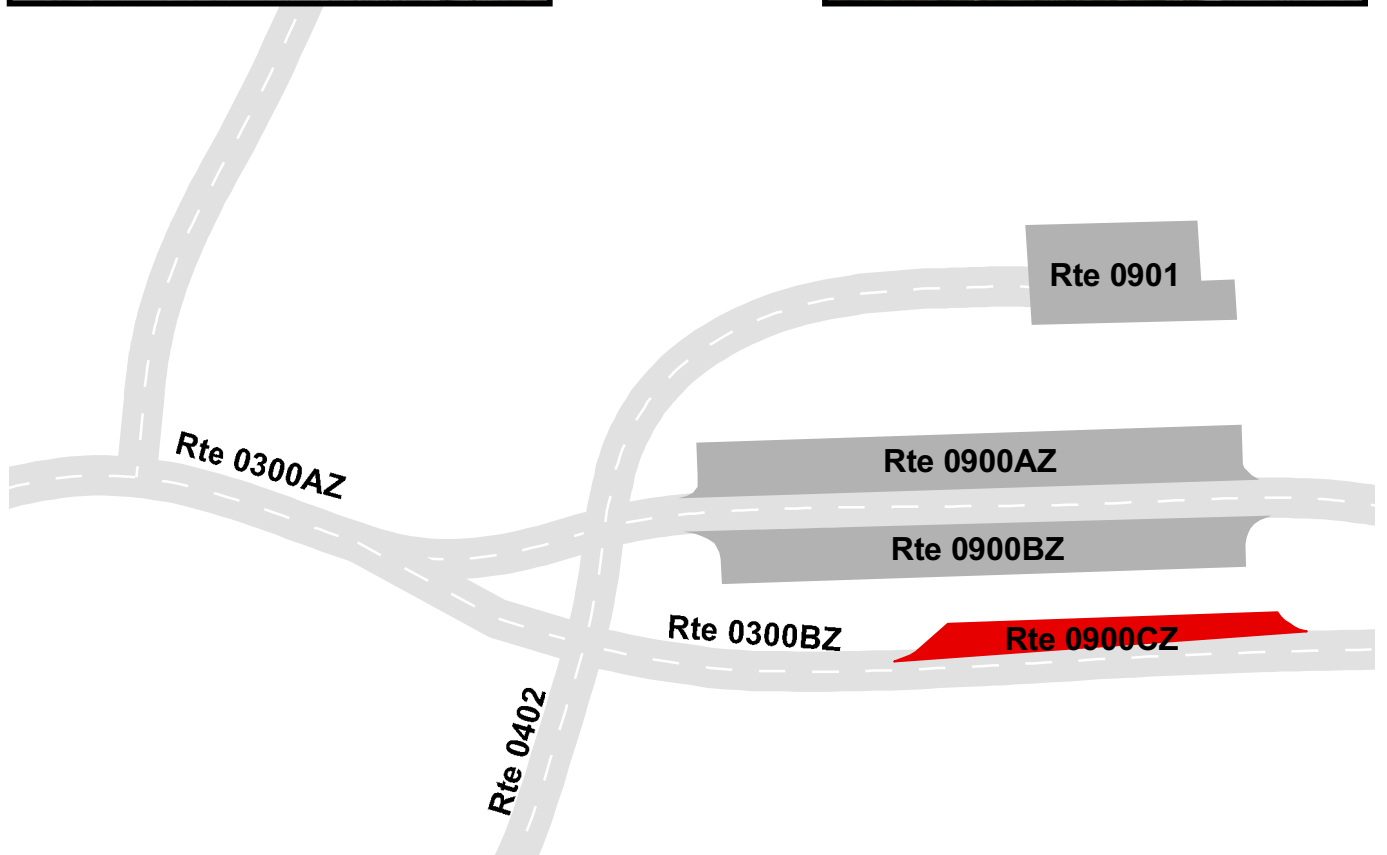
VISITOR CENTER PARKING C

ADJACENT TO ROUTE 0300BZ (TOUR ROAD B) ON LEFT

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900CZ	PUBLIC	3/17/2011	1,784	0.03	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

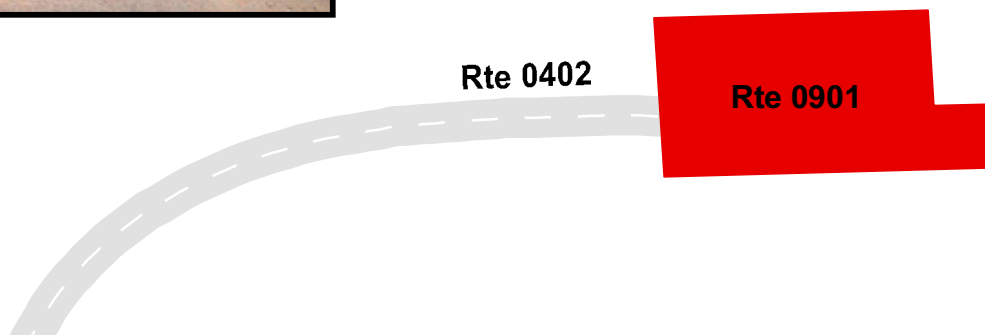
PEA RIDGE NATIONAL MILITARY PARK

Route 0901

MAINTENANCE COMPLEX PARKING
 FROM END OF ROUTE 0402 (ADMINISTRATIVE ROAD)
 TO MAINTENANCE COMPLEX

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0901	NONPUBLIC	3/17/2011	3,307	0.06	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	1	NO CURB AND GUTTER	NO CURB	POOR/45

* Lane miles are based on 11' lane widths



0

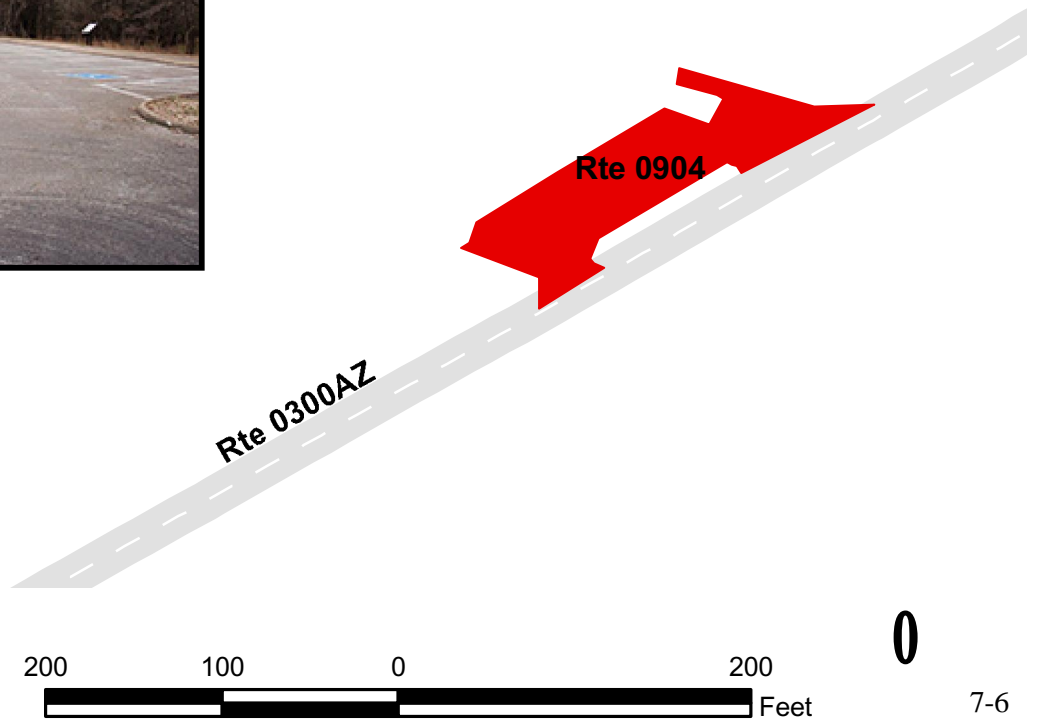
PEA RIDGE NATIONAL MILITARY PARK

Route 0904

OLD PICNIC AREA PARKING
 FROM ROUTE 0300ZZ (TOUR ROADS)
 TO ROUTE 0300ZZ (TOUR ROADS)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0904	PUBLIC	3/17/2011	7,413	0.13	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	2	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



PEA RIDGE NATIONAL MILITARY PARK

Route 0905

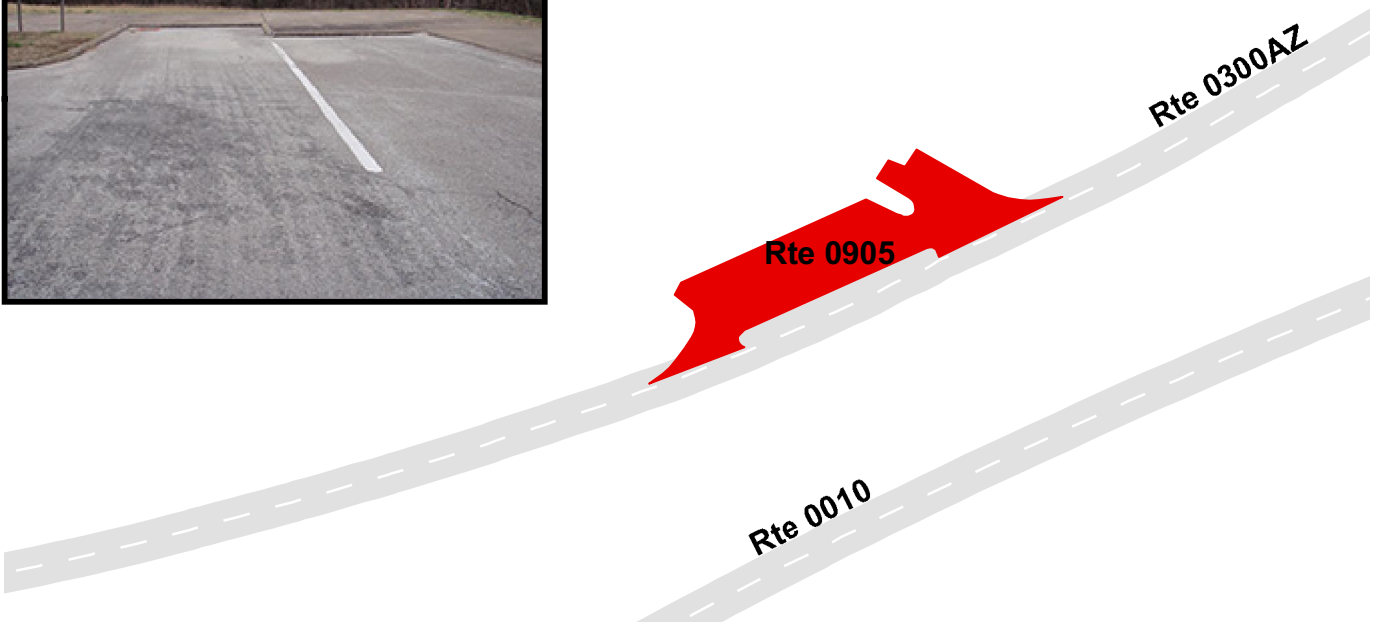
CURTIS'S HEADQUARTERS PARKING

FROM ROUTE 0300ZZ (TOUR ROADS)

TO ROUTE 0300ZZ (TOUR ROADS)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905	PUBLIC	3/17/2011	7,750	0.13	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	2	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

PEA RIDGE NATIONAL MILITARY PARK

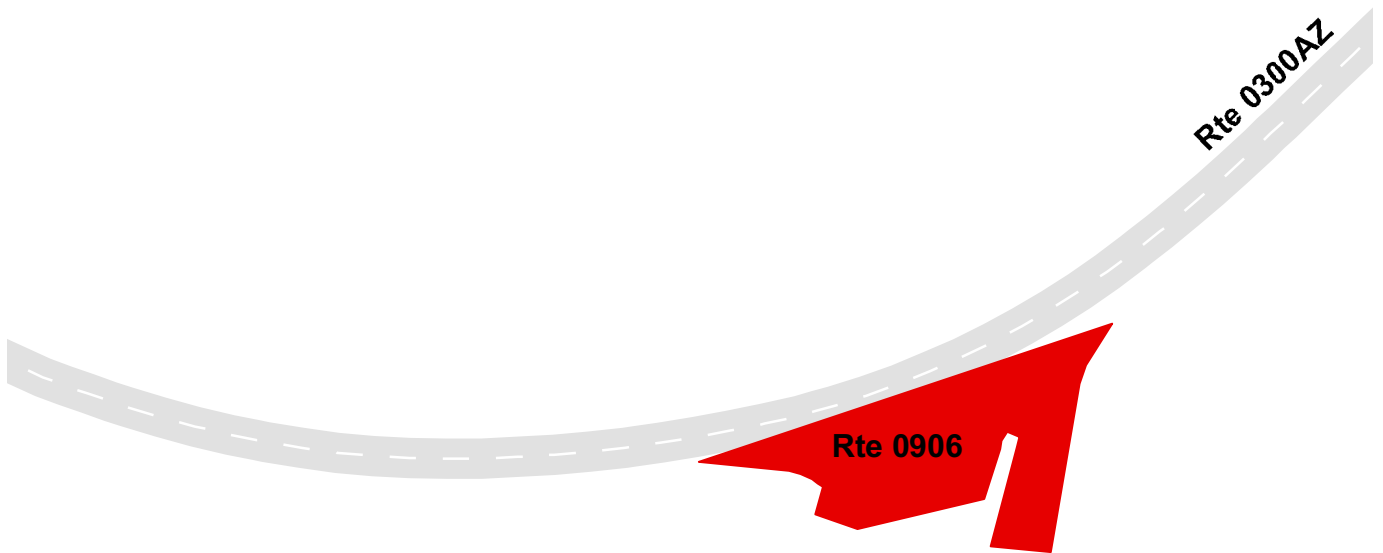
Route 0906

LEETOWN HAMLET PARKING

ADJACENT TO ROUTE 0300ZZ (TOUR ROADS)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0906	PUBLIC	3/17/2011	3,551	0.06	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

PEA RIDGE NATIONAL MILITARY PARK

Route 0907

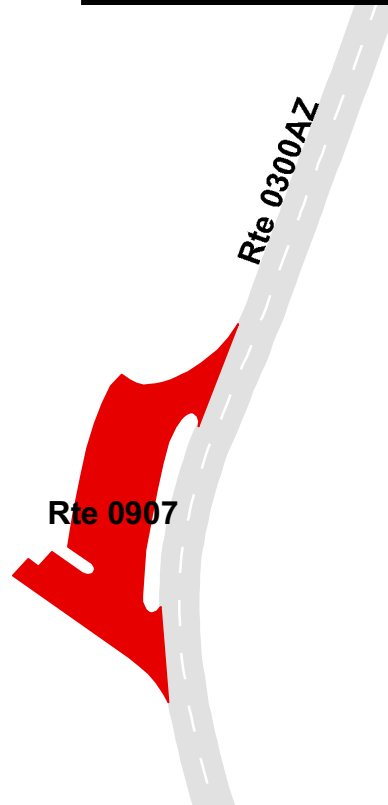
LEETOWN BATTLEFIELD PARKING

FROM ROUTE 0300ZZ (TOUR ROADS)

TO ROUTE 0300ZZ (TOUR ROADS)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0907	PUBLIC	3/17/2011	8,721	0.15	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

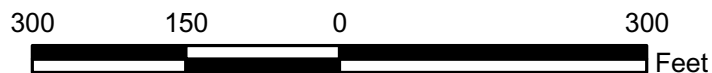
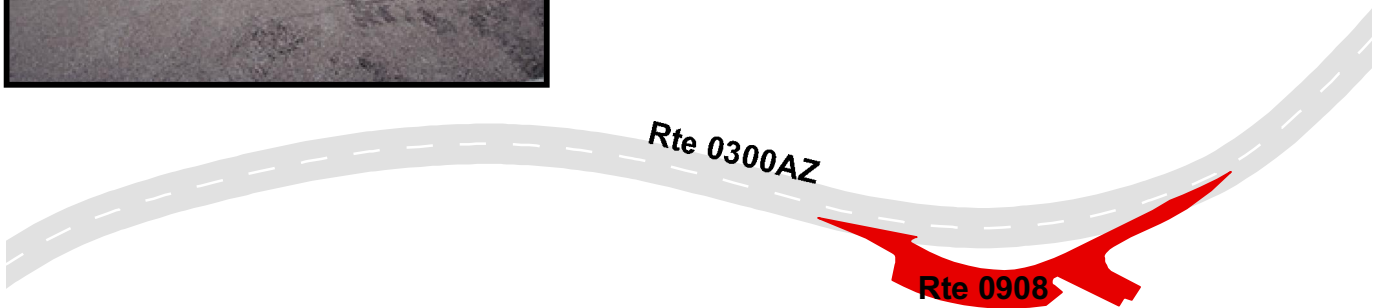
PEA RIDGE NATIONAL MILITARY PARK

Route 0908

WEST OVERLOOK PARKING
 FROM ROUTE 0300ZZ (TOUR ROADS)
 TO ROUTE 0300ZZ (TOUR ROADS)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0908	PUBLIC	3/17/2011	8,915	0.15	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	3	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

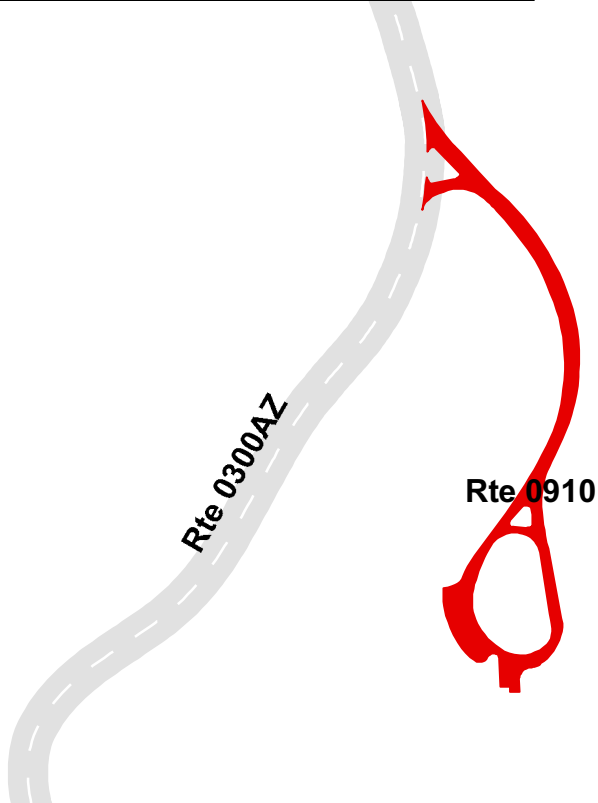
PEA RIDGE NATIONAL MILITARY PARK

Route 0910

EAST OVERLOOK PARKING
FROM ROUTE 0300ZZ (TOUR ROADS)
TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0910	PUBLIC	3/17/2011	30,329	0.52	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
4	0	0	NO CURB AND GUTTER	CONCRETE CURB	GOOD/90

* Lane miles are based on 11' lane widths



0

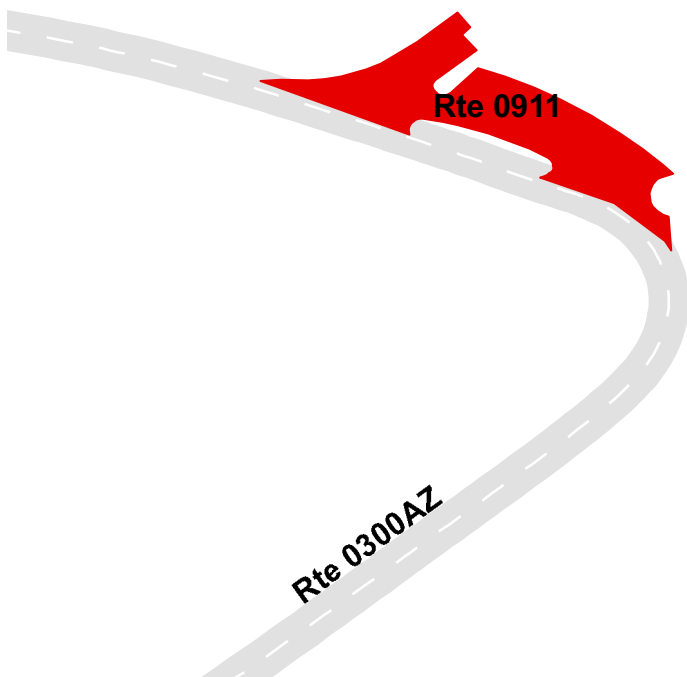
PEA RIDGE NATIONAL MILITARY PARK

Route 0911

ELKHORN TAVERN PARKING
 FROM ROUTE 0300ZZ (TOUR ROADS)
 TO ROUTE 0300ZZ (TOUR ROADS)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0911	PUBLIC	3/17/2011	8,227	0.14	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	3	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

PEA RIDGE NATIONAL MILITARY PARK

Route 0912

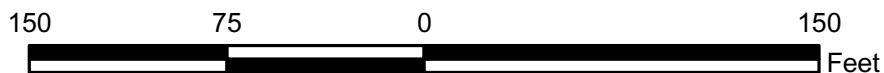
FEDERAL EARTHWORK

FROM ROUTE 5002 (LITTLE SUGAR CREEK ROAD)

TO ROUTE 5002 (LITTLE SUGAR CREEK ROAD)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0912	PUBLIC	3/17/2011	5,523	0.10	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



0

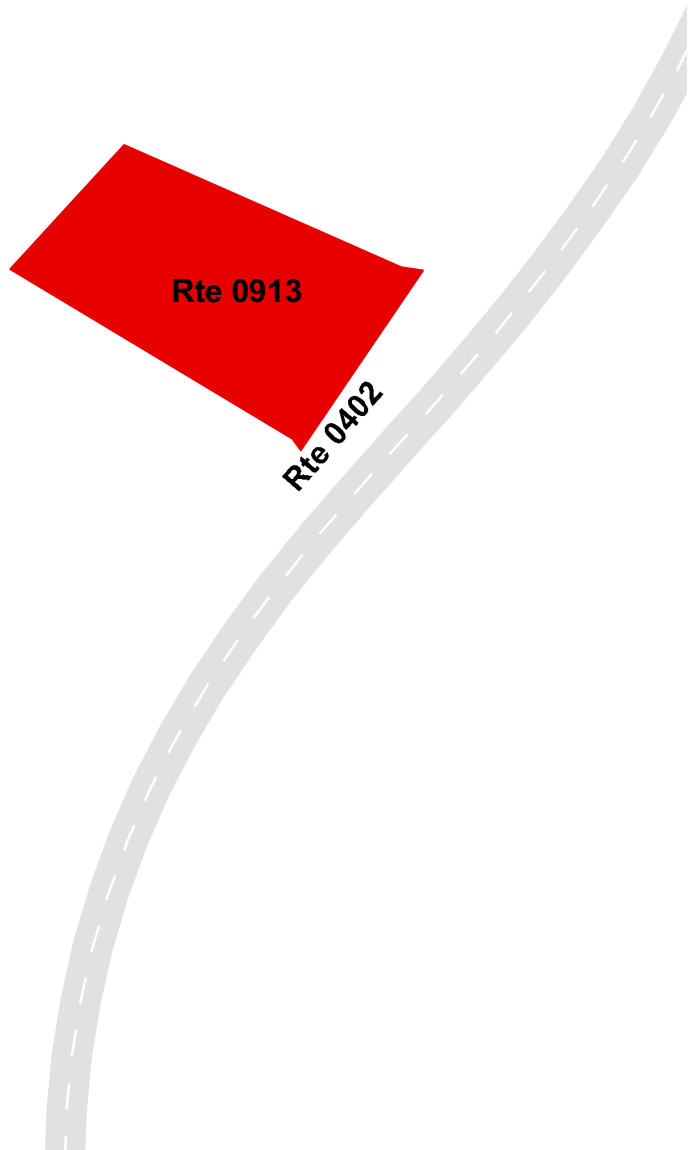
PEA RIDGE NATIONAL MILITARY PARK

Route 0913

ADMINISTRATIVE PARKING
 FROM ROUTE 0402 (ADMINISTRATIVE ROAD)
 TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0913	NONPUBLIC	3/17/2011	1,553	0.03	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	NO CURB AND GUTTER	NO CURB	POOR/45

* Lane miles are based on 11' lane widths



0

Section 8
Parkwide/Route
Maintenance Features Summaries



Pea Ridge National Military Park



**Federal Lands Highway
Road Inventory Program**

PERI: PARKWIDE MAINTENANCE FEATURES SUMMARY
Includes DCV, MRL, MRP & PKG routes collected in Cycle-5

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all DCV driven routes. Culverts, drop inlets, and gates were also collected on all Manually Rated Routes and Paved Parking areas. Those totals are reflected below.

FEATURE	LINEAR FEET	COUNT
BRIDGE	--	3
CATTLE GUARD	--	0
CULVERT	--	54
CURB	1,255	--
DROP INLET	--	17
GATE	--	5
GUARD/GUIDE RAIL	248	--
CABLE	0	--
NON-CABLE	248	--
GUARD/GUIDE WALL	52	--
BOLLARD	0	--
TEMPORARY BARRIER	0	--
NON TEMP/BOLLARD	52	--
INTERSECTION	--	65
LOW WATER CROSSING	0	0
MILE MARKER	--	2
OVERPASS	--	0
PARK BOUNDARY	--	0
PAVED DITCH	3,011	--
PULLOUT	449	3
RAILROAD CROSSING	--	0
RETAINING WALL	0	0
SIGN	--	99
STATE BOUNDARY	--	0
TRAFFIC LIGHT	--	0
TUNNEL	0	0

PERI: DCV ROUTE MAINTENANCE FEATURES SUMMARY

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5.

FEATURE	ROUTE 0010 U.S. HIGHWAY 62	ROUTE 0202 WINTON SPRINGS ROAD	ROUTE 0300ZZ TOUR ROADS	ROUTE 0402 ADMINISTRATIVE ROAD	UNIT
BRIDGE	0	1	2	0	EACH
CATTLE GUARD	0	0	0	0	EACH
CULVERT	9	0	40	1	EACH
CURB	0	237	981	37	LINEAR FEET
DROP INLET	0	0	6	0	EACH
GATE	0	0	3	1	EACH
GUARD/GUIDE RAIL	0	0	248	0	LINEAR FEET
CABLE	0	0	0	0	LINEAR FEET
NON-CABLE	0	0	248	0	LINEAR FEET
GUARD/GUIDE WALL	0	52	0	0	LINEAR FEET
BOLLARD	0	0	0	0	LINEAR FEET
TEMPORARY BARRIER	0	0	0	0	LINEAR FEET
NON TEMP/BOLLARD	0	52	0	0	LINEAR FEET
INTERSECTION	15	3	39	8	EACH
LOW WATER CROSSING	0	0	0	0	EACH
LOW WATER CROSSING	0	0	0	0	LINEAR FEET
MILE MARKER	2	0	0	0	EACH
OVERPASS	0	0	0	0	EACH
PARK BOUNDARY	0	0	0	0	EACH
PAVED DITCH	0	0	3,011	0	LINEAR FEET
PULLOUT	0	0	3	0	EACH
PULLOUT	0	0	449	0	LINEAR FEET
RAILROAD CROSSING	0	0	0	0	EACH
RETAINING WALL	0	0	0	0	EACH
RETAINING WALL	0	0	0	0	LINEAR FEET
SIGN	34	5	56	4	EACH
STATE BOUNDARY	0	0	0	0	EACH
TRAFFIC LIGHT	0	0	0	0	EACH
TUNNEL	0	0	0	0	EACH
TUNNEL	0	0	0	0	LINEAR FEET

PERI: STRUCTURE LIST

ROUTE NUMBER	FUNCTIONAL CLASS	MILEPOST START	MILEPOST END	FEATURE	STRUCTURE NUMBER
0202	3	0.021	0.027	BRIDGE	7330-002
0300AZ	1	0.719	0.725	BRIDGE	7330-001
0300AZ	1	1.428	1.437	BRIDGE	7330-003

Section 9
Route Maintenance Features
Road Logs



Pea Ridge National Military Park



**Federal Lands Highway
Road Inventory Program**

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: U.S. HIGHWAY 62

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM BATTLEFIELD ROAD ON RIGHT
0.000	0.000	INTERSECTION	RIGHT	PAVED ROUTE (BATTLEFIELD ROAD)
0.000	0.000	INTERSECTION	N/A	PAVED ROUTE (US HIGHWAY 62 / BROWNFIELD HIGHWAY)
0.007	0.007	SIGN	RIGHT	GUIDE, BATTLEFIELD RD
0.009	0.009	SIGN	LEFT	GUIDE, PEA RIDGE NATIONAL MILITARY PARK UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
0.011	0.011	INTERSECTION	LEFT	PAVED ROUTE
0.096	0.096	CULVERT	N/A	N/A
0.128	0.128	INTERSECTION	RIGHT	UNPAVED ROUTE (N OLD WIRE ROAD)
0.139	0.139	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.379	0.379	MILE MARKER	RIGHT	N/A
0.445	0.445	CULVERT	N/A	N/A
0.596	0.596	CULVERT	N/A	N/A
0.627	0.627	INTERSECTION	RIGHT	UNPAVED SPUR
0.674	0.674	INTERSECTION	RIGHT	UNPAVED ROUTE (N OLD WIRE ROAD)
0.704	0.704	INTERSECTION	RIGHT	UNPAVED ROUTE (COUNTY ROAD 856)
0.763	0.763	SIGN	RIGHT	GUIDE, PEA RIDGE NATL MILITARY PARK ENTRANCE 1/2 MILE
1.055	1.055	INTERSECTION	LEFT	ROUTE 0402 (ADMINISTRATIVE ROAD)
1.055	1.055	SIGN	LEFT	REGULATORY, DO NOT ENTER
1.116	1.116	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
1.165	1.165	SIGN	LEFT	GUIDE, NATIONAL PARK SERVICE
1.180	1.180	SIGN	LEFT	GUIDE, NATIONAL PARK SERVICE
1.189	1.189	INTERSECTION	LEFT	ROUTE 0300AZ (TOUR ROAD A)
1.192	1.192	SIGN	LEFT	GUIDE, PEA RIDGE NATIONAL MILITARY PARK UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
1.361	1.361	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
1.363	1.363	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.375	1.375	SIGN	RIGHT	REGULATORY, ADOPT A HIGHWAY LITTER CONTROL NEXT 1 MILE IN MEMORY OF JOE W VAUGHN
1.375	1.375	SIGN	RIGHT	WARNING, UNABLE TO READ FROM VIDEO

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: U.S. HIGHWAY 62

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
1.539	1.539	CULVERT	N/A	N/A
1.685	1.685	CULVERT	N/A	N/A
1.740	1.740	SIGN	LEFT	GUIDE, PEA RIDGE NATL MILITARY PARK ENTRANCE 1/2 MILE
1.838	1.838	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.927	1.927	CULVERT	N/A	N/A
2.003	2.003	INTERSECTION	RIGHT	PAVED ROUTE (COUNTY ROAD 857)
2.052	2.052	SIGN	LEFT	GUIDE, PEA RIDGE NATIONAL MILITARY PARK
2.097	2.097	CULVERT	N/A	N/A
2.130	2.130	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
2.254	2.254	SIGN	RIGHT	REGULATORY, CENTER LANE ONLY
2.314	2.314	CULVERT	N/A	N/A
2.372	2.372	SIGN	LEFT	GUIDE, ADOPT A HIGHWAY LITTER CONTROL NEXT 1 MILE IN MEMORY OF JOE W VAUGHN
2.372	2.372	SIGN	LEFT	WARNING, UNABLE TO READ FROM VIDEO
2.377	2.377	MILE MARKER	RIGHT	N/A
2.437	2.437	INTERSECTION	RIGHT	PAVED ROUTE (RANCHVIEW ROAD)
2.442	2.442	SIGN	RIGHT	GUIDE, RANCHVIEW RD
2.442	2.442	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
2.450	2.450	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
2.508	2.508	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
2.600	2.600	SIGN	LEFT	REGULATORY, CENTER LANE ONLY
2.628	2.628	INTERSECTION	RIGHT	PAVED ROUTE (PAUL PRATT ROAD)
2.634	2.634	SIGN	RIGHT	GUIDE, PAUL PRATT RD
2.634	2.634	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
2.704	2.704	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
3.039	3.039	CULVERT	N/A	N/A
3.042	3.042	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
3.099	3.099	SIGN	RIGHT	WARNING, 45 M.P.H.
3.099	3.099	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
3.173	3.173	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: U.S. HIGHWAY 62

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
3.178	3.178	SIGN	RIGHT	GUIDE, MARSHALL RD
3.178	3.178	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
3.182	3.182	INTERSECTION	N/A	PAVED ROUTE (US HIGHWAY 62 / BROWNFIELD HIGHWAY)
3.182	3.182	INTERSECTION	RIGHT	PAVED ROUTE (ALVIN SEAMSTER ROAD)
3.182	3.182	INTERSECTION	LEFT	PAVED ROUTE (ALVIN SEAMSTER ROAD)
3.182	3.182	ROUTE END	N/A	TO ALVIN SEAMSTER ROAD ON RIGHT

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0202: WINTON SPRINGS ROAD

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0300ZZ (TOUR ROADS)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0300AZ (TOUR ROAD A)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0300AZ (TOUR ROAD A)
0.008	0.008	SIGN	RIGHT	REGULATORY, YIELD
0.019	0.019	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.019	0.019	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.021	0.026	GUARD/GUIDE WALL	RIGHT	N/A
0.021	0.027	BRIDGE	N/A	7330-002 (WINTON SPRING ROAD BRIDGE)
0.022	0.027	GUARD/GUIDE WALL	LEFT	N/A
0.030	0.030	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.030	0.030	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.033	0.059	CURB	RIGHT	N/A
0.038	0.057	CURB	LEFT	N/A
0.114	0.114	INTERSECTION	N/A	ROUTE 0902 (HORSE TRAILHEAD PARKING)
0.114	0.114	ROUTE END	N/A	TO ROUTE 0902 (HORSE TRAILHEAD PARKING)

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300AZ: TOUR ROAD A

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (U.S. HIGHWAY 62)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (U.S. HIGHWAY 62)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (U.S. HIGHWAY 62)
0.005	0.005	SIGN	LEFT	REGULATORY, STOP
0.009	0.009	GATE	N/A	N/A
0.009	0.009	SIGN	RIGHT	GUIDE, PARK OPEN TO PUBLIC 6AM-6PM
0.009	0.009	SIGN	RIGHT	GUIDE, U.S. FEE AREA
0.027	0.027	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.036	0.036	INTERSECTION	LEFT	ROUTE 0300BZ (TOUR ROAD B)
0.036	0.133	ONE-WAY	N/A	N/A
0.055	0.073	CURB	RIGHT	N/A
0.058	0.058	INTERSECTION	LEFT	PAVED SPUR
0.062	0.062	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.062	0.074	CURB	LEFT	N/A
0.096	0.096	INTERSECTION	LEFT	ROUTE 0900BZ (VISITOR CENTER PARKING B)
0.096	0.096	INTERSECTION	RIGHT	ROUTE 0900AZ (VISITOR CENTER PARKING A)
0.114	0.120	CURB	LEFT	N/A
0.114	0.119	CURB	RIGHT	N/A
0.122	0.122	INTERSECTION	LEFT	ROUTE 0402 (ADMINISTRATIVE ROAD)
0.122	0.122	INTERSECTION	RIGHT	ROUTE 0402 (ADMINISTRATIVE ROAD)
0.125	0.125	SIGN	RIGHT	GUIDE, TOUR ROAD EXIT
0.133	0.133	INTERSECTION	LEFT	ROUTE 0300BZ (TOUR ROAD B)
0.149	0.149	SIGN	LEFT	REGULATORY, SPEED LIMIT 15
0.156	0.156	CULVERT	N/A	N/A
0.158	0.158	SIGN	RIGHT	REGULATORY, DO NOT ENTER
0.159	0.159	INTERSECTION	RIGHT	ROUTE 0300AZ (TOUR ROAD A)
0.171	0.171	INTERSECTION	RIGHT	UNPAVED ROUTE
0.173	0.173	SIGN	RIGHT	GUIDE, TELEGRAPH ROAD
0.173	0.173	SIGN	RIGHT	GUIDE, NO HUNTING ALLOWED
0.179	0.179	CULVERT	N/A	N/A

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300AZ: TOUR ROAD A

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.179	0.179	GATE	N/A	N/A
0.182	0.182	SIGN	RIGHT	GUIDE, ROAD CLOSED
0.192	0.192	INTERSECTION	LEFT	ROUTE 0903 (ROADS, TRAILS, AND GROUNDS BUILDING PARKING)
0.198	0.198	CULVERT	N/A	N/A
0.276	0.276	SIGN	RIGHT	GUIDE, STOP 1
0.283	0.283	INTERSECTION	RIGHT	ROUTE 0904 (OLD PICNIC AREA PARKING)
0.290	0.305	CURB	RIGHT	N/A
0.309	0.309	INTERSECTION	RIGHT	ROUTE 0904 (OLD PICNIC AREA PARKING)
0.406	0.406	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
0.418	0.418	CULVERT	N/A	N/A
0.473	0.473	INTERSECTION	RIGHT	ROUTE 0905 (CURTIS'S HEADQUARTERS PARKING)
0.479	0.501	CURB	RIGHT	N/A
0.482	0.482	SIGN	RIGHT	GUIDE, STOP 2
0.482	0.482	SIGN	RIGHT	GUIDE, CURTIS HEADQUARTERS
0.505	0.505	INTERSECTION	RIGHT	ROUTE 0905 (CURTIS'S HEADQUARTERS PARKING)
0.647	0.717	PAVED DITCH	LEFT	N/A
0.671	0.671	SIGN	RIGHT	GUIDE, HORSE TRAIL HEAD
0.671	0.671	SIGN	RIGHT	GUIDE, PARK OPEN TO PUBLIC 6AM-6PM
0.698	0.698	INTERSECTION	RIGHT	ROUTE 0202 (WINTON SPRINGS ROAD)
0.698	6.497	ONE-WAY	N/A	N/A
0.711	0.711	SIGN	RIGHT	REGULATORY, BEGIN ONE WAY TRAFFIC
0.714	0.714	SIGN	RIGHT	REGULATORY, DO NOT ENTER
0.717	0.717	GATE	N/A	N/A
0.718	0.718	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.719	0.725	BRIDGE	N/A	7330-001 (WINTON SPRING TOUR ROAD BRIDGE)
0.719	0.726	GUARD/GUIDE RAIL	RIGHT	N/A
0.719	0.728	GUARD/GUIDE RAIL	LEFT	N/A
0.719	0.719	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.807	0.807	CULVERT	N/A	N/A

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300AZ: TOUR ROAD A

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.906	0.906	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
0.906	0.906	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.966	0.966	CULVERT	N/A	N/A
1.134	1.134	CULVERT	N/A	N/A
1.170	1.170	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
1.250	1.250	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.297	1.354	PAVED DITCH	RIGHT	N/A
1.345	1.355	PAVED DITCH	LEFT	N/A
1.402	1.402	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
1.402	1.402	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
1.424	1.424	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
1.424	1.424	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.424	1.440	GUARD/GUIDE RAIL	LEFT	N/A
1.425	1.440	GUARD/GUIDE RAIL	RIGHT	N/A
1.428	1.437	BRIDGE	N/A	7330-003 (LEE CREEK BRIDGE)
1.465	1.501	PAVED DITCH	RIGHT	N/A
1.465	1.524	PAVED DITCH	LEFT	N/A
1.548	1.548	CULVERT	N/A	N/A
1.608	1.615	CURB	LEFT	N/A
1.622	1.622	INTERSECTION	LEFT	ROUTE 0906 (LEETOWN HAMLET PARKING)
1.625	1.625	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
1.628	1.634	CURB	LEFT	N/A
1.633	1.633	SIGN	LEFT	GUIDE, STOP 3
1.633	1.633	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
1.796	1.796	CULVERT	N/A	N/A
1.902	1.902	SIGN	LEFT	REGULATORY, DO NOT ENTER
1.910	1.910	INTERSECTION	LEFT	ROUTE 0907 (LEETOWN BATTLEFIELD PARKING)
1.916	1.916	SIGN	LEFT	GUIDE, LEETOWN BATTLEFIELD
1.916	1.916	SIGN	LEFT	GUIDE, STOP 4
1.945	1.945	INTERSECTION	LEFT	ROUTE 0907 (LEETOWN BATTLEFIELD PARKING)

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300AZ: TOUR ROAD A

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
1.989	1.989	CULVERT	N/A	N/A
2.044	2.044	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
2.126	2.126	CULVERT	N/A	N/A
2.140	2.140	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
2.326	2.326	CULVERT	N/A	N/A
2.362	2.362	CULVERT	N/A	N/A
2.367	2.367	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
2.401	2.401	CULVERT	N/A	N/A
2.508	2.508	CULVERT	N/A	N/A
2.542	2.542	CULVERT	N/A	N/A
2.565	2.592	PULLOUT	LEFT	N/A
2.567	2.590	CURB	LEFT	N/A
2.569	2.569	SIGN	LEFT	GUIDE, STOP 5
2.728	2.728	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
2.736	2.736	INTERSECTION	RIGHT	ROUTE 0401 (FORD ROAD)
2.738	2.738	SIGN	RIGHT	GUIDE, SERVICE ROAD AUTHORIZED VEHICLES ONLY
2.755	2.755	CULVERT	N/A	N/A
2.803	2.803	CULVERT	N/A	N/A
2.871	2.871	CULVERT	N/A	N/A
2.974	2.974	CULVERT	N/A	N/A
3.076	3.076	CULVERT	N/A	N/A
3.153	3.153	CULVERT	N/A	N/A
3.233	3.294	PAVED DITCH	LEFT	N/A
3.235	3.235	CULVERT	N/A	N/A
3.362	3.427	PAVED DITCH	LEFT	N/A
3.366	3.366	CULVERT	N/A	N/A
3.367	3.367	CULVERT	N/A	N/A
3.427	3.427	INTERSECTION	RIGHT	ROUTE 0908 (WEST OVERLOOK PARKING)
3.434	3.434	SIGN	RIGHT	GUIDE, STOP 6
3.434	3.434	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300AZ: TOUR ROAD A

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
3.478	3.478	INTERSECTION	RIGHT	ROUTE 0908 (WEST OVERLOOK PARKING)
3.487	3.487	CULVERT	N/A	N/A
3.677	3.677	CULVERT	N/A	N/A
3.682	3.809	PAVED DITCH	RIGHT	N/A
3.771	3.771	CULVERT	N/A	N/A
3.831	3.831	CULVERT	N/A	N/A
3.941	3.941	CULVERT	N/A	N/A
4.004	4.004	CULVERT	N/A	N/A
4.247	4.247	CULVERT	N/A	N/A
4.348	4.348	CULVERT	N/A	N/A
4.672	4.672	CULVERT	N/A	N/A
4.873	4.873	SIGN	LEFT	REGULATORY, DO NOT ENTER
4.877	4.877	INTERSECTION	LEFT	ROUTE 0910 (EAST OVERLOOK PARKING)
4.888	4.888	SIGN	N/A	GUIDE, EAST OVERLOOK
4.900	4.900	INTERSECTION	LEFT	ROUTE 0910 (EAST OVERLOOK PARKING)
4.907	4.992	PAVED DITCH	LEFT	N/A
4.928	4.928	DROP INLET	LEFT	N/A
4.957	4.957	CULVERT	N/A	N/A
5.004	5.004	CULVERT	N/A	N/A
5.034	5.034	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
5.043	5.043	CULVERT	N/A	N/A
5.107	5.107	DROP INLET	LEFT	N/A
5.156	5.156	DROP INLET	LEFT	N/A
5.210	5.210	DROP INLET	LEFT	N/A
5.268	5.268	DROP INLET	LEFT	N/A
5.411	5.411	DROP INLET	LEFT	N/A
5.522	5.522	SIGN	LEFT	REGULATORY, DO NOT ENTER
5.522	5.522	SIGN	LEFT	REGULATORY, SPEED LIMIT 15
5.522	5.527	CURB	LEFT	N/A
5.532	5.532	INTERSECTION	LEFT	ROUTE 0911 (ELKHORN TAVERN PARKING)

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300AZ: TOUR ROAD A

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
5.539	5.554	CURB	LEFT	N/A
5.539	5.539	SIGN	LEFT	GUIDE, STOP 8
5.539	5.539	SIGN	LEFT	GUIDE, ELKHORN TAVERN
5.555	5.555	CULVERT	N/A	N/A
5.562	5.562	INTERSECTION	LEFT	ROUTE 0911 (ELKHORN TAVERN PARKING)
5.582	5.582	INTERSECTION	LEFT	ROUTE 0400 (TELEGRAPH ROAD)
5.705	5.705	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
5.764	5.764	INTERSECTION	RIGHT	ROUTE 0401 (FORD ROAD)
5.966	5.966	SIGN	LEFT	GUIDE, STOP 9
5.968	5.996	PULLOUT	LEFT	N/A
6.202	6.202	CULVERT	N/A	N/A
6.213	6.213	SIGN	RIGHT	GUIDE, STOP 10
6.214	6.244	PULLOUT	RIGHT	N/A
6.217	6.242	CURB	RIGHT	N/A
6.388	6.388	CULVERT	N/A	N/A
6.496	6.496	SIGN	RIGHT	REGULATORY, STOP
6.497	6.497	INTERSECTION	LEFT	ROUTE 0300AZ (TOUR ROAD A)
6.497	6.497	SIGN	N/A	GUIDE, EXIT
6.497	6.497	INTERSECTION	RIGHT	ROUTE 0300AZ (TOUR ROAD A)
6.497	6.497	ROUTE END	N/A	TO END OF LOOP

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0300BZ: TOUR ROAD B

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0300AZ (TOUR ROAD A) AT MP 0.13
0.000	0.000	INTERSECTION	LEFT	ROUTE 0300AZ (TOUR ROAD A)
0.000	0.000	INTERSECTION	N/A	ROUTE 0300AZ (TOUR ROAD A)
0.000	0.101	ONE-WAY	N/A	N/A
0.018	0.018	INTERSECTION	RIGHT	ROUTE 0402 (ADMINISTRATIVE ROAD)
0.018	0.018	INTERSECTION	LEFT	ROUTE 0402 (ADMINISTRATIVE ROAD)
0.021	0.042	CURB	LEFT	N/A
0.022	0.022	SIGN	RIGHT	GUIDE, EXIT
0.060	0.060	INTERSECTION	LEFT	ROUTE 0900CZ (VISITOR CENTER PARKING C)
0.072	0.078	CURB	LEFT	N/A
0.082	0.082	INTERSECTION	LEFT	PAVED SPUR
0.101	0.101	INTERSECTION	LEFT	ROUTE 0300AZ (TOUR ROAD A)
0.101	0.101	INTERSECTION	RIGHT	ROUTE 0300AZ (TOUR ROAD A)
0.101	0.101	ROUTE END	N/A	TO ROUTE 0300AZ (TOUR ROAD A) AT MP 0.04

PERI: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0402: ADMINISTRATIVE ROAD

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5 on all paved routes.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (U.S. HIGHWAY 62)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (U.S. HIGHWAY 62)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (U.S. HIGHWAY 62)
0.005	0.005	SIGN	LEFT	REGULATORY, STOP
0.006	0.006	GATE	N/A	N/A
0.010	0.010	SIGN	LEFT	REGULATORY, DO NOT ENTER
0.010	0.010	SIGN	LEFT	REGULATORY, UNABLE TO READ FROM VIDEO
0.047	0.047	INTERSECTION	LEFT	ROUTE 0913 (ADMINISTRATIVE PARKING)
0.048	0.048	CULVERT	N/A	N/A
0.082	0.082	SIGN	RIGHT	GUIDE, EXIT
0.084	0.084	INTERSECTION	RIGHT	ROUTE 0300BZ (TOUR ROAD B)
0.084	0.084	INTERSECTION	LEFT	ROUTE 0300BZ (TOUR ROAD B)
0.088	0.092	CURB	RIGHT	N/A
0.094	0.094	INTERSECTION	LEFT	ROUTE 0300AZ (TOUR ROAD A)
0.094	0.094	INTERSECTION	RIGHT	ROUTE 0300AZ (TOUR ROAD A)
0.098	0.101	CURB	RIGHT	N/A
0.139	0.139	INTERSECTION	N/A	ROUTE 0901 (MAINTENANCE COMPLEX PARKING)
0.139	0.139	ROUTE END	N/A	TO ROUTE 0901 (MAINTENANCE COMPLEX PARKING)

Section 10 Appendix



Pea Ridge National Military Park



Federal Lands Highway
Road Inventory Program

Explanation of Changes to the RIP Index Equations and Determination of PCR

In 2005, the FHWA began implementing the use of a Pavement Management System to assist the National Park Service in prioritizing Pavement Maintenance and Rehabilitation activities. The PMS used by FHWA is the Highway Pavement Management Application (HPMA) and this software has the ability to store inventory and condition data from RIP and forecast future performance using prediction models. Outputs include performance and condition reports at the National, Region, Park, or Route level. A regional prioritized list and optimization have been produced for most regions and the Federal Highway Deferred Maintenance is calculated via the HPMA as well.

In an effort to improve the accuracy of treatment recommendations and pavement condition descriptions vis a vis the distresses and indexes that comprise the Pavement Condition Rating (PCR), an extensive study was completed throughout 2010 that has resulted in changes to the Road Inventory Program condition reporting method and specifically, the calculation of PCR. It was determined that a better representation of PCR could be achieved by modifying the relative impact certain distresses would have on the overall rating.

Through the use of HPMA data, it was noted that false failure indicators existed with the existing PCR model, and that it would be necessary to reduce their impact. The distresses affected in this way were Rutting and Roughness. Conversely, experience showed that roadways with extensive cracking present were often shown to have a high PCR. Therefore, the crack index models were adjusted to be more sensitive to changes in crack severity or quantity. It was also determined that these issues were not due to a problem with data acquisition (i.e. the RIP “van”), but with the way the collected data was processed. The final change was to provide guidance on when to use the Roughness Condition Index (RCI) in the PCR calculation. Roughness data is of little value to determining overall condition on routes that, due to their length or geometrics, have lower vehicle operating speeds. Therefore, in Cycle 5, only routes that have lengths of one half mile or greater and posted speed limits of 25 mph or greater will have RCI reported and included in the PCR calculations.

The changes that were implemented were endorsed by management at both the FHWA and NPS. In order to show the effectiveness of these changes, several sites were ground truth tested to ensure that an improvement was achieved between the relationship of PCR and the actual Maintenance and Rehabilitation needs that were represented. The changes will allow greater use of RIP and HPMA data for not simply condition data reporting, but also as a reliable tool for project identification and selection.

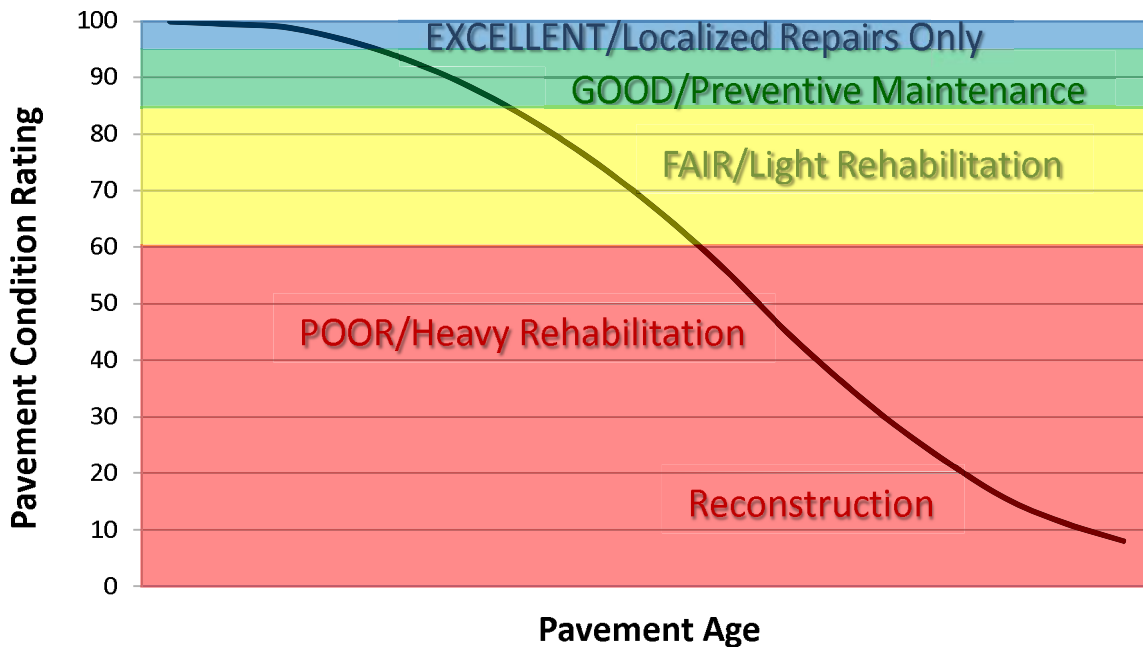
Explanation of the Excellent, Good, Fair and Poor Condition Descriptions

In addition to the RIP Index changes that will be implemented in Cycle 5, we will also aim to provide greater assistance in translating good/fair/poor categories into pavement needs categories. The PCR can be used to indicate the place in the Pavement Life Cycle and the types of treatments that should be considered now and into the future.

- Excellent/New: PCR of 95-100. Pavements in this range will require only spot repairs
- Good: PCR of 85-94. Pavements in this range will likely be candidates for Preventive Maintenance. Examples include Chip and Slurry Seals, Micro Surfacing and Thin Overlays.
- Fair: PCR of 61-84. Pavements in this range will likely be candidates of Light Rehabilitation (L3R). Examples include single-lift overlays up to 2.5 inches in total thickness, milling and overlays.
- Poor: PCR of 60 or below. Pavements in this range will likely be candidates of Heavy Rehabilitation or Reconstruction (H3R or 4R). Examples include Pulverization, Multiple Lift Overlays, and Reconstruction.

At this time, specific Maintenance and Rehabilitation activities should be evaluated and recommended at the project level. Site-specific conditions that influence treatment type should be determined based on performing a subsurface investigation and/or pavement condition survey, and not be based solely on RIP data. Additionally, RIP produces a snapshot of conditions the year in which the data was collected. For further information or to obtain additional Pavement Management System's data from our Highway Pavement Management Application (HPMA) please contact the Eastern Federal Lands pavement team.

Condition Categories and Treatments



DESCRIPTION OF RATING SYSTEM

The Federal Highway Administration (FHWA), Road Inventory Program (RIP) for the National Park Service (NPS), collects roadway condition data on paved surfaces (asphalt, concrete, brick, and cobblestone) on roads, parkways, and parking areas in national parks nationwide. The road surface condition data is collected using an automated Data Collection Vehicle (DCV). Roads having brick or cobblestone surfacing are not normally surveyed with the DCV, but are manually rated for condition rating.

The FHWA RIP is implemented based on the premise that an accurate pavement surface condition assessment can be accomplished using automated crack detection technology as applied to digital images. Various methods of pavement condition assessment have been developed over the years with varying degrees of accuracy and acceptance. The use of digital photography to record pavement images and subsequent crack detection and classification has undergone continuous improvements over the past decade. Digital cameras with increasingly superior resolution and high definition have become more affordable, and the proprietary programming code and algorithms have been improved in crack detection software.

With the use of quality digital photography and automated crack detection software, FHWA RIP is tasked with executing a pavement condition assessment on about 5000 miles of National Park Service roads and parkways. Foremost in setting up the basis of pavement distress identification is employing the distress identification protocols used by FHWA. There is no single distress identification system that is universal among entities conducting a program of distress identification. For the purpose of the NPS RIP, FHWA employs distress identification protocols that are specific to this program.

FHWA has referenced the “*Distress Identification Manual for the Long-Term Pavement Performance Program*”, Publication No. FHWA-RD 03-031, June 2003, as the point-of-reference for distress types on NPS pavement. In truth, the FHWA RIP distress types are similar to those described in the LTPP manual with some modifications. This document, “*Distress Identification Manual for the NPS Road Inventory Program, Cycle 5, 2010-2013*” was developed using the “*Distress Identification Manual for the Long-Term Pavement Performance Program*” as a guideline. Definitions of severity levels based on crack width contained in this document adhere to the LTPP Distress ID Manual. Modifications have been made to the definition of Alligator and Longitudinal Cracking and determination of Alligator Cracking severity. This manual also addresses Rutting and Roughness and its application to RIP.

In 2010, FHWA RIP began the fifth cycle of data collection in national parks. For Cycle 5, data will be collected in approximately 81 large parks (10 or more paved route miles) on Functional Class 1, 2, and 7 routes plus any new routes or parking areas previously not collected, totaling an estimated 4,459 paved route miles. Additionally, 168 small parks will be collected comprising approximately 529 paved route miles and associated paved parking areas. The data is used to support the National Park Service road maintenance program and Pavement Management System (PMS) developed and maintained by FHWA.

This “*Distress Identification Manual for the NPS Road Inventory Program, Cycle 5, 2010-2013*” will be used as a reference resource in crack detection and classification, determination of distress severity and extent, and in the calculation of distress index values for the FHWA RIP Cycle 5.

SURFACE DISTRESSES

Surface Condition Rating - SCR

Surface distresses are measured in the primary lane only. In the classification and measurement of all paved surface condition data, results will be reported in the database in record intervals of 0.02 miles (105.6 feet) (smallest granularity) along the route.

Surface distresses determined from digital images

- Transverse Cracks
- Longitudinal Cracks
- Alligator Cracks
- Patching/Potholes

Surface distress measured by DCV (Data Collection Vehicle) LRMS (Laser Rut Measuring System)

- Rutting

Each of the five surface distresses is assigned a computed surface distress index

- Transverse Crack Index
- Longitudinal Crack Index
- Alligator Crack Index
- Patching/Pothole Index
- Rutting Index

Surface distress data are classified as listed above, measured for severity, and quantified for extent. Classification, severity, and extent of these five surface distresses comprise the three main elements for calculation of SCR (Surface Condition Rating).

In addition to the five surface distresses, a **Structural Crack Index** is computed, which is a combination of the Longitudinal Crack Index and the Alligator Crack Index. The Structural Crack Index is then used in lieu of the LC and AC indices to compute SCR.

Roughness Condition Index - RCI

Additional condition data measured by DCV (lasers and accelerometers)

- Roughness (IRI)

Roughness is measured by FHWA's DCV and reported as International Roughness Index (IRI) in inches/mile. Using IRI, the Roughness Condition Index (RCI) is computed.

Pavement Condition Rating - PCR

Using the SCR (computed from the five surface distresses) and the RCI, an overall Pavement Condition Rating (PCR) is computed. The formula for PCR is:

$$\text{Asphalt PCR} = (0.60 * \text{SCR}) + (0.40 * \text{RCI})$$

$$\text{Concrete PCR} = \text{RCI}$$

A detailed description of each distress index formula, roughness index formula, SCR and PCR is provided in this document beginning on page 23.

Each classified surface distress will fall into one or more *severity*...LOW, MEDIUM, or HIGH based on criteria listed. For each severity, an *extent* is established based on the measured quantity of the distress within that severity. Within each *severity* individual distresses are assigned a *Maximum Allowable Extent* (MAE). For example, LOW severity transverse cracking may be allowed up to 21.1 cracks within a 0.02 interval before it reaches MAE and fails.

The index formulas are based on a scale of 0-100. A PCR index value of 100 would indicate a “new” road with no measurable distresses or rough ride. A PCR value of 60 is determined to be *terminable serviceability* and the road is considered failed. The range of index values with condition descriptors is:

POOR (<=60), FAIR (61 - 84), GOOD (85 - 94), EXCELLENT (95 - 100)

Index values are generally computed based on cumulative deducts of the measured severities. As shown in the index formulas below, as any single severity reaches or exceeds MAE, the index computes to a value of 60 or less, and the road fails for that 0.02 interval.

Note: As a result of a unique combination of measured surface distresses and IRI, index values occasionally compute to less than 0 or greater than 100. In this instance, an index value < 0 defaults to 0. Index values > 100 default to 100. For all indices, a higher value indicates a better road condition, and a lower value indicates a poorer road condition.

On the following page, Table 1 summarizes the different types of distresses measured.

TABLE 1: Distress Summary

ASPHALT-SURFACED PAVEMENT DISTRESS TYPES with RUTTING and ROUGHNESS				
DISTRESS TYPE	UNIT OF MEASURE...	...CONVERTED TO	DEFINED SEVERITY LEVELS?	MEASURED BY
Alligator Cracking	Square Feet	Percent of Lane Per 0.02 Mile	Yes	Digital Image Crack Detection Software
Transverse Cracking	Linear Feet	Number of Cracks Per 0.02 Mile	Yes	Digital Image Crack Detection Software
Longitudinal Cracking	Linear feet	Percent of Lane Length Per 0.02 Mile	Yes	Digital Image Crack Detection Software
Patching/Potholes	Square Feet	Percent of Lane Per 0.02 Mile	No	Digital Image Crack Detection Software
Rutting	Inches	Rut Depth Per 0.02 Mile	Yes	DCV – Laser Rut Measuring System (LRMS)
Roughness	IRI	*RCI Per 0.02 Mile	No	DCV – Lasers /Accelerometers

***Note: Roughness is measured on concrete roadways, but surface distresses and rutting are not measured. For concrete, PCR = RCI**

ALLIGATOR CRACKING

Description

Alligator cracking is considered a combination of fatigue and block cracking. It is a series of interconnected cracks in various stages of development. Alligator cracking develops into a many-sided pattern that resembles chicken wire or alligator skin. It can occur anywhere in the road lane. Alligator cracking must have a quantifiable area.

Severity Levels

LOW

An area of cracks with no or very few interconnecting cracks and the cracks are not spalled. Cracks are ≤ 0.25 in (6mm) in mean width. Cracks in the pattern are no further apart than 1 foot (0.328 m). May be sealed cracks with sealant in good condition and a crack width that cannot be determined.

MEDIUM

An area of interconnected cracks that form a complete pattern. Cracks may be slightly spalled. Cracks are >0.25 in. (6 mm) and ≤ 0.75 in. (19 mm) or any crack with a mean width ≤ 19 mm and adjacent low severity cracking. Cracks in the pattern are no further apart than 6 in. (150 mm).

HIGH

An area of interconnected cracks forming a complete pattern. Cracks are moderately or severely spalled. Cracks are >0.75 in (19mm) or any crack with a mean width ≤ 0.75 in (19mm) and adjacent medium to high severity random cracking.

A combination of observed crack width and crack pattern is used to determine overall severity of alligator cracking. Based on above description of each severity, the highest level of crack width and crack pattern determines overall severity. Table 2 illustrates this.

TABLE 2: Alligator Crack Severity Levels

ALLIGATOR CRACKING SEVERITY LEVELS		Crack Pattern		
		LOW	MED	HIGH
Crack Width	LOW	L	M	H
	MED	M	M	H
	HI	H	H	H

LONGITUDINAL CRACKING

Description

Longitudinal cracking occurs predominantly parallel to the pavement centerline. It can occur anywhere within the lane. Longitudinal cracks occurring in the wheelpath may be noteworthy.

Severity Levels

LOW

Cracks with a mean width of < 0.25 in. (6 mm). Sealed cracks with sealant in good condition and a width that cannot be determined.

MED

Cracks with a mean width > 0.25 in. (6 mm) and ≤ 0.75 in. (19 mm). Also, any crack with a mean width < 0.75 in. (19 mm) and adjacent random low severity cracking.

HIGH

Cracks with a mean width > 0.75 in. (19 mm). Also, any crack with a mean width < 0.75 in. (19 mm) and adjacent random medium to high severity cracking.

TRANSVERSE CRACKING

Description

Transverse cracking occurs predominantly perpendicular to the pavement centerline. It can occur anywhere within the lane.

Severity Levels

LOW

Cracks with a mean width of < 0.25 in. (6 mm). Sealed cracks with sealant in good condition and a width that cannot be determined.

MED

Cracks with a mean width > 0.25 in. (6 mm) and ≤ 0.75 in. (19 mm). Also, any crack with a mean width < 0.75 in. (19 mm) and adjacent random low severity cracking.

HIGH

Cracks with a mean width > 0.75 in. (19 mm). Also, any crack with a mean width < 0.75 in. (19 mm) and adjacent random medium to high severity cracking.

PATCHING AND POTHOLES

Description

Patching is an area of pavement surface that has been removed and replaced with patching material or an area of pavement surface that has had additional patching material applied. Patching may encompass partial lane or full lane width. On full lane width patching; the total, contiguous length of patch may not exceed 0.30 mi. (0.48 km). (Any full-lane patch exceeding 0.30 mi. in length is considered a pavement change). Patching must have a quantifiable area.

Potholes are bowl-shaped holes of various sizes occurring in the pavement surface.

Severity Levels

There are no stratified severities for Patching/Potholes. They either are present or they are not.

RUTTING

Description

Rutting is a longitudinal surface depression in the wheelpath.

Severity Levels

LOW

Ruts with a measured depth $\geq 0.20''$ and $\leq 0.49''$

MED

Ruts with a measured depth $\geq 0.50''$ and $\leq 0.99''$

HIGH

Ruts with a measured depth $\geq 1.00''$

Ruts $< 0.20''$ are not included in the distress calculations.

ROUGHNESS

Description

Roughness is the measurement of the unevenness of the pavement in the direction of travel. It is measured in units of IRI (International Roughness Index), inches per mile, and is indicative of ride comfort.

Severity Levels

There are no stratified severity levels for roughness. The roughness (or smoothness) of a road surface can be defined by IRI in the following table.

TABLE 3: IRI

IRI Descriptions	
Type of Road	Typical IRI (in/mile)
New Road, no noticeable roughness	<90
Small level of roughness	90 – 126
Road of average roughness	126 – 190
Road with above average roughness	190 – 253
Road with severe roughness	253 – 380
Nearly impassable	>380

INDEX FORMULAS

Note: All index formulas listed below contain MAE applicable to 0.02 mile (105.6 feet) interval.

Alligator Crack Index

$$AC_INDEX = 100 - 40 * [(\%LOW / 35) + (\%MED / 15) + (\%HI / 5)]$$

Where:

The values *%LOW*, *%MED* and *%HI* report the percentage of the observed pavement (0.02 mile, primary lane) that contains alligator cracking within the respective severities. These values range from 0 to 100.

%LOW = Percent of total area (primary lane, 0.02 in length), low severity

%MED = Percent of total area (primary lane, 0.02 in length), medium severity

%HI = Percent of total area (primary lane, 0.02 in length), high severity

Percent of total area is computed as:

$$\frac{\text{square foot area of alligator crack severity}}{0.02 \text{ mile} * \text{lane width}}$$

In AC_INDEX, the denominators 35, 15, and 5 are the Maximum Allowable Extents (MAE) for each severity. In other words, we will allow up to 35% of low severity alligator cracking for a 0.02 interval before failure, 15% for medium severity, and so on. As you can see, if any single severity reaches MAE the resulting index value is 60, or failure.

Longitudinal Crack Index

$$LC_INDEX = 100 - 40 * [(\%LOW / 175) + (\%MED / 75) + (\%HI / 25)]$$

Where:

The values *%LOW*, *%MED*, and *%HI* report the length of longitudinal cracking within each severity as a percent of the section length (0.02 mile, primary lane).

These values are ≥ 0 and can exceed 100.

%LOW = Percent of interval length (primary lane, 0.02 in length), low severity

%MED = Percent of interval length (primary lane, 0.02 in length), medium severity

%HI = Percent of interval length (primary lane, 0.02 in length), high severity

Percent of interval length is computed as:

$$\frac{\text{length of respective longitudinal cracking}}{0.02 \text{ mile (105.6 feet)}}$$

In LC_INDEX, the denominators 175, 75, and 25 are the Maximum Allowable Extents (MAE) for each severity. In other words, we will allow up to 175% of low severity alligator cracking for a 0.02 interval before failure, 75% for medium severity, and so on. As you can see, if any single severity reaches MAE the resulting index value is 60, or failure.

Structural Crack Index

$$SC_INDEX = [100 - ((100 - AC_INDEX) + (100 - LC_INDEX))]$$

Structural Crack Index is a combination of Alligator Cracking and Longitudinal Cracking, and is used in the SCR formula in lieu of AC and LC separately.

Transverse Crack Index

$$TC_INDEX = 100 - 40 * [(LOW / 21.1) + (MED / 4.4) + (HI / 2.6)]$$

Where:

The values *LOW*, *MED* and *HI* report a count of the total number of transverse cracks (reported to three decimals) within each severity level, where one transverse crack is equal to the lane width. These values are ≥ 0 .

LOW = Number of cracks in interval (primary lane, 0.02 in length), low severity

MED = Number of cracks in interval (primary lane, 0.02 in length), medium severity

HI = Number of cracks in interval (primary lane, 0.02 in length), high severity

Number of cracks is computed as:

$$\frac{\text{Total length of transverse cracks}}{\text{Lane width}}$$

In TC_INDEX, the denominators 21.1, 4.4, and 2.6 are the Maximum Allowable Extents (MAE) for each severity. In other words, we will allow up to 21.1 low severity transverse cracks for a 0.02 interval before failure, 4.4 cracks for medium severity, and so on. As you can see, if any single severity reaches MAE the resulting index value is 60, or failure.

Patching Index

$$\text{PATCH_INDEX} = 100 - 40 * (\% \text{PATCHING} / 80)$$

Where:

The value *%PATCHING* reports the percentage of the observed pavement (0.02 mile, primary lane) that contains patching/potholes. This value ranges from 0 to 100.

%PATCHING = Percent of total area (primary lane, 0.02 in length)

Percent of total area is computed as:

$$\frac{\text{square foot area of patching/potholes}}{0.02 \text{ mile} * \text{lane width}}$$

There are no severity levels for patching. It either exists or does not.

In PATCH_INDEX, the denominator 80 is the Maximum Allowable Extent (MAE) for each severity. In other words, we will allow up to 80% patching for a 0.02 interval before failure. As you can see, if patching/potholes reaches MAE the resulting index value is 60, or failure.

Rutting Index

$$\text{RUT_INDEX} = 100 - 40 * [(\% \text{LOW} / 535) + (\% \text{MED} / 205) + (\% \text{HI} / 40)]$$

Where:

20 rut depth measurements are taken per 0.02 interval for each of 2 wheel paths (left and right), resulting in a total of 40 measurements taken for both wheel paths. *Each wheelpath is analyzed independently for rut severities.* The values *%LOW*, *%MED* and *%HI* are a *total percentage* of left wheelpath percentage and right wheelpath percentage added together for the respective severity. These values range from 0 to 200.

%LOW = Percent of LOW ruts in left wheelpath based on 20 ruts, plus percent of LOW ruts in right wheelpath based on 20 ruts.

%MED = Percent of MED ruts in left wheelpath based on 20 ruts, plus percent of MED ruts in right wheelpath based on 20 ruts.

%HI = Percent of HI ruts in left wheelpath based on 20 ruts, plus percent of HI ruts in right wheelpath based on 20 ruts.

Percent of rut measurements within each severity can also be computed as:

$$\frac{\text{total number of ruts within each severity in both wheelpaths}}{20} * 100$$

In RUT_INDEX, the denominators 535, 205, and 40 are the Maximum Allowable Extents for each severity. In other words, the formula allows up to 535% low severity

ruts for a 0.02 interval before. However, since 200 is the highest measurable percentage allowed, 535% is unattainable and therefore, no amount of LOW severity rutting will cause the RUT_INDEX to fail a road. Similarly, since the MAE for MED severity rutting is 205, no amount of MED severity rutting will cause the RUT_INDEX to reach 60 and fail the road. As you can see, LOW severity rutting reaches MAE the resulting index value is 60, or failure. This formula was intentionally designed to minimize the impact of LOW and MED severity rutting on RUT_INDEX.

Roughness Condition Index (Asphalt)

$$RCI = 32 * [5 * (2.718282 ^ {(-0.0041 * AVG IRI)})]$$

Where:

The value *AVG IRI* reports the average value of the Left IRI and Right IRI measurements for the interval (0.02 mile, primary lane). This value can range from approximately 40 to 999.0.

Average IRI is computed as:

$$\frac{\text{Left wheelpath IRI} + \text{Right wheelpath IRI}}{2}$$

There is no applicable threshold for failure for this index.

Roughness Condition Index (Concrete)

$$RCI = -0.0012(IRI^2) + 0.0499(IRI) + 99.542$$

For concrete, PCR = RCI

Surface Condition Rating Index

SCR = *Lowest* Index Value Of: [SC_INDEX, TC_INDEX, PATCH_INDEX, RUT_INDEX]

Note: The modified SCR equation above combines AC_INDEX and LC_INDEX, and considers that a single AC/LC index value of the Structural Crack Index (SC_INDEX). The lowest of the four computed index values (SC_INDEX, TC_INDEX, PATCH_INDEX, or RUT_INDEX) becomes the SCR.

Where:

See above for determinations of SC_INDEX, TC_INDEX, PATCH_INDEX and RUT_INDEX.

The threshold for failure for this index is SCR = 60.

Data Collection Vehicle Subsystems

Data on paved roads in Cycle 5 is collected by FHWA using a Pathway Services Inc. Data Collection Vehicle (DCV), called PathRunner. The DCV is driven in the primary-direction lane at posted speed limits and less.

CAMERAS

Forward-facing and rear-facing video is collected as .jpg digital imagery at a frequency of 26.4 feet.

Two forward-facing cameras are mounted above the vehicle cab, one pointed straight ahead and the other to the right shoulder providing seamless 120 degree viewing.

CAMERA SPECIFICATIONS	
Two Forward/ One Rear Facing	
Camera lens/type	FUJINON CCTV LENS H16x10B-Y41
Focal length	10 mm – 160 mm
Image size	8.8 mm x 6.6mm
Image format	*.jpg
Image resolution	HD 2000 X 1200
Image pixel size	depends on distance
Zoom ratio	16x
Max Relative Aperture	1:2.5
Iris range	F25-T800 (Equivalent to F800)

Pavement images are created using a Laser Scan Imaging System. This system is composed of a single high resolution line-scan camera and two lasers configured to image an approximate 11-foot wide lane with 1 mm resolution.

CAMERA SPECIFICATIONS	
Pavement Line Scan	
Image size	4280 pixels/line
Image width	4 meters (3950 mm nominal)
Laser class	3B
Power	250W
Vehicle speed limitations	62 mph
Environment	Dry pavement, day or night
Sensor size (approx)	300 mm(H) x 375 mm(L) x 200 mm(D)
Image frame length	26.4 feet

DMI (Distance Measuring Instrument)

The DMI (Distance Measuring Instrument) obtains road length measurements that are accurate to 0.1% for speeds up to 60 mph. The DMI is connected to the hub of the rear wheel on the driver's side, and is calibrated to the revolutions of the rear vehicle axle on a regular basis.

ROUGHNESS (IRI)

The collection system includes a South Dakota type laser profiler manufactured based on active Class 1 ASTM E950 standards. The dynamic profile of the pavement surface is collected from which the IRI roughness data is computed. The sensors include one accelerometer on each wheelpath, one height sensor (laser) on each wheelpath, and a distance transducer.

IRI SPECIFICATIONS	
Reported IRI units	Inches/mile
Vehicle speed limitations	12-62 mph
IRI equipment certification	Texas Transportation Institute (TTI)
Wavelengths accommodated	6 in. – 300 feet
IRI computed & reported	World Bank Technical Paper Number 46
Environment	Dry pavement, day or night, above 32 degrees F
Adherence to specifications	ASTM E950-98 (2004), ASTM E 1926-08, AASHTO MP 11-08, AASHTO PP 49-08

RUTTING

Rutting depths are measured using an INO Laser Rut Measurement System (LRMS). This system is a transverse profiling device that detects and characterizes pavement rutting. The LRMS can acquire full 4 meter width profiles of a pavement lane at normal traffic speeds and uses two laser profilers that digitize transverse sections of the pavement.

RUTTING SPECIFICATIONS	
Reported rut depth units	Inches
Vehicle speed limitations	Up to 62 mph
Sampling rate	30-150 profiles/second
Transverse resolution	1280 points/profile
Transverse field-of-view	4 m
Depth accuracy (nominal)	+/- 1 mm
Environment	Dry pavement, day or night, above 32 degrees F
Adherence to specifications	ASTM E1703M-95 (reapproved 2005)

GPS & INERTIAL SYSTEMS

GPS is collected by an onboard system employing Omnistar real time correction and a gyroscope Inertial Measuring Unit (IMU) to provide accurate positioning data in instances of satellite obstruction. All GPS coordinates are tied to image and linear distance measurements.

GPS SPECIFICATIONS	
Static accuracy	Sub-meter
Dynamic accuracy	2-3 meters
Receiver	12 satellite tracking
Coordinate system	Lat Lon WGS 84
Environment	Day or night
Cross-slope	+ - 0.1 degrees
Grade	+ - 0.1 degrees

GPS on Manually Rated Roads (MRR)

Parking areas, some roads, and other paved areas that are not fully drivable with the DCV are collected manually by field technicians. GPS is collected for these routes using portable Trimble GPS backpack units.

Geodatabase – Background and Metadata

In addition to this park report, a *geodatabase* containing both tabular and spatial data specific to this park has been provided. All data disseminated in the preceding report has been obtained from the tables and fields within said geodatabase. The geodatabase can be referenced for tabular data via Microsoft Access or for both tabular and spatial data via ESRI's ArcGIS Suite of software which consists of; ArcMap, ArcCatalog and ArcExplorer. Consolidating the RIP data into one database creates a seamless relationship of tables and geographic data. It will allow RIP to facilitate easier updates and enhancements in the future.

A geodatabase can be thought of as simply a database containing spatial data. Many different tables are contained with the park's geodatabase. A complete and thorough description of the tables and fields contained within this geodatabase can be found in the *metadata*. The metadata is attached directly within the geodatabase and can be accessed via ESRI's ArcCatalog.

GLOSSARY OF TERMS AND ABBREVIATIONS

<u>TERM OR ABBREVIATION</u>	<u>DESCRIPTION OR DEFINITION</u>
AC	Alligator Cracking
CRS	Condition Rating Sheets (Section 5)
DCV	Data Collection Vehicle
Excellent	Excellent rating with an index value of 95 to 100
Fair	Fair rating with an index value from 61 to 84
FUNCT_CLASS	Functional Classification (see Route ID, Section 2)
Good	Good rating with an index value from 85 to 94
IRI	International Roughness Index
Lane Width	Width from road centerline to fogline, or from centerline to edge-of-pavement when no fogline exists
LC	Longitudinal Cracking
MRR	Manually Rated Route
MRL	Manually Rated Line
MRP	Manually Rated Polygon
N/A	Not Applicable
NC	Not Collected
PATCH	Patching and Potholes
Paved Width	Width from edge-of-pavement to edge-of-pavement
PCR	Pavement Condition Rating
PKG	Parking Area
Poor	Poor rating with an index value of 0 to 60
RCI	Roughness Condition Index
SC	Structural Cracking
SCR	Surface Condition Rating
TC	Transverse Cracking