Federal Lands Highway

Road Inventory Program

Road Inventory and Condition Assessment

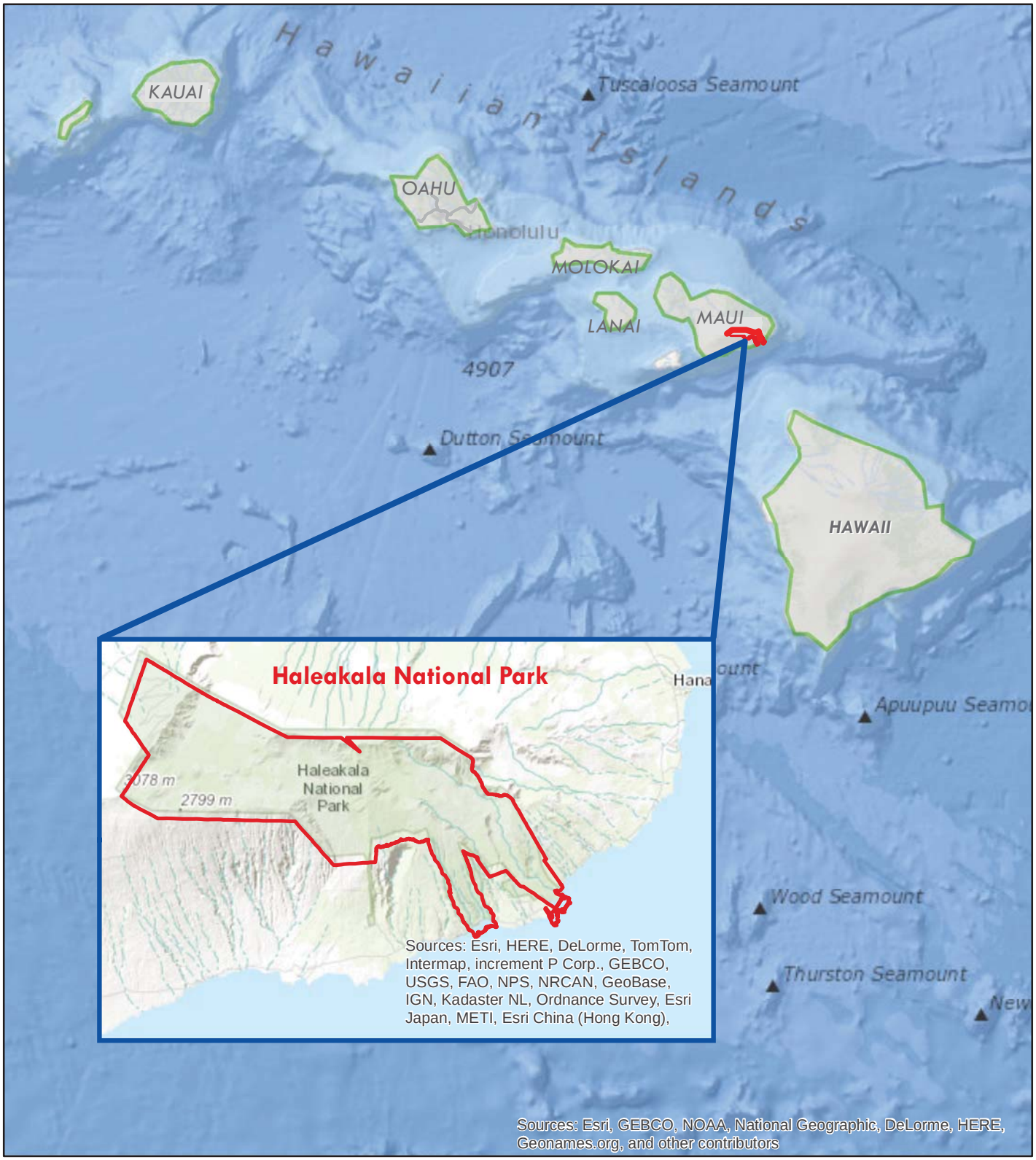
Haleakala National Park

HALE

Cycle 5 Report

Prepared By: Federal Highway Administration
Road Inventory Program (RIP)
Data Collected: 04/2014
Report Date: 11/2014

Haleakala National Park
in
Hawaii



DCV = Data Collection Vehicle

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INTRODUCTION

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

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

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

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

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

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

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

Cycle 5 has launched in the summer of 2010 and will again comprise all parks, large and small, that are served by paved roads and/or parking areas. For Cycle 5, the decision was made to collect condition data in large parks on Functional Class 1, 2, and 7 paved routes only, as well as any new routes that were previously not collected. In small parks, all paved routes and parking areas will be collected. As a result, this will include 81 large parks with 4,459 paved route miles and 231 small parks with 529 paved route miles and associated paved parking areas.

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

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

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

Respectfully,

FHWA RIP Team

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Section 2
Park Route Inventory

Haleakala National Park

Federal Lands Highway
Road Inventory Program

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

White = Paved Routes, DCV Driven
Yellow = Unpaved Routes, DCV not Driven
Blue = All Paved Parking Areas
Green = All Unpaved Parking Areas
Grey = Paved Routes, DCV not Driven
Black = State, Local or Private non-NPS Routes
= Concession Route Flag ON

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

** DCV - Data Collection Vehicle NC - Not Collected

HALE

HALEAKALA NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0010	5	2652		HALEAKALA PARK ROAD	FROM NORTH PARK BOUNDARY (AT CATTLE GUARD) AND END OF ROUTE 5378 (STATE ROUTE 378 / HALEAKALA HIGHWAY)	TO ROUTE 0903ZZ (HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM))	SUMMIT	10.51	0.00	10.51	1		AS	1
0100	5	39530		RED HILL ROAD	FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD)	TO ROUTE 0904 (RED HILL SUMMIT PARKING LOT)	SUMMIT	0.56	0.00	0.56	1		AS	1
0200	5	39531		MAGNETIC PEAK SPUR ROAD	FROM ROUTE 0100 (RED HILL ROAD)	TO SOUTH PARK BOUNDARY (OBSERVATORY / PARK BOUNDARY FENCE)	SUMMIT	0.20	0.00	0.20	2		AS	1
0201	5	39532		KALAHAKU OVERLOOK ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 8.73	TO ROUTE 0905ZZ (KALAHAKU OVERLOOK PARKING AREAS)	SUMMIT	0.25	0.00	0.25	2		AS	1
0202	5	31839		HOSMER GROVE SPUR ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD)	TO ROUTE 0906ZZ (HOSMER GROVE CAMPGROUND PARKING AREAS)	SUMMIT	0.45	0.00	0.45	3		AS	1
0203	5	2653		KIPAHULU CAMPGROUND AND PICNIC ACCESS ROAD	FROM ROUTE 0910 (KIPAHULU VISITOR CENTER PARKING)	TO END OF LOOP	KIPAHULU	0.08	0.33	0.41	3	6,420	CO	2
0204ZZ	5	97853		KAPAHU FARM SERVICE ROAD	FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)	TO END	KIPAHULU	0.07	0.38	0.45	6	1,478	CO	2
0400	5	31842		PERMANENT QUARTERS SERVICE ROAD	FROM ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)	TO END	SUMMIT	0.12	0.00	0.12	5		AS	1
0401	5	31841		MAINTENANCE YARD SERVICE ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD)	TO ROUTE 0907 (PU'U NIANIAU MAINTENANCE YARD PARKING)	SUMMIT	0.14	0.00	0.14	5		AS	1
0402	5	31840		SEASONAL HOUSING PARKING SPUR ROAD	FROM ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)	TO END OF LOOP	SUMMIT	0.08	0.00	0.08	5		AS	1
0403	5	31838		RAIN SHED SERVICE ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 2.27	TO WATER TANKS	SUMMIT	0.00	0.00	0.00	6	7,295	AS	1

Cycle 5 NPS/RIP Route ID Report

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White = Paved Routes, DCV Driven
Yellow = Unpaved Routes, DCV not Driven
Blue = All Paved Parking Areas
Green = All Unpaved Parking Areas
Grey = Paved Routes, DCV not Driven
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HALEAKALA NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0405	5	97654		KIPAHULU ROAD TO WATER TANK	FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)	TO END OF LOOP NEAR WATER TANK	KIPAHULU	0.17	0.31	0.48	6	7,719	CO	2
0900ZZ	5	31833		HEADQUARTERS VISITOR PARKING AREAS	FROM ROUTE 0010 (HALEAKALA PARK ROAD)	TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)	SUMMIT	0.00	0.00	0.00		14,108	AS	1
0901	5	31835		HALEMAU'U 8,000 FOOT TRAILHEAD PARKING	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 4.55	TO PARKING	SUMMIT	0.00	0.00	0.00		12,176	AS	1
0902	5	31836		LELEIWI OVERLOOK PARKING	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 7.27	TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 7.32	SUMMIT	0.00	0.00	0.00		8,178	AS	1
0903ZZ	5	31830		HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)	FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD) AND ADJACENT TO ROUTE 0100 (RED HILL ROAD)	TO PARKING	SUMMIT	0.00	0.00	0.00		46,088	AS	1
0904	5	31831		RED HILL SUMMIT PARKING LOT	FROM END OF ROUTE 0100 (RED HILL ROAD)	TO PARKING	SUMMIT	0.00	0.00	0.00		20,100	AS	1
0905ZZ	5	31837		KALAHAKU OVERLOOK PARKING AREAS	ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD)		SUMMIT	0.00	0.00	0.00		5,557	AS	1
0906ZZ	5	31832		HOSMER GROVE CAMPGROUND PARKING AREAS	FROM ROUTE 0202 (HOSMER GROVE ROAD)	TO PARKING	SUMMIT	0.00	0.00	0.00		13,597	AS	1
0907	NC	39534		PU'U NIANIAU MAINTENANCE YARD PARKING	FROM END OF ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)	TO PARKING	SUMMIT	0.00	0.00	0.00		1,400	GR	
0908ZZ	5	102613		PU'U NIANIAU RESIDENCE PARKING AREAS	ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)		SUMMIT	0.00	0.00	0.00		3,039	AS	1
0910	5	39535		KIPAHULU VISITOR CENTER PARKING	FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)	TO PARKING	KIPAHULU	0.00	0.00	0.00		50,288	CO	2
0911	NC	39536		KIPAHULU VISITOR CENTER OVERFLOW PARKING	FROM ROUTE 0203 (KIPAHULU CAMPGROUND AND PICNIC ACCESS ROAD)	TO PARKING	KIPAHULU	0.00	0.00	0.00		30,000	NV	

Cycle 5 NPS/RIP Route ID Report

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Yellow = Unpaved Routes, DCV not Driven
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Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0912	NC	39537		KIPAHULU MAINTENANCE YARD	FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)	TO PARKING	KIPAHULU	0.00	0.00	0.00		25,585	NV	
0913	**5**	**31834**		**HEADQUARTERS EMPLOYEE PARKING LOT**	**FROM ROUTE 0900ZZ (HEADQUARTERS VISITOR PARKING AREAS)**	**TO ROUTE 0400 (PERMANENT QUARTERS SERVICE ROAD)**	**SUMMIT**	**0.00**	**0.00**	**0.00**		**11,492**	**AS**	**1**
0914	NC	116130		PU'U NIANIAU TNC HOUSE AND RESEARCH OFFICES BUILDING PARKING LOT	FROM ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)	TO PARKING	SUMMIT	0.00	0.00	0.00		1,025	GR	
0915	**5**			**ENTRANCE STATION PARKING**	**ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD)**		**SUMMIT**	**0.00**	**0.00**	**0.00**		**1,435**	**AS**	**1**
5031	4			COUNTY ROAD 31 / PIILANI HIGHWAY	FROM END OF ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY) AT KELEPA BRIDGE	TO INTERSECTION WITH ROUTE 5037 (STATE ROUTE 37 / KULA HIGHWAY) AT MP 25.24	N/A	20.34	4.90	25.24			AS	3
5036	4			STATE ROUTE 36 / HANA HIGHWAY	FROM END OF ROUTE 5360 (STATE ROUTE 360 / HANA HIGHWAY) AT INTERSECTION WITH KEAWA PLACE IN HANA	TO BEGINNING OF ROUTE 5031 (COUNTY ROAD 31 / PIILANI HIGHWAY) AT KELEPA BRIDGE AT MP 13.32	N/A	12.73	0.59	13.32			AS	2,3
5037	4			STATE ROUTE 37 / KULA HIGHWAY	FROM END OF ROUTE 5031 (COUNTY ROAD 31 / PIILANI HIGHWAY)	TO INTERSECTION WITH STATE ROUTE 377 / KEKAULIKE AVENUE	N/A	7.13	0.00	7.13			AS	3
5360	4			STATE ROUTE 360 / HANA HIGHWAY	FROM COUNTY ROAD 365 / KAUPAKALUA ROAD	TO BEGINNING OF ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY) AT INTERSECTION WITH KEAWA PLACE IN HANA	N/A	34.49	0.00	34.49			AS	3
5378	**5**			**STATE ROUTE 378 / HALEAKALA HIGHWAY**	**FROM STATE ROUTE 377**	**TO BEGINNING OF ROUTE 0010 (HALEAKALA PARK ROAD) AT CATTLE GUARD**	**N/A**	**10.17**	**0.00**	**10.17**			**AS**	**1,3**

Cycle 5 NPS/RIP Route ID Report

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White = Paved Routes, DCV Driven	Yellow = Unpaved Routes, DCV not Driven	Blue = All Paved Parking Areas	Green = All Unpaved Parking Areas
Grey = Paved Routes, DCV not Driven	Black = State, Local or Private non-NPS Routes	= Concession Route Flag ON	

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CYCLE 5 SUMMARY TOTALS FOR HALEAKALA NATIONAL PARK

CYCLE 5 ROUTE TOTALS

DCV Driven Route Miles	12.32
Manually Rated Route Miles	0.32
TOTAL PARK ROUTE MILES COLLECTED IN CYCLE 5	12.64
Manually Rated Routes (SQFT)	7,295
TOTAL UNPAVED PARK ROUTE MILES	1.02

CYCLE 5 CONCESSION TOTALS

Concession Paved Route Miles	0.00
Concession Unpaved Route Miles	0.00
TOTAL CONCESSION ROUTE MILES	0.00
Concession Paved Parking Area SQFT	0
Concession Unpaved Parking Area SQFT	0
TOTAL CONCESSION PARKING AREA SQFT	0
Concession Manually Rated Routes SQFT	0

* CYCLE 5 PARKING AREA TOTALS

Paved Parking (SQFT)	186,058
Unpaved Parking (SQFT)	58,010
TOTAL PARKING (SQFT)	244,068

CYCLE 5 WEIGHTED AVERAGE PARK VALUES

DCV Driven PCR	85
**Manually Rated Routes PCR	81
**Parking PCR	89
***Total Equivalent Lane Miles	27.15

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

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

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

Cycle 5 NPS/RIP Route ID Report

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General Park Road Functional Classification Table

Class 1 Principal Park Road/Rural Parkway (Public Roads) Roads which constitute the main access route, circulatory tour, or thoroughfare for park visitors. Route Numbers 1 - 99. Note: Rural parkways (e.g. Natchez Trace) are numbered 1 - 9. State Routes Inventoried for Park. Route Numbers 5000-5999

Class 2 Connector Park Road (Public Roads) - Roads which provide access within a park to areas of scenic, scientific, recreational or cultural interest, such as overlooks, campgrounds, etc. Route Numbers 100-199.

Class 3 Special Purpose Park Road (Public Roads) - Roads which provide circulation within public areas, such as campgrounds, picnic areas, visitor center complexes, concessionaire facilities, etc. These roads generally serve low-speed traffic and are often designed for one-way circulation. Route Numbers 200-299.

Class 4 Primitive Park Roads (Public Roads) - Roads which provide circulation through remote areas and/or access to primitive campgrounds and undeveloped areas. These roads frequently have no minimum design standards and their use may be limited to specially equipped vehicles. Route Numbers 200-299.
Note: Functional Classes 3 and 4 have the same route numbers because, historically, they were numbered similarly.

Class 5 Administrative Access Road (Administrative Roads) - All public roads intended for access to administrative developments or structures such as park offices, employee quarters, or utility areas. Route Numbers 400-499.

Class 6 Restricted Road (Administrative Roads) - All roads normally closed to the public, including patrol roads, truck trails, and other similar roads. Route Numbers 400-499.
Note: Functional Classes 5 and 6 have the same route numbers because historically they were numbered similarly and often there is little distinction between these routes. For example, because utility areas and employee housing are often closed to the public, this restriction would result in classification of FC 6 rather than FC 5.

Class 7 Urban Parkway (Urban Parkways and City Streets) - These facilities serve high volumes of park and non-park related traffic and are restricted, limited-access facilities in an urban area. This category of roads primarily encompasses the major parkways which serve as gateways to our nation's capital. Other major park roads or portions thereof, however, may be included in this category. Route Numbers 1-9.

Class 8 City Streets (Urban Parkways and City Streets) - City streets are usually extensions of the adjoining street system that are owned and maintained by the National Park Service. The construction and/or reconstruction should conform with accepted local engineering practice and local conditions. Route Numbers 600-699.

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

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

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

Surface Type Abbreviations:

AS - Asphaltic Concrete Pavement

CO - Portland Cement Concrete Pavement

BR - Brick or Pavers Road Bed

CB - Cobble Stone Road Bed

GR - Gravel Road Bed

SA - Sand Road Bed

NV - Native or Dirt Material Road Bed

OT - Other Materials Road Bed

NPS/RIP Subcomponent Details for HALE

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HALE

HALEAKALA NATIONAL PARK

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0204ZZ	97853	5	KAPAHU FARM SERVICE ROAD	FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)	TO END		6	0.07	0.38	0.45	1,478
0900ZZ	31833	5	HEADQUARTERS VISITOR PARKING AREAS	FROM ROUTE 0010 (HALEAKALA PARK ROAD)	TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)			0.00	0.00	0.00	14,108
0903ZZ	31830	5	HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)	FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD) AND ADJACENT TO ROUTE 0100 (RED HILL ROAD)	TO PARKING			0.00	0.00	0.00	46,088
0905ZZ	31837	5	KALAHAKU OVERLOOK PARKING AREAS	ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD)				0.00	0.00	0.00	5,557
0906ZZ	31832	5	HOSMER GROVE CAMPGROUND PARKING AREAS	FROM ROUTE 0202 (HOSMER GROVE ROAD)	TO PARKING			0.00	0.00	0.00	13,597
0908ZZ	102613	5	PU'U NIANIAU RESIDENCE PARKING AREAS	ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)				0.00	0.00	0.00	3,039

HALE-0204ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0204AZ	97853	NC	KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 1)	FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)	TO ROUTE 0204BZ (KAPAHU FARM SERVICE ROAD (PAVED SECTION 1))		6	0.00	0.16	0.16	
0204BZ	97853	5	KAPAHU FARM SERVICE ROAD (PAVED SECTION 1)	FROM ROUTE 0204AZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 1))	TO ROUTE 0204CZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2))		6	0.03	0.00	0.03	697
0204CZ	97853	NC	KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2)	FROM ROUTE 0204BZ (KAPAHU FARM SERVICE ROAD (PAVED SECTION 1))	TO ROUTE 0204DZ (KAPAHU FARM SERVICE ROAD (PAVED SECTION 2))		6	0.00	0.14	0.14	
0204DZ	97853	5	KAPAHU FARM SERVICE ROAD (PAVED SECTION 2)	FROM ROUTE 0204CZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2))	TO ROUTE 0204EZ(KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 3))		6	0.04	0.00	0.04	781
0204EZ	97853	NC	KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 3)	FROM ROUTE 0204DZ (KAPAHU FARM SERVICE ROAD (PAVED SECTION 2))	TO END		6	0.00	0.08	0.08	

NPS/RIP Subcomponent Details for HALE

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HALE

HALEAKALA NATIONAL PARK

HALE-0900ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0900AZ	31833	5	HEADQUARTERS VISITOR PARKING A	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.03 (ON RIGHT)	TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)			0.00	0.00	0.00	11,113
0900BZ	31833	5	HEADQUARTERS VISITOR PARKING B	ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.06 (ON LEFT)				0.00	0.00	0.00	2,995

HALE-0903ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0903AZ	31830	5	HALEAKALA VISITOR CENTER PARKING A (CRATER RIM)	FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD)	TO PARKING			0.00	0.00	0.00	44,003
0903BZ	31830	5	HALEAKALA VISITOR CENTER PARKING B (CRATER RIM)	ADJACENT TO ROUTE 0100 (RED HILL ROAD)				0.00	0.00	0.00	2,085

HALE-0905ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0905AZ	31837	5	KALAHAKU OVERLOOK PARKING A	ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20				0.00	0.00	0.00	4,239
0905BZ	31837	5	KALAHAKU OVERLOOK PARKING B	ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24				0.00	0.00	0.00	1,318

NPS/RIP Subcomponent Details for HALE

Shading Color Key:
Red text denotes approx. mileage

White = Paved Routes, DCV Driven
Yellow = Unpaved Routes, DCV not Driven
Blue = All Paved Parking Areas
Green = All Unpaved Parking Areas
Grey = Paved Routes, DCV not Driven
Black = State, Local or Private non-NPS Routes
= Concession Route Flag ON

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

HALE

HALEAKALA NATIONAL PARK

HALE-0906ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0906AZ	31832	5	HOSMER GROVE CAMPGROUND PARKING A	FROM END OF ROUTE 0202 (HOSMER GROVE SPUR ROAD)	TO PARKING			0.00	0.00	0.00	7,003
0906BZ	31832	5	HOSMER GROVE CAMPGROUND PARKING B	FROM ROUTE 0202 (HOSMER GROVE SPUR ROAD) AT MP 0.42	TO PARKING			0.00	0.00	0.00	4,736
0906CZ	31832	5	HOSMER GROVE CAMPGROUND PARKING C	ADJACENT TO ROUTE 0202 (HOSMER GROVE SPUR ROAD) AT MP 0.23				0.00	0.00	0.00	1,858

HALE-0908ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0908AZ	102613	5	PU'U NIANIAU RESIDENCE PARKING	ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)				0.00	0.00	0.00	1,310
0908BZ	102613	5	PU'U NIANIAU RESIDENCE OVERFLOW PARKING	ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)				0.00	0.00	0.00	1,729

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - HALE

ROUTES ADDED FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Reason for Addition**	**Comments**
0915	ENTRANCE STATION PARKING	OTHER	PAVED PARKING ADDED TO INVENTORY IN CYCLE 5.
5378	STATE ROUTE 378 / HALEAKALA HIGHWAY	OTHER	NON-NPS ROAD ADDED TO INVENTORY IN CYCLE 5.

ROUTES MODIFIED FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Modification**	**Comments**
0203	KIPAHULU CAMPGROUND AND PICNIC ACCESS ROAD	SURFACE TYPE CHANGE	THE BEND ALONG THE ROADWAY INTO THE KIPAHULU CAMPGROUND IS NOW CONCRETE. THE ROAD WAS ENTIRELY UNPAVED IN CYCLE 4. ROUTE NAME CHANGED FROM "HIGHWAY 31, HANA HIGHWAY, KIPAHULU AREA".
0204ZZ	KAPAHU FARM SERVICE ROAD	SURFACE TYPE CHANGE	ROUTE 0204ZZ HAS 3 UNPAVED SEGMENTS AND 2 PAVED SEGMENTS. SEGMENTS 1, 3, AND 5 ARE GRAVEL; SEGMENTS 2 AND 4 ARE TWO-TRACK, CONCRETE SEGMENTS (WITH GRASS MEDIAN). ROUTE WAS ENTIRELY UNPAVED IN CYCLE 4. FUNCTIONAL CLASS CHANGED FROM 4 TO 6 BECAUSE IT IS A NONPUBLIC ROAD.
0405	KIPAHULU ROAD TO WATER TANK	SURFACE TYPE CHANGE	ROUTE 0405 HAS TWO UNPAVED SEGMENTS AND ONE PAVED SEGMENT. THE PAVED SECTION IS A TWO-TRACK, CONCRETE ROAD (WITH GRASS MEDIAN). THE FIRST UNPAVED SEGMENT IS GRAVEL; THE SECOND UNPAVED SEGMENT IS GRASS/DIRT. ROUTE WAS INVENTORIED AS ENTIRELY UNPAVED IN CYCLE 4. ROUTE NAME WAS CHANGED FROM "KIPAHULU SERVICE ROAD". FUNCTIONAL CLASS CHANGED FROM 5 TO 6 BECAUSE IT IS A NONPUBLIC ROAD.

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - HALE

OTHER CHANGES FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Change**	**Comments**
0400	PERMANENT QUARTERS SERVICE ROAD	OTHER	ROUTE COLLECTED WITH THE DATA COLLECTION VEHICLE (DCV) IN CYCLE 5 (IN CYCLE 4 IT WAS MANUALLY RATED). ROUTE NAME CHANGED FROM "HEADQUARTERS RESIDENCE ROAD". FUNCTIONAL CLASS CHANGED FROM 4 TO 5 BECAUSE IT IS AN ADMINISTRATIVE ROAD.
0401	MAINTENANCE YARD SERVICE ROAD	OTHER	FUNCTIONAL CLASS CHANGED FROM 4 TO 5 BECAUSE IT IS AN ADMINISTRATIVE ROAD. ROUTE NAME CHANGED FROM "PU'U NIANIAU ROAD".
0402	SEASONAL HOUSING PARKING SPUR ROAD	ROUTE SPLIT	CYCLE 4 ROUTE 0402 WAS SPLIT INTO A ROAD (ROUTE 0402) AND PARKING AREAS (ROUTE 0908ZZ). THE ROUTE NAME FOR 0402 CHANGED FROM "PU'U NIANIAU RESIDENCE ROAD". THE FUNCTIONAL CLASS CHANGED FROM 4 TO 5 BECAUSE IT IS AN ADMINISTRATIVE ROAD.
0403	RAIN SHED SERVICE ROAD	OTHER	GPS AND SQUARE FOOTAGE UPDATED IN CYCLE 5. ROUTE NAME CHANGED FROM "WATER CATCHMENT ROAD". FUNCTIONAL CLASS CHANGED FROM 5 TO 6 BECAUSE IT IS A NONPUBLIC ROAD.
0900ZZ	HEADQUARTERS VISITOR PARKING AREAS	ROUTE NAME	ROUTE NAME CHANGED FROM "PARK HEADQUARTERS PARKING AREAS".
0904	RED HILL SUMMIT PARKING LOT	ROUTE NAME	ROUTE NAME CHANGED FROM "PU'U'ULA'ULA SUMMIT PARKING".
0906ZZ	HOSMER GROVE CAMPGROUND PARKING AREAS	SQ FEET CHANGE	GPS AND SQUARE FOOTAGE UPDATED IN CYCLE 5. THERE WAS RECONSTRUCTION AND SHAPE CHANGES ON "PARKING B" NEAR THE RESTROOM.
0908ZZ	PU'U NIANIAU RESIDENCE PARKING AREAS	ROUTES COMBINED	GPS AND SQUARE FOOTAGE UPDATED IN CYCLE 5. A SECTION OF PARKING WAS SPLIT FROM CYCLE 4 ROUTE 0402 AND COMBINED INTO ROUTE 0908ZZ.
0910	KIPAHULU VISITOR CENTER PARKING	SURFACE TYPE CHANGE	ROUTE WAS UNPAVED IN CYCLE 4, AND IS NOW CONCRETE.

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - HALE

OTHER CHANGES FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Change**	**Comments**
0913	HEADQUARTERS EMPLOYEE PARKING LOT	SQ FEET CHANGE	GPS AND SQUARE FOOTAGE UPDATED IN CYCLE 5.

Section 3
Park Summary Information

Haleakala National Park

Federal Lands Highway
Road Inventory Program

HALE: 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	1.35	10.96%	3.20	25.97%	1.94	15.75%	4.58	37.18%	**11.07**
2	0.00	0.00%	0.12	0.97%	0.04	0.32%	0.29	2.35%	**0.45**
3							0.45	3.65%	**0.45**
4									
5	0.25	2.03%	0.02	0.16%	0.04	0.32%	0.04	0.32%	**0.35**
6									
7									
8									
Totals	**1.60**	**12.99%**	**3.34**	**27.11%**	**2.02**	**16.39%**	**5.36**	**43.50%**	**12.32**

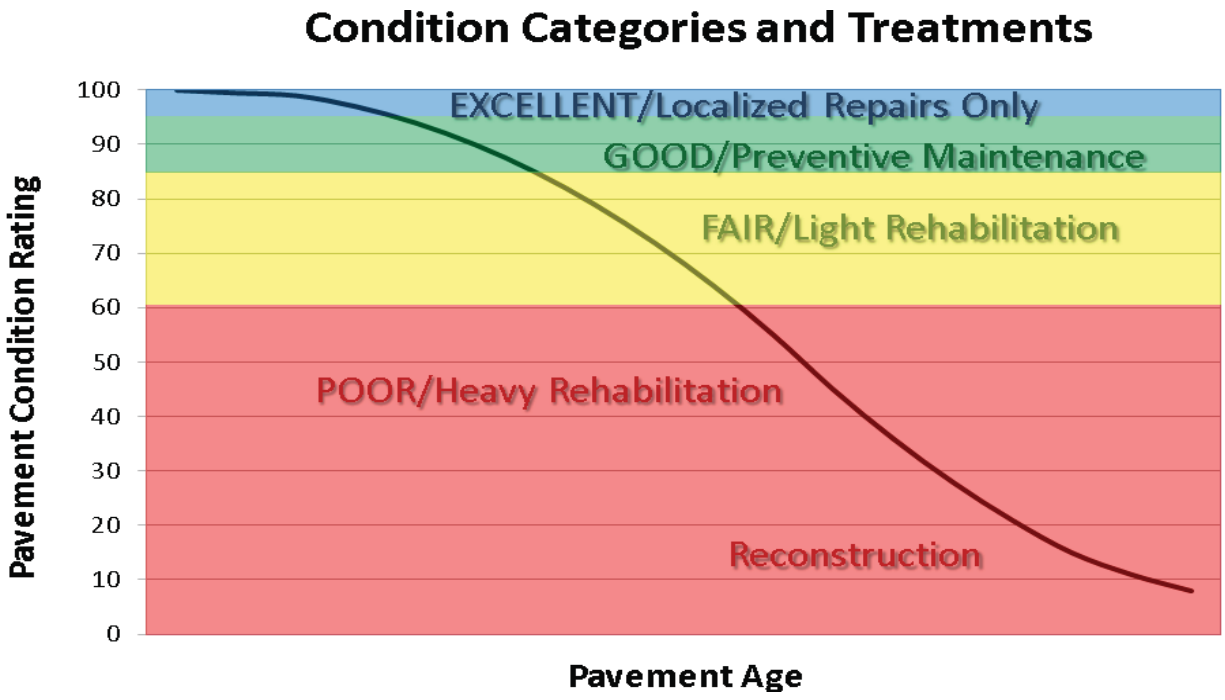
Note: **The information in this table is derived from the PMS_20 table in the Park database, which only contains processed data from routes collected with the Data Collection Vehicle (DCV). Information for Manually Rated Routes (MRR) and Parking Areas is not reported in this table. Only Functional Class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

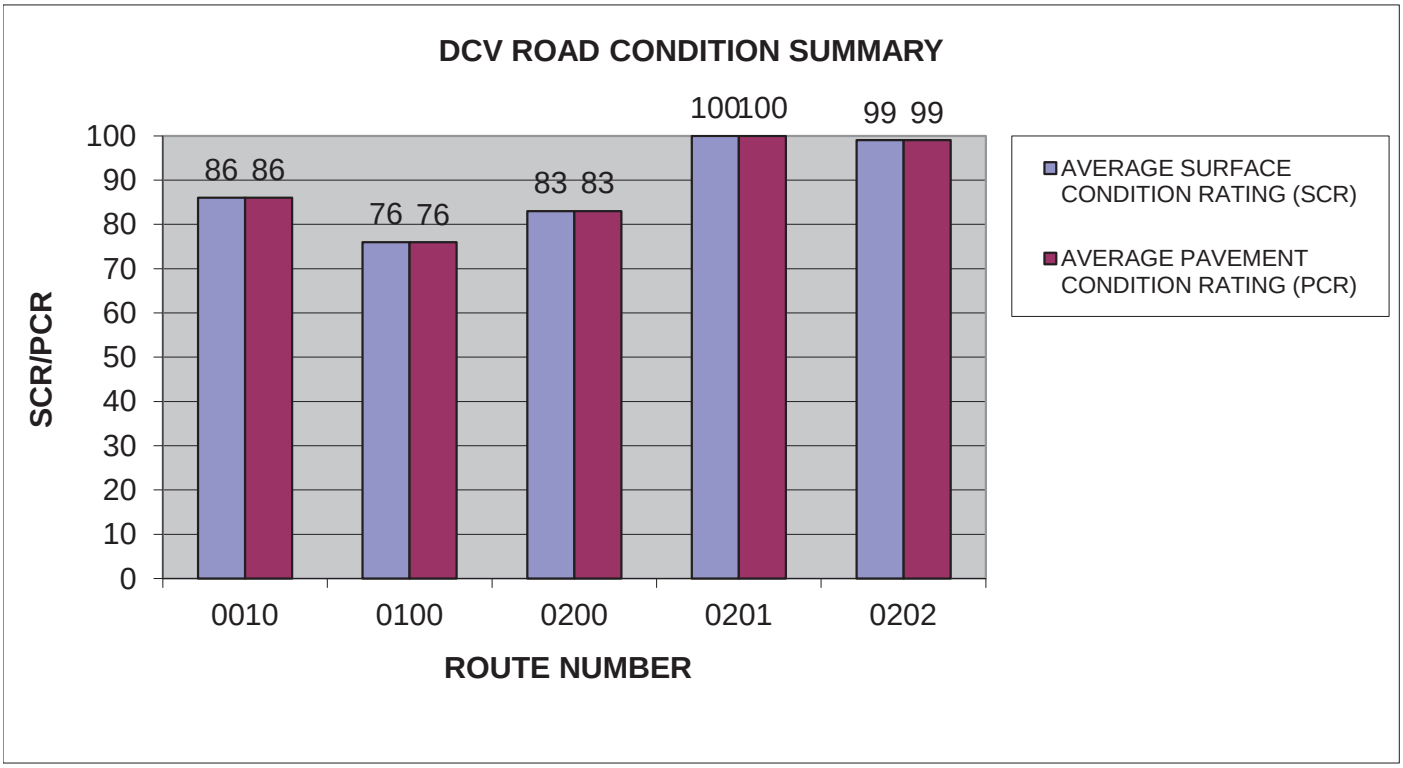
At this time, specific Maintenance and Rehabilitation activities should be evaluated and recommended at the project level. Site-specific conditions that influence treatment type should be determined based on performing a subsurface investigation and/or pavement condition survey, and not be based solely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



HALE: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

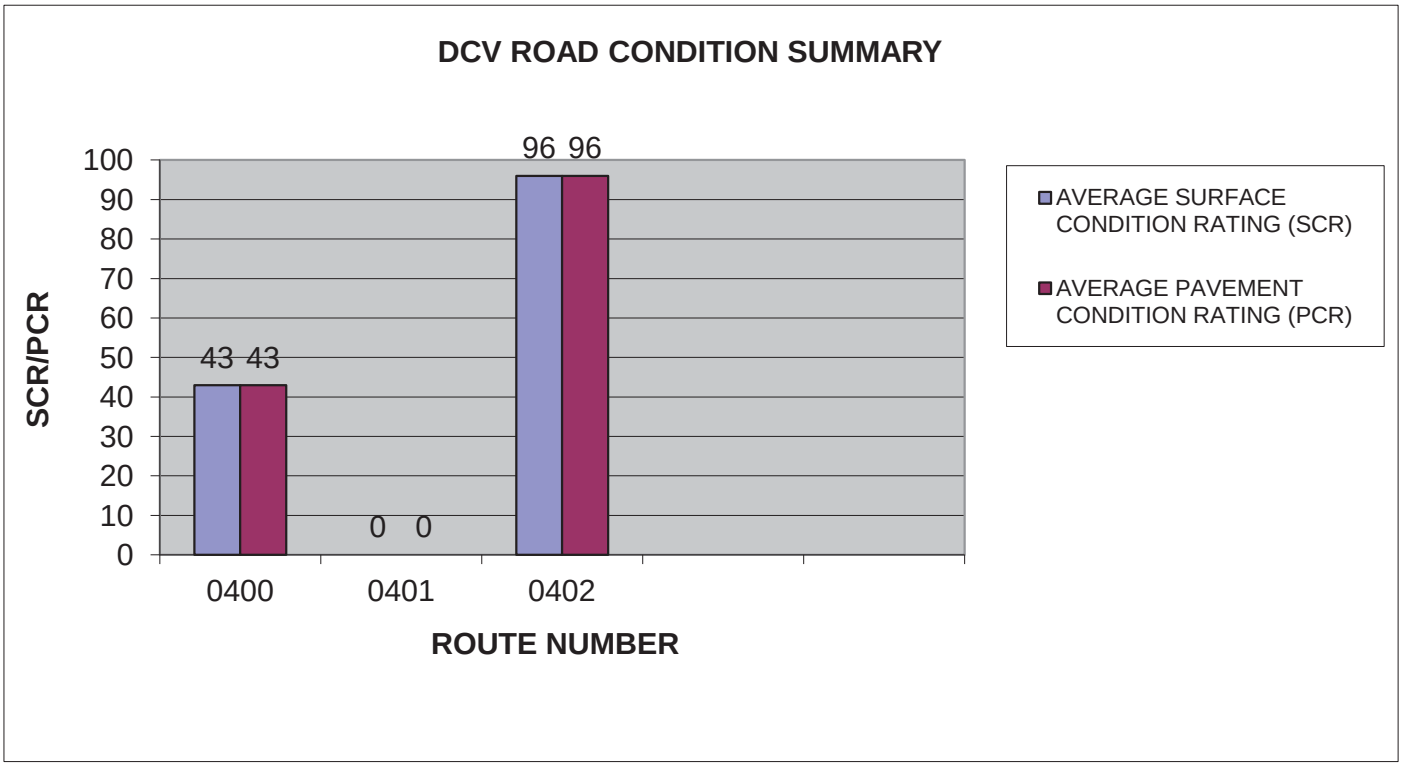
ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	PAVED LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0010	HALEAKALA PARK ROAD	1	10.51	ASPHALT	86	86
0100	RED HILL ROAD	1	0.56	ASPHALT	76	76
0200	MAGNETIC PEAK SPUR ROAD	2	0.20	ASPHALT	83	83
0201	KALAHAKU OVERLOOK ROAD	2	0.25	ASPHALT	100	100
0202	HOSMER GROVE SPUR ROAD	3	0.45	ASPHALT	99	99



HALE: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

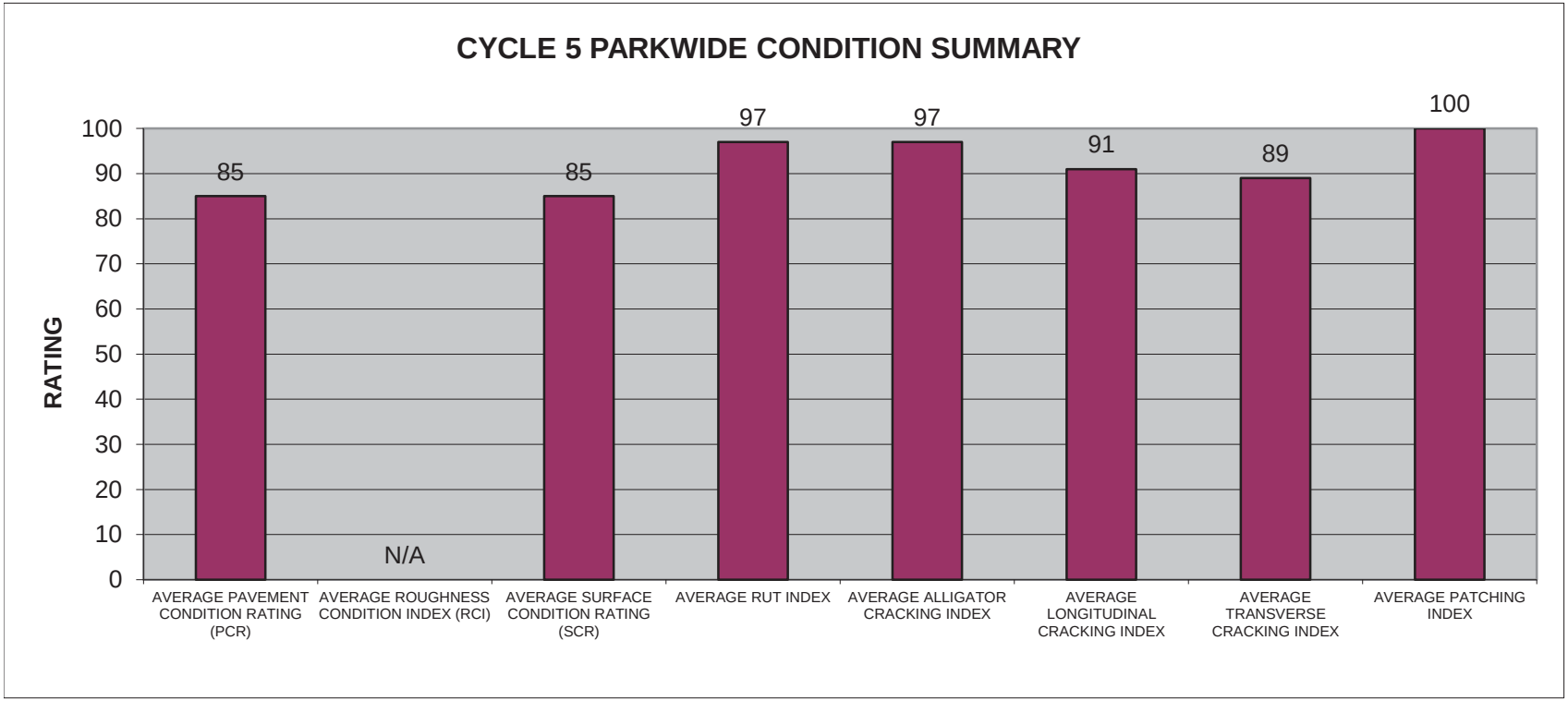
ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	PAVED LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0400	PERMANENT QUARTERS SERVICE ROAD	5	0.12	ASPHALT	43	43
0401	MAINTENANCE YARD SERVICE ROAD	5	0.14	ASPHALT	0	0
0402	SEASONAL HOUSING PARKING SPUR ROAD	5	0.08	ASPHALT	96	96



HALE: 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
85	N/A	85	97	97	91	89	100

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

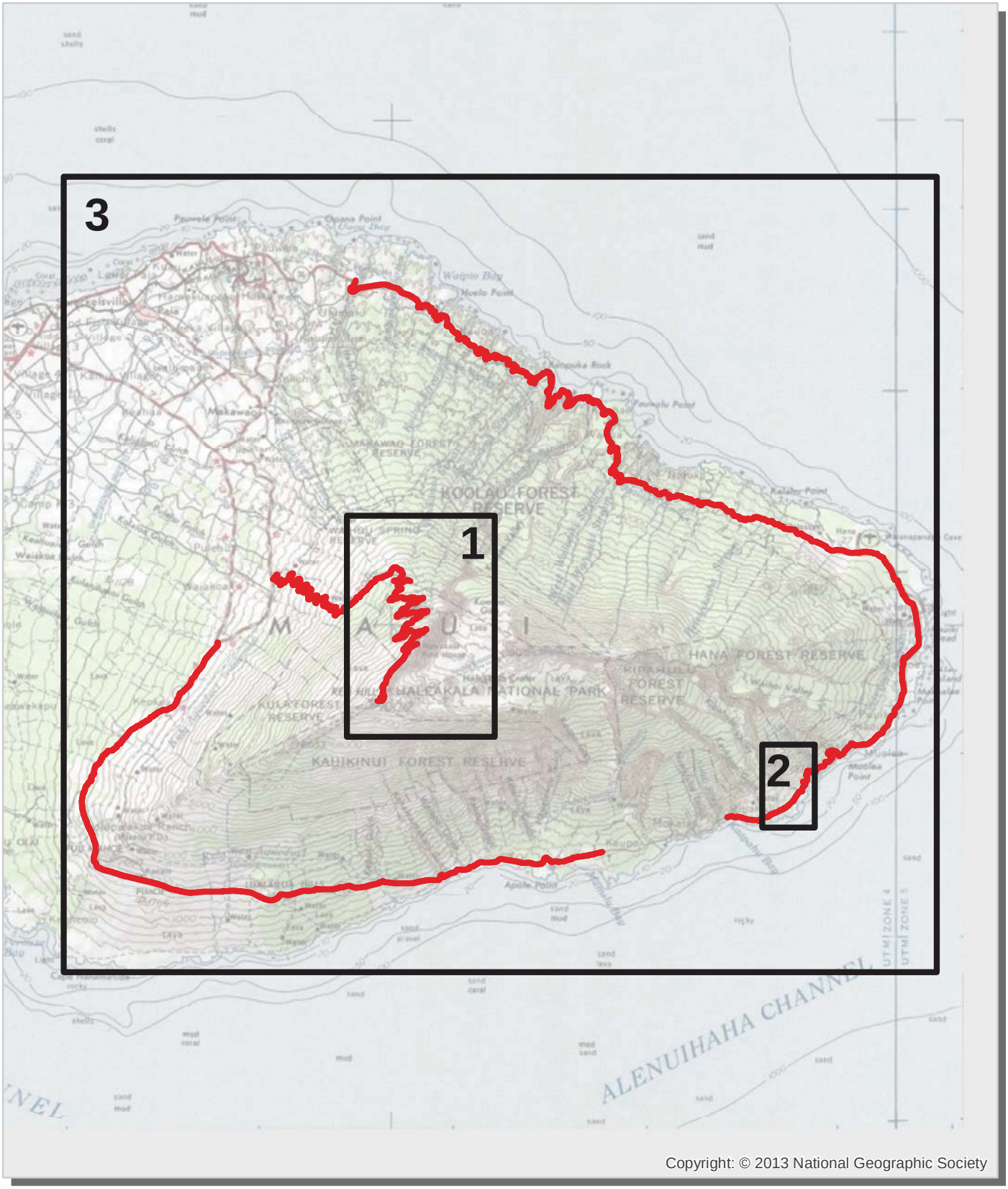


Section 4
Park Route Location Maps

Haleakala National Park

Federal Lands Highway
Road Inventory Program

Haleakala National Park
Route Location Map
Key Map

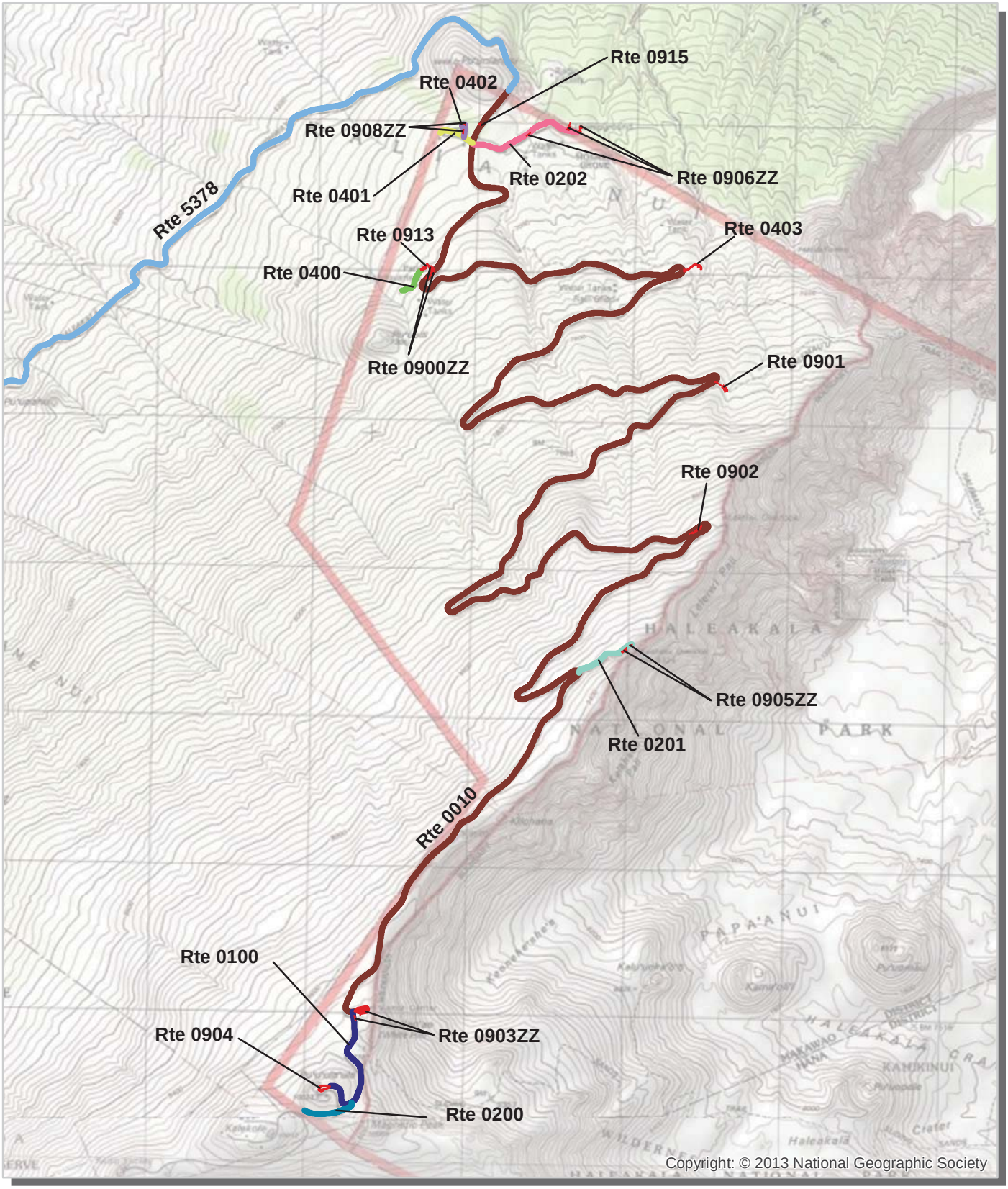


Cycle 5 Collected Routes

4.5 2.25 0 4.5
Miles

N

Haleakala National Park
Route Location Map
Area 1

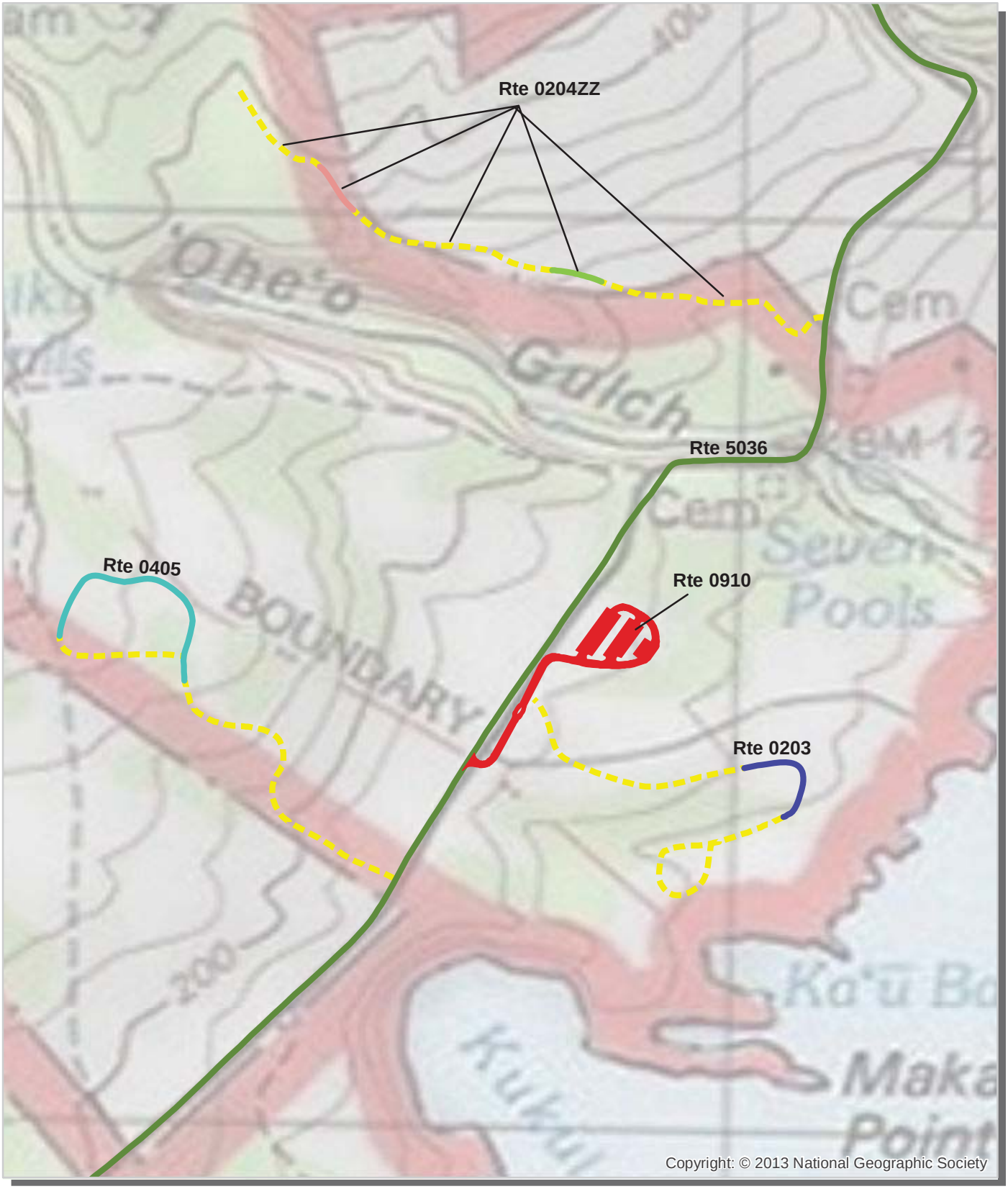


Unique colors used to differentiate routes

0.55 0.275 0 0.55 Miles

N

Haleakala National Park
Route Location Map
Area 2



Unique colors used to differentiate routes

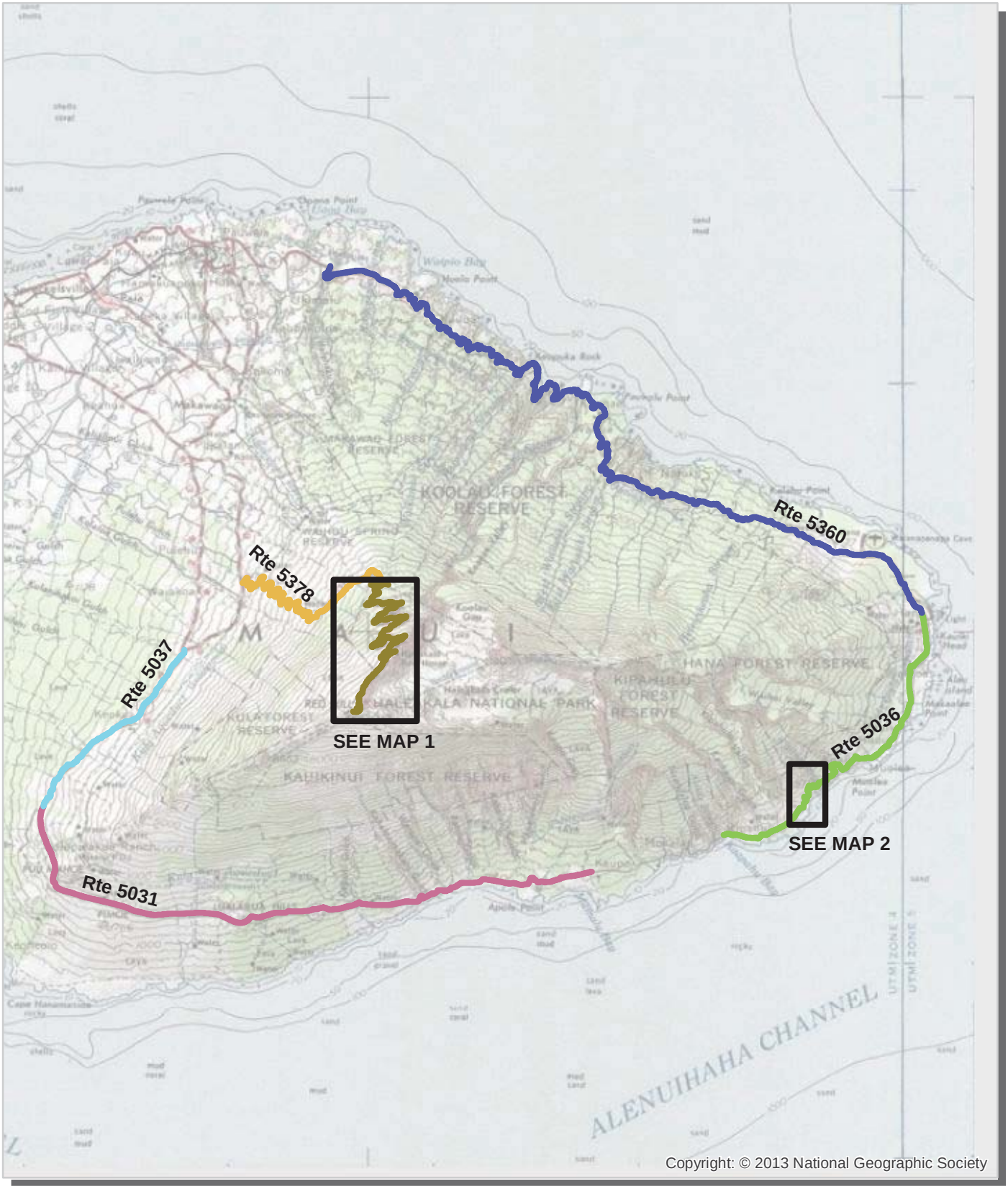
Unpaved Road Segments

0.095 0.0475 0 0.095

Miles

N

Haleakala National Park
Route Location Map
Area 3

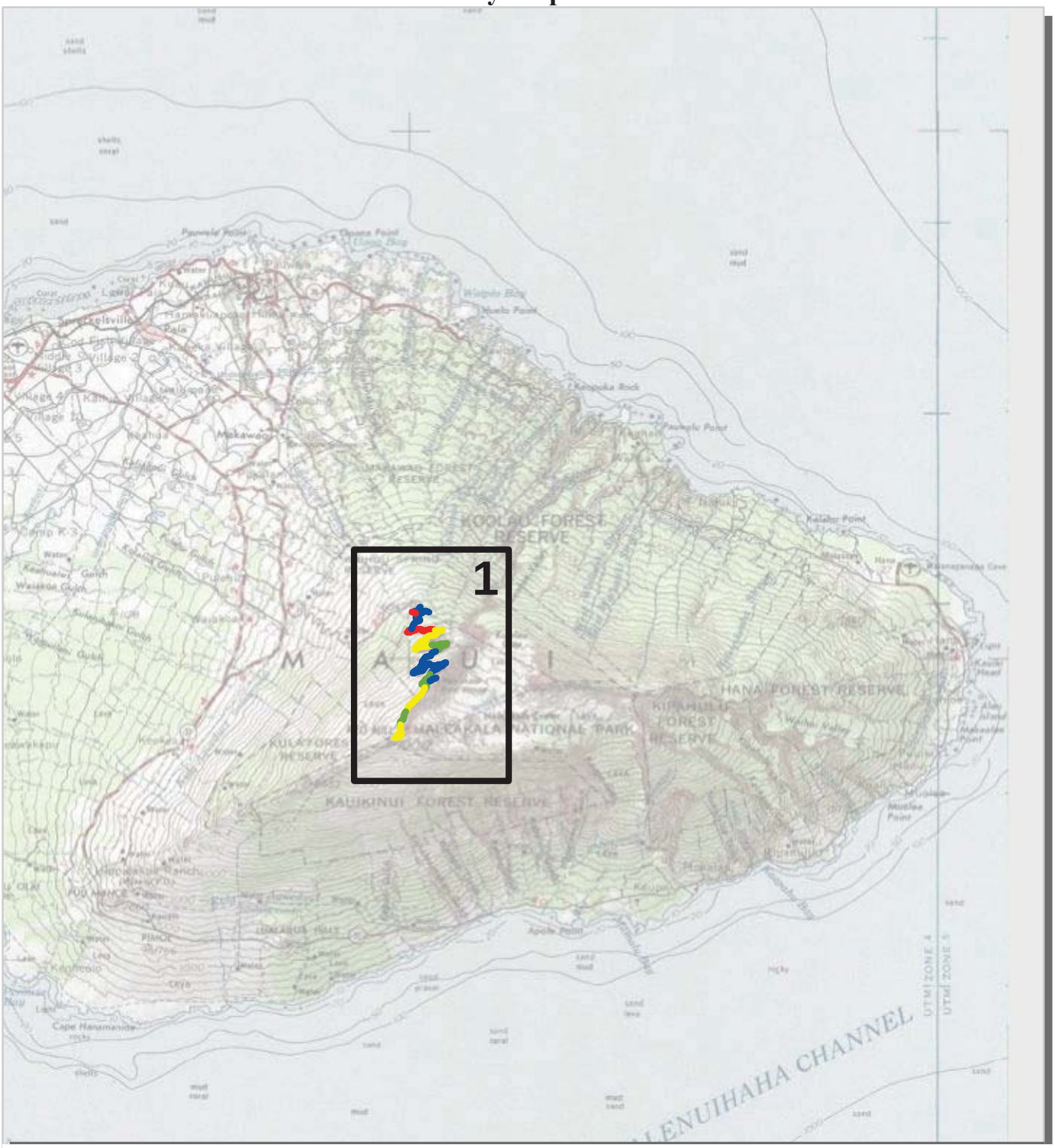


Unique colors used to differentiate routes

4.5 2.25 0 4.5
Miles

N

Haleakala National Park
Route Condition Map
PCR - Mile by Mile
Key Map



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

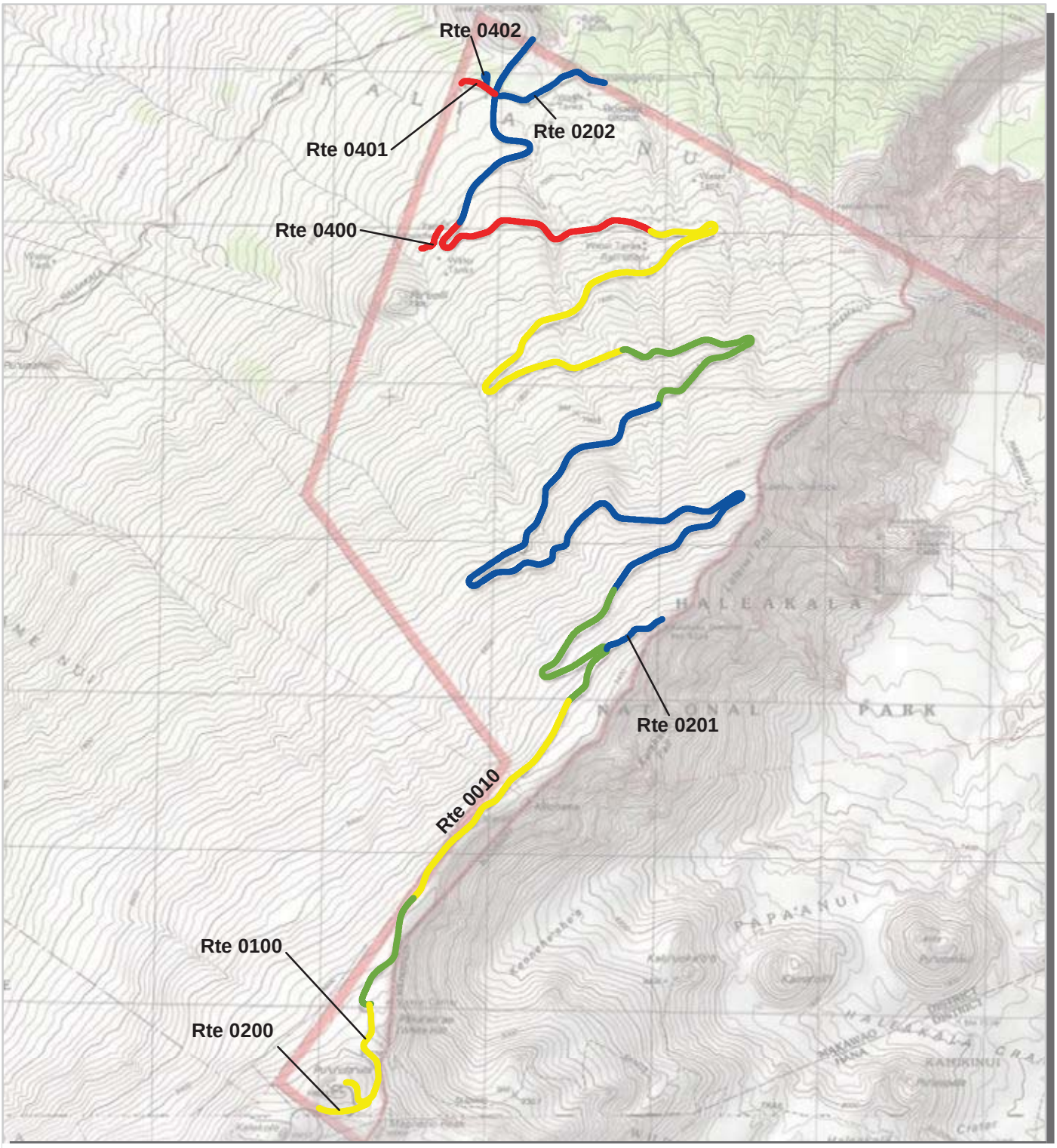
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

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

4.5 2.25 0 4.5
Miles

N

Haleakala National Park
Route Condition Map
PCR - Mile by Mile
Area 1



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

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

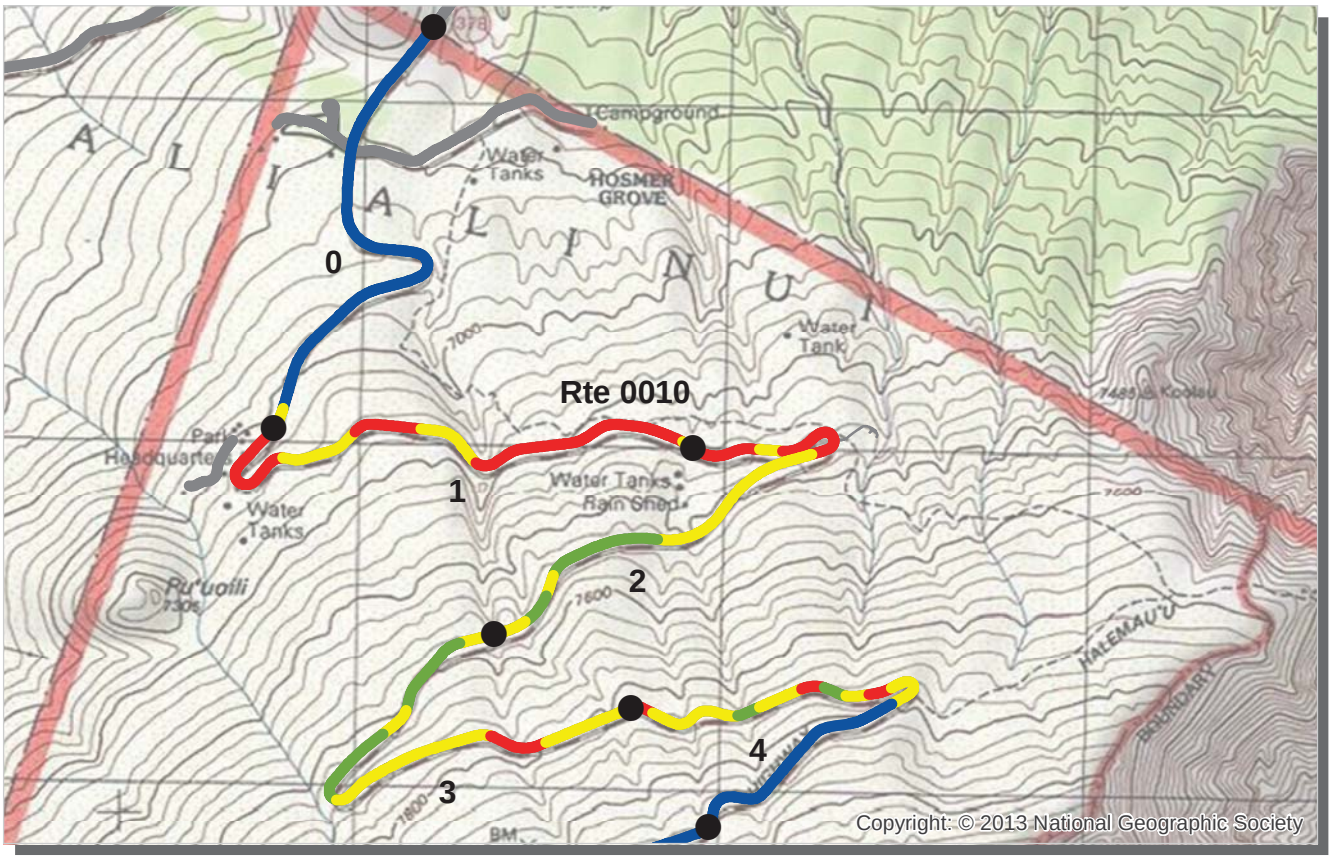
0.55 0.275 0 0.55 Miles

N

Section 5
Paved Route
Condition Rating Sheets

Haleakala National Park

Federal Lands Highway
Road Inventory Program



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

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

ROUTE: 0010 HALEAKALA PARK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 4/2/2014

PACIFIC WEST REGION **TOTAL LENGTH: 10.51 Miles**

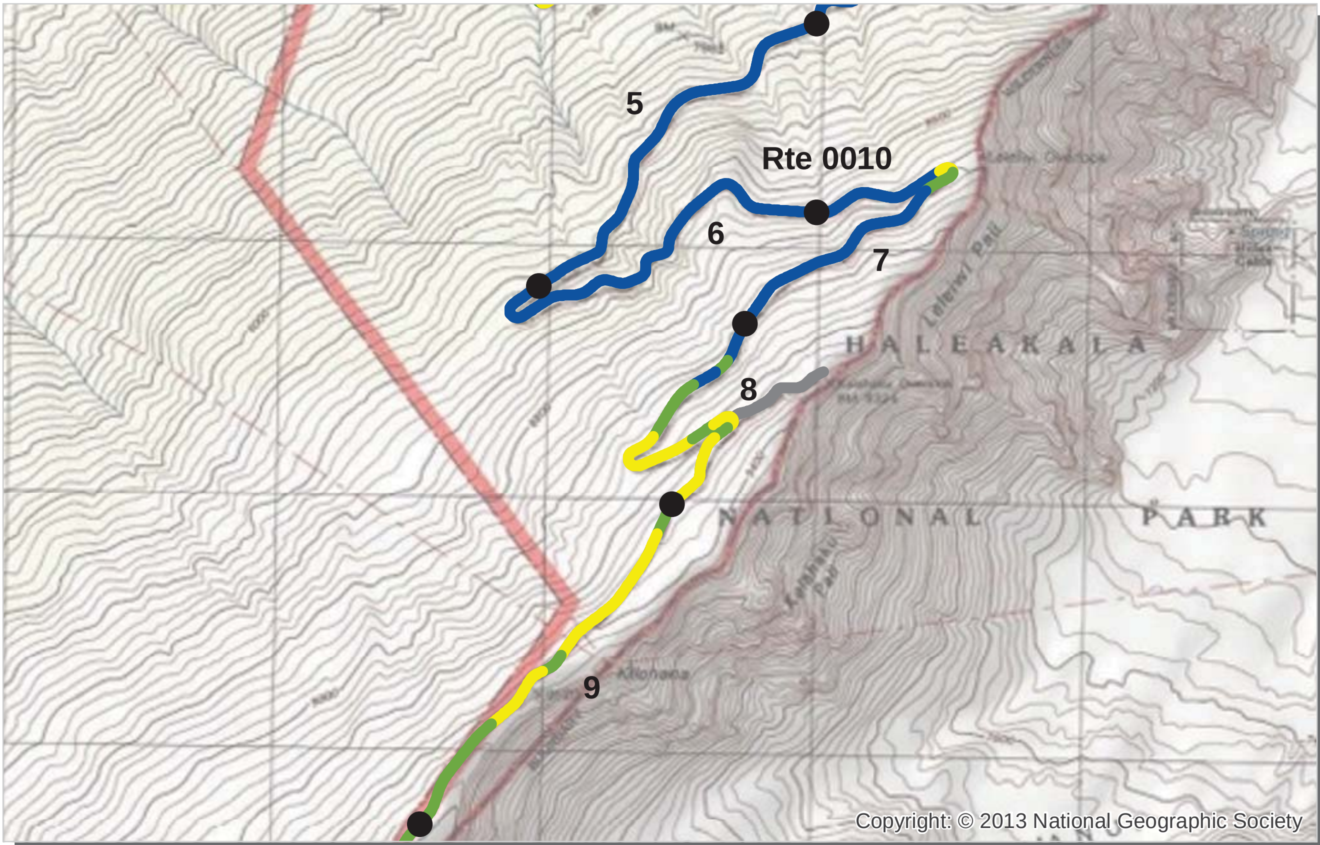
Section Number	0	1	2	3	4
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	24	22	21	21	21
Lane Width (ft)	10	9	9	10	9
Roadway Condition Information					
SCR (Surface Condition Rating)	99	52	72	80	88
PCR (Pavement Condition Rating)	99	52	72	80	88
Distress Index Values					
Structural Crack Index	99	52	72	80	88
Transverse Cracking Index	99	78	81	83	91
Patching Index	100	100	100	100	97
Rutting Index	100	93	96	95	96
Roughness Condition Index (RCI)	NC	NC	NC	NC	NC

NOTES:

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

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

NC - Not Collected N/A - Not Applicable



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

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

ROUTE: 0010 HALEAKALA PARK ROAD

HALE : HALEAKALA NATIONAL PARK

COLLECTED: 4/2/2014

PACIFIC WEST REGION **TOTAL LENGTH: 10.51 Miles**

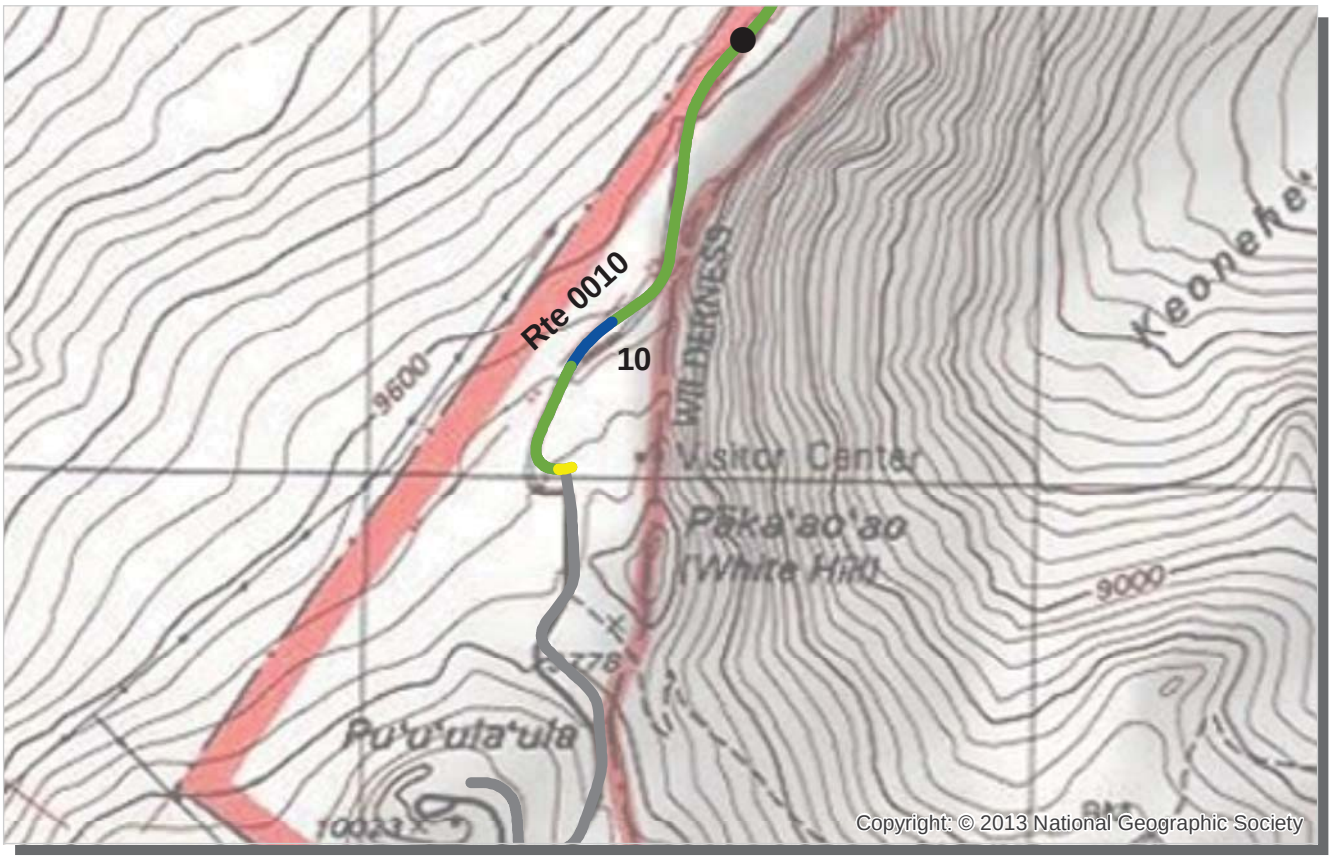
Section Number	5	6	7	8	9
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	21	21	21	21	21
Lane Width (ft)	9	9	9	9	9
Roadway Condition Information					
SCR (Surface Condition Rating)	100	99	98	87	84
PCR (Pavement Condition Rating)	100	99	98	87	84
Distress Index Values					
Structural Crack Index	100	99	98	94	96
Transverse Cracking Index	100	99	99	87	84
Patching Index	100	100	100	100	100
Rutting Index	100	100	98	98	98
Roughness Condition Index (RCI)	NC	NC	NC	NC	NC

NOTES:

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

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

NC - Not Collected N/A - Not Applicable



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

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

ROUTE: 0010 HALEAKALA PARK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 4/2/2014

PACIFIC WEST REGION **TOTAL LENGTH: 10.51 Miles**

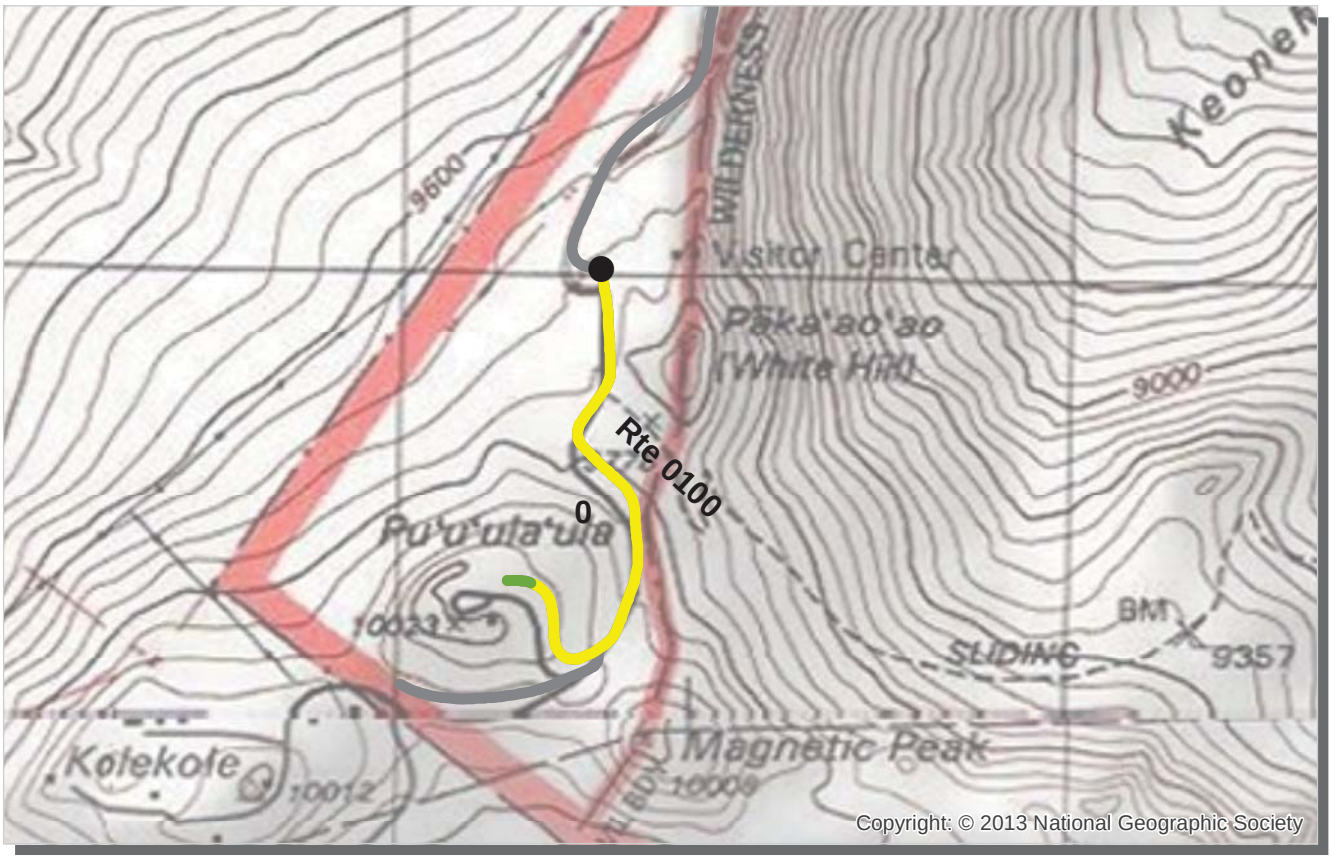
Section Number	10				
Section Length (mi)	0.51				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	22				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	91				
PCR (Pavement Condition Rating)	91				
Distress Index Values					
Structural Crack Index	96				
Transverse Cracking Index	91				
Patching Index	100				
Rutting Index	95				
Roughness Condition Index (RCI)	NC				

NOTES:

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

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

NC - Not Collected N/A - Not Applicable



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

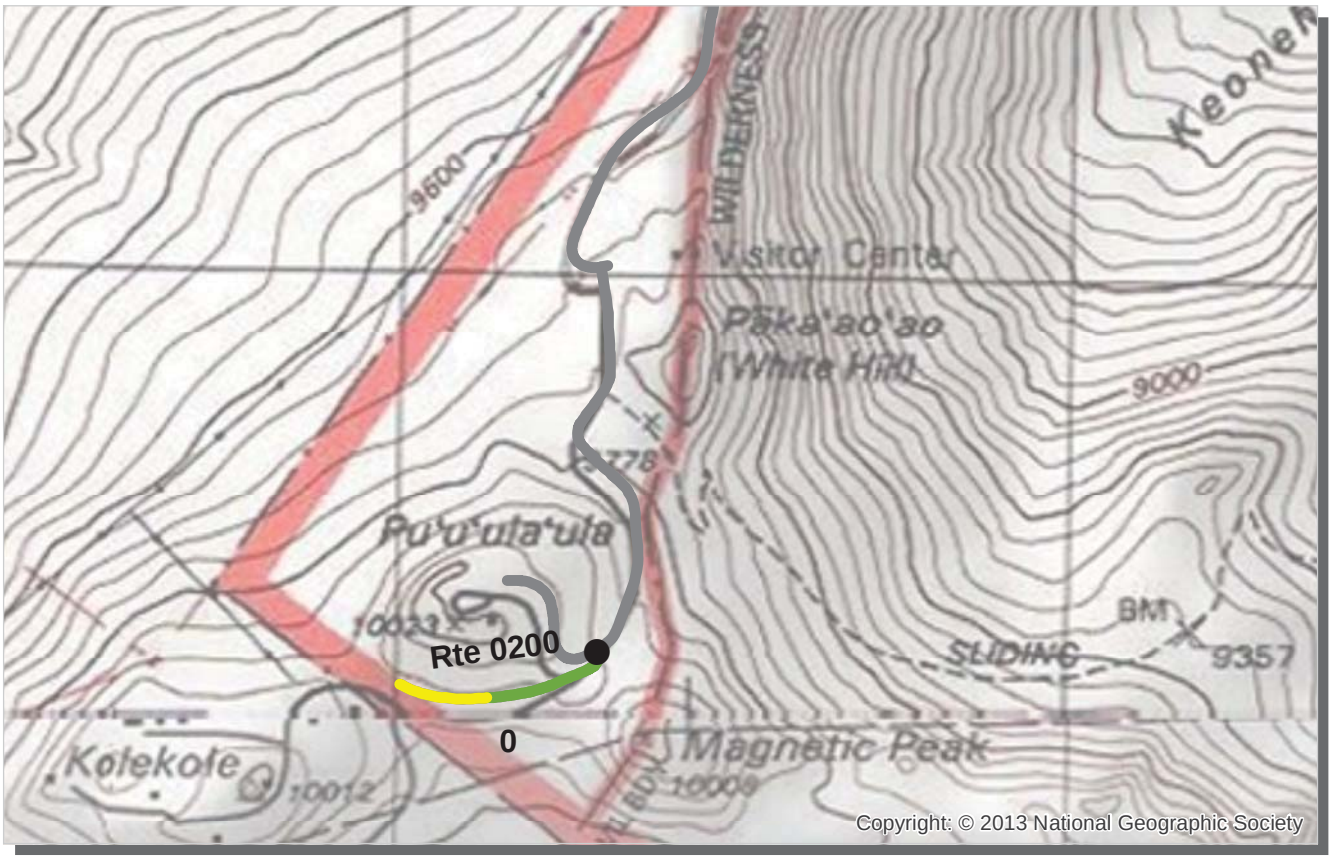
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0100 RED HILL ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 3/29/2014
PACIFIC WEST REGION **TOTAL LENGTH: 0.56 Miles**

Section Number	0				
Section Length (mi)	0.56				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	22				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	76				
PCR (Pavement Condition Rating)	76				
Distress Index Values					
Structural Crack Index	88				
Transverse Cracking Index	76				
Patching Index	100				
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 - Not Applicable



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

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

ROUTE: 0200 MAGNETIC PEAK SPUR ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 3/29/2014

PACIFIC WEST REGION **TOTAL LENGTH: 0.20 Miles**

Section Number	0				
Section Length (mi)	0.20				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	19				
Lane Width (ft)	8				
Roadway Condition Information					
SCR (Surface Condition Rating)	83				
PCR (Pavement Condition Rating)	83				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	83				
Patching Index	100				
Rutting Index	100				
Roughness Condition Index (RCI)	NC				

NOTES:

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

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

NC - Not Collected N/A - Not Applicable

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

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

ROUTE: 0201 KALAHAKU OVERLOOK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 4/2/2014

PACIFIC WEST REGION **TOTAL LENGTH: 0.25 Miles**

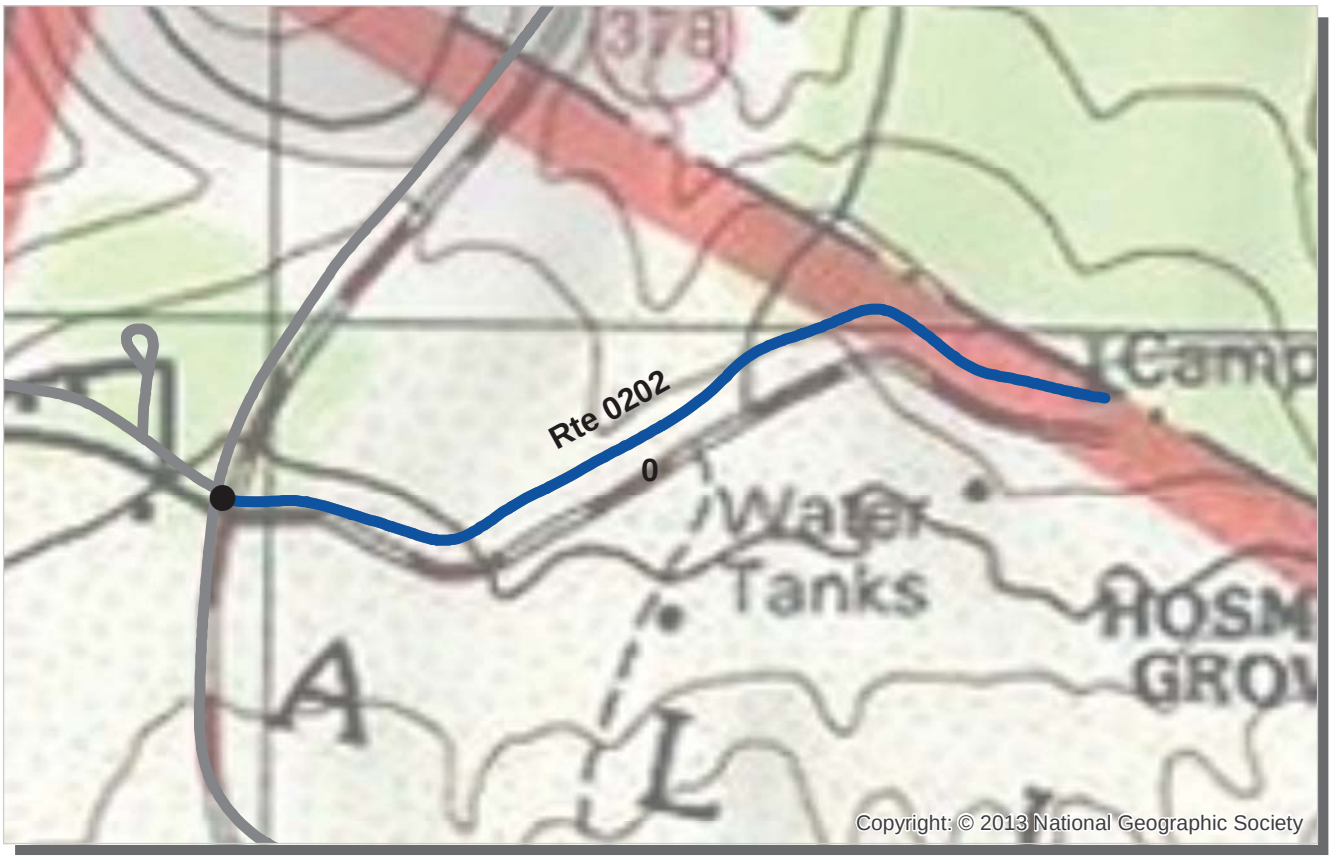
Section Number	0				
Section Length (mi)	0.25				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	21				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	100				
PCR (Pavement Condition Rating)	100				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	100				
Roughness Condition Index (RCI)	NC				

NOTES:

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

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

NC - Not Collected N/A - Not Applicable



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

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

ROUTE: 0202 HOSMER GROVE SPUR ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 3/29/2014
PACIFIC WEST REGION **TOTAL LENGTH: 0.45 Miles**

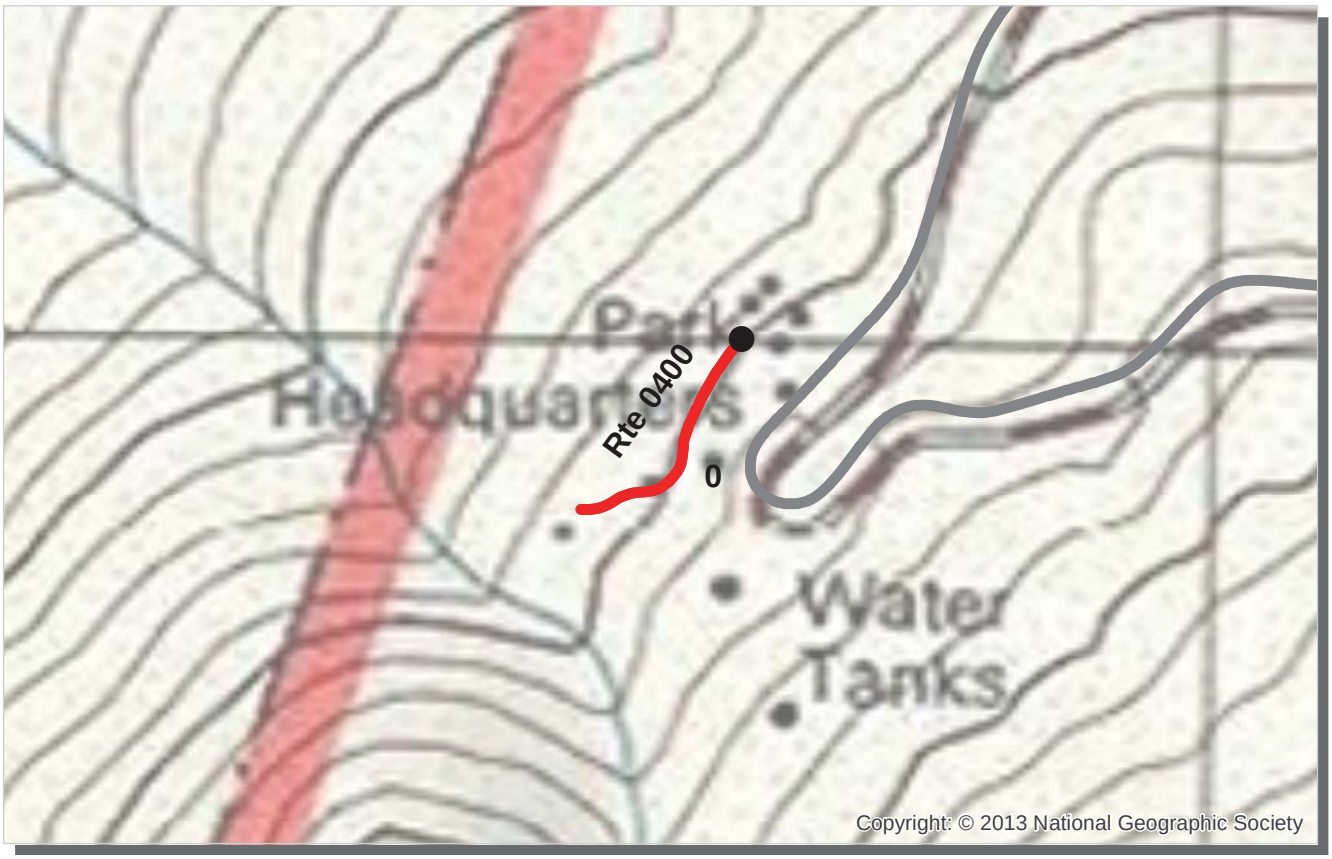
Section Number	0				
Section Length (mi)	0.45				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	19				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	99				
PCR (Pavement Condition Rating)	99				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	99				
Roughness Condition Index (RCI)	NC				

NOTES:

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

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

NC - Not Collected N/A - Not Applicable



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

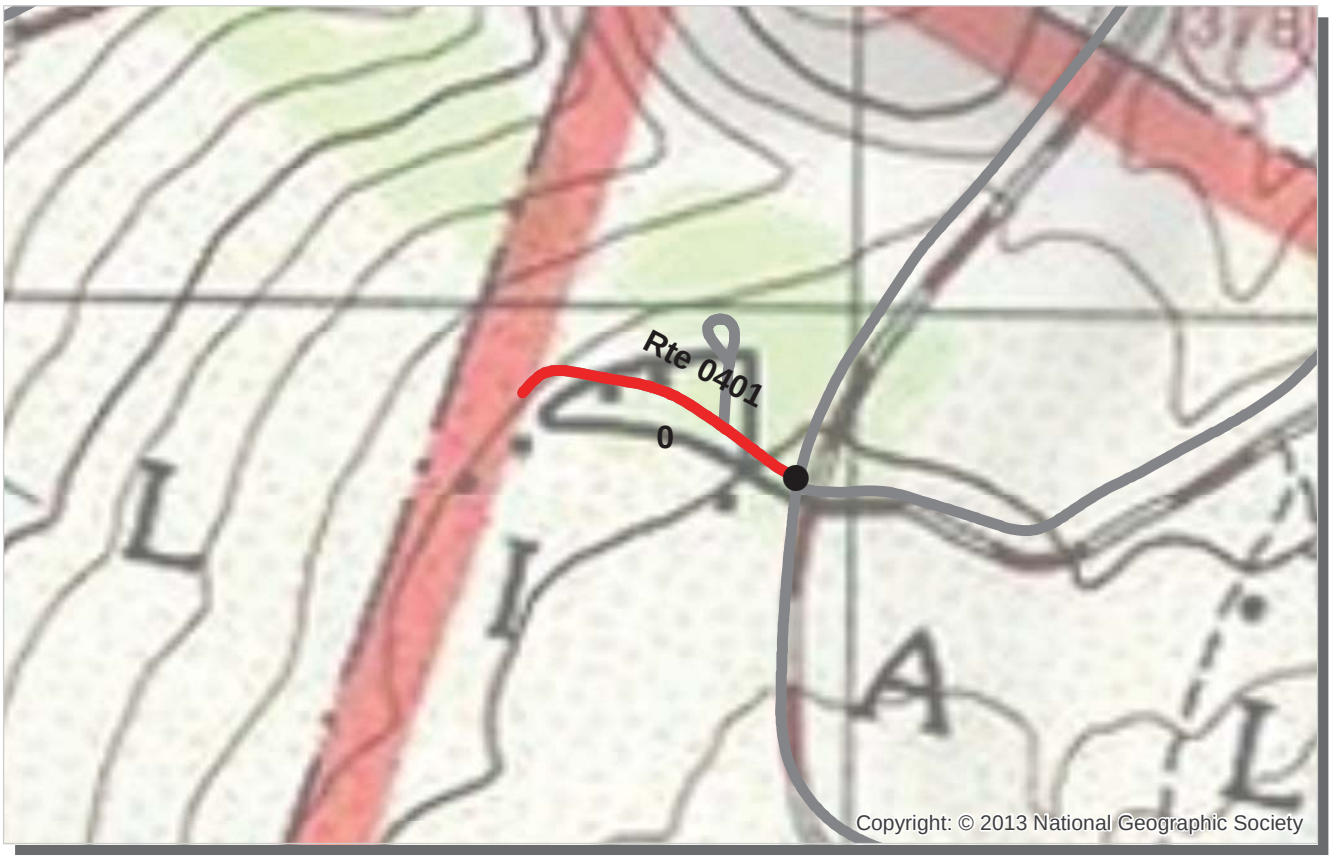
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0400 PERMANENT QUARTERS SERVICE ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 3/29/2014
PACIFIC WEST REGION **TOTAL LENGTH: 0.12 Miles**

Section Number	0				
Section Length (mi)	0.12				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	11				
Lane Width (ft)	11				
Roadway Condition Information					
SCR (Surface Condition Rating)	43				
PCR (Pavement Condition Rating)	43				
Distress Index Values					
Structural Crack Index	66				
Transverse Cracking Index	43				
Patching Index	100				
Rutting Index	87				
Roughness Condition Index (RCI)	NC				

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



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

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

ROUTE: 0401 MAINTENANCE YARD SERVICE ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 3/29/2014
PACIFIC WEST REGION **TOTAL LENGTH: 0.14 Miles**

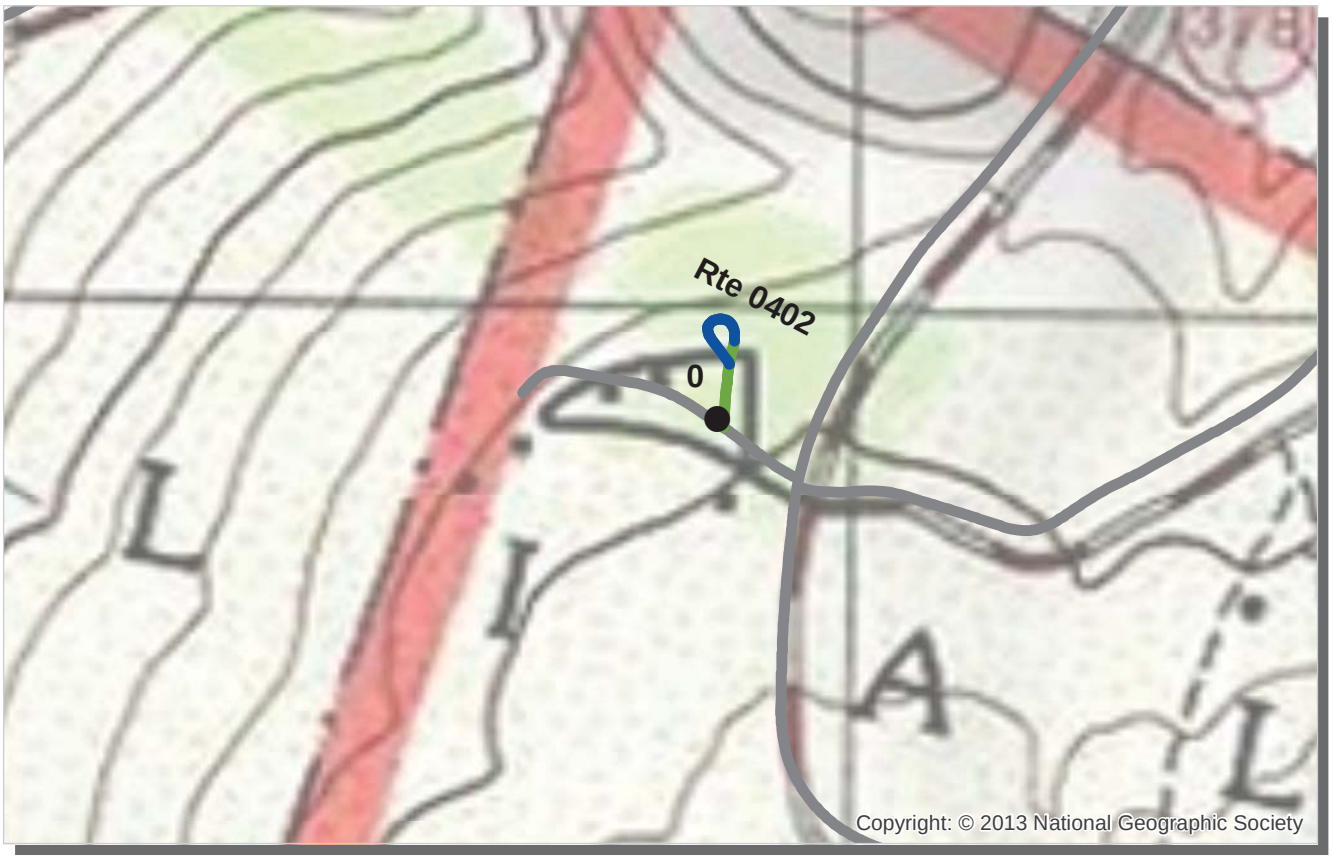
Section Number	0				
Section Length (mi)	0.14				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	13				
Lane Width (ft)	13				
Roadway Condition Information					
SCR (Surface Condition Rating)	0				
PCR (Pavement Condition Rating)	0				
Distress Index Values					
Structural Crack Index	0				
Transverse Cracking Index	63				
Patching Index	99				
Rutting Index	91				
Roughness Condition Index (RCI)	NC				

NOTES:

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

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

NC - Not Collected N/A - Not Applicable



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

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

ROUTE: 0402 SEASONAL HOUSING PARKING SPUR ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 3/29/2014
PACIFIC WEST REGION **TOTAL LENGTH: 0.08 Miles**

Section Number	0				
Section Length (mi)	0.08				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	16				
Lane Width (ft)	16				
Roadway Condition Information					
SCR (Surface Condition Rating)	96				
PCR (Pavement Condition Rating)	96				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	97				
Patching Index	96				
Rutting Index	98				
Roughness Condition Index (RCI)	NC				

NOTES:

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

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

NC - Not Collected N/A - Not Applicable

Section 6
Manually Rated Paved Route Condition Rating Sheets

Haleakala National Park

Federal Lands Highway
Road Inventory Program

Haleakala National Park

MANUALLY RATED PAVED ROUTE CONDITION RATING SHEETS

Manually rated roads are non-linear roads or roads not suitable for the Data Collection Vehicle (DCV). The manually rated roads at Haleakala National Park (HALE) were collected twice in Cycle 5 by the Road Inventory Program (RIP).

- January 2012: First manual collection (no automated vehicle collection)
- March / April 2014: Automated vehicle and second manual collection*

Following the 2012 data collection effort, the RIP Automated Data Collection Vehicle (DCV) visited Hawaii in March / April of 2014 to perform automated collection on all NPS paved roads. During the DCV collection visit, a second manual condition assessment was performed on parking areas and manually rated roads and the previous Cycle 5 manual condition ratings were updated.

The 2014 condition assessment at HALE incorporated new manual rating methodologies designed to improve the identification of treatment recommendations and pavement condition descriptions for Manually Rated Routes. These new methodologies will be used in future Cycle 6 collections and were included in this 2014 Final Cycle 5 Report. A detailed description of the new manual rating procedures can be found in the Appendix of this Report.

To facilitate comparisons of the 2012 and 2014 manual ratings, both condition rating sheets for each route are included in this final Cycle 5 Report.

- Section 6A: Updated Ratings from March and April of 2014
- Section 6B: Previous Ratings from January of 2012

Note: Paved routes at Kipahulu were collected in 2012, but not recollected during the 2014 collection visit.

SECTION 6A

MANUALLY RATED PAVED ROUTE CONDITION RATING SHEETS

FROM

MARCH & APRIL 2014

Haleakala National Park

ROUTE 0203: KIPAHULU CAMPGROUND AND PICNIC ACCESS ROAD

Manual Rating

FROM ROUTE 0910 (KIPAHULU VISITOR CENTER PARKING)

TO END OF LOOP

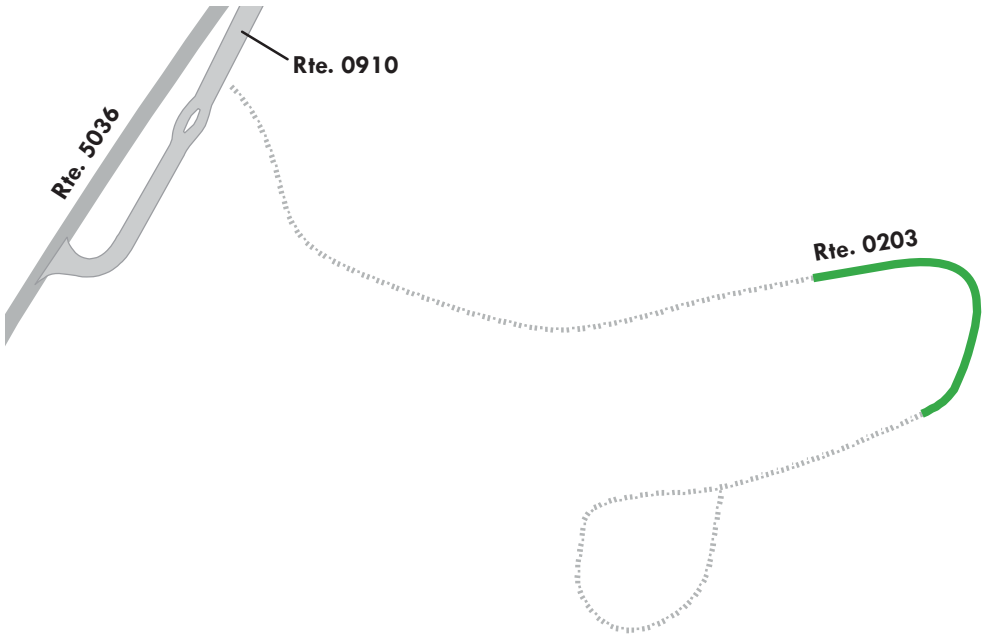
Inspection Date	FMSS Number	User Access	Surface Type
1/14/2012	2653	PUBLIC	CONCRETE
Paved Length (mi.) / Width (ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
0.08 miles / 16 feet	0.11	GOOD / 90	
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

NOTE: Routes at Kipahulu were not recollected during the second Cycle 5 collection trip in 2014. Therefore, the information shown on this page is from the first Cycle 5 collection trip which was in January 2012.



N

Feet

0 350 700

Unpaved portions of Route 0203 are shown in gray, dashed lines.

Haleakala National Park

ROUTE 0204ZZ: KAPAHU FARM SERVICE ROAD

Summary Route

Manual Rating

FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)

TO END

Inspection Date	FMSS Number	User Access	Surface Type
1/14/2012	97853	NONPUBLIC	CONCRETE
Paved Length (mi.) / Width (ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
0.07 miles / 4 feet	0.025	SUMMARY / 45	
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	

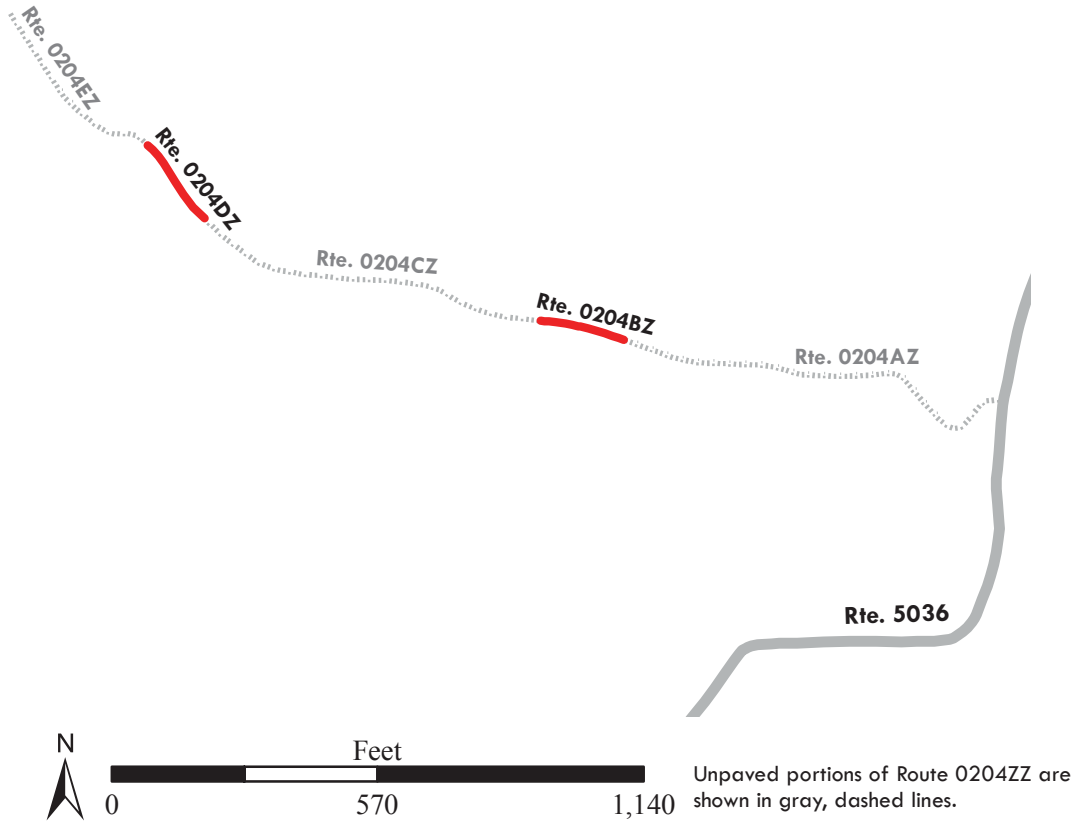
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

NOTE: Routes at Kipahulu were not recollected during the second Cycle 5 collection trip in 2014. Therefore, the information shown on this page is from the first Cycle 5 collection trip which was in January 2012.

Route 0204ZZ is a two-track, concrete wheelpath road with a grass median.



Haleakala National Park

ROUTE 0204BZ: KAPAHU FARM SERVICE ROAD (PAVED SECTION 1)

Subcomponent of Route HALE-0204ZZ

Manual Rating

FROM ROUTE 0204AZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 1))

TO ROUTE 0204CZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2))

Inspection Date	FMSS Number	User Access	Surface Type
1/14/2012	97853	NONPUBLIC	CONCRETE
Paved Length (mi.) / Width (ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
0.03 miles / 4 feet	0.01	POOR / 45	
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	

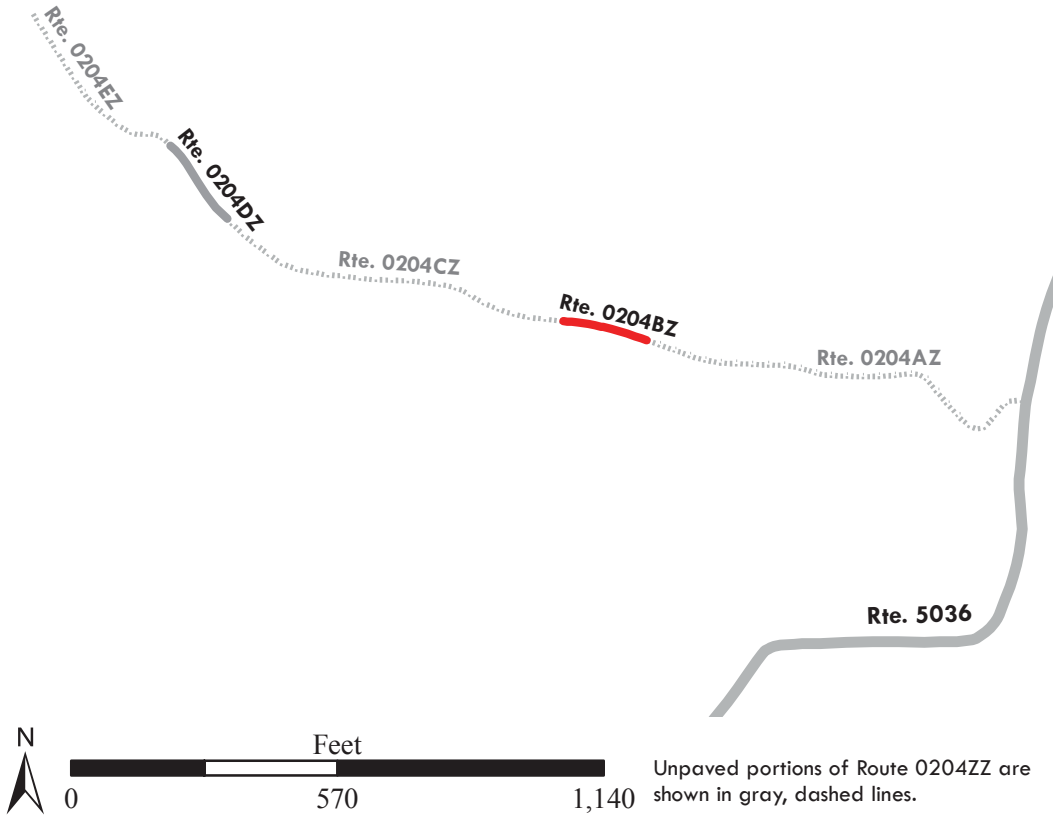
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

NOTE: Routes at Kipahulu were not recollected during the second Cycle 5 collection trip in 2014. Therefore, the information shown on this page is from the first Cycle 5 collection trip which was in January 2012.

Route 0204BZ is a two-track, concrete wheelpath road with a grass median.



Unpaved portions of Route 0204ZZ are shown in gray, dashed lines.

Haleakala National Park

ROUTE 0204DZ: KAPAHU FARM SERVICE ROAD (PAVED SECTION 2)

Subcomponent of Route HALE-0204ZZ

Manual Rating

FROM ROUTE 0204CZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2))

TO ROUTE 0204EZ(KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 3))

Inspection Date	FMSS Number	User Access	Surface Type
1/14/2012	97853	NONPUBLIC	CONCRETE
Paved Length (mi.) / Width (ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
0.04 miles / 4 feet	0.01	POOR / 45	
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	

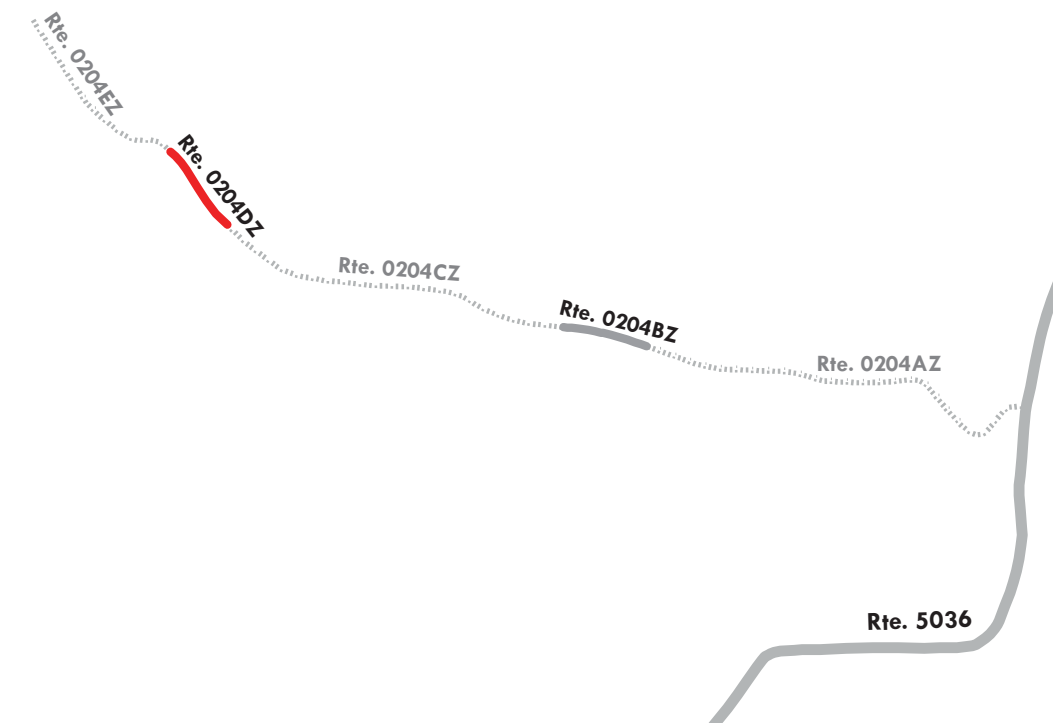
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

NOTE: Routes at Kipahulu were not recollected during the second Cycle 5 collection trip in 2014. Therefore, the information shown on this page is from the first Cycle 5 collection trip which was in January 2012.

Route 0204DZ is a two-track, concrete wheelpath road with a grass median.



Unpaved portions of Route 0204ZZ are shown in gray, dashed lines.

Haleakala National Park

ROUTE 0403: RAIN SHED SERVICE ROAD

Manual Rating

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 2.27

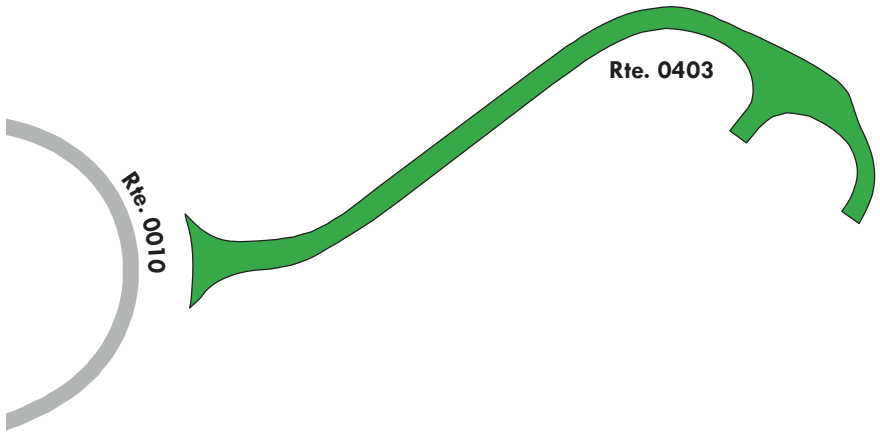
TO WATER TANKS

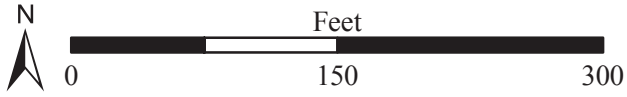
Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31838	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
7,295	0.13	NOT APPLICABLE	N/A
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
1	0	1	
Pavement Recommendation		**Condition Rating / PCR**	
PREVENTIVE MAINTENANCE		GOOD / 90	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas





Haleakala National Park

ROUTE 0405: KIPAHULU ROAD TO WATER TANK

Manual Rating

FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)

TO END OF LOOP NEAR WATER TANK

Inspection Date	FMSS Number	User Access	Surface Type
1/14/2012	97654	NONPUBLIC	CONCRETE
Paved Length (mi.) / Width (ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
0.17 miles / 8.6 feet	0.13	FAIR / 73	
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	

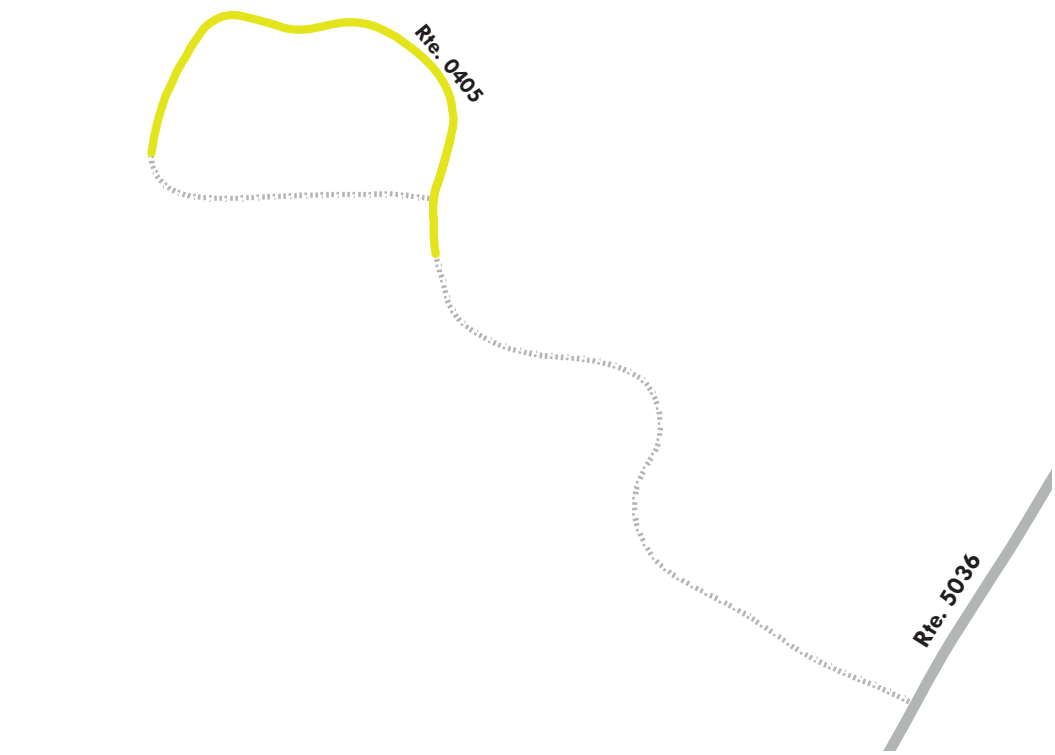
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

NOTE: Routes at Kipahulu were not recollected during the second Cycle 5 collection trip in 2014. Therefore, the information shown on this page is from the first Cycle 5 collection trip which was in January 2012.

Route 0405 is a two-track, concrete wheelpath road with a grass median.



Unpaved portions of Route 0405 are shown in gray, dashed lines.

SECTION 6B

MANUALLY RATED PAVED ROUTE CONDITION RATING SHEETS

FROM

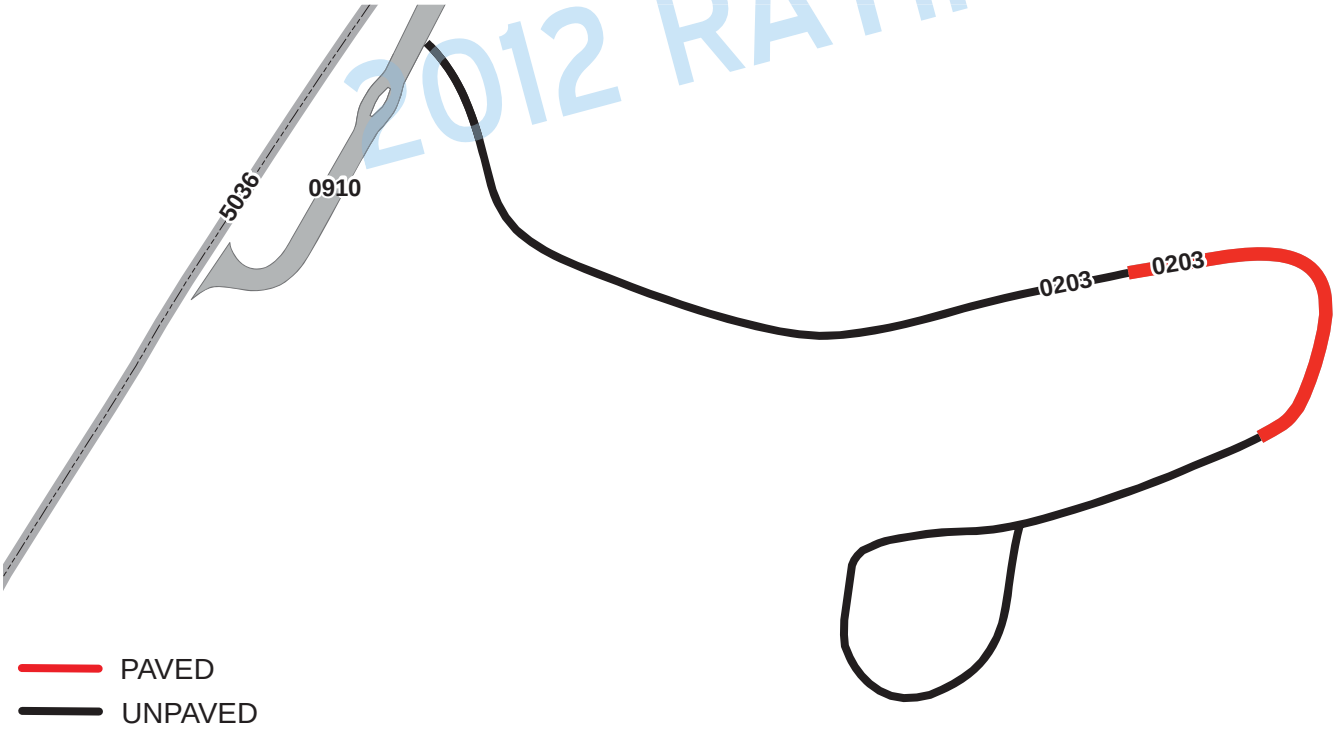
JANUARY 2012

Haleakala National Park
MRL Route 0203
KIPAHULU CAMPGROUND AND PICNIC ACCESS ROAD

FROM ROUTE 0910 (KIPAHULU VISITOR CENTER PARKING)
TO END OF LOOP

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles **	Paved Length (mi)	Paved Width (ft)
0203	PUBLIC	1/14/2012	6420	0.111	0.076	16
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO	NO	90 GOOD	CO

** Lane miles are based on 11' lane widths



300 150 0 300 600 Feet

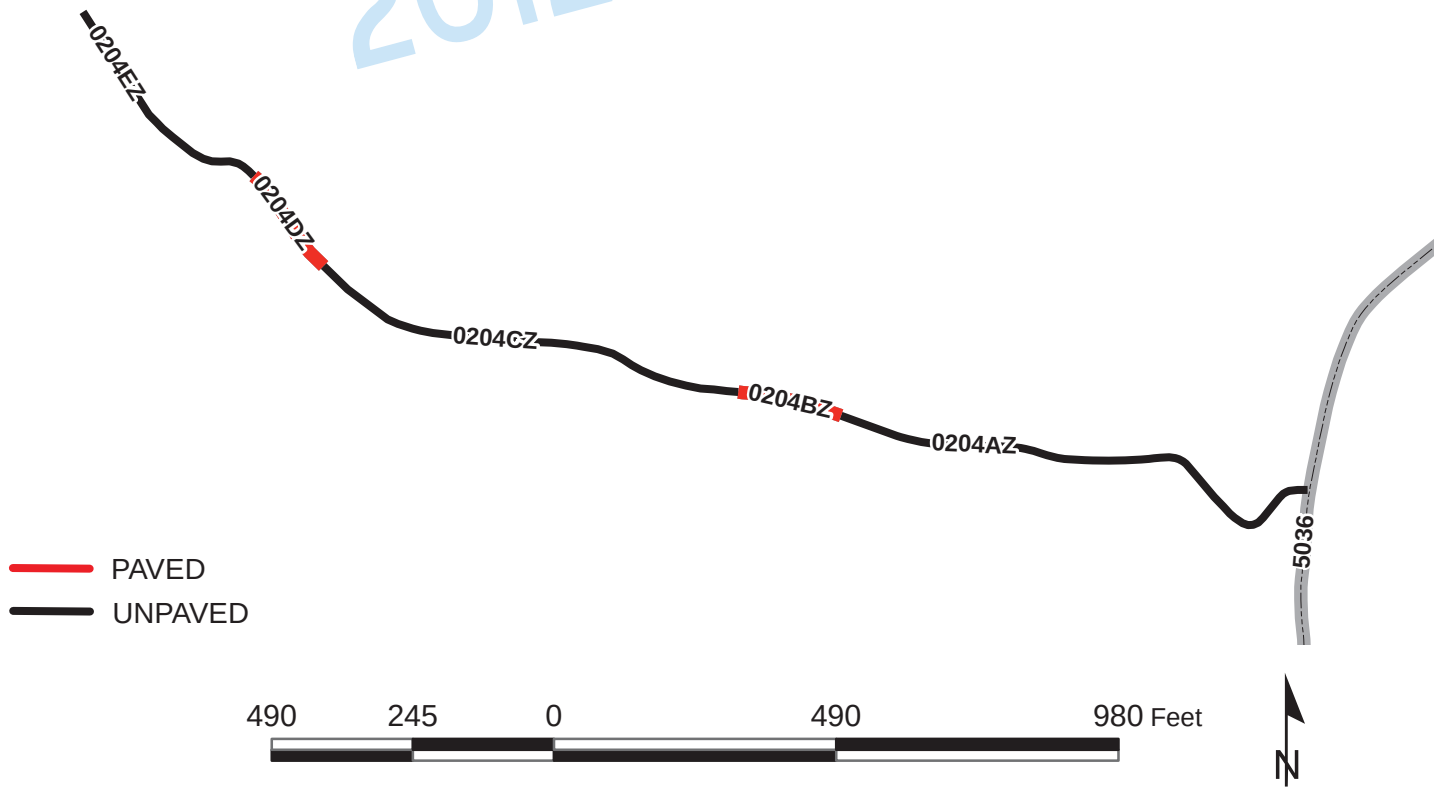
N

Haleakala National Park
MRL Route 0204ZZ Summary Record
KAPAHU FARM SERVICE ROAD

FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)
TO END

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles **	Paved Length (mi)	Paved Width (ft)
0204ZZ	PUBLIC	1/14/2012	1478	0.025	0.07	4
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO	NO	45 SUMMARY	CO

** Lane miles are based on 11' lane widths



Haleakala National Park
MRL Route 0204BZ Subcomponent Record
KAPAHU FARM SERVICE ROAD (SECTION 1)

FROM ROUTE 0204AZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 1))
TO ROUTE 0204CZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2))

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles **	Paved Length (mi)	Paved Width (ft)
0204BZ	PUBLIC	1/14/2012	697	0.012	0.033	4
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO	NO	45 POOR	CO

** Lane miles are based on 11' lane widths

PAVED
UNPAVED

70 35 0 70 140 Feet

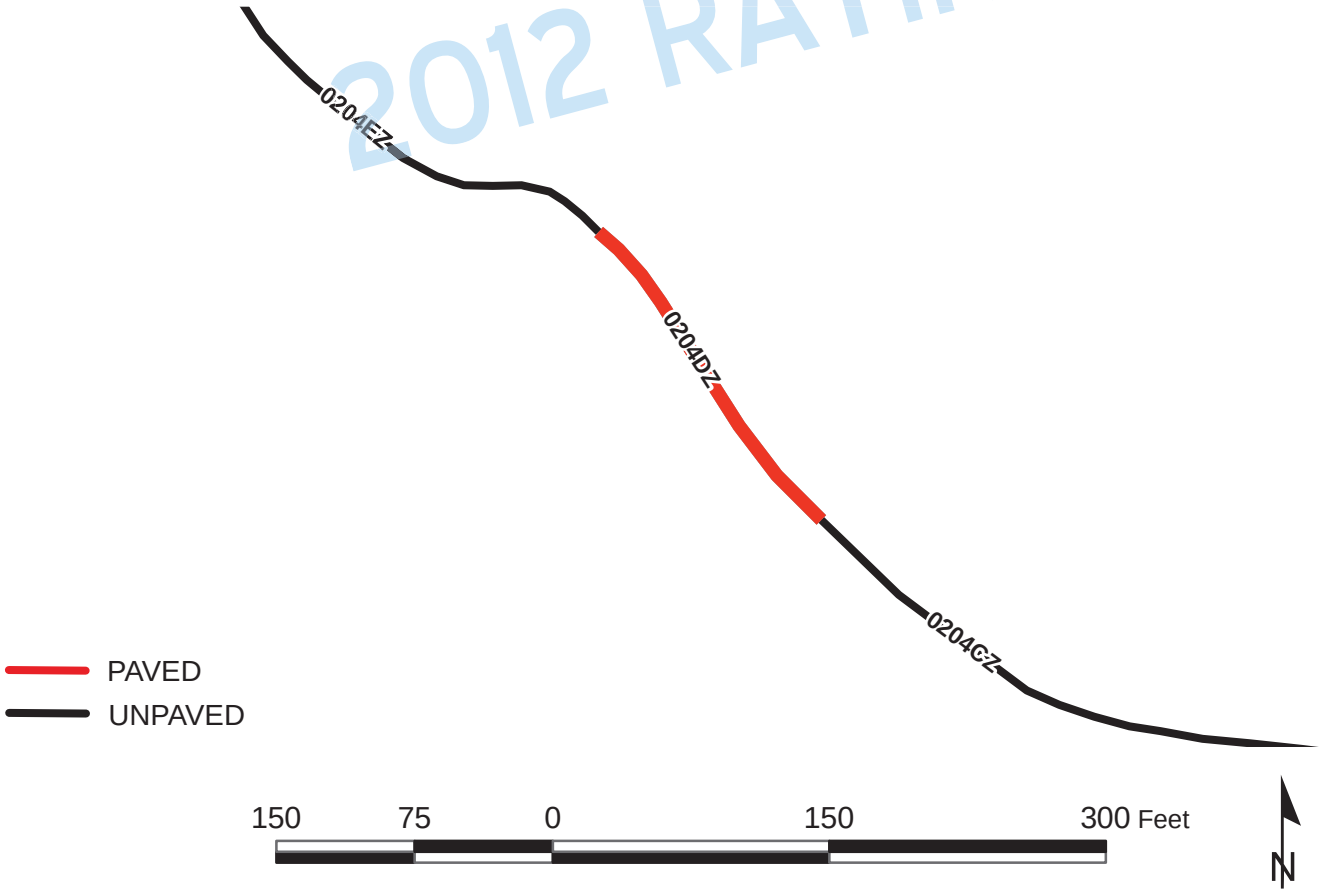
N

Haleakala National Park
MRL Route 0204DZ Subcomponent Record
KAPAHU FARM SERVICE ROAD (SECTION 2)

FROM ROUTE 0204CZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 2))
TO ROUTE 0204EZ (KAPAHU FARM SERVICE ROAD (UNPAVED SECTION 3))

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles **	Paved Length (mi)	Paved Width (ft)
0204DZ	PUBLIC	1/14/2012	781	0.013	0.037	4
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO	NO	45 POOR	CO

** Lane miles are based on 11' lane widths

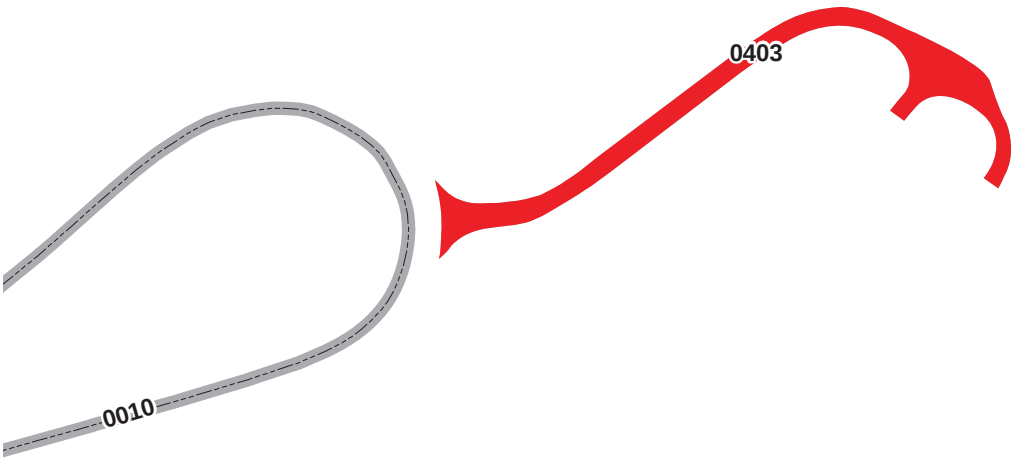


Haleakala National Park
MRP Route 0403
RAIN SHED SERVICE ROAD

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 2.27 (ON LEFT)
TO WATER TANKS

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0403	NONPUBLIC	1/13/2012	7295	0.126	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
1	0	1	NO	NO	73 FAIR

* Lane miles are based on 11' lane widths



190 95 0 190 380 Feet

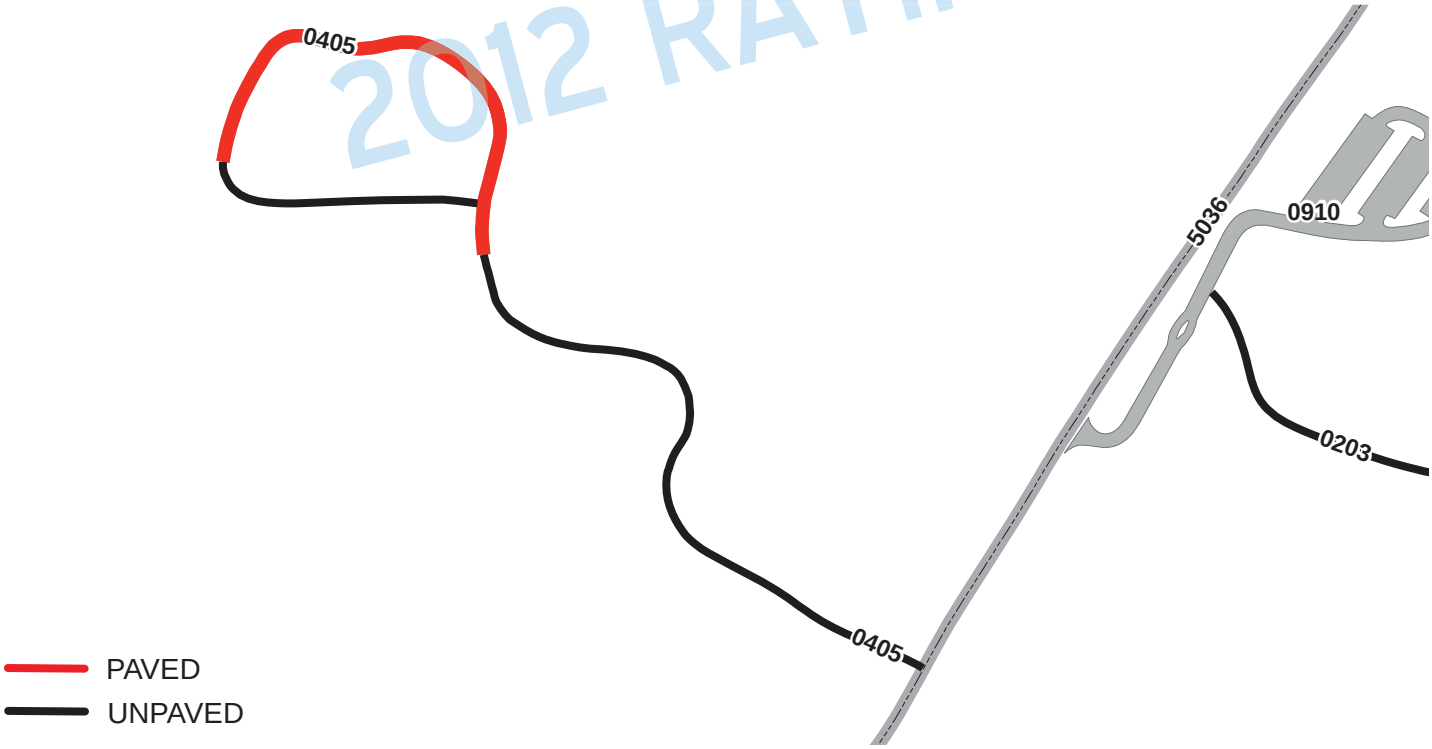
N

Haleakala National Park
MRL Route 0405
KIPAHULU ROAD TO WATER TANK

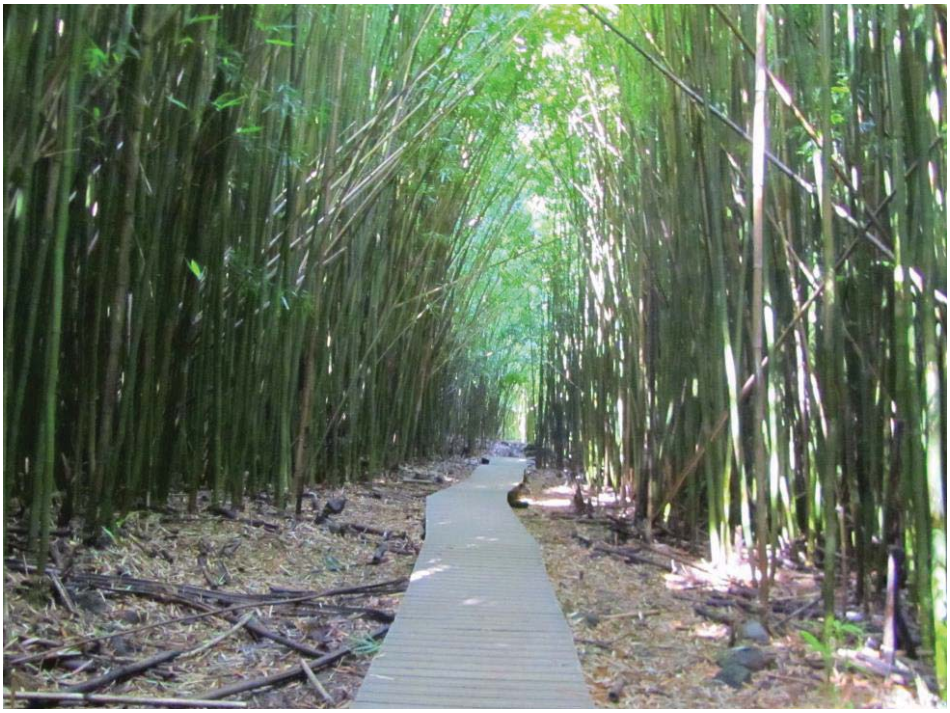
FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)
TO END OF LOOP NEAR WATER TANK

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles **	Paved Length (mi)	Paved Width (ft)
0405	NONPUBLIC	1/14/2012	7719	0.133	0.17	8.6
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO	NO	73 FAIR	CO

** Lane miles are based on 11' lane widths



Section 7
Parking Area
Condition Rating Sheets



Haleakala National Park

Federal Lands Highway
Road Inventory Program

Haleakala National Park

PARKING AREA CONDITION RATING SHEETS

Parking areas at Haleakala National Park (HALE) were collected twice in Cycle 5 by the Road Inventory Program (RIP).

- January 2012: First manual collection (no automated vehicle collection)
- March / April 2014: Automated vehicle and second manual collection*

Following the 2012 data collection effort, the RIP Automated Data Collection Vehicle (DCV) visited Hawaii in April of 2014 to perform automated collection on all NPS paved roads. During the DCV collection visit, a second manual condition assessment was performed on parking areas and manually rated roads and the previous Cycle 5 manual condition ratings were updated.

The 2014 condition assessment at HALE incorporated new manual rating methodologies designed to improve the identification of treatment recommendations and pavement condition descriptions for Manually Rated Routes. These new methodologies will be used in future Cycle 6 collections and were included in this 2014 Final Cycle 5 Report. A detailed description of the new manual rating procedures can be found in the Appendix of this Report.

To facilitate comparisons of the 2012 and 2014 manual ratings, both condition rating sheets for each route are included in this final Cycle 5 Report.

- Section 7A: Updated Ratings from March and April of 2014
- Section 7B: Previous Ratings from January of 2012

Note: Paved routes at Kipahulu were collected in 2012, but not recollected during the 2014 collection visit.

SECTION 7A

PARKING AREA CONDITION RATING SHEETS

FROM

MARCH & APRIL 2014

Haleakala National Park

ROUTE 0900ZZ: HEADQUARTERS VISITOR PARKING AREAS

Summary Route

Manual Rating

FROM ROUTE 0010 (HALEAKALA PARK ROAD)

TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31833	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
14,108	0.24	SUMMARY / 82	

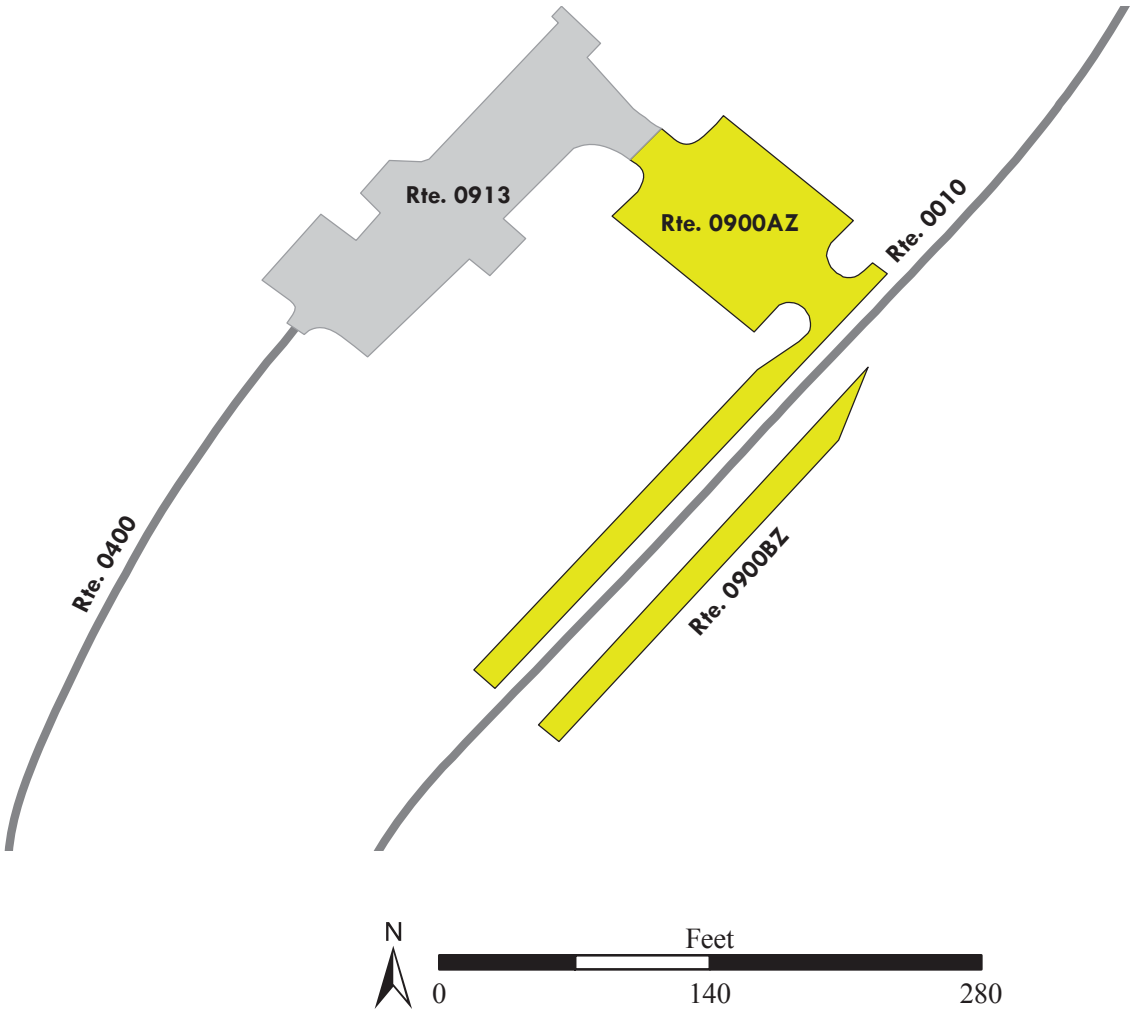
Culverts	Drop Inlets	Gates
0	2	0

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

The condition shown on this page reflects the overall condition; it may not reflect individual subcomponent condition ratings.



Haleakala National Park

ROUTE 0900AZ: HEADQUARTERS VISITOR PARKING A

Subcomponent of Route HALE-0900ZZ

Manual Rating

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.03 (ON RIGHT)

TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31833	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
11,113	0.19	NOT APPLICABLE	LIGHT REPAIR

Curb Type	Curb & Gutter Type
NO CURB	CONCRETE CURB AND GUTTER

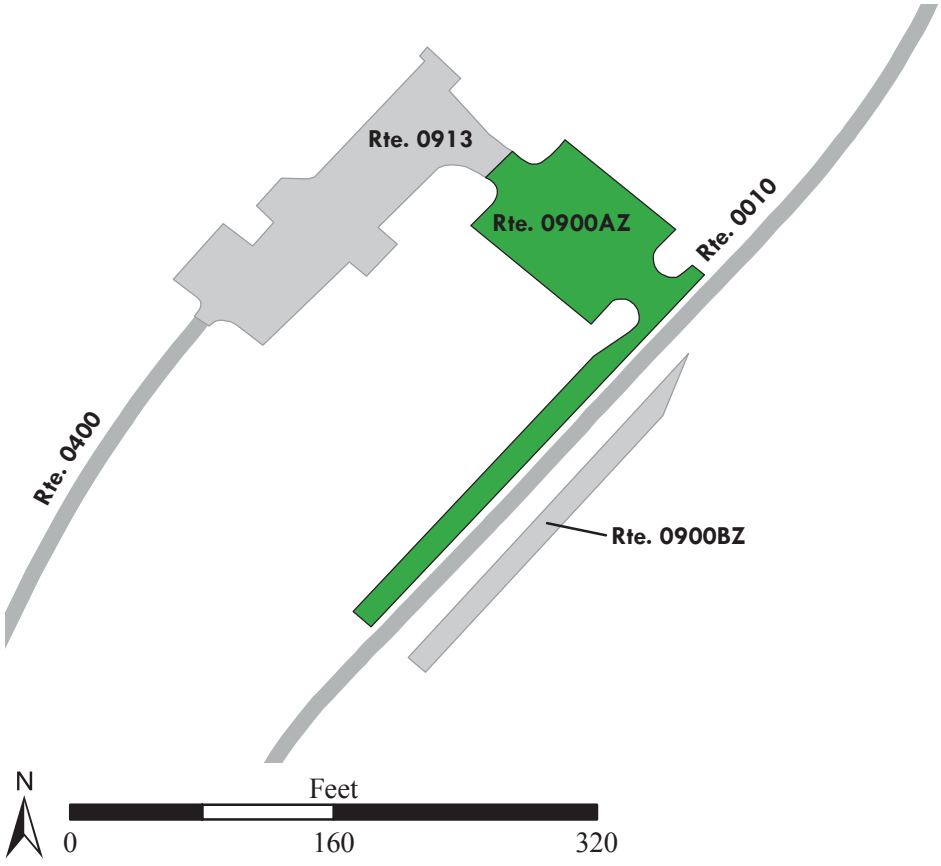
Culverts	Drop Inlets	Gates
0	2	0

Pavement Recommendation	Condition Rating / PCR
PREVENTIVE MAINTENANCE	GOOD / 90

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0900BZ: HEADQUARTERS VISITOR PARKING B

Subcomponent of Route HALE-0900ZZ

Manual Rating

ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.06 (ON LEFT)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31833	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
2,995	0.05	NOT APPLICABLE	LIGHT REPAIR

Curb Type	Curb & Gutter Type
NO CURB	CONCRETE CURB AND GUTTER

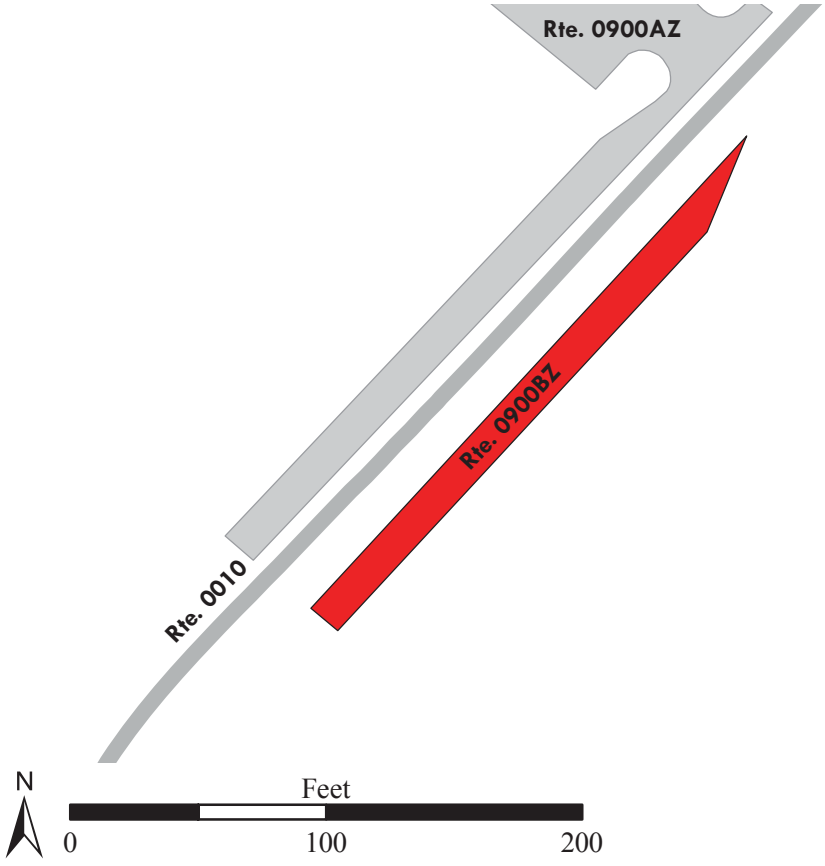
Culverts	Drop Inlets	Gates
0	0	0

Pavement Recommendation	Condition Rating / PCR
HEAVY 3R TREATMENTS	POOR / 53

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0901: HALEMAU'U 8,000 FOOT TRAILHEAD PARKING

Manual Rating

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 4.55

TO PARKING

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31835	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
12,176	0.21	NOT APPLICABLE	DO NOTHING

Curb Type	Curb & Gutter Type
NO CURB	CONCRETE CURB AND GUTTER

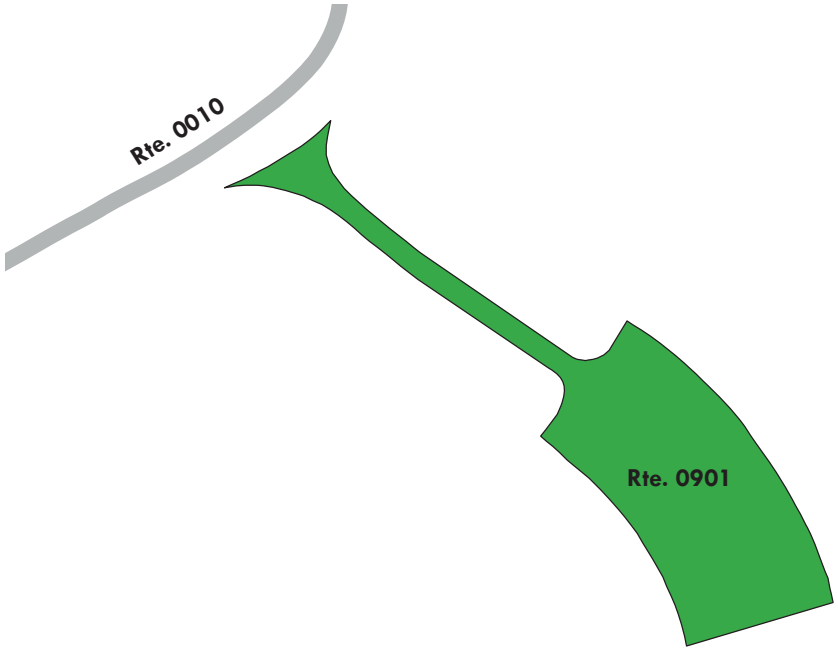
Culverts	Drop Inlets	Gates
0	0	0

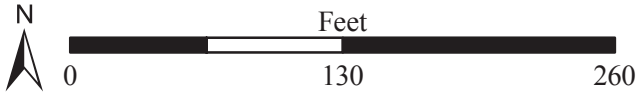
Pavement Recommendation	Condition Rating / PCR
PREVENTIVE MAINTENANCE	GOOD / 90

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas





Haleakala National Park

ROUTE 0902: LELEIWI OVERLOOK PARKING

Manual Rating

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 7.27

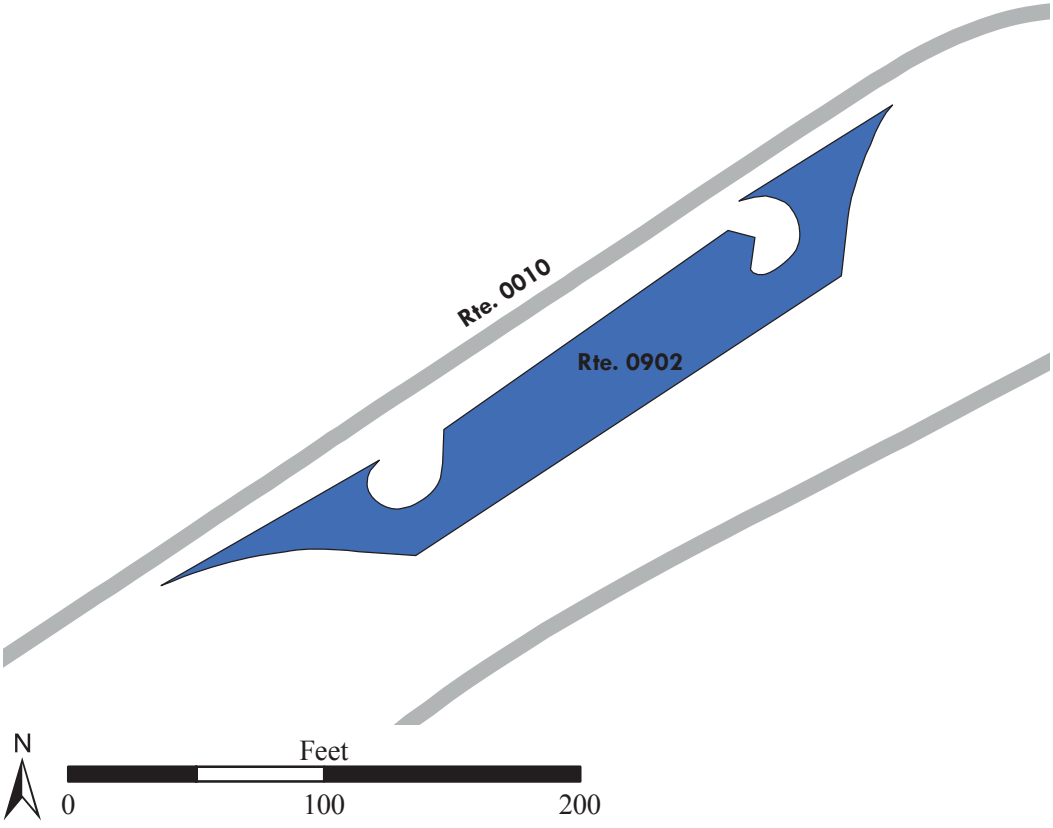
TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 7.32

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31836	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
8,178	0.14	5	LIGHT REPAIR
Curb Type		**Curb & Gutter Type**	
ASPHALT CURB		CONCRETE CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
DO NOTHING		EXCELLENT / 97	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0903ZZ: HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)

Summary Route

Manual Rating

FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD) AND ADJACENT TO ROUTE 0100 (RED HILL ROAD)

TO PARKING

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31830	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
46,088	0.79	SUMMARY / 96	

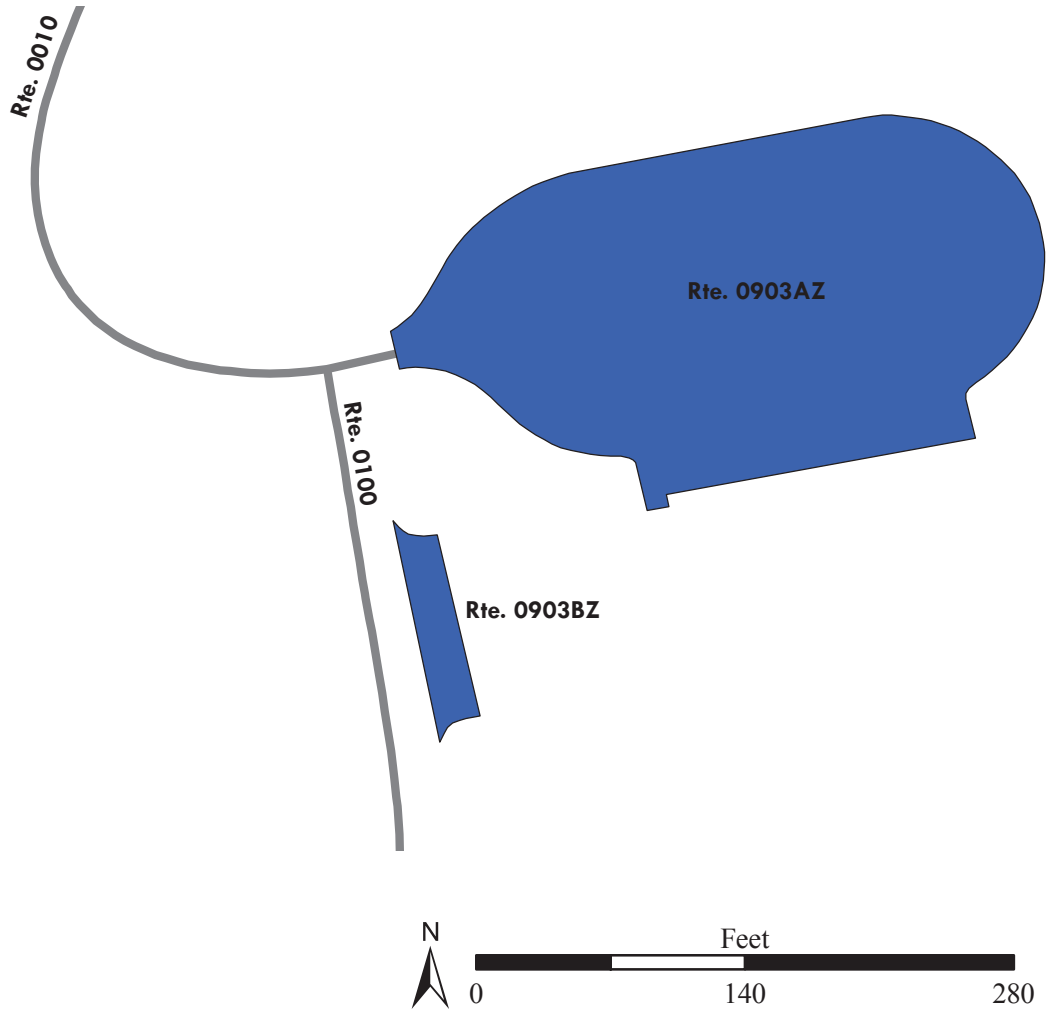
Culverts	Drop Inlets	Gates
0	1	0

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

The condition shown on this page reflects the overall condition; it may not reflect individual subcomponent condition ratings.



Haleakala National Park

ROUTE 0903AZ: HALEAKALA VISITOR CENTER PARKING A (CRATER RIM)

Subcomponent of Route HALE-0903ZZ

Manual Rating

FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD)

TO PARKING

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31830	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
44,003	0.76	NOT APPLICABLE	DO NOTHING

Curb Type	Curb & Gutter Type
NO CURB	CONCRETE CURB AND GUTTER

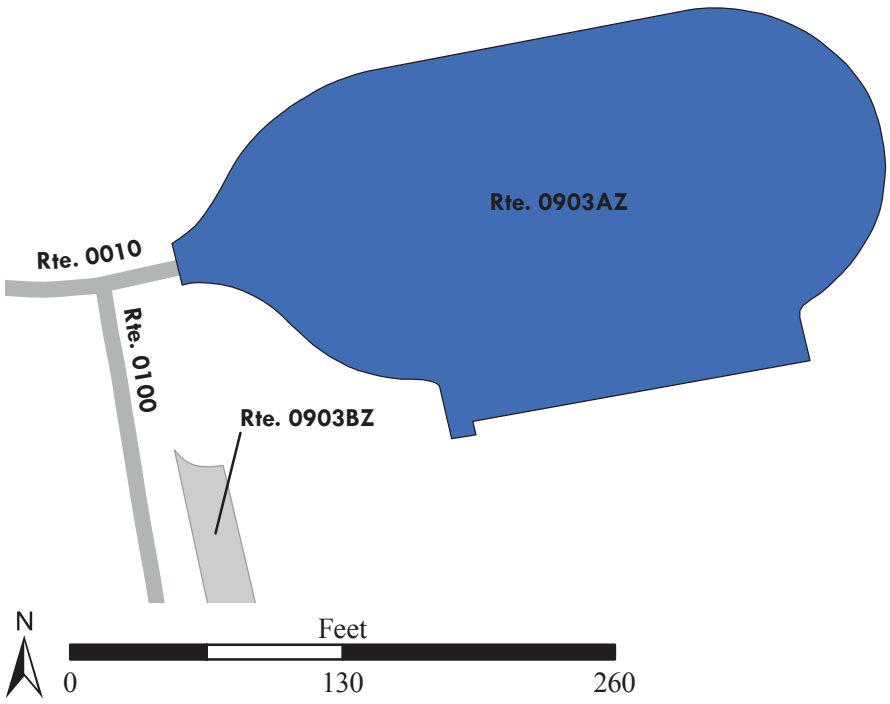
Culverts	Drop Inlets	Gates
0	1	0

Pavement Recommendation	Condition Rating / PCR
DO NOTHING	EXCELLENT / 97

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0903BZ: HALEAKALA VISITOR CENTER PARKING B (CRATER RIM)

Subcomponent of Route HALE-0903ZZ

Manual Rating

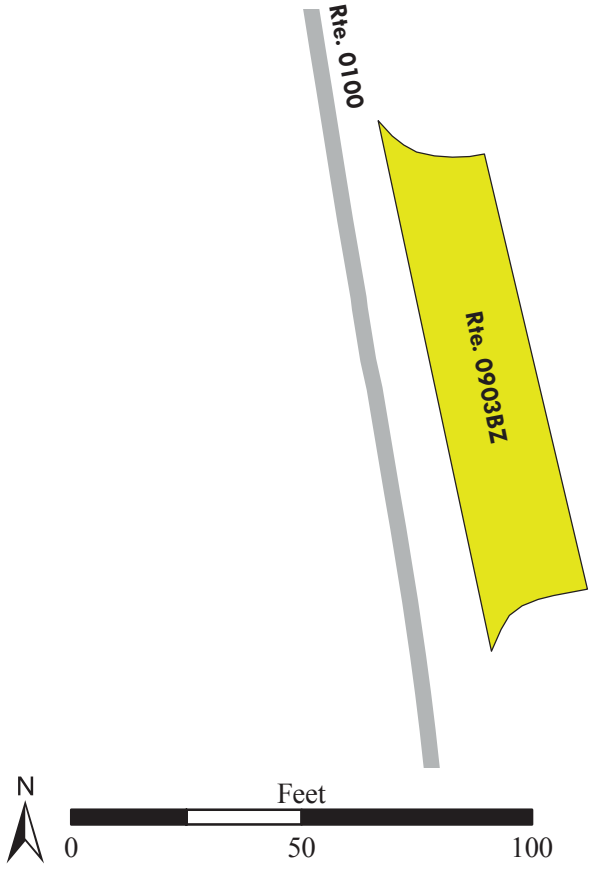
ADJACENT TO ROUTE 0100 (RED HILL ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31830	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
2,085	0.04	6	DO NOTHING
Curb Type		**Curb & Gutter Type**	
ASPHALT & CONCRETE CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
LIGHT 3R TREATMENTS		FAIR / 73	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0904: RED HILL SUMMIT PARKING LOT

Manual Rating

FROM END OF ROUTE 0100 (RED HILL ROAD)

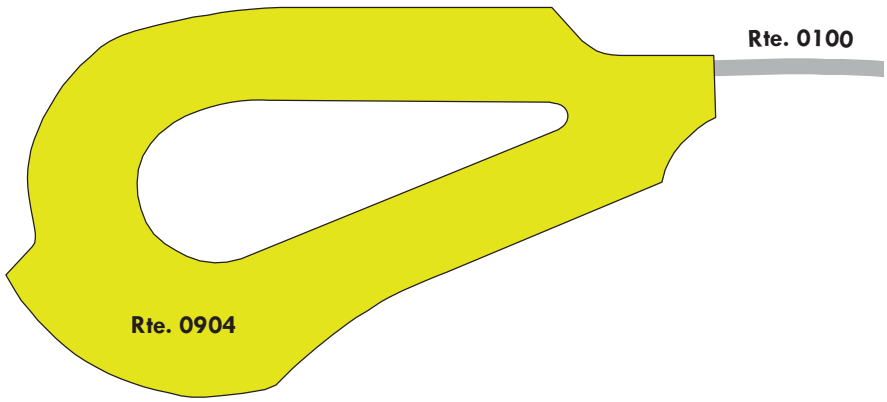
TO PARKING

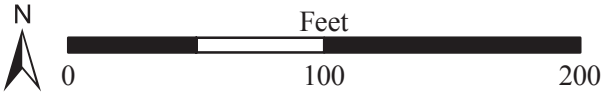
Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31831	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
20,100	0.35	NOT APPLICABLE	DO NOTHING
Curb Type		**Curb & Gutter Type**	
NO CURB		CONCRETE CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
LIGHT 3R TREATMENTS		FAIR / 73	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas





Haleakala National Park

ROUTE 0905ZZ: KALAHAKU OVERLOOK PARKING AREAS

Summary Route

Manual Rating

ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31837	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
5,557	0.10	SUMMARY / 97	

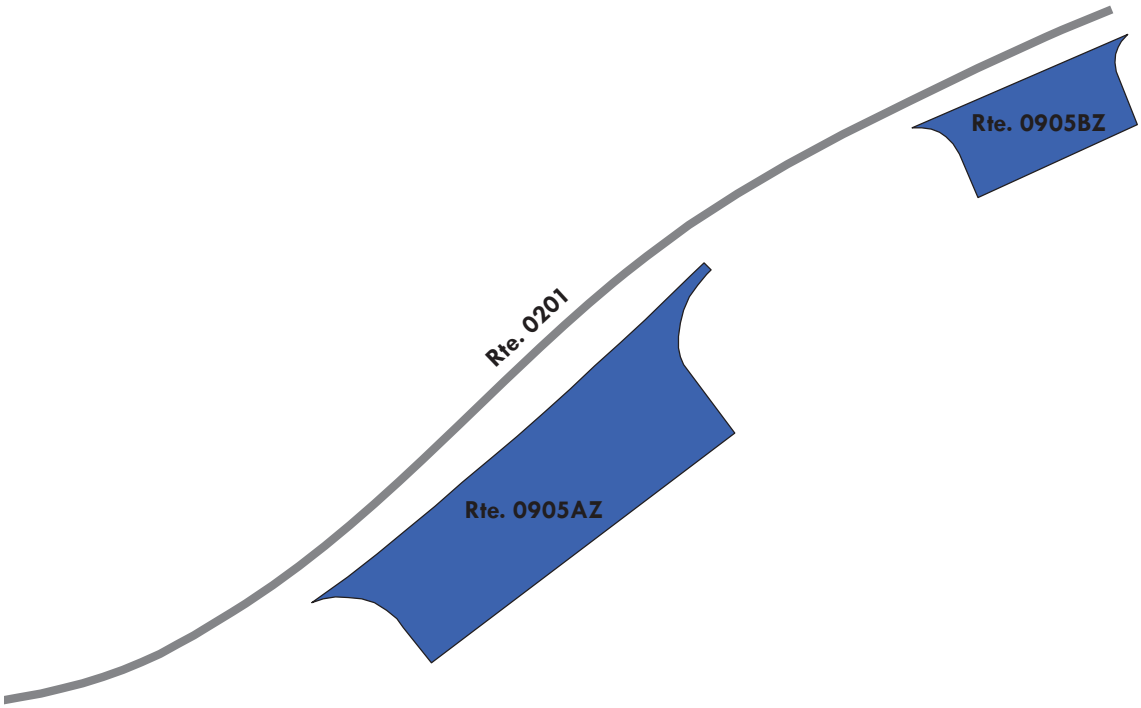
Culverts	Drop Inlets	Gates
0	0	0

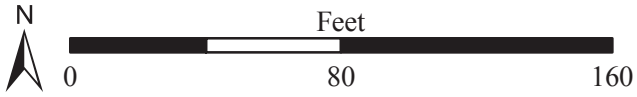
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

The condition shown on this page reflects the overall condition; it may not reflect individual subcomponent condition ratings.





Haleakala National Park

ROUTE 0905AZ: KALAHAKU OVERLOOK PARKING A

Subcomponent of Route HALE-0905ZZ

Manual Rating

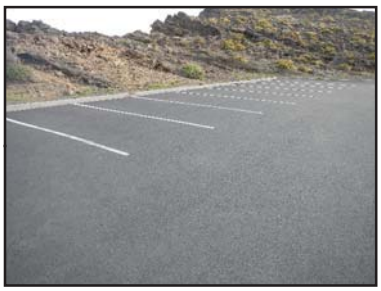
ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20

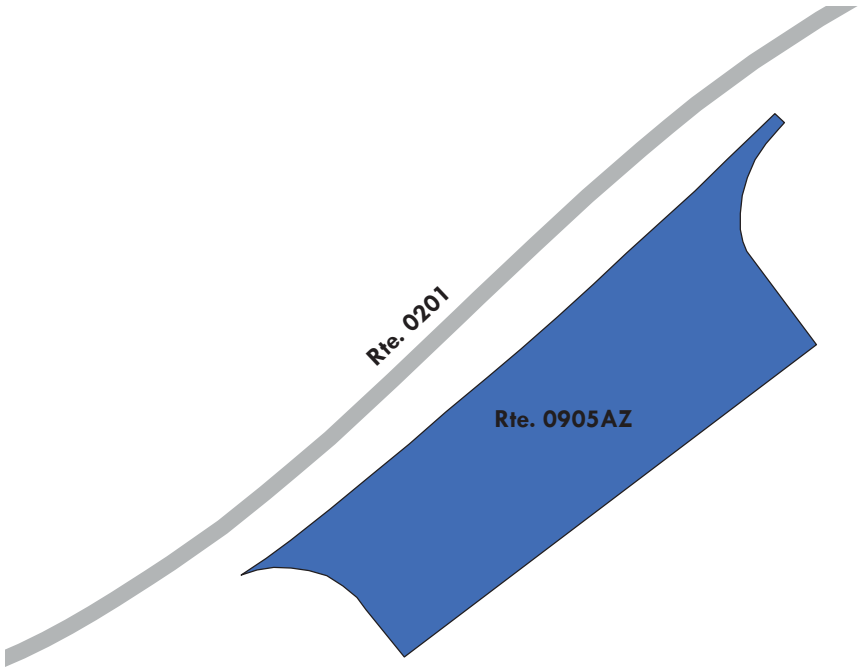
Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31837	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
4,239	0.07	NOT APPLICABLE	LIGHT REPAIR
Curb Type		**Curb & Gutter Type**	
NO CURB		CONCRETE CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
DO NOTHING		EXCELLENT / 97	

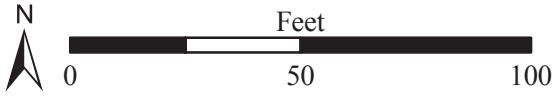
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas







Haleakala National Park

ROUTE 0905BZ: KALAHAKU OVERLOOK PARKING B

Subcomponent of Route HALE-0905ZZ

Manual Rating

ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24

Inspection Date	FMSS Number	User Access	Surface Type
3/27/2014	31837	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
1,318	0.02	NOT APPLICABLE	DO NOTHING

Curb Type	Curb & Gutter Type
NO CURB	CONCRETE CURB AND GUTTER

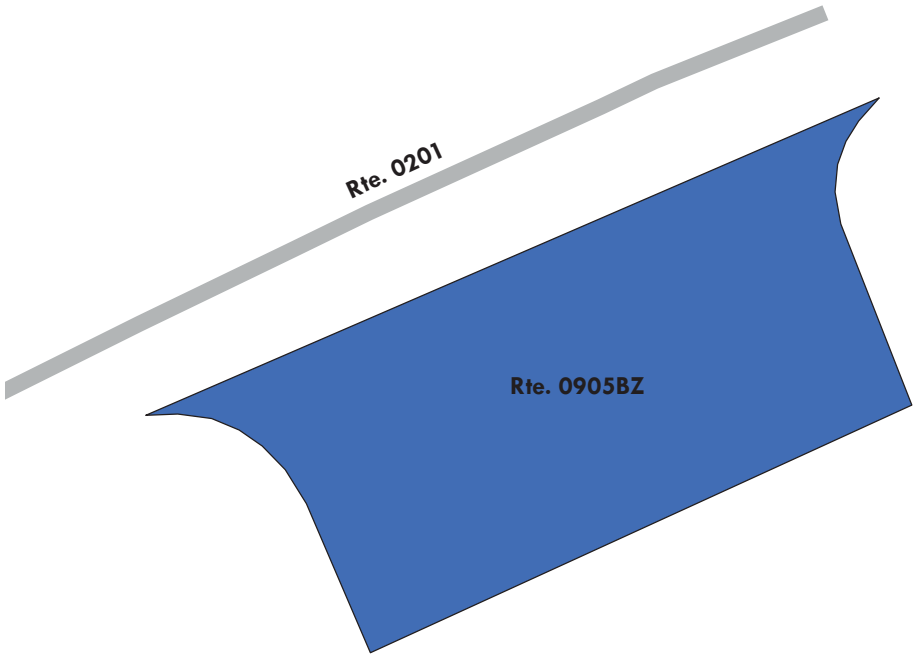
Culverts	Drop Inlets	Gates
0	0	0

Pavement Recommendation	Condition Rating / PCR
DO NOTHING	EXCELLENT / 97

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0906ZZ: HOSMER GROVE CAMPGROUND PARKING AREAS

Summary Route

Manual Rating

FROM ROUTE 0202 (HOSMER GROVE ROAD)

TO PARKING

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31832	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
13,597	0.23	SUMMARY / 90	

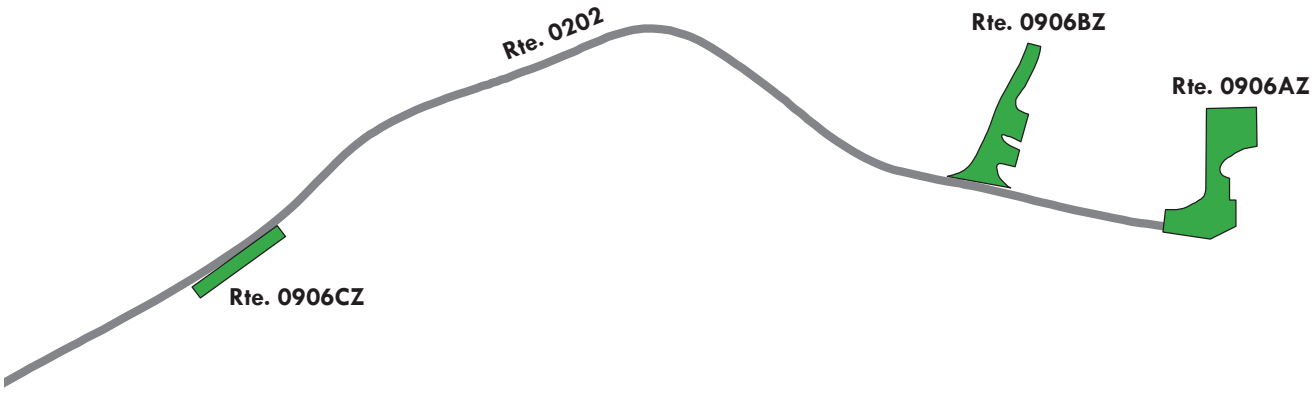
Culverts	Drop Inlets	Gates
0	0	1

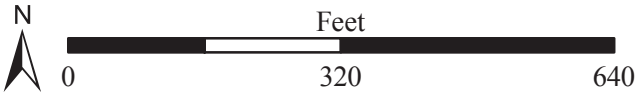
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

The condition shown on this page reflects the overall condition; it may not reflect individual subcomponent condition ratings.





Haleakala National Park

ROUTE 0906AZ: HOSMER GROVE CAMPGROUND PARKING A

Subcomponent of Route HALE-0906ZZ

Manual Rating

FROM END OF ROUTE 0202 (HOSMER GROVE SPUR ROAD)

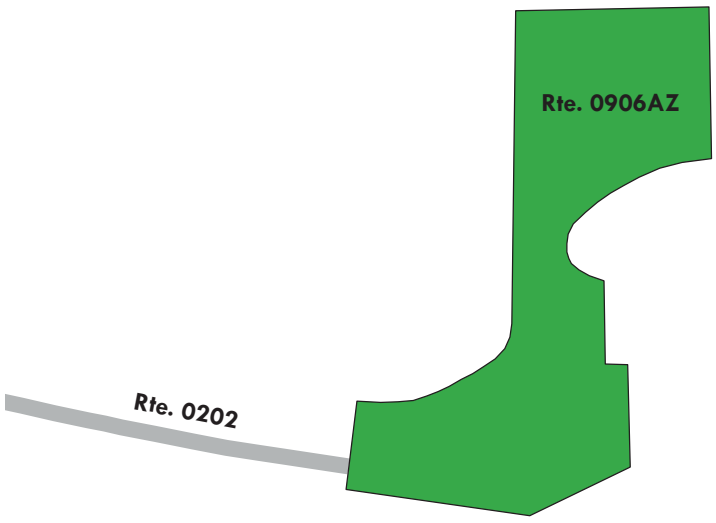
TO PARKING

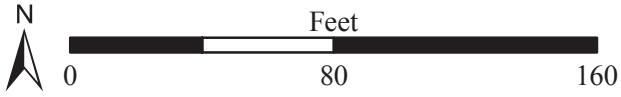
Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31832	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
7,003	0.12	6	DO NOTHING
Curb Type		**Curb & Gutter Type**	
CONCRETE CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
PREVENTIVE MAINTENANCE		GOOD / 90	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas





Haleakala National Park

ROUTE 0906BZ: HOSMER GROVE CAMPGROUND PARKING B

Subcomponent of Route HALE-0906ZZ

Manual Rating

FROM ROUTE 0202 (HOSMER GROVE SPUR ROAD) AT MP 0.42

TO PARKING

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31832	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
4,736	0.08	NOT APPLICABLE	N/A

Curb Type	Curb & Gutter Type
NO CURB	NO CURB AND GUTTER

Culverts	Drop Inlets	Gates
0	0	1

Pavement Recommendation	Condition Rating / PCR
PREVENTIVE MAINTENANCE	GOOD / 90

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

Haleakala National Park

ROUTE 0906CZ: HOSMER GROVE CAMPGROUND PARKING C

Subcomponent of Route HALE-0906ZZ

Manual Rating

ADJACENT TO ROUTE 0202 (HOSMER GROVE SPUR ROAD) AT MP 0.23

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31832	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
1,858	0.03	7	DO NOTHING

Curb Type	Curb & Gutter Type
CONCRETE CURB	NO CURB AND GUTTER

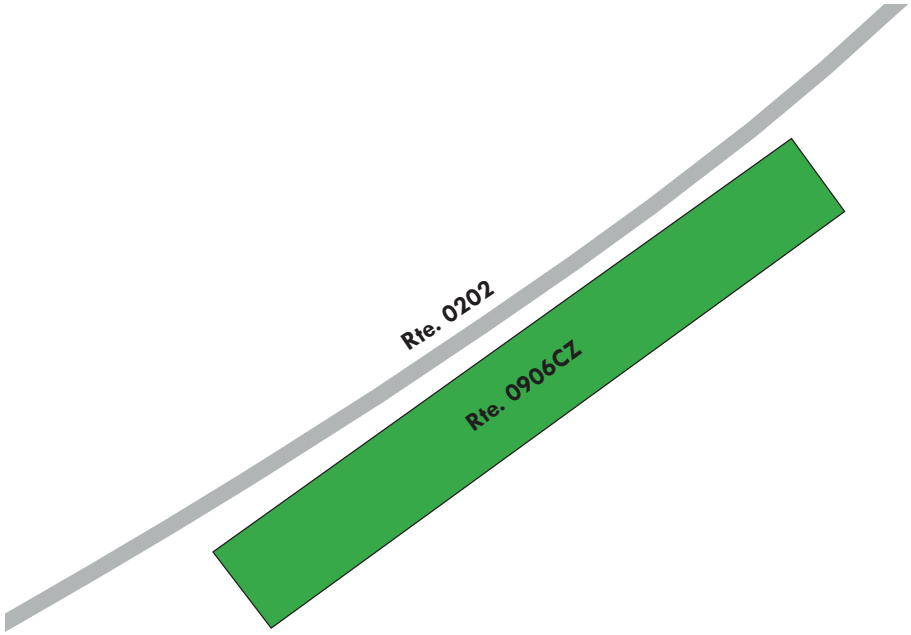
Culverts	Drop Inlets	Gates
0	0	0

Pavement Recommendation	Condition Rating / PCR
PREVENTIVE MAINTENANCE	GOOD / 90

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0908ZZ: PU'U NIANIAU RESIDENCE PARKING AREAS

Summary Route

Manual Rating

ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	102613	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Condition Rating / PCR**	
3,039	0.05	SUMMARY / 90	

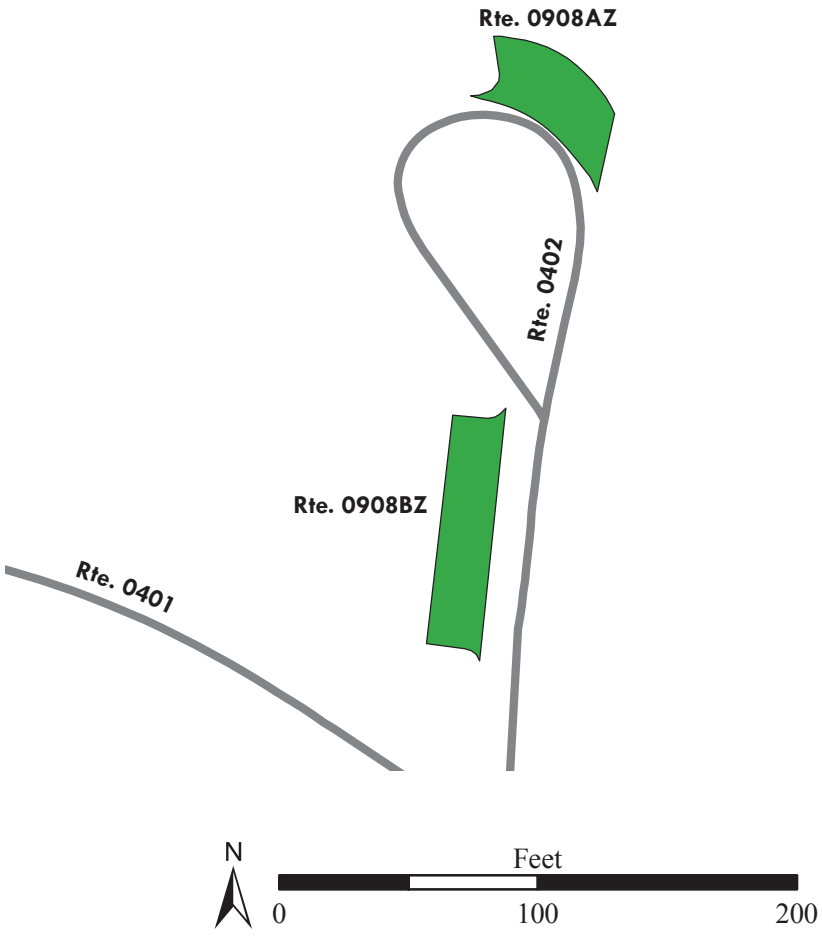
Culverts	Drop Inlets	Gates
0	0	0

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

The condition shown on this page reflects the overall condition; it may not reflect individual subcomponent condition ratings.



Haleakala National Park

ROUTE 0908AZ: PU'U NIANIAU RESIDENCE PARKING

Subcomponent of Route HALE-0908ZZ

Manual Rating

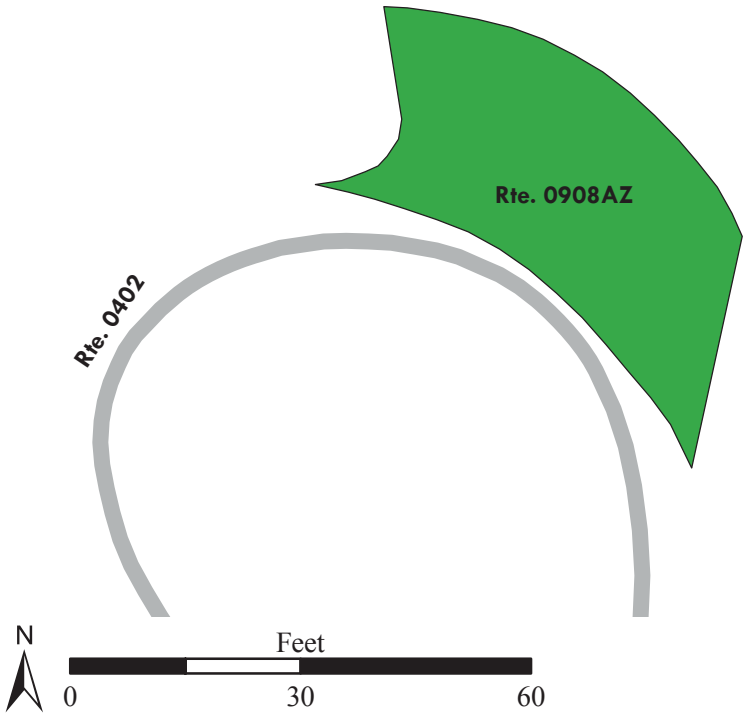
ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	102613	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
1,310	0.02	NOT APPLICABLE	N/A
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
PREVENTIVE MAINTENANCE		GOOD / 90	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0908BZ: PU'U NIANIAU RESIDENCE OVERFLOW PARKING

Subcomponent of Route HALE-0908ZZ

Manual Rating

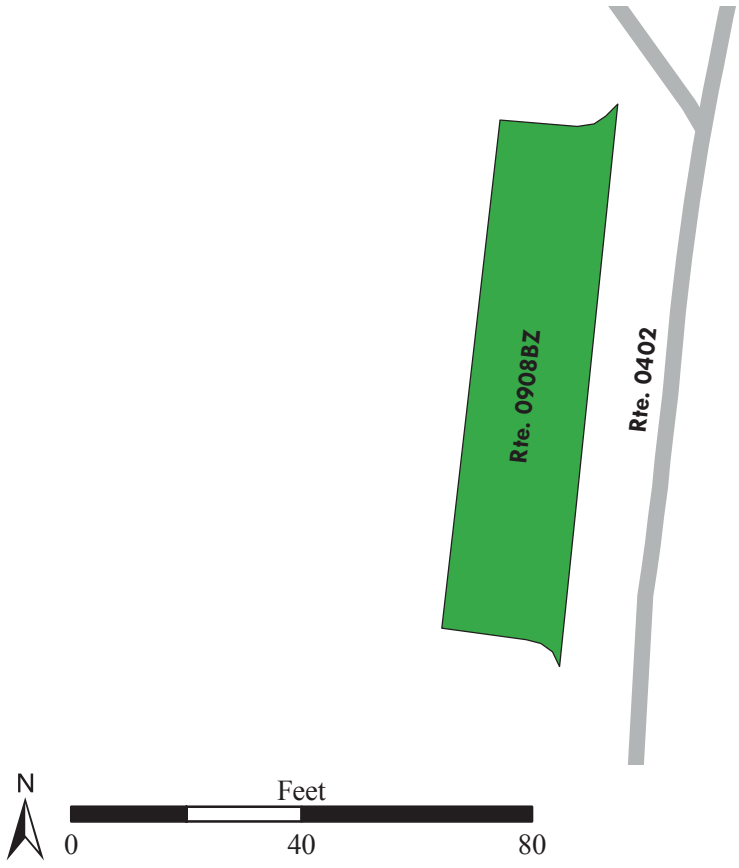
ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	102613	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
1,729	0.03	NOT APPLICABLE	N/A
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
PREVENTIVE MAINTENANCE		GOOD / 90	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0910: KIPAHULU VISITOR CENTER PARKING

Manual Rating

FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)

TO PARKING

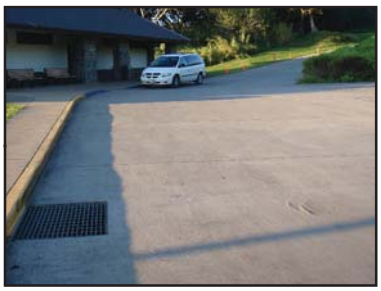
Inspection Date	FMSS Number	User Access	Surface Type
1/14/2012	39535	PUBLIC	CONCRETE
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
50,288	0.87		NOT COLLECTED
Curb Type		**Curb & Gutter Type**	
CONCRETE CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	1	1	
Pavement Recommendation		**Condition Rating / PCR**	
PREVENTIVE MAINTENANCE		GOOD / 90	

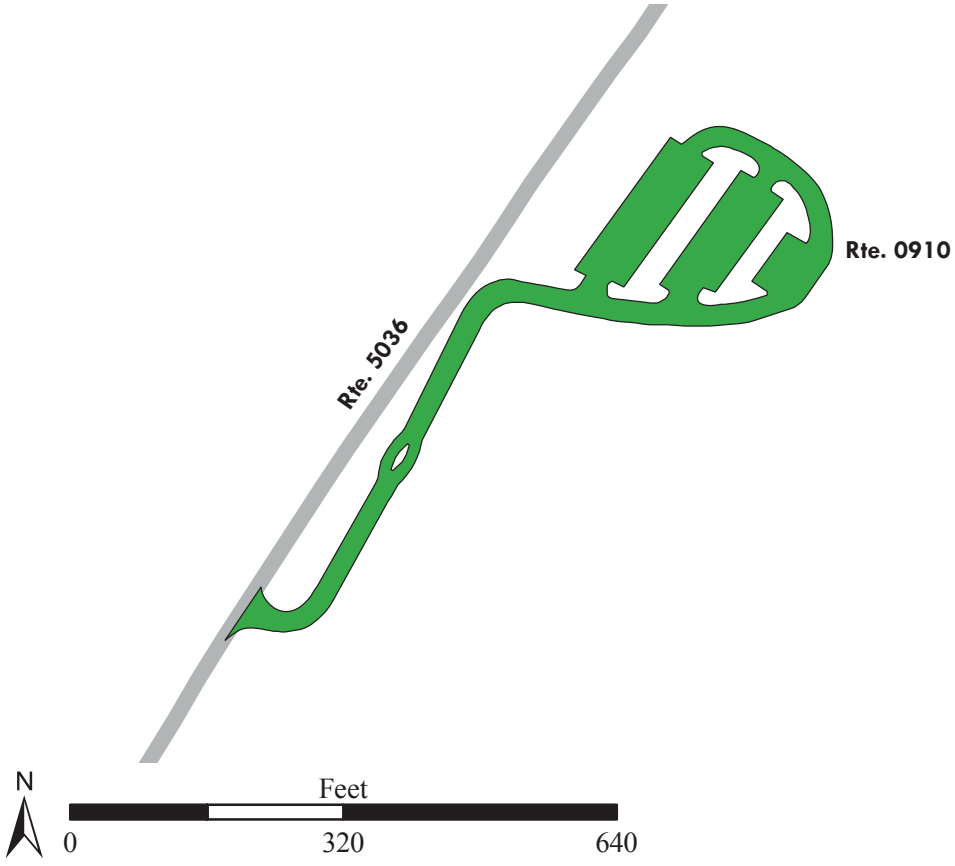
Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas

NOTE: Routes at Kipahulu were not recollected during the second Cycle 5 collection trip in 2014. Therefore, the information shown on this page is from the first Cycle 5 collection trip which was in January 2012.





Haleakala National Park

ROUTE 0913: HEADQUARTERS EMPLOYEE PARKING LOT

Manual Rating

FROM ROUTE 0900ZZ (HEADQUARTERS VISITOR PARKING AREAS)

TO ROUTE 0400 (PERMANENT QUARTERS SERVICE ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	31834	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
11,492	0.20	5	DO NOTHING

Curb Type	Curb & Gutter Type
CONCRETE CURB	NO CURB AND GUTTER

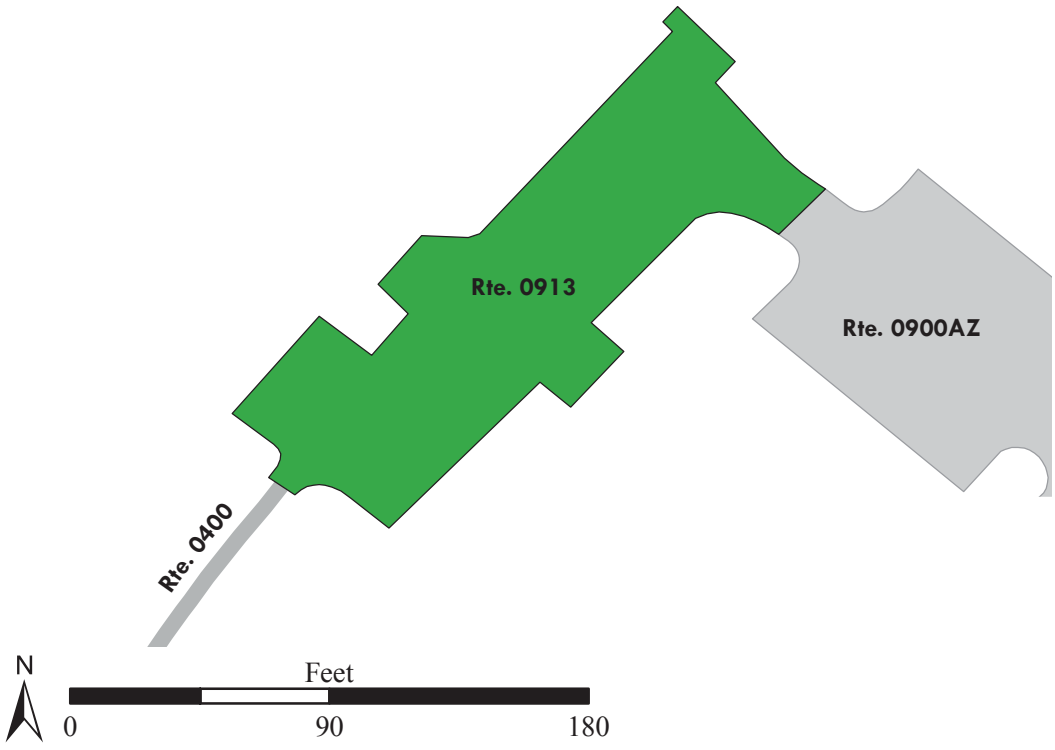
Culverts	Drop Inlets	Gates
0	0	0

Pavement Recommendation	Condition Rating / PCR
PREVENTIVE MAINTENANCE	GOOD / 90

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



Haleakala National Park

ROUTE 0915: ENTRANCE STATION PARKING

Manual Rating

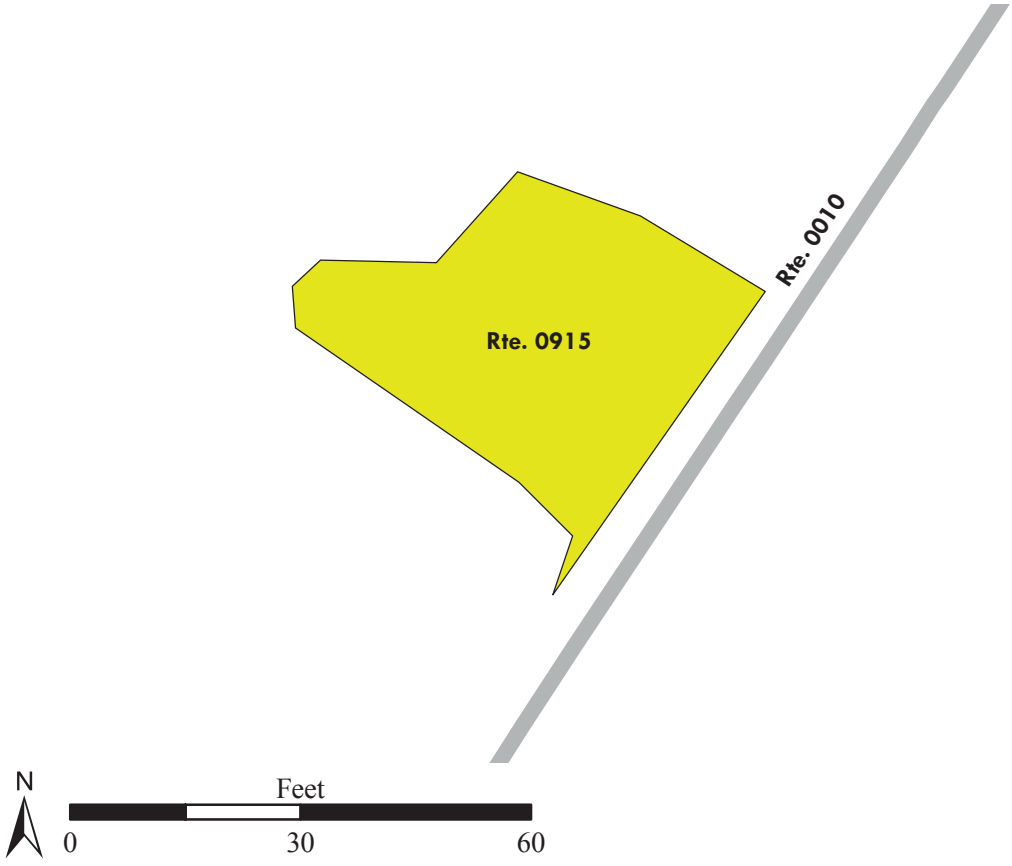
ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
4/1/2014	NOT AVAILABLE	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
1,435	0.03	NOT APPLICABLE	N/A
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
LIGHT 3R TREATMENTS		FAIR / 73	

Route Condition Legend – Pavement Condition Rating (PCR)

Poor (0 - 60) Fair (61- 84) Good (85 - 94) Excellent (95 - 100) Not Rated

See Appendix for definitions and formulas



SECTION 7B

PARKING AREA CONDITION RATING SHEETS

FROM

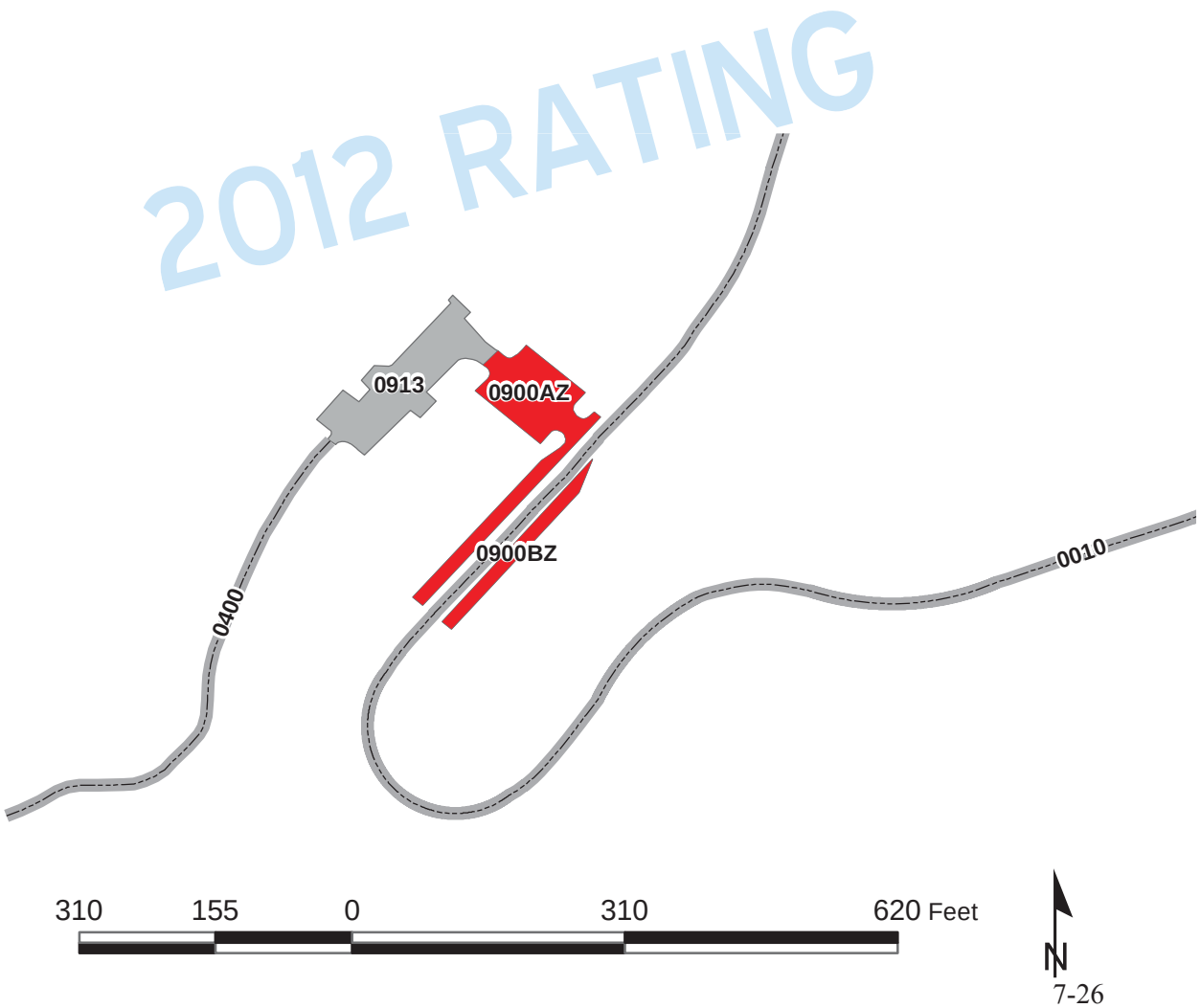
JANUARY 2012

Haleakala National Park
Route 0900ZZ Summary Record
HEADQUARTERS VISITOR PARKING AREAS

FROM ROUTE 0010 (HALEAKALA PARK ROAD) (ON LEFT AND RIGHT)
TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900ZZ	PUBLIC	1/13/2012	14108	0.243	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	2	0	CONCRETE	NO	73 SUMMARY

* Lane miles are based on 11' lane widths

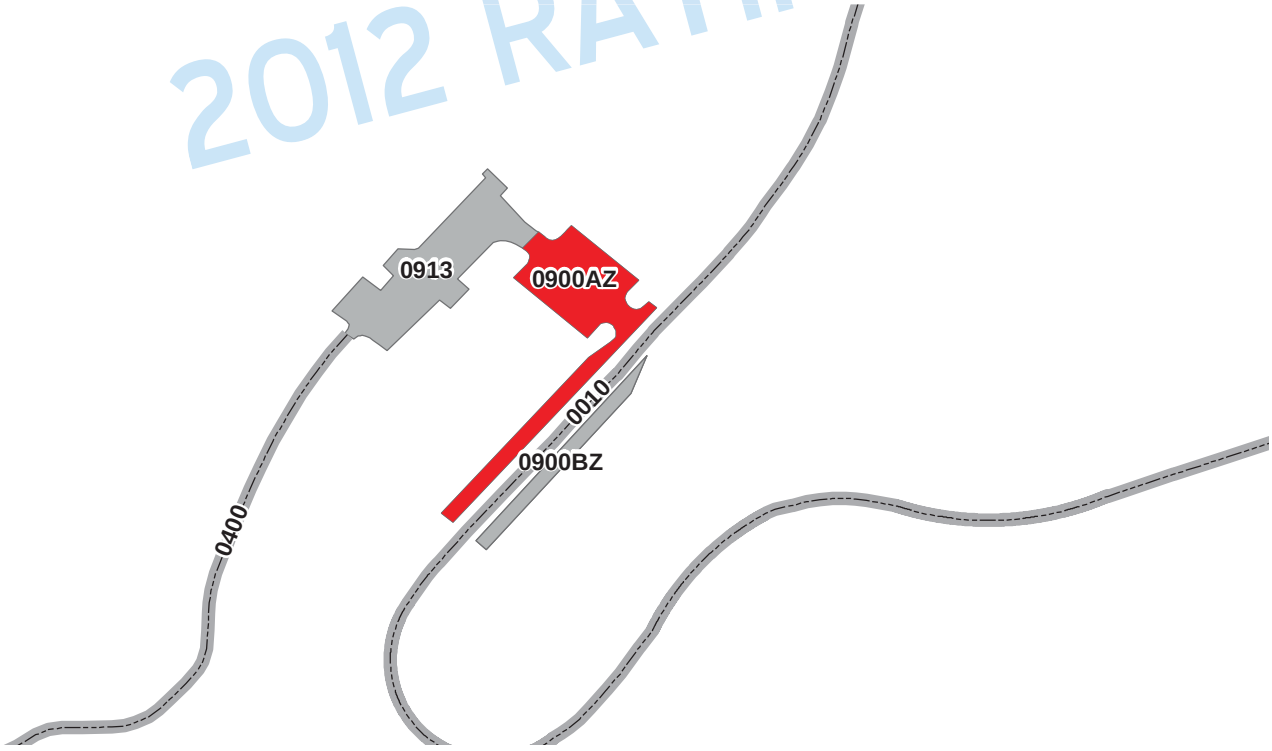


Haleakala National Park
Route 0900AZ Subcomponent Record
HEADQUARTERS VISITOR PARKING A

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.03 (ON RIGHT)
TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900AZ	PUBLIC	1/13/2012	11113	0.191	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	2	0	CONCRETE	NO	73 FAIR

* Lane miles are based on 11' lane widths



280 140 0 280 560 Feet

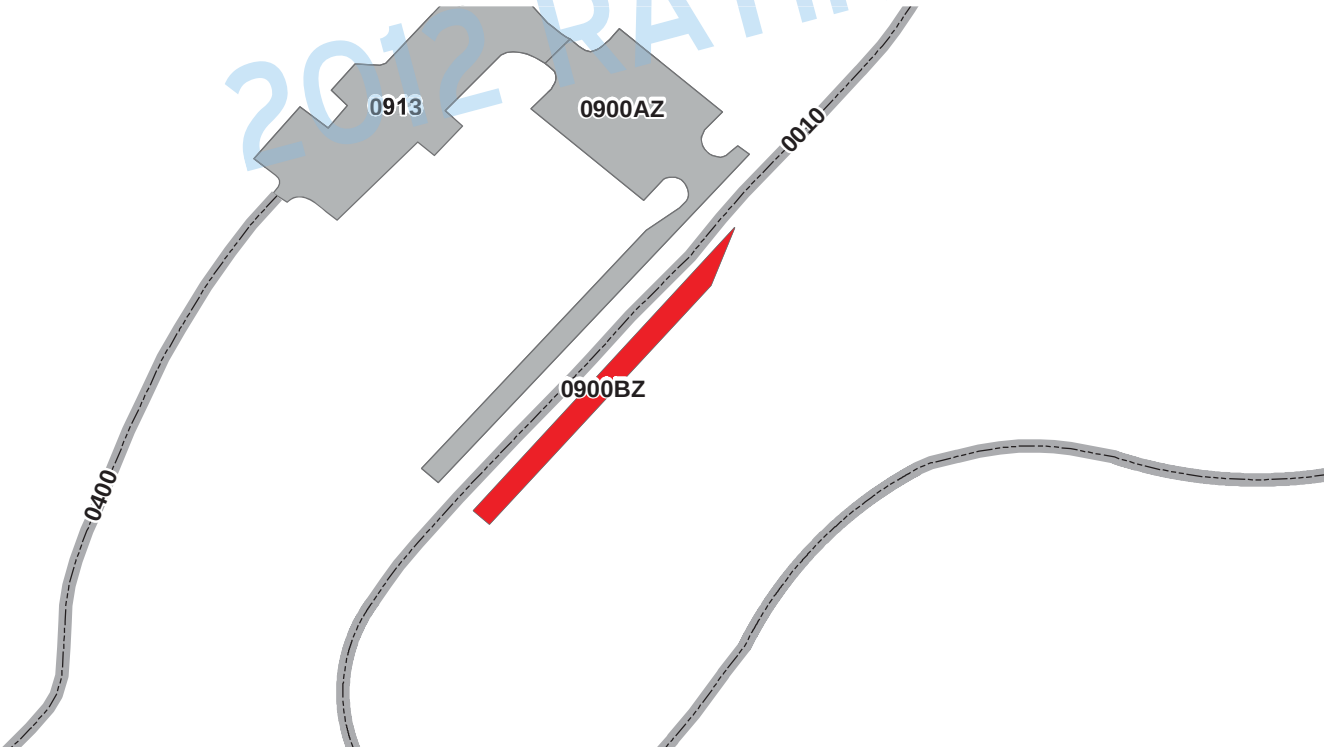
N

Haleakala National Park
Route 0900BZ Subcomponent Record
HEADQUARTERS VISITOR PARKING B

ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.06 (ON LEFT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900BZ	PUBLIC	1/13/2012	2995	0.052	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	NO	73 FAIR

* Lane miles are based on 11' lane widths

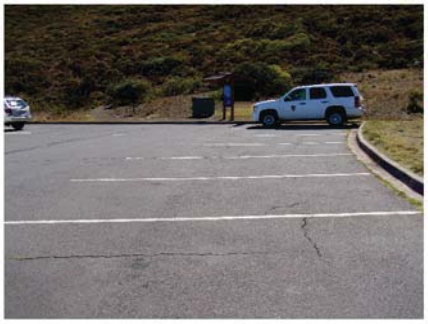


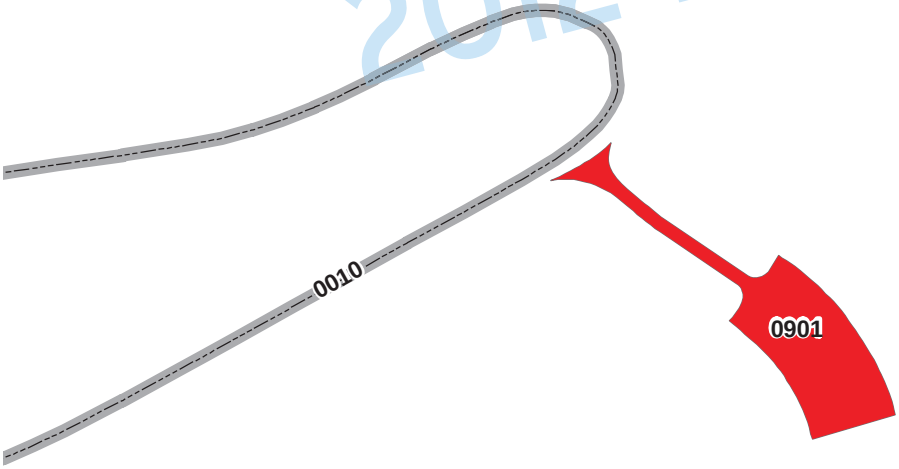
Haleakala National Park
Route 0901
HALEMAU'U TRAILHEAD PARKING

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 4.55 (ON LEFT)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0901	PUBLIC	1/13/2012	12176	0.21	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	NO	45 POOR

* Lane miles are based on 11' lane widths





240 120 0 240 480 Feet

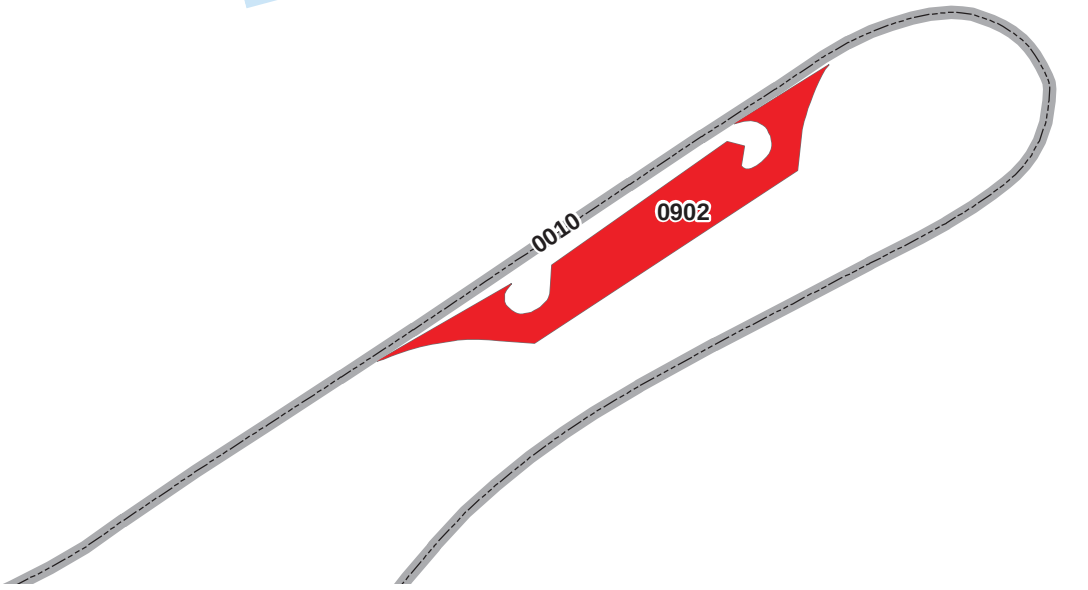
N

Haleakala National Park
Route 0902
LELEIWI OVERLOOK PARKING

FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 7.28 (ON RIGHT)
TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 7.33 (ON RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0902	PUBLIC	1/13/2012	8178	0.141	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	ASPHALT	45 POOR

* Lane miles are based on 11' lane widths



175 87.5 0 175 350 Feet

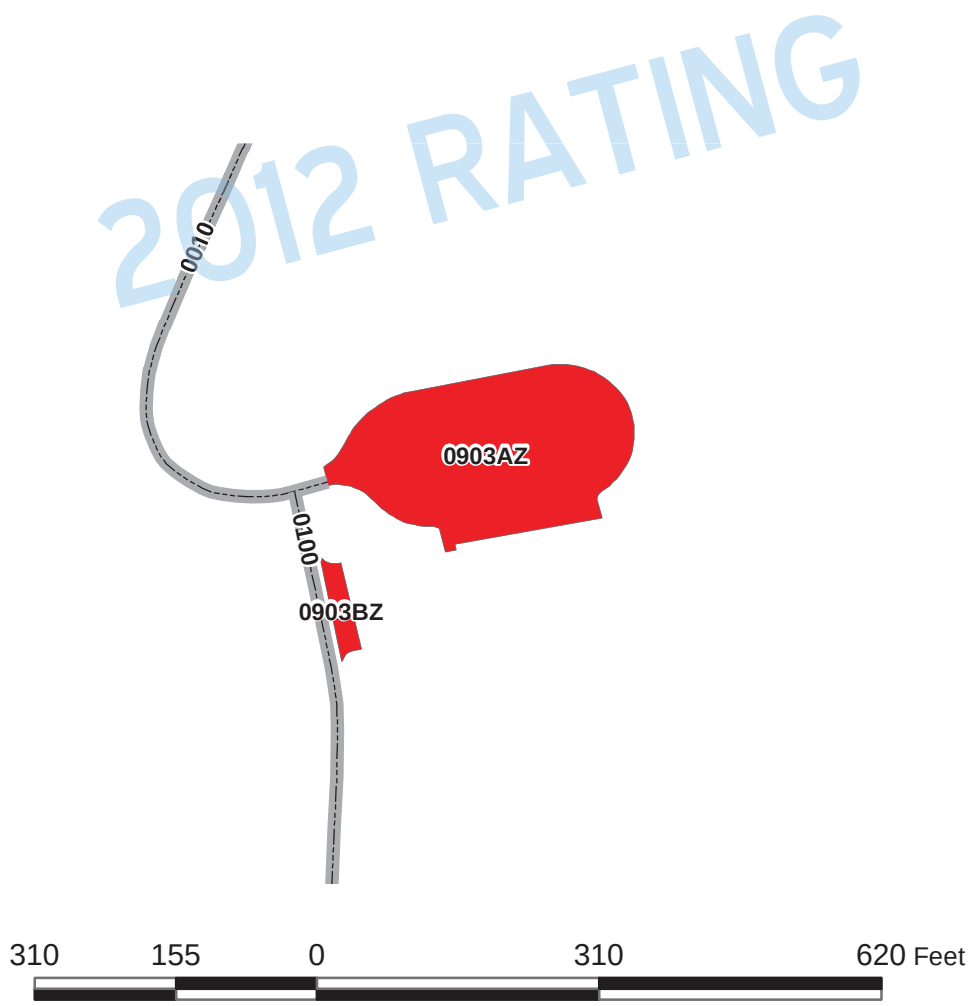
N

Haleakala National Park
Route 0903ZZ Summary Record
HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)

FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD) AND
ADJACENT TO ROUTE 0100 (RED HILL ROAD)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0903ZZ	PUBLIC	1/13/2012	46088	0.794	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	1	0	CONCRETE	ASPHALT/ CONCRETE	72 SUMMARY

* Lane miles are based on 11' lane widths

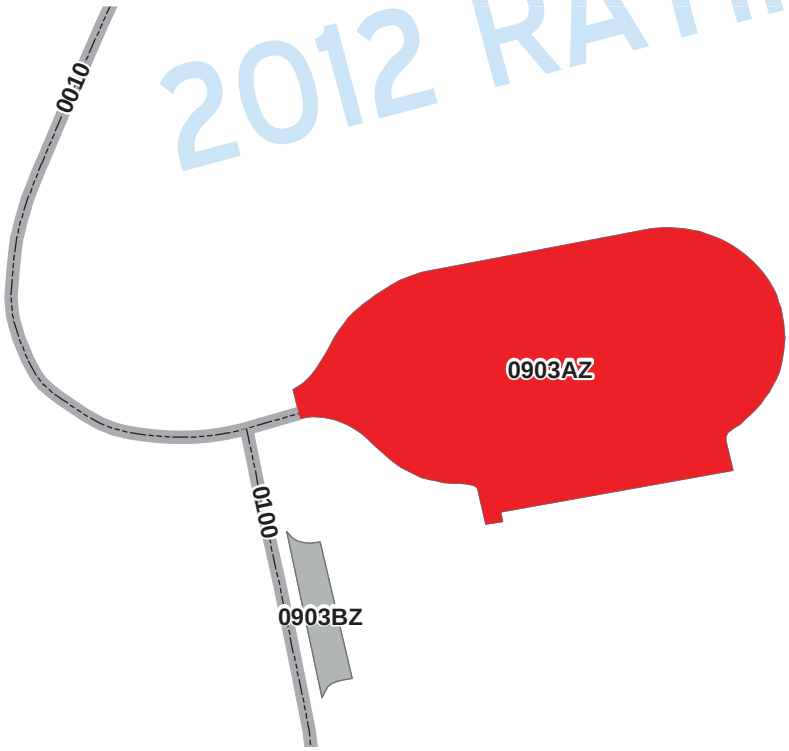


Haleakala National Park
Route 0903AZ Subcomponent Record
HALEAKALA VISITOR CENTER PARKING A (CRATER RIM)

FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0903AZ	PUBLIC	1/13/2012	44003	0.758	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	1	0	CONCRETE	NO	73 FAIR

* Lane miles are based on 11' lane widths



190 95 0 190 380 Feet

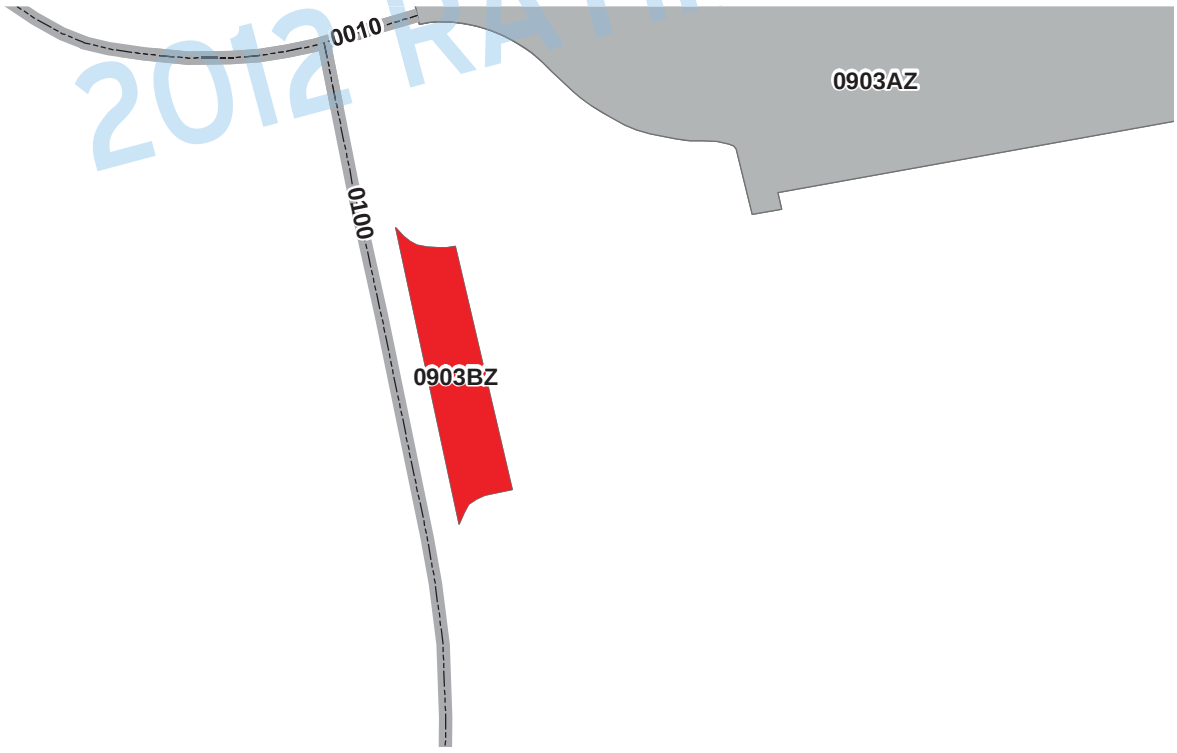
N

Haleakala National Park
Route 0903BZ Subcomponent Record
HALEAKALA VISITOR CENTER PARKING B (CRATER RIM)

ADJACENT TO ROUTE 0100 (RED HILL ROAD) AT MP 0.02 (ON LEFT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0903BZ	PUBLIC	1/13/2012	2085	0.036	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	ASPHALT/ CONCRETE	45 POOR

* Lane miles are based on 11' lane widths

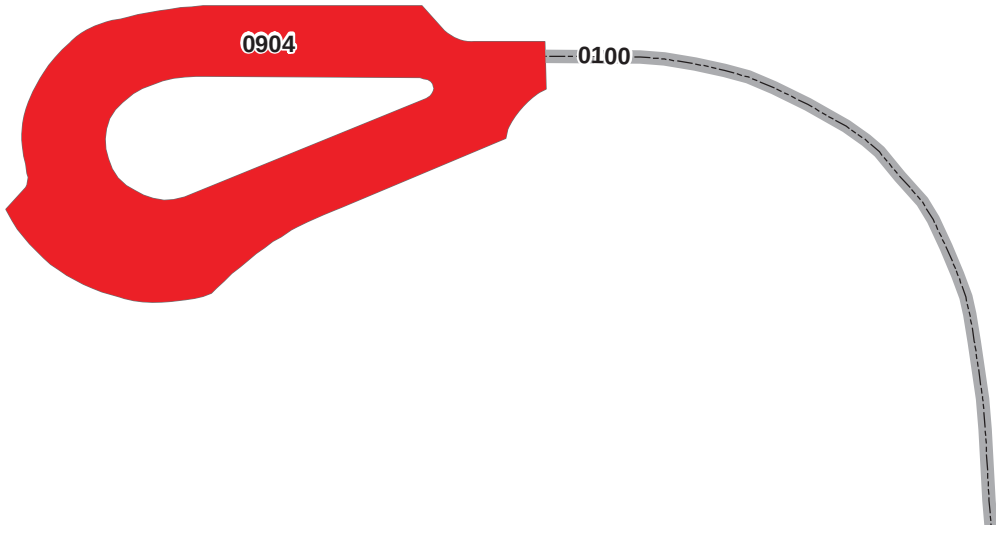


Haleakala National Park
Route 0904
RED HILL SUMMIT PARKING LOT

FROM END OF ROUTE 0100 (RED HILL ROAD)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0904	PUBLIC	1/13/2012	20100	0.346	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	NO	90 GOOD

* Lane miles are based on 11' lane widths



140 70 0 140 280 Feet

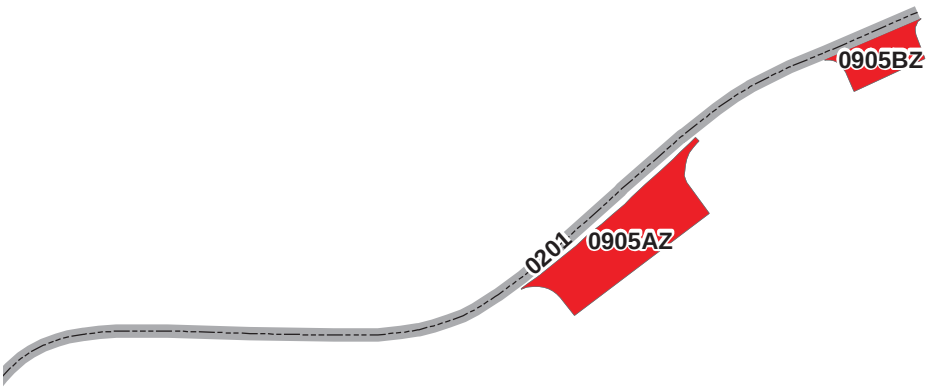
N

Haleakala National Park
Route 0905ZZ Summary Record
KALAHAKU OVERLOOK PARKING AREAS

ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) (ON RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905ZZ	PUBLIC	1/13/2012	5557	0.096	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	CONCRETE	77 SUMMARY

* Lane miles are based on 11' lane widths



180 90 0 180 360 Feet

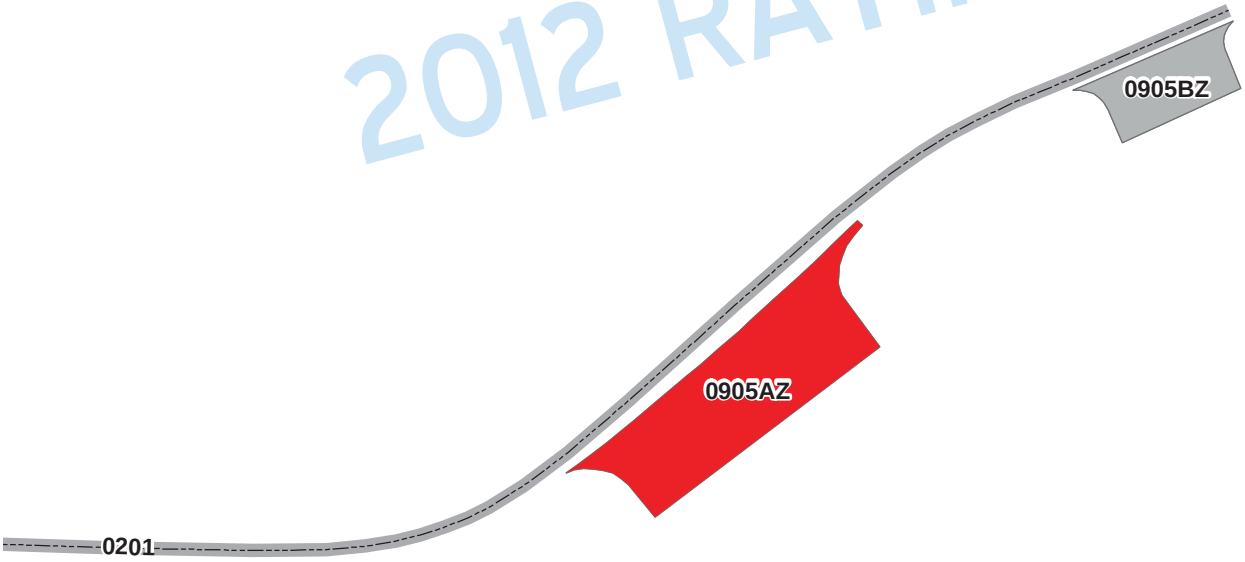
N

Haleakala National Park
Route 0905AZ Subcomponent Record
KALAHAKU OVERLOOK PARKING A

ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20 (ON RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905AZ	PUBLIC	1/13/2012	4239	0.073	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	CONCRETE	73 FAIR

* Lane miles are based on 11' lane widths



110 55 0 110 220 Feet

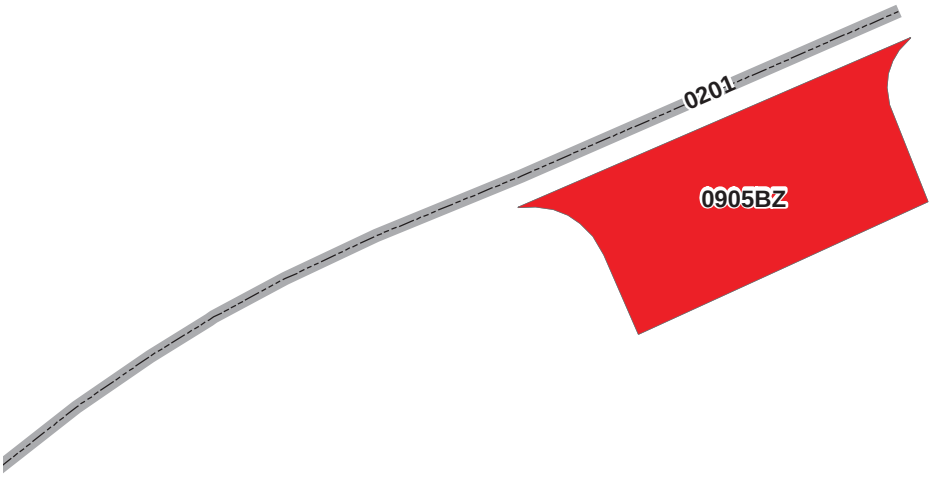
N

Haleakala National Park
Route 0905BZ Subcomponent Record
KALAHAKU OVERLOOK PARKING B

ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24 (ON RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0905BZ	PUBLIC	1/13/2012	1318	0.023	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	CONCRETE	NO	90 GOOD

* Lane miles are based on 11' lane widths



40 20 0 40 80 Feet

N

Haleakala National Park
Route 0906ZZ Summary Record
HOSMER GROVE CAMPGROUND PARKING AREAS

FROM ROUTE 0202 (HOSMER GROVE ROAD)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0906ZZ	PUBLIC	1/13/2012	13214	0.228	AS

Culverts	Drop Inlets	Gates	Curb & Gutter	Curb	PCR
0	0	1	NO	CONCRETE	90 SUMMARY

* Lane miles are based on 11' lane widths

590 295 0 590 1,180 Feet

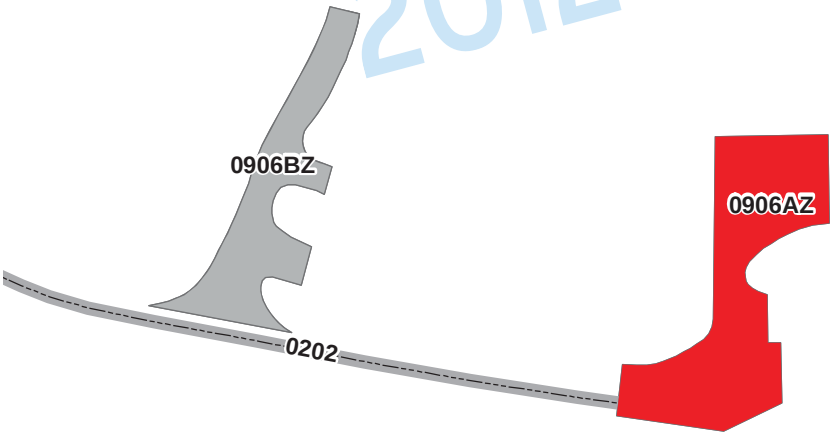
N

Haleakala National Park
Route 0906AZ Subcomponent Record
HOSMER GROVE CAMPGROUND PARKING A

FROM END OF ROUTE 0202 (HOSMER GROVE ROAD)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0906AZ	PUBLIC	1/13/2012	7003	0.121	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	CONCRETE	90 GOOD

* Lane miles are based on 11' lane widths



140 70 0 140 280 Feet

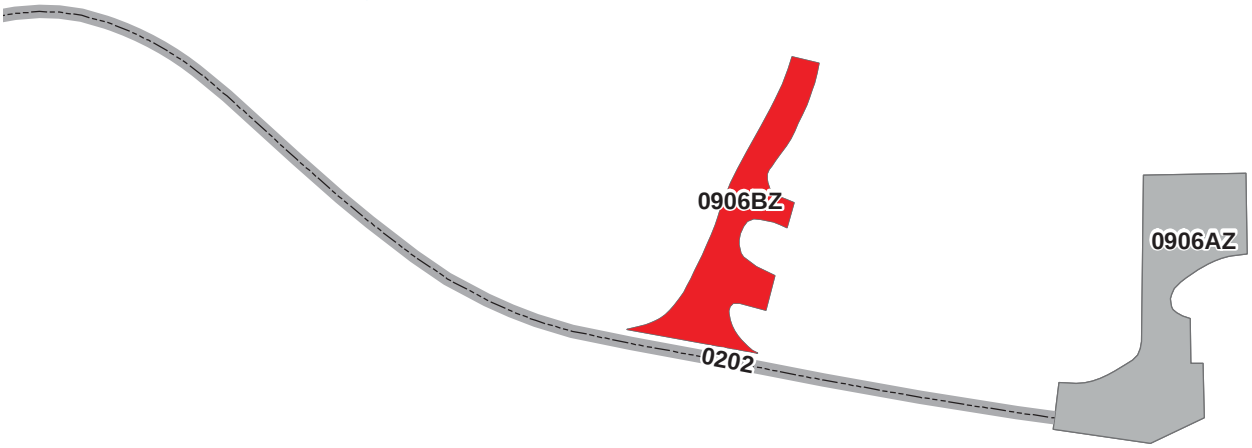
N

Haleakala National Park
Route 0906BZ Subcomponent Record
HOSMER GROVE CAMPGROUND PARKING B

FROM ROUTE 0202 (HOSMER GROVE ROAD) AT MP 0.42 (ON LEFT)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0906BZ	PUBLIC	1/13/2012	4353	0.075	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	1	NO	NO	90 GOOD

* Lane miles are based on 11' lane widths



160 80 0 160 320 Feet

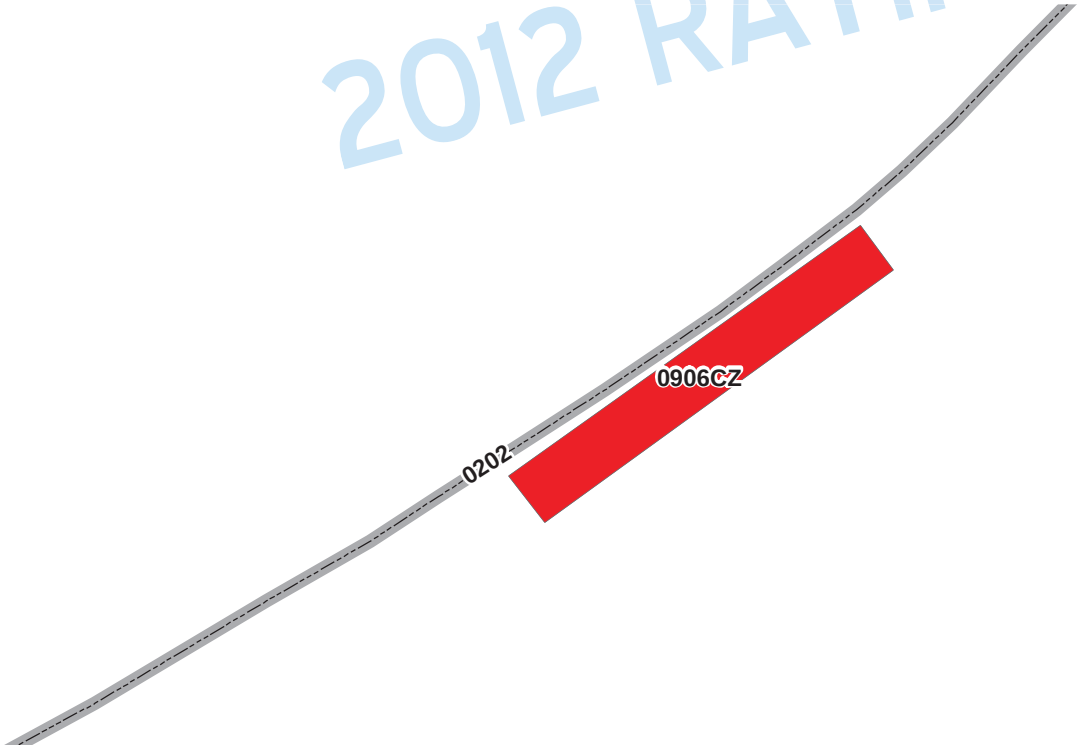
N

Haleakala National Park
Route 0906CZ Subcomponent Record
HOSMER GROVE CAMPGROUND PARKING C

ADJACENT TO ROUTE 0202 (HOSMER GROVE ROAD) AT MP 0.23 (ON RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0906CZ	PUBLIC	1/13/2012	1858	0.032	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	CONCRETE	90 GOOD

* Lane miles are based on 11' lane widths



80 40 0 80 160 Feet

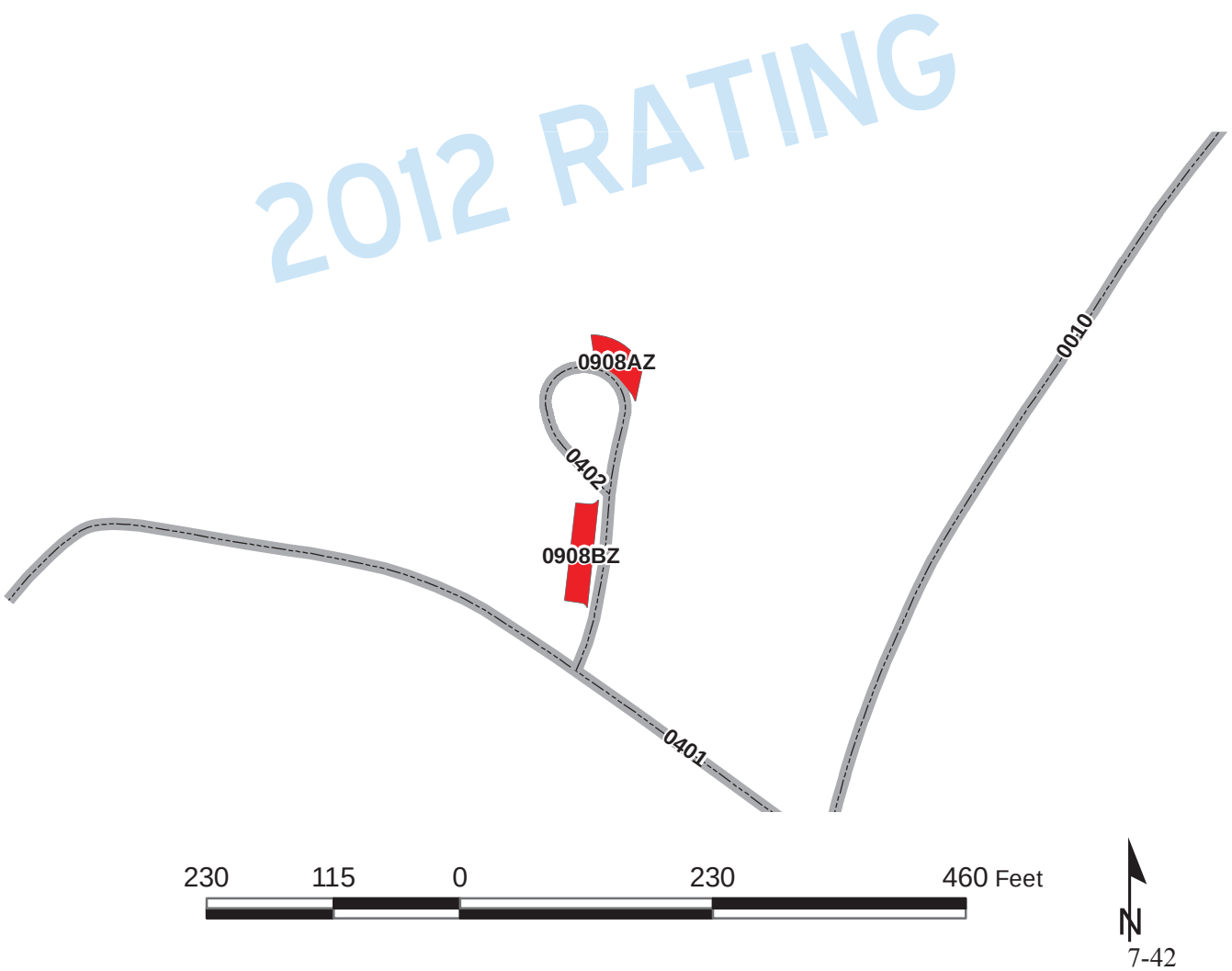
N

Haleakala National Park
Route 0908ZZ Summary Record
PU'U NIANIAU RESIDENCE PARKING AREAS

ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD) (ON LEFT AND RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0908ZZ	NONPUBLIC	1/13/2012	3039	0.053	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	NO	80 SUMMARY

* Lane miles are based on 11' lane widths

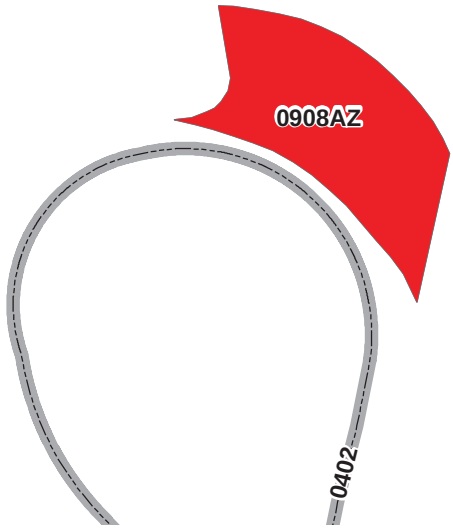


Haleakala National Park
Route 0908AZ Subcomponent Record
PU'U NIANIAU RESIDENCE PARKING

ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD) (ON RIGHT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0908AZ	NONPUBLIC	1/13/2012	1310	0.023	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	NO	90 GOOD

* Lane miles are based on 11' lane widths



50 25 0 50 100 Feet

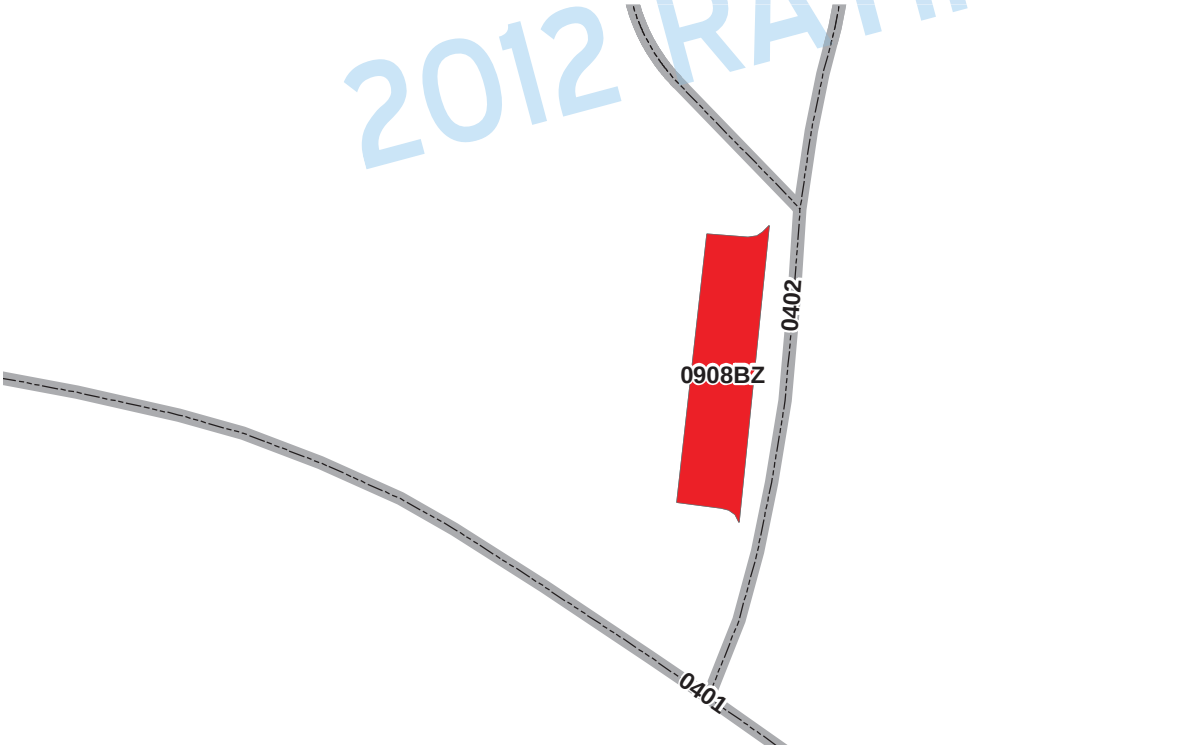
N

Haleakala National Park
Route 0908BZ Subcomponent Record
PU'U NIANIAU RESIDENCE OVERFLOW PARKING

ADJACENT TO ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD) (ON LEFT)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0908BZ	NONPUBLIC	1/13/2012	1729	0.03	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	NO	73 FAIR

* Lane miles are based on 11' lane widths



90 45 0 90 180 Feet

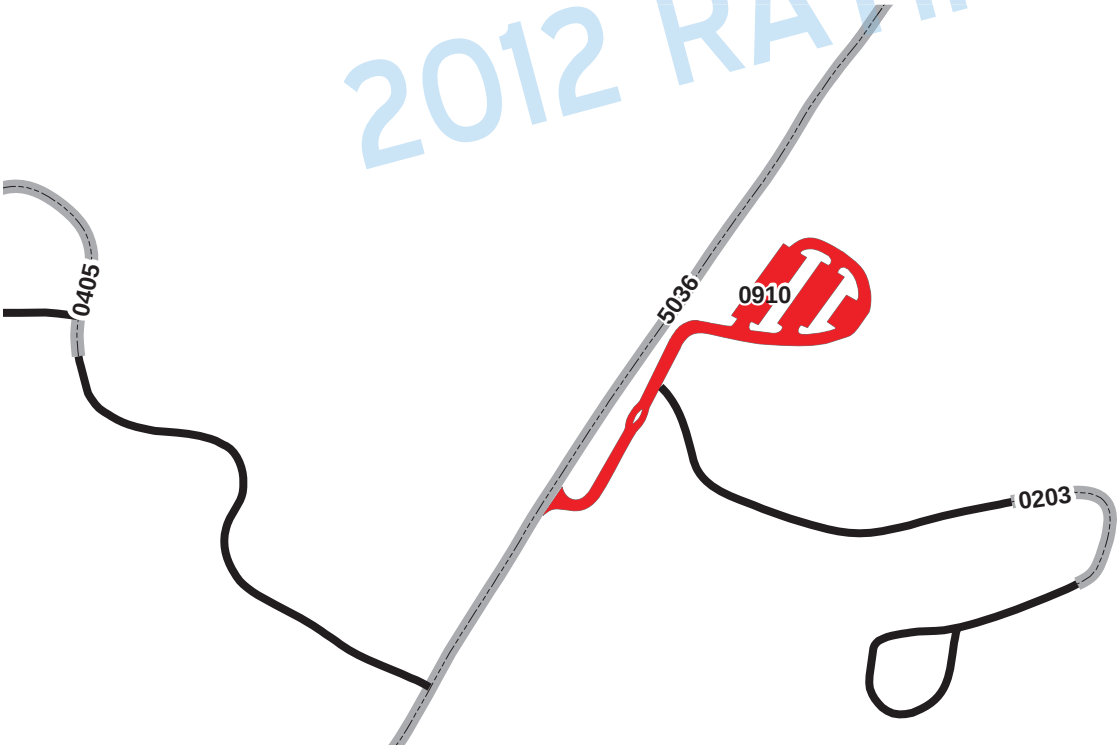
N

Haleakala National Park
Route 0910
KIPAHULU VISITOR CENTER PARKING

FROM ROUTE 5036 (STATE ROUTE 36 / HANA HIGHWAY)
TO PARKING

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0910	PUBLIC	1/14/2012	50288	0.866	CO
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	1	1	NO	CONCRETE	90 GOOD

* Lane miles are based on 11' lane widths

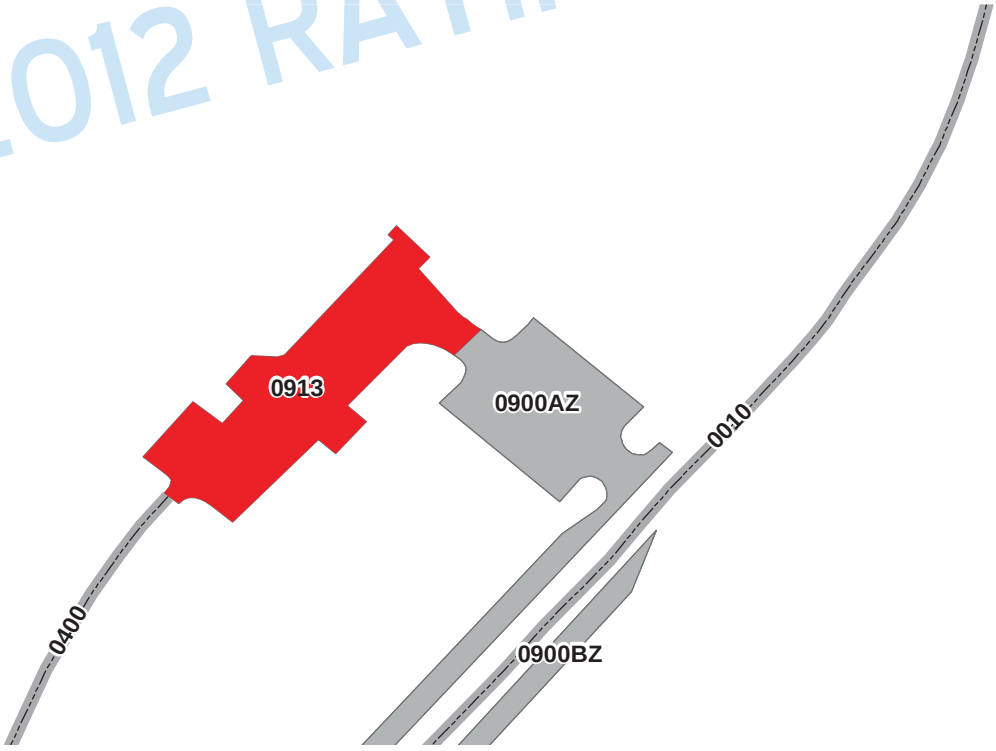


Haleakala National Park
Route 0913
HEADQUARTERS EMPLOYEE PARKING LOT

FROM ROUTE 0900ZZ (HEADQUARTERS VISITOR PARKING AREAS)
TO ROUTE 0400 (PERMANENT QUARTERS SERVICE ROAD)

Route Number	Public / Non Public	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0913	NONPUBLIC	1/13/2012	11492	0.198	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO	CONCRETE	90 GOOD

* Lane miles are based on 11' lane widths



170 85 0 170 340 Feet

N

Haleakala National Park
Route 0915
ENTRANCE STATION PARKING

Route 0915 was added to the inventory in 2014. Therefore, there is no 2012 manual rating to show in Section 7B. See Section 7A.

Section 8
Parkwide/Route
Maintenance Features Summaries

Haleakala National Park

Federal Lands Highway
Road Inventory Program

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

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

FEATURE	LINEAR FEET	COUNT
BRIDGE	--	1
CATTLE GUARD	--	2
CULVERT	--	87
CURB	53,700	--
DROP INLET	--	5
GATE	--	6
GUARD/GUIDE RAIL	74	--
CABLE	0	--
NON-CABLE	74	--
GUARD/GUIDE WALL	195	--
BOLLARD	0	--
TEMPORARY BARRIER	0	--
NON TEMP/BOLLARD	195	--
INTERSECTION	--	50
LOW WATER CROSSING	74	1
MILE MARKER	--	20
OVERPASS	--	0
PARK BOUNDARY	--	2
PAVED DITCH	819	--
PULLOUT	1,293	8
RAILROAD CROSSING	--	0
RETAINING WALL	564	7
SIGN	--	152
STATE BOUNDARY	--	0
TRAFFIC LIGHT	--	0
TUNNEL	0	0

HALE: DCV ROUTE MAINTENANCE FEATURES SUMMARY

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

FEATURE	ROUTE 0010 HALEAKALA PARK ROAD	ROUTE 0100 RED HILL ROAD	ROUTE 0200 MAGNETIC PEAK SPUR ROAD	ROUTE 0201 KALAHAKU OVERLOOK ROAD	ROUTE 0202 HOSMER GROVE SPUR ROAD	ROUTE 0400 PERMANENT QUARTERS SERVICE ROAD	UNIT
BRIDGE	1	0	0	0	0	0	EACH
CATTLE GUARD	1	0	1	0	0	0	EACH
CULVERT	79	1	1	3	2	0	EACH
CURB	48,277	5,307	0	116	0	0	LINEAR FEET
DROP INLET	1	0	0	0	0	0	EACH
GATE	2	1	0	0	0	0	EACH
GUARD/GUIDE RAIL	74	0	0	0	0	0	LINEAR FEET
CABLE	0	0	0	0	0	0	LINEAR FEET
NON-CABLE	74	0	0	0	0	0	LINEAR FEET
GUARD/GUIDE WALL	195	0	0	0	0	0	LINEAR FEET
BOLLARD	0	0	0	0	0	0	LINEAR FEET
TEMPORARY BARRIER	0	0	0	0	0	0	LINEAR FEET
NON TEMP/BOLLARD	195	0	0	0	0	0	LINEAR FEET
INTERSECTION	15	5	4	5	7	2	EACH
LOW WATER CROSSING	0	0	0	0	1	0	EACH
LOW WATER CROSSING	0	0	0	0	74	0	LINEAR FEET
MILE MARKER	20	0	0	0	0	0	EACH
OVERPASS	0	0	0	0	0	0	EACH
PARK BOUNDARY	1	0	1	0	0	0	EACH
PAVED DITCH	645	0	0	0	174	0	LINEAR FEET
PULLOUT	8	0	0	0	0	0	EACH
PULLOUT	1,293	0	0	0	0	0	LINEAR FEET
RAILROAD CROSSING	0	0	0	0	0	0	EACH
RETAINING WALL	6	0	1	0	0	0	EACH
RETAINING WALL	548	0	16	0	0	0	LINEAR FEET
SIGN	128	8	3	2	7	0	EACH
STATE BOUNDARY	0	0	0	0	0	0	EACH
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

HALE: DCV ROUTE MAINTENANCE FEATURES SUMMARY

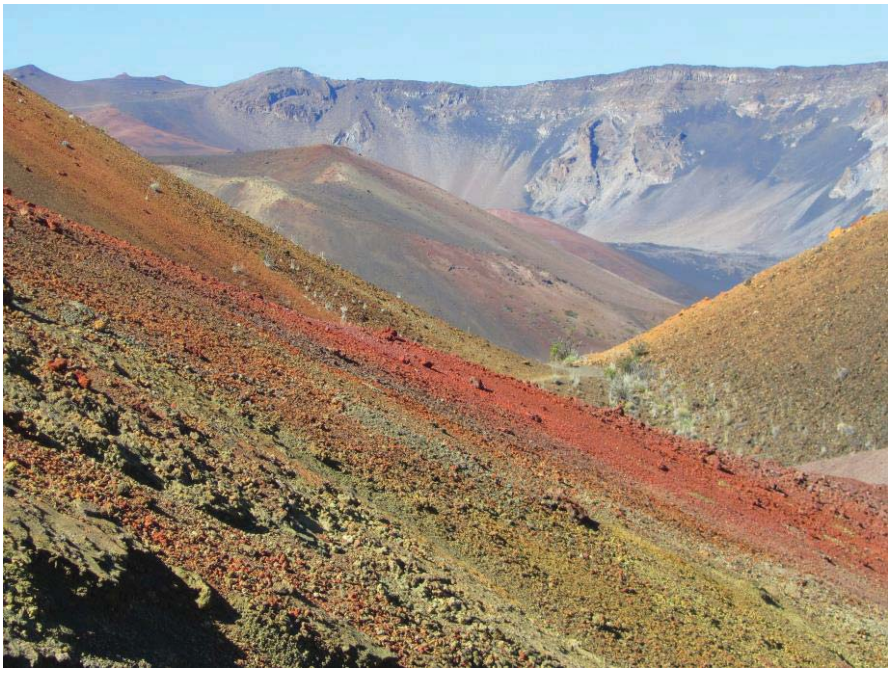
Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 5.

FEATURE	ROUTE 0401 MAINTENANCE YARD SERVICE ROAD	ROUTE 0402 SEASONAL HOUSING PARKING SPUR ROAD		UNIT
BRIDGE	0	0		EACH
CATTLE GUARD	0	0		EACH
CULVERT	0	0		EACH
CURB	0	0		LINEAR FEET
DROP INLET	0	0		EACH
GATE	0	0		EACH
GUARD/GUIDE RAIL	0	0		LINEAR FEET
CABLE	0	0		LINEAR FEET
NON-CABLE	0	0		LINEAR FEET
GUARD/GUIDE WALL	0	0		LINEAR FEET
BOLLARD	0	0		LINEAR FEET
TEMPORARY BARRIER	0	0		LINEAR FEET
NON TEMP/BOLLARD	0	0		LINEAR FEET
INTERSECTION	5	7		EACH
LOW WATER CROSSING	0	0		EACH
LOW WATER CROSSING	0	0		LINEAR FEET
MILE MARKER	0	0		EACH
OVERPASS	0	0		EACH
PARK BOUNDARY	0	0		EACH
PAVED DITCH	0	0		LINEAR FEET
PULLOUT	0	0		EACH
PULLOUT	0	0		LINEAR FEET
RAILROAD CROSSING	0	0		EACH
RETAINING WALL	0	0		EACH
RETAINING WALL	0	0		LINEAR FEET
SIGN	2	2		EACH
STATE BOUNDARY	0	0		EACH
TRAFFIC LIGHT	0	0		EACH
TUNNEL	0	0		EACH
TUNNEL	0	0		LINEAR FEET

HALE: STRUCTURE LIST

ROUTE NUMBER	FUNCTIONAL CLASS	MILEPOST START	MILEPOST END	FEATURE	STRUCTURE NUMBER
0010	1	1.616	1.629	BRIDGE	8290-001

Section 9
Route Maintenance Features
Road Logs



Haleakala National Park

Federal Lands Highway
Road Inventory Program

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM NORTH PARK BOUNDARY (AT CATTLE GUARD) AND END OF ROUTE 5378 (STATE ROUTE 378 / HALEAKALA HIGHWAY)
0.000	0.000	PARK BOUNDARY	N/A	N/A
0.000	0.000	SIGN	LEFT	REGULATORY, SPEED LIMIT 30
0.000	0.000	INTERSECTION	N/A	ROUTE 5378 (STATE ROUTE 378 / HALEAKALA HIGHWAY)
0.004	0.004	SIGN	LEFT	WARNING, WATCH FOR BIKERS
0.004	0.077	CURB	RIGHT	N/A
0.005	0.005	SIGN	LEFT	REGULATORY, END STATE HIGHWAY
0.006	0.006	CATTLE GUARD	N/A	N/A
0.006	0.006	SIGN	RIGHT	REGULATORY, END STATE HIGHWAY
0.006	0.006	SIGN	RIGHT	REGULATORY, REDUCED SPEED 20 M.P.H.
0.028	0.068	PULLOUT	RIGHT	N/A
0.068	0.068	SIGN	RIGHT	GUIDE, HALEAKALA NATIONAL PARK
0.074	0.074	SIGN	RIGHT	GUIDE, HALEALAKA NATIONAL PARK
0.076	0.076	SIGN	RIGHT	WARNING, STOP AHEAD
0.092	0.092	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.098	0.098	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.125	0.146	CURB	N/A	N/A
0.133	0.133	SIGN	LEFT	REGULATORY, SPEED LIMIT 20
0.133	0.133	SIGN	N/A	REGULATORY, STOP
0.133	0.133	SIGN	N/A	GUIDE, U.S. FEE AREA
0.133	0.133	SIGN	N/A	GUIDE, DRIVE NEAR PAY AT WINDOW $10
0.135	0.135	SIGN	N/A	REGULATORY, HALEAKALA 6:10 AM 6:48 PM
0.135	0.135	SIGN	RIGHT	REGULATORY, STOP
0.163	0.163	SIGN	RIGHT	GUIDE, FIRE DANGER TODAY
0.171	0.171	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.176	0.176	INTERSECTION	RIGHT	ROUTE 0915 (ENTRANCE STATION PARKING)
0.196	0.196	SIGN	RIGHT	GUIDE, HOSMER GROVE CAMPGROUND
0.231	0.231	SIGN	RIGHT	WARNING, NENE CROSSING
0.231	0.231	SIGN	RIGHT	WARNING, NEXT 10 MILES

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.241	0.241	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.263	0.263	INTERSECTION	RIGHT	ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)
0.268	0.268	INTERSECTION	LEFT	ROUTE 0202 (HOSMER GROVE SPUR ROAD)
0.270	0.270	GATE	N/A	N/A
0.292	0.292	CULVERT	N/A	N/A
0.297	0.297	SIGN	LEFT	REGULATORY, SPEED LIMIT 20
0.323	0.323	SIGN	LEFT	GUIDE, HOSMER GROVE CAMPGROUND
0.336	0.336	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.396	0.396	SIGN	RIGHT	GUIDE, WILDERNESS CAMPING PERMITS NEXT RIGHT
0.452	0.452	SIGN	LEFT	REGULATORY, SPEED LIMIT 20
0.464	0.464	SIGN	RIGHT	GUIDE, TURN ON HEADLIGHTS IN CLOUDS
0.486	0.486	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.486	0.486	SIGN	RIGHT	WARNING, 20 M.P.H.
0.525	0.525	CULVERT	N/A	N/A
0.542	0.542	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.552	0.552	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.560	0.560	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.568	0.568	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.581	0.581	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.592	0.592	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.601	0.601	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.611	0.611	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.614	0.648	CURB	RIGHT	N/A
0.646	0.646	SIGN	LEFT	WARNING, 20 M.P.H.
0.646	0.646	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.730	0.730	CULVERT	N/A	N/A
0.768	0.768	SIGN	RIGHT	GUIDE, VISITOR CENTER HEADQUARTERS
0.774	0.774	MILE MARKER	RIGHT	N/A
0.778	0.778	MILE MARKER	LEFT	N/A
0.806	0.806	CULVERT	N/A	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.838	0.838	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.867	0.867	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.867	0.867	SIGN	RIGHT	WARNING, PED XING
0.882	0.882	CULVERT	N/A	N/A
0.900	0.900	SIGN	LEFT	REGULATORY, SPEED LIMIT 20
0.921	1.026	CURB	RIGHT	N/A
0.922	0.922	SIGN	RIGHT	GUIDE, ELEV. 7000 FEET
0.967	0.967	CULVERT	N/A	N/A
0.985	0.985	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
1.022	1.022	SIGN	RIGHT	REGULATORY, PARKING
1.031	1.031	SIGN	LEFT	WARNING, NENE CROSSING
1.031	1.031	SIGN	LEFT	REGULATORY, PARKING
1.032	1.032	INTERSECTION	RIGHT	ROUTE 0900AZ (HEADQUARTERS VISITOR PARKING A)
1.033	1.078	CURB-AND-GUTTER	RIGHT	N/A
1.041	1.041	DROP INLET	RIGHT	N/A
1.059	1.059	INTERSECTION	LEFT	ROUTE 0900BZ (HEADQUARTERS VISITOR PARKING B)
1.076	1.185	CURB	LEFT	N/A
1.080	1.080	GATE	N/A	N/A
1.085	1.085	SIGN	RIGHT	WARNING, 20 M.P.H.
1.085	1.085	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.158	1.158	CULVERT	N/A	N/A
1.165	1.230	CURB	RIGHT	N/A
1.172	1.172	SIGN	LEFT	WARNING, PED XING
1.172	1.172	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
1.182	1.182	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
1.200	1.200	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
1.219	1.342	CURB	LEFT	N/A
1.220	1.220	SIGN	LEFT	REGULATORY, SPEED LIMIT 20
1.241	1.241	CULVERT	N/A	N/A
1.241	1.241	SIGN	RIGHT	WARNING, FALLING ROCK

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
1.297	1.297	CULVERT	N/A	N/A
1.326	1.326	SIGN	LEFT	GUIDE, VISITOR CENTER HEADQUARTERS LEFT 03 MILES
1.334	1.410	CURB	RIGHT	N/A
1.361	1.361	CULVERT	N/A	N/A
1.410	1.494	PAVED DITCH	RIGHT	N/A
1.414	1.414	CULVERT	N/A	N/A
1.434	1.449	CURB	LEFT	N/A
1.434	1.448	GUARD/GUIDE RAIL	LEFT	N/A
1.434	1.448	PULLOUT	LEFT	N/A
1.440	1.440	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
1.447	1.447	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
1.494	1.560	CURB	RIGHT	N/A
1.546	1.609	CURB	LEFT	N/A
1.555	1.555	SIGN	RIGHT	WARNING, NARROW BRIDGE
1.608	1.623	GUARD/GUIDE WALL	LEFT	N/A
1.608	1.623	GUARD/GUIDE WALL	RIGHT	N/A
1.612	1.612	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
1.612	1.612	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.616	1.629	BRIDGE	N/A	8290-001 (HALEAKALA HIGHWAY BRIDGE)
1.623	1.623	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
1.623	1.623	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
1.624	1.654	CURB	LEFT	N/A
1.641	1.704	CURB	RIGHT	N/A
1.680	1.680	SIGN	LEFT	WARNING, NARROW BRIDGE
1.704	1.742	PAVED DITCH	RIGHT	N/A
1.710	1.710	CULVERT	N/A	N/A
1.751	1.814	CURB	LEFT	N/A
1.775	1.775	CULVERT	N/A	N/A
1.789	1.997	CURB	RIGHT	N/A
1.838	1.838	MILE MARKER	RIGHT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
1.841	1.841	MILE MARKER	LEFT	N/A
1.849	1.849	CULVERT	N/A	N/A
1.996	1.996	CULVERT	N/A	N/A
2.003	2.067	CURB	LEFT	N/A
2.057	2.137	CURB	RIGHT	N/A
2.062	2.062	CULVERT	N/A	N/A
2.116	2.116	CULVERT	N/A	N/A
2.137	2.213	CURB	LEFT	N/A
2.193	2.343	CURB	RIGHT	N/A
2.199	2.199	CULVERT	N/A	N/A
2.199	2.199	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
2.199	2.199	SIGN	RIGHT	WARNING, 20 M.P.H.
2.271	2.271	INTERSECTION	LEFT	ROUTE 0403 (RAIN SHED SERVICE ROAD)
2.318	2.497	CURB	LEFT	N/A
2.350	2.350	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
2.350	2.350	SIGN	LEFT	WARNING, 20 M.P.H.
2.425	2.425	CULVERT	N/A	N/A
2.481	2.641	CURB	RIGHT	N/A
2.499	2.499	CULVERT	N/A	N/A
2.595	2.865	CURB	LEFT	N/A
2.624	2.624	CULVERT	N/A	N/A
2.845	2.845	MILE MARKER	LEFT	N/A
2.848	2.848	MILE MARKER	RIGHT	N/A
2.852	3.022	CURB	RIGHT	N/A
2.868	2.868	CULVERT	N/A	N/A
2.910	2.910	CULVERT	N/A	N/A
2.912	2.912	SIGN	RIGHT	WARNING, SLOW VEHICLES MUST USE TURN OUT
2.942	2.942	CULVERT	N/A	N/A
2.950	2.987	PULLOUT	RIGHT	N/A
2.956	2.989	PULLOUT	LEFT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
2.971	2.971	SIGN	RIGHT	REGULATORY, NO PARKING ANY TIME
2.988	2.988	SIGN	RIGHT	WARNING, NENE CROSSING
2.995	3.201	CURB	LEFT	N/A
2.999	2.999	CULVERT	N/A	N/A
3.035	3.035	SIGN	LEFT	WARNING, SLOW VEHICLES MUST USE TURN OUT
3.191	3.290	CURB	RIGHT	N/A
3.211	3.211	CULVERT	N/A	N/A
3.255	3.485	CURB	LEFT	N/A
3.334	3.334	SIGN	RIGHT	WARNING, 20 M.P.H.
3.334	3.334	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
3.349	3.349	CULVERT	N/A	N/A
3.416	3.416	CULVERT	N/A	N/A
3.475	3.589	CURB	RIGHT	N/A
3.505	3.505	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
3.505	3.505	SIGN	LEFT	WARNING, 20 M.P.H.
3.515	3.515	CULVERT	N/A	N/A
3.588	3.588	CULVERT	N/A	N/A
3.616	3.765	CURB	RIGHT	N/A
3.704	3.704	CULVERT	N/A	N/A
3.745	3.846	CURB	LEFT	N/A
3.786	3.793	GUARD/GUIDE WALL	RIGHT	N/A
3.796	3.796	CULVERT	N/A	N/A
3.801	4.037	CURB	RIGHT	N/A
3.869	3.869	CULVERT	N/A	N/A
3.870	3.870	MILE MARKER	LEFT	N/A
3.871	3.871	MILE MARKER	RIGHT	N/A
3.971	3.971	CULVERT	N/A	N/A
4.025	4.115	CURB	LEFT	N/A
4.102	4.102	CULVERT	N/A	N/A
4.110	4.176	CURB	RIGHT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
4.163	4.233	CURB	LEFT	N/A
4.213	4.213	CULVERT	N/A	N/A
4.219	4.385	CURB	RIGHT	N/A
4.304	4.304	CULVERT	N/A	N/A
4.307	4.307	SIGN	RIGHT	GUIDE, HIKER PICK-UP AREA 800 FT
4.372	4.487	CURB	LEFT	N/A
4.427	4.427	SIGN	RIGHT	GUIDE, HALEMAU'U TRAIL TURN LEFT O.I MI
4.428	4.428	CULVERT	N/A	N/A
4.449	4.449	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
4.449	4.449	SIGN	RIGHT	WARNING, 20 M.P.H.
4.456	4.905	CURB	RIGHT	N/A
4.457	4.493	PULLOUT	RIGHT	N/A
4.463	4.489	RETAINING WALL	RIGHT	N/A
4.492	4.492	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
4.520	4.520	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
4.520	4.520	SIGN	RIGHT	WARNING, PED XING
4.545	4.545	INTERSECTION	LEFT	ROUTE 0901 (HALEMAU'U 8,000 FOOT TRAILHEAD PARKING)
4.549	4.549	SIGN	RIGHT	GUIDE, ELEV. 8000 FEET
4.587	4.587	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
4.587	4.587	SIGN	LEFT	WARNING, 20 M.P.H.
4.607	4.607	SIGN	LEFT	WARNING, PED XING
4.607	4.607	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
4.615	4.615	SIGN	LEFT	GUIDE, HALEMAU'U .1 MI TRAIL
4.629	4.629	CULVERT	N/A	N/A
4.678	4.747	CURB	LEFT	N/A
4.769	4.769	CULVERT	N/A	N/A
4.867	4.867	MILE MARKER	RIGHT	N/A
4.871	4.871	MILE MARKER	LEFT	N/A
4.881	4.881	CULVERT	N/A	N/A
4.905	4.923	RETAINING WALL	LEFT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
4.991	5.031	CURB	RIGHT	N/A
5.010	5.010	CULVERT	N/A	N/A
5.072	5.072	CULVERT	N/A	N/A
5.079	5.167	CURB	LEFT	N/A
5.189	5.214	RETAINING WALL	LEFT	N/A
5.201	5.308	CURB	RIGHT	N/A
5.215	5.215	CULVERT	N/A	N/A
5.311	5.465	CURB	LEFT	N/A
5.452	5.452	CULVERT	N/A	N/A
5.557	5.557	CULVERT	N/A	N/A
5.558	5.622	CURB	LEFT	N/A
5.690	5.690	CULVERT	N/A	N/A
5.720	5.743	CURB	RIGHT	N/A
5.732	5.732	CULVERT	N/A	N/A
5.739	5.794	CURB	LEFT	N/A
5.789	5.789	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
5.815	5.866	CURB	RIGHT	N/A
5.818	5.818	SIGN	LEFT	REGULATORY, SPEED LIMIT 30
5.832	5.832	CULVERT	N/A	N/A
5.876	5.881	RETAINING WALL	LEFT	N/A
5.890	5.921	CURB	LEFT	N/A
5.896	5.896	MILE MARKER	RIGHT	N/A
5.898	5.898	MILE MARKER	LEFT	N/A
5.921	5.921	CULVERT	N/A	N/A
5.935	6.075	CURB	LEFT	N/A
5.947	5.947	CULVERT	N/A	N/A
5.956	5.956	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
5.956	5.956	SIGN	LEFT	WARNING, AVOID BRAKE FAILURE USE LOW GEARS
6.003	6.003	CULVERT	N/A	N/A
6.033	6.033	SIGN	RIGHT	WARNING, 30 M.P.H.

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
6.033	6.033	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
6.088	6.088	CULVERT	N/A	N/A
6.132	6.175	CURB	LEFT	N/A
6.178	6.178	SIGN	LEFT	WARNING, 20 M.P.H.
6.178	6.178	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
6.193	6.264	CURB	RIGHT	N/A
6.208	6.208	CULVERT	N/A	N/A
6.249	6.321	CURB	LEFT	N/A
6.277	6.284	RETAINING WALL	RIGHT	N/A
6.283	6.283	CULVERT	N/A	N/A
6.408	6.408	CULVERT	N/A	N/A
6.418	6.458	CURB	LEFT	N/A
6.451	6.507	CURB	RIGHT	N/A
6.454	6.454	CULVERT	N/A	N/A
6.507	6.530	RETAINING WALL	RIGHT	N/A
6.533	6.554	CURB	LEFT	N/A
6.542	6.542	CULVERT	N/A	N/A
6.546	6.803	CURB	RIGHT	N/A
6.611	6.611	CULVERT	N/A	N/A
6.670	6.670	CULVERT	N/A	N/A
6.803	6.837	PULLOUT	LEFT	N/A
6.811	6.811	SIGN	LEFT	REGULATORY, UNABLE TO READ FROM VIDEO
6.886	6.886	MILE MARKER	RIGHT	N/A
6.886	6.886	SIGN	LEFT	WARNING, SLOW VEHICLES MUST USE TURN OUT
6.889	6.889	MILE MARKER	LEFT	N/A
6.915	6.915	CULVERT	N/A	N/A
6.965	6.965	CULVERT	N/A	N/A
7.015	7.049	CURB	LEFT	N/A
7.020	7.020	CULVERT	N/A	N/A
7.074	7.148	CURB	RIGHT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
7.158	7.253	CURB	LEFT	N/A
7.180	7.180	SIGN	RIGHT	GUIDE, LELEIWI OVERLOOK
7.190	7.190	CULVERT	N/A	N/A
7.224	7.224	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
7.224	7.224	SIGN	RIGHT	WARNING, 20 M.P.H.
7.225	7.264	CURB	RIGHT	N/A
7.250	7.250	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
7.250	7.250	SIGN	RIGHT	WARNING, PED XING
7.271	7.271	INTERSECTION	RIGHT	ROUTE 0902 (LELEIWI OVERLOOK PARKING)
7.280	7.313	CURB-AND-GUTTER	RIGHT	N/A
7.308	7.308	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
7.317	7.317	INTERSECTION	RIGHT	ROUTE 0902 (LELEIWI OVERLOOK PARKING)
7.323	7.414	CURB	RIGHT	N/A
7.338	7.338	CULVERT	N/A	N/A
7.406	7.477	CURB	LEFT	N/A
7.408	7.408	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
7.408	7.408	SIGN	LEFT	WARNING, PED XING
7.429	7.429	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
7.429	7.429	SIGN	LEFT	WARNING, 20 M.P.H.
7.450	7.450	SIGN	LEFT	GUIDE, LELEIWI OVERLOOK PARKING
7.505	7.505	CULVERT	N/A	N/A
7.514	7.547	CURB	RIGHT	N/A
7.537	7.658	CURB	LEFT	N/A
7.674	7.729	CURB	RIGHT	N/A
7.683	7.683	CULVERT	N/A	N/A
7.761	7.788	CURB	LEFT	N/A
7.762	7.762	CULVERT	N/A	N/A
7.817	7.916	CURB	LEFT	N/A
7.897	7.897	MILE MARKER	LEFT	N/A
7.898	7.898	MILE MARKER	RIGHT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
7.927	7.927	CULVERT	N/A	N/A
7.956	7.956	SIGN	RIGHT	GUIDE, ELEV. 9000 FEET
7.997	8.021	CURB	LEFT	N/A
7.998	7.998	CULVERT	N/A	N/A
8.079	8.079	CULVERT	N/A	N/A
8.091	8.158	CURB	RIGHT	N/A
8.160	8.306	CURB	LEFT	N/A
8.164	8.164	CULVERT	N/A	N/A
8.231	8.231	SIGN	RIGHT	WARNING, SLOW VEHICLES MUST USE TURN OUT
8.278	8.303	PULLOUT	RIGHT	N/A
8.319	8.319	CULVERT	N/A	N/A
8.355	8.401	CURB	RIGHT	N/A
8.371	8.371	SIGN	RIGHT	WARNING, 20 M.P.H.
8.371	8.371	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
8.392	8.520	CURB	LEFT	N/A
8.500	8.767	CURB	RIGHT	N/A
8.525	8.525	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
8.525	8.525	SIGN	LEFT	WARNING, 20 M.P.H.
8.558	8.558	CULVERT	N/A	N/A
8.662	8.662	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
8.662	8.662	SIGN	RIGHT	WARNING, 20 M.P.H.
8.688	8.688	SIGN	RIGHT	REGULATORY, GRAPHIC SIGN NO TEXT
8.696	8.696	CULVERT	N/A	N/A
8.702	8.702	SIGN	LEFT	GUIDE, SUMMIT 2 MI
8.733	8.733	INTERSECTION	LEFT	ROUTE 0201 (KALAHAKU OVERLOOK ROAD)
8.761	8.761	SIGN	LEFT	GUIDE, KALAHAKU OVERLOOK SILVERSWORD AREA
8.765	8.847	CURB	LEFT	N/A
8.803	8.803	SIGN	LEFT	WARNING, 20 M.P.H.
8.803	8.803	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
8.847	8.873	PULLOUT	LEFT	N/A

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
8.860	8.962	CURB	RIGHT	N/A
8.873	8.891	CURB	LEFT	N/A
8.917	8.917	MILE MARKER	LEFT	N/A
8.917	8.917	MILE MARKER	RIGHT	N/A
8.935	9.103	CURB	LEFT	N/A
9.115	9.325	CURB	RIGHT	N/A
9.304	9.435	CURB	LEFT	N/A
9.312	9.312	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
9.312	9.312	SIGN	LEFT	WARNING, AVOID BRAKE FAILURE USE LOW GEARS
9.402	9.520	CURB	RIGHT	N/A
9.510	9.588	CURB	LEFT	N/A
9.582	9.660	CURB	RIGHT	N/A
9.646	9.924	CURB	LEFT	N/A
9.753	9.753	CULVERT	N/A	N/A
9.920	10.000	CURB	RIGHT	N/A
9.933	9.933	MILE MARKER	RIGHT	N/A
9.936	9.936	MILE MARKER	LEFT	N/A
9.985	10.123	CURB	LEFT	N/A
10.022	10.022	CULVERT	N/A	N/A
10.114	10.299	CURB	RIGHT	N/A
10.206	10.206	SIGN	LEFT	REGULATORY, SPEED LIMIT 30
10.281	10.510	CURB	LEFT	N/A
10.287	10.287	CULVERT	N/A	N/A
10.406	10.406	CULVERT	N/A	N/A
10.486	10.503	CURB	RIGHT	N/A
10.506	10.506	INTERSECTION	RIGHT	ROUTE 0100 (RED HILL ROAD)
10.510	10.510	INTERSECTION	N/A	ROUTE 0903AZ (HALEAKALA VISITOR CENTER PARKING A (CRATER RIM))
10.510	10.510	SIGN	RIGHT	GUIDE, HALEAKALA VISITOR CENTER HALEAKALA NATIONAL PARK

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
10.510	10.510	ROUTE END	N/A	TO ROUTE 0903ZZ (HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM))

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0100: RED HILL ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM END OF ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.004	0.009	CURB	LEFT	N/A
0.004	0.475	CURB	RIGHT	N/A
0.005	0.005	GATE	N/A	N/A
0.005	0.005	SIGN	LEFT	REGULATORY, STOP
0.007	0.007	SIGN	LEFT	REGULATORY, ROAD CLOSED
0.007	0.007	SIGN	RIGHT	GUIDE, UNABLE TO READ FROM VIDEO
0.028	0.028	INTERSECTION	LEFT	ROUTE 0903BZ (HALEAKALA VISITOR CENTER PARKING B (CRATER RIM))
0.031	0.419	CURB	LEFT	N/A
0.035	0.035	CULVERT	N/A	N/A
0.049	0.049	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.404	0.404	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.421	0.421	INTERSECTION	LEFT	ROUTE 0200 (MAGNETIC PEAK SPUR ROAD)
0.426	0.560	CURB	LEFT	N/A
0.429	0.429	SIGN	LEFT	GUIDE, SUMMIT
0.553	0.560	CURB	RIGHT	N/A
0.559	0.559	SIGN	RIGHT	GUIDE, ELEV. 10,000 FEET
0.560	0.560	SIGN	N/A	REGULATORY, KEEP RIGHT
0.560	0.560	INTERSECTION	N/A	ROUTE 0904 (RED HILL SUMMIT PARKING LOT)
0.560	0.560	ROUTE END	N/A	TO ROUTE 0904 (RED HILL SUMMIT PARKING LOT)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0200: MAGNETIC PEAK SPUR ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0100 (RED HILL ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0100 (RED HILL ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0100 (RED HILL ROAD)
0.017	0.017	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
0.038	0.038	SIGN	RIGHT	GUIDE, PARKING LIGHTS ONLY BEYOND THIS POINT
0.142	0.145	RETAINING WALL	RIGHT	N/A
0.144	0.144	CULVERT	N/A	N/A
0.196	0.196	INTERSECTION	LEFT	PAVED ROUTE (NON NPS)
0.204	0.204	CATTLE GUARD	N/A	N/A
0.204	0.204	INTERSECTION	N/A	PAVED ROUTE (OBSERVATORY ROAD / NON NPS)
0.204	0.204	PARK BOUNDARY	N/A	N/A
0.204	0.204	SIGN	RIGHT	GUIDE, AUTHORIZED ENTRY ONLY NO PRIVATE VEHICLES BEYOND THIS POINT
0.204	0.204	ROUTE END	N/A	TO SOUTH PARK BOUNDARY (OBSERVATORY / PARK BOUNDARY FENCE)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0201: KALAHAKU OVERLOOK ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 8.73
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.006	0.006	SIGN	LEFT	REGULATORY, STOP
0.026	0.026	CULVERT	N/A	N/A
0.095	0.095	CULVERT	N/A	N/A
0.147	0.147	CULVERT	N/A	N/A
0.207	0.207	INTERSECTION	RIGHT	ROUTE 0905AZ (KALAHAKU OVERLOOK PARKING A)
0.217	0.217	SIGN	RIGHT	REGULATORY, NO PARKING ANY TIME
0.217	0.239	CURB	RIGHT	N/A
0.246	0.246	INTERSECTION	RIGHT	ROUTE 0905BZ (KALAHAKU OVERLOOK PARKING B)
0.249	0.249	INTERSECTION	N/A	DEAD END
0.249	0.249	ROUTE END	N/A	TO ROUTE 0905ZZ (KALAHAKU OVERLOOK PARKING AREAS)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0202: HOSMER GROVE SPUR ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.004	0.004	SIGN	LEFT	REGULATORY, STOP
0.026	0.026	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.056	0.056	INTERSECTION	LEFT	PAVED PARKING
0.129	0.129	SIGN	RIGHT	WARNING, GRAPHIC SIGN NO TEXT
0.159	0.173	LOW WATER CROSSING	N/A	N/A
0.173	0.173	SIGN	RIGHT	GUIDE, HOLUA 6.0 CAMPGROUND 0.3
0.182	0.182	SIGN	LEFT	WARNING, GRAPHIC SIGN NO TEXT
0.235	0.235	INTERSECTION	RIGHT	ROUTE 0906CZ (HOSMER GROVE CAMPGROUND PARKING C)
0.272	0.272	INTERSECTION	LEFT	PAVED ROUTE (FAA SERVICE ROAD / NON NPS)
0.301	0.301	CULVERT	N/A	N/A
0.392	0.425	PAVED DITCH	RIGHT	N/A
0.406	0.406	SIGN	LEFT	REGULATORY, SPEED LIMIT 20
0.414	0.414	INTERSECTION	LEFT	ROUTE 0906BZ (HOSMER GROVE CAMPGROUND PARKING B)
0.418	0.418	SIGN	LEFT	GUIDE, FIRE DANGER TODAY
0.428	0.428	CULVERT	N/A	N/A
0.451	0.451	INTERSECTION	N/A	ROUTE 0906AZ (HOSMER GROVE CAMPGROUND PARKING A)
0.451	0.451	ROUTE END	N/A	TO ROUTE 0906ZZ (HOSMER GROVE CAMPGROUND PARKING AREAS)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0400: PERMANENT QUARTERS SERVICE ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)
0.000	0.000	INTERSECTION	N/A	ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)
0.124	0.124	INTERSECTION	N/A	DEAD END
0.124	0.124	ROUTE END	N/A	TO END

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0401: MAINTENANCE YARD SERVICE ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.005	0.005	SIGN	LEFT	REGULATORY, STOP
0.005	0.005	SIGN	RIGHT	REGULATORY, SERVICE AREA AUTHORIZED PERSONNEL ONLY
0.043	0.043	INTERSECTION	RIGHT	ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)
0.128	0.128	INTERSECTION	RIGHT	ROUTE 0914 (PU'U NIANIAU TNC HOUSE AND RESEARCH OFFICES BUILDING PARKING LOT)
0.143	0.143	INTERSECTION	N/A	ROUTE 0907 (PU'U NIANIAU MAINTENANCE YARD PARKING)
0.143	0.143	ROUTE END	N/A	TO ROUTE 0907 (PU'U NIANIAU MAINTENANCE YARD PARKING)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0402: SEASONAL HOUSING PARKING SPUR ROAD

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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0401 (MAINTENANCE YARD SERVICE ROAD)
0.005	0.005	SIGN	LEFT	REGULATORY, STOP
0.017	0.017	INTERSECTION	LEFT	ROUTE 0908BZ (PU'U NIANIAU RESIDENCE OVERFLOW PARKING)
0.031	0.031	SIGN	N/A	REGULATORY, KEEP RIGHT
0.032	0.032	INTERSECTION	LEFT	ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)
0.032	0.081	ONE-WAY	N/A	N/A
0.051	0.051	INTERSECTION	RIGHT	ROUTE 0908AZ (PU'U NIANIAU RESIDENCE PARKING)
0.081	0.081	INTERSECTION	LEFT	ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)
0.081	0.081	INTERSECTION	RIGHT	ROUTE 0402 (SEASONAL HOUSING PARKING SPUR ROAD)
0.081	0.081	ROUTE END	N/A	TO END OF LOOP

Section 10
Appendix

Haleakala National Park

Federal Lands Highway
Road Inventory Program

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

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

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

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

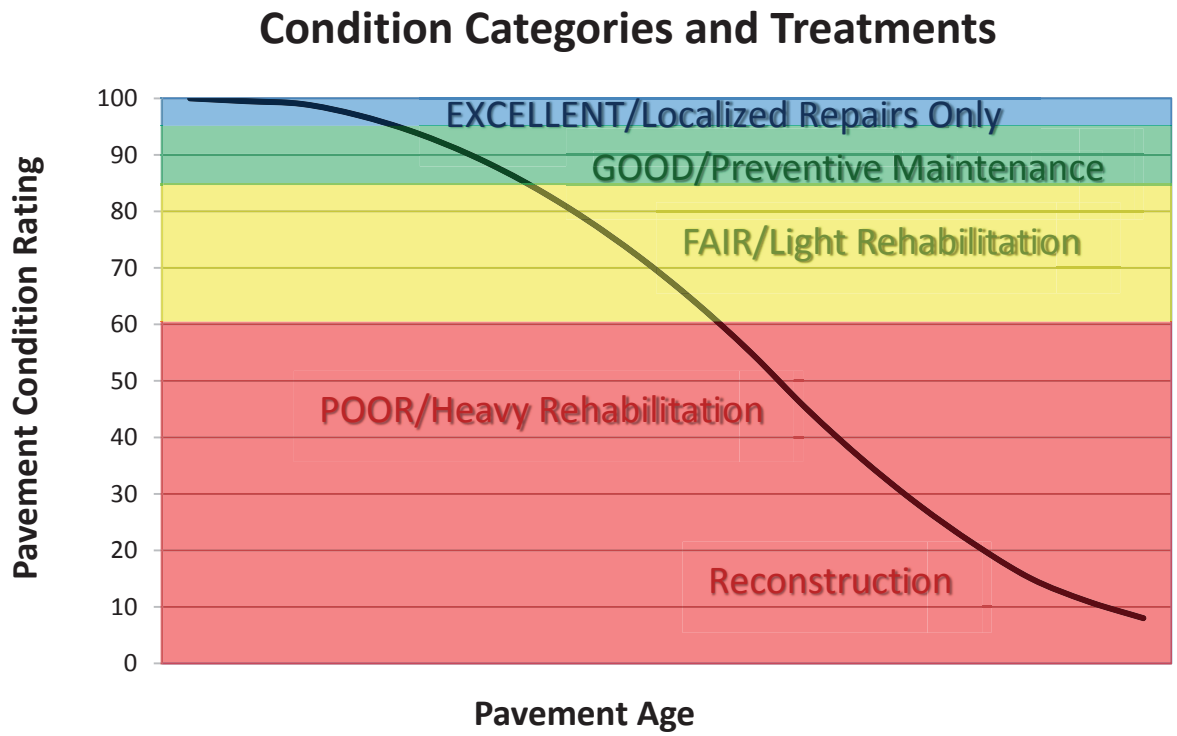
The changes that were implemented were endorsed by management at both the FHWA and NPS. In order to show the effectiveness of these changes, several sites were ground truth tested to ensure that an improvement was achieved between the relationship of PCR and the actual Maintenance and Rehabilitation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

Explanation of the Condition Descriptions

The Pavement Condition Rating (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.



Description of Pavement Treatment Types

1. Preventive Maintenance is a planned strategy of cost-effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without significantly increasing the structural capacity). Preventive maintenance is typically applied to pavements in good condition having significant remaining service life. As a major component of pavement preservation, preventive maintenance is a strategy of extending the service life by applying cost-effective treatments to the surface or near-surface of structurally sound pavements. Examples of preventive treatments include asphalt crack sealing, chip sealing, slurry or micro-surfacing, thin and ultra-thin hot-mix asphalt overlay, concrete joint sealing, diamond grinding, dowel-bar retrofit, and isolated, partial and/or full-depth concrete repairs to restore functionality of individual slabs.

2. Pavement Rehabilitation consists of structural enhancements that extend the service life of an existing pavement and/or improve its load carrying capacity. Rehabilitation techniques include restoration treatments and structural overlays. Rehabilitation projects extend the life of existing pavement structures either by restoring existing structural capacity through the elimination of age-related, environmental cracking of embrittled pavement surface or by increasing pavement thickness to strengthen existing pavement sections to accommodate existing or projected traffic loading conditions. Two sub-categories result from these distinctions, which are directly related to the restoration or increase of structural capacity.

    - **Light Rehabilitation (L3R)** - Examples include single-lift overlays up to 2.5 inches in total thickness and milling and overlays for flexible pavements

    - **Heavy Rehabilitation (H3R)** – Requires rehabilitation with grade improvement. H3R stands for resurfacing, restoration, and rehabilitation projects. H3R projects typically involve multi-depth (overlays > 2.5 inches) pavement improvement work (short of full-depth replacement) and targeted safety improvements. H3R projects generally involve retention of the existing three-dimensional alignment.

3. Reconstruction (4R) is defined as the replacement of the entire existing pavement structure by the placement of the equivalent or increased pavement structure. Reconstruction usually requires the complete removal and replacement of the existing pavement structure. Reconstruction may utilize either new or recycled materials incorporated into the materials used for the reconstruction of the complete pavement section. Reconstruction is required when a pavement has either failed or has become functionally obsolete.

Description of Automated Vehicle Ratings

DESCRIPTION OF RATING SYSTEM

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

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

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

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

In 2010, FHWA RIP began the fifth cycle of data collection in national parks. For Cycle 5, data will be collected in approximately 81 large parks (10 or more paved route miles) on Functional Class 1, 2, and 7 routes plus any new routes or parking areas previously not collected, totaling an estimated 4,459 paved route miles. Additionally, 231 small parks will be collected comprising approximately 529 paved route miles and associated paved parking areas. The data is used to support the National Park Service road maintenance program and Pavement Management System (PMS) developed and maintained by FHWA.

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

SURFACE DISTRESSES

Surface Condition Rating - SCR

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

Surface distresses determined from digital images

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

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

- Rutting

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

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

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

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

Roughness Condition Index - RCI

Additional condition data measured by DCV (lasers and accelerometers)

- Roughness (IRI)

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

Pavement Condition Rating - PCR

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

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

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

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

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

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

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

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

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

TABLE 1: Distress Summary

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

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

ALLIGATOR CRACKING

Description

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

Severity Levels

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

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

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

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

TABLE 2: Alligator Crack Severity Levels

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

LONGITUDINAL CRACKING

Description

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

Severity Levels

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

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

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

TRANSVERSE CRACKING

Description

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

Severity Levels

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

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

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

PATCHING AND POTHOLES

Description

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

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

Severity Levels

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

RUTTING

Description

Rutting is a longitudinal surface depression in the wheelpath.

Severity Levels

LOW
Ruts with a measured depth ≥ 0.20" and ≤ 0.49"

MED
Ruts with a measured depth ≥ 0.50" and ≤ 0.99"

HIGH
Ruts with a measured depth ≥ 1.00"

Ruts < 0.20" are not included in the distress calculations.

ROUGHNESS

Description

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

Severity Levels

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

TABLE 3: IRI

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

INDEX FORMULAS

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

Alligator Crack Index

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

Where:

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

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

Percent of total area is computed as:

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

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

Longitudinal Crack Index

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

Where:

The values *%LOW*, *%MED*, and *%HI* report the length of longitudinal cracking within each severity as a percent of the section length (0.02 mile, primary lane).
These values are ≥ 0 and can exceed 100.

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

Percent of interval length is computed as:

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

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

Structural Crack Index

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

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

Transverse Crack Index

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

Where:

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

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

Number of cracks is computed as:

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

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

Patching Index

PATCH_INDEX = 100 – 40 * (%PATCHING / 80)

Where:

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

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

Percent of total area is computed as:

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

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

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

Rutting Index

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

Where:

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

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

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

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

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

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

Roughness Condition Index (Asphalt)

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

Where:

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

Average IRI is computed as:

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

There is no applicable threshold for failure for this index.

Roughness Condition Index (Concrete)

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

For concrete, PCR = RCI

Surface Condition Rating Index

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

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

Where:

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

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

Data Collection Vehicle Subsystems

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

CAMERAS

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

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

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

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

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

DMI (Distance Measuring Instrument)

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

ROUGHNESS (IRI)

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

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

RUTTING

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

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

GPS & INERTIAL SYSTEMS

GPS is collected by an onboard system employing OmniSTAR real-time correction and a gyroscope (spin-type) to provide accurate positioning data (pitch/roll/heading) in instances of satellite obstruction. All GPS coordinates are tied to image and linear distance measurements.

GPS SPECIFICATIONS	
Static accuracy	Sub-meter
Dynamic accuracy	2-3 meters
Receiver	12 satellite tracking
Coordinate system	Lat Lon WGS 84
Environment	Day or night
Cross-slope	+- 0.5 degrees
Grade	+- 0.5 degrees

Description of Manual Ratings

Description of Manual Rating Methods

In 2013, the Federal Highway Administration updated existing Manual Rating Procedures in an effort to better align pavement conditions for Manually Rated Routes and Parking with the Highway Pavement Management Application (HPMA). HPMA is the Pavement Management System used by the FHWA to store inventory and condition data from the Road Inventory Program (RIP) and forecast future performance using prediction models. HPMA uses pavement condition data (collected by the Road Inventory Program) to develop life cycles for pavements and recommend treatments to maximize useable pavement life while minimizing costs associated with maintenance and repair.

The Federal Highway Administration (FHWA) developed a set of manual rating methods for pavement that are appropriate for Federal Roadways. Two different methods were developed for linear roads and a separate method was developed for parking areas and nonlinear roads. These methods employ a 0-100 rating scale and improve consistency and objectivity in the manual evaluation of surface distresses. They are compatible with ratings that are collected by the automated Data Collection Vehicle (DCV).

- The first of the two manual evaluation methods for roads uses rating criteria to assign index values to each distress type based on a visual evaluation of severity and extent.

- The second manual evaluation method for roads is very time demanding and is best employed on only a select set of routes which may have the highest visitor use and require a more intensive assessment. This method will be used for the Manual Rating of Function Class 1, 2, 7, and 8 Roads. This method is based on measurements that are recorded for each instance of a surface distress. These measurements are converted into index values using conversion formulas.

- Parking areas and non-linear roads are rated similar to the first method shown above, however, there are some slight differences due to the non-linear nature.

The details and criteria used for each of these rating methods are outlined below.

Visual Inspection Method for Manually Rating Secondary Roads

The visual inspection method for manually rated roads uses condition rating criteria that have been developed by FHWA. This criteria is based on a visual evaluation of the severity and extent of distresses to determine the overall condition of the roadway. This method is used for secondary roads that are Functional Class 3, 4, 5, and 6. This constitutes the majority of manually rated roads collected by the Road Inventory Program.

Rating Section Lengths

For this method, Manually Rated Roads are rated in sections. These sections may be made based on length of changes in surface type or condition as described below. The ratings are then aggregated to give an overall rating for the Route:

- Rating sections should be no longer than .25 miles in order to keep the area being rated manageable.
- A new rating section may be started based on changes in condition, width, or surface type if these changes represent a significant portion of the route (are not isolated instances).
- If the road condition, width, and surface type remain constant then new sections do not need to be created unless the road exceeds .25 miles.

Rating Criteria

For this method, Manually Rated Roads are evaluated using a visual inspection of the six distress types listed below. Each distress is assigned one of five index values. An overall Surface Condition Rating (SCR) and Pavement Condition Rating (PCR) are calculated based on these index values.

- Alligator Cracking
    - Rating based on percentage of road surface affected
- Longitudinal Cracking
    - Rating based on severity level (crack width) and percentage of road section length of longitudinal cracks
- Transverse Cracking
    - Rating based on crack width, crack spacing, and percentage of surface affected
- Patching
    - Rating based on percentage of road surface affected
- Rutting
    - Rating based on percentage of road surface affected
- Roughness
    - Only included if the overall roadway length is greater than 0.5 miles and the posted speed limit is greater than or equal to 25 mph. Subjective rating based on the overall ride comfort of the section.

Concrete Routes also receive a PCR rating based on visual evaluation of the following six distress types.

- Slab Faulting at Joints
- Slab Cracking and breakup
- Surface Delamination and Pop-outs
- Joint Distresses
- Patching

Distress Measurement Method for Manually Rating Primary Roads

A more intensive and time demanding assessment than our standard method was developed for Primary roads that are functional class 1, 2, 7, or 8. These high visitation roads are usually accessible by the automated Data Collection Vehicle but in rare instances may need to be manually rated. The method developed is based on measuring each instance of a distress. These measurements are totaled over each section length being measured and are then converted into index values between 0 and 100 (100 being a road with no distress) using index formula equations outlined below. The goal of this method is to produce measured index values which are directly comparable to the automated Data Collection Vehicle.

Rating Section Lengths

For the distress measurement method roads are broken into sections in order to rate. Distress measurements are totaled for each section separately in order to determine the index value for that particular section. The section length to be rated is determined based on the following rules:

- Rating sections are between 0.25 and 0.50 miles long
- A new rating section is created if there is a significant change in condition or pavement width
- If there are no significant changes in condition or pavement width, rating sections are broken at equal intervals, typically 0.50 miles

Manual Distress Measurements

Alligator Cracking

- Alligator cracking is measured by area (square feet). Instances of Alligator cracking are measured along the length and multiplied by the average width of the distressed area.
- The index for alligator cracking takes the total area of cracking compared to the interval length and converts it to a percentage. That percentage is then input into an index formula that yields a value between 0 and 100 (0 being the most distressed).
- Severity levels are not defined for manually measured Alligator cracks. The Alligator Crack Index formula is calculated based on an assumption of medium severity.

Longitudinal Cracking

- Longitudinal cracking (cracking in the direction parallel to the roadway) is measured by length (ft.).
- The index for longitudinal cracking takes the total length of cracking compared to the interval length and converts it to a percentage broken down by severity. That percentage is then input into a formula that yields a value between 0 and 100 (0 being the most distressed).
- Two severity levels are defined for manually measured Longitudinal Cracks. Lower severity cracks are those with a mean width of less than 0.25 inches. Sealed cracks with sealant in good condition are also considered lower severity. Higher severity cracks are those with a mean width of greater than 0.25 inches.

Transverse Cracking

- Transverse cracking (cracking in the direction perpendicular to the roadway) is measured by length (ft).
- The index for transverse cracking takes the total number of cracks (1 crack would encompass the full lane) broken down by severity. The total numbers of each severity are then put into a formula that yields a value between 0 and 100 (0 being the most distressed).

- Two severity levels are defined for manually measured Transverse Cracks. Lower severity cracks are those with a mean width of <= 0.25 inches. Sealed cracks with sealant in good condition are also considered lower severity. Higher severity cracks are those with a mean width of > 0.25 inches.

Patching and Potholes

- Patching and Potholes are measured by area (square feet). Instances of Patching are measured along the length and multiplied by the average width of the patch.
- Instances of full lane width patching cannot be longer than 0.100 miles, otherwise is should be considered a pavement change rather than a distress.
- There are no stratified severities for Patching. It is either present or it is not.

Rutting

- Visible rutting is measured by length (feet) in each wheelpath. Rutting needs only to be visible for it to be rated.
- Severity levels are not defined for manually measured rutting.

Roughness

- Roughness is given a subjective rating of Excellent, Good, Fair, or Poor based on the overall riding comfort of the section. Roughness is only included if the overall roadway length is greater than 0.5 miles and the posted speed limit is greater than or equal to 25 mph.

Index Formulas for Distress Measurement Method:

The method used to convert distress measurements into index values is shown below. The Surface Condition Rating and Pavement Condition Rating are calculated based on these index values.

Alligator Crack Index for Manual Rating:

AC_INDEX = 100 – 40 * (%ALLIGATOR / 15)

Where:

%ALLIGATOR = Percent of total area of section being rated that contains Alligator cracking.

Longitudinal Crack Index for Manual Rating:

LC_INDEX = 100 – 40 * [(%LOW / 175) + (%MED / 75)]

Where:

%LOW = Percent length of longitudinal cracks where crack width <= 0.25 inches
%HIGH = Percent length of longitudinal cracks where crack width > 0.25 inches

Transverse Crack Index for Manual Rating:

TC_INDEX = 100 – 40 * [(LOW / 21.1) + (MED / 4.4)]

Where:

LOW = Count of the total number of transverse cracks within the section length where one transverse crack is equal to the lane width and the crack width <= 0.25 inches
HIGH = Count of the total number of transverse cracks within the section length where one transverse crack is equal to the lane width and the crack width > 0.25 inches

Number of cracks is computed as:
Total length of transverse cracks/Lane width

Patching Index for Manual Rating:

PATCH_INDEX = 100 – 40 * (%PATCHING / 80)

Where:

%PATCHING = Percentage of pavement section that contains patching/potholes.

Rutting Index for Manual Rating:

RUT_INDEX = 100 – 40 * (%RUTTING / 205)

Where:

%RUTTING = Percentage length of rutting within the section being measured.

Method for Manually Rating Paved Parking Areas and Non-Linear Roads

Parking areas are evaluated based on a visual inspection using condition rating criteria that has been developed by FHWA. This criteria is based on a visual evaluation of the severity and extent of distresses to determine the overall condition of the parking area. This overall condition rating is linked to the level of repair and rehabilitation practices required.

A distress index is determined for each of the distresses listed below for Asphalt and Concrete Parking areas. The overall Pavement Condition Rating (PCR) of the parking lot is driven by the most severe distress present.

Rating Criteria:

Asphalt Parking Distress Types

- Alligator Cracking
  - Rating based on percentage of road surface affected
- Longitudinal, Transverse and Block cracking
  - Rating based on crack width, crack spacing, and percentage of surface affected
- Rutting and Distortions
  - Rating based on percentage of road surface affected
- Hot Mix Asphalt Patches
  - Rating based on overall percentage of HMA patches
- Potholes and Cold Patches
  - Rating based on percentage of road surface affected
- Surface Raveling and Bleeding
  - Rating based on percentage of road surface affected

Concrete Parking Distress Types

- Slab Faulting at Joints
  - Rating based on height differential between adjacent slabs or pieces of broken slabs
- Slab Cracking and breakup
  - Rating based on quantity of cracks and if slab is acting to able distribute load as designed
- Surface Delamination and Pop-outs
  - Rating based on percentage of road surface affected to include pop-outs, spalls and surface delamination
- Joint Distresses
  - Rating based on sealant condition and concrete distresses at/or adjacent to joints
- Patching
  - Rating based on percentage of road surface affected

Curb Inspection and Treatments

During inspections of manually rated parking lots and routes, the curb reveal and overall curb condition are evaluated. The curb condition is used to determine a recommendation.

Curb Reveal
The vertical distance on the curb face from the gutter flow line or pavement surface to the top of curb. When resurfacing adjacent to curb, the resulting curb reveal should be no less than 4 inches. Additionally, when resurfacing adjacent to a gutter, the resulting pavement surface should be flush with the gutter pan. In cases where a resurfacing would violate either of these parameters, the surface may need to be milled or removed to adjust to these field conditions.

Curb Recommendations
The following treatment categories are based on the overall percentage of distresses along the entire curb structure for a specific pavement structure. Distresses include spalling, cracking, loss of material and any other damage which prevents the curb from conveying storm runoff or failing to perform in its intended function.

- Overall curb damage ranging 0%-5%:
    - DO NOTHING
- Overall curb damage ranging 5%-20%
    - LIGHT REPAIR
- Overall curb damage ranging 20%-50%
    - MODERATE REPAIR
- Overall curb damage greater than 50%:
    - REPLACE

GPS on Manually Rated Roads (MRR)

Parking areas, some roads, and other paved areas that are not fully drivable with the Data Collection Vehicle are collected manually by field technicians. GPS is collected for these routes using portable Trimble GPS backpack units. Paved campground pads and driveways are not typically included in the inventory or GPS.

Geodatabase – Background and Metadata

In addition to this park report, a geodatabase containing both tabular and spatial data specific to this park has been provided. All data disseminated in the preceding report has been obtained from the tables and fields within said geodatabase. The geodatabase can be referenced for tabular data via Microsoft Access or for both tabular and spatial data via ESRI's ArcGIS Suite of software which consists of; ArcMap, ArcCatalog and ArcExplorer. Consolidating the RIP data into one database creates a seamless relationship of tabular and geographic data. It will allow RIP to facilitate easier updates and enhancements in the future. A geodatabase can be thought of as simply a database containing spatial data. Many different tables are contained within the park's geodatabase. A complete and thorough description of the tables and fields contained within this geodatabase can be found in the metadata. The metadata is attached directly within the geodatabase and can be accessed via ESRI's ArcCatalog. The metadata portion of the geodatabase also includes data dictionary report functionality that formats the metadata into an easy to read report.

Glossary of Terms and Abbreviations

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
AC	Alligator Cracking
CRS	Condition Rating Sheets (Section 5)
Curb Recommendation	Curb remediation based on overall percentage of curb distress
Curb Reveal	Height of curb exposed from gutter flow line to top of curb
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
HPMA	Highway Pavement Management Application
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