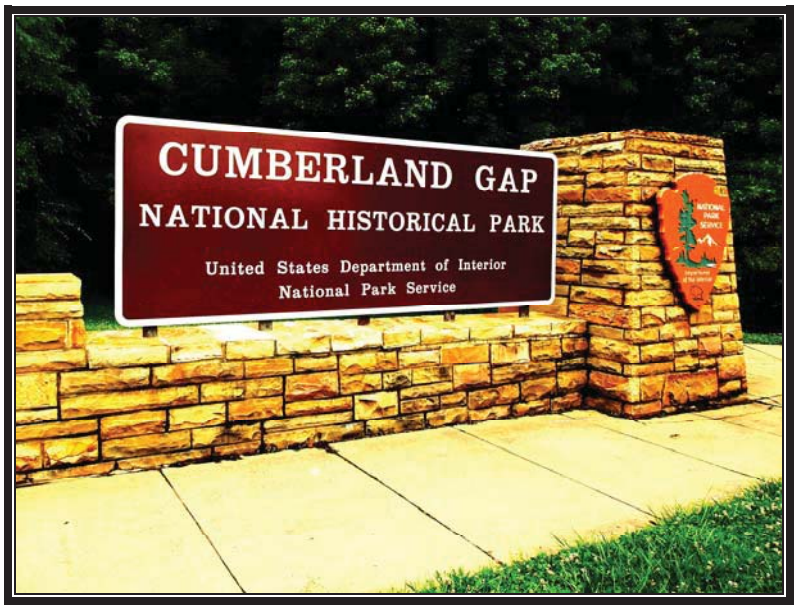
Federal Lands Highway

Road Inventory Program

Road Inventory and Condition Assessment

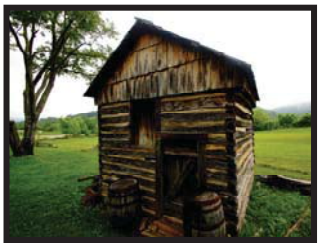


Cumberland Gap National Historical Park
CUGA

Cycle 5 Report

Prepared By: Federal Highway Administration
Road Inventory Program (RIP)
Data Collected: 11/2012
Report Date: 07/2013

Cumberland Gap National Historical Park
in
Kentucky, Virginia, and Tennessee



DCV = Data Collection Vehicle

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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 231 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

Cumberland Gap
National Historical 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
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Green = All Unpaved Parking Areas
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= 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

*** Only Functional Class 1, 2, & 7 routes, and previously uncollected routes were collected in Cycle 5

CUGA

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0010	5	38600		PINNACLE ROAD	FROM ROUTE 5025 (US HIGHWAY 25E) NORTHBOUND	TO ROUTE 0913 (PINNACLE PARKING)	N/A	3.99	0.00	3.99	1		AS	1,2
0012	5	38590		BARTLETT PARK ROAD	FROM ROUTE 0010 (PINNACLE ROAD) AT MP 0.64	TO BEGINNING OF ROUTE 0104 (CEMETERY ROAD)	N/A	0.49	0.00	0.49	1		AS	1
0013	5	101467		US HIGHWAY 25E SOUTHBOUND ACCESS ROAD	FROM ROUTE 5025 (US HIGHWAY 25E) SOUTHBOUND	TO ROUTE 5025 (US HIGHWAY 25E) SOUTHBOUND	N/A	0.33	0.00	0.33	1		AS	1
0100	5	38592		SUGAR RUN OVERLOOK ROAD	FROM ROUTE 0010 (PINNACLE ROAD) AT MP 1.60	TO PARK BOUNDARY	N/A	2.77	0.00	2.77	1		AS	2
0102	4	102565		LITTLE YELLOW CREEK ROAD	FROM ROUTE 0010 (PINNACLE ROAD)	TO ROUTE 0910 (LITTLE YELLOW CREEK OVERFLOW PARKING)	N/A	0.07	0.00	0.07	3	7,762	AS	1
0103	5	225928		DANIEL BOONE PARKING ACCESS ROAD	FROM US HIGHWAY 58	TO PARK BOUNDARY	N/A	0.36	0.00	0.36	1		AS	2
0104	5	239274		CEMETERY ROAD	FROM END OF ROUTE 0012 (BATLETT PARK ROAD)	TO CEMETERY AT MP 0.262	N/A	0.08	0.18	0.26	1	3,464	AS	1
0105	5	38593		WILDERNESS CAMPGROUND ACCESS ROAD	FROM US HIGHWAY 58	TO BEGINNING OF ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)	N/A	0.80	0.00	0.80	2		AS	3
0200	4	38591		WILDERNESS ROAD PICNIC AREA	FROM ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)	TO END OF LOOP	N/A	0.49	0.00	0.49	3		AS	3
0202ZZ	5	100394		WILDERNESS ROAD CAMPGROUND	FROM END OF ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)	THROUGH CAMPGROUND	N/A	1.74	0.00	1.74	3		AS	3
0203	5	99965		ENTRANCE ROAD AT TWCP	FROM STATE ROUTE 724 / PARK BOUNDARY	TO ROUTE 0927ZZ (TWCP PARKING AREAS)	N/A	0.19	0.00	0.19	3		AS	4
0204	NC	38595		SHILLALAH CREEK ROAD	FROM STATE ROUTE 217	TO BROWNIES CREEK ROAD	N/A	0.00	5.00	5.00	4		GR	
0403	4	102573		PUMP HOUSE SERVICE ROAD	FROM ROUTE 0010 (PINNACLE ROAD)	TO END	N/A	0.04	0.00	0.04	6	1,901	AS	2

Cycle 5 NPS/RIP Route ID Report

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CUGA

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0409	NC	102521		DAVIS BRANCH ROAD	FROM ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	TO END	N/A	0.00	1.50	1.50	6		GR	
0411	NC	100402		CUMBERLAND COLLEGE ROAD	FROM ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	TO END	N/A	0.00	1.00	1.00	6		NV	
0421	4	100403		DUPLEX DRIVE	FROM ROUTE 0012 (BARTLETT PARK ROAD) AT MP 0.37	TO DEAD END	N/A	0.11	0.00	0.11	5		AS	1
0422	NC	38601		COLSON LANE	FROM US HIGHWAY 58	TO END	N/A	0.00	0.50	0.50	6		GR	
0423	NC	38589		CUPP CABIN ROAD	FROM BROWNIES CREEK ROAD	TO END	N/A	0.00	0.22	0.22	6		GR	
0424	NC	38775		HOOT OWL HOLLOW ROAD	FROM TIPRELL ROAD	TO END	N/A	0.00	1.00	1.00	6		GR	
0900	4	100247		VISITOR CENTER PARKING	FROM ROUTE 0010 (PINNACLE ROAD)	TO ROUTE 0010 (PINNACLE ROAD)	N/A	0.00	0.00	0.00		86,083	AS	1
0901A	4	100406		RANGER STATION EMPLOYEE PARKING A	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		4,410	AS	1
0901B	4	100407		RANGER STATION EMPLOYEE PARKING B	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		10,664	AS	1
0902	4	100408		VIP CAMPSITE PARKING	ADJACENT TO ROUTE 0903 (HEADQUARTERS PARKING)		N/A	0.00	0.00	0.00		1,796	AS	1
0903	4	100409		HEADQUARTERS PARKING	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		11,501	AS	1
0904	4	100410		HEADQUARTERS EMPLOYEE PARKING	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO ROUTE 0012 (BARTLETT PARK ROAD)	N/A	0.00	0.00	0.00		10,535	AS	1
0905ZZ	**5**	**100411**		**BARTLETT PARK PICNIC AREA PARKING**	**ADJACENT TO ROUTE 0012 (BARTLETT PARK ROAD)**		**N/A**	**0.00**	**0.00**	**0.00**		**13,134**	**AS**	**1**
0906	4	100414		HEADQUARTERS HANDICAPPED PARKING	FROM ROUTE 0421 (DUPLEX DRIVE)	TO PARKING	N/A	0.00	0.00	0.00		974	AS	1
0907A	4	100416		MAINTENANCE AREA A	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		21,155	AS	1
0907B	4	100576		MAINTENANCE AREA B	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		11,910	AS	1
0908A	4	100578		RESOURCE MANAGEMENT PARKING A	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		3,537	AS	1

Cycle 5 NPS/RIP Route ID Report

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CUGA

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0908B	4	100592		RESOURCE MANAGEMENT PARKING B	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		1,682	AS	1
0909	NC	102574		STORAGE AREA	FROM ROUTE 0012 (BARTLETT PARK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		20,000	GR	
0910	NC	102571		LITTLE YELLOW CREEK OVERFLOW PARKING	FROM END OF ROUTE 0102 (LITTLE YELLOW CREEK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		60,000	GR	
0911	4	100593		FORT MCCOOK PARKING	FROM ROUTE 0010 (PINNACLE ROAD)	TO PARKING	N/A	0.00	0.00	0.00		3,874	AS	2
0912	4	101151		MIDWAY PARKING	FROM ROUTE 0010 (PINNACLE ROAD)	TO PARKING	N/A	0.00	0.00	0.00		6,219	AS	2
0913	4	101152		PINNACLE PARKING	FROM END OF ROUTE 0010 (PINNACLE ROAD)	TO PARKING	N/A	0.00	0.00	0.00		40,943	AS	2
0914	4	93475		THOMAS WALKER PARKING	FROM ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		51,519	AS	2
0915	4	101153		DARK RIDGE OVERLOOK PARKING	FROM ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	TO ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	N/A	0.00	0.00	0.00		4,634	AS	2
0916	4	101154		SUGAR RUN TURNAROUND	FROM ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	TO ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	N/A	0.00	0.00	0.00		5,284	AS	2
0917	4	101155		SUGAR RUN PICNIC AREA PARKING	FROM ROUTE 0100 (SUGAR RUN OVERLOOK ROAD)	TO PARKING	N/A	0.00	0.00	0.00		16,182	AS	2
0918A	4	101156		WILDERNESS ROAD TRAILHEAD PARKING A	FROM ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)	TO ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)	N/A	0.00	0.00	0.00		15,354	AS	3
0918B	NC	101157		WILDERNESS ROAD TRAILHEAD PARKING B	FROM ROUTE 0918A (WILDERNESS ROAD TRAILHEAD PARKING A)	TO ROUTE 0918A (WILDERNESS ROAD TRAILHEAD PARKING A)	N/A	0.00	0.00	0.00		9,000	GR	
0919	4	101158		WILDERNESS ROAD CAMPGROUND DUMP STATION	FROM ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)	TO ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)	N/A	0.00	0.00	0.00		8,301	AS	3
0920	4	101159		GROUP CAMPING PARKING	ADJACENT TO ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)		N/A	0.00	0.00	0.00		4,950	AS	3
0921	4	101160		AMPHITHEATER HANDICAPPED PARKING	ADJACENT TO ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)		N/A	0.00	0.00	0.00		1,237	AS	3

Cycle 5 NPS/RIP Route ID Report

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CUGA

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0922ZZ	4	101161		WILDERNESS ROAD PICNIC AREAS	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)		N/A	0.00	0.00	0.00		12,489	AS	3
0923	4	101166		WILDERNESS ROAD CAMPGROUND REGISTRATION PARKING	ADJACENT TO ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)		N/A	0.00	0.00	0.00		2,079	AS	3
0925	4	101389		IRON FURNACE PARKING	FROM PENNLYN AVENUE	TO PENNLYN AVENUE	N/A	0.00	0.00	0.00		15,344	AS	2
0926	4	93433		DANIEL BOONE PARKING	FROM ROUTE 0103 (DANIEL BOONE PARKING ACCESS ROAD)	TO PARKING	N/A	0.00	0.00	0.00		54,724	AS	2
0927ZZ	**5**	**240421**		**TWCP PARKING AREAS**	**FROM ROUTE 0203 (ENTRANCE ROAD AT TWCP)**	**TO PARKING**	**N/A**	**0.00**	**0.00**	**0.00**		**5,215**	**AS**	**4**
0928	**5**	**240416**		**DUPLEX PARKING**	**ADJACENT TO ROUTE 0421 (DUPLEX DRIVE)**		**N/A**	**0.00**	**0.00**	**0.00**		**1,489**	**CO**	**1**
0929	**5**	**240418**		**AMPHITHEATER BUS PARKING**	**FROM ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)**	**TO PARKING**	**N/A**	**0.00**	**0.00**	**0.00**		**1,487**	**AS**	**3**
5025	**5**			**US HIGHWAY 25E**	**FROM EAST CUMBERLAND AVENUE**	**TO INTERSECTION WITH NETTLETON ROAD**	**N/A**	**3.35**	**0.00**	**3.35**			**AS**	**1,2**

Cycle 5 NPS/RIP Route ID Report

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CYCLE 5 COLLECTED SUMMARY TOTALS FOR CUMBERLAND GAP NATIONAL HISTORICAL PARK

CYCLE 5 COLLECTED ROUTE TOTALS

DCV Driven Route Miles	9.71
Manually Rated Route Miles	0.08
TOTAL PARK ROUTE MILES COLLECTED IN CYCLE 5	9.79
Manually Rated Routes (SQFT)	0

* CYCLE 5 COLLECTED PARKING AREA TOTALS

Paved Parking (SQFT)	18,751

CYCLE 5 COLLECTED CONCESSION TOTALS

Concession Paved Route Miles	0.00
Concession Paved Parking Area SQFT	0
Concession Manually Rated Routes SQFT	0

CYCLE 5 COLLECTED WEIGHTED AVERAGE PARK VALUES

DCV Driven PCR	95
**Manually Rated Routes PCR	97
**Parking PCR	94
***Total Equivalent Lane Miles	20.06

TOTAL PARK SUMMARY FOR CUMBERLAND GAP NATIONAL HISTORICAL PARK

ROUTE TOTALS

TOTAL PAVED PARK ROUTE MILES	11.45
TOTAL PAVED PARKING (SQFT)	428,705

* - 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

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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 Locations. 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 CUGA

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).

CUGA

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0202ZZ	**100394**	**5**	**WILDERNESS ROAD CAMPGROUND**	**FROM END OF ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)**	**THROUGH CAMPGROUND**		**3**	**1.74**	**0.00**	**1.74**	
0905ZZ	**100411**	**5**	**BARTLETT PARK PICNIC AREA PARKING**	**ADJACENT TO ROUTE 0012 (BARTLETT PARK ROAD)**				**0.00**	**0.00**	**0.00**	**13,134**
0922ZZ	101161	4	WILDERNESS ROAD PICNIC AREAS	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)				0.00	0.00	0.00	12,489
0927ZZ	**240421**	**5**	**TWCP PARKING AREAS**	**FROM ROUTE 0203 (ENTRANCE ROAD AT TWCP)**	**TO PARKING**			**0.00**	**0.00**	**0.00**	**5,215**

CUGA-0202ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0202AZ	100394	4	WILDERNESS ROAD CAMPGROUND LOOP A	FROM ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)	TO ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)		3	0.09	0.00	0.09	
0202BZ	100394	4	WILDERNESS ROAD CAMPGROUND LOOP B	FROM ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)	TO ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)		3	0.12	0.00	0.12	
0202CZ	100394	4	WILDERNESS ROAD CAMPGROUND LOOP C	FROM ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)	TO ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)		3	0.18	0.00	0.18	
0202DZ	100394	4	WILDERNESS ROAD CAMPGROUND LOOP D	FROM ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)	TO ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)		3	0.23	0.00	0.23	
0202EZ	100394	4	WILDERNESS ROAD CAMPGROUND LOOP E	FROM ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)	TO ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)		3	0.19	0.00	0.19	
0202FZ	100394	4	WILDERNESS ROAD CAMPGROUND LOOP F	FROM ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)	TO ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)		3	0.14	0.00	0.14	
0202GZ	**100394**	**5**	**WILDERNESS ROAD CAMPGROUND LOOP G**	**FROM END OF ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)**	**TO END OF LOOP**		**3**	**0.79**	**0.00**	**0.79**	

NPS/RIP Subcomponent Details for CUGA

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).

CUGA

CUMBERLAND GAP NATIONAL HISTORICAL PARK

CUGA-0905ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0905AZ	100411	4	BARTLETT PARK PICNIC AREA PARKING A	ADJACENT TO ROUTE 0012 (BARTLETT PARK ROAD)				0.00	0.00	0.00	1,543
0905BZ	**100411**	**5**	**BARTLETT PARK PICNIC AREA PARKING B**	**FROM ROUTE 0012 (BARTLETT PARK ROAD)**	**TO PARKING**			**0.00**	**0.00**	**0.00**	**10,560**
0905CZ	100411	4	BARTLETT PARK PICNIC AREA PARKING C	ADJACENT TO ROUTE 0012 (BARTLETT PARK ROAD)				0.00	0.00	0.00	1,031

CUGA-0922ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0922AZ	101161	4	WILDERNESS ROAD PICNIC AREA PARKING A	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)				0.00	0.00	0.00	3,864
0922BZ	101161	4	WILDERNESS ROAD PICNIC AREA PARKING B	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)				0.00	0.00	0.00	2,129
0922CZ	101161	4	WILDERNESS ROAD PICNIC AREA PARKING C	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)				0.00	0.00	0.00	1,837
0922DZ	101161	4	WILDERNESS ROAD PICNIC AREA PARKING D	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)				0.00	0.00	0.00	2,583
0922EZ	101161	4	WILDERNESS ROAD PICNIC AREA PARKING E	ADJACENT TO ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)				0.00	0.00	0.00	2,076

CUGA-0927ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0927AZ	**240421**	**5**	**TWCP PARKING A**	**FROM END OF ROUTE 0203 (ENTRANCE ROAD AT TWCP)**	**TO PARKING**			**0.00**	**0.00**	**0.00**	**2,386**
0927BZ	**240421**	**5**	**TWCP PARKING B**	**ADJACENT TO ROUTE 0203 (ENTRANCE ROAD AT TWCP)**				**0.00**	**0.00**	**0.00**	**2,829**

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - CUGA

ROUTES ADDED FROM PREVIOUS INVENTORY:

Route #	Route Name	Reason for Addition	Comments
0104	CEMETERY ROAD	OTHER	NEW ROUTE ADDED TO INVENTORY IN CYCLE 5.
0928	DUPLEX PARKING	RECENTLY CONSTRUCTED ROUTE	NEW PARKING LOT ADDED TO THE INVENTORY IN CYCLE 5.
0929	AMPHITHEATER BUS PARKING	RECENTLY CONSTRUCTED ROUTE	NEW PARKING LOT ADDED TO THE INVENTORY IN CYCLE 5.
5025	US HIGHWAY 25E	OTHER	NON-NPS ROAD ADDED TO THE INVENTORY IN CYCLE 5.

OTHER CHANGES FROM PREVIOUS INVENTORY:

Route #	Route Name	Type of Change	Comments
0100	SUGAR RUN OVERLOOK ROAD	FUNCTIONAL CLASS CHANGE	FUNCTIONAL CLASSIFICATION CHANGED FROM 2 TO 1 IN CYCLE 5 BECAUSE THE ROAD IS A PRINCIPAL ROUTE.
0102	LITTLE YELLOW CREEK ROAD	FUNCTIONAL CLASS CHANGE	FUNCTIONAL CLASSIFICATION CHANGED FROM 2 TO 3 IN CYCLE 5.
0103	DANIEL BOONE PARKING ACCESS ROAD	LENGTH CHANGE	LENGTH INCREASED IN CYCLE 5 BECAUSE THE ROAD WAS COLLECTED ABOUT 0.1 MILES SHORT IN CYCLE 4. FUNCTIONAL CLASSIFICATION CHANGED FROM 2 TO 1 IN CYCLE 5.
0105	WILDERNESS CAMPGROUND ACCESS ROAD	OTHER	TO AVOID CONFUSION, THE ROUTE NUMBER WAS CHANGED FROM 0202 IN CYCLE 4 TO 0105 IN CYCLE 5 BECAUSE ROUTES 0202A - 0202G WERE COMBINED AS 0202ZZ IN CYCLE 5. THE FUNCTIONAL CLASSIFICATION OF ROUTE 0105 CHANGED FROM 3 TO 2 BECAUSE IT IS AN ACCESS ROAD TO THE CAMPGROUND. THE ACCESS ROAD WAS SHORTENED AND NOW ENDS AT THE BEGINNING OF THE CAMPGROUND LOOP.

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - CUGA

OTHER CHANGES FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Change**	**Comments**
0202ZZ	WILDERNESS ROAD CAMPGROUND	ROUTES COMBINED	CYCLE 4 ROUTES 0202A THROUGH 0202G WERE COMBINED IN CYCLE 5 TO BECOME 0202ZZ. SUBCOMPONENT ROUTE 0202GZ (THE OUTER LOOP) WAS LENGTHENED WHEN PART OF THE ENTRANCE ROAD, ROUTE 0105 (CYCLE 4 ROUTE 0202), WAS TRANSFERRED OVER TO ROUTE 0202ZZ.
0203	ENTRANCE ROAD AT TWCP	ROUTE SPLIT	THIS ROAD WAS COLLECTED BY THE DATA COLLECTION VEHICLE (DCV) IN CYCLE 5, BUT WAS MANUALLY RATED IN CYCLE 4. THE ADJACENT PARKING AREAS WERE SPLIT FROM THE ROAD IN CYCLE 5 AND ARE A SEPARATE LOCATION IN FMSS (ROUTE 0927ZZ).
0905ZZ	BARTLETT PARK PICNIC AREA PARKING	ROUTES COMBINED	CYCLE 4 ROUTES 0905A, 0905B, AND 0905C WERE COMBINED AS SUBCOMPONENTS OF 0905ZZ IN CYCLE 5. THE SHAPE OF SUBCOMPONENT 0905BZ WAS RECOLLECTED IN CYCLE 5 TO ADD A MISSING SECTION IN THE NORTHWEST CORNER.
0922ZZ	WILDERNESS ROAD PICNIC AREAS	ROUTES COMBINED	CYCLE 4 ROUTES 0922A THROUGH 0922E WERE COMBINED INTO 0922ZZ IN CYCLE 5.
0927ZZ	TWCP PARKING AREAS	ROUTE SPLIT	ROUTE 0927ZZ WAS SPLIT FROM CYCLE 4 ROUTE 0203 IN CYCLE 5.

ROUTES REMOVED FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Reason for Removal**	**Comments**
0924	PULLOUT PARKING	OTHER	REMOVED FROM THE INVENTORY BECAUSE IT IS A PULLOUT, NOT A PARKING LOT.

Section 3
Park Summary Information

Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

CUGA: 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	0.18	1.85%	0.95	9.77%	0.98	10.08%	5.83	59.98%	**7.94**
2			0.02	0.21%	0.04	0.41%	0.74	7.61%	**0.80**
3	0.05	0.51%	0.02	0.21%	0.10	1.03%	0.81	8.33%	**0.98**
4									
5									
6									
7									
8									
Totals	**0.23**	**2.37%**	**0.99**	**10.18%**	**1.12**	**11.52%**	**7.38**	**75.93%**	**9.72**

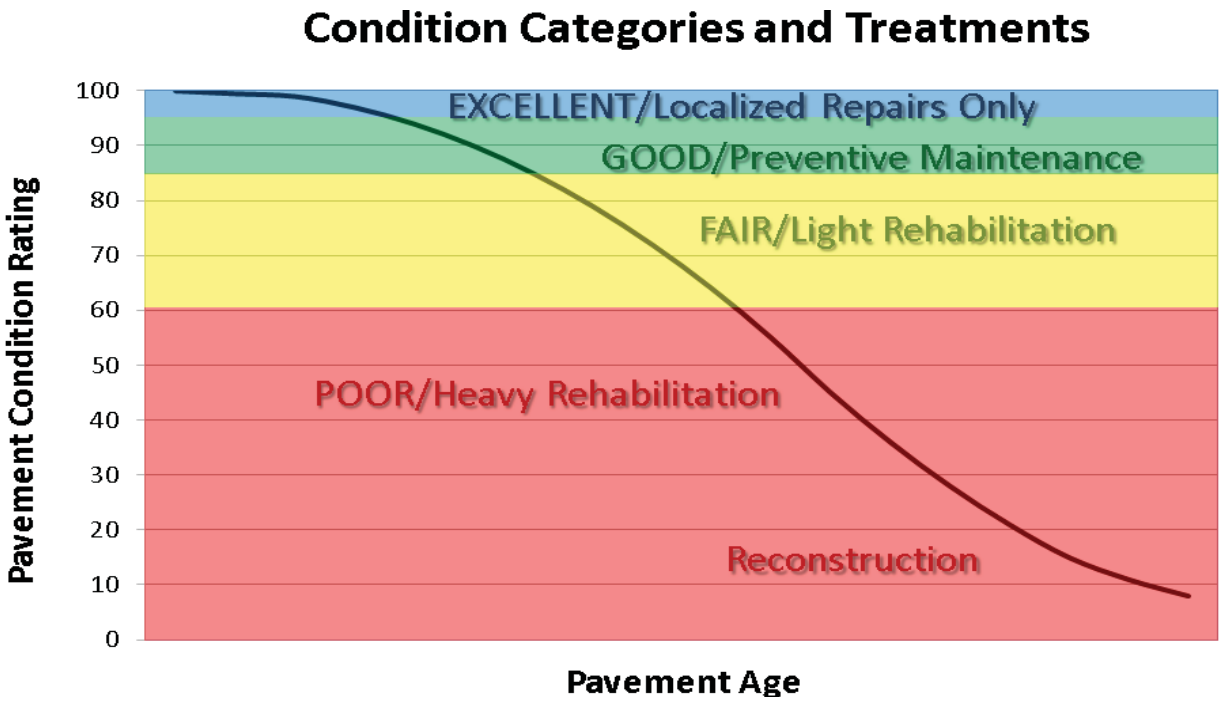
Note: **The information in this table is derived from the PMS_20 table in the Park database, which only contains processed data from routes collected with the Data Collection Vehicle (DCV). Information for Manually Rated Routes (MRR) and Parking Areas is not reported in this table. Only Functional Class 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.

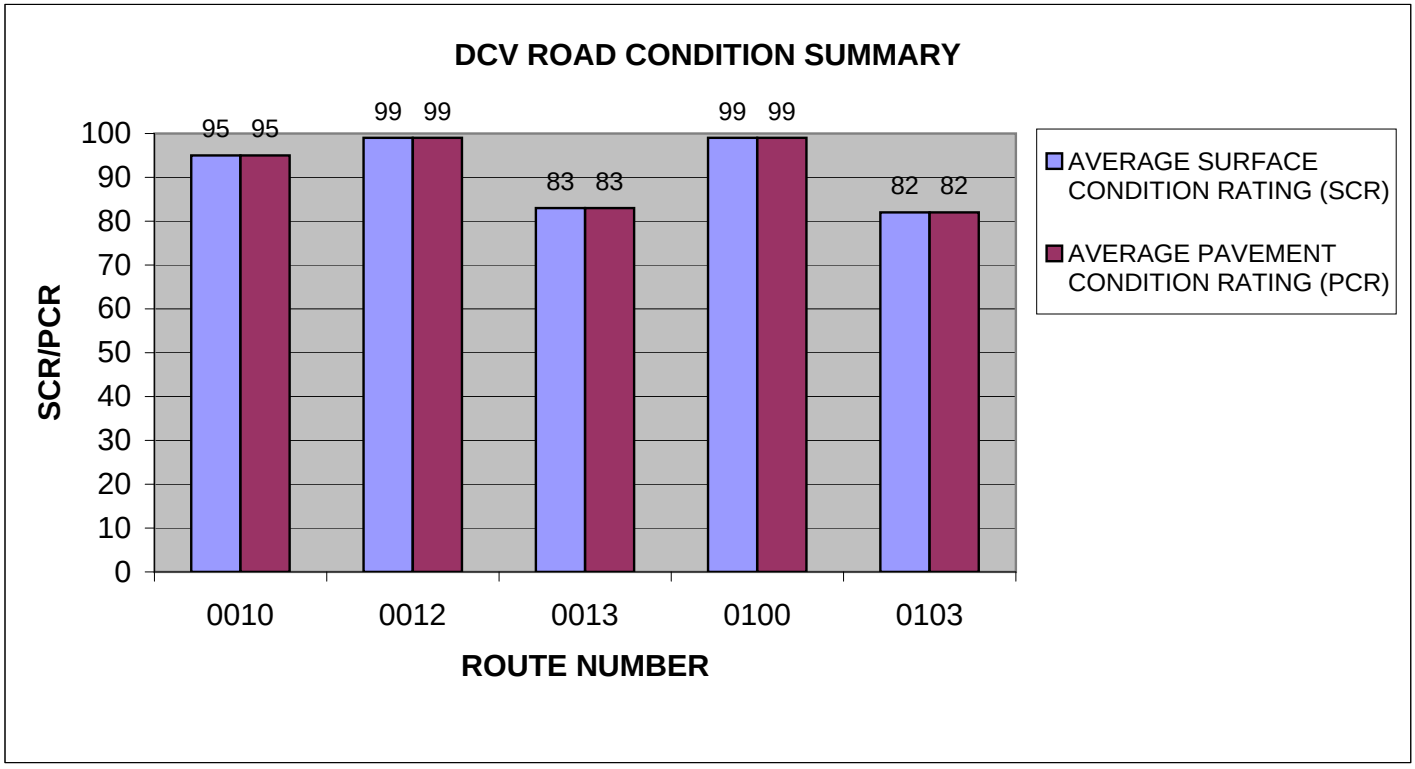
At this time, specific Maintenance and Rehabilitation activities should be evaluated and recommended at the project level. Site-specific conditions that influence treatment type should be determined based on performing a subsurface investigation and/or pavement condition survey, and not be based solely 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.



CUGA: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

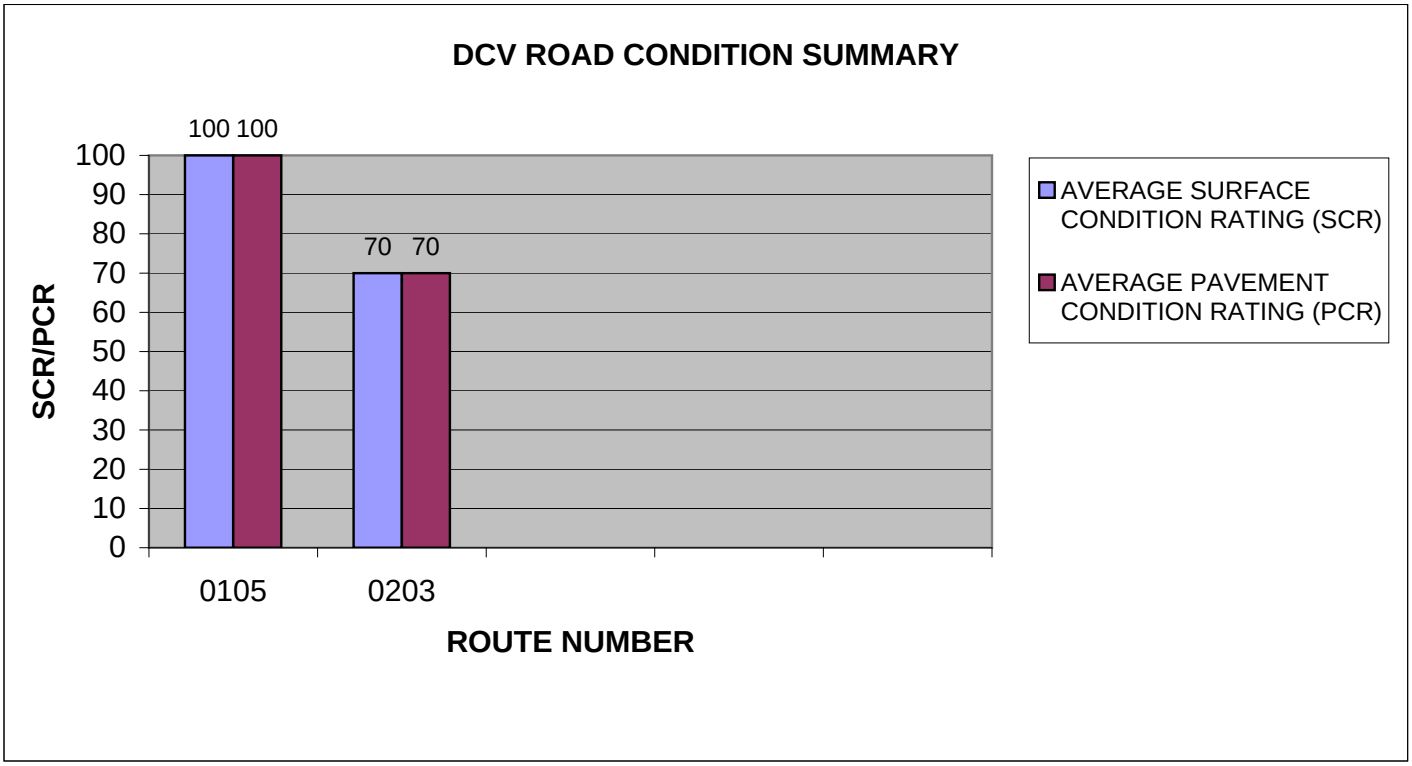
ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	PAVED LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0010	PINNACLE ROAD	1	3.99	ASPHALT	95	95
0012	BARTLETT PARK ROAD	1	0.49	ASPHALT	99	99
0013	US HIGHWAY 25E SOUTHBOUND ACCESS ROAD	1	0.33	ASPHALT	83	83
0100	SUGAR RUN OVERLOOK ROAD	1	2.77	ASPHALT	99	99
0103	DANIEL BOONE PARKING ACCESS ROAD	1	0.36	ASPHALT	82	82



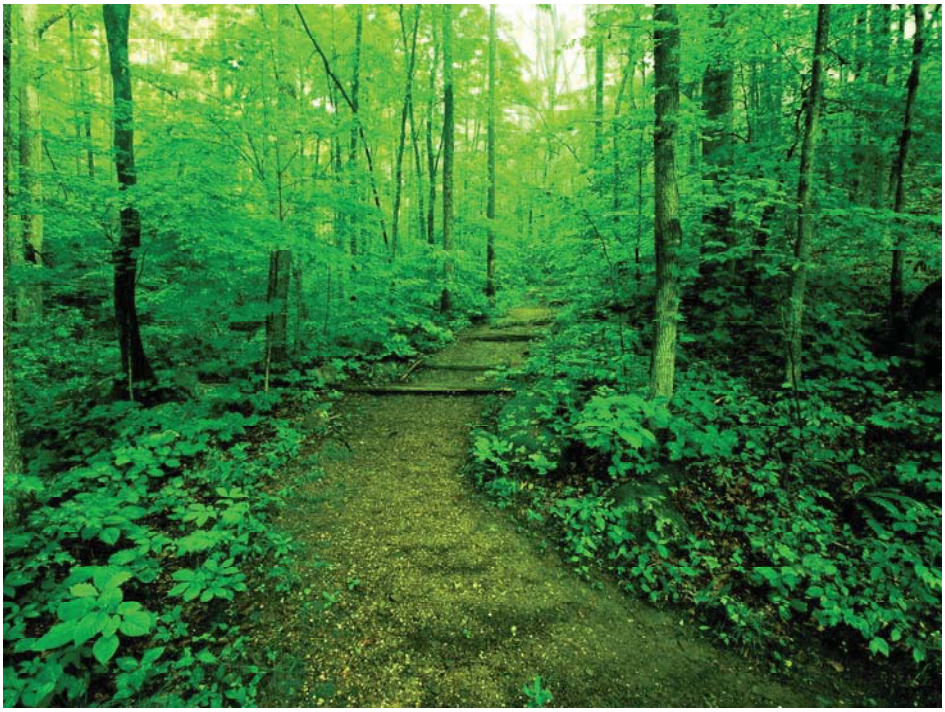
CUGA: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	PAVED LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0105	WILDERNESS CAMPGROUND ACCESS ROAD	2	0.80	ASPHALT	100	100
0203	ENTRANCE ROAD AT TWCP	3	0.19	ASPHALT	70	70



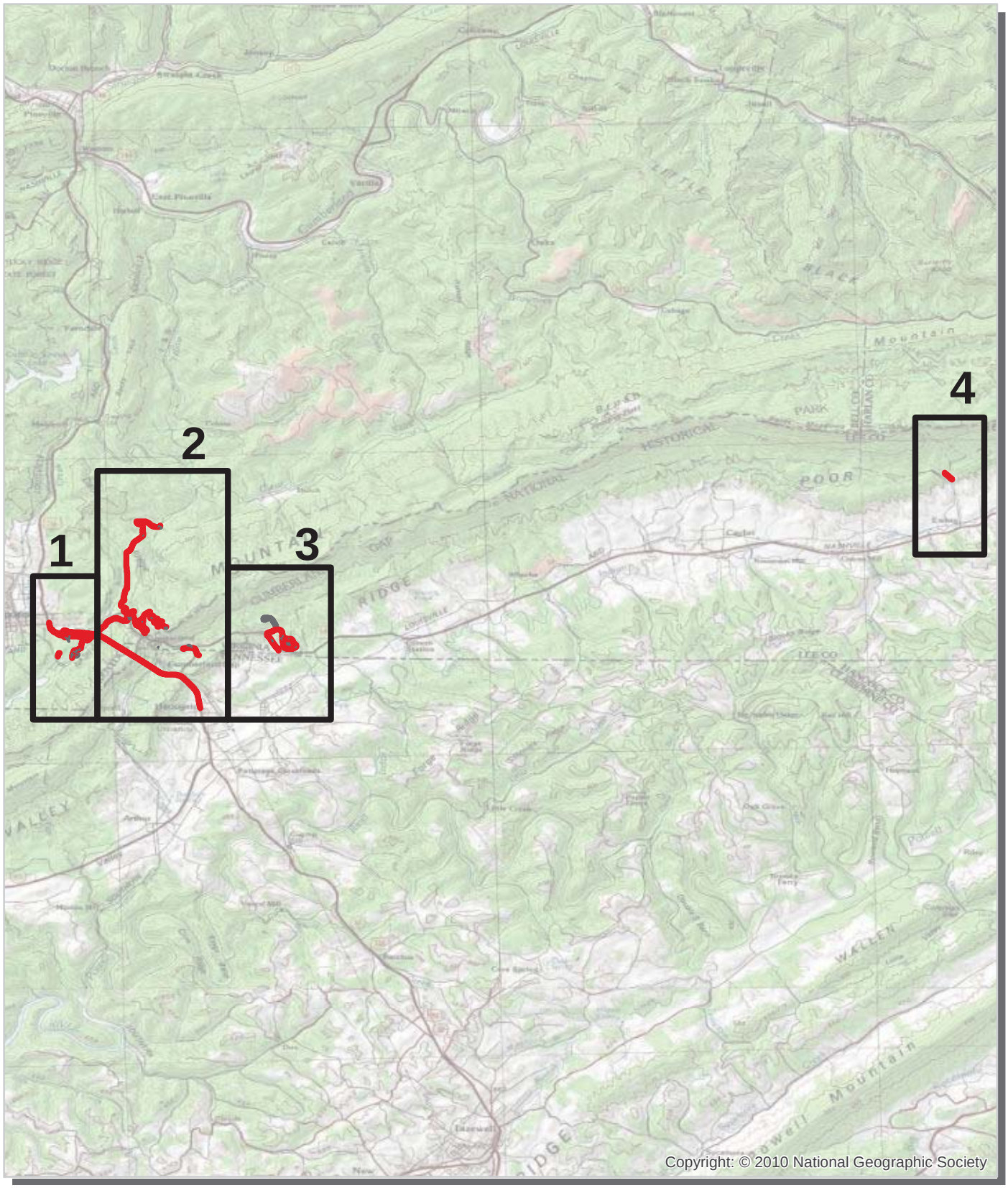
Section 4
Park Route Location Maps



Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

Cumberland Gap National Historical Park
Route Location Map
Key Map



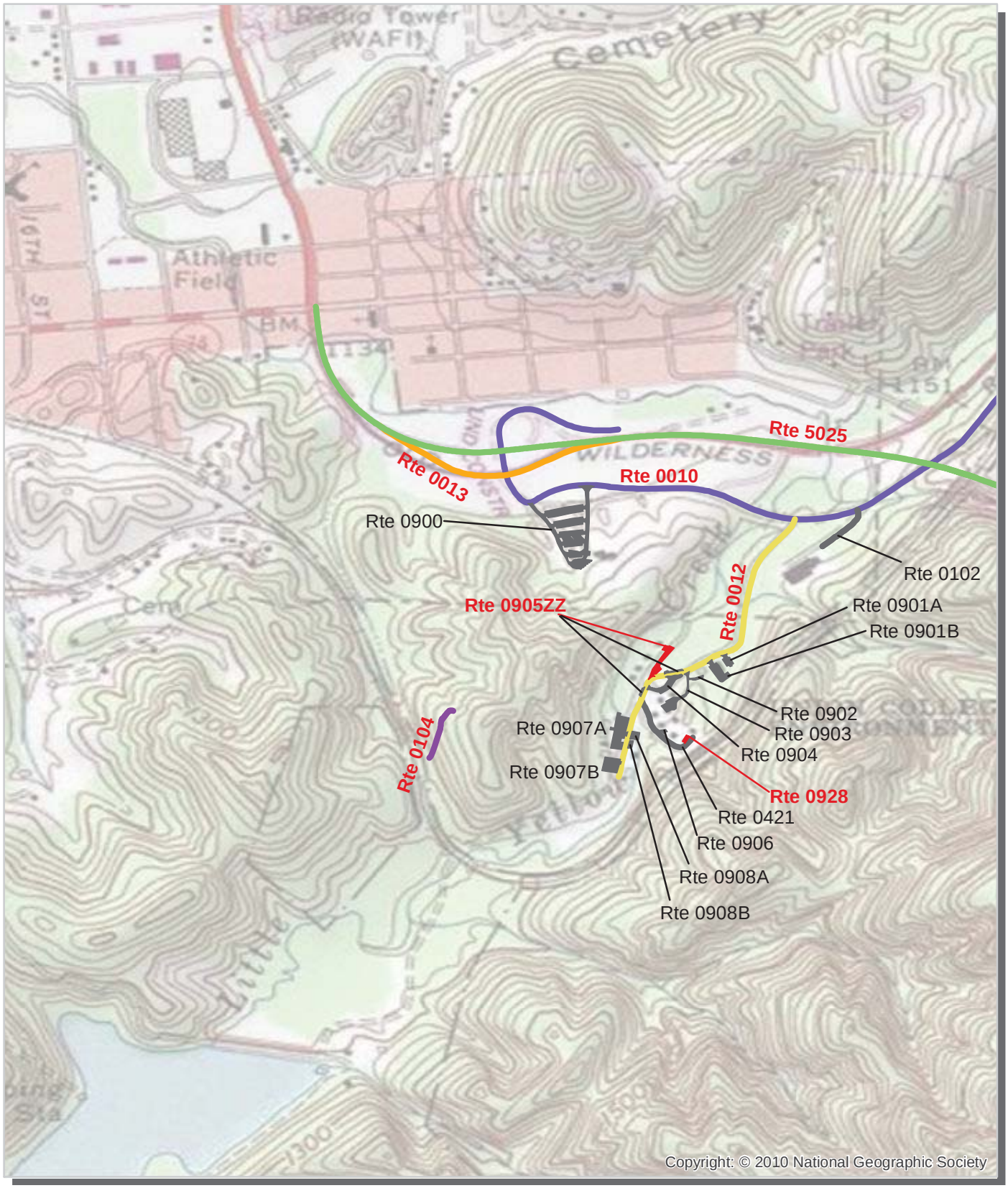
Cycle 5 Collected Routes

Routes Collected in Previous Cycle

3 1.5 0 3 Miles

N

Cumberland Gap National Historical Park
Route Location Map
Area 1



Unique colors used to differentiate routes

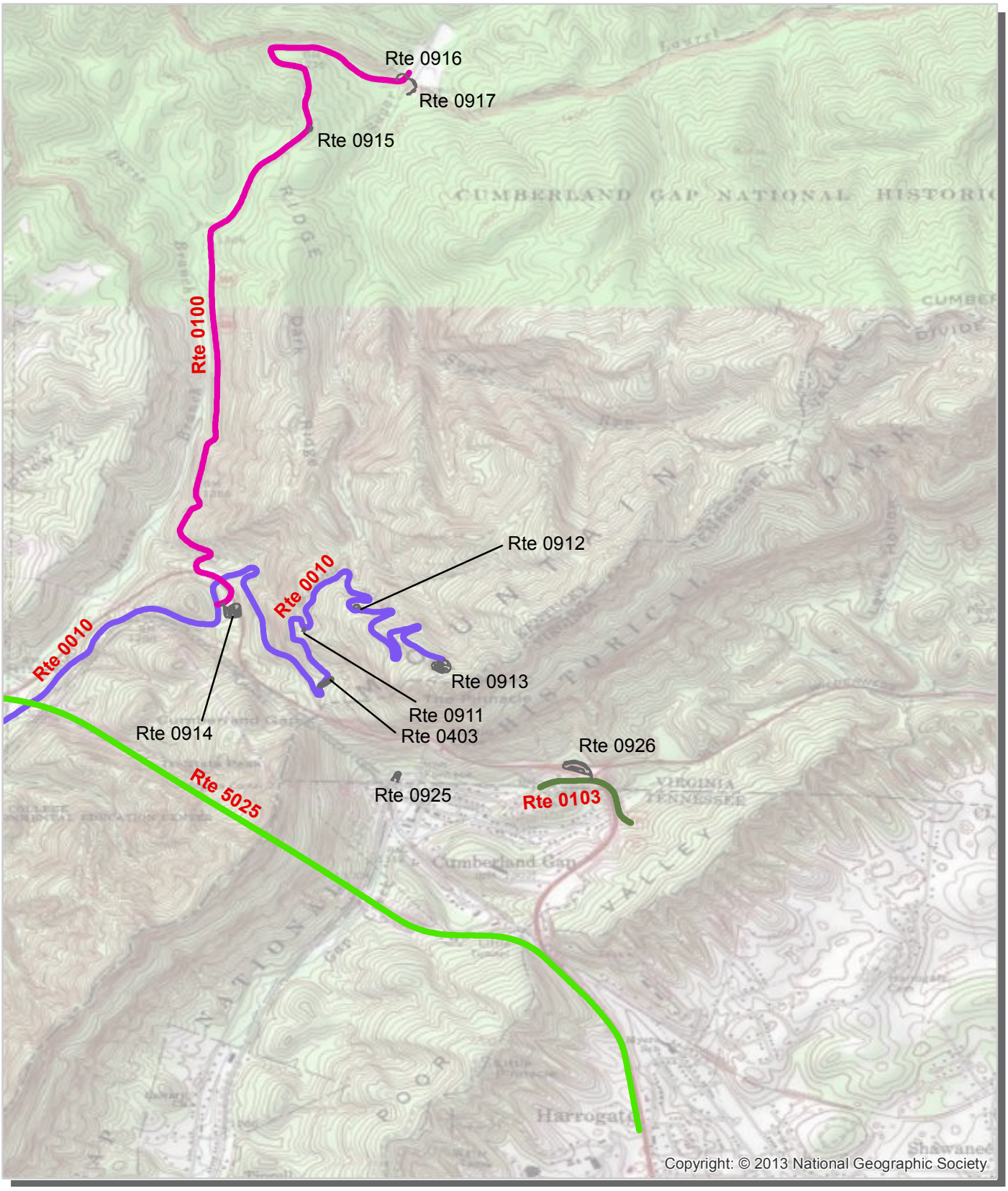
Routes Collected in Previous Cycle

0.2 0.1 0 0.2

Miles

N

Cumberland Gap National Historical Park
Route Location Map
Area 2



Unique colors used to differentiate routes

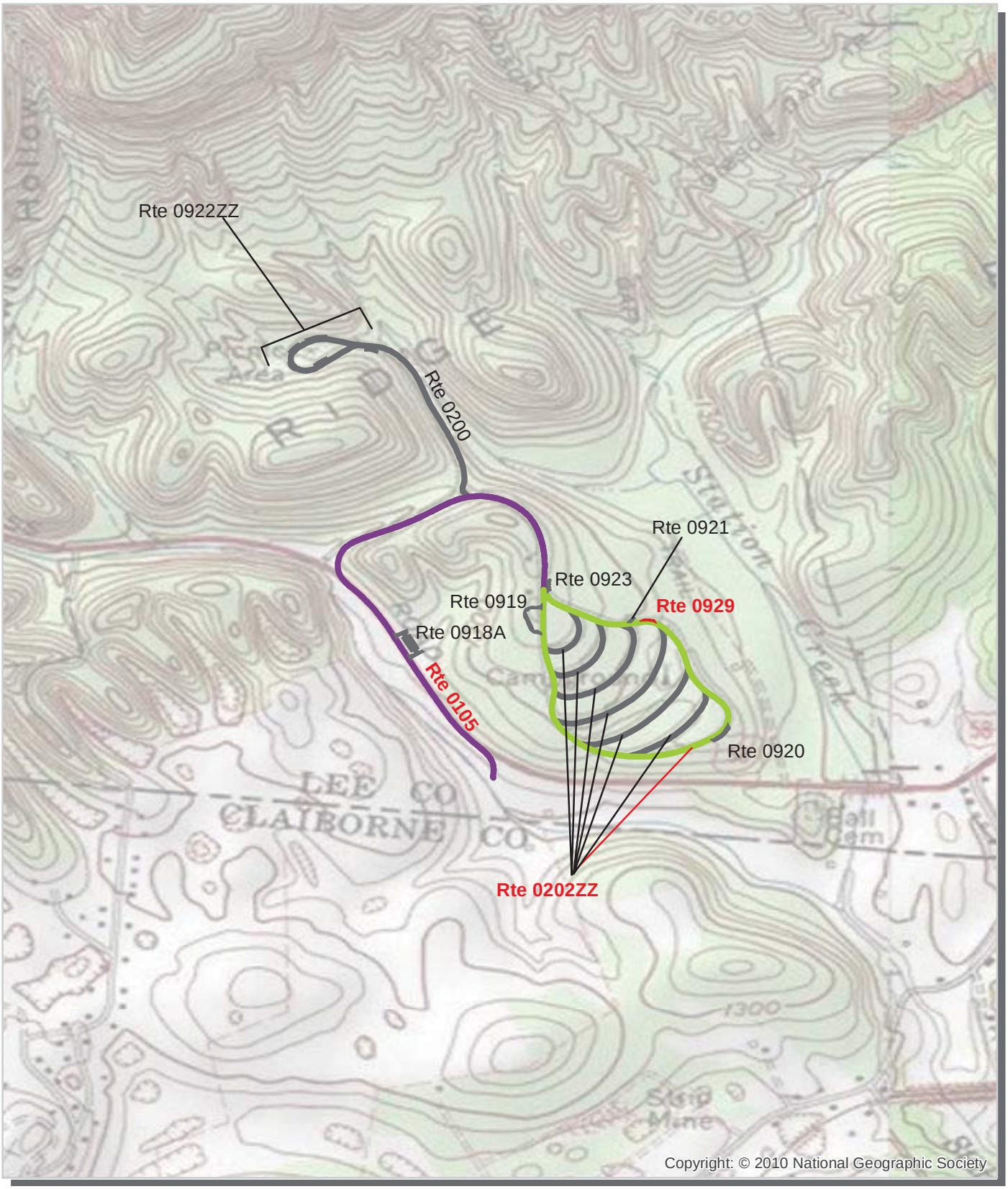
Routes Collected in Previous Cycle

0.5 0.25 0 0.5

Miles

N

Cumberland Gap National Historical Park
Route Location Map
Area 3



Unique colors used to differentiate routes

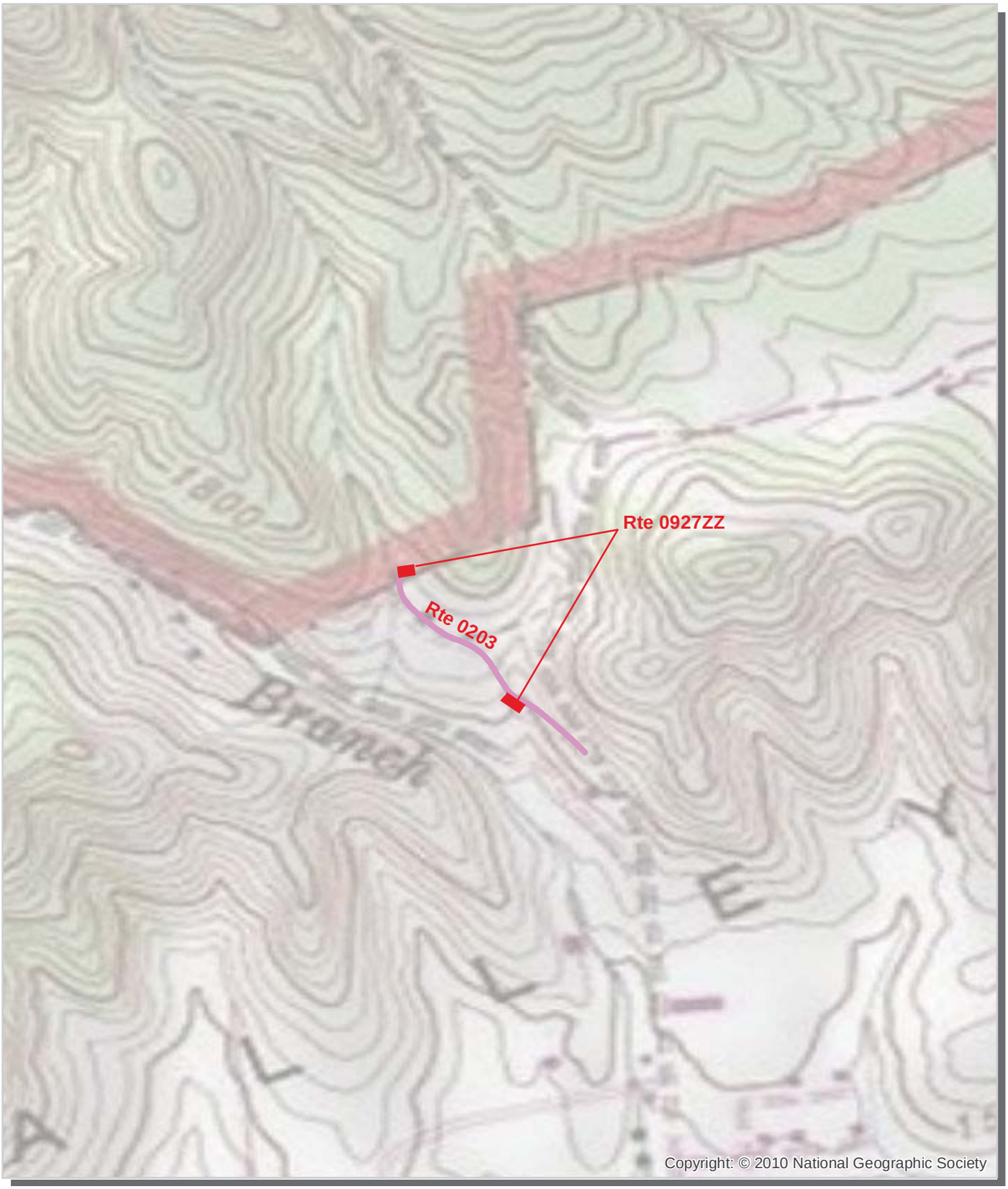
Routes Collected in Previous Cycle

0.2 0.1 0 0.2

Miles

N

Cumberland Gap National Historical Park
Route Location Map
Area 4



Unique colors used to differentiate routes

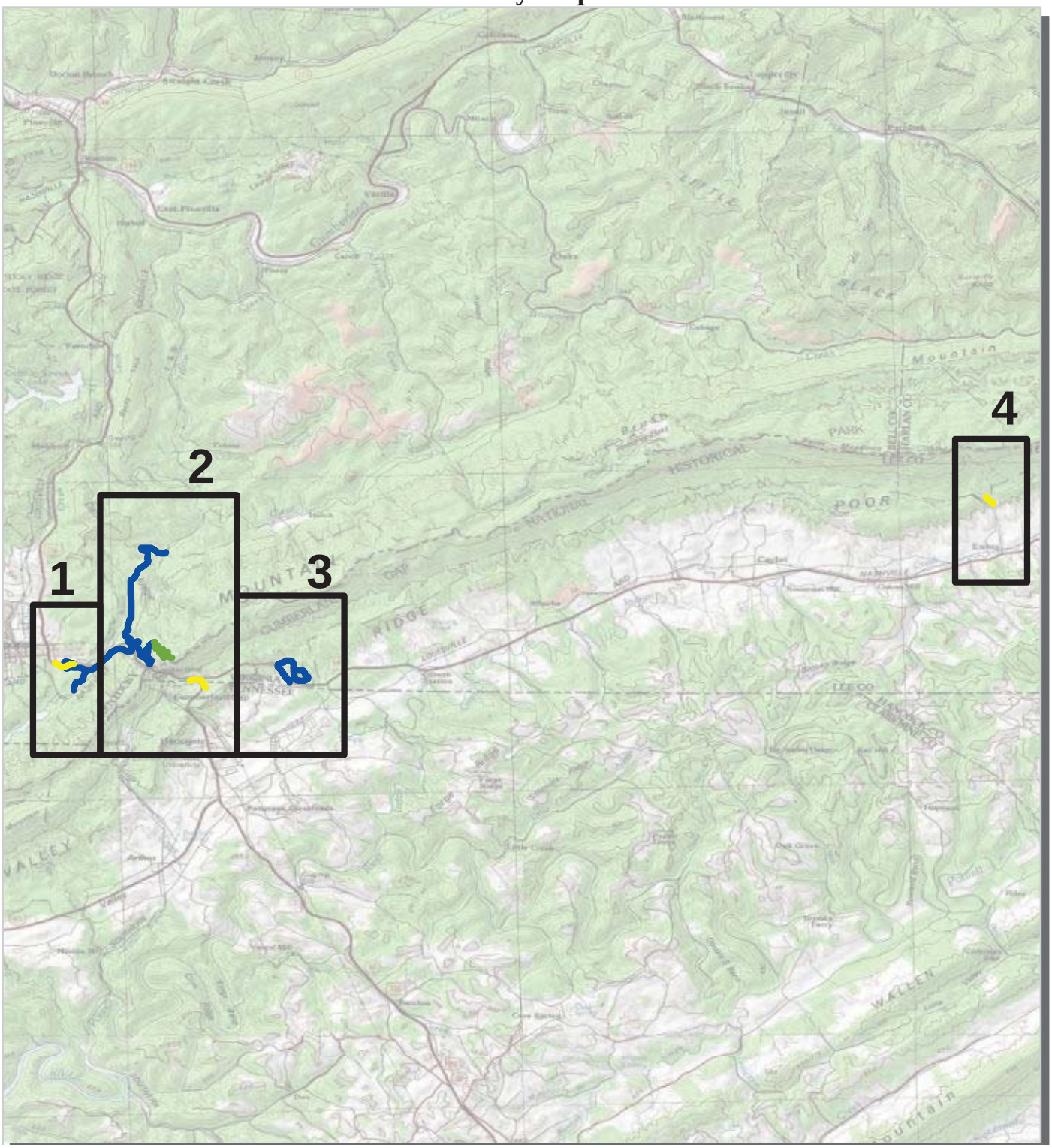
Routes Collected in Previous Cycle

0.1 0.05 0 0.1

Miles

N

Cumberland Gap National Historical Park
Route Condition Map
PCR - Mile by Mile
Key Map



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

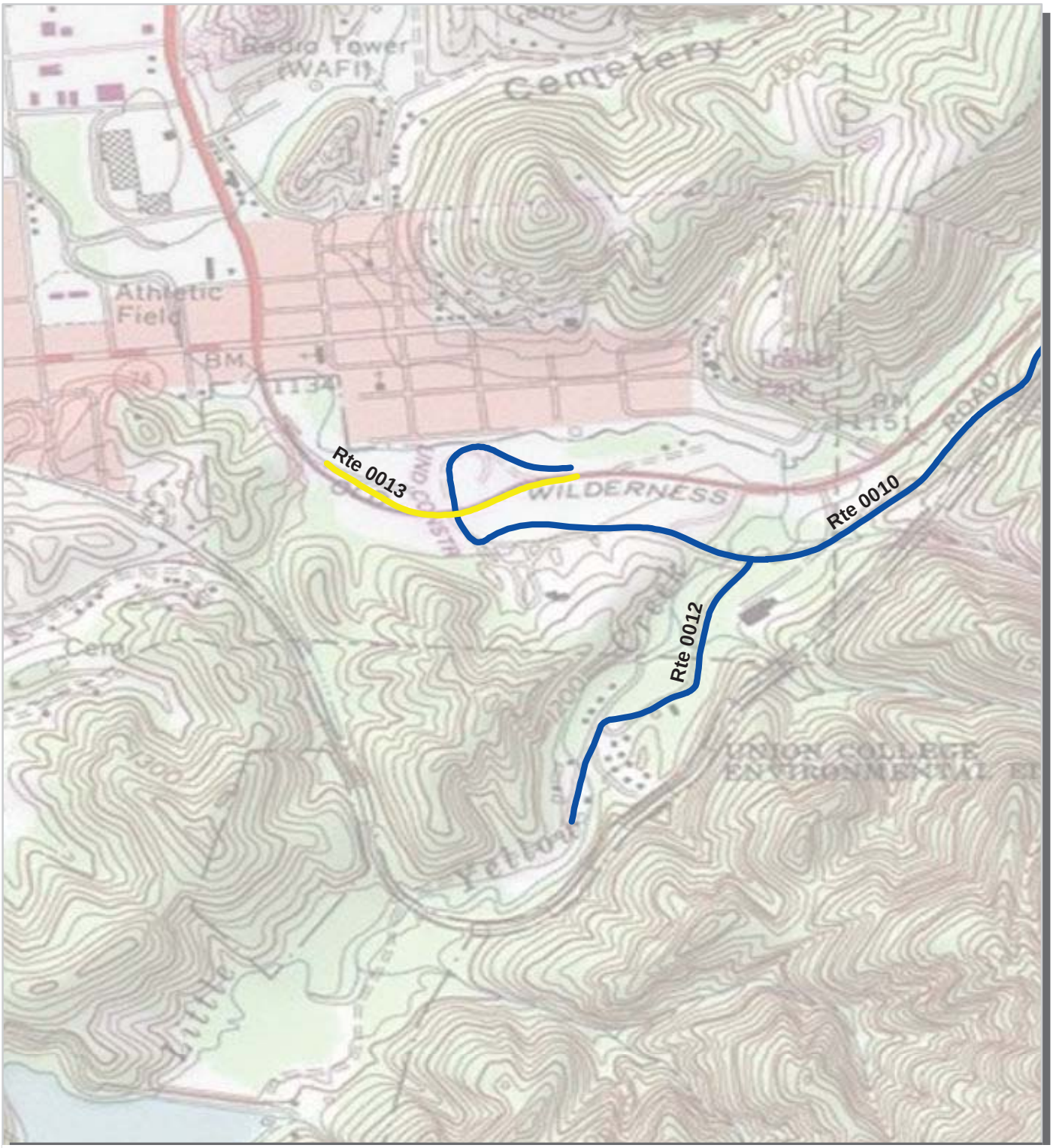
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

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

3 1.5 0 3 Miles

N

Cumberland Gap National Historical Park
Route Condition Map
PCR - Mile by Mile
Area 1



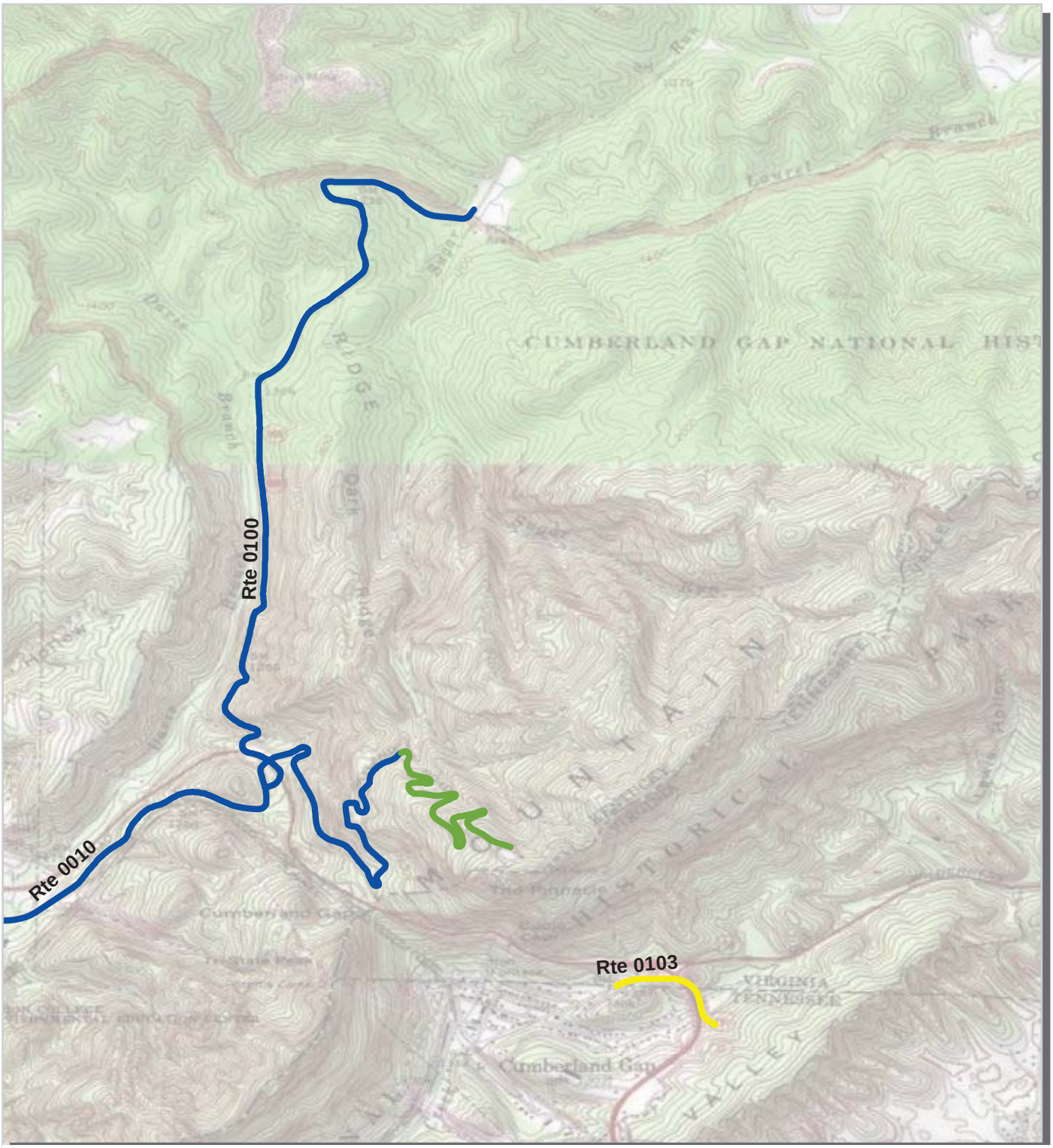
PCR — Poor (0 - 60) | Fair (61 - 84) | Good (85 - 94) | Excellent (95 - 100) | No Data

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

0.2 0.1 0 0.2 Miles

N

Cumberland Gap National Historical Park
Route Condition Map
PCR - Mile by Mile
Area 2



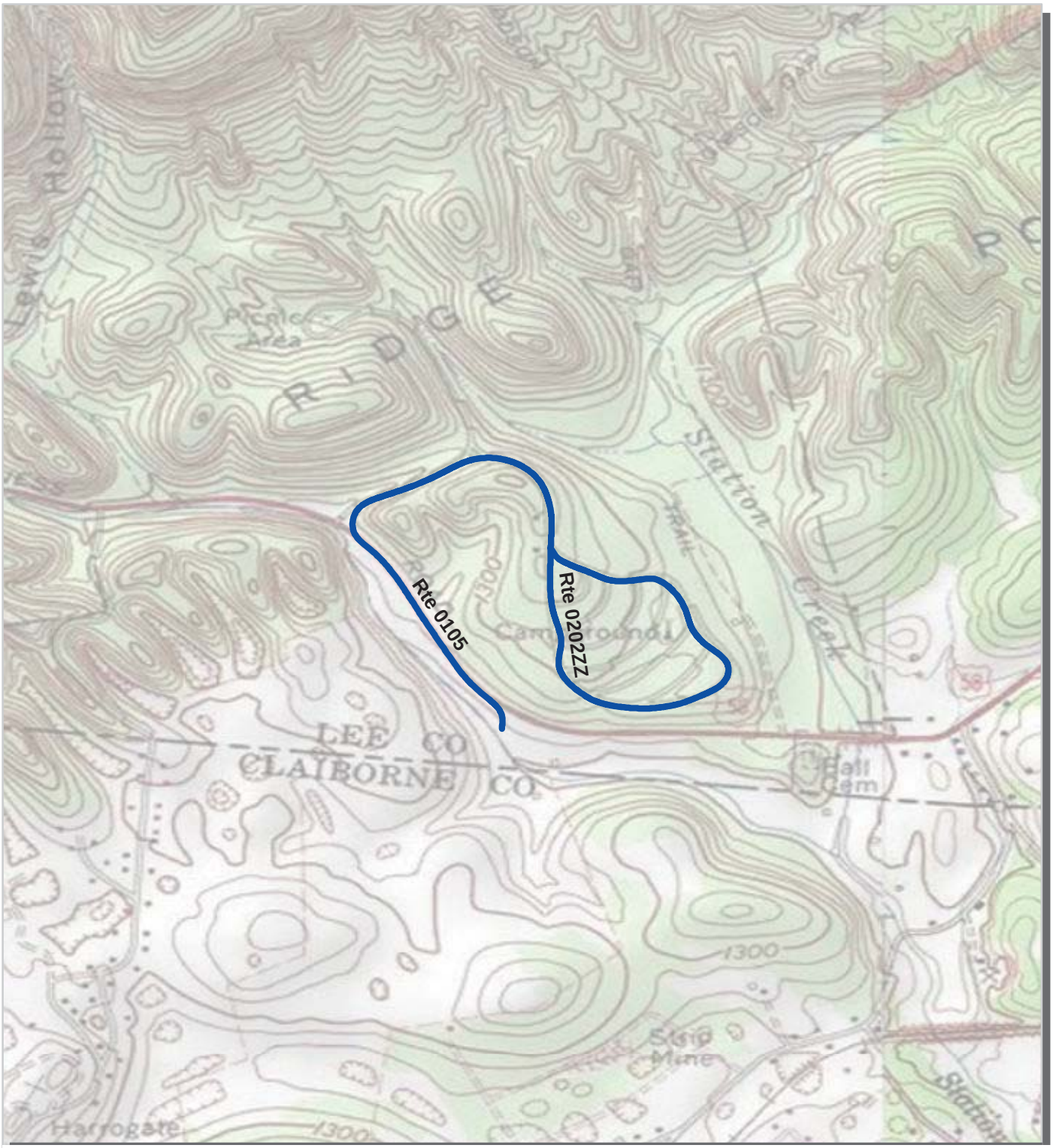
PCR	Poor	Fair	Good	Excellent	No Data
	(0 - 60)	(61 - 84)	(85 - 94)	(95 - 100)	

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

0.5 0.25 0 0.5 Miles

N

Cumberland Gap National Historical Park
Route Condition Map
PCR - Mile by Mile
Area 3



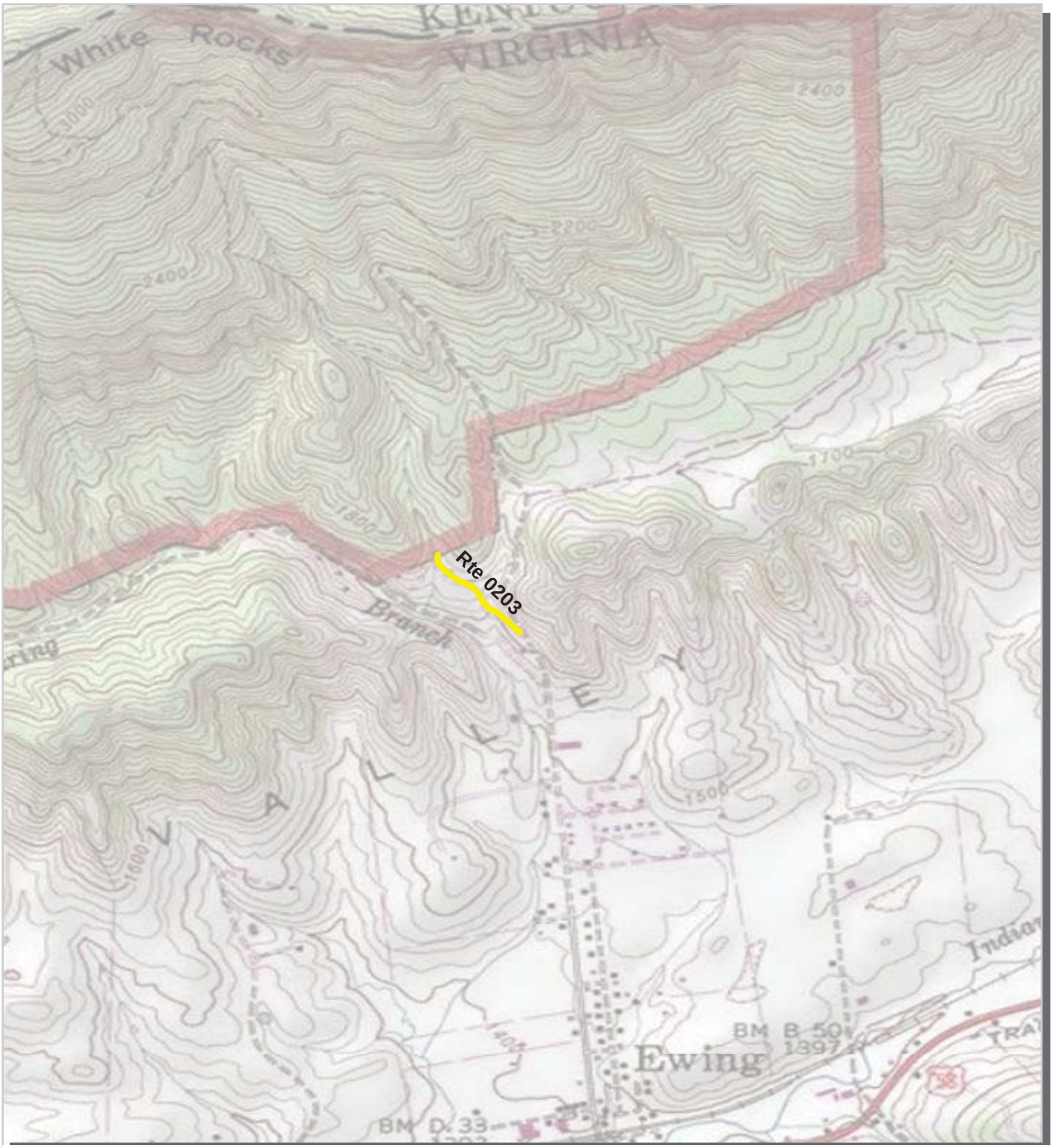
PCR	Poor	Fair	Good	Excellent	No Data
	(0 - 60)	(61 - 84)	(85 - 94)	(95 - 100)	

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

0.4 0.2 0 0.4 Miles

N

Cumberland Gap National Historical Park
Route Condition Map
PCR - Mile by Mile
Area 4



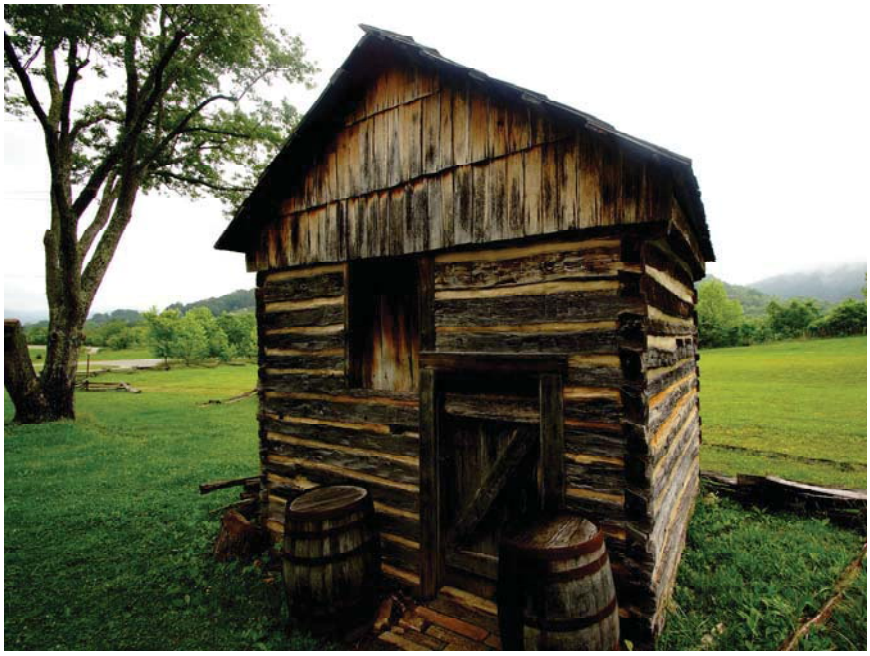
PCR	Poor	Fair	Good	Excellent	No Data
	(0 - 60)	(61 - 84)	(85 - 94)	(95 - 100)	

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

0.4 0.2 0 0.4 Miles

N

Section 5
Paved Route
Condition Rating Sheets



Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

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 PINNACLE ROAD
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/1/2012

SOUTHEAST REGION **TOTAL LENGTH: 3.99 Miles**

Section Number	0	1	2	3	
Section Length (mi)	1.00	1.00	1.00	0.99	
Cross Section Information					
Number of Lanes	2	2	2	2	
Paved Width (ft)	27	24	21	21	
Lane Width (ft)	11	10	9	9	
Roadway Condition Information					
SCR (Surface Condition Rating)	95	99	96	90	
PCR (Pavement Condition Rating)	95	99	96	90	
Distress Index Values					
Structural Crack Index	95	100	100	100	
Transverse Cracking Index	100	100	100	100	
Patching Index	100	100	100	100	
Rutting Index	99	99	96	90	
Roughness Condition Index (RCI)	NC	NC	NC	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

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: 0012 BARTLETT PARK ROAD
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/2/2012
SOUTHEAST REGION **TOTAL LENGTH: 0.49 Miles**

Section Number	0				
Section Length (mi)	0.49				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	19				
Lane Width (ft)	9				
Roadway Condition Information					
SCR (Surface Condition Rating)	99				
PCR (Pavement Condition Rating)	99				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	99				
Rutting Index	99				
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

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: 0013 US HIGHWAY 25E SOUTHBOUND ACCESS ROAD
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/2/2012

SOUTHEAST REGION **TOTAL LENGTH: 0.33 Miles**

Section Number	0				
Section Length (mi)	0.33				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	29				
Lane Width (ft)	18				
Roadway Condition Information					
SCR (Surface Condition Rating)	83				
PCR (Pavement Condition Rating)	83				
Distress Index Values					
Structural Crack Index	83				
Transverse Cracking Index	99				
Patching Index	100				
Rutting Index	99				
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

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: 0100 SUGAR RUN OVERLOOK ROAD
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/2/2012
SOUTHEAST REGION **TOTAL LENGTH: 2.77 Miles**

Section Number	0	1	2		
Section Length (mi)	1.00	1.00	0.77		
Cross Section Information					
Number of Lanes	2	2	2		
Paved Width (ft)	22	21	21		
Lane Width (ft)	10	9	10		
Roadway Condition Information					
SCR (Surface Condition Rating)	99	100	96		
PCR (Pavement Condition Rating)	97	100	97		
Distress Index Values					
Structural Crack Index	100	100	98		
Transverse Cracking Index	100	100	100		
Patching Index	100	100	100		
Rutting Index	99	100	96		
Roughness Condition Index (RCI)	95	100	99		

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

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: 0103 DANIEL BOONE PARKING ACCESS ROAD
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/1/2012
SOUTHEAST REGION **TOTAL LENGTH: 0.36 Miles**

Section Number	0				
Section Length (mi)	0.36				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	32				
Lane Width (ft)	12				
Roadway Condition Information					
SCR (Surface Condition Rating)	82				
PCR (Pavement Condition Rating)	82				
Distress Index Values					
Structural Crack Index	82				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	99				
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

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

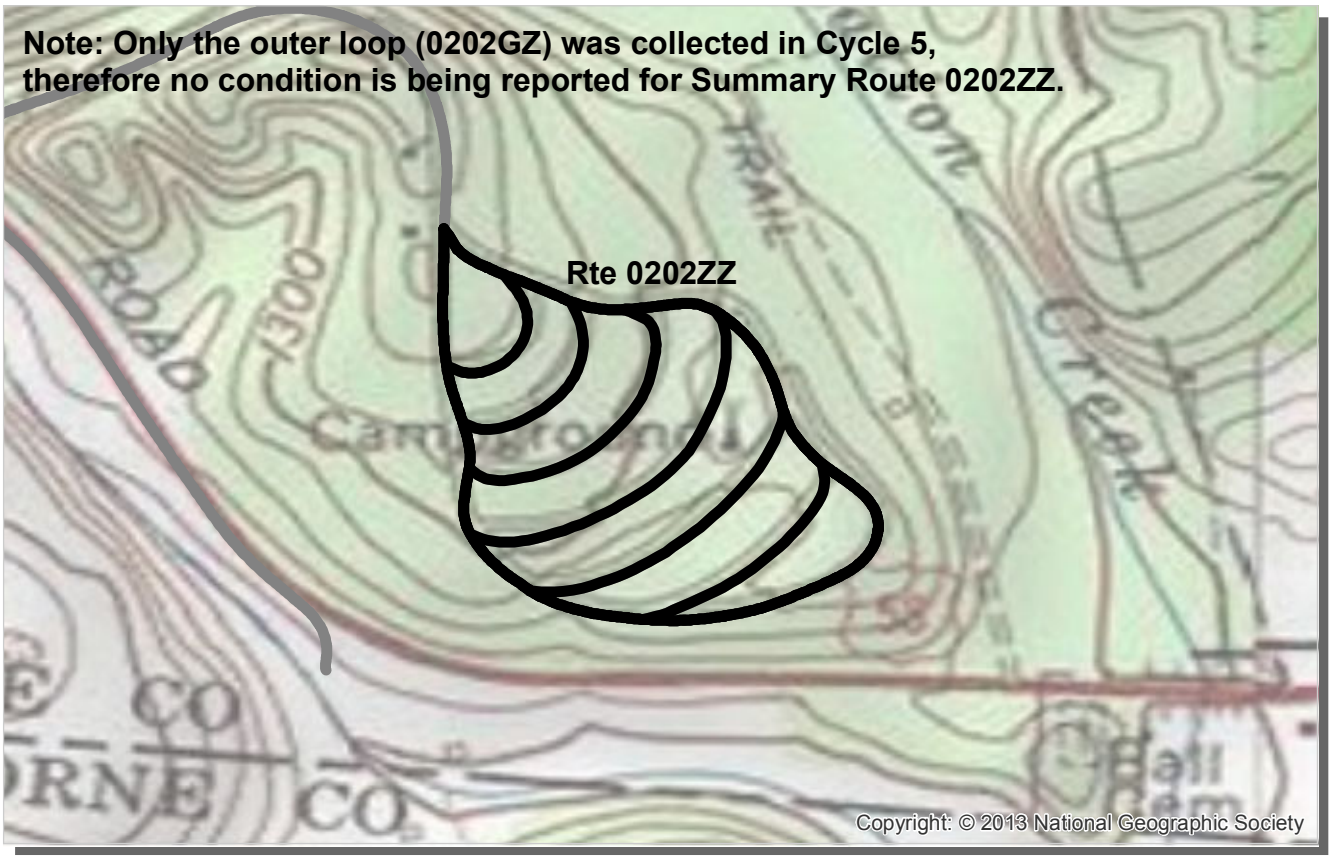
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0105 WILDERNESS CAMPGROUND ACCESS ROAD
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/1/2012
SOUTHEAST REGION **TOTAL LENGTH: 0.80 Miles**

Section Number	0				
Section Length (mi)	0.80				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	24				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	100				
PCR (Pavement Condition Rating)	100				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	100				
Roughness Condition Index (RCI)	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



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

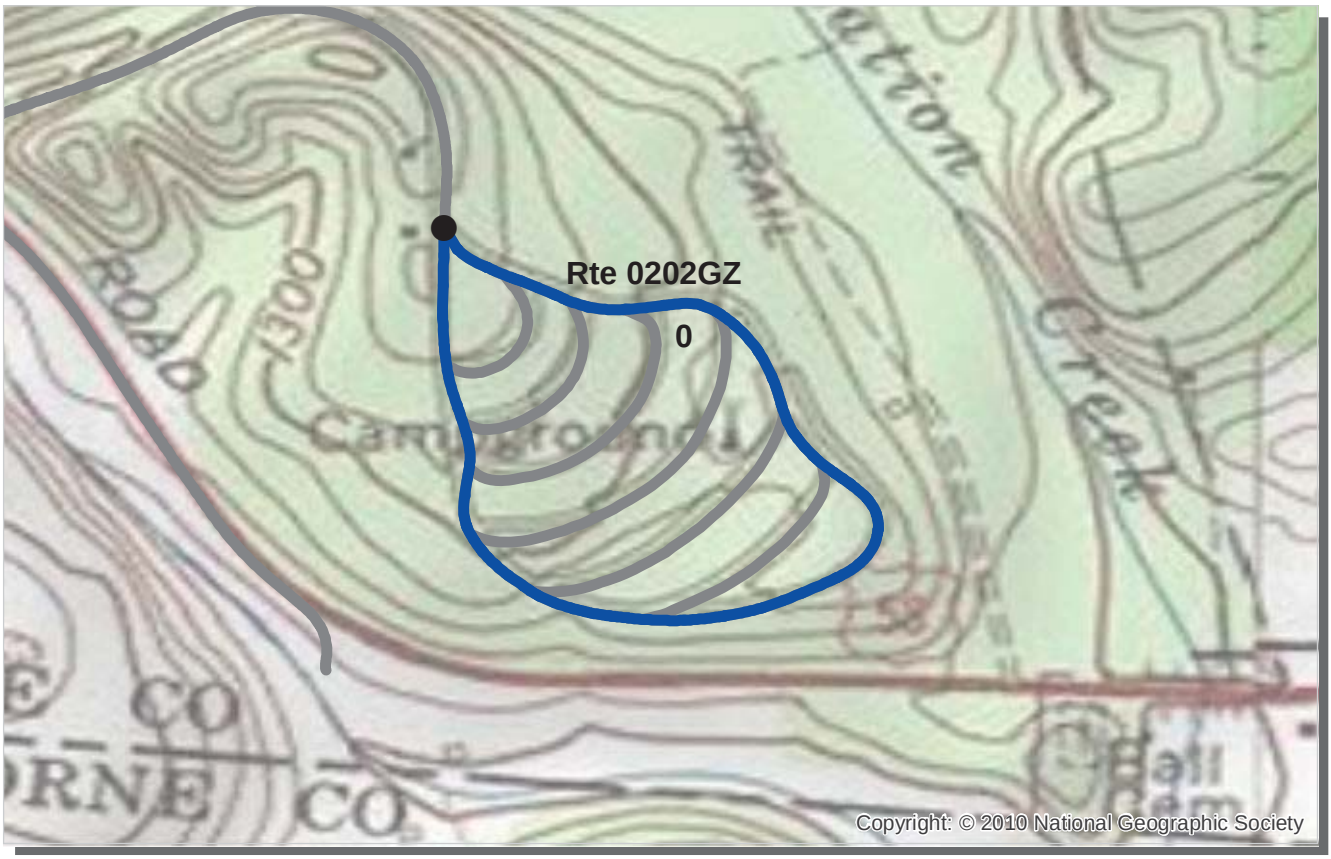
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0202ZZ WILDERNESS ROAD CAMPGROUND
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

Summary Record **COLLECTED: 11/1/2012**
SOUTHEAST REGION **TOTAL LENGTH: 1.74 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)	N/A				
PCR (Pavement Condition Rating)	N/A				
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



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: 0202GZ WILDERNESS ROAD CAMPGROUND LOOP G
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

Subcomponent Record **COLLECTED: 11/1/2012**
SOUTHEAST REGION **TOTAL LENGTH: 0.79 Miles**

Section Number	0				
Section Length (mi)	0.79				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	15				
Lane Width (ft)	12				
Roadway Condition Information					
SCR (Surface Condition Rating)	99				
PCR (Pavement Condition Rating)	99				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	99				
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

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: 0203 ENTRANCE ROAD AT TWCP
CUGA : CUMBERLAND GAP NATIONAL HISTORICAL PARK

COLLECTED: 11/1/2012
SOUTHEAST REGION **TOTAL LENGTH: 0.19 Miles**

Section Number	0				
Section Length (mi)	0.19				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	15				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	70				
PCR (Pavement Condition Rating)	70				
Distress Index Values					
Structural Crack Index	70				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	90				
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

Section 6
Manually Rated Paved Route Condition Rating Sheets

Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Route 0104

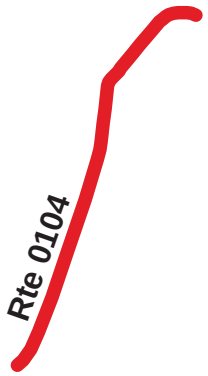
CEMETERY ROAD

FROM END OF ROUTE 0012 (BATLETT PARK ROAD)

TO CEMETERY AT MP 0.262

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Paved Length (mi)	Paved Width (ft)
0104	PUBLIC	5/23/2012	3,464	0.06	0.08	8
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	1	NO CURB AND GUTTER	NO CURB	EXCELLENT/97	AS

* Lane miles are based on 11' lane widths



400 200 0 400

Feet

N

Section 7
Parking Area
Condition Rating Sheets

Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

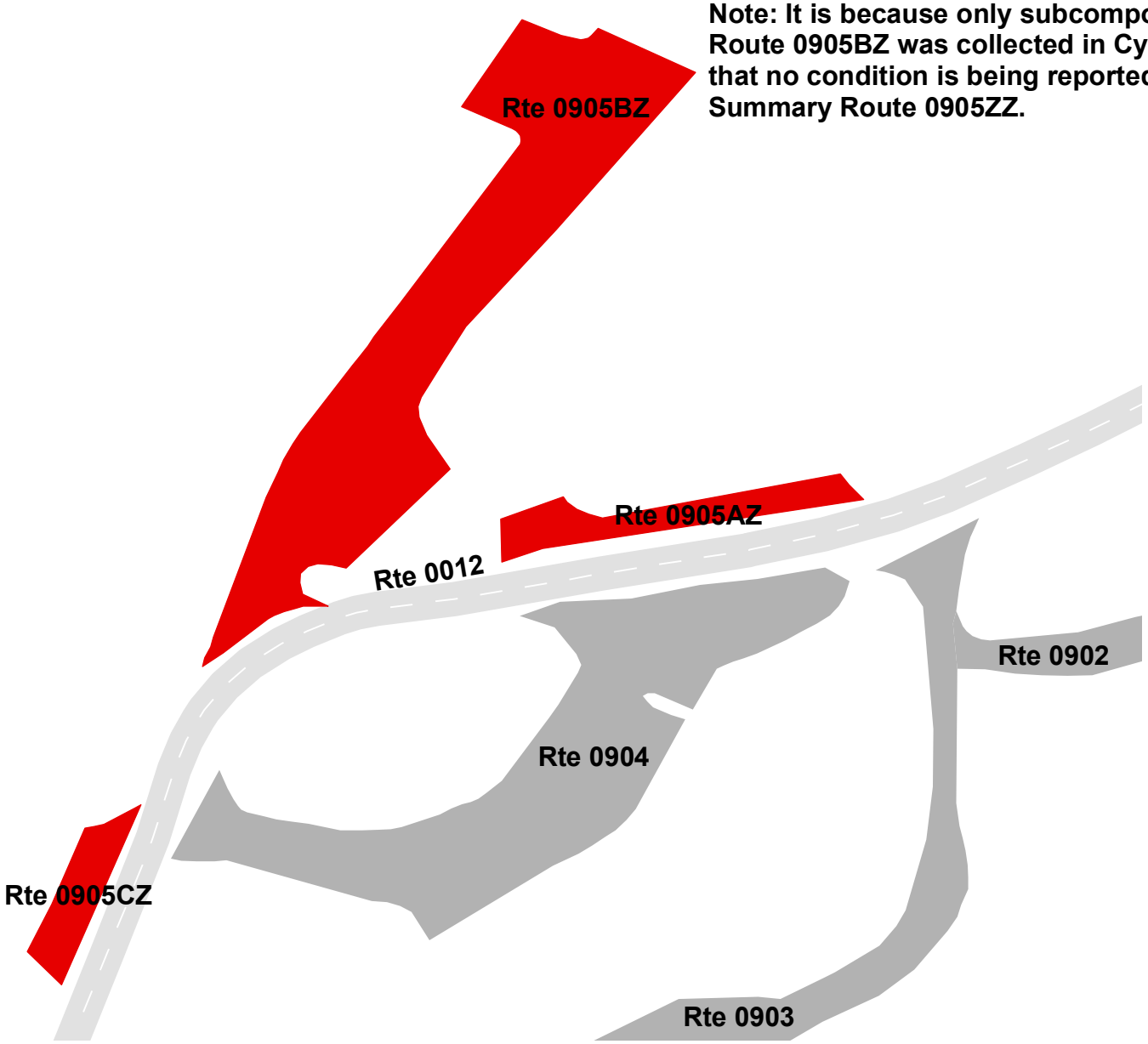
CUMBERLAND GAP NATIONAL HISTORICAL PARK
Route 0905ZZ
BARTLETT PARK PICNIC AREA PARKING
ADJACENT TO ROUTE 0012 (BARTLETT PARK ROAD)

Summary Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905ZZ	PUBLIC	5/23/2012	13,134	0.23	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
N/A	N/A	N/A	N/A	N/A	SUMMARY/N/A

* Lane miles are based on 11' lane widths

Note: It is because only subcomponent Route 0905BZ was collected in Cycle 5 that no condition is being reported for Summary Route 0905ZZ.



CUMBERLAND GAP NATIONAL HISTORICAL PARK

Route 0905BZ

BARTLETT PARK PICNIC AREA PARKING B

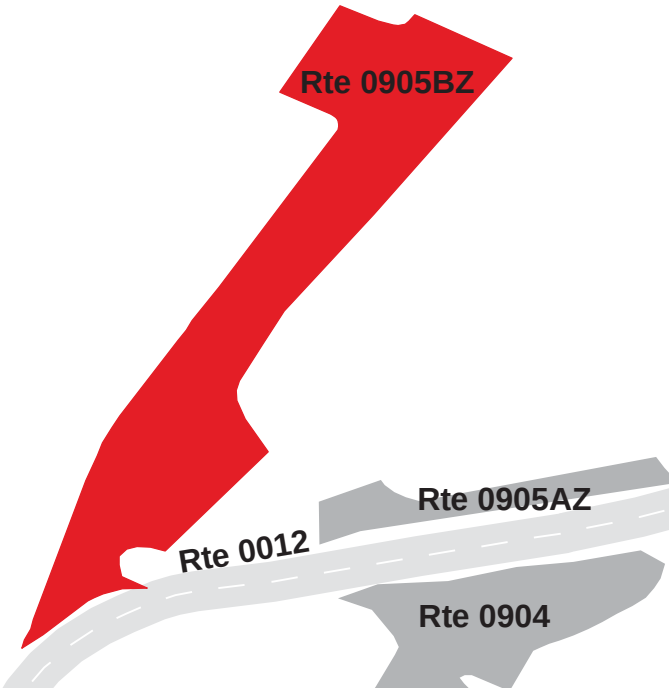
FROM ROUTE 0012 (BARTLETT PARK ROAD)

TO PARKING

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905BZ	PUBLIC	5/23/2012	10,560	0.18	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	EXCELLENT/97

* Lane miles are based on 11' lane widths



200 100 0 200 Feet

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Route 0927ZZ

TWCP PARKING AREAS

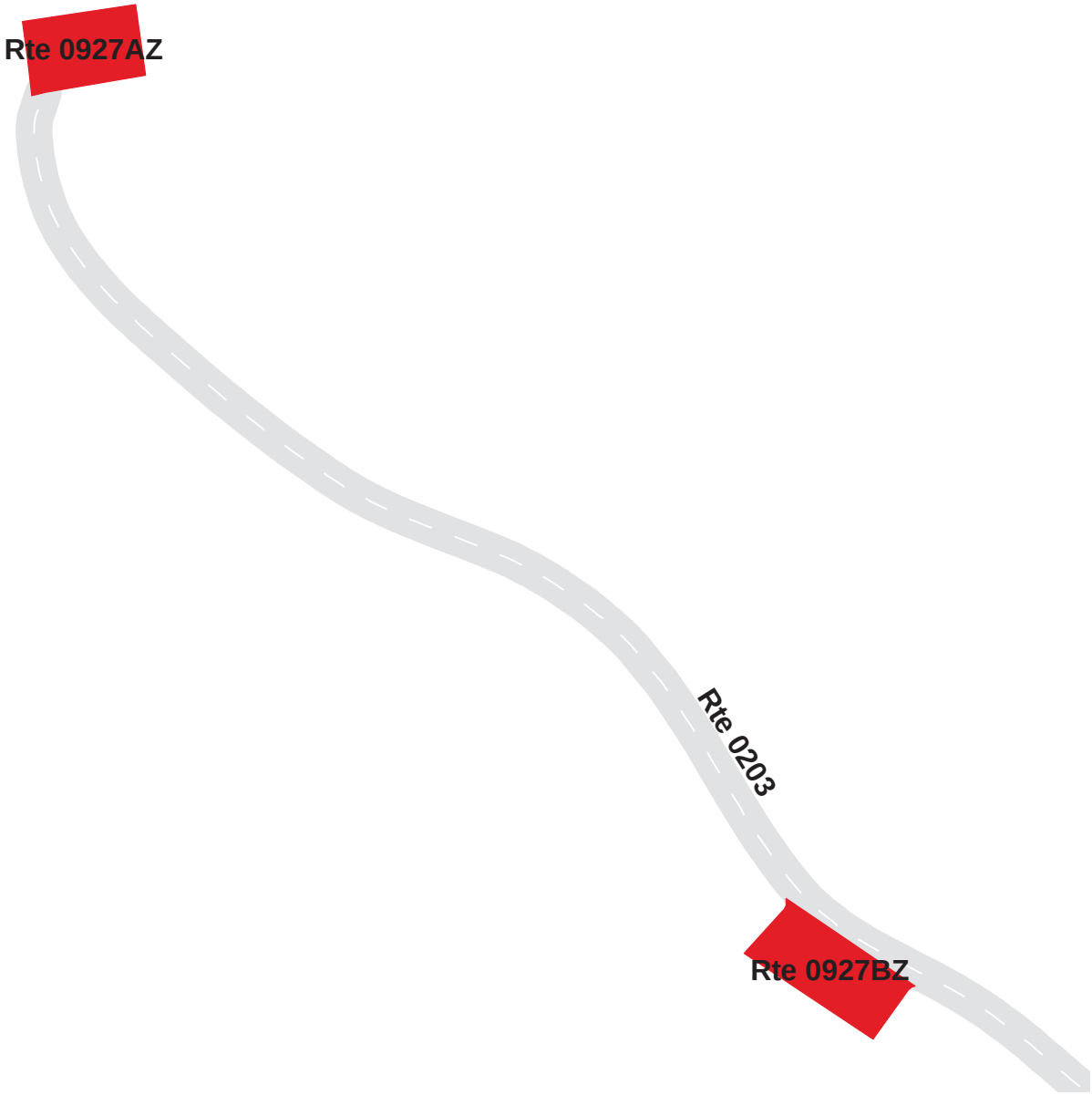
FROM ROUTE 0203 (ENTRANCE ROAD AT TWCP)

TO PARKING

Summary Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0927ZZ	PUBLIC	5/23/2012	5,215	0.09	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	SUMMARY/90

* Lane miles are based on 11' lane widths



CUMBERLAND GAP NATIONAL HISTORICAL PARK

Route 0927AZ

TWCP PARKING A

FROM END OF ROUTE 0203 (ENTRANCE ROAD AT TWCP)

TO PARKING

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0927AZ	PUBLIC	5/23/2012	2,386	0.04	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Route 0927BZ

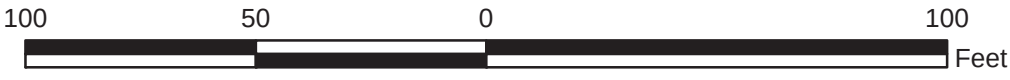
TWCP PARKING B

ADJACENT TO ROUTE 0203 (ENTRANCE ROAD AT TWCP)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0927BZ	PUBLIC	5/23/2012	2,829	0.05	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	GOOD/90

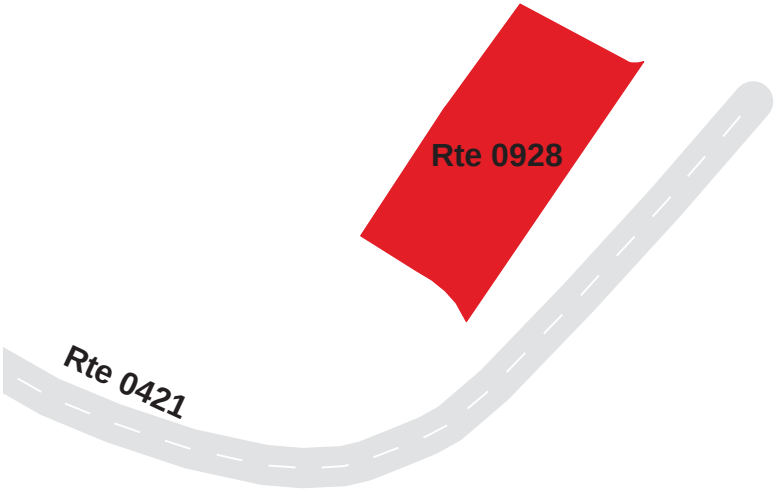
* Lane miles are based on 11' lane widths

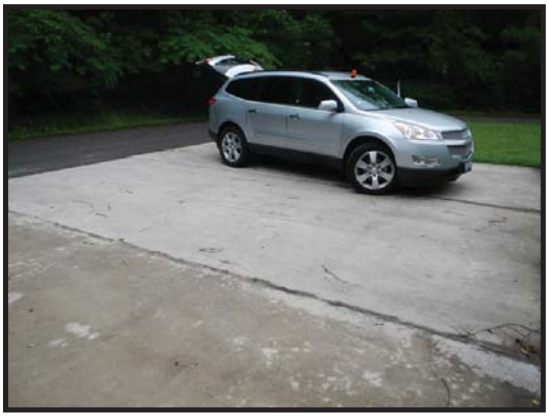


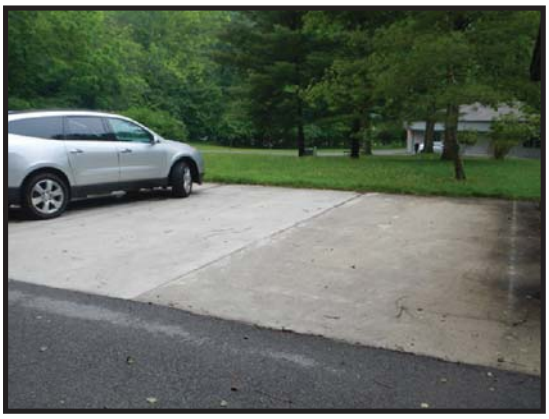
CUMBERLAND GAP NATIONAL HISTORICAL PARK
Route 0928
DUPLEX PARKING
ADJACENT TO ROUTE 0421 (DUPLEX DRIVE)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0928	NONPUBLIC	5/23/2012	1,489	0.03	CO
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths







100 50 0 100
Feet

CUMBERLAND GAP NATIONAL HISTORICAL PARK

Route 0929

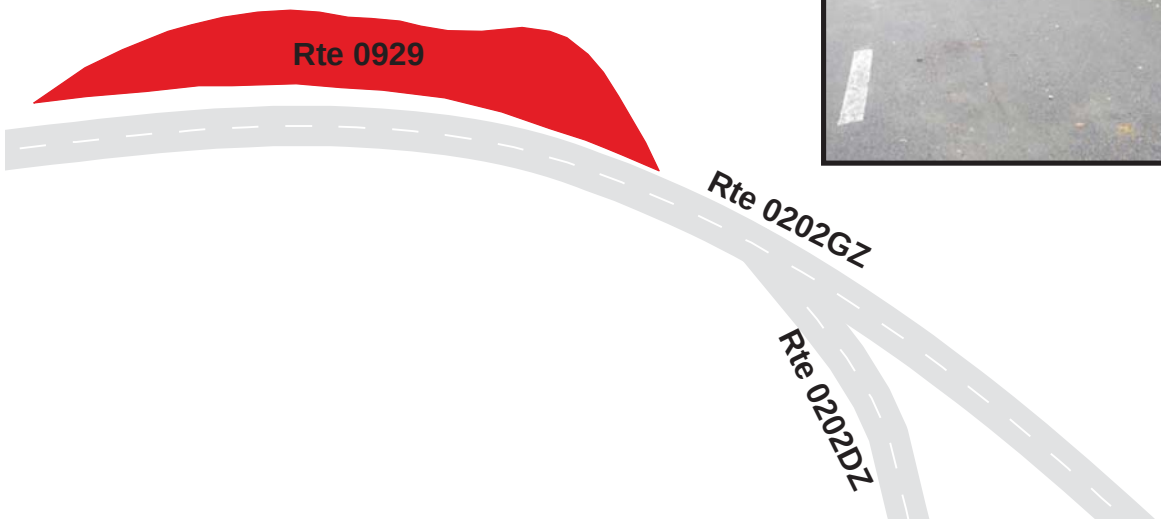
AMPHITHEATER BUS PARKING

FROM ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)

TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0929	PUBLIC	5/23/2012	1,487	0.03	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths



100 50 0 100 Feet

N

Section 8
Route Maintenance Features Summaries

Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

CUGA: DCV ROUTE MAINTENANCE FEATURES SUMMARY

Notice: Culverts and drop inlets were NOT marked by NPS in Cycle 5 along new or re-aligned DCV driven routes.

FEATURE	ROUTE 0103 DANIEL BOONE PARKING ACCESS ROAD	ROUTE 0105 WILDERNESS CAMPGROUND ACCESS ROAD	ROUTE 0203 ENTRANCE ROAD AT TWCP		UNIT
BRIDGE	0	0	0		EACH
CATTLE GUARD	0	0	0		EACH
CULVERT	0	0	0		EACH
CURB	53	84	0		LINEAR FEET
DROP INLET	0	0	0		EACH
GATE	0	0	1		EACH
GUARD/GUIDE RAIL	866	312	0		LINEAR FEET
CABLE	0	0	0		LINEAR FEET
NON-CABLE	866	312	0		LINEAR FEET
GUARD/GUIDE WALL	0	0	0		LINEAR FEET
BOLLARD	0	0	0		LINEAR FEET
TEMPORARY BARRIER	0	0	0		LINEAR FEET
NON TEMP/BOLLARD	0	0	0		LINEAR FEET
INTERSECTION	5	9	6		EACH
LOW WATER CROSSING	0	0	0		EACH
LOW WATER CROSSING	0	0	0		LINEAR FEET
MILE MARKER	0	0	0		EACH
OVERPASS	0	0	0		EACH
PARK BOUNDARY	1	1	1		EACH
PAVED DITCH	201	2,196	0		LINEAR FEET
PULLOUT	0	0	0		EACH
PULLOUT	0	0	0		LINEAR FEET
RAILROAD CROSSING	0	0	0		EACH
RETAINING WALL	0	0	0		EACH
RETAINING WALL	0	0	0		LINEAR FEET
SIGN	26	23	7		EACH
STATE BOUNDARY	0	0	0		EACH
TRAFFIC LIGHT	0	0	0		EACH
TUNNEL	0	0	0		EACH
TUNNEL	0	0	0		LINEAR FEET

Data Collected 11/2012

STRUCTURE LIST

This park is classified as a large park. Therefore, in Cycle 5, BIP-Structures were inventoried only if they were located along routes that were modified or previously uncollected by RIP, so this report does not provide an all-inclusive listing of all BIP-Structures in the park.

Section 9
Route Maintenance Features
Road Logs

Cumberland Gap
National Historical Park

Federal Lands Highway
Road Inventory Program

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0103: DANIEL BOONE PARKING ACCESS ROAD

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM US HIGHWAY 58
0.000	0.000	INTERSECTION	RIGHT	PAVED ROUTE (US HIGHWAY 58 / NON NPS)
0.000	0.000	INTERSECTION	LEFT	PAVED ROUTE (US HIGHWAY 58 / NON NPS)
0.008	0.008	SIGN	LEFT	REGULATORY, GRAPHIC SIGN NO TEXT
0.008	0.008	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
0.008	0.008	SIGN	LEFT	REGULATORY, TO
0.008	0.008	SIGN	LEFT	REGULATORY, 58
0.008	0.008	SIGN	LEFT	REGULATORY, GRAPHIC SIGN NO TEXT
0.008	0.008	SIGN	LEFT	REGULATORY, STOP
0.008	0.008	SIGN	LEFT	REGULATORY, 25 E
0.008	0.008	SIGN	LEFT	REGULATORY, EAST
0.008	0.008	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.032	0.032	INTERSECTION	LEFT	PAVED ROUTE (ADAMS INDUSTRIAL LANE / NON NPS)
0.033	0.094	GUARD/GUIDE RAIL	LEFT	N/A
0.034	0.034	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.050	0.050	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.050	0.122	GUARD/GUIDE RAIL	RIGHT	N/A
0.067	0.067	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
0.094	0.094	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.104	0.104	SIGN	RIGHT	GUIDE, IRON FURNACE CUMBERLAND GAP
0.122	0.122	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.135	0.135	SIGN	LEFT	GUIDE, NATIONAL PARK VISITOR CENTER 2 CAMPGROUND 1
0.196	0.203	CURB	RIGHT	N/A
0.201	0.232	GUARD/GUIDE RAIL	LEFT	N/A
0.201	0.201	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.204	0.204	INTERSECTION	RIGHT	ROUTE 0926 (DANIEL BOONE PARKING)
0.204	0.204	SIGN	LEFT	GUIDE, TX
0.208	0.211	CURB	RIGHT	N/A
0.219	0.219	SIGN	RIGHT	GUIDE, DANIEL BOONE PARKING AREA CUMBERLAND GAP
0.232	0.232	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0103: DANIEL BOONE PARKING ACCESS ROAD

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.294	0.332	PAVED DITCH	RIGHT	N/A
0.297	0.297	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.309	0.309	SIGN	LEFT	REGULATORY, UNABLE TO READ FROM VIDEO
0.355	0.355	SIGN	RIGHT	REGULATORY, $500 FINE FOR LITTERING
0.355	0.355	SIGN	RIGHT	REGULATORY, RADAR ENFORCED
0.355	0.355	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
0.355	0.355	SIGN	RIGHT	GUIDE, ENTER CLAIBORNE CO. LEAVE LEE.CO.
0.356	0.356	INTERSECTION	N/A	PAVED ROUTE (N CUMBERLAND DRIVE / NON NPS)
0.356	0.356	PARK BOUNDARY	N/A	N/A
0.356	0.356	ROUTE END	N/A	TO PARK BOUNDARY

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0105: WILDERNESS CAMPGROUND ACCESS ROAD

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM US HIGHWAY 58
0.000	0.000	SIGN	N/A	REGULATORY, DIVIDED HIGHWAY
0.000	0.000	SIGN	N/A	REGULATORY, DO NOT ENTER
0.000	0.000	SIGN	N/A	REGULATORY, GRAPHIC SIGN NO TEXT
0.000	0.000	SIGN	N/A	REGULATORY, EAST
0.000	0.000	INTERSECTION	RIGHT	PAVED ROUTE (US HIGHWAY 58 / NON NPS)
0.000	0.000	PARK BOUNDARY	N/A	N/A
0.000	0.000	INTERSECTION	LEFT	PAVED ROUTE (US HIGHWAY 58 / NON NPS)
0.000	0.000	SIGN	N/A	REGULATORY, 58
0.004	0.004	SIGN	RIGHT	REGULATORY, DO NOT ENTER
0.004	0.063	GUARD/GUIDE RAIL	LEFT	N/A
0.004	0.004	SIGN	LEFT	REGULATORY, 58
0.004	0.004	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.004	0.004	SIGN	LEFT	REGULATORY, GRAPHIC SIGN NO TEXT
0.004	0.004	SIGN	LEFT	REGULATORY, STOP
0.004	0.004	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.026	0.026	SIGN	RIGHT	GUIDE, THOMAS B. FUGATE WILDERNESS ROAD AREA CUMBERLAND GAP NATIONAL HISTORICAL PARK
0.048	0.048	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
0.063	0.063	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.065	0.065	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.220	0.220	INTERSECTION	RIGHT	ROUTE 0918A (WILDERNESS ROAD TRAILHEAD PARKING A)
0.256	0.256	INTERSECTION	RIGHT	ROUTE 0918A (WILDERNESS ROAD TRAILHEAD PARKING A)
0.363	0.779	PAVED DITCH	RIGHT	N/A
0.390	0.390	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.459	0.459	SIGN	LEFT	REGULATORY, SPEED LIMIT 25
0.572	0.572	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
0.575	0.575	INTERSECTION	LEFT	ROUTE 0200 (WILDERNESS ROAD PICNIC AREA) SPUR
0.581	0.581	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
0.588	0.588	INTERSECTION	LEFT	ROUTE 0200 (WILDERNESS ROAD PICNIC AREA)

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0105: WILDERNESS CAMPGROUND ACCESS ROAD

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.707	0.707	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.749	0.749	SIGN	RIGHT	REGULATORY, 854 NATIONAL PARK ROAD
0.766	0.766	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.780	0.796	CURB	RIGHT	N/A
0.786	0.786	INTERSECTION	LEFT	ROUTE 0923 (WILDERNESS ROAD CAMPGROUND REGISTRATION PARKING)
0.789	0.789	SIGN	RIGHT	GUIDE, REGISTRATION REQUIRED
0.796	0.796	INTERSECTION	LEFT	ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)
0.796	0.796	INTERSECTION	N/A	ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)
0.796	0.796	ROUTE END	N/A	TO BEGINNING OF ROUTE 0202ZZ (WILDERNESS ROAD CAMPGROUND)

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0202GZ: WILDERNESS ROAD CAMPGROUND LOOP G

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM END OF ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)
0.000	0.000	INTERSECTION	N/A	ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)
0.000	0.791	ONE-WAY	N/A	N/A
0.010	0.010	SIGN	RIGHT	GUIDE, WELCOME
0.014	0.014	SIGN	LEFT	REGULATORY, ONE WAY
0.015	0.024	PAVED DITCH	LEFT	N/A
0.018	0.018	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
0.018	0.018	SIGN	RIGHT	GUIDE, NO PICNICKING
0.026	0.026	INTERSECTION	RIGHT	ROUTE 0919 (WILDERNESS ROAD CAMPGROUND DUMP STATION)
0.028	0.032	PAVED DITCH	RIGHT	N/A
0.030	0.030	SIGN	RIGHT	GUIDE, CAMPGROUND HOST
0.030	0.030	SIGN	RIGHT	GUIDE, QUIET HOURS 10:00 PM-6:00 AM ENFORCED
0.049	0.266	PAVED DITCH	RIGHT	N/A
0.067	0.086	PAVED DITCH	LEFT	N/A
0.068	0.068	INTERSECTION	RIGHT	ROUTE 0919 (WILDERNESS ROAD CAMPGROUND DUMP STATION)
0.070	0.070	SIGN	LEFT	REGULATORY, ONE WAY
0.082	0.082	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.092	0.092	INTERSECTION	LEFT	ROUTE 0202AZ (WILDERNESS ROAD CAMPGROUND LOOP A)
0.098	0.098	SIGN	LEFT	GUIDE, A
0.112	0.125	PAVED DITCH	LEFT	N/A
0.120	0.120	SIGN	RIGHT	GUIDE, DUMPSTER
0.128	0.128	INTERSECTION	LEFT	ROUTE 0202BZ (WILDERNESS ROAD CAMPGROUND LOOP B)
0.134	0.157	PAVED DITCH	LEFT	N/A
0.139	0.139	SIGN	LEFT	GUIDE, B
0.158	0.158	INTERSECTION	LEFT	ROUTE 0202CZ (WILDERNESS ROAD CAMPGROUND LOOP C)
0.166	0.199	PAVED DITCH	LEFT	N/A
0.166	0.166	SIGN	LEFT	GUIDE, C

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0202GZ: WILDERNESS ROAD CAMPGROUND LOOP G

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FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.206	0.206	INTERSECTION	LEFT	ROUTE 0202DZ (WILDERNESS ROAD CAMPGROUND LOOP D)
0.211	0.252	PAVED DITCH	LEFT	N/A
0.212	0.212	SIGN	LEFT	GUIDE, D
0.255	0.255	INTERSECTION	LEFT	ROUTE 0202EZ (WILDERNESS ROAD CAMPGROUND LOOP E)
0.260	0.260	SIGN	RIGHT	GUIDE, DUMPSTER
0.261	0.261	SIGN	LEFT	GUIDE, E
0.286	0.319	PAVED DITCH	LEFT	N/A
0.307	0.307	SIGN	RIGHT	REGULATORY, DO NOT ENTER
0.320	0.320	INTERSECTION	LEFT	ROUTE 0202FZ (WILDERNESS ROAD CAMPGROUND LOOP F)
0.327	0.525	PAVED DITCH	LEFT	N/A
0.331	0.331	SIGN	LEFT	GUIDE, F
0.334	0.334	SIGN	RIGHT	GUIDE, GROUP CAMPING ONLY RESERVATIONS REQUIRED
0.384	0.384	SIGN	LEFT	GUIDE, G
0.421	0.421	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
0.422	0.422	SIGN	LEFT	GUIDE, GRAPHIC SIGN NO TEXT
0.438	0.438	INTERSECTION	RIGHT	ROUTE 0920 (GROUP CAMPING PARKING)
0.510	0.510	INTERSECTION	LEFT	ROUTE 0202FZ (WILDERNESS ROAD CAMPGROUND LOOP F)
0.521	0.521	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.542	0.542	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.548	0.548	INTERSECTION	LEFT	ROUTE 0202EZ (WILDERNESS ROAD CAMPGROUND LOOP E)
0.558	0.592	PAVED DITCH	RIGHT	N/A
0.562	0.593	PAVED DITCH	LEFT	N/A
0.594	0.594	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.620	0.632	PAVED DITCH	RIGHT	N/A
0.626	0.626	INTERSECTION	LEFT	ROUTE 0202DZ (WILDERNESS ROAD CAMPGROUND LOOP D)
0.627	0.627	SIGN	RIGHT	GUIDE, DUMPSTER
0.630	0.630	SIGN	RIGHT	REGULATORY, ONE WAY
0.635	0.635	SIGN	RIGHT	GUIDE, GIBSON GAP TRAIL TRAIL MISCHA MOKWA SCOUT ADVENTURE TRAIL RIDGE TRAIL HEASLEY SETTLEMENT
0.645	0.645	INTERSECTION	RIGHT	ROUTE 0929 (AMPHITHEATER BUS PARKING)

CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0202GZ: WILDERNESS ROAD CAMPGROUND LOOP G

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.654	0.661	PAVED DITCH	RIGHT	N/A
0.663	0.663	SIGN	RIGHT	GUIDE, GRAPHIC SIGN NO TEXT
0.665	0.665	INTERSECTION	RIGHT	ROUTE 0921 (AMPHITHEATER HANDICAPPED PARKING)
0.669	0.726	PAVED DITCH	RIGHT	N/A
0.677	0.677	SIGN	RIGHT	REGULATORY, ONE WAY
0.678	0.678	INTERSECTION	LEFT	ROUTE 0202CZ (WILDERNESS ROAD CAMPGROUND LOOP C)
0.679	0.687	PAVED DITCH	LEFT	N/A
0.705	0.705	INTERSECTION	LEFT	ROUTE 0202BZ (WILDERNESS ROAD CAMPGROUND LOOP B)
0.706	0.743	PAVED DITCH	LEFT	N/A
0.708	0.708	SIGN	RIGHT	REGULATORY, ONE WAY
0.722	0.722	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.725	0.725	SIGN	RIGHT	GUIDE, DUMPSTER
0.752	0.752	INTERSECTION	LEFT	ROUTE 0202AZ (WILDERNESS ROAD CAMPGROUND LOOP A)
0.753	0.776	PAVED DITCH	LEFT	N/A
0.765	0.765	INTERSECTION	LEFT	PAVED SPUR
0.779	0.779	SIGN	RIGHT	GUIDE, LEWIS HOLLOW TRAIL
0.791	0.791	INTERSECTION	LEFT	ROUTE 0202GZ (WILDERNESS ROAD CAMPGROUND LOOP G)
0.791	0.791	INTERSECTION	N/A	ROUTE 0105 (WILDERNESS CAMPGROUND ACCESS ROAD)
0.791	0.791	ROUTE END	N/A	TO END OF LOOP

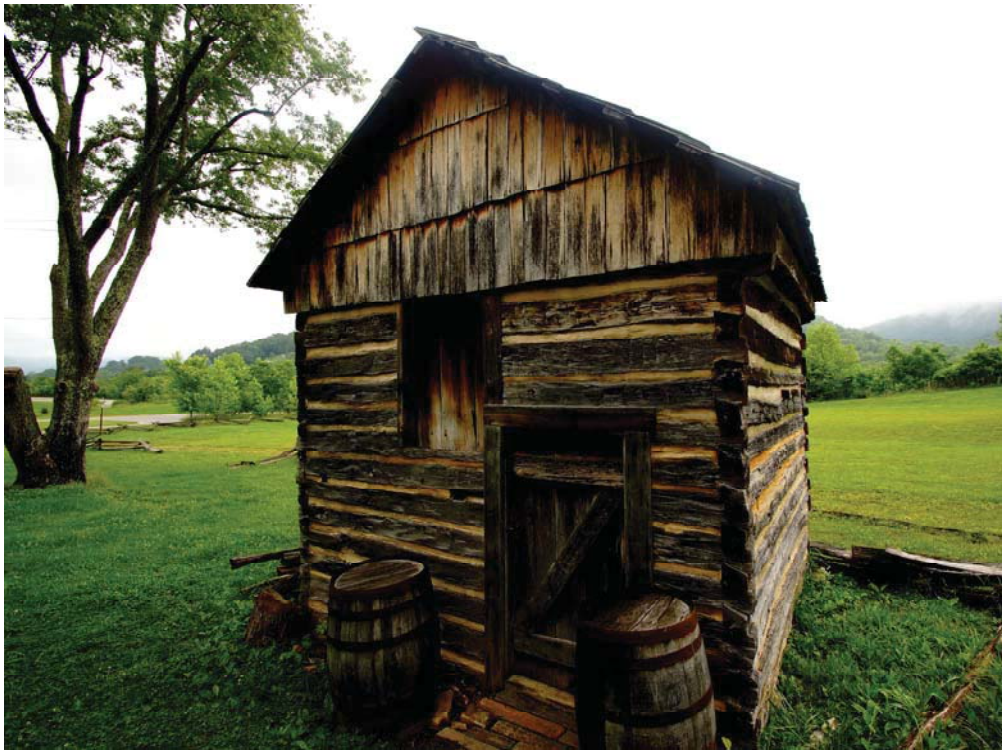
CUGA: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0203: ENTRANCE ROAD AT TWCP

Notice: Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on any new or re-aligned DCV driven routes. Therefore no culverts or drop inlets are reported in Section 9, unless a culvert has a BIP structure number attached to it.

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM STATE ROUTE 724 / PARK BOUNDARY
0.000	0.000	INTERSECTION	N/A	PAVED ROUTE (STATE ROUTE 724 / NON NPS)
0.000	0.000	INTERSECTION	RIGHT	PAVED ROUTE (STATE ROUTE 724 / NON NPS)
0.000	0.000	PARK BOUNDARY	N/A	N/A
0.005	0.005	SIGN	LEFT	GUIDE, SAND CAVE RD
0.005	0.005	SIGN	LEFT	GUIDE, SAND CAVE RD
0.005	0.005	SIGN	LEFT	GUIDE, CIVITAN PARK RD
0.060	0.060	INTERSECTION	LEFT	ROUTE 0927BZ (TWCP PARKING B)
0.072	0.072	SIGN	LEFT	GUIDE, GATE CLOSES AT DARK
0.075	0.075	GATE	N/A	N/A
0.076	0.076	SIGN	LEFT	GUIDE, THOMAS WALKER CIVIC PARK AREA
0.079	0.079	SIGN	RIGHT	GUIDE, NO HORSES
0.079	0.079	SIGN	RIGHT	GUIDE, NO CAMPING
0.132	0.132	INTERSECTION	LEFT	UNPAVED PARKING
0.148	0.148	INTERSECTION	LEFT	UNPAVED PARKING
0.189	0.189	INTERSECTION	N/A	ROUTE 0927AZ (TWCP PARKING A)
0.189	0.189	ROUTE END	N/A	TO ROUTE 0927ZZ (TWCP PARKING AREAS)

Section 10
Appendix



Cumberland Gap
National Historical 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 in relation to the distresses and indexes that comprise the Pavement Condition Rating (PCR), an extensive study was completed throughout 2010 that 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.

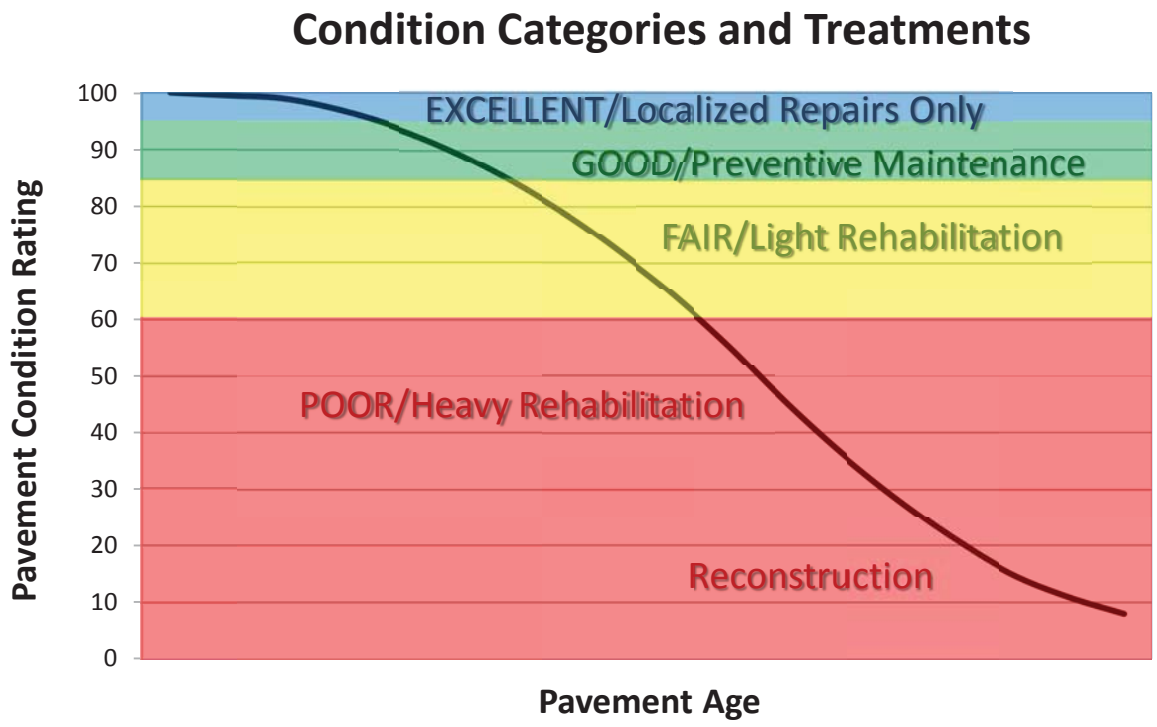
The changes that were implemented were endorsed by management at both the FHWA and NPS. In order to show the effectiveness of these changes, several sites were ground truth tested to ensure that an improvement was achieved between the relationship of PCR and the actual Maintenance and Rehabilitation needs that were represented. 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.

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

In addition to the RIP Index changes that were implemented in Cycle 5, we will 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.

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.



DESCRIPTION OF RATING SYSTEM

The Federal Highway Administration (FHWA), National Park Service Road Inventory Program (NPS-RIP), collects condition data on paved roads, parkways, and parking areas in park units nationwide. Road surface condition data is collected using an automated Data Collection Vehicle (DCV). Roads having brick, cobblestone, or wood surfaces are not normally surveyed with the DCV, but are manually rated for the purpose of assigning a condition rating. Unpaved roads, parkways, and parking areas are not currently being evaluated for condition. Paved campground pads and driveways are also not currently being evaluated for condition.

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 high 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. The FHWA RIP distress types are similar to those described in the LTPP manual with some modifications. The 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 NPS-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, 231 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:

Asphalt PCR = (0.60 * SCR) + (0.40 * RCI)
Concrete PCR = RCI

A detailed description of each distress index formula, roughness index formula, SCR and PCR is provided in this document beginning on page 8.

Each classified surface distress will fall into one or more s*everity*…LOW, MEDIUM, or HIGH based on criteria listed. For each severity, an e*xtent* 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 a patch may not exceed 0.30 mi. (0.48 km). Any full-lane width patch exceeding 0.30 mi. in length is considered a pavement change, not a patch for the purposes of distress analysis. 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:

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

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:

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

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

PATCH_INDEX = 100 – 40 * (%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:

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

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

RUT_INDEX = 100 – 40 * [(%LOW / 535) + (%MED / 205) + (%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:

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

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 (spin-type) to provide accurate positioning data (pitch/roll/heading) 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	+- 0.5 degrees
Grade	+- 0.5 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. Paved campground pads and driveways are not typically included in the inventory or GPS.

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 tabular 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. The metadata portion of the geodatabase also includes data dictionary report functionality that formats the metadata into an easy to read report.

GLOSSARY OF TERMS AND ABBREVIATIONS

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
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