



# Federal Lands Highway Road Inventory Program

Road Inventory and Condition Assessment

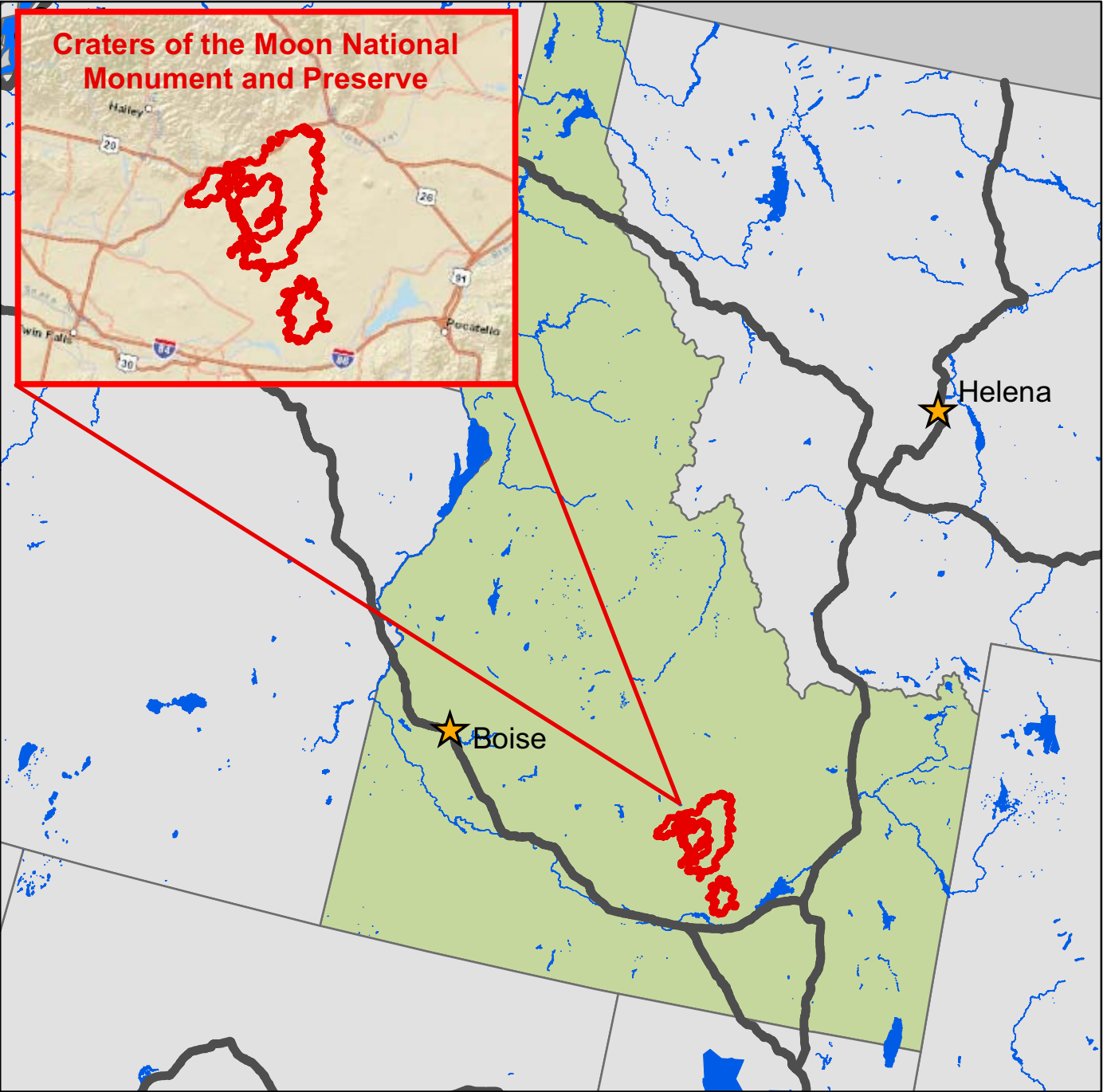


## Craters of the Moon National Monument and Preserve CRMO - 9280

### Cycle 5 Report

Prepared By: Federal Highway Administration  
Road Inventory Program (RIP)  
Data Collection Date: 10/2010  
Report Date: 02/2012

# Craters of the Moon National Monument and Preserve in Idaho





DCV = Data Collection Vehicle

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# Section 1 Introduction



## Craters of the Moon National Monument and Preserve



Federal Lands Highway  
Road Inventory Program



## INTRODUCTION

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

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

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

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

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

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

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

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

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

In 1998, the Transportation Equity Act for the 21<sup>st</sup> 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



## Craters of the Moon National Monument and Preserve



Federal Lands Highway  
Road Inventory Program

# Cycle 5 NPS/RIP Route ID Report

Road Inventory Program 02/15/2012

(Numerical By Route #)

Page 1 of 4

Shading Color Key:

White = Paved Routes, DCV Driven

Yellow = Unpaved Routes, DCV not Driven

Blue = All Paved Parking Areas

Green = All Unpaved Parking Areas

Red text denotes approx. mileage

Grey = Paved Routes, DCV not Driven

Black = State, Local or Private non-NPS Routes

■ = Concession Route Flag ON

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

\*\* DCV - Data Collection Vehicle NC - Not Collected

## CRMO

### CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0010	5	69351		ENTRANCE ROAD	FROM ROUTE 5000 (U.S. HIGHWAY 26/93/20) TO BEGINNING OF ROUTE 0102 (SCENIC LOOP DRIVE)	N/A	1.93	0.00	1.93	1	0	AS	1,2
0100	5	98479		DEVIL'S ORCHARD ROAD	FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.26 TO ROUTE 0906 (DEVIL'S ORCHARD PARKING)	N/A	0.28	0.00	0.28	2	30,603	AS	2
0101	5	98480		TREE MOLDS ROAD	FROM ROUTE 0102 (SCENIC LOOP DRIVE) ON RIGHT TO ROUTE 0911 (TREE MOLDS PARKING)	N/A	1.19	0.00	1.19	2	125,664	AS	2
0102	5	98481		SCENIC LOOP DRIVE	FROM END OF ROUTE 0010 (ENTRANCE ROAD) TO END OF LOOP	N/A	2.79	0.00	2.79	2	0	AS	2
0103	5	98482		SPATTER CONE ROAD	FROM ROUTE 0102 (SCENIC LOOP DRIVE) ON RIGHT AT MP 0.95 TO ROUTE 0908 (SPATTER CONE PARKING)	N/A	0.10	0.00	0.10	2	0	AS	2
0104	5	98483		CAVES TRAIL ROAD	FROM ROUTE 0102 (SCENIC LOOP DRIVE) ON RIGHT AT MP 2.30 TO ROUTE 0912 (CAVES PARKING)	N/A	0.08	0.00	0.08	2	0	AS	2
0200ZZ	5	98485		CAMPGROUND ROADS	FROM ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT 0.335 THROUGH CAMPGROUND	N/A	0.53	0.00	0.53	3	6,574	AS	1
0207	NC	69357		NORTH END ROADS	FROM ROUTE 5000 (U.S. HIGHWAY 26/93/20) THROUGH NORTH END ROADS	N/A	0.00	13.82	13.82	4	0	GR	
0401	NC	98500		BONE YARD ROAD	FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.38 TO END	N/A	0.00	0.27	0.27	5	0	GR	
0405	5	98506		EMPLOYEE HOUSING	FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.15 TO ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.213	N/A	0.11	0.00	0.11	5	0	AS	1
0900	5	98507		EAST VISITOR CENTER PARKING	FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.032 TO ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.076	N/A	0.00	0.00	0.00		13,916	AS	1
0901	5	98508		WEST VISITOR CENTER PARKING	FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.122 TO ROUTE 0405 (EMPLOYEE HOUSING)	N/A	0.00	0.00	0.00		16,213	AS	1
0902	5	98509		ADMINISTRATIVE PARKING	FROM ROUTE 0405 (EMPLOYEE HOUSING) TO PARKING	N/A	0.00	0.00	0.00		15,692	AS	1
0903	5	98510		NORTH CRATER FLOW TRAIL PARKING	FROM ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT MP 0.691 TO ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT MP 0.750	N/A	0.00	0.00	0.00		16,708	AS	1

# Cycle 5 NPS/RIP Route ID Report

Road Inventory Program 02/15/2012

(Numerical By Route #)

Shading Color Key:

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

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

Green = All Unpaved Parking Areas
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Red text denotes approx. mileage

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

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## CRMO

### CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0904	5	98511		NORTH CRATER TRAIL PARKING	ADJACENT TO ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT MP 0.816	N/A	0.00	0.00	0.00		7,705	AS	1
0905	5	98512		OLD MAN PULLOUT	ADJACENT TO ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 1.570	N/A	0.00	0.00	0.00		5,510	AS	2
0906	5	98513		DEVILS ORCHARD PARKING	FROM END OF ROUTE 0100 (DEVIL'S ORCHARD ROAD) TO PARKING	N/A	0.00	0.00	0.00		15,260	AS	2
0907	5	98514		INFERNO CONE PARKING	FROM ROUTE 0102 (SCENIC LOOP DRIVE) ON LEFT AT 0.798 TO ROUTE 0102 (SCENIC LOOP DRIVE) ON LEFT AT 0.842	N/A	0.00	0.00	0.00		10,475	AS	2
0908	5	98515		SPATTER CONE PARKING	FROM END OF ROUTE 0103 (SPATTER CONE ROAD) TO PARKING	N/A	0.00	0.00	0.00		17,162	AS	2
0911	5	98518		TREE MOLDS PARKING	FROM END OF ROUTE 0101 (TREE MOLDS ROAD) TO PARKING	N/A	0.00	0.00	0.00		18,915	AS	2
0912	5	98519		CAVES PARKING	FROM END OF ROUTE 0104 (CAVES TRAIL ROAD) TO PARKING	N/A	0.00	0.00	0.00		39,021	AS	2
0914ZZ	5	98521		RESIDENTIAL PARKING AREAS	ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON LEFT AND RIGHT	N/A	0.00	0.00	0.00		4,008	AS	1
5000	5			U.S. HIGHWAY 26/93/20	FROM PARK SIGN HEADING WEST TO PARK SIGN (FACING EASTBOUND TRAFFIC)	N/A	20.15	0.00	20.15		0	AS	1,3



# Cycle 5 NPS/RIP Route ID Report

Shading Color Key:  
 Red text denotes  
 approx. mileage

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Grey = Paved Routes, DCV not Driven

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

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

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## CYCLE 5 SUMMARY TOTALS FOR CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

<b>CYCLE 5 ROUTE TOTALS</b>	
DCV Driven Route Miles	5.43
Manually Rated Route Miles	1.58
<b>TOTAL PARK ROUTE MILES COLLECTED IN CYCLE 5</b>	<b>7.01</b>
Manually Rated Routes (SQFT)	162,841
<b>TOTAL UNPAVED PARK ROUTE MILES</b>	<b>14.09</b>

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

<b>* CYCLE 5 PARKING AREA TOTALS</b>	
Paved Parking (SQFT)	180,585
Unpaved Parking (SQFT)	0
<b>TOTAL PARKING (SQFT)</b>	<b>180,585</b>

<b>CYCLE 5 WEIGHTED AVERAGE PARK VALUES</b>	
DCV Driven PCR	93
**Manually Rated Routes PCR	73
**Parking PCR	81
<b>***Total Equivalent Lane Miles</b>	<b>14.96</b>

\* - 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

Road Inventory Program 02/15/2012

(Numerical By Route #)

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Shading Color Key:

White = Paved Routes, DCV Driven

Yellow = Unpaved Routes, DCV not Driven

Blue = All Paved Parking Areas

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Black = State, Local or Private non-NPS Routes

= Concession Route Flag ON

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## General Park Road Functional Classification Table

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

\*\*\*\*\*

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

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

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

## Surface Type Abbreviations:

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

# NPS/RIP Subcomponent Details for CRMO

Road Inventory Program 02/15/2012

(Numerical By Subcomponent #)

Page 1 of 2

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White = Paved Routes, DCV Driven

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## CRMO

### CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

#### Asset Entered in FMSS System

Rte. No.	FMSS No.	Cycle Collected	Route Description		Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
			Route Name	From To						
0200ZZ	98485	5	CAMPGROUND ROADS	FROM ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT 0.335 THROUGH CAMPGROUND		3	0.53	0.00	0.53	6,574
0914ZZ	98521	5	RESIDENTIAL PARKING AREAS	ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON LEFT AND RIGHT			0.00	0.00	0.00	4,008

#### Asset CRMO-0200ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Description		Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
			Route Name	From To						
0200Z	98485	5	CAMPGROUND ENTRANCE ROAD	FROM ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT 0.33 TO END OF LOOP		3	0.23	0.00	0.23	0
0201Z	98485	5	CAMPSITE ACCESS ROAD	FROM ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) ON LEFT AT MP 0.067 TO ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) ON LEFT AT MP 0.090		3	0.02	0.00	0.02	1,521
0202Z	98485	5	CAMPGROUND EXIT ROAD	FROM INTERSECTION OF ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) AND ROUTE 0201Z (CAMPSITE ACCESS ROAD) TO ROUTE 0010 (ENTRANCE ROAD)		3	0.05	0.00	0.05	2,730
0204Z	98485	5	CAMPGROUND LOOPS A/B	FROM ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) ON RIGHT TO END OF LOOP		3	0.18	0.00	0.18	0
0206Z	98485	5	CAMPGROUND LOOP	FROM ROUTE 0204Z (CAMPGROUND LOOPS A/B) ON LEFT AT 0.045 TO END OF LOOP		3	0.04	0.00	0.04	2,323

# NPS/RIP Subcomponent Details for CRMO

Road Inventory Program 02/15/2012

(Numerical By Subcomponent #)

Page 2 of 2

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Black = State, Local or Private non-NPS Routes

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## CRMO

### CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

#### Asset CRMO-0914ZZ 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
0914AZ	98521	5	RESIDENTIAL PARKING A	ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON LEFT AT MP 0.015					0.00	0.00	0.00	1,303
0914BZ	98521	5	RESIDENTIAL PARKING B	ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON RIGHT AT MP 0.016					0.00	0.00	0.00	414
0914CZ	98521	5	RESIDENTIAL PARKING C	ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON RIGHT AT MP 0.027					0.00	0.00	0.00	795
0914DZ	98521	5	RESIDENTIAL PARKING D	ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON RIGHT AT MP 0.052					0.00	0.00	0.00	1,496

**ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - CRMO**

**ROUTES ADDED FROM PREVIOUS INVENTORY:**

Route #	Route Name	Reason for Addition	Comments
5000	U.S. HIGHWAY 26/93/20	OTHER	ADDED TO THE INVENTORY IN CYCLE 5

**ROUTES MODIFIED FROM PREVIOUS INVENTORY:**

Route #	Route Name	Type of Modification	Comments
0900	EAST VISITOR CENTER PARKING	SQ FEET CHANGE	MINOR ADJUSTMENT MADE TO SHAPE TO REFLECT PARKING LOT GEOMETRY ACCURATELY
0905	OLD MAN PULLOUT	SQ FEET CHANGE	MINOR ADJUSTMENT MADE TO SHAPE TO REFLECT PARKING LOT GEOMETRY ACCURATELY
0907	INFERNO CONE PARKING	SQ FEET CHANGE	MINOR ADJUSTMENT MADE TO SHAPE TO REFLECT PARKING LOT GEOMETRY ACCURATELY
0914ZZ	RESIDENTIAL PARKING AREAS	RECONSTRUCTED	NEW SECTIONS OF PARKING WERE CONSTRUCTED AFTER THE CYCLE 3 COLLECTION. THEY WERE COLLECTED AND COMBINED WITH THE ORIGINAL ROUTE 0914, NOW CALLED 0914ZZ IN CYCLE 5

**OTHER CHANGES FROM PREVIOUS INVENTORY:**

Route #	Route Name	Type of Change	Comments
0200ZZ	CAMPGROUND ROADS	ROUTES COMBINED	CYCLE 3 ROUTES 0200-0206 WERE COMBINED INTO 0200ZZ DURING THE CYCLE 5 ROUTE ID MEETING. SUBCOMPONENT ROUTES 0201Z, 0202Z AND 0206Z WERE COLLECTED WITH THE VEHICLE IN CYCLE 3 BUT WERE MAUALLY RATED IN CYCLE 5 BECAUSE OF SHORT LENGTH.



**ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - CRMO**

<b>ROUTES REMOVED FROM PREVIOUS INVENTORY:</b>			
<b>Route #</b>	<b>Route Name</b>	<b>Reason for Removal</b>	<b>Comments</b>
0909	LAVA CASCADES PULL-OUT	OTHER	DELETED PER PARK STAFF REQUEST IN CYCLE 5 BECAUSE IT IS CONSIDERED A PULLOUT
0910	BIG SINK PULL-OUT	OTHER	DELETED PER PARK STAFF REQUEST IN CYCLE 5 BECAUSE IT IS CONSIDERED A PULLOUT
0913	CINDER GARDEN PULL-OUT	OTHER	DELETED PER PARK STAFF REQUEST IN CYCLE 5 BECAUSE IT IS CONSIDERED A PULLOUT
0915	HANDICAP CAMPSITE PARKING	OTHER	DELETED PER PARK REQUEST IN CYCLE 5 MEETING (HANDICAP PARKING FOR A CAMPING SITE PAD)

# Section 3

## Park Summary Information



## Craters of the Moon National Monument and Preserve



Federal Lands Highway  
Road Inventory Program

## CRMO: 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	3.32%	0.86	15.87%	0.89	16.42%	1.93
2	0.10	1.85%	0.28	5.17%	0.72	13.28%	1.87	34.50%	2.97
3	0.02	0.37%	0.20	3.69%	0.15	2.77%	0.04	0.74%	0.41
4									
5					0.03	0.55%	0.08	1.48%	0.11
6									
7									
8									
<b>Totals</b>	<b>0.12</b>	<b>2.21%</b>	<b>0.66</b>	<b>12.18%</b>	<b>1.76</b>	<b>32.47%</b>	<b>2.88</b>	<b>53.14%</b>	<b>5.42</b>

**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.

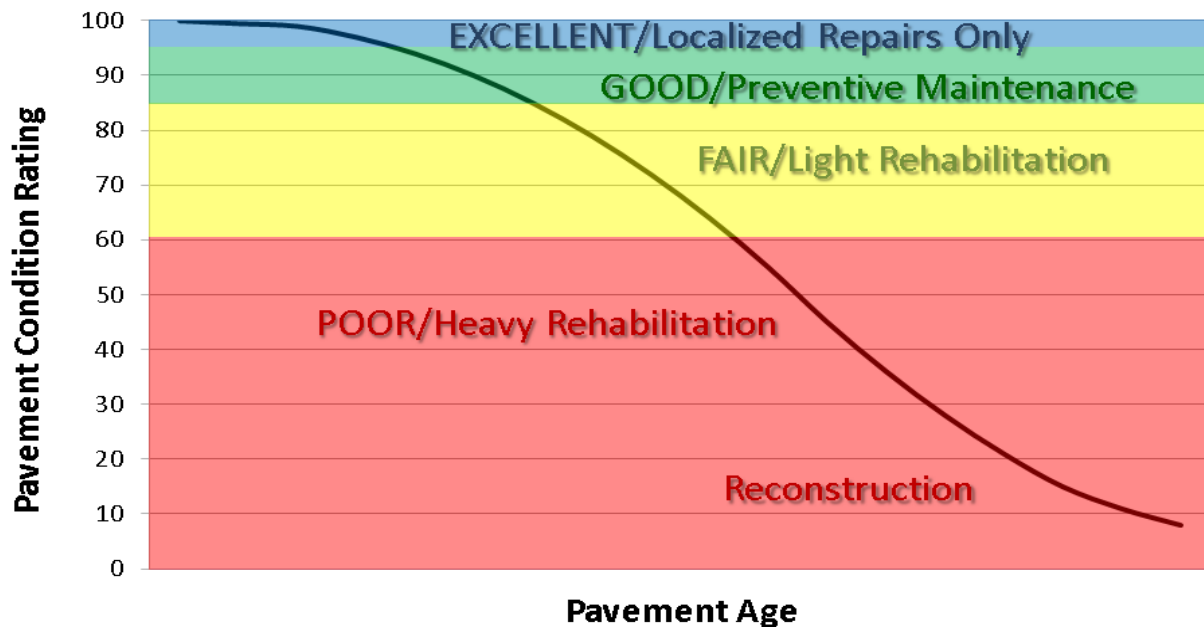
### Explanation of the Excellent, Good, Fair and Poor Condition Descriptions

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.

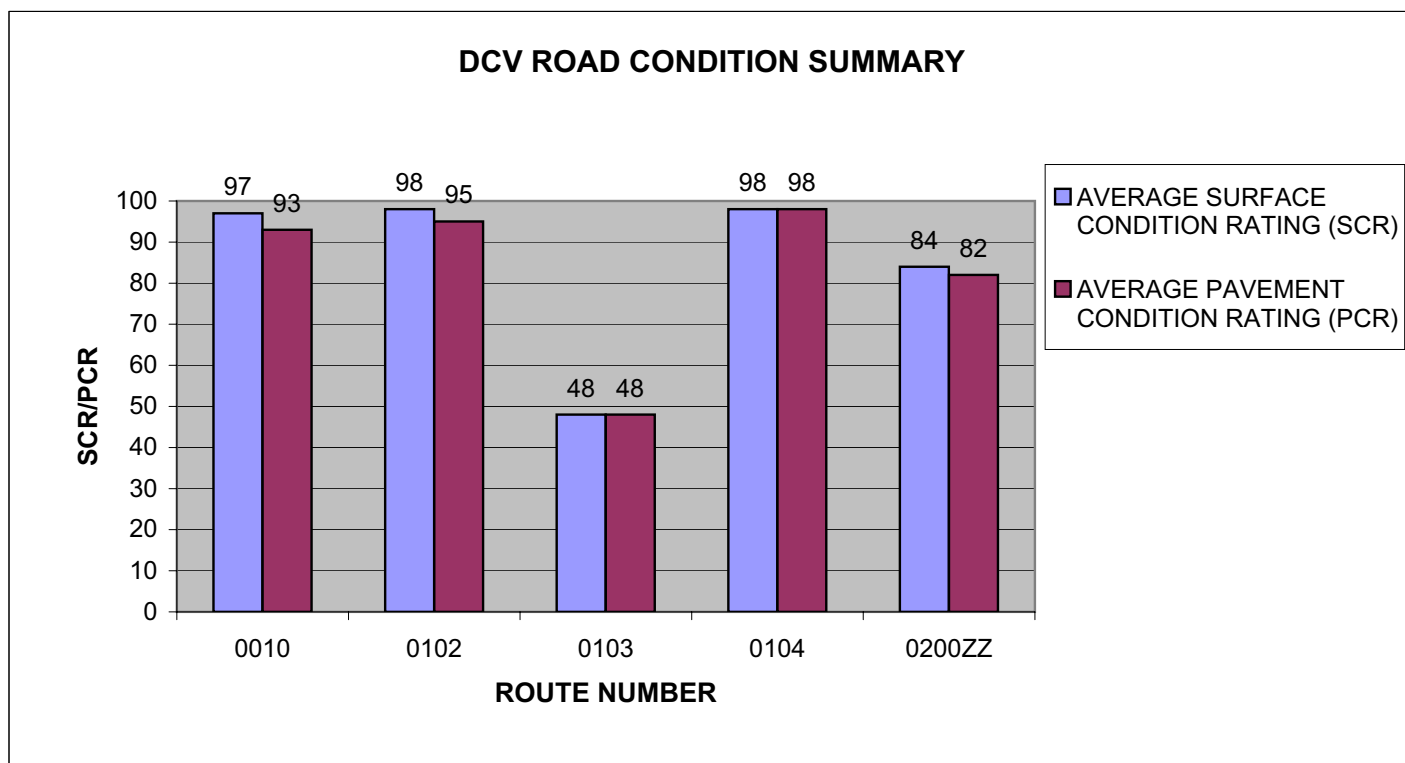
### Condition Categories and Treatments



# CRMO: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	ROUTE LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0010	ENTRANCE ROAD	1	1.93	ASPHALT	97	93
0102	SCENIC LOOP DRIVE	2	2.79	ASPHALT	98	95
0103	SPATTER CONE ROAD	2	0.10	ASPHALT	48	48
0104	CAVES TRAIL ROAD	2	0.08	ASPHALT	98	98
0200ZZ	CAMPGROUND ROADS	3	0.53	ASPHALT	84	82

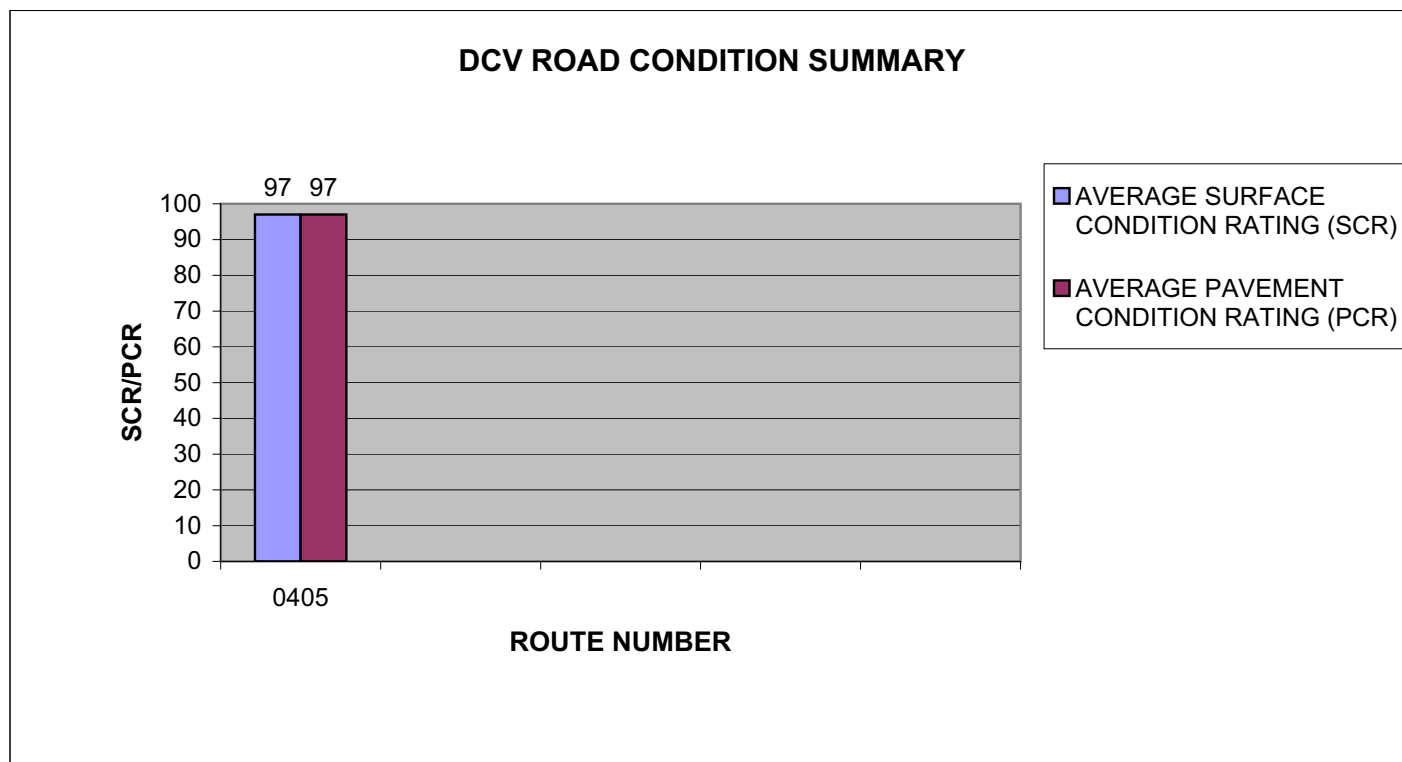




# CRMO: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

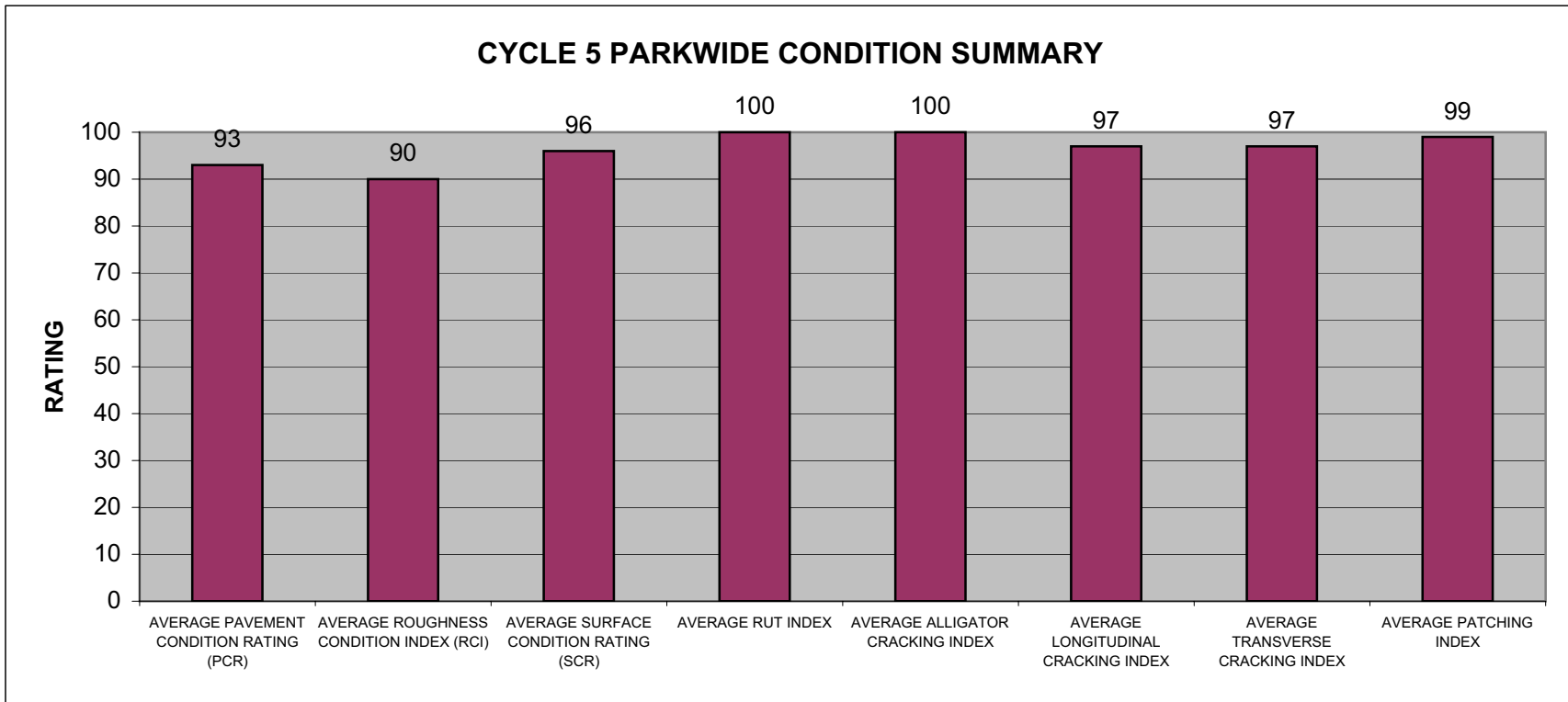
ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	ROUTE LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0405	EMPLOYEE HOUSING	5	0.11	ASPHALT	97	97



# CRMO: PARKWIDE DCV CONDITION SUMMARY

AVERAGE PAVEMENT CONDITION RATING (PCR)	AVERAGE ROUGHNESS CONDITION INDEX (RCI)	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE RUT INDEX	AVERAGE ALLIGATOR CRACKING INDEX	AVERAGE LONGITUDINAL CRACKING INDEX	AVERAGE TRANSVERSE CRACKING INDEX	AVERAGE PATCHING INDEX
93	90	96	100	100	97	97	99

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



# Section 4

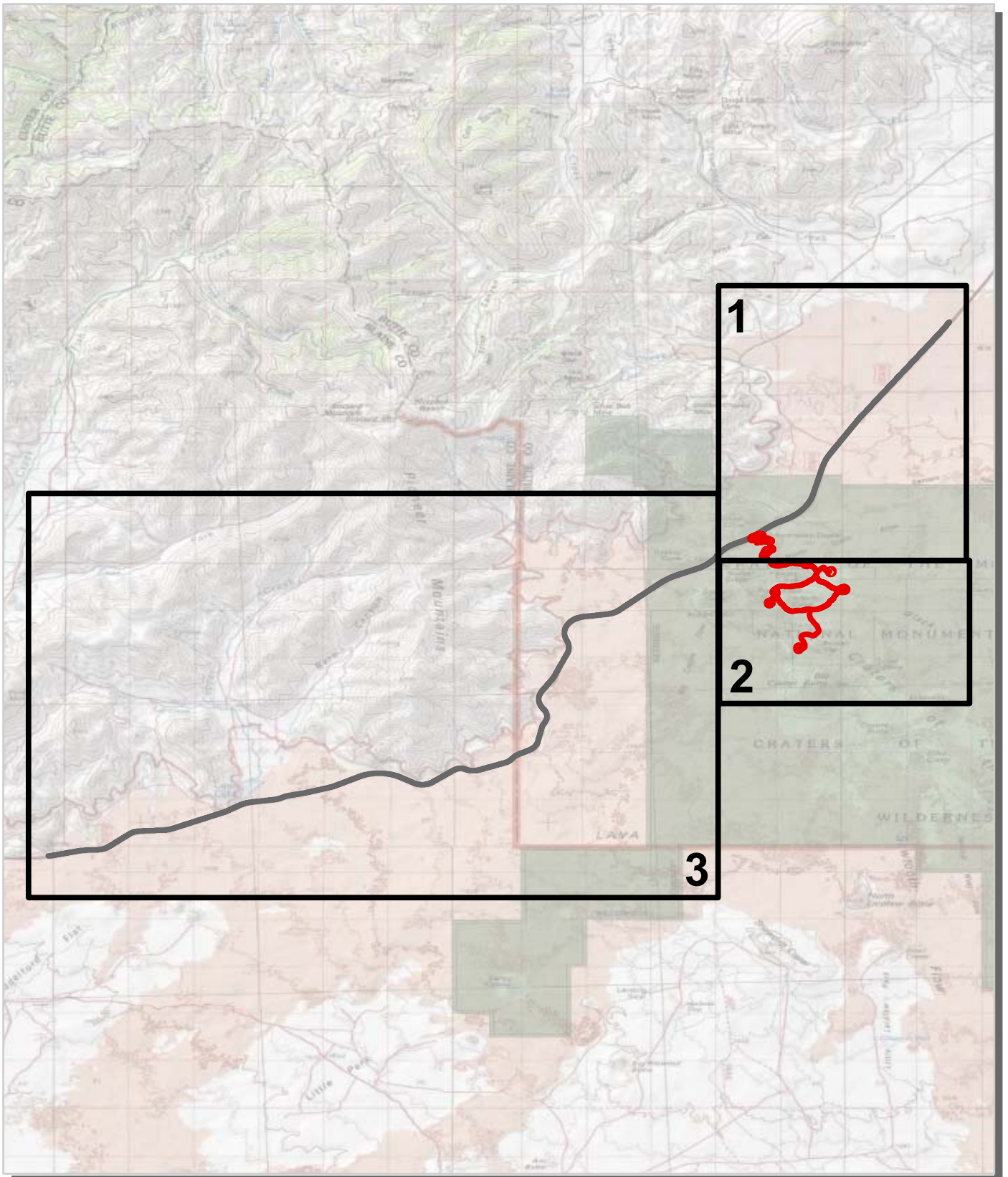
## Park Route Location Maps




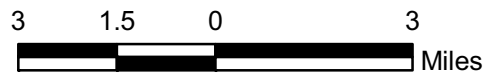
## Craters of the Moon National Monument and Preserve



**Craters of the Moon National Monument and Preserve  
Route Location Map  
Key Map**

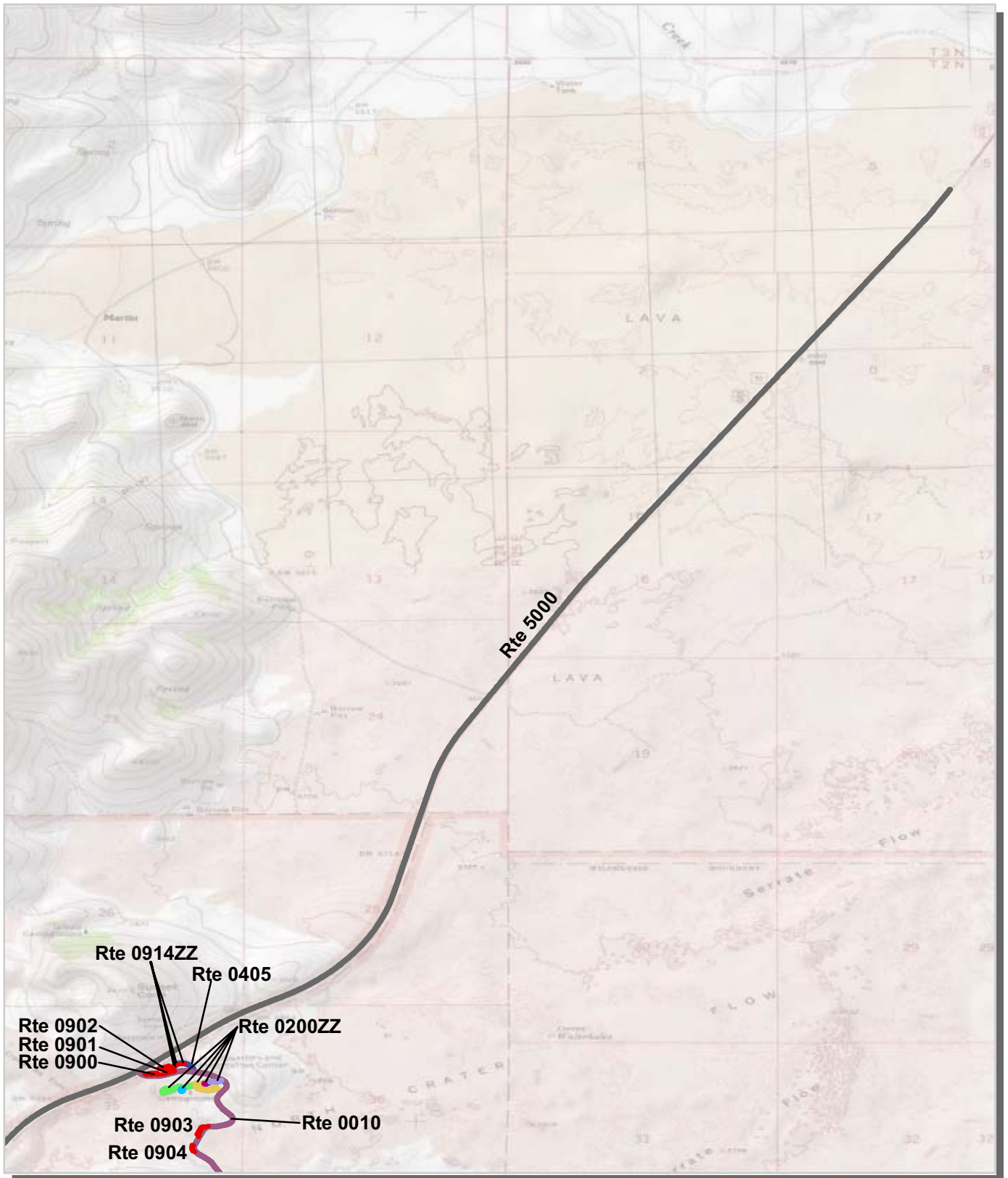


 Cycle 5 Collected Routes

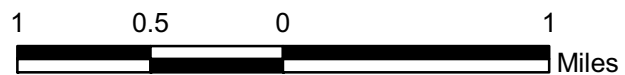




# Craters of the Moon National Monument and Preserve Route Location Map Area 1

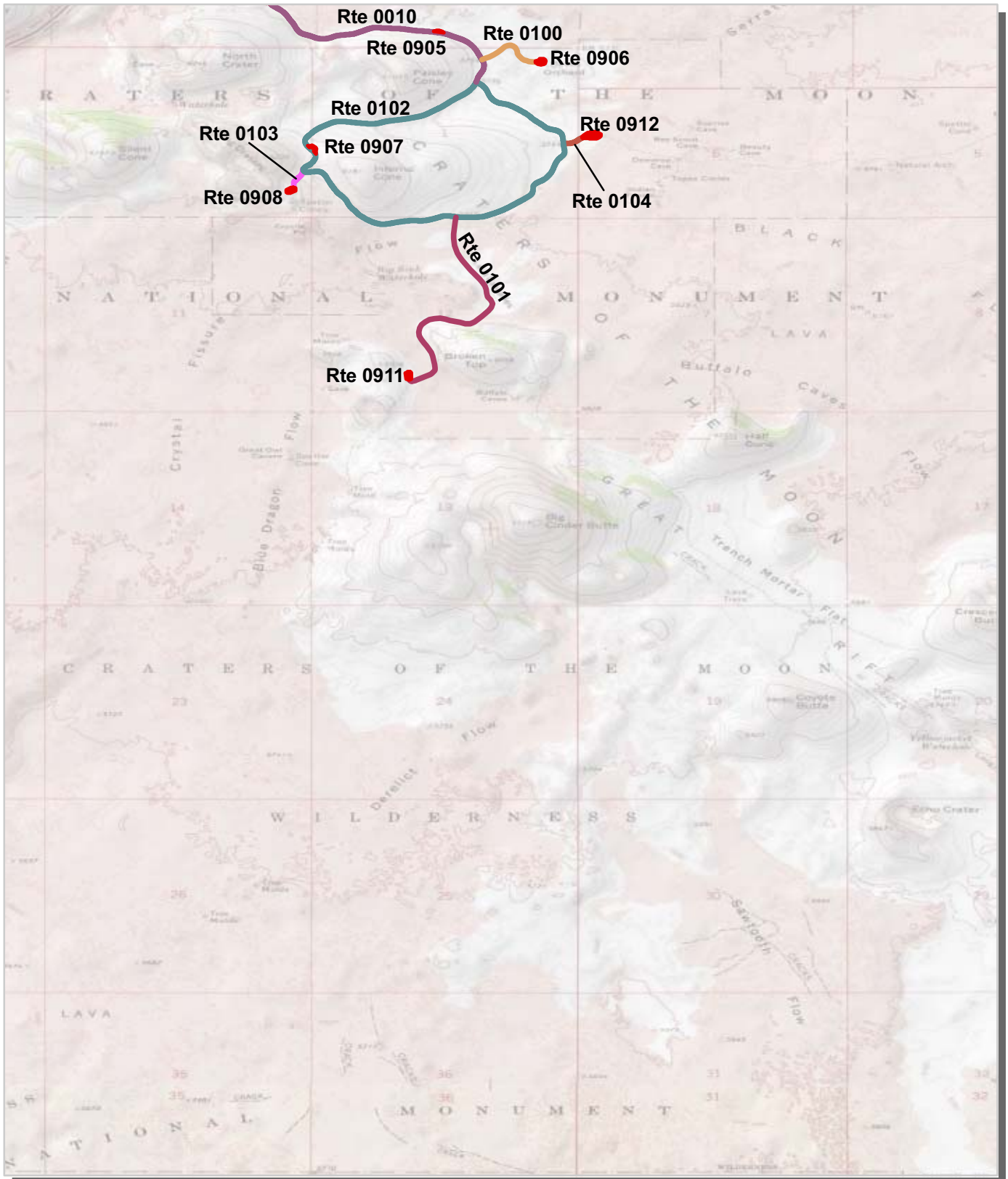


Unique colors used to differentiate routes

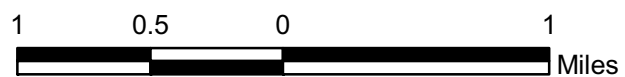




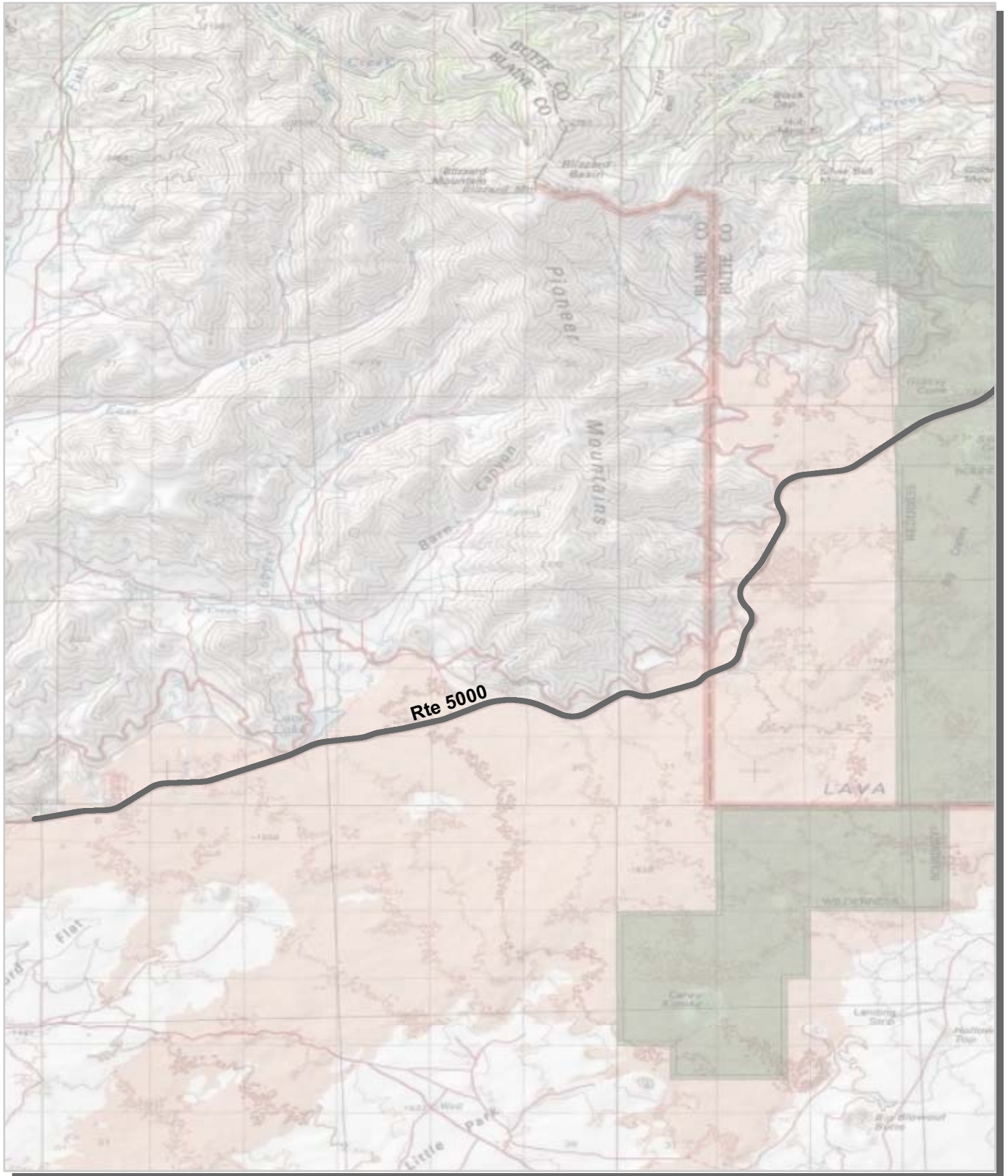
# Craters of the Moon National Monument and Preserve Route Location Map Area 2



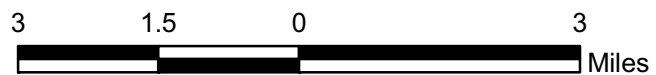
Unique colors used to differentiate routes



# Craters of the Moon National Monument and Preserve Route Location Map Area 3



Unique colors used to differentiate routes



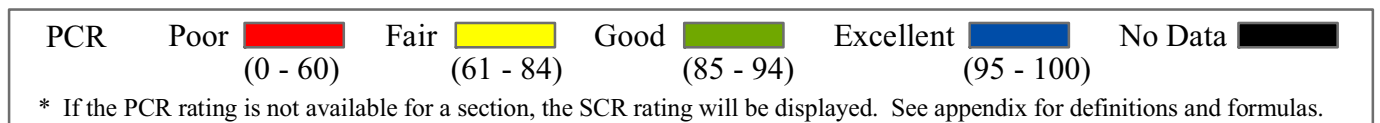
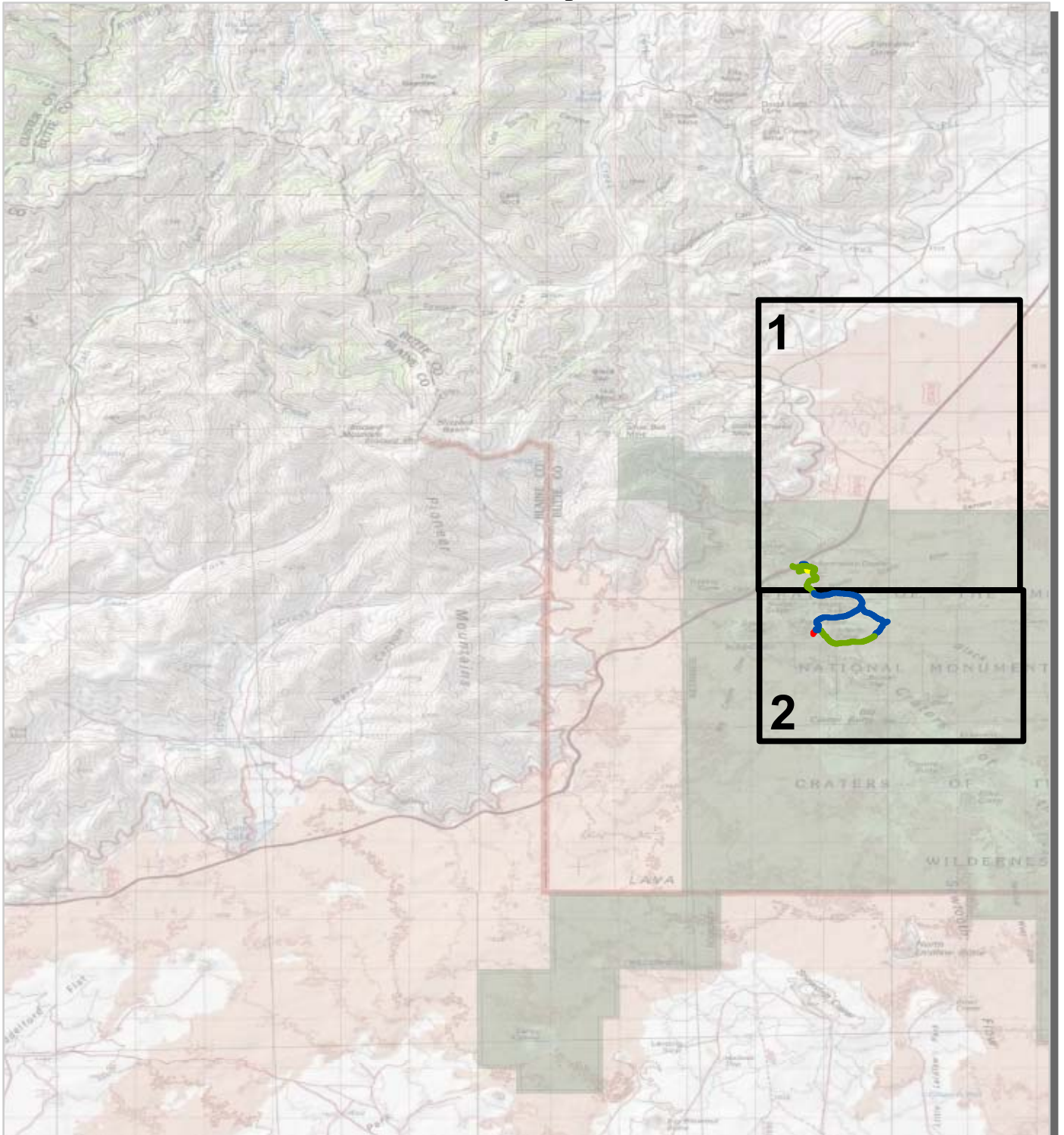


# Craters of the Moon National Monument and Preserve

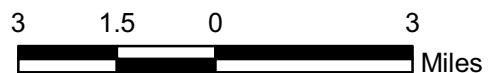
## Route Condition Map

### PCR - Mile by Mile

### Key Map



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

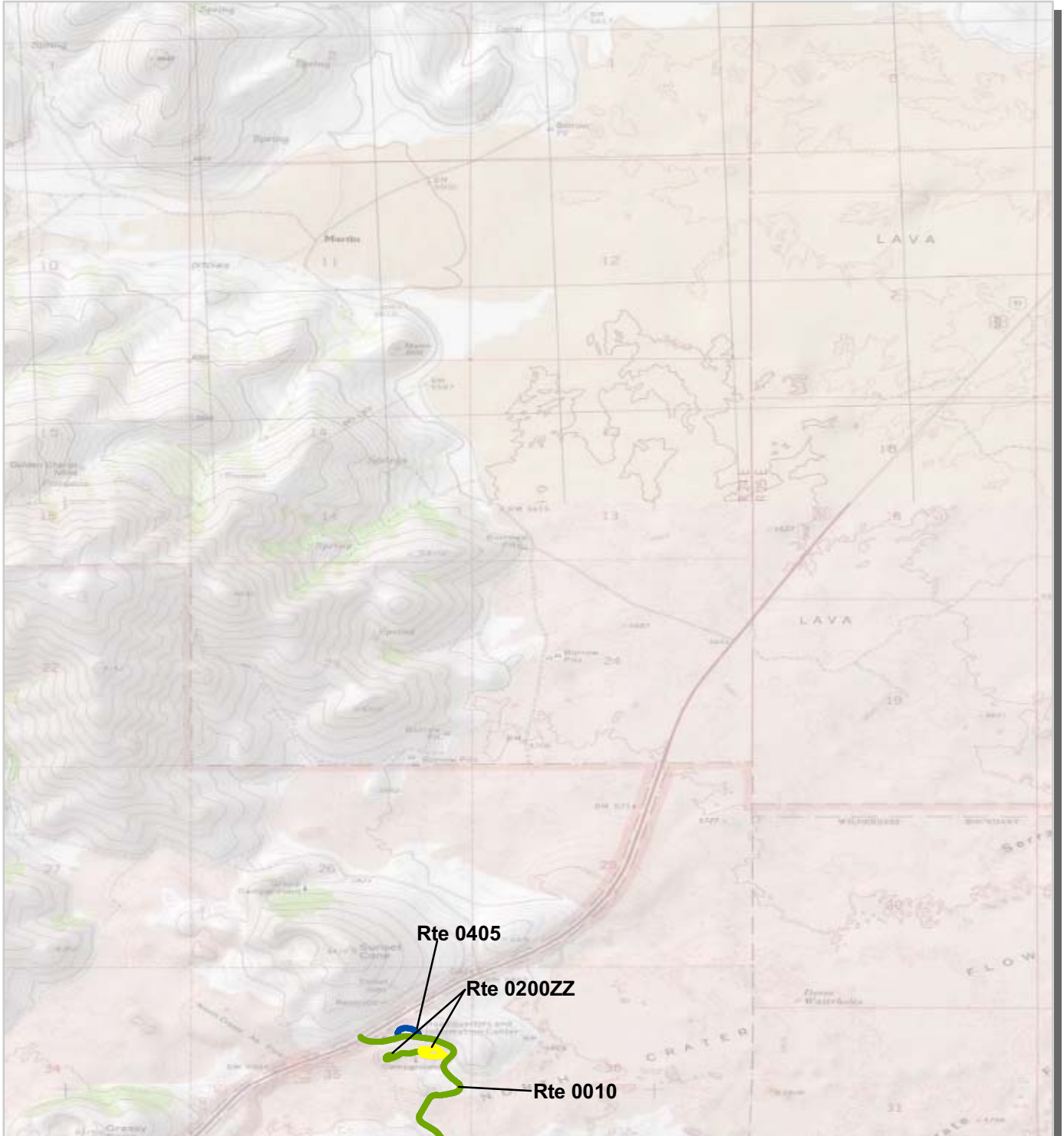


# Craters of the Moon National Monument and Preserve

## Route Condition Map

### PCR - Mile by Mile

#### Area 1



PCR	Poor	<span style="display: inline-block; width: 20px; height: 10px; background-color: red; border: 1px solid black;"></span>	Fair	<span style="display: inline-block; width: 20px; height: 10px; background-color: yellow; border: 1px solid black;"></span>	Good	<span style="display: inline-block; width: 20px; height: 10px; background-color: green; border: 1px solid black;"></span>	Excellent	<span style="display: inline-block; width: 20px; height: 10px; background-color: blue; border: 1px solid black;"></span>	No Data	<span style="display: inline-block; width: 20px; height: 10px; background-color: black; border: 1px solid black;"></span>
	(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.

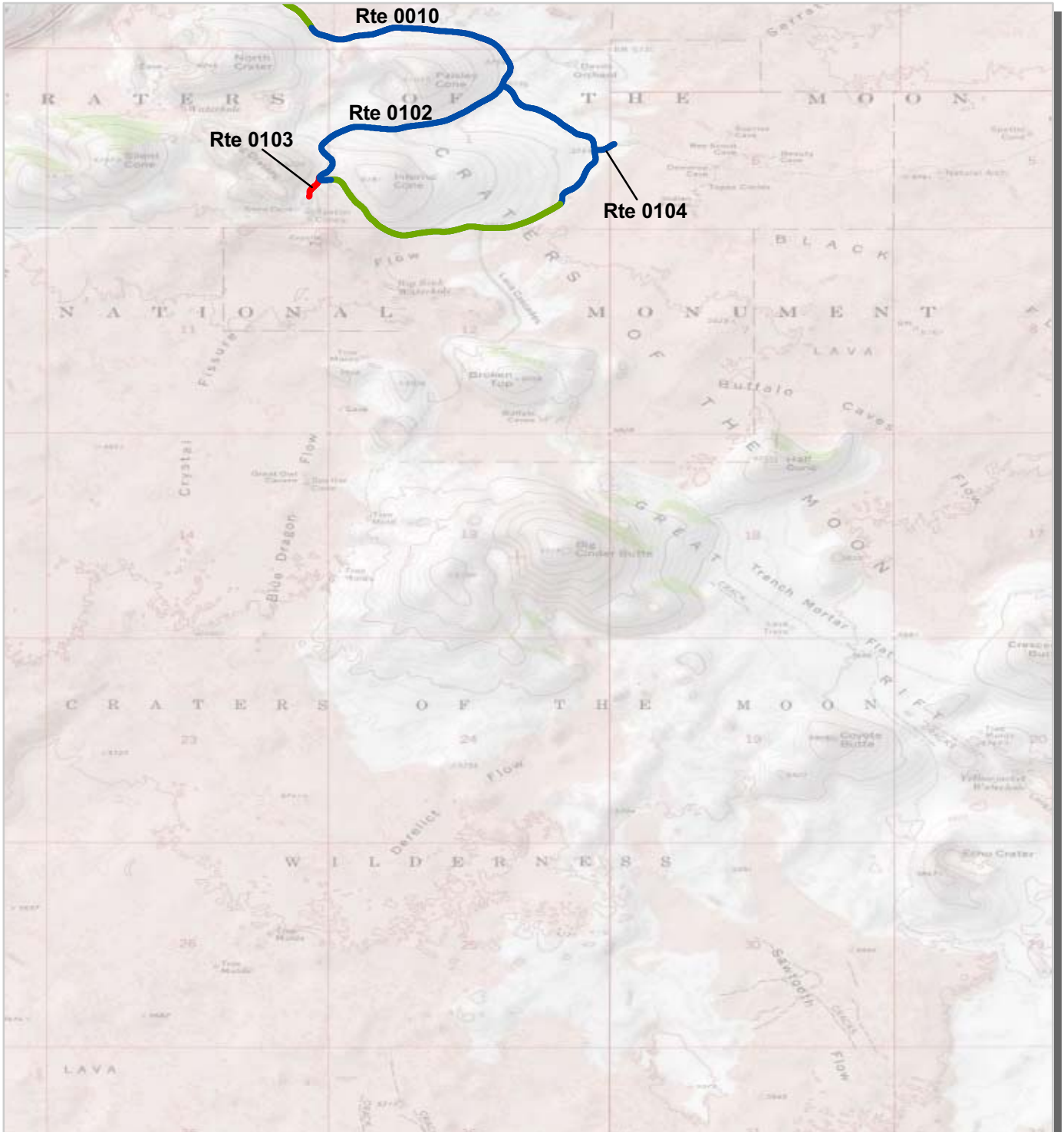


# Craters of the Moon National Monument and Preserve

## Route Condition Map

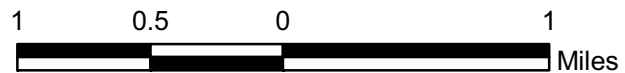
### PCR - Mile by Mile

#### Area 2



PCR	Poor	<span style="color: red;">■</span>	Fair	<span style="color: yellow;">■</span>	Good	<span style="color: green;">■</span>	Excellent	<span style="color: blue;">■</span>	No Data	<span style="color: black;">■</span>
	(0 - 60)		(61 - 84)		(85 - 94)		(95 - 100)			

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





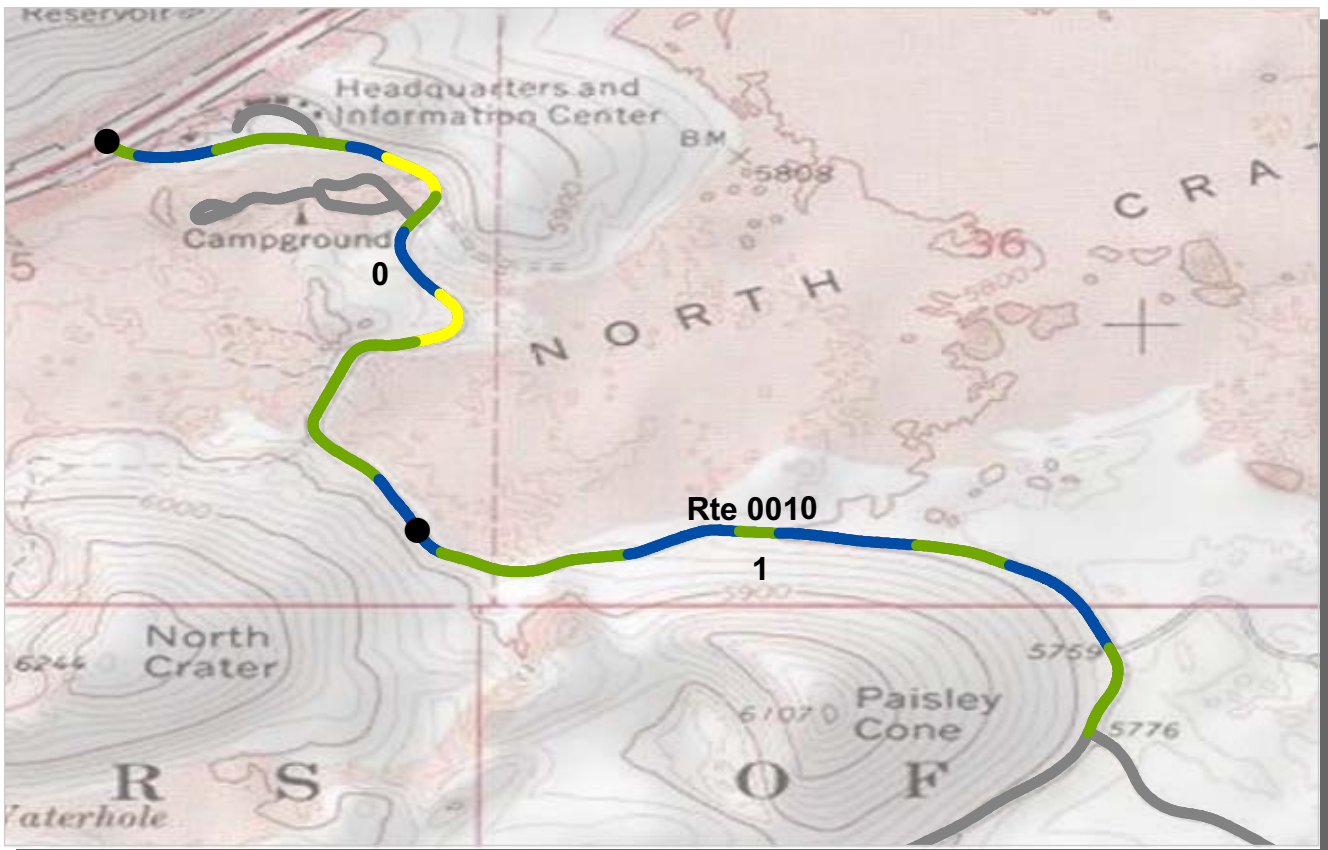
**Section 5**  
**Paved Route**  
**Condition Rating Sheets**



Craters of the Moon National  
Monument and Preserve



Federal Lands Highway  
Road Inventory Program



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

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

**ROUTE: 0010 ENTRANCE ROAD**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 1.93 Miles**

<i>Section Number</i>	0	1			
<i>Section Length (mi)</i>	1.00	0.93			
<i>Cross Section Information</i>					
Number of Lanes	2	2			
Paved Width (ft)	23	22			
Lane Width (ft)	11	11			
<i>Roadway Condition Information</i>					
SCR (Surface Condition Rating)	97	97			
PCR (Pavement Condition Rating)	92	95			
<i>Distress Index Values</i>					
Structural Crack Index	97	97			
Transverse Cracking Index	98	99			
Patching Index	100	100			
Rutting Index	100	100			
Roughness Condition Index (RCI)	84	92			

**NOTES:**

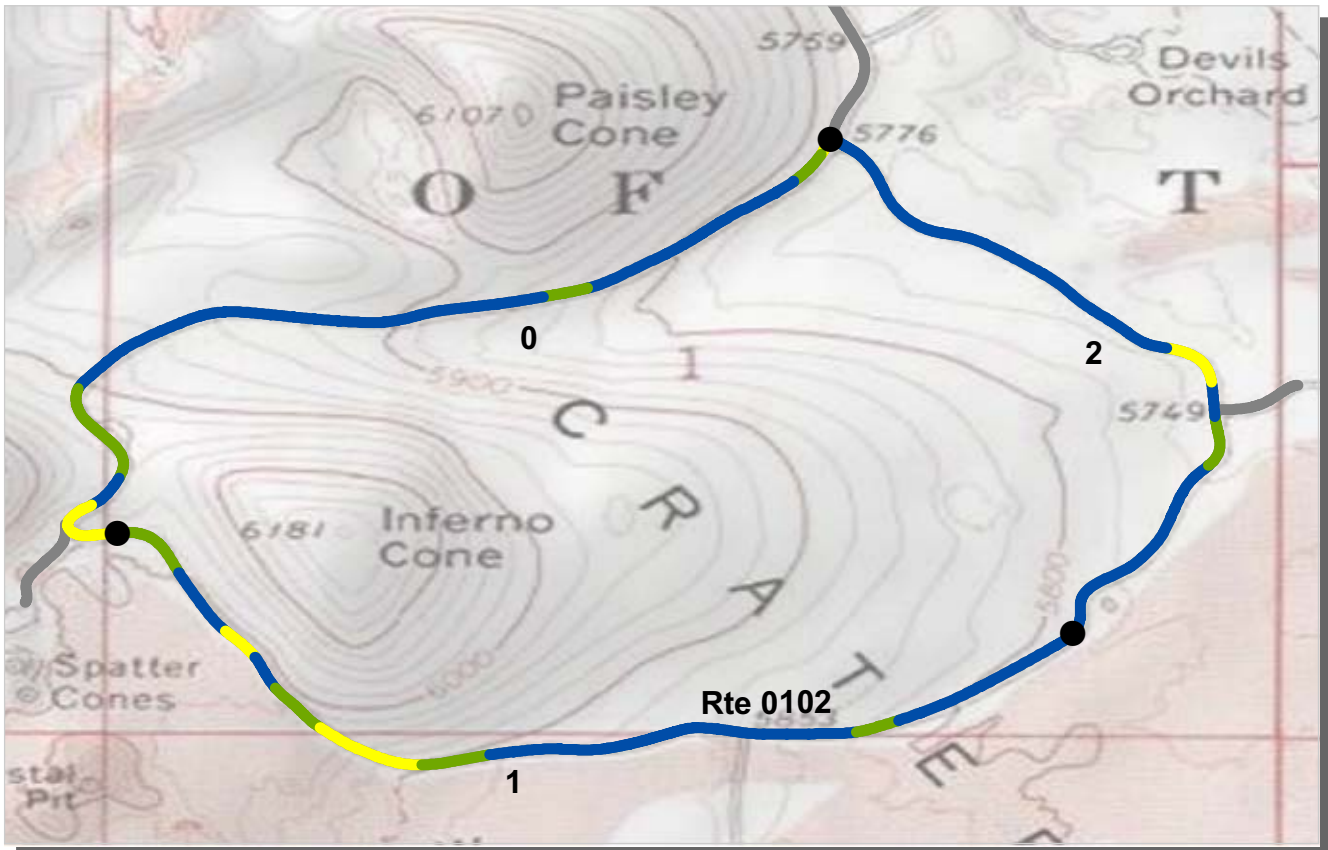
Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.

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

NC - Not Collected    N/A - Non Applicable

**ROUTE: 0010 ENTRANCE ROAD**





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: 0102 SCENIC LOOP DRIVE**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 2.79 Miles**

<i>Section Number</i>	0	1	2		
<i>Section Length (mi)</i>	1.00	1.00	0.79		
<i>Cross Section Information</i>					
Number of Lanes	1	1	1		
Paved Width (ft)	15	16	15		
Lane Width (ft)	15	16	15		
<i>Roadway Condition Information</i>					
SCR (Surface Condition Rating)	98	97	99		
PCR (Pavement Condition Rating)	96	94	96		
<i>Distress Index Values</i>					
Structural Crack Index	98	97	99		
Transverse Cracking Index	98	100	99		
Patching Index	100	100	100		
Rutting Index	100	100	100		
Roughness Condition Index (RCI)	93	89	92		

**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 - Non Applicable



**ROUTE: 0102 SCENIC LOOP DRIVE**



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

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

**ROUTE: 0103 SPATTER CONE ROAD**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 0.10 Miles**

<b>Section Number</b>	0				
<b>Section Length (mi)</b>	0.10				
<b>Cross Section Information</b>					
Number of Lanes	2				
Paved Width (ft)	23				
Lane Width (ft)	13				
<b>Roadway Condition Information</b>					
SCR (Surface Condition Rating)	48				
PCR (Pavement Condition Rating)	48				
<b>Distress Index Values</b>					
Structural Crack Index	84				
Transverse Cracking Index	48				
Patching Index	100				
Rutting Index	97				
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 - Non Applicable

**ROUTE: 0103 SPATTER CONE ROAD**



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

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

**ROUTE: 0104 CAVES TRAIL ROAD**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 0.08 Miles**

<b>Section Number</b>	0				
<b>Section Length (mi)</b>	0.08				
<b>Cross Section Information</b>					
Number of Lanes	2				
Paved Width (ft)	25				
Lane Width (ft)	13				
<b>Roadway Condition Information</b>					
SCR (Surface Condition Rating)	98				
PCR (Pavement Condition Rating)	98				
<b>Distress Index Values</b>					
Structural Crack Index	100				
Transverse Cracking Index	98				
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.

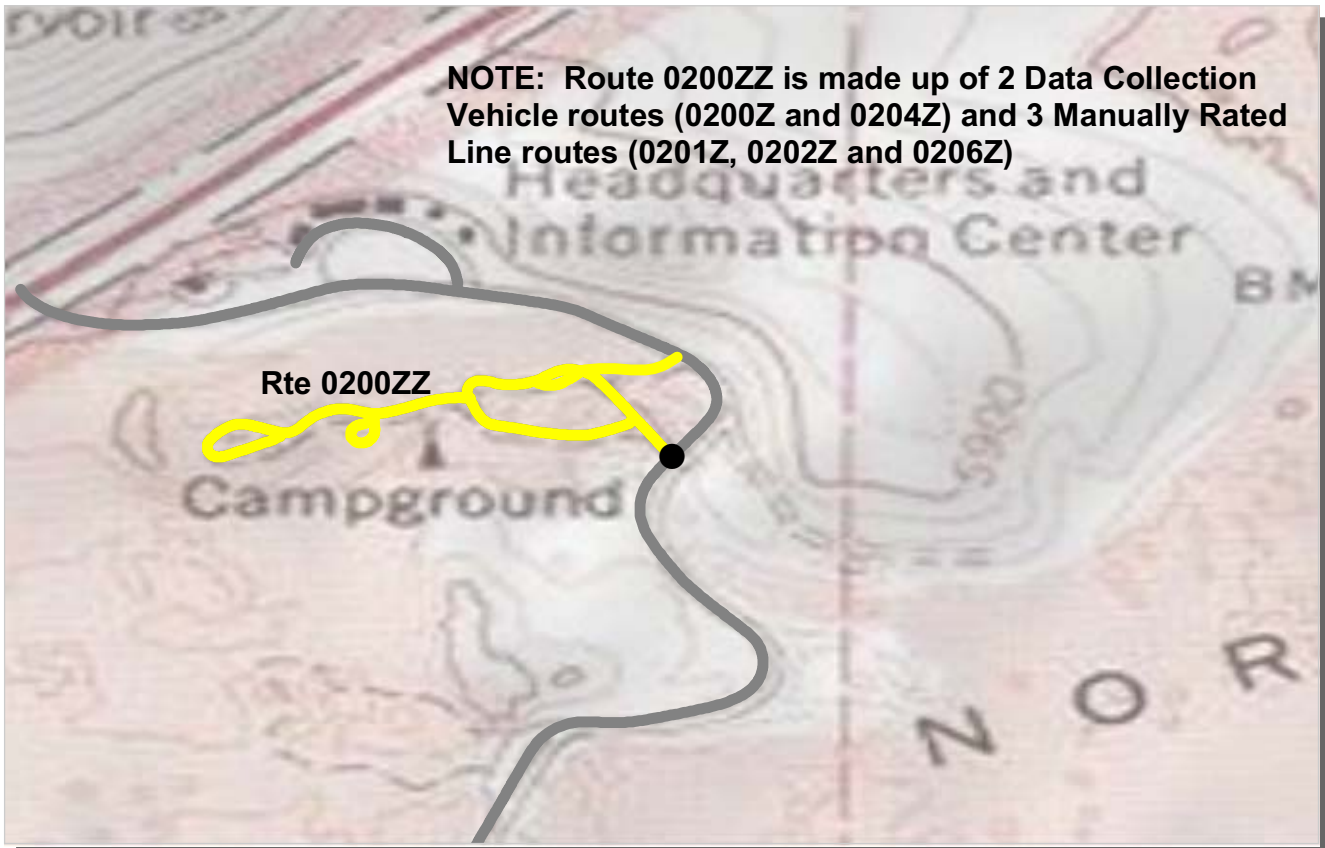
See Section 10 for explanation of SCR, PCR, & all Distress Index Values.

NC - Not Collected    N/A - Non Applicable



**ROUTE: 0104 CAVES TRAIL ROAD**

**NOTE: Route 0200ZZ is made up of 2 Data Collection Vehicle routes (0200Z and 0204Z) and 3 Manually Rated Line routes (0201Z, 0202Z and 0206Z)**



PCR	Poor	<span style="background-color: red; width: 20px; height: 10px; display: inline-block;"></span>	Fair	<span style="background-color: yellow; width: 20px; height: 10px; display: inline-block;"></span>	Good	<span style="background-color: green; width: 20px; height: 10px; display: inline-block;"></span>	Excellent	<span style="background-color: blue; width: 20px; height: 10px; display: inline-block;"></span>	No Data	<span style="background-color: black; width: 20px; height: 10px; display: inline-block;"></span>
		(0 - 60)		(61 - 84)		(85 - 94)		(95 - 100)		

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

**ROUTE: 0200ZZ CAMPGROUND ROADS**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

Summary Record COLLECTED: 10/5/2010  
**PACIFIC WEST REGION** **TOTAL LENGTH: 0.53 Miles**

<b>Section Number</b>					
<b>Section Length (mi)</b>					
<b>Cross Section Information</b>					
Number of Lanes	N/A				
Paved Width (ft)	N/A				
Lane Width (ft)	N/A				
<b>Roadway Condition Information</b>					
SCR (Surface Condition Rating)	84				
PCR (Pavement Condition Rating)	82				
<b>Distress Index Values</b>					
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:**

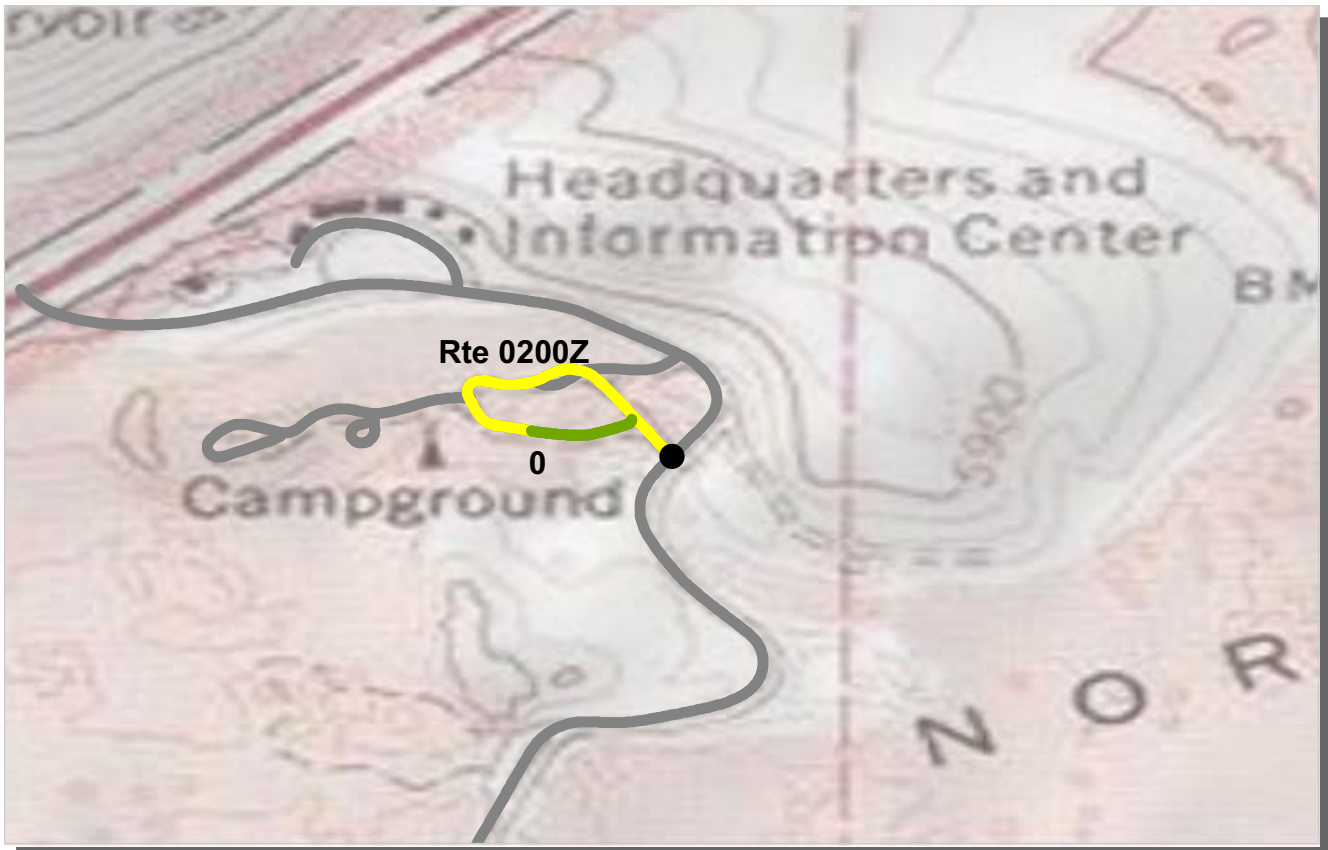
Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.

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

NC - Not Collected N/A - Non Applicable

**ROUTE: 0200ZZ CAMPGROUND ROADS**





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

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

**ROUTE: 0200Z CAMPGROUND ENTRANCE ROAD**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

Subcomponent Record

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 0.23 Miles**

<b>Section Number</b>	0				
<b>Section Length (mi)</b>	0.23				
<b>Cross Section Information</b>					
Number of Lanes	2				
Paved Width (ft)	17				
Lane Width (ft)	11				
<b>Roadway Condition Information</b>					
SCR (Surface Condition Rating)	81				
PCR (Pavement Condition Rating)	81				
<b>Distress Index Values</b>					
Structural Crack Index	81				
Transverse Cracking Index	89				
Patching Index	95				
Rutting Index	97				
Roughness Condition Index (RCI)	NC				

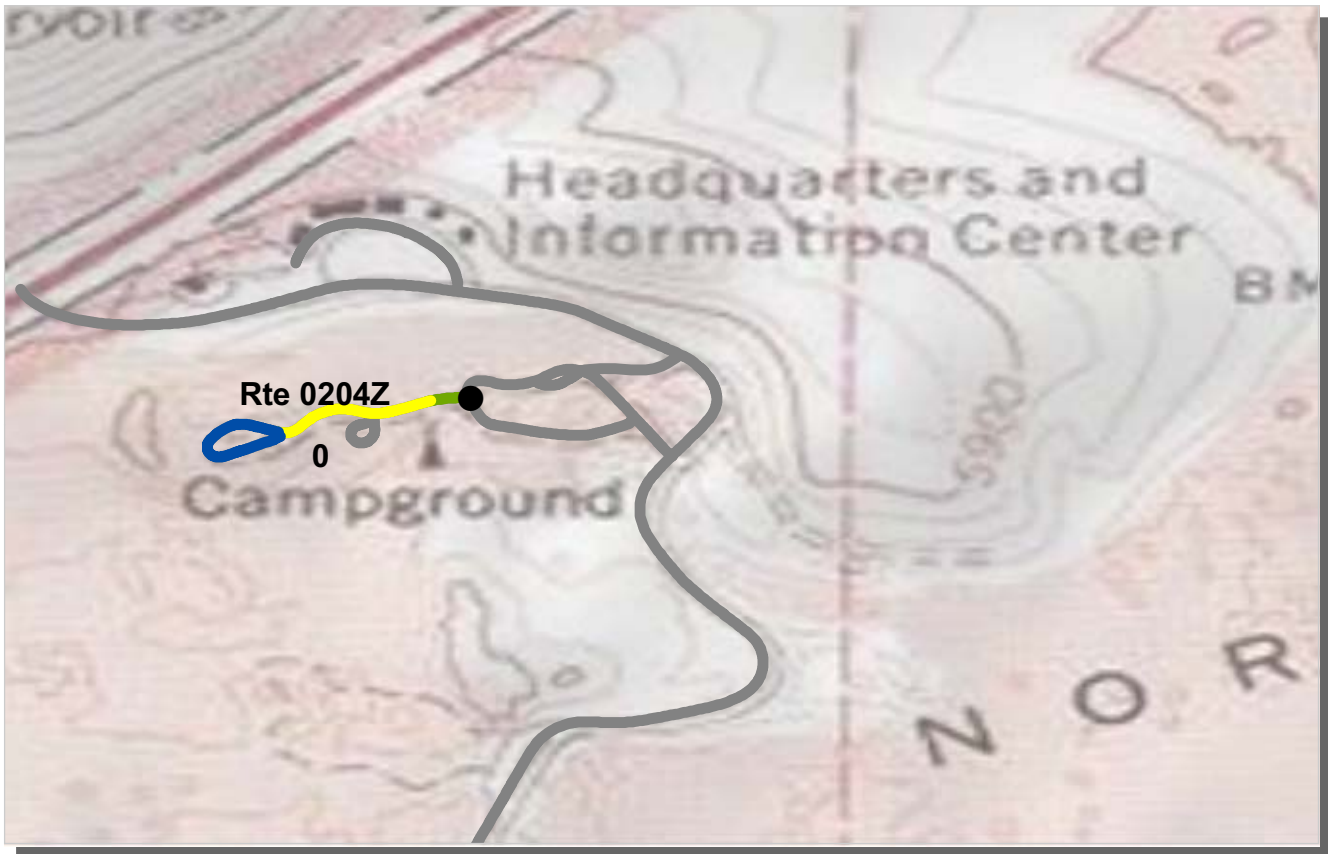
NOTES:

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 - Non Applicable

**ROUTE: 0200Z CAMPGROUND ENTRANCE ROAD**



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

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

**ROUTE: 0204Z CAMPGROUND LOOPS A/B**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

Subcomponent Record

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 0.18 Miles**

<b>Section Number</b>	0				
<b>Section Length (mi)</b>	0.18				
<b>Cross Section Information</b>					
Number of Lanes	2				
Paved Width (ft)	13				
Lane Width (ft)	9				
<b>Roadway Condition Information</b>					
SCR (Surface Condition Rating)	88				
PCR (Pavement Condition Rating)	88				
<b>Distress Index Values</b>					
Structural Crack Index	96				
Transverse Cracking Index	95				
Patching Index	88				
Rutting Index	96				
Roughness Condition Index (RCI)	NC				

NOTES:

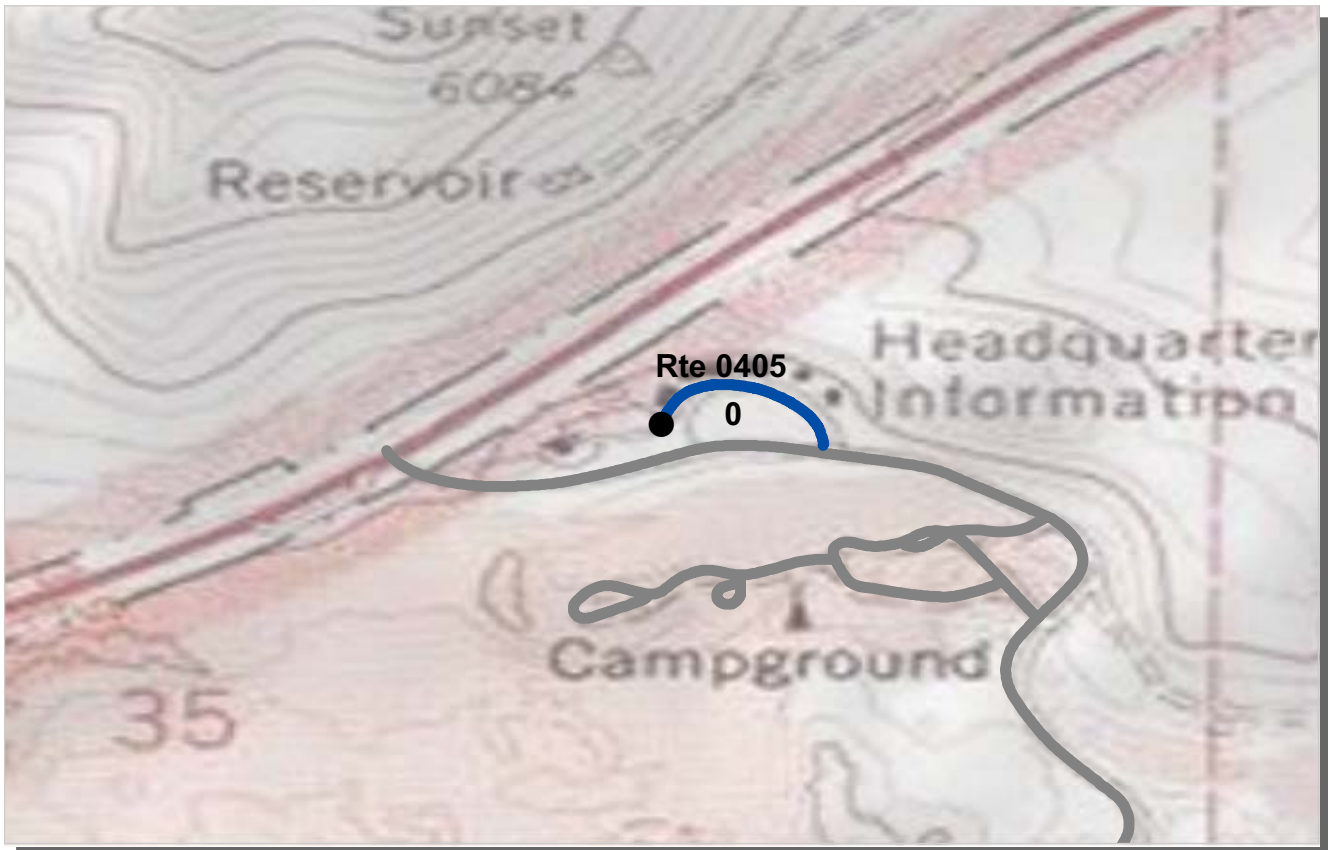
Structural Crack Index is a combination of the Longitudinal Cracking Index and Alligator Cracking Index.

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

NC - Not Collected    N/A - Non Applicable



**ROUTE: 0204Z CAMPGROUND LOOPS A/B**



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

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

**ROUTE: 0405 EMPLOYEE HOUSING**

**CRMO : CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE**

**COLLECTED: 10/5/2010**

**PACIFIC WEST REGION**

**TOTAL LENGTH: 0.11 Miles**

<b>Section Number</b>	0				
<b>Section Length (mi)</b>	0.11				
<b>Cross Section Information</b>					
Number of Lanes	2				
Paved Width (ft)	23				
Lane Width (ft)	12				
<b>Roadway Condition Information</b>					
SCR (Surface Condition Rating)	97				
PCR (Pavement Condition Rating)	97				
<b>Distress Index Values</b>					
Structural Crack Index	100				
Transverse Cracking Index	99				
Patching Index	99				
Rutting Index	97				
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 - Non Applicable



**ROUTE: 0405 EMPLOYEE HOUSING**



**Section 6**  
**Manually Rated Paved Route  
Condition Rating Sheets**



Craters of the Moon National  
Monument and Preserve



Federal Lands Highway  
Road Inventory Program

# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0100

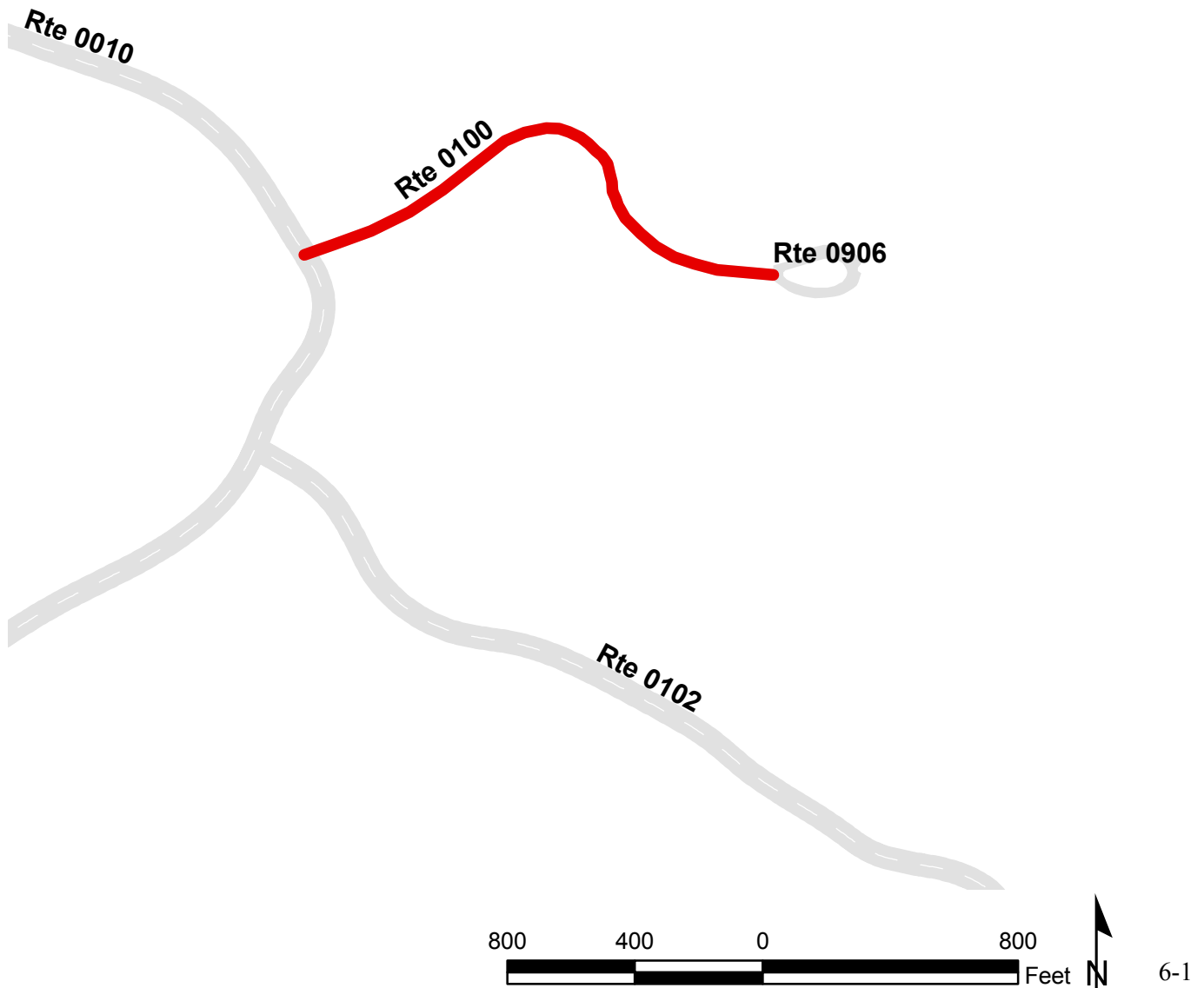
### DEVIL'S ORCHARD ROAD

FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.26  
TO ROUTE 0906 (DEVIL'S ORCHARD PARKING)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	MRL	
					Length (mi)	Width (ft)
0100	PUBLIC	10/5/2010	30,603	0.53	0.28	21
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR	Surface Type
NC	NC	NC	N/A	N/A	CONSTRUCT/NC	AS

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0101

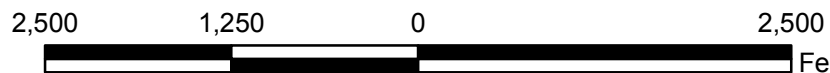
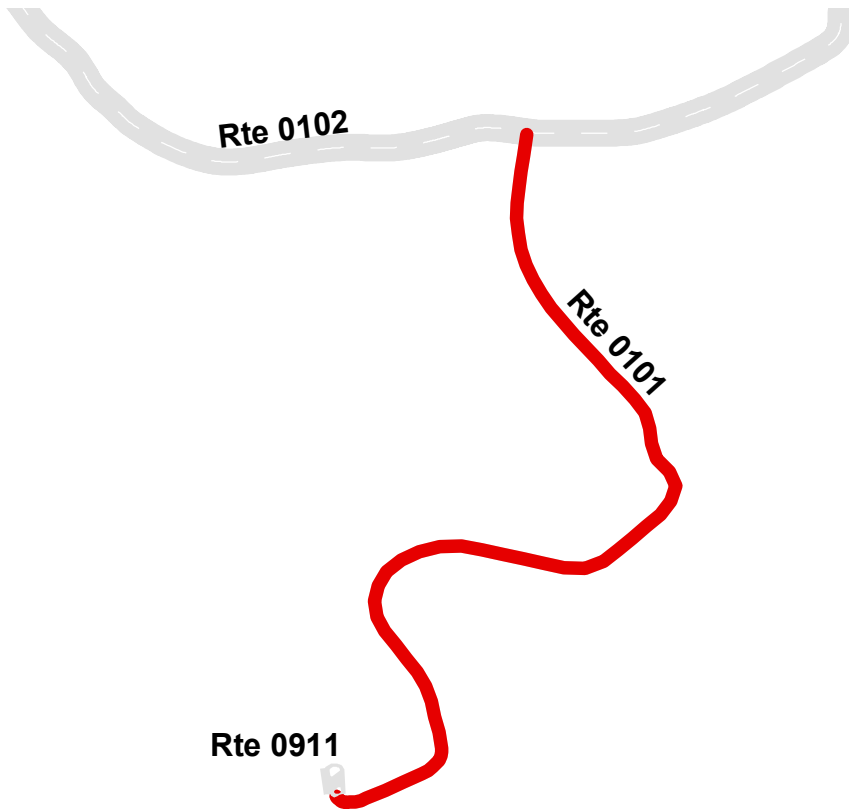
### TREE MOLDS ROAD

FROM ROUTE 0102 (SCENIC LOOP DRIVE) ON RIGHT  
TO ROUTE 0911 (TREE MOLDS PARKING)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	MRL	
					Length (mi)	Width (ft)
0101	PUBLIC	10/5/2010	125,664	2.16	1.19	20
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR	Surface Type
NC	NC	NC	N/A	N/A	CONSTRUCT/NC	AS

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0200ZZ

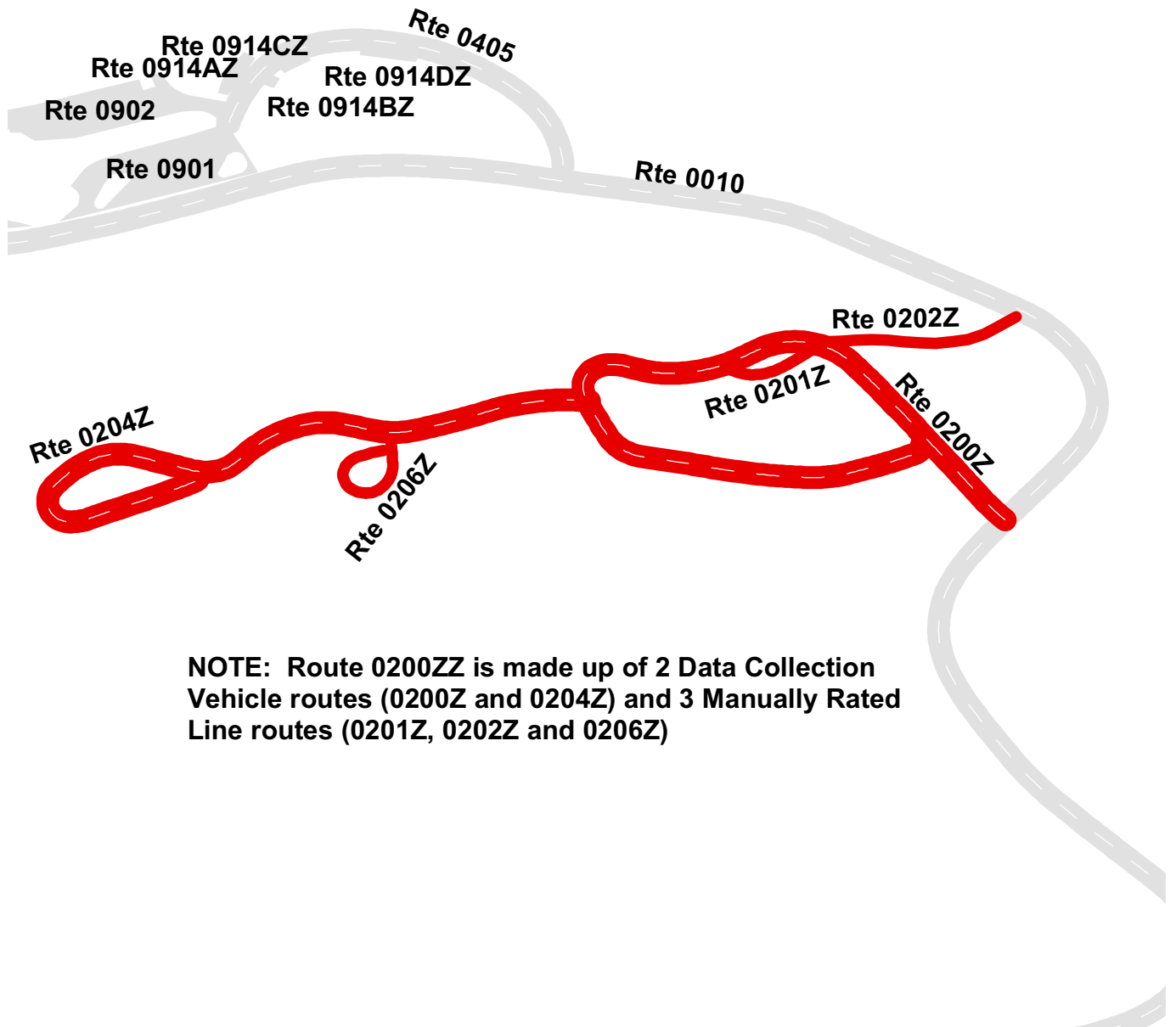
### CAMPGROUND ROADS

FROM ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT 0.335  
THROUGH CAMPGROUND

Summary Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	MRL	
					Length (mi)	Width (ft)
0200ZZ	PUBLIC	10/5/2010	6,574	0.69	0.53	14.2
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR	Surface Type
0	0	1	N/A	N/A	SUMMARY/82	AS

\* Lane miles are based on 11' lane widths



**NOTE: Route 0200ZZ is made up of 2 Data Collection Vehicle routes (0200Z and 0204Z) and 3 Manually Rated Line routes (0201Z, 0202Z and 0206Z)**



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0201Z

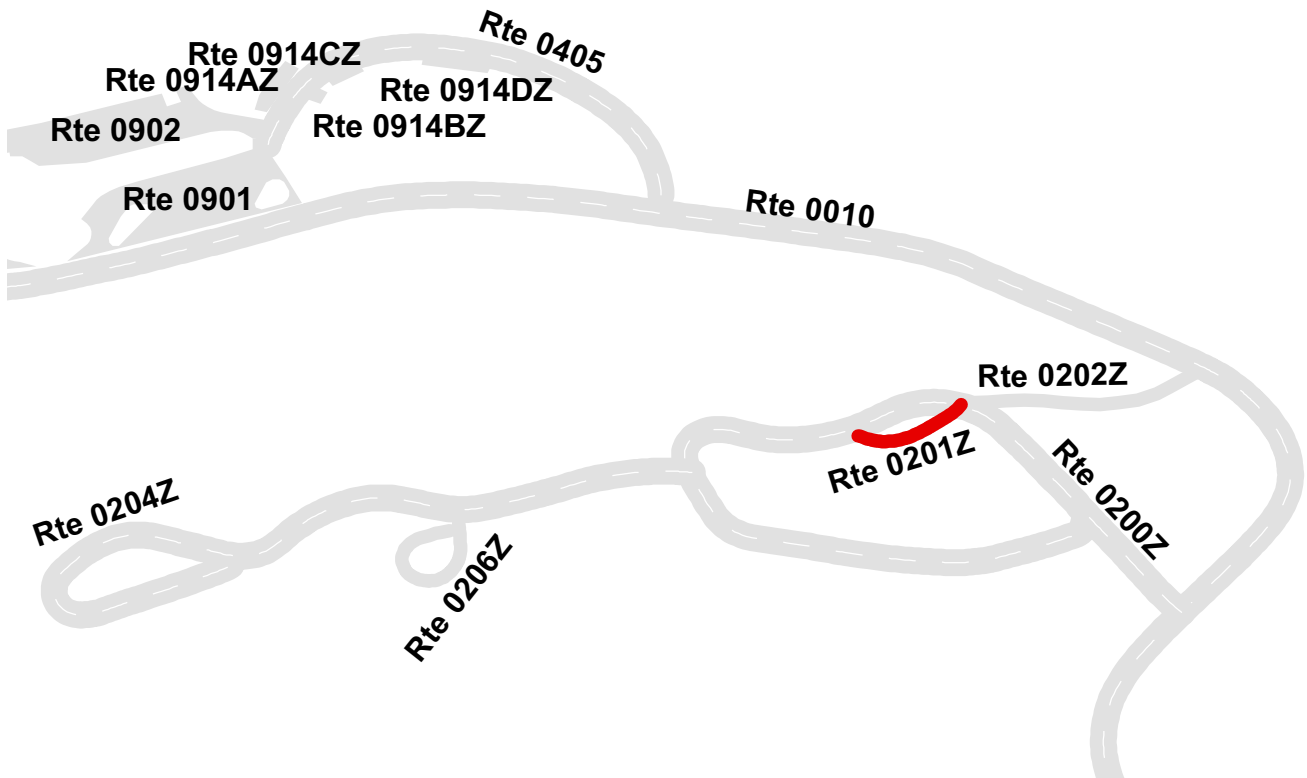
### CAMPSITE ACCESS ROAD

FROM ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) ON LEFT AT MP 0.067  
TO ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) ON LEFT AT MP 0.090

#### Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	MRL	
					Length (mi)	Width (ft)
0201Z	PUBLIC	10/5/2010	1,521	0.03	0.02	12
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR	Surface Type
0	0	0	NO CURB AND GUTTER	NO CURB	FAIR/73	AS

\* Lane miles are based on 11' lane widths



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0202Z

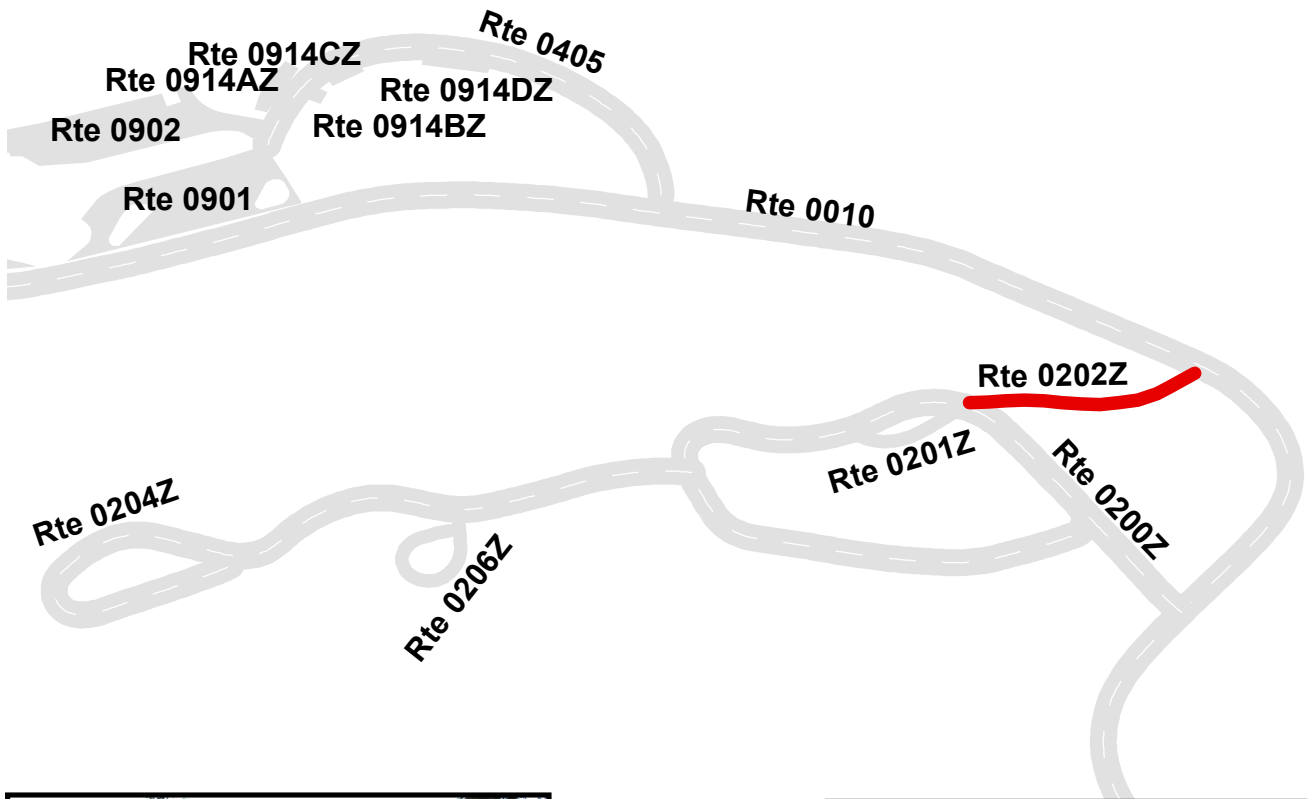
### CAMPGROUND EXIT ROAD

FROM INTERSECTION OF ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) AND ROUTE 0201Z (CAMPSITE ACCESS ROAD)  
TO ROUTE 0010 (ENTRANCE ROAD)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	MRL	
					Length (mi)	Width (ft)
0202Z	PUBLIC	10/5/2010	2,730	0.05	0.05	11
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR	Surface Type
0	0	0	NO CURB AND GUTTER	NO CURB	FAIR/73	AS

\* Lane miles are based on 11' lane widths



520 260 0 520



Feet



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0206Z

### CAMPGROUND LOOP

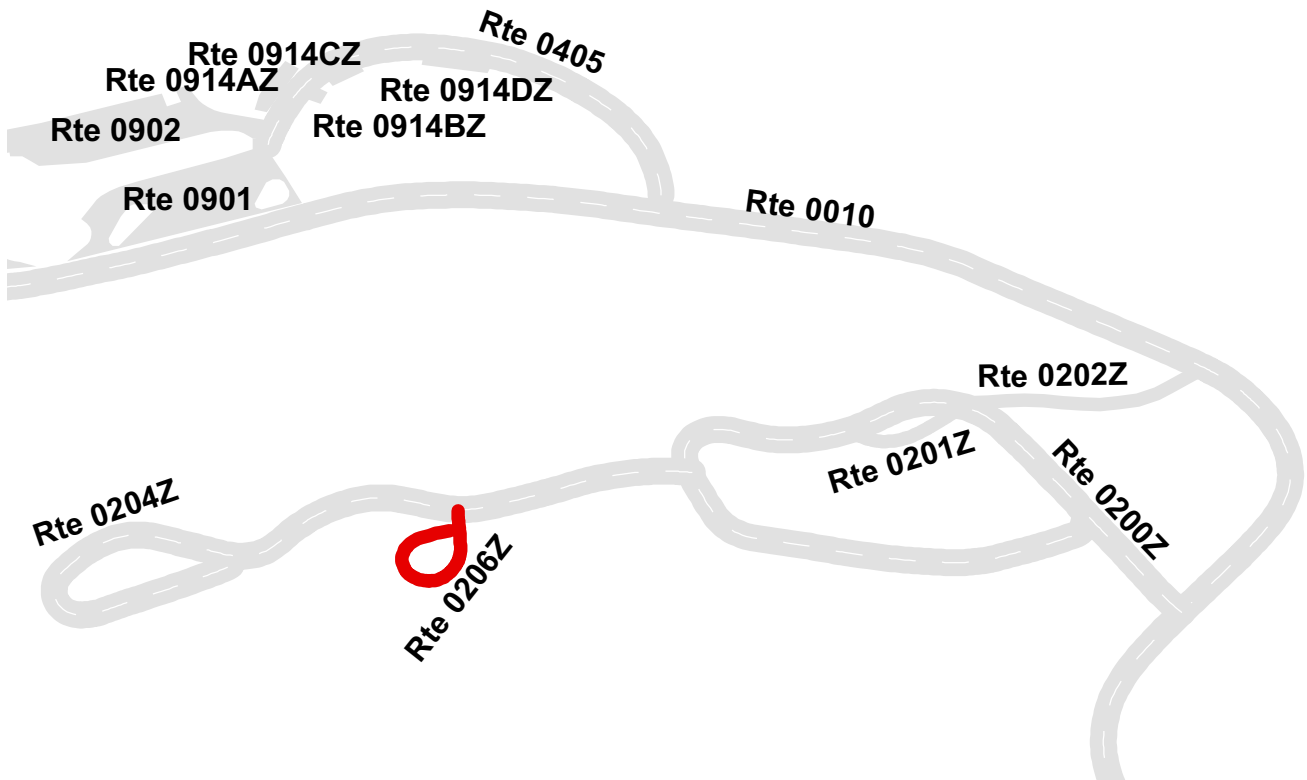
FROM ROUTE 0204Z (CAMPGROUND LOOPS A/B) ON LEFT AT 0.045

TO END OF LOOP

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	MRL	
					Length (mi)	Width (ft)
0206Z	PUBLIC	10/5/2010	2,323	0.04	0.04	10
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR	Surface Type
0	0	0	NO CURB AND GUTTER	NO CURB	FAIR/73	AS

\* Lane miles are based on 11' lane widths





**Section 7**  
**Parking Area**  
**Condition Rating Sheets**



Craters of the Moon National  
Monument and Preserve



Federal Lands Highway  
Road Inventory Program

# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0900

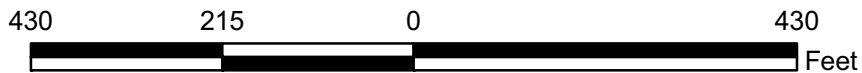
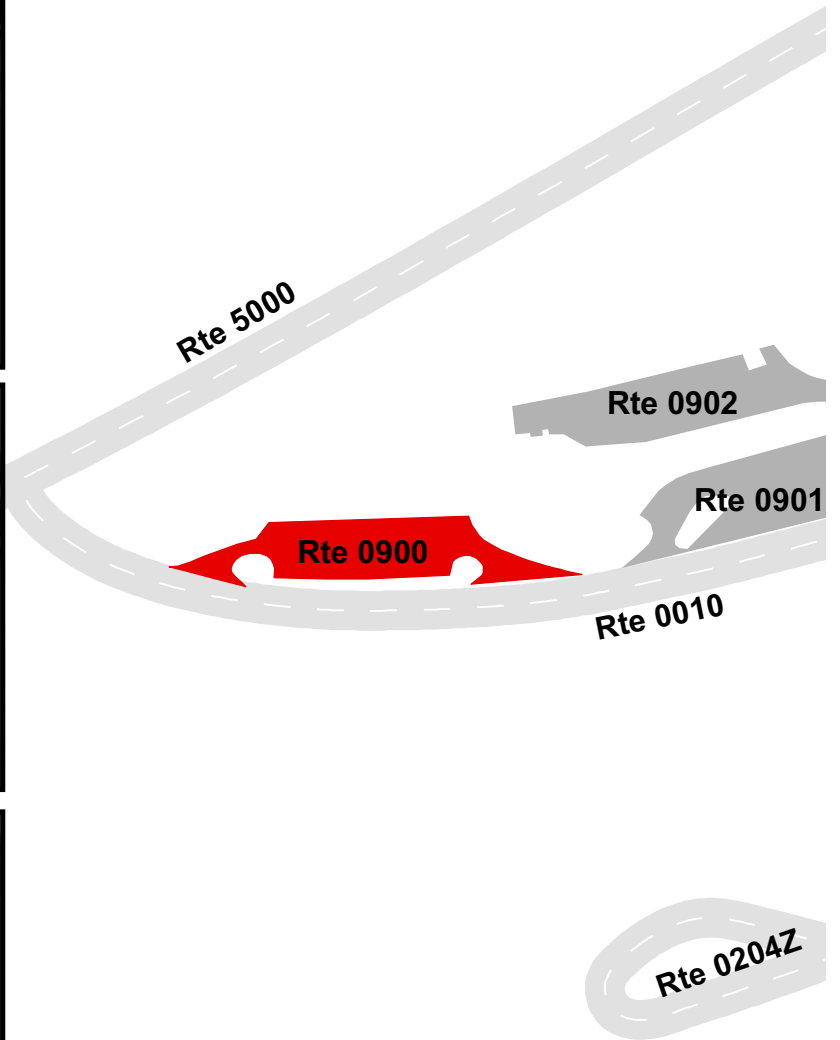
### EAST VISITOR CENTER PARKING

FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.032

TO ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.076

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900	PUBLIC	10/5/2010	13,916	0.24	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	1	0	CONCRETE CURB AND GUTTER	NO CURB	FAIR/73

\* Lane miles are based on 11' lane widths



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0901

WEST VISITOR CENTER PARKING

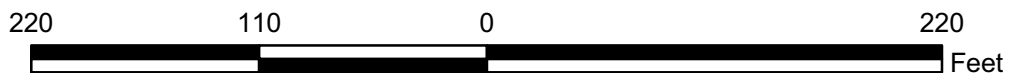
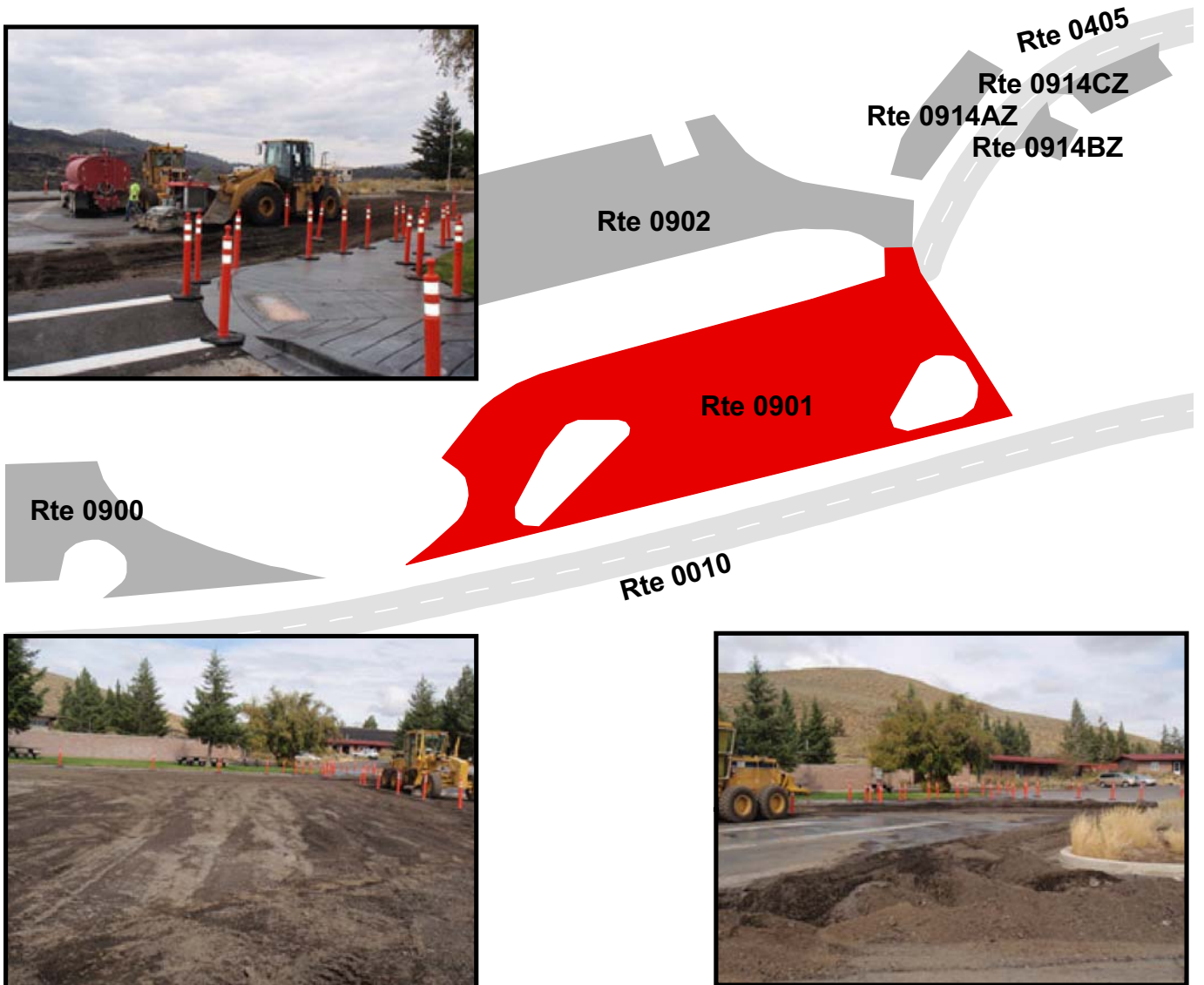
FROM ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.122

TO ROUTE 0405 (EMPLOYEE HOUSING)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0901	PUBLIC	10/5/2010	16,213	0.28	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
NC	NC	NC	CONCRETE CURB AND GUTTER	NO CURB	CONSTRUCT/NC

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.



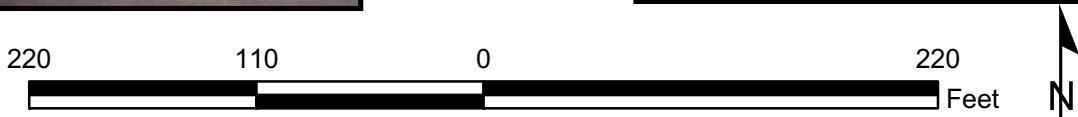
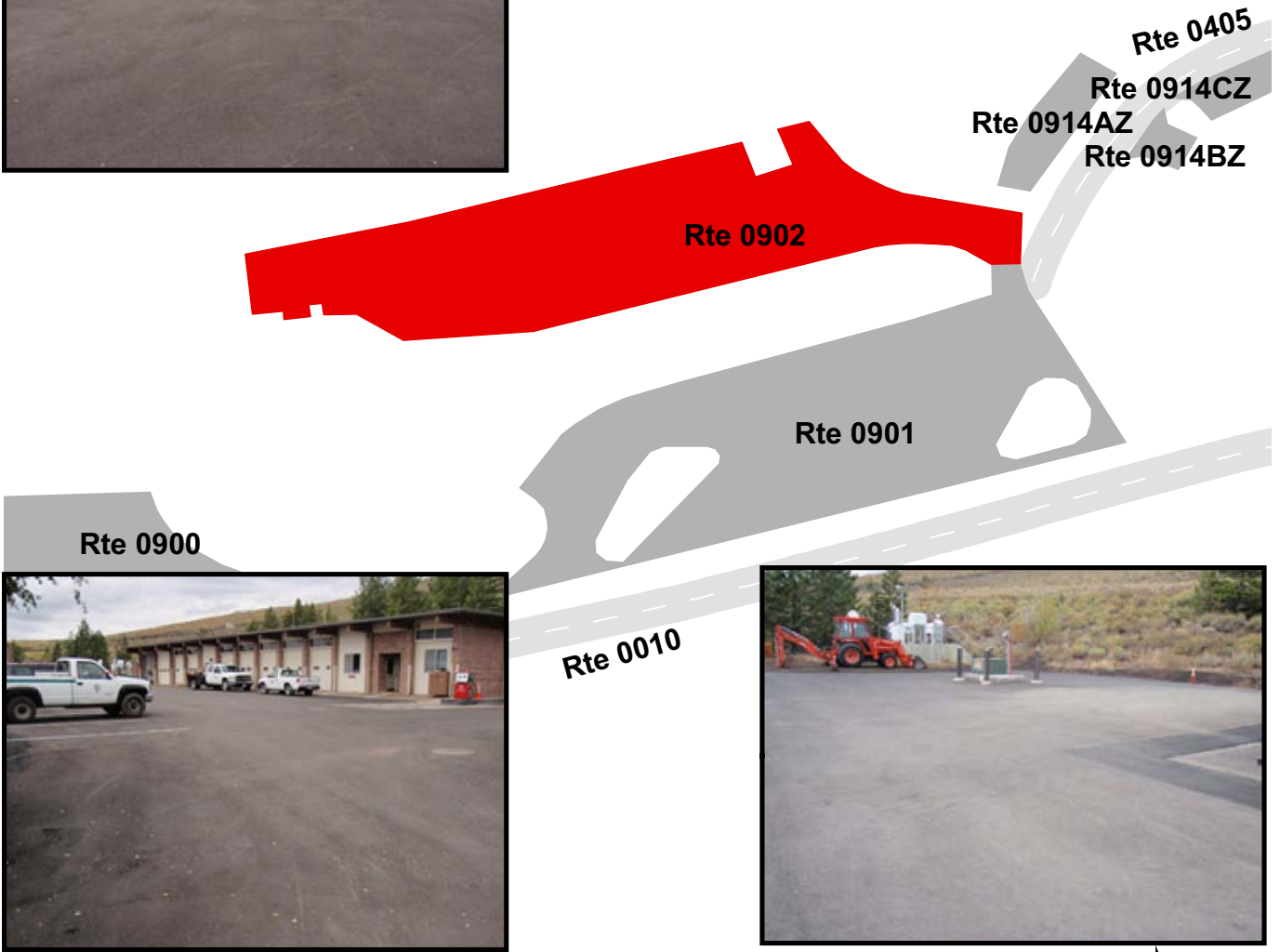
# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0902

ADMINISTRATIVE PARKING  
FROM ROUTE 0405 (EMPLOYEE HOUSING)  
TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0902	NONPUBLIC	10/5/2010	15,692	0.27	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

\* Lane miles are based on 11' lane widths



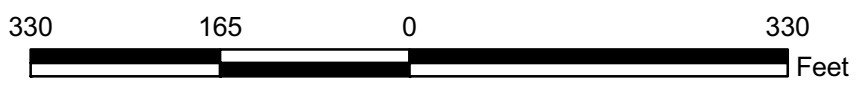
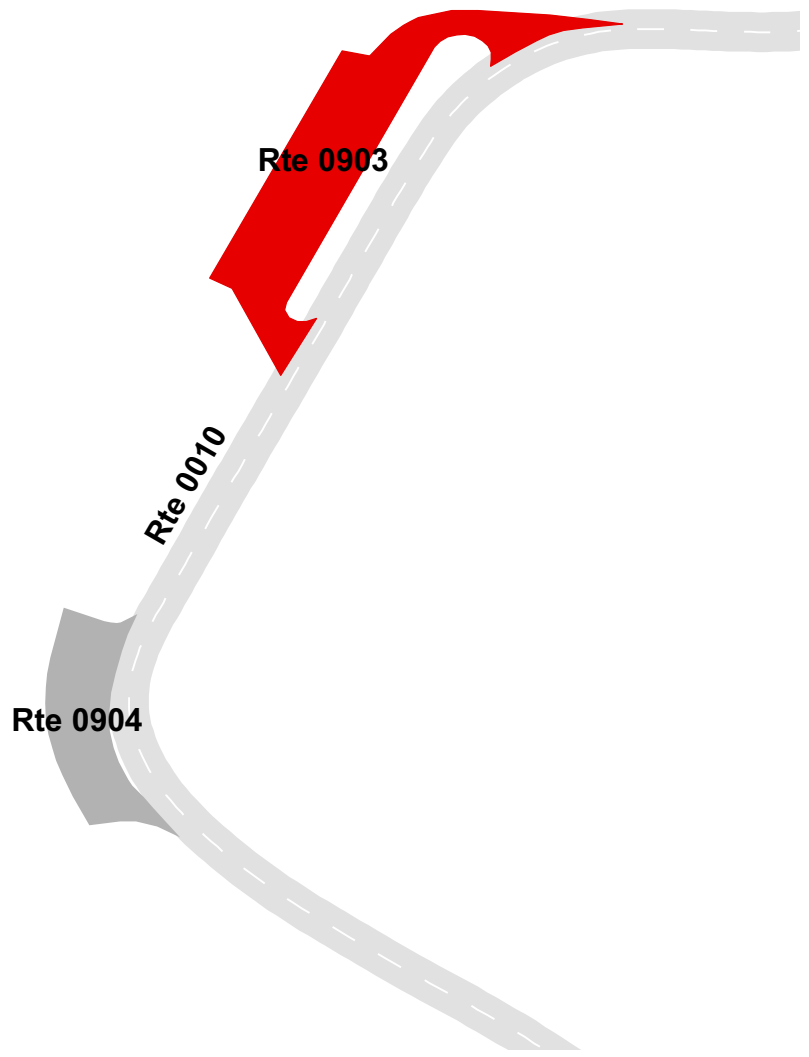
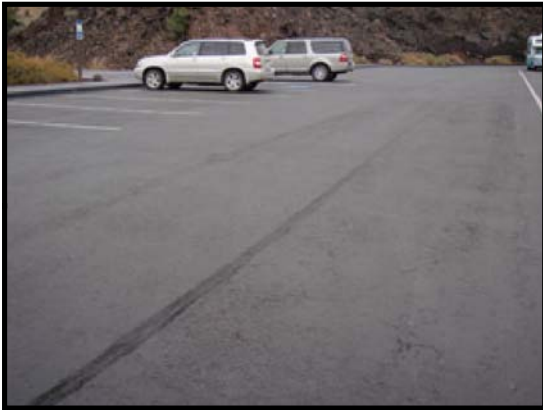
# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0903

NORTH CRATER FLOW TRAIL PARKING  
 FROM ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT MP 0.691  
 TO ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT MP 0.750

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0903	PUBLIC	10/5/2010	16,708	0.29	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

\* Lane miles are based on 11' lane widths





# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0904

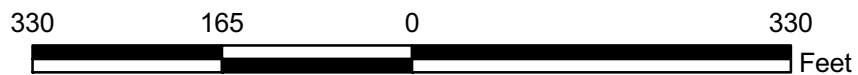
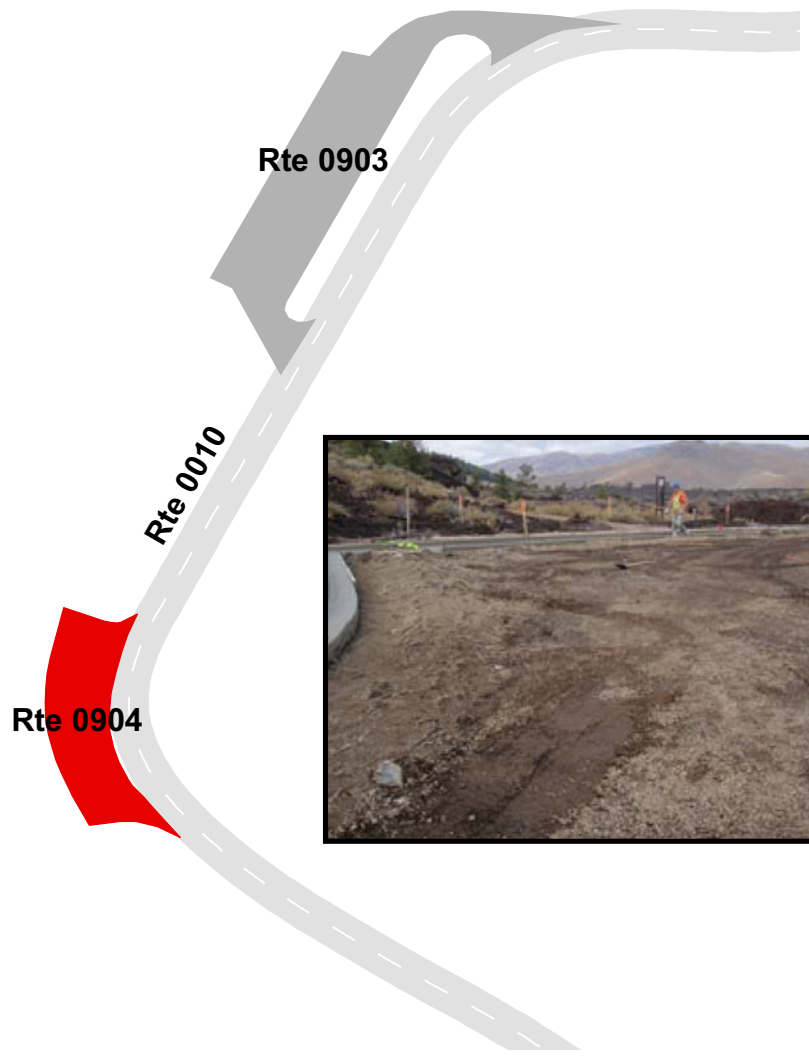
### NORTH CRATER TRAIL PARKING

ADJACENT TO ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT MP 0.816

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0904	PUBLIC	10/5/2010	7,705	0.13	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
NC	NC	NC	CONCRETE CURB AND GUTTER	NO CURB	CONSTRUCT/NC

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.





# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

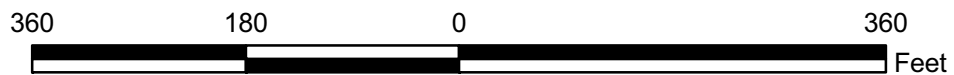
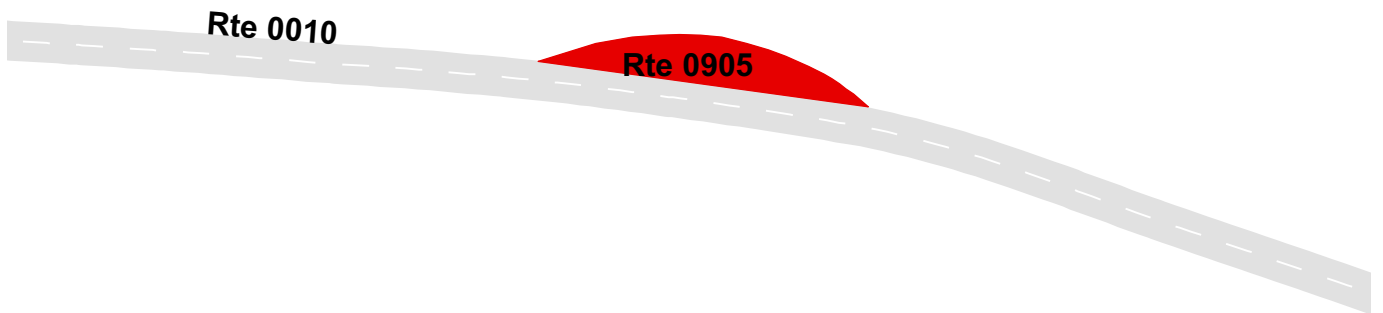
## Route 0905

### OLD MAN PULLOUT

ADJACENT TO ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 1.570

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905	PUBLIC	10/5/2010	5,510	0.10	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

\* Lane miles are based on 11' lane widths



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

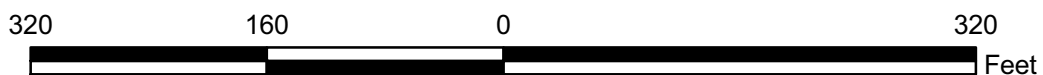
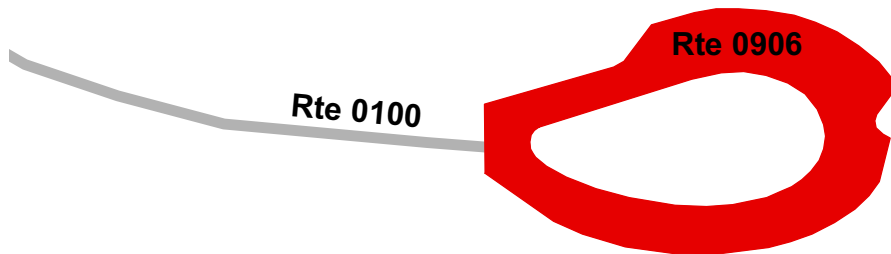
## Route 0906

DEVILS ORCHARD PARKING  
 FROM END OF ROUTE 0100 (DEVIL'S ORCHARD ROAD)  
 TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0906	PUBLIC	10/5/2010	15,260	0.26	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
NC	NC	NC	N/A	N/A	CONSTRUCT/NC

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0907

### INFERNO CONE PARKING

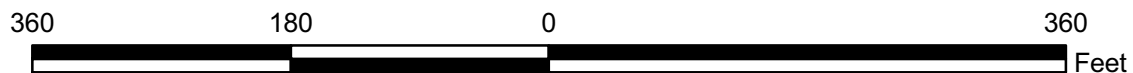
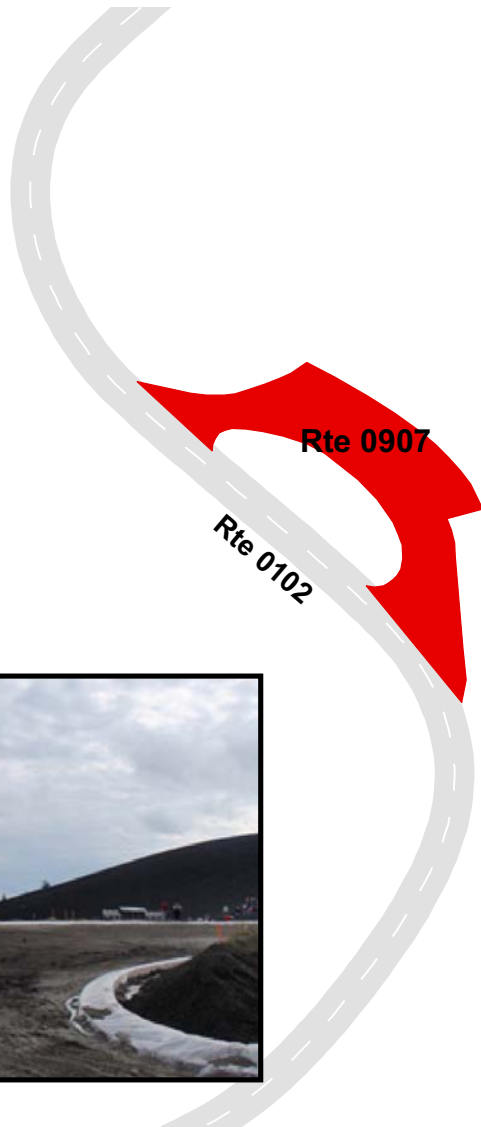
FROM ROUTE 0102 (SCENIC LOOP DRIVE) ON LEFT AT 0.798

TO ROUTE 0102 (SCENIC LOOP DRIVE) ON LEFT AT 0.842

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0907	PUBLIC	10/5/2010	10,475	0.18	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
NC	NC	NC	CONCRETE CURB AND GUTTER	NO CURB	CONSTRUCT/NC

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.



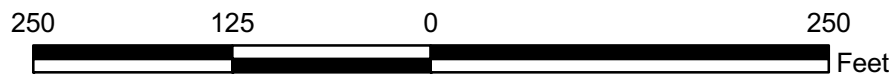
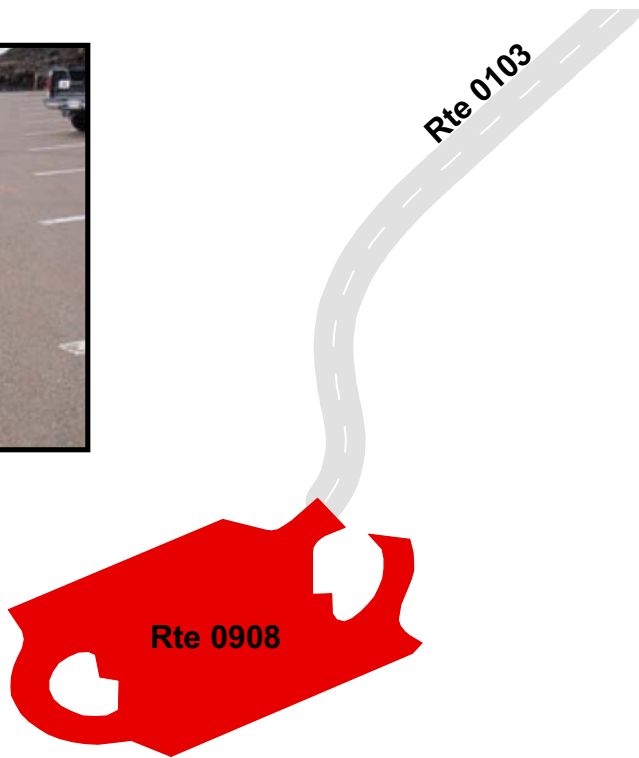
# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0908

SPATTER CONE PARKING  
 FROM END OF ROUTE 0103 (SPATTER CONE ROAD)  
 TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0908	PUBLIC	10/5/2010	17,162	0.30	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	1	0	CONCRETE CURB AND GUTTER	NO CURB	POOR/45

\* Lane miles are based on 11' lane widths



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

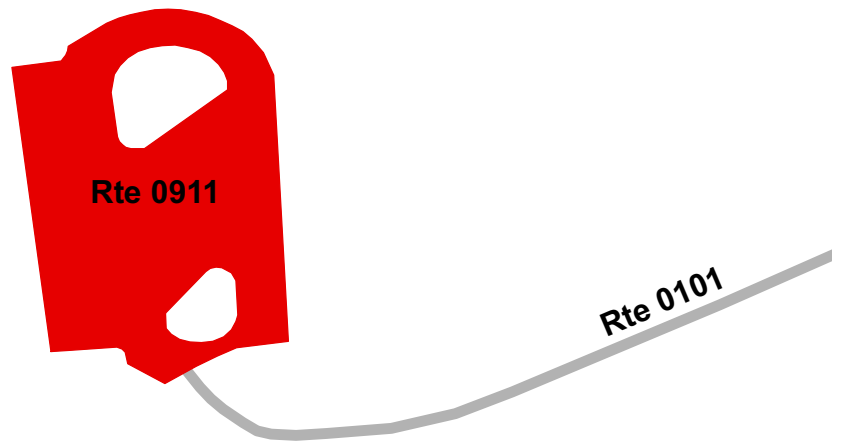
## Route 0911

TREE MOLDS PARKING  
 FROM END OF ROUTE 0101 (TREE MOLDS ROAD)  
 TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0911	PUBLIC	10/5/2010	18,915	0.33	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
NC	NC	NC	N/A	N/A	CONSTRUCT/NC

\* Lane miles are based on 11' lane widths

NOTE: No data is available for this route as construction was in progress at the time of data collection.



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

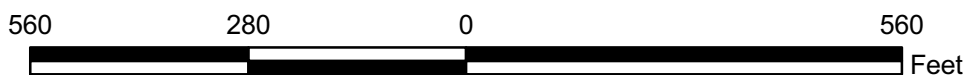
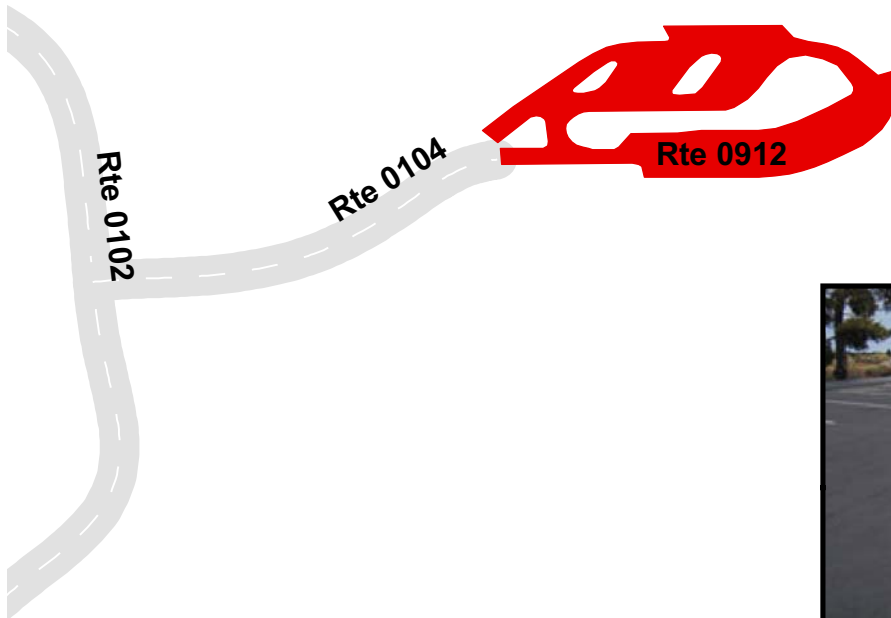
## Route 0912

### CAVES PARKING

FROM END OF ROUTE 0104 (CAVES TRAIL ROAD)  
TO PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0912	PUBLIC	10/5/2010	39,021	0.67	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	2	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

\* Lane miles are based on 11' lane widths





# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0914ZZ

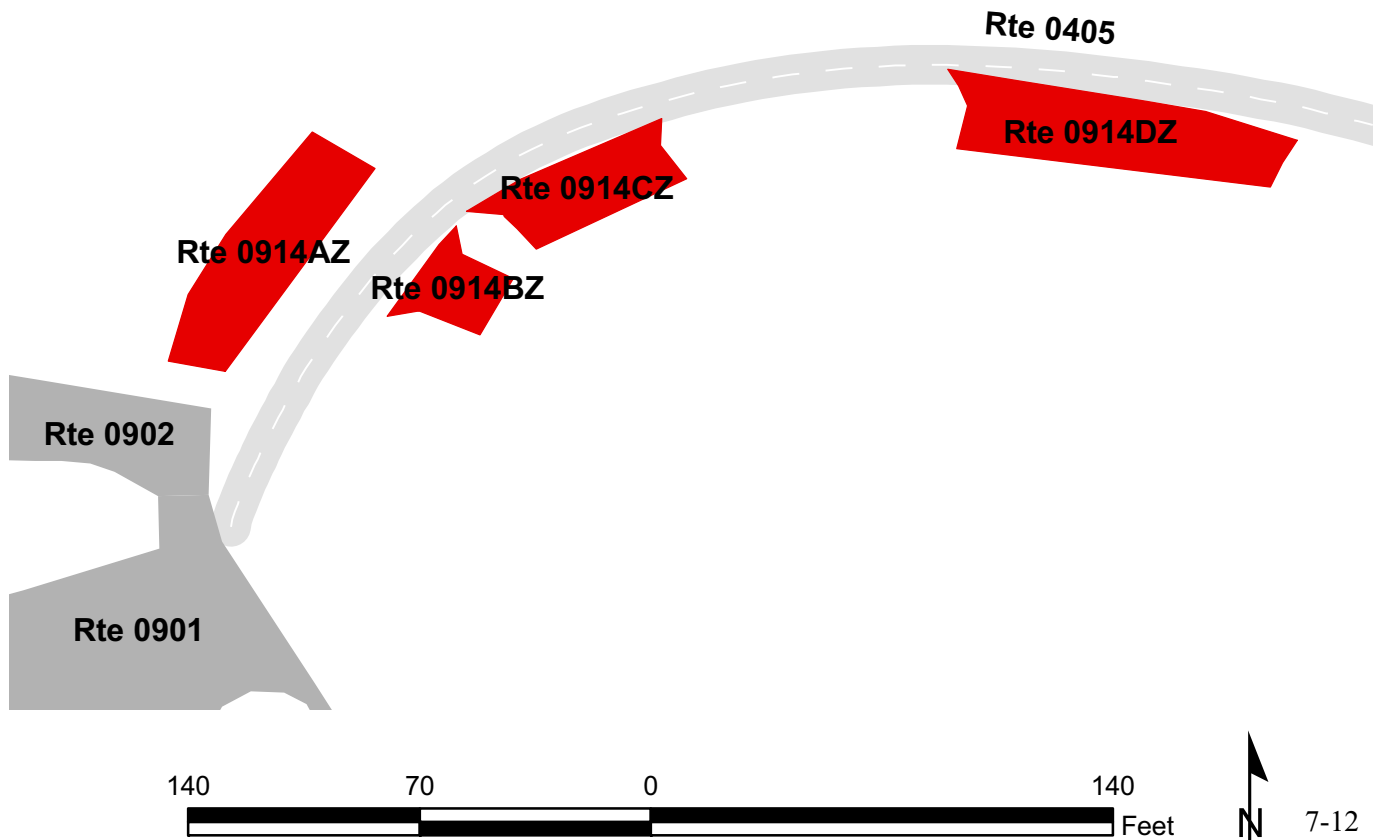
### RESIDENTIAL PARKING AREAS

ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON LEFT AND RIGHT

Summary Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0914ZZ	NONPUBLIC	10/5/2010	4,008	0.07	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	CONCRETE CURB AND GUTTER	NO CURB	SUMMARY/90

\* Lane miles are based on 11' lane widths



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0914AZ

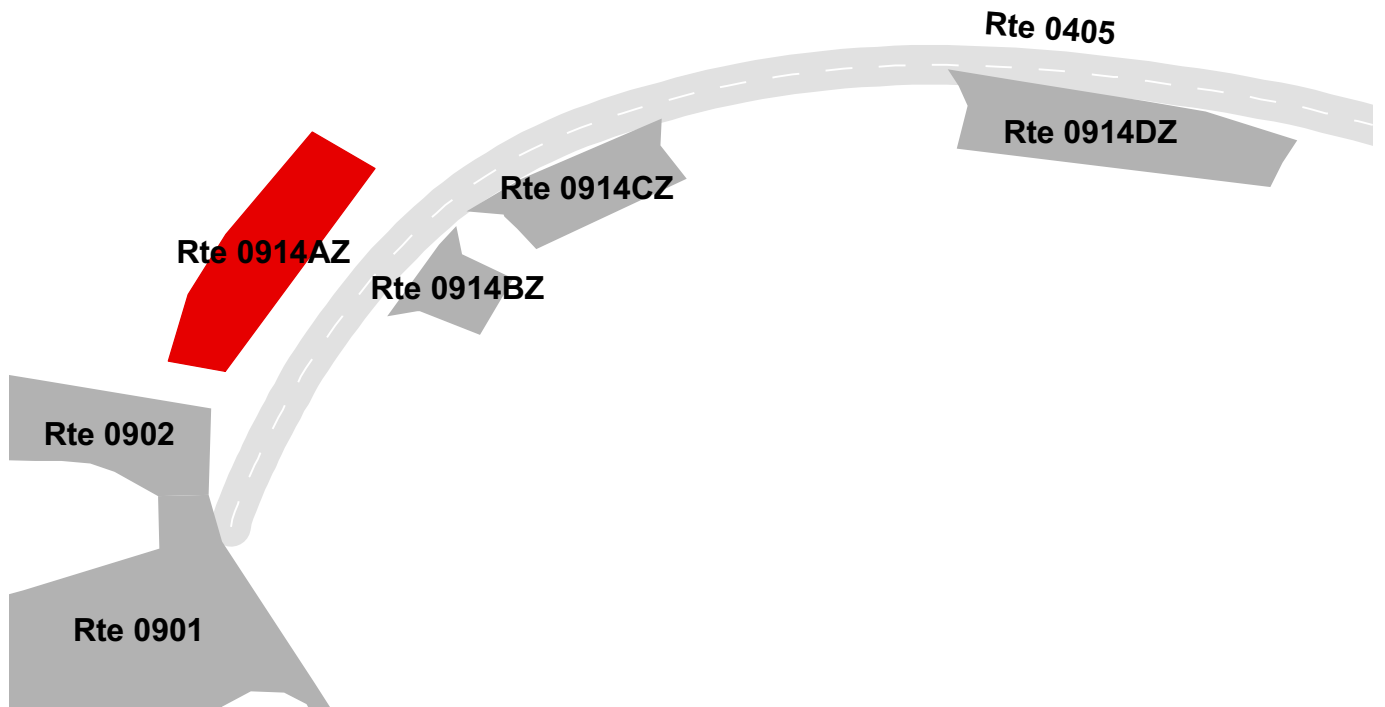
### RESIDENTIAL PARKING A

ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON LEFT AT MP 0.015

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0914AZ	NONPUBLIC	10/5/2010	1,303	0.02	AS
Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

\* Lane miles are based on 11' lane widths



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0914BZ

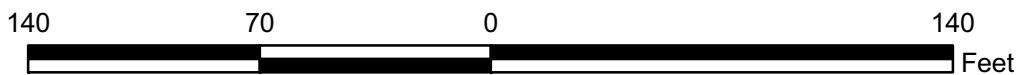
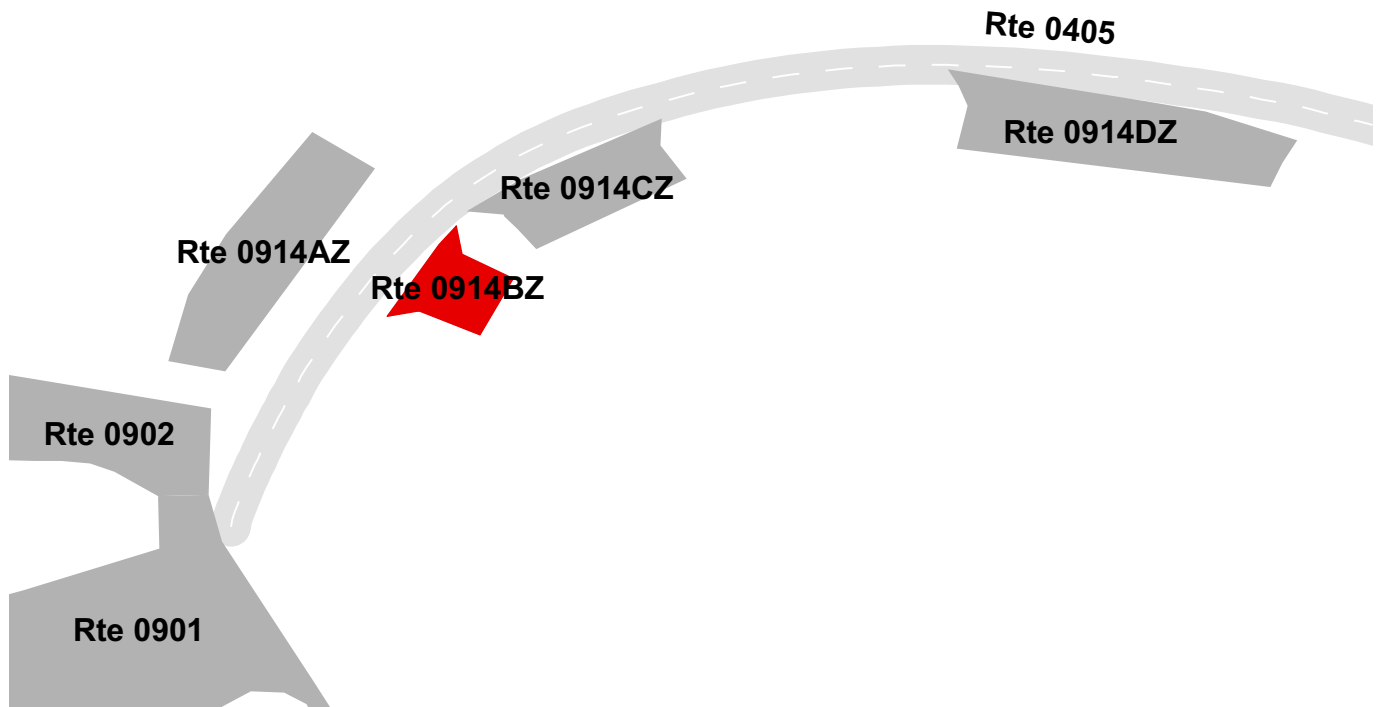
### RESIDENTIAL PARKING B

ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON RIGHT AT MP 0.016

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0914BZ	NONPUBLIC	10/5/2010	414	0.01	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



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0914CZ

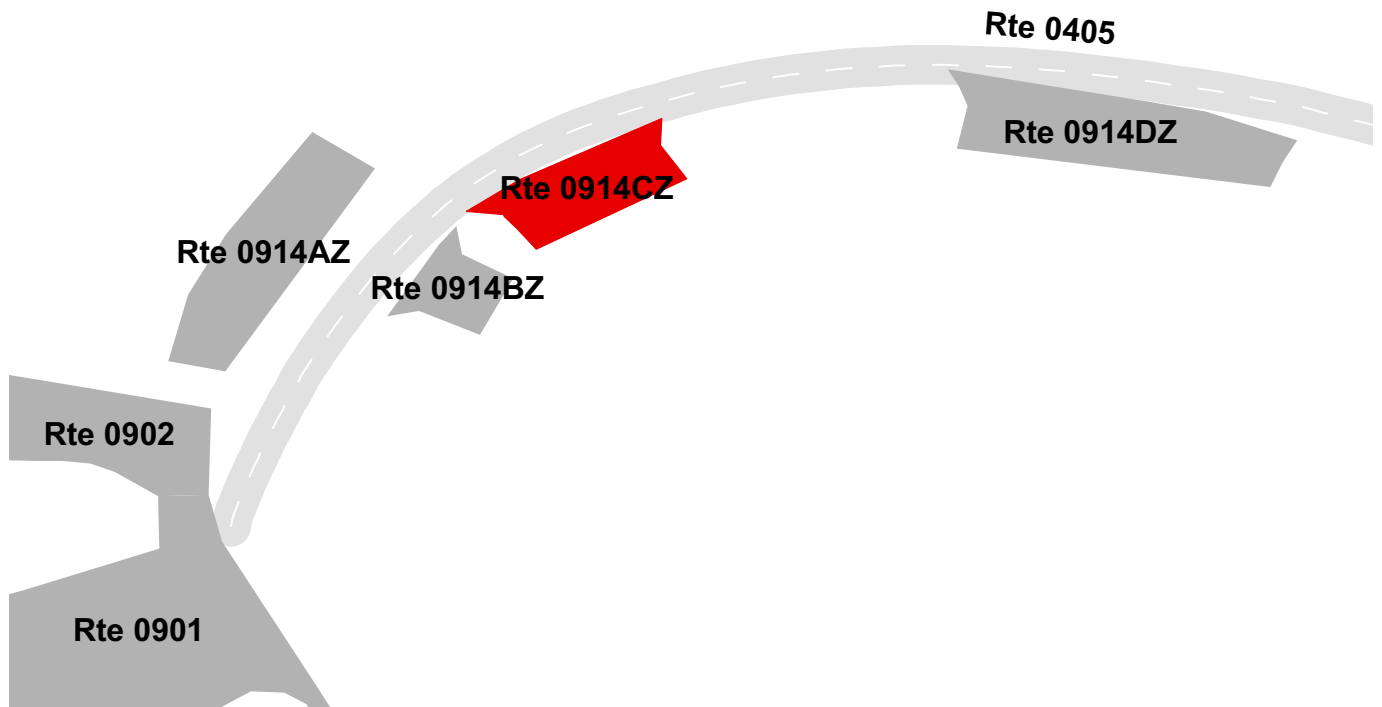
### RESIDENTIAL PARKING C

ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON RIGHT AT MP 0.027

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0914CZ	NONPUBLIC	10/5/2010	795	0.01	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



# CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE

## Route 0914DZ

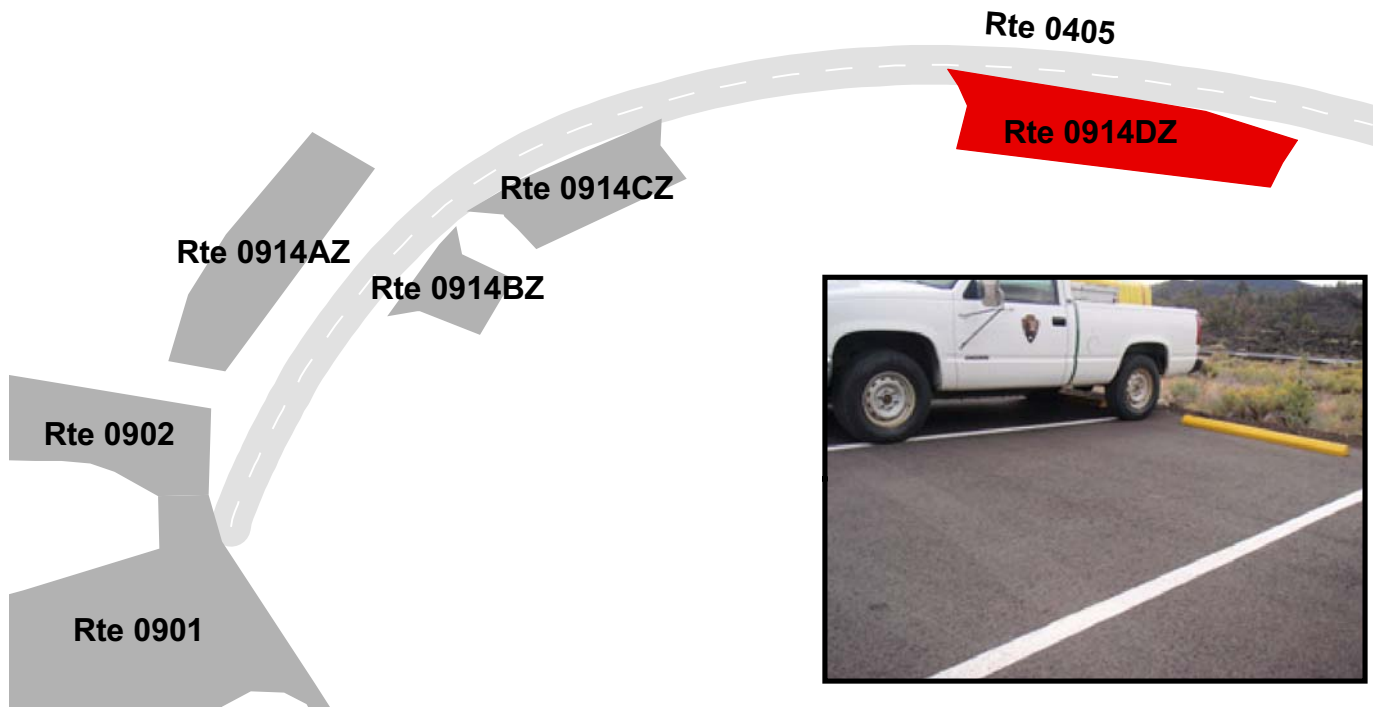
### RESIDENTIAL PARKING D

ADJACENT TO ROUTE 0405 (EMPLOYEE HOUSING) ON RIGHT AT MP 0.052

Subcomponent Record

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0914DZ	NONPUBLIC	10/5/2010	1,496	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





**Section 8**  
**Parkwide/Route**  
**Maintenance Features Summaries**



Craters of the Moon National  
Monument and Preserve



Federal Lands Highway  
Road Inventory Program



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

Notice: Culverts and drop inlets were NOT marked by NPS in Cycle 5 along DCV driven routes, therefore the culvert and drop inlet counts below reflect only on Manually Rated Routes and Paved Parking areas in Cycle 5.

<b>FEATURE</b>	<b>LINEAR FEET</b>	<b>COUNT</b>
BARRIER	0	--
BOLLARD	0	--
BRIDGE	--	0
CABLE	0	--
CATTLE GUARD	--	0
CULVERT	--	0
CURB	47,968	--
DROP INLET	--	4
GATE	--	4
GUARD/GUIDE RAIL	0	--
GUARD/GUIDE WALL	0	--
INTERSECTION	--	60
LOW WATER CROSSING	0	0
MILE MARKER	--	0
OVERPASS	--	0
OVERHEAD SIGN	--	0
PARK BOUNDARY	--	0
PAVED DITCH	0	--
PULLOUT	998	6
RAILROAD CROSSING	--	0
RETAINING WALL	0	0
SIGN	--	58
STATE BOUNDARY	--	0
TEMPORARY BARRIER	0	--
TRAFFIC LIGHT	--	0
TUNNEL	0	0

## CRMO: DCV ROUTE MAINTENANCE FEATURES SUMMARY

FEATURE	ROUTE 0010 ENTRANCE ROAD	ROUTE 0102 SCENIC LOOP DRIVE	ROUTE 0103 SPATTER CONE ROAD	ROUTE 0104 CAVES TRAIL ROAD	ROUTE 0200ZZ CAMPGROUND ROADS	ROUTE 0405 EMPLOYEE HOUSING	UNIT
BARRIER	0	0	0	0	0	0	LINEAR FEET
BOLLARD	0	0	0	0	0	0	LINEAR FEET
BRIDGE	0	0	0	0	0	0	EACH
CABLE	0	0	0	0	0	0	LINEAR FEET
CATTLE GUARD	0	0	0	0	0	0	EACH
CULVERT	0	0	0	0	0	0	EACH
CURB	17,313	28,824	950	844	0	37	LINEAR FEET
DROP INLET	0	0	0	0	0	0	EACH
GATE	3	0	0	0	1	0	EACH
GUARD/GUIDE RAIL	0	0	0	0	0	0	LINEAR FEET
GUARD/GUIDE WALL	0	0	0	0	0	0	LINEAR FEET
INTERSECTION	17	10	5	3	15	10	EACH
LOW WATER CROSSING	0	0	0	0	0	0	EACH
LOW WATER CROSSING	0	0	0	0	0	0	LINEAR FEET
MILE MARKER	0	0	0	0	0	0	EACH
OVERHEAD SIGN	0	0	0	0	0	0	EACH
OVERPASS	0	0	0	0	0	0	EACH
PARK BOUNDARY	0	0	0	0	0	0	EACH
PAVED DITCH	0	0	0	0	0	0	LINEAR FEET
PULLOUT	1	5	0	0	0	0	EACH
PULLOUT	195	803	0	0	0	0	LINEAR FEET
RAILROAD CROSSING	0	0	0	0	0	0	EACH
RETAINING WALL	0	0	0	0	0	0	EACH
RETAINING WALL	0	0	0	0	0	0	LINEAR FEET
SIGN	31	12	1	3	11	0	EACH
STATE BOUNDARY	0	0	0	0	0	0	EACH
TEMPORARY BARRIER	0	0	0	0	0	0	LINEAR FEET
TRAFFIC LIGHT	0	0	0	0	0	0	EACH
TUNNEL	0	0	0	0	0	0	EACH
TUNNEL	0	0	0	0	0	0	LINEAR FEET

Notice: Culverts and drop inlets were NOT marked by NPS in Cycle 5. However a culvert could appear below if it has a BIP structure number associated with it.

## **STRUCTURE LIST**

No data available for this section.

**Section 9**  
**Route Maintenance Features**  
**Road Logs**



**Craters of the Moon National  
Monument and Preserve**



# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0010: ENTRANCE ROAD

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 ROUTE 5000 (U.S. HIGHWAY 26/93/20)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 5000 (U.S. HIGHWAY 26/93/20)
0.000	0.000	SIGN	N/A	GUIDE, ARCO
0.000	0.000	SIGN	N/A	GUIDE, TWIN FALLS BOISE
0.000	0.000	INTERSECTION	LEFT	ROUTE 5000 (U.S. HIGHWAY 26/93/20)
0.007	0.007	SIGN	LEFT	REGULATORY, STOP
0.017	0.027	CURB-AND-GUTTER	LEFT	N/A
0.032	0.032	INTERSECTION	LEFT	ROUTE 0900 (EAST VISITOR CENTER PARKING)
0.032	0.032	SIGN	RIGHT	GUIDE, CRATERS LOOP DRIVE CAMPGROUND VISITOR CENTER
0.039	0.074	CURB-AND-GUTTER	LEFT	N/A
0.040	0.040	SIGN	LEFT	WARNING, UNABLE TO READ FROM VIDEO
0.059	0.059	SIGN	RIGHT	GUIDE, BUSES, RV'S AND TRAILERS SECOND LEFT
0.076	0.076	INTERSECTION	LEFT	ROUTE 0900 (EAST VISITOR CENTER PARKING)
0.085	0.098	CURB-AND-GUTTER	LEFT	N/A
0.099	0.099	SIGN	RIGHT	GUIDE, BUS, RV & TRAILER PARKING
0.099	0.099	SIGN	RIGHT	GUIDE, U.S FEE AREA
0.108	0.115	CURB-AND-GUTTER	LEFT	N/A
0.122	0.122	INTERSECTION	LEFT	ROUTE 0901 (WEST VISITOR CENTER PARKING)
0.139	0.148	CURB	LEFT	N/A
0.154	0.154	INTERSECTION	LEFT	ROUTE 0405 (EMPLOYEE HOUSING)
0.160	0.166	CURB	LEFT	N/A
0.162	0.331	CURB	RIGHT	N/A
0.163	0.163	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.168	0.168	GATE	N/A	N/A
0.169	0.169	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.169	0.169	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.170	0.170	SIGN	RIGHT	REGULATORY, ROAD CLOSED
0.219	0.219	INTERSECTION	LEFT	ROUTE 0405 (EMPLOYEE HOUSING)
0.224	0.321	CURB	LEFT	N/A



# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0010: ENTRANCE ROAD

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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
0.227	0.227	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.335	0.335	INTERSECTION	RIGHT	ROUTE 0202Z (CAMPGROUND EXIT ROAD)
0.350	0.355	CURB	N/A	N/A
0.351	0.351	SIGN	LEFT	GUIDE, CRATERS OF THE MOON NATIONAL MONUMENT AND PRESERVE
0.383	0.383	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.384	0.384	INTERSECTION	LEFT	ROUTE 0401 (BONE YARD ROAD)
0.391	1.548	CURB	LEFT	N/A
0.393	0.411	CURB	RIGHT	N/A
0.402	0.402	SIGN	RIGHT	GUIDE, CRATERS LOOP DRIVE CAMPGROUND
0.418	0.418	INTERSECTION	RIGHT	ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD)
0.423	0.689	CURB	RIGHT	N/A
0.531	0.531	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.657	0.657	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.691	0.691	INTERSECTION	RIGHT	ROUTE 0903 (NORTH CRATER FLOW TRAIL PARKING)
0.699	0.746	CURB-AND-GUTTER	RIGHT	N/A
0.702	0.702	SIGN	RIGHT	GUIDE, NORTH CRATER FLOW
0.750	0.750	INTERSECTION	RIGHT	ROUTE 0903 (NORTH CRATER FLOW TRAIL PARKING)
0.755	0.794	CURB-AND-GUTTER	RIGHT	N/A
0.772	0.772	SIGN	RIGHT	GUIDE, NORTH CRATER
0.816	0.816	INTERSECTION	RIGHT	ROUTE 0904 (NORTH CRATER TRAIL PARKING)
0.842	1.926	CURB	RIGHT	N/A
0.853	0.853	SIGN	LEFT	REGULATORY, SPEED LIMIT 15
0.853	0.853	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
0.854	0.854	GATE	N/A	N/A
0.855	0.855	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.855	0.855	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.856	0.856	SIGN	RIGHT	REGULATORY, ROAD CLOSED
1.136	1.173	PULLOUT	LEFT	N/A
1.226	1.226	SIGN	RIGHT	GUIDE, OFF-ROAD DRIVING PROHIBITED

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0010: ENTRANCE ROAD

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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
1.548	1.553	CURB-AND-GUTTER	LEFT	N/A
1.570	1.570	INTERSECTION	LEFT	ROUTE 0905 (OLD MAN PULLOUT)
1.594	1.794	CURB	LEFT	N/A
1.780	1.780	SIGN	RIGHT	GUIDE, DEVIL'S ORCHARD
1.797	1.797	INTERSECTION	LEFT	ROUTE 0100 (DEVIL'S ORCHARD ROAD)
1.808	1.920	CURB	LEFT	N/A
1.811	1.811	GATE	N/A	N/A
1.812	1.812	SIGN	LEFT	WARNING, UNABLE TO READ FROM VIDEO
1.812	1.812	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.813	1.813	SIGN	LEFT	GUIDE, DEVIL'S ORCHARD
1.813	1.813	SIGN	RIGHT	REGULATORY, ROAD CLOSED
1.926	1.926	INTERSECTION	LEFT	ROUTE 0102 (SCENIC LOOP DRIVE)
1.926	1.926	INTERSECTION	N/A	ROUTE 0102 (SCENIC LOOP DRIVE)
1.926	1.926	ROUTE END	N/A	TO BEGINNING OF ROUTE 0102 (SCENIC LOOP DRIVE)

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0102: SCENIC LOOP DRIVE

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 0010 (ENTRANCE ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0102 (SCENIC LOOP DRIVE)
0.000	0.000	INTERSECTION	N/A	ROUTE 0010 (ENTRANCE ROAD)
0.000	0.952	CURB	RIGHT	N/A
0.000	2.789	ONE-WAY	N/A	N/A
0.011	0.791	CURB	LEFT	N/A
0.585	0.617	PULLOUT	RIGHT	N/A
0.793	0.793	SIGN	RIGHT	GUIDE, INFERNO CONE VIEWPOINT
0.798	0.798	INTERSECTION	LEFT	ROUTE 0907 (INFERNO CONE PARKING)
0.842	0.842	INTERSECTION	LEFT	ROUTE 0907 (INFERNO CONE PARKING)
0.850	2.789	CURB	LEFT	N/A
0.954	0.954	INTERSECTION	RIGHT	ROUTE 0103 (SPATTER CONE ROAD)
0.960	0.960	SIGN	RIGHT	GUIDE, SPATTER CONES
0.967	0.967	INTERSECTION	RIGHT	ROUTE 0103 (SPATTER CONE ROAD) OPPOSITE LANE
0.970	1.273	CURB	RIGHT	N/A
1.177	1.205	PULLOUT	RIGHT	N/A
1.273	1.305	CURB-AND-GUTTER	RIGHT	N/A
1.275	1.275	SIGN	RIGHT	WARNING, 10%
1.276	1.302	PULLOUT	RIGHT	N/A
1.305	1.673	CURB	RIGHT	N/A
1.605	1.633	PULLOUT	LEFT	N/A
1.665	1.665	SIGN	RIGHT	GUIDE, TREE MOLDS 2 MILES
1.668	1.668	SIGN	LEFT	REGULATORY, DO NOT ENTER
1.680	1.680	INTERSECTION	RIGHT	ROUTE 0101 (TREE MOLDS ROAD)
1.686	2.297	CURB	RIGHT	N/A
1.882	1.882	SIGN	RIGHT	REGULATORY, SPEED LIMIT 25
1.953	1.953	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
2.036	2.074	PULLOUT	LEFT	N/A
2.292	2.292	SIGN	RIGHT	GUIDE, CAVE AREA
2.296	2.296	SIGN	LEFT	REGULATORY, DO NOT ENTER

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0102: SCENIC LOOP DRIVE

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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.

<b>FROM MILEPOST</b>	<b>TO MILEPOST</b>	<b>FEATURE</b>	<b>SIDE</b>	<b>COMMENT</b>
2.307	2.307	INTERSECTION	RIGHT	ROUTE 0104 (CAVES TRAIL ROAD)
2.315	2.789	CURB	RIGHT	N/A
2.771	2.771	SIGN	RIGHT	REGULATORY, END ONE WAY
2.775	2.775	SIGN	LEFT	REGULATORY, DO NOT ENTER
2.789	2.789	INTERSECTION	LEFT	ROUTE 0102 (SCENIC LOOP DRIVE)
2.789	2.789	INTERSECTION	RIGHT	ROUTE 0010 (ENTRANCE ROAD)
2.789	2.789	SIGN	N/A	GUIDE, CRATERS LOOP DRIVE VISITOR CENTER / EXIT
2.789	2.789	ROUTE END	N/A	TO END OF LOOP

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0103: SPATTER CONE ROAD

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 ROUTE 0102 (SCENIC LOOP DRIVE) ON RIGHT AT MP 0.95
0.000	0.090	CURB	RIGHT	N/A
0.000	0.000	INTERSECTION	LEFT	ROUTE 0102 (SCENIC LOOP DRIVE)
0.000	0.000	INTERSECTION	N/A	ROUTE 0102 (SCENIC LOOP DRIVE)
0.010	0.010	SIGN	LEFT	REGULATORY, DO NOT ENTER
0.018	0.018	INTERSECTION	LEFT	ROUTE 0103 (SPATTER CONE ROAD) OPPOSITE LANE
0.022	0.090	CURB	LEFT	N/A
0.090	0.098	CURB-AND-GUTTER	LEFT	N/A
0.090	0.102	CURB-AND-GUTTER	RIGHT	N/A
0.100	0.102	CURB-AND-GUTTER	LEFT	N/A
0.102	0.102	INTERSECTION	LEFT	ROUTE 0908 (SPATTER CONE PARKING)
0.102	0.102	INTERSECTION	N/A	ROUTE 0908 (SPATTER CONE PARKING)
0.102	0.102	ROUTE END	N/A	TO ROUTE 0908 (SPATTER CONE PARKING)



# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0104: CAVES TRAIL ROAD

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 ROUTE 0102 (SCENIC LOOP DRIVE) ON RIGHT AT MP 2.30
0.000	0.068	CURB	RIGHT	N/A
0.000	0.066	CURB	LEFT	N/A
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0102 (SCENIC LOOP DRIVE)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0102 (SCENIC LOOP DRIVE)
0.000	0.000	SIGN	N/A	REGULATORY, ONE WAY
0.006	0.006	SIGN	LEFT	REGULATORY, YIELD
0.066	0.080	CURB-AND-GUTTER	LEFT	N/A
0.068	0.080	CURB-AND-GUTTER	RIGHT	N/A
0.080	0.080	INTERSECTION	RIGHT	ROUTE 0912 (CAVES PARKING)
0.080	0.080	SIGN	LEFT	REGULATORY, GRAPHIC SIGN NO TEXT
0.080	0.080	ROUTE END	N/A	TO ROUTE 0912 (CAVES PARKING)

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0200Z: CAMPGROUND ENTRANCE ROAD

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 ROUTE 0010 (ENTRANCE ROAD) ON RIGHT AT 0.33
0.000	0.000	SIGN	N/A	GUIDE, CRATERS LOOP DRIVE PARK EXIT
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (ENTRANCE ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (ENTRANCE ROAD)
0.009	0.009	SIGN	LEFT	REGULATORY, STOP
0.029	0.029	INTERSECTION	LEFT	ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD)
0.067	0.067	INTERSECTION	LEFT	ROUTE 0201Z (CAMPSITE ACCESS ROAD)
0.067	0.067	INTERSECTION	RIGHT	ROUTE 0202Z (CAMPGROUND EXIT ROAD)
0.067	0.231	ONE-WAY	N/A	N/A
0.070	0.070	SIGN	RIGHT	GUIDE, CAMPSITES EXIT
0.090	0.090	INTERSECTION	LEFT	ROUTE 0201Z (CAMPSITE ACCESS ROAD)
0.135	0.135	INTERSECTION	RIGHT	ROUTE 0204Z (CAMPGROUND LOOPS A/B)
0.209	0.209	SIGN	RIGHT	REGULATORY, DO NOT ENTER
0.231	0.231	INTERSECTION	LEFT	ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD)
0.231	0.231	INTERSECTION	RIGHT	ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD)
0.231	0.231	ROUTE END	N/A	TO END OF LOOP

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0204Z: CAMPGROUND LOOPS A/B

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD) ON RIGHT
0.000	0.000	INTERSECTION	LEFT	ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0200Z (CAMPGROUND ENTRANCE ROAD)
0.000	0.000	SIGN	N/A	REGULATORY, ONE WAY
0.002	0.002	SIGN	RIGHT	REGULATORY, DO NOT ENTER
0.006	0.006	GATE	N/A	N/A
0.007	0.007	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.007	0.007	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.008	0.008	SIGN	RIGHT	REGULATORY, ROAD CLOSED
0.045	0.045	INTERSECTION	LEFT	ROUTE 0206Z (CAMPGROUND LOOP)
0.096	0.096	INTERSECTION	LEFT	ROUTE 0204Z (CAMPGROUND LOOPS A/B)
0.096	0.183	ONE-WAY	N/A	N/A
0.100	0.100	SIGN	LEFT	REGULATORY, ONE WAY
0.182	0.182	SIGN	LEFT	WARNING, UNABLE TO READ FROM VIDEO
0.183	0.183	INTERSECTION	LEFT	ROUTE 0204Z (CAMPGROUND LOOPS A/B)
0.183	0.183	INTERSECTION	N/A	ROUTE 0204Z (CAMPGROUND LOOPS A/B)
0.183	0.183	ROUTE END	N/A	TO END OF LOOP

# CRMO: ROUTE MAINTENANCE FEATURES ROAD LOG

## ROUTE 0405: EMPLOYEE HOUSING

**Notice:** Culverts and drop inlets were NOT marked by NPS nor inventoried by RIP in Cycle 5 on the 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 ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.15
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (ENTRANCE ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (ENTRANCE ROAD)
0.000	0.005	CURB-AND-GUTTER	LEFT	N/A
0.001	0.001	INTERSECTION	LEFT	ROUTE 0901 (WEST VISITOR CENTER PARKING)
0.002	0.002	INTERSECTION	LEFT	ROUTE 0902 (ADMINISTRATIVE PARKING)
0.010	0.012	CURB-AND-GUTTER	LEFT	N/A
0.015	0.015	INTERSECTION	LEFT	ROUTE 0914AZ (RESIDENTIAL PARKING A)
0.016	0.016	INTERSECTION	RIGHT	ROUTE 0914BZ (RESIDENTIAL PARKING B)
0.027	0.027	INTERSECTION	RIGHT	ROUTE 0914CZ (RESIDENTIAL PARKING C)
0.052	0.052	INTERSECTION	RIGHT	ROUTE 0914DZ (RESIDENTIAL PARKING D)
0.114	0.114	INTERSECTION	LEFT	ROUTE 0010 (ENTRANCE ROAD)
0.114	0.114	INTERSECTION	RIGHT	ROUTE 0010 (ENTRANCE ROAD)
0.114	0.114	ROUTE END	N/A	TO ROUTE 0010 (ENTRANCE ROAD) ON LEFT AT MP 0.213

# Section 10 Appendix



## Craters of the Moon National Monument and Preserve



Federal Lands Highway  
Road Inventory Program



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

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

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

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

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

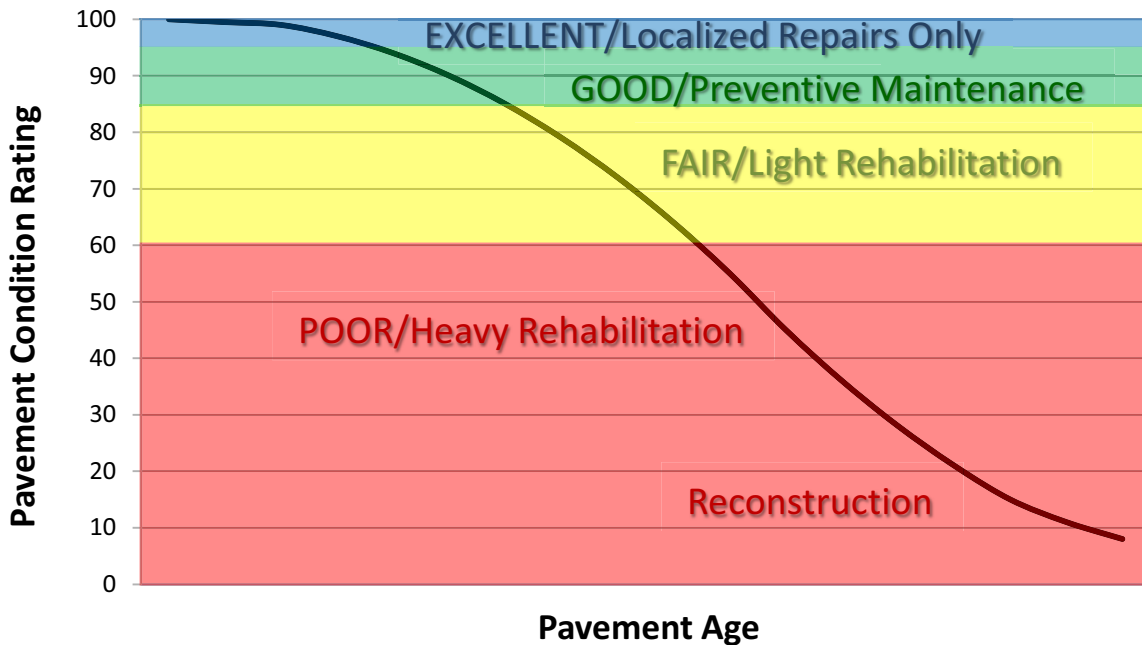
# Explanation of the Excellent, Good, Fair and Poor Condition Descriptions

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

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

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

## Condition Categories and Treatments



## DESCRIPTION OF RATING SYSTEM

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

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

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

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

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

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

# **SURFACE DISTRESSES**

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## **Surface Condition Rating - SCR**

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

### **Surface distresses determined from digital images**

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

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

- Rutting

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

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

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

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

## **Roughness Condition Index - RCI**

### **Additional condition data measured by DCV (lasers and accelerometers)**

- Roughness (IRI)

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

## **Pavement Condition Rating - PCR**

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

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

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

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

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

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

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

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

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

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



**TABLE 1: Distress Summary**

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

**\*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  $\leq 0.25$  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  $\leq 0.75$  in. (19 mm) or any crack with a mean width  $\leq 19$  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  $\leq 0.75$  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**

<b>ALLIGATOR CRACKING SEVERITY LEVELS</b>		<b>Crack Pattern</b>		
		<b>LOW</b>	<b>MED</b>	<b>HIGH</b>
<b>Crack Width</b>	<b>LOW</b>	L	M	H
	<b>MED</b>	M	M	H
	<b>HI</b>	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  $\leq 0.75$  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  $\leq 0.75$  in. (19 mm). Also, any crack with a mean width  $< 0.75$  in. (19 mm) and adjacent random low severity cracking.

#### **HIGH**

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

## **PATCHING AND POTHOLES**

### **Description**

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

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

### **Severity Levels**

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

## **RUTTING**

### **Description**

Rutting is a longitudinal surface depression in the wheelpath.

### **Severity Levels**

#### **LOW**

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

#### **MED**

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

#### **HIGH**

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

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

## **ROUGHNESS**

### **Description**

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

### **Severity Levels**

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

**TABLE 3: IRI**

<b>IRI Descriptions</b>	
<b>Type of Road</b>	<b>Typical IRI ( in/mile )</b>
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

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

### Alligator Crack Index

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

Where:

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

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

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

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

Percent of total area is computed as:

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

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

### Longitudinal Crack Index

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

Where:

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

These values are  $\geq 0$  and can exceed 100.

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

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

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

Percent of interval length is computed as:

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



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

### **Structural Crack Index**

$$SC\_INDEX = [100 - ((100 - AC\_INDEX) + (100 - LC\_INDEX))]$$

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

### **Transverse Crack Index**

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

Where:

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

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

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

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

Number of cracks is computed as:

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

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

## Patching Index

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

Where:

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

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

Percent of total area is computed as:

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

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

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

## Rutting Index

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

Where:

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

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

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

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

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

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

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

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

### **Roughness Condition Index (Asphalt)**

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

Where:

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

Average IRI is computed as:

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

There is no applicable threshold for failure for this index.

### **Roughness Condition Index (Concrete)**

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

For concrete, PCR = RCI

### **Surface Condition Rating Index**

**SCR** = *Lowest* Index Value Of: [SC\_INDEX, TC\_INDEX, PATCH\_INDEX, RUT\_INDEX]

*Note: The modified SCR equation above combines AC\_INDEX and LC\_INDEX, and considers that a single AC/LC index value of the Structural Crack Index (SC\_INDEX). The lowest of the four computed index values (SC\_INDEX, TC\_INDEX, PATCH\_INDEX, or RUT\_INDEX) becomes the SCR.*

Where:

See above for determinations of SC\_INDEX, TC\_INDEX, PATCH\_INDEX and RUT\_INDEX.

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

## Data Collection Vehicle Subsystems

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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.

<b>CAMERA SPECIFICATIONS</b>	
<b>Two Forward/ One Rear Facing</b>	
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.

<b>CAMERA SPECIFICATIONS</b>	
<b>Pavement Line Scan</b>	
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.

<b>IRI SPECIFICATIONS</b>	
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.

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

## **GPS & INERTIAL SYSTEMS**

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

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

### GPS on Manually Rated Roads (MRR)

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



## Geodatabase – Background and Metadata

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

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

## **GLOSSARY OF TERMS AND ABBREVIATIONS**

<b><u>TERM OR ABBREVIATION</u></b>	<b><u>DESCRIPTION OR DEFINITION</u></b>
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