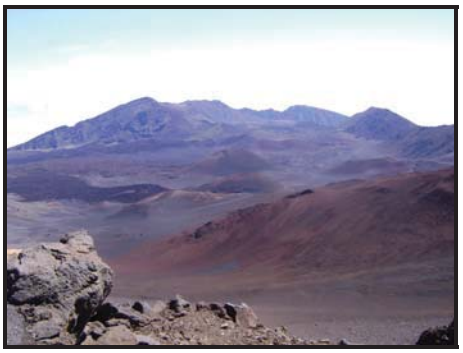
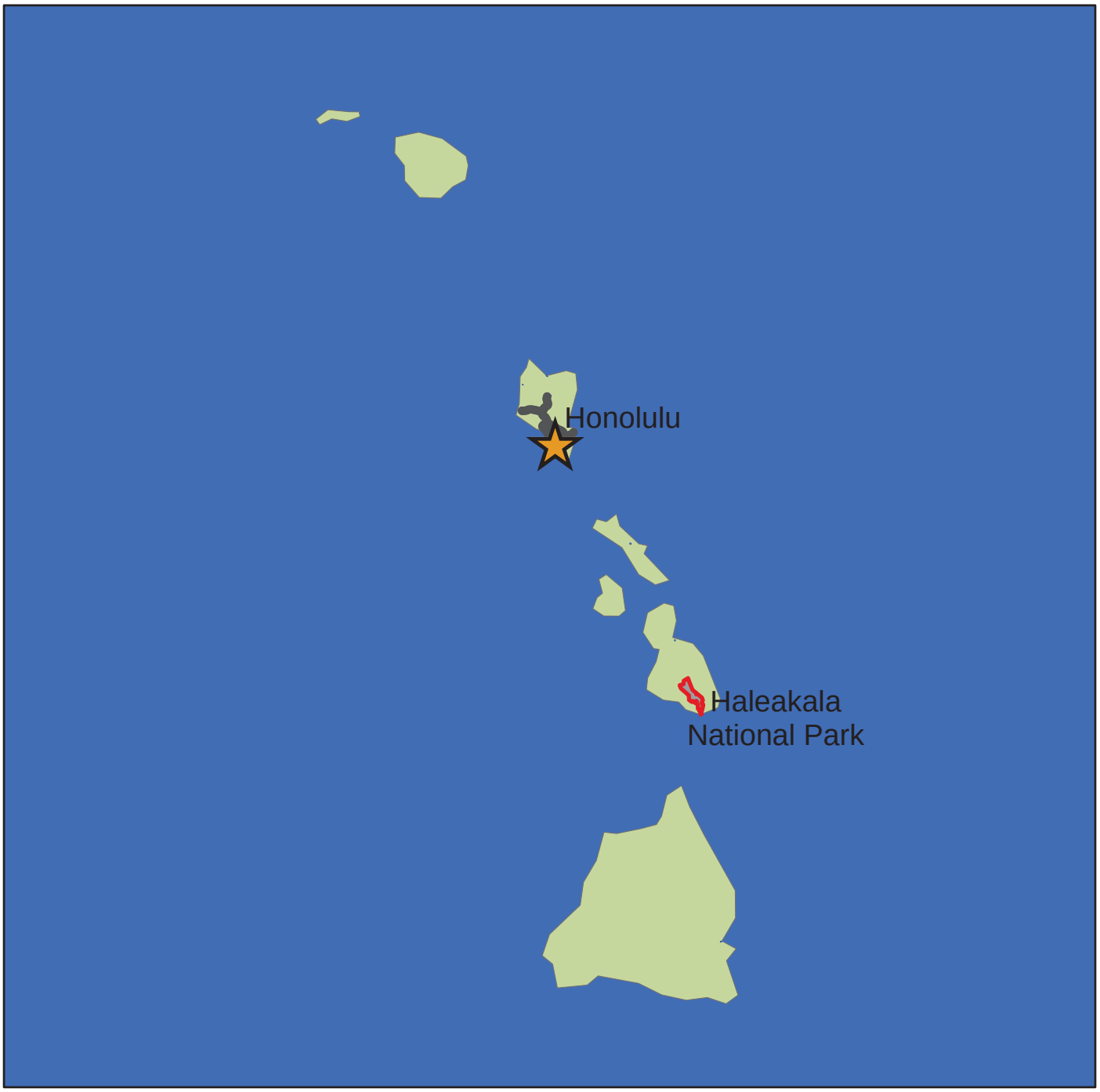
national park service

The Road Inventory
of
Haleakala National Park
HALE – 8290
Cycle 4



Prepared By:
Federal Highway Administration
Road Inventory Program
Cycle 4

Haleakala National Park
in
Hawaii



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Haleakala National Park

Section 1
Introduction

INTRODUCTION

Background: In 1976, the National Park Service (NPS) and the Federal Highway Administration (FHWA) entered into a Memorandum of Agreement (MOA), establishing the Road Inventory Program (RIP). In 1980, the NPS and the FHWA terminated the 1976 MOA and entered into a new MOA that provided for the completion of the initial phase of the RIP. The purpose of the RIP, per the 1980 MOA was to maintain and update RIP data in order to develop long-range costs and programs to bring National Park Service (NPS) roads up to, or to maintain, designated standards, and establish a maintenance management program.

The FHWA's Federal Lands Highway (FLH) was assigned the task of identifying condition deficiencies and corrective priorities along with associated corrective costs, inventorying maintenance features (e.g., culverts, signs, guardrail, etc.), summarizing the data and findings in a report and providing a photographic record of the road system.

The FLH completed the initial phase of the RIP in the early 1980's. As a result of this effort, each park received a RIP book, also known as the "Brown Book," that included the information collected during this initial RIP phase.

In an effort to maintain and update the RIP data, a cyclical data collection and reporting process was reestablished in the 1990's. The FLH completed two cycles of RIP data collection between 1994 and 2001. Cycle 1 was collected in 44 large parks from 1994 to 1996. This data was found to be unusable for comparison to future cycles. Cycle 2 data was collected from March 1997 to January 2001 in 79 large parks and 5 small parks containing 4,874 route miles. Each park received a copy of a Cycle 2 RIP Report, also known as the "Blue Book". Cycle 3 was completed from 2001 through 2004, and included data collection in all parks that contain pavement.

Since 1984, the RIP Program has been funded through the Federal Lands Highway Program's Park Roads and Parkways (PRP) Program. Currently, the NPS Washington Headquarters' Park Facility Management Division is responsible for coordinating the RIP program with the FLH. 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) which requires the Federal Highway Administration and the National Park Service, to develop, by rule, a Pavement Management System (PMS) for the park roads and parkways serving the National Park System. As a result of the requirements in TEA-21, the NPS and FHWA are in the process of developing a PMS. The PMS will assist the decision-makers in effectively spending limited PRP Program funds. The PMS

will provide information for planning and programming road maintenance, rehabilitation, and reconstruction activities. RIP data will provide the basic information for this system.

Key information included in the RIP is the mileage inventory and condition assessments accomplished by the RIP Program. The mileage and condition data are used in the current allocation formula of PRP Program funds.

RIP Cycle 4: Cycle 4 data collection was initiated in spring 2006, where 86 large parks, consisting of 5,553 route miles and 6,232 paved parking areas, were selected as a representative sample of the entire NPS paved road network. Cycle 4 is scheduled for completion in spring 2009 and will serve the PMS in further development of its pavement preservation techniques.

In the Cycle 4 Reports, a general condition rating of excellent, good, fair and poor is ascribed to each one-mile section of paved roadway, and to each paved parking area. This condition rating system provides a realistic means of assessing the general funding needs for road improvements. Along with these descriptive condition ratings, a numerical rating between 0 and 100 is ascribed to each mile of road and to each parking area. This numerical rating is called a Pavement Condition Rating (PCR). The PCR rating system is described in Section 10 of this report.

All of the fieldwork required for obtaining inventory, condition, and maintenance feature information is coordinated with each park and the regional offices to ensure that the information in the RIP reports is accurate.

The FLH is responsible for all the data presented in this report. Anyone having questions or comments regarding the contents of this report is encouraged to contact the FHWA RIP Coordinator. It is our aim to provide exceptional customer satisfaction in our delivery of the RIP program.

The FHWA RIP Team

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Haleakala National Park

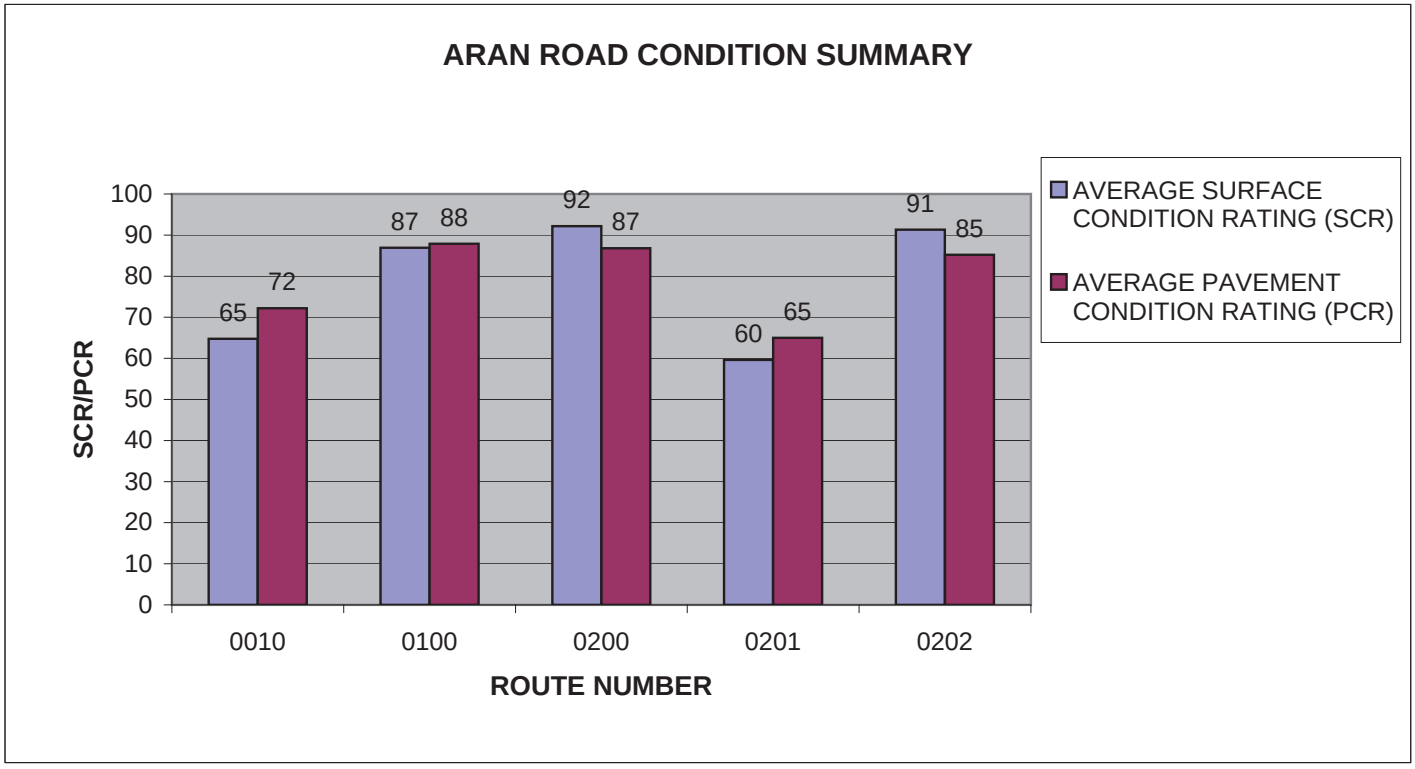
Section 2
Park Summary Information

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

F.C.	Pavement Condition Rating (PCR)								TOTAL MILES
	Poor (<=60)		Fair (61-84)		Good (85-94)		Excellent (95-100)		
	MILES	%	MILES	%	MILES	%	MILES	%	
1	1.70	13.97%	7.20	59.16%	1.52	12.49%	0.68	5.59%	**11.10**
2	0.09	0.74%	0.23	1.89%	0.12	0.99%	0.02	0.16%	**0.46**
3	0.04	0.33%	0.22	1.81%	0.10	0.82%	0.10	0.82%	**0.46**
4	0.15	1.23%							**0.15**
5									
6									
7									
8									
Totals	**1.98**	**16.27%**	**7.65**	**62.86%**	**1.74**	**14.30%**	**0.80**	**6.57%**	**12.17**

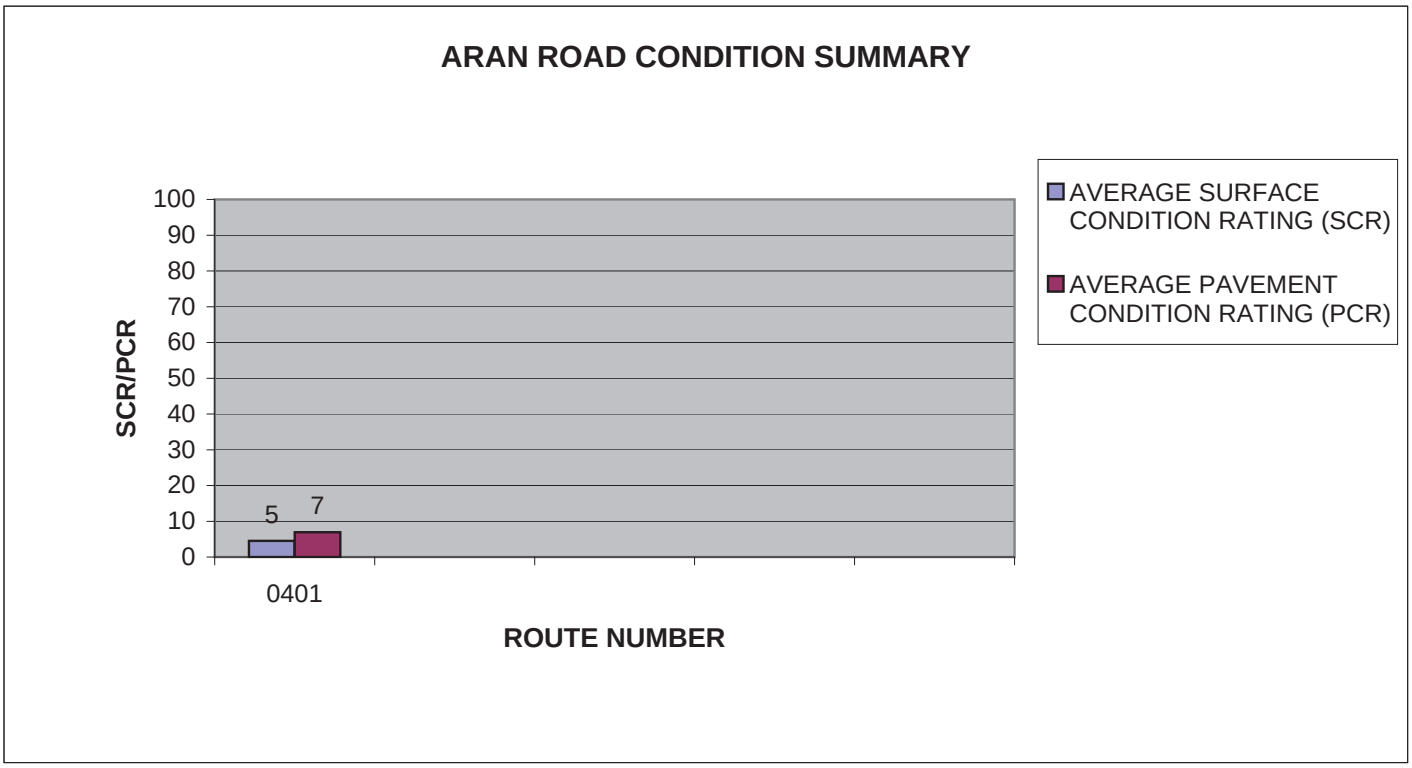
HALE: ARAN ROAD CONDITION SUMMARY

ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	ROUTE LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0010	HALEAKALA PARK ROAD	1	10.53	ASPHALT	65	72
0100	RED HILL ROAD	1	0.57	ASPHALT	87	88
0200	MAGNETIC PEAK SPUR ROAD	2	0.21	ASPHALT	92	87
0201	KALAHAKU OVERLOOK ROAD	2	0.25	ASPHALT	60	65
0202	HOSMER GROVE ROAD	3	0.46	ASPHALT	91	85



HALE: ARAN ROAD CONDITION SUMMARY

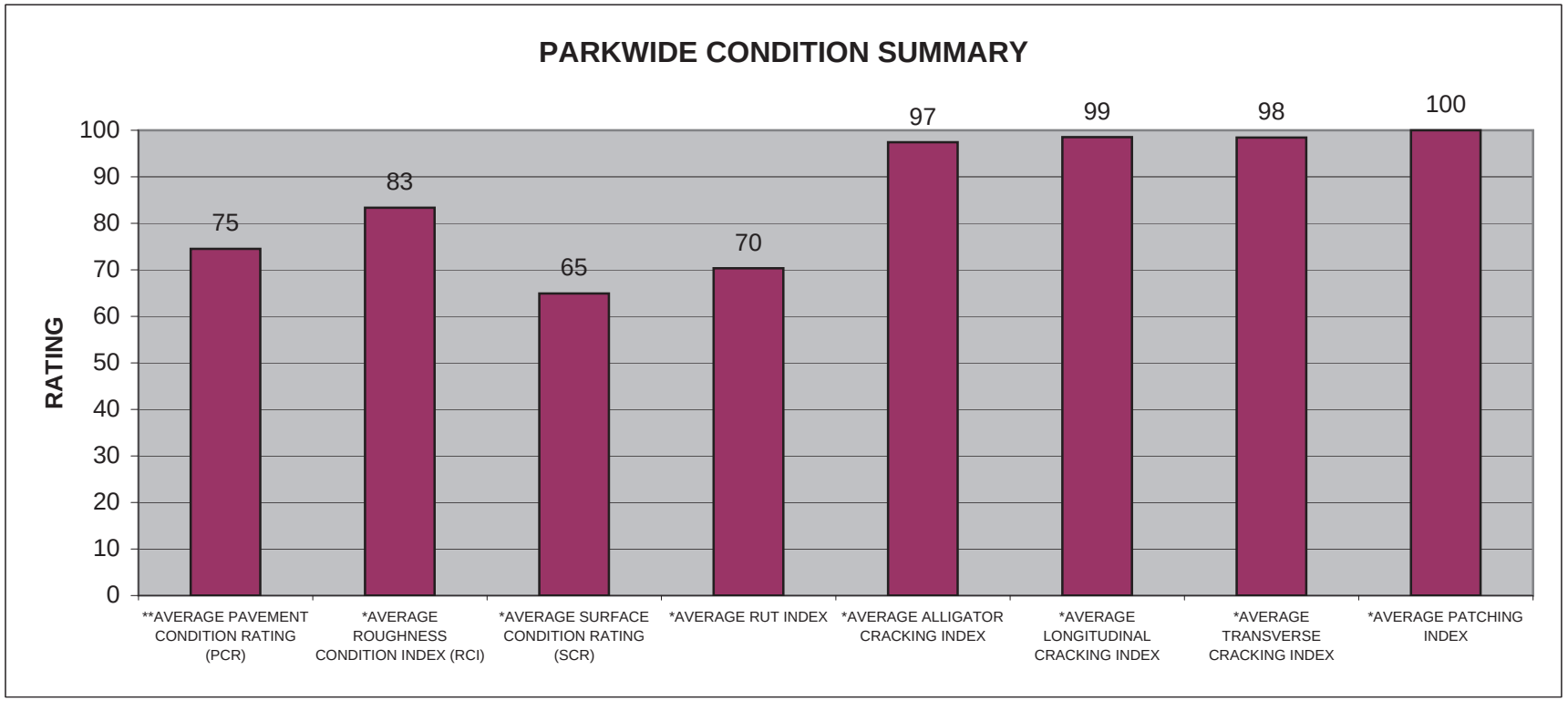
ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	ROUTE LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0401	PU'U NIANIAU ROAD	4	0.15	ASPHALT	5	7



HALE: PARKWIDE CONDITION SUMMARY

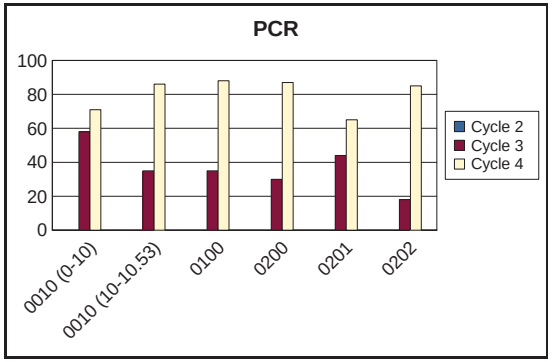
**AVERAGE PAVEMENT CONDITION RATING (PCR)	*AVERAGE ROUGHNESS CONDITION INDEX (RCI)	*AVERAGE SURFACE CONDITION RATING (SCR)	*AVERAGE RUT INDEX	*AVERAGE ALLIGATOR CRACKING INDEX	*AVERAGE LONGITUDINAL CRACKING INDEX	*AVERAGE TRANSVERSE CRACKING INDEX	*AVERAGE PATCHING INDEX
75	83	65	70	97	99	98	100

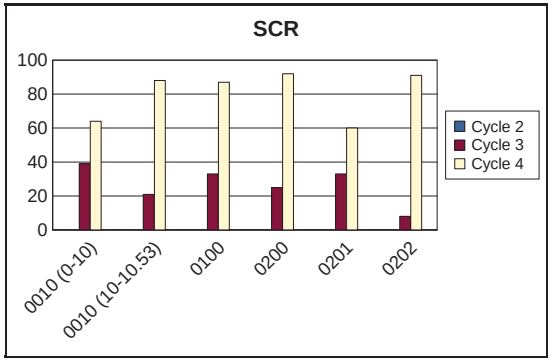
*** PCR Index is based on all ARAN-driven roads, parking areas, and manually rated routes.*
** Index values are based on ARAN-driven roads only.*

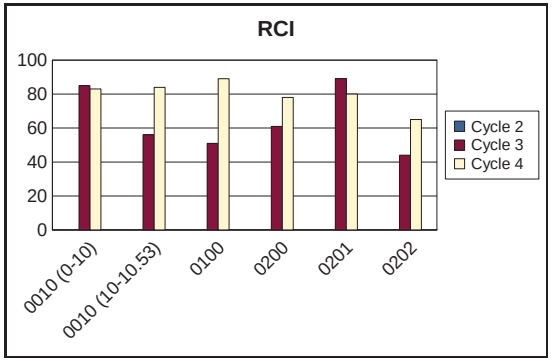


HALE CYCLE 2 vs CYCLE 3 vs CYCLE 4 CONDITION COMPARISONS

				PAVEMENT CONDITION RATING (PCR)				SURFACE CONDITION RATING (SCR)				ROUGHNESS CONDITION INDEX (RCI)				
ROUTE NUMBER	PAVED MILES	FROM MILEPOST	TO MILEPOST	CYCLE 2	CYCLE 3	CYCLE 4	PERCENT CHANGE	CYCLE 2	CYCLE 3	CYCLE 4	PERCENT CHANGE	CYCLE 2	CYCLE 3	CYCLE 4	PERCENT CHANGE	COMMENT
0010	10.00	0.00	10.00	N/A	58	71	+22%	N/A	39	64	+64%	N/A	85	83	-2%	
0010	0.53	10.00	10.53	N/A	35	86	+146%	N/A	21	88	+319%	N/A	56	84	+50%	
0100	0.57	0.00	0.57	N/A	35	88	+151%	N/A	33	87	+164%	N/A	51	89	+75%	
0200	0.21	0.00	0.21	N/A	30	87	+190%	N/A	25	92	+268%	N/A	61	78	+28%	
0201	0.25	0.00	0.25	N/A	44	65	+48%	N/A	33	60	+82%	N/A	89	80	-10%	
0202	0.47	0.00	0.47	N/A	18	85	+372%	N/A	8	91	+1038%	N/A	44	65	+48%	

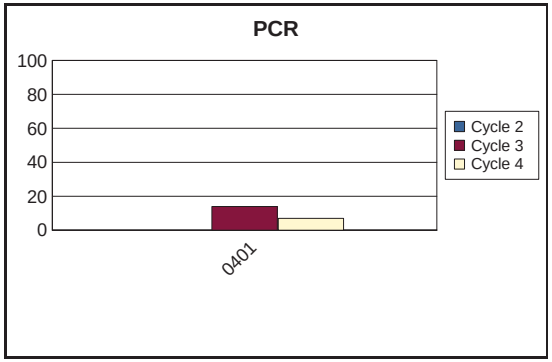


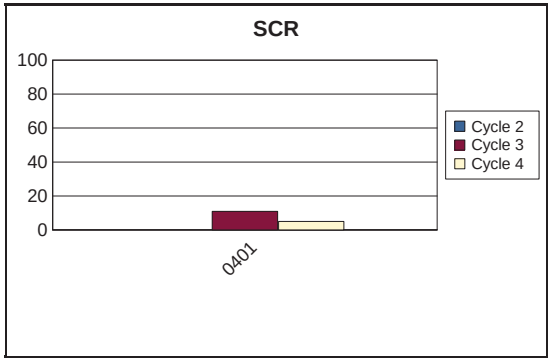


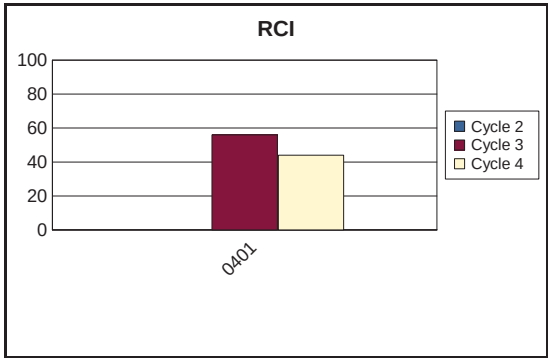


HALE CYCLE 2 vs CYCLE 3 vs CYCLE 4 CONDITION COMPARISONS

				PAVEMENT CONDITION RATING (PCR)				SURFACE CONDITION RATING (SCR)				ROUGHNESS CONDITION INDEX (RCI)				
ROUTE NUMBER	PAVED MILES	FROM MILEPOST	TO MILEPOST	CYCLE 2	CYCLE 3	CYCLE 4	PERCENT CHANGE	CYCLE 2	CYCLE 3	CYCLE 4	PERCENT CHANGE	CYCLE 2	CYCLE 3	CYCLE 4	PERCENT CHANGE	COMMENT
0401	0.15	0.00	0.15	N/A	14	7	-50%	N/A	11	5	-55%	N/A	56	44	-21%	



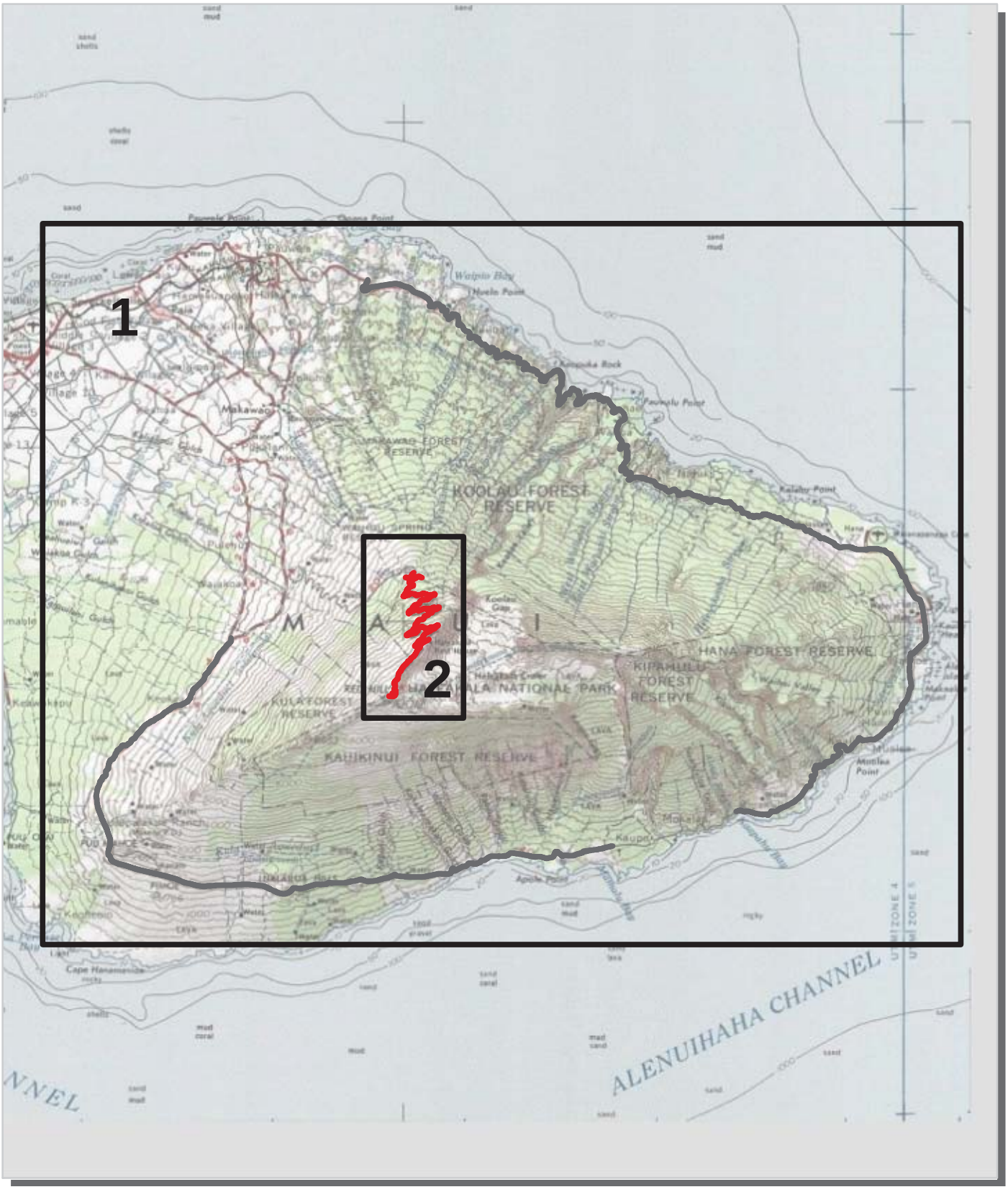




Haleakala National Park

Section 3
Park Route Location / Condition Maps

Haleakala National Park
Route Location Map
Key Map



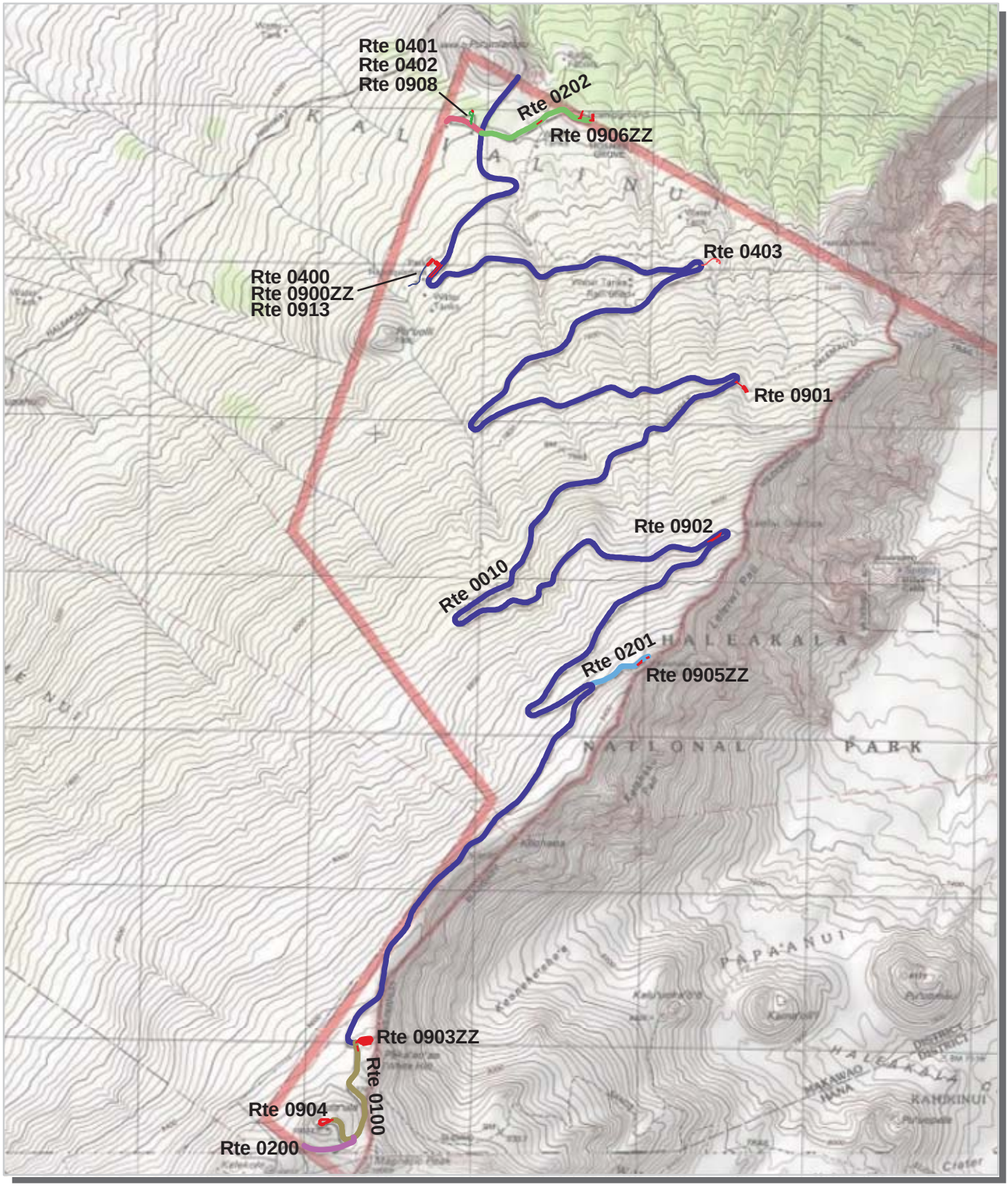
Haleakala National Park
Route Location Map
Area 1

Unique colors used to differentiate routes

5 2.5 0 5 Miles

N

Haleakala National Park
Route Location Map
Area 2

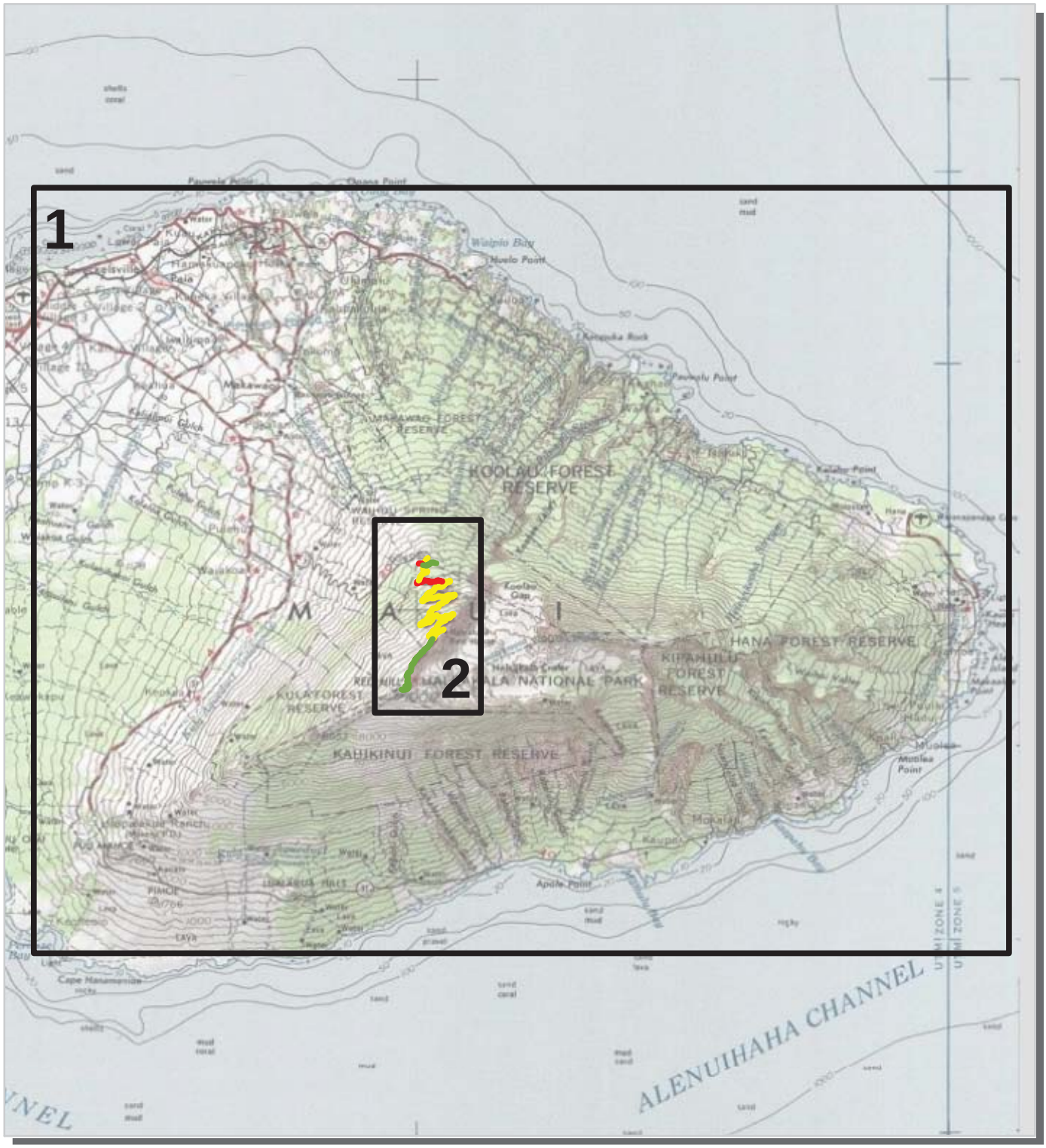


Unique colors used to differentiate routes

0.6 0.3 0 0.6
Miles

N

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



PCR	Poor	Fair	Good	Excellent	No Data
	(<=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.

5 2.5 0 5 Miles

N

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

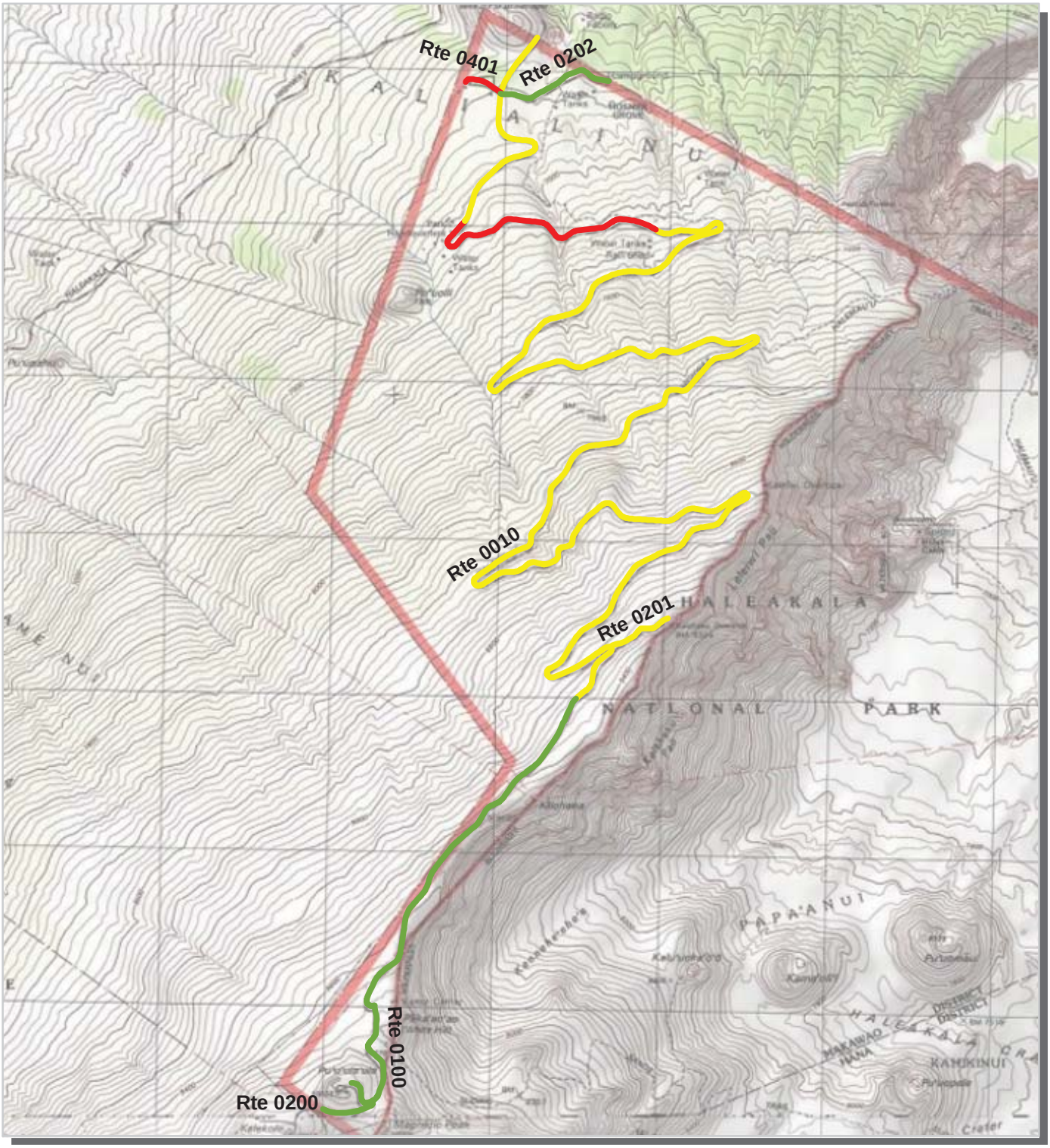
PCR	Poor	Fair	Good	Excellent	No Data
	(<=60)	(61 - 84)	(85 - 94)	(95 - 100)	

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

5 2.5 0 5 Miles

N

Haleakala National Park
Route Condition Map
PCR - Mile by Mile
Area 2



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

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

0.6 0.3 0 0.6 Miles

N

Haleakala National Park

Section 4
Park Route Inventory

NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

** Unpaved Routes displayed on report were obtained from FMSS database and not inventoried by Road Inventory Program (RIP)

HALE

HALEAKALA NATIONAL PARK

Rte. No.	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Rte. Lanes	Manual Rated SQ/FT	Surf. Type	Area Maps
0010	00002652		HALEAKALA PARK ROAD	FROM NORTH PARK BOUNDARY	TO ROUTE 0903ZZ (HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM))	SUMMIT	10.530	0.000	10.530	1		0	AS	2
0100	39530		RED HILL ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 10.53 (ON RIGHT)	TO ROUTE 0904 (PU'U'ULA'ULA SUMMIT PARKING)	SUMMIT	0.570	0.000	0.570	1		0	AS	2
0200	39531		MAGNETIC PEAK SPUR ROAD	FROM ROUTE 0100 (RED HILL ROAD) AT MP 0.43 (ON LEFT)	TO SOUTH PARK BOUNDARY (OBSERVATORY/PARK BOUNDARY FENCE)	SUMMIT	0.210	0.000	0.210	2		0	AS	2
0201	39532		KALAHAKU OVERLOOK ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 8.74 (ON LEFT)	TO ROUTE 0905ZZ (KALAHAKU OVERLOOK)	SUMMIT	0.250	0.000	0.250	2		0	AS	2
0202	31839		HOSMER GROVE ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 0.26 (ON LEFT)	TO ROUTE 0906ZZ (HOSMER GROVE PARKING AREAS)	SUMMIT	0.460	0.000	0.460	3		0	AS	2
0203	00002653		HIGHWAY 31, HANA HIGHWAY, KIPAHULU AREA	FROM STATE ROUTE 36 (PIILANI HIGHWAY)	THROUGH OVERFLOW PARKING AND CAMPGROUND	KIPAHULU	0.000	0.000	0.000	3		0	GR	
0204	97853		KAPAHU FARM SERVICE ROAD	FROM ROUTE 0203 (HIGHWAY 31, HANA HIGHWAY, KIPAHULU AREA)	TO END	KIPAHULU	0.000	0.500	0.500	4		0	OT	
0400	31842		HEADQUARTERS RESIDENCE ROAD	FROM ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)	TO END	SUMMIT	0.146	0.000	0.146	4		6,454	AS	2
0401	31841		PU'U NIANIAU ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 0.26 (ON RIGHT)	TO ROUTE 0907 (PU'U NIANIAU MAINTENANCE YARD)	SUMMIT	0.150	0.000	0.150	4		0	AS	2
0402	31840		PU'U NIANIAU RESIDENCE ROAD	FROM ROUTE 0401 (PU'U NIANIAU ROAD) AT MP 0.04 (ON RIGHT)	TO END OF LOOP	SUMMIT	0.085	0.000	0.085	4		9,842	AS	2
0403	31838		WATER CATCHMENT ROAD	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 2.27 (ON LEFT)	TO WATER TANKS	SUMMIT	0.062	0.000	0.062	5		7,169	AS	2
0404	39533		KIPAHULU SERVICE (CAMPGROUND) ROAD	FROM ROUTE 0203 (HIGHWAY 31, HANA HIGHWAY, KIPAHULU AREA)	TO END	KIPAHULU	0.000	1.000	1.000	5		27,597	GR	
0405	97654		KIPAHULU SERVICE ROAD	FROM ROUTE 0203 (HIGHWAY 31, HANA HIGHWAY, KIPAHULU AREA)	TO END	KIPAHULU	0.000	0.000	0.000	5		0	OT	

NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

** Unpaved Routes displayed on report were obtained from FMSS database and not inventoried by Road Inventory Program (RIP)

HALE

HALEAKALA NATIONAL PARK

Rte. No.	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Rte. Lanes	Manual Rated SQ/FT	Surf. Type	Area Maps
0900ZZ	31833		PARK HEADQUARTERS PARKING AREAS	ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.04 (ON LEFT AND RIGHT)		SUMMIT	0.000	0.000	0.000			14,133	AS	2
0901	31835		HALEMAU'U TRAILHEAD PARKING	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 4.55 (ON LEFT)	TO PARKING	SUMMIT	0.000	0.000	0.000			12,041	AS	2
0902	31836		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)	SUMMIT	0.000	0.000	0.000			8,290	AS	2
0903ZZ	31830		HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT END AND BEGINING OF ROUTE 0100	TO PARKING	SUMMIT	0.000	0.000	0.000			46,548	AS	2
0904	31831		PU'U'ULA'ULA SUMMIT PARKING	FROM ROUTE 0100 (RED HILL ROAD) AT END	TO PARKING	SUMMIT	0.000	0.000	0.000			22,617	AS	2
0905ZZ	31837		KALAHAKU OVERLOOK PARKING AREAS	FROM ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20 (ON RIGHT)	TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24 (ON RIGHT)	SUMMIT	0.000	0.000	0.000			5,366	AS	2
0906ZZ	31832		HOSMER GROVE PARKING AREAS	ADJACENT TO AND AT END OF ROUTE 0202 (HOSMER GROVE ROAD)		SUMMIT	0.000	0.000	0.000			12,434	AS	2
0907	39534		PU'U NIANIAU MAINTENANCE YARD	FROM ROUTE 0401 (PU'U NIANIAU ROAD) AT END	TO PARKING	SUMMIT	0.000	0.000	0.000			0	GR	
0908	102613		PU'U NIANIAU RESIDENCE PARKING	FROM ROUTE 0402 (PU'U NIANIAU RESIDENCE ROAD) AT END	TO PARKING	SUMMIT	0.000	0.000	0.000			1,013	AS	2
0909	102611		WATER CATCHMENT TANK PARKING	FROM ROUTE 0403 (WATER CATCHMENT ROAD) AT END	TO PARKING	SUMMIT	0.000	0.000	0.000			0	GR	
0910	39535		KIPAHULU VISITOR CENTER	ADJACENT TO STATE ROUTE 36 (PIILANI HIGHWAY) AT SOUTHEAST PARK BOUNDARY		KIPAHULU	0.000	0.000	0.000			28,695	GR	
0911	39536		KIPAHULU VISITOR CENTER OVERFLOW PARKING	ADJACENT TO ROUTE 0203 (HIGHWAY 31, HANA HIGHWAY, KIPAHULU AREA) ON LEFT		KIPAHULU	0.000	0.000	0.000			22,926	OT	

NPS/RIP Route ID Report

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Red text denotes approx. mileage

White = Paved Routes, ARAN Driven
Yellow = Unpaved Routes, ARAN not Driven
Blue = All Paved Parking Areas
Green = All Unpaved Parking Areas
Grey = Paved Routes, ARAN not Driven
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HALE

HALEAKALA NATIONAL PARK

Rte. No.	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Rte. Lanes	Manual Rated SQ/FT	Surf. Type	Area Maps
0912	39537		KIPAHULU MAINTENANCE AREA	ADJACENT TO STATE ROUTE 36 (PIILANI HIGHWAY) AT SOUTHEAST PARK BOUNDARY NEAR ROUTE 0910		KIPAHULU	0.000	0.000	0.000			25,585	OT	
0913	31834		HEADQUARTERS EMPLOYEE PARKING LOT	FROM ROUTE 0900AZ (PARK HEADQUARTERS PARKING A)	TO ROUTE 0400 (HEADQUARTERS RESIDENCE ROAD)	SUMMIT	0.000	0.000	0.000			10,523	AS	2
5031	N/A		HIGHWAY 31	FROM KALEPA BRIDGE (END OF 5036)	TO STATE HIGHWAY/KULA HIGHWAY (BEGINNING OF 5037)	N/A	20.340	4.900	25.240	1		0	AS	1
5036	N/A		HANA HIGHWAY (FROM KEAWA PLACE)	FROM INTERSECTION WITH KEAWA PLACE IN HANA (END OF 5360)	TO KELEPA BRIDGE (BEGINNING OF 5031)	N/A	12.730	0.590	13.320	1		0	AS	1
5037	N/A		KULA HIGHWAY	FROM STATE HIGHWAY/KULA HIGHWAY (END OF 5031)	TO INTERSECTION WITH HIGHWAY 377/KEKAULIKE AVENUE	N/A	7.130	0.000	7.130	1		0	AS	1
5360	N/A		HANA HIGHWAY	FROM INTERSECTION WITH STATE ROUTE 365	TO INTERSECTION WITH KEAWA PLACE IN HANA (BEGINNING OF 5036)	N/A	34.490	0.000	34.490	1		0	AS	1

NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

** Unpaved Routes displayed on report were obtained from FMSS database and not inventoried by Road Inventory Program (RIP)

SUMMARY TOTALS FOR HALEAKALA NATIONAL PARK

ROUTE TOTALS

ARAN Driven Route Miles	12.170
All Paved Route Miles	12.463
All Unpaved Route Miles	1.500
TOTAL PARK ROUTE MILES	13.963
All Manually Rated Roads (SQFT)	23,466

PARKING AREA TOTALS

All Paved Parking (SQFT)	132,966
All Unpaved Parking (SQFT)	77,206
TOTAL ALL PARKING (SQFT)	210,172

LANE MILE TOTALS

ARAN Driven Lane Miles	23.195
Paved Parking Lane Miles	2.289
Paved MRR Lane Miles	0.404
TOTAL PAVED LANE MILES	25.888

CONCESSION TOTALS

Concession Paved Route Miles	0.000
Concession Unpaved Route Miles	0.000
Concession Paved Parking Area SQFT	0
Concession Unpaved Parking Area SQFT	0
Concession Paved MRR SQFT	0

WEIGHTED AVERAGE PARK VALUES

PCR (Rating)	SCR (Rating)	RCI (Rating)	RUT (Index)	AC (Index)	LC (Index)	TC (Index)	PATCH (Index)	PCR (Concession)
74.31	64.91	83.36	70.33	97.42	98.52	98.42	99.99	N/A

NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

** Unpaved Routes displayed on report were obtained from FMSS database and not inventoried by Road Inventory Program (RIP)

General Park Road Functional Classification Table

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

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

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

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

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

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

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

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

****

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

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

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

Shading Color Key:
Red text denotes approx. mileage

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

** Unpaved Routes displayed on report were obtained from FMSS database and not inventoried by Road Inventory Program (RIP)

HALE

HALEAKALA NATIONAL PARK

Asset Entered in FMSS System

Rte. No.	FMSS No.	Sub Comp	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0900ZZ	31833		PARK HEADQUARTERS PARKING AREAS	ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.04 (ON LEFT AND RIGHT)				0.00	0.00	0.00	14,133
0903ZZ	31830		HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT END AND BEGINING OF ROUTE 0100	TO PARKING			0.00	0.00	0.00	46,548
0905ZZ	31837		KALAHAKU OVERLOOK PARKING AREAS	FROM ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20 (ON RIGHT)	TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24 (ON RIGHT)			0.00	0.00	0.00	5,366
0906ZZ	31832		HOSMER GROVE PARKING AREAS	ADJACENT TO AND AT END OF ROUTE 0202 (HOSMER GROVE ROAD)				0.00	0.00	0.00	12,434

Asset HALE-0900ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Sub Comp	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	■	PARK HEADQUARTERS PARKING A	ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.03 (ON RIGHT)	TO ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)			0.00	0.00	0.00	11,074
0900BZ	31833	■	PARK HEADQUARTERS PARKING B	ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.06 (ON LEFT)				0.00	0.00	0.00	3,059

Asset HALE-0903ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Sub Comp	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	■	HALEAKALA VISITOR CENTER PARKING A (CRATER RIM)	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT END	TO PARKING			0.00	0.00	0.00	44,491
0903BZ	31830	■	HALEAKALA VISITOR CENTER PARKING B (CRATER RIM)	ADJACENT TO ROUTE 0100 (RED HILL ROAD) AT MP 0.02 (ON LEFT)				0.00	0.00	0.00	2,057

NPS/RIP Subcomponent Details for HALE

Shading Color Key:
Red text denotes approx. mileage

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

** Unpaved Routes displayed on report were obtained from FMSS database and not inventoried by Road Inventory Program (RIP)

HALE

HALEAKALA NATIONAL PARK

Asset HALE-0905ZZ Subcomponent Breakdown

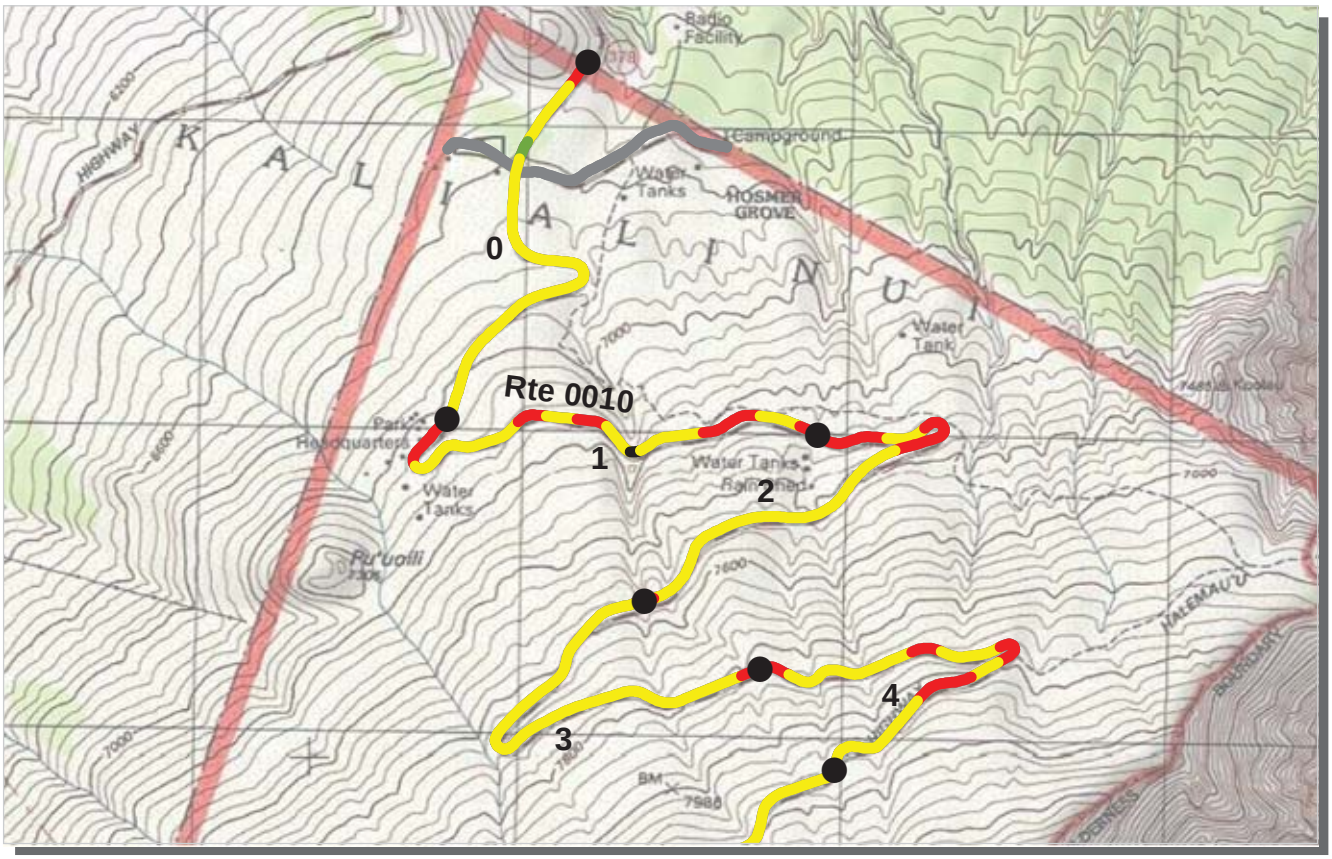
Rte. No.	FMSS No.	Sub Comp	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0905AZ	31837	☐	KALAHAKU OVERLOOK PARKING A	ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20 (ON RIGHT)				0.00	0.00	0.00	4,195
0905BZ	31837	☐	KALAHAKU OVERLOOK PARKING B	ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24 (ON RIGHT)				0.00	0.00	0.00	1,171

Asset HALE-0906ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Sub Comp	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	☐	HOSMER GROVE PARKING A	FROM ROUTE 0202 (HOSMER GROVE ROAD) AT END	TO PARKING			0.00	0.00	0.00	6,660
0906BZ	31832	☐	HOSMER GROVE PARKING B	FROM ROUTE 0202 (HOSMER GROVE ROAD) AT MP 0.42 (ON LEFT)	TO PARKING			0.00	0.00	0.00	3,997
0906CZ	31832	☐	HOSMER GROVE PARKING C	ADJACENT TO ROUTE 0202 (HOSMER GROVE ROAD) AT MP 0.23 (ON RIGHT)				0.00	0.00	0.00	1,778

Haleakala National Park

Section 5
Paved Route Condition Rating Sheets (CRS)



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

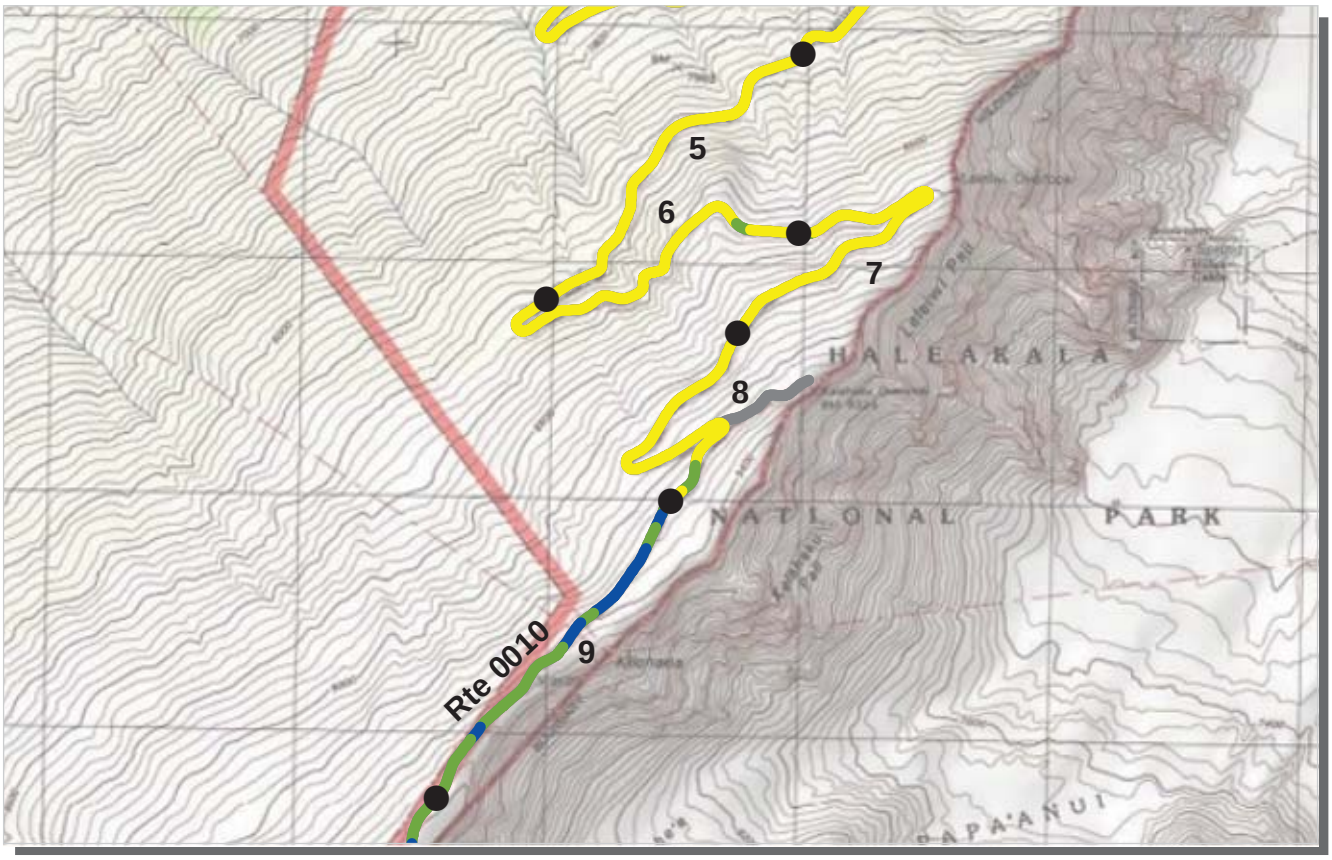
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0010 HALEAKALA PARK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 10.53 Miles**

Section Number	0	1	2	3	4
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	2	3	2	2	2
Paved Width (ft)	23	22	20	21	21
Lane Width (ft)	10	9	9	9	10
Shoulder Width Right (ft)	NC	NC	NC	NC	NC
Shoulder Width Left (ft)	NC	NC	NC	NC	NC
Roadway Condition Information					
SCR (Surface Condition Rating)	67	49	53	68	55
PCR (Pavement Condition Rating)	72	59	64	73	64
Distress Index Values					
Alligator Cracking Index	100	87	91	99	97
Longitudinal Cracking Index	100	96	96	96	97
Tranverse Cracking Index	100	96	97	97	96
Patching Index	100	100	100	100	100
Rutting Index	67	69	69	76	66
Roughness Condition Index (RCI)	82	76	79	80	77

NC - Not Collected



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

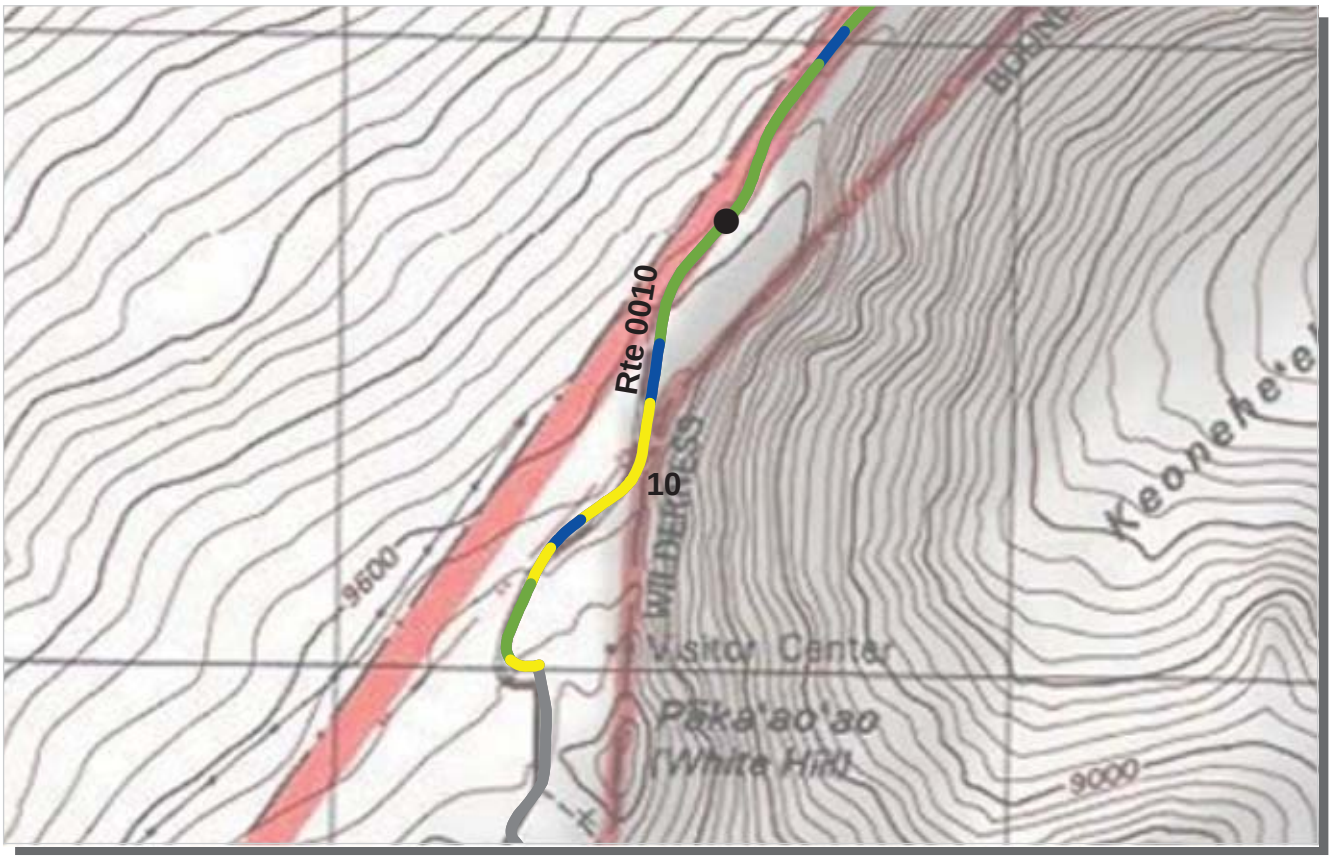
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0010 HALEAKALA PARK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 10.53 Miles**

Section Number	5	6	7	8	9
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
Traffic	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
AADT					
SADT					
ADT Date					
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
Shoulder Width Right (ft)	NC	NC	NC	NC	NC
Shoulder Width Left (ft)	NC	NC	NC	NC	NC
Roadway Condition Information					
SCR (Surface Condition Rating)	57	60	66	71	90
PCR (Pavement Condition Rating)	70	71	76	74	92
Distress Index Values					
Alligator Cracking Index	100	100	100	100	100
Longitudinal Cracking Index	100	100	100	100	100
Tranverse Cracking Index	100	99	100	99	100
Patching Index	100	100	100	100	100
Rutting Index	57	61	67	72	91
Roughness Condition Index (RCI)	90	87	90	80	94

NC - Not Collected



PCR Poor (<=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.

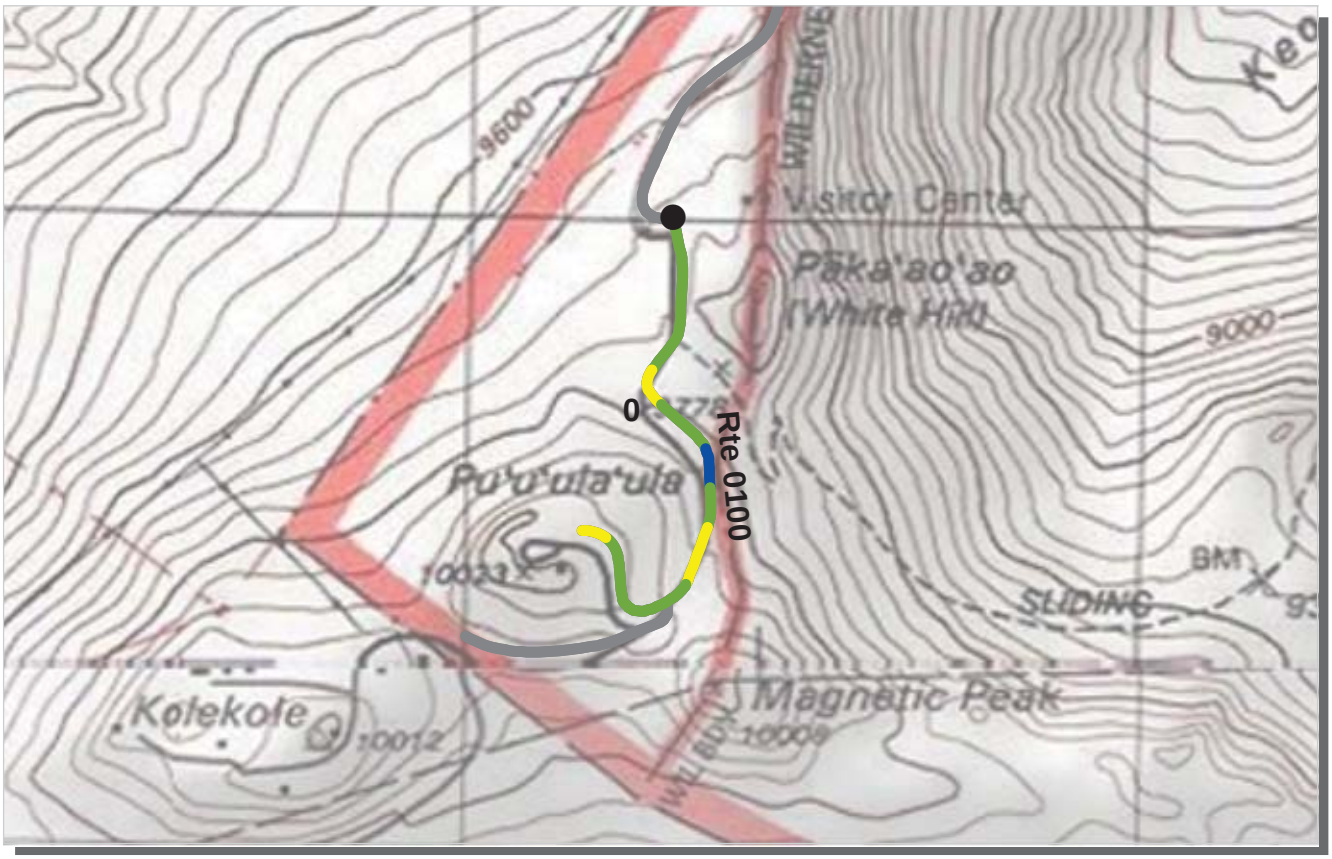
ROUTE: 0010 HALEAKALA PARK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 10.53 Miles**

Section Number	10				
Section Length (mi)	0.53				
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	21				
Lane Width (ft)	9				
Shoulder Width Right (ft)	NC				
Shoulder Width Left (ft)	NC				
Roadway Condition Information					
SCR (Surface Condition Rating)	88				
PCR (Pavement Condition Rating)	86				
Distress Index Values					
Alligator Cracking Index	100				
Longitudinal Cracking Index	100				
Tranverse Cracking Index	100				
Patching Index	100				
Rutting Index	88				
Roughness Condition Index (RCI)	84				

NC - Not Collected

ROUTE: 0010 HALEAKALA PARK ROAD



PCR Poor (<=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.

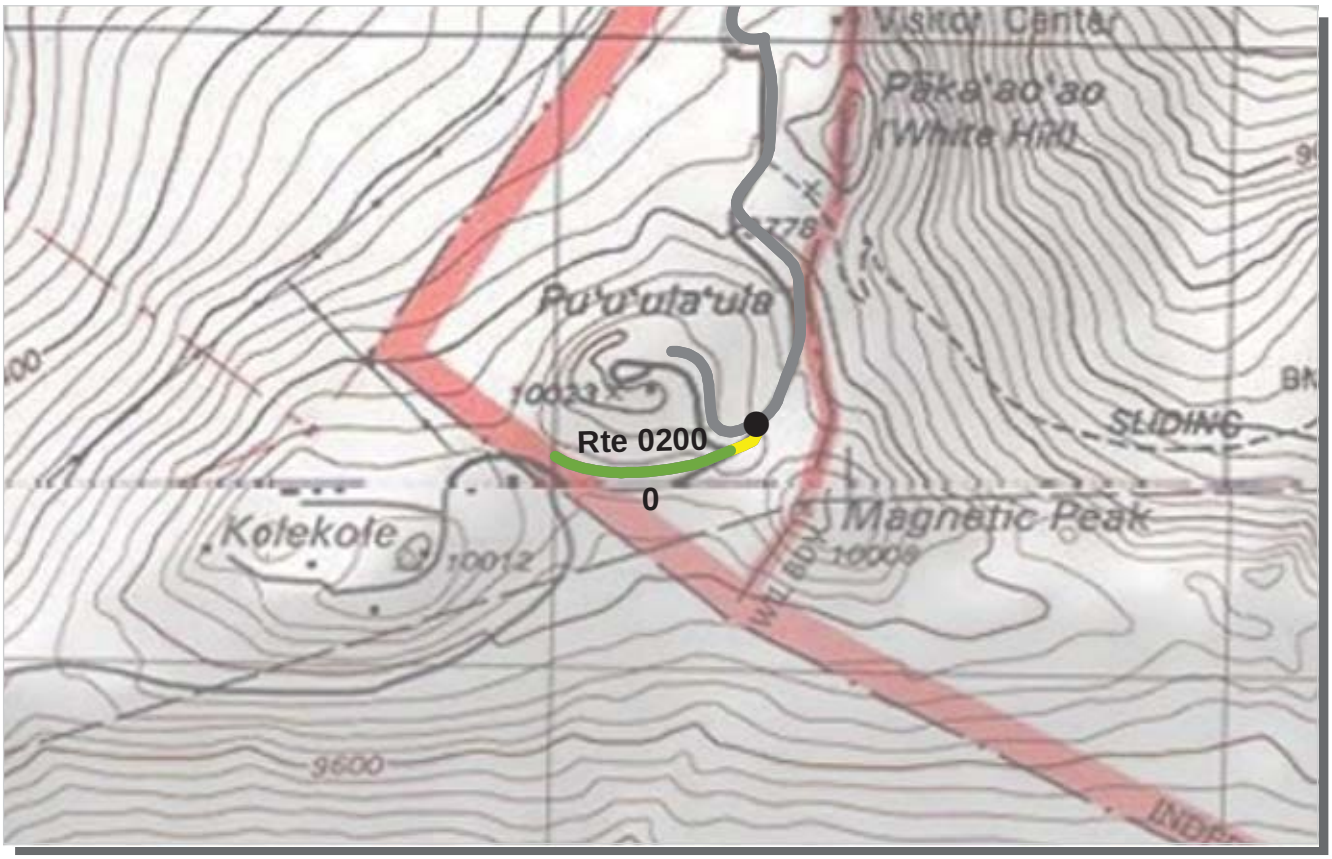
ROUTE: 0100 RED HILL ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 0.57 Miles**

Section Number	0				
Section Length (mi)	0.57				
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	19				
Lane Width (ft)	8				
Shoulder Width Right (ft)	NC				
Shoulder Width Left (ft)	NC				
Roadway Condition Information					
SCR (Surface Condition Rating)	87				
PCR (Pavement Condition Rating)	88				
Distress Index Values					
Alligator Cracking Index	100				
Longitudinal Cracking Index	100				
Tranverse Cracking Index	100				
Patching Index	100				
Rutting Index	87				
Roughness Condition Index (RCI)	88				

NC - Not Collected

ROUTE: 0100 RED HILL ROAD



PCR Poor (<=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.

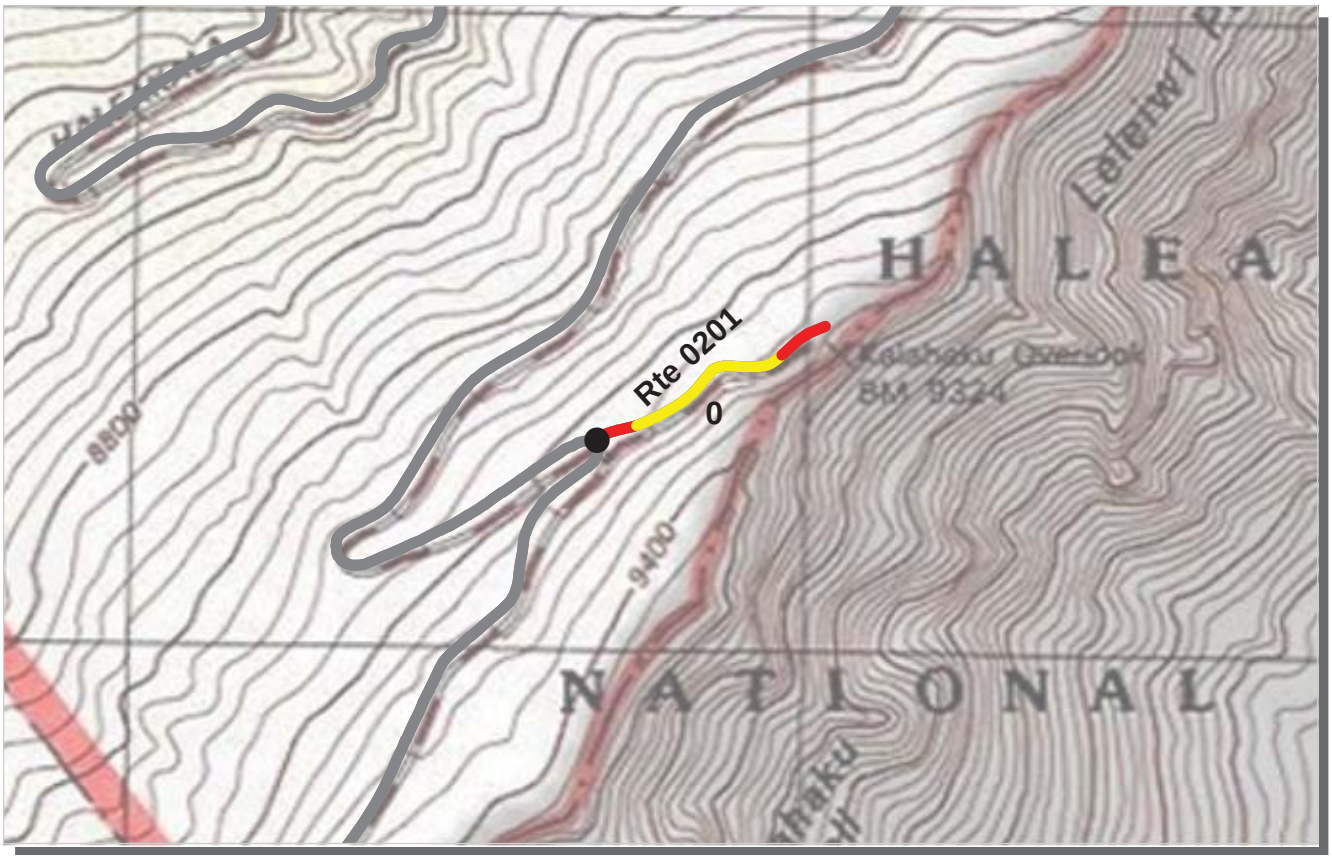
ROUTE: 0200 MAGNETIC PEAK SPUR ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 0.21 Miles**

Section Number	0				
Section Length (mi)	0.21				
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	18				
Lane Width (ft)	8				
Shoulder Width Right (ft)	NC				
Shoulder Width Left (ft)	NC				
Roadway Condition Information					
SCR (Surface Condition Rating)	92				
PCR (Pavement Condition Rating)	86				
Distress Index Values					
Alligator Cracking Index	100				
Longitudinal Cracking Index	100				
Tranverse Cracking Index	98				
Patching Index	100				
Rutting Index	93				
Roughness Condition Index (RCI)	78				

NC - Not Collected

ROUTE: 0200 MAGNETIC PEAK SPUR ROAD



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

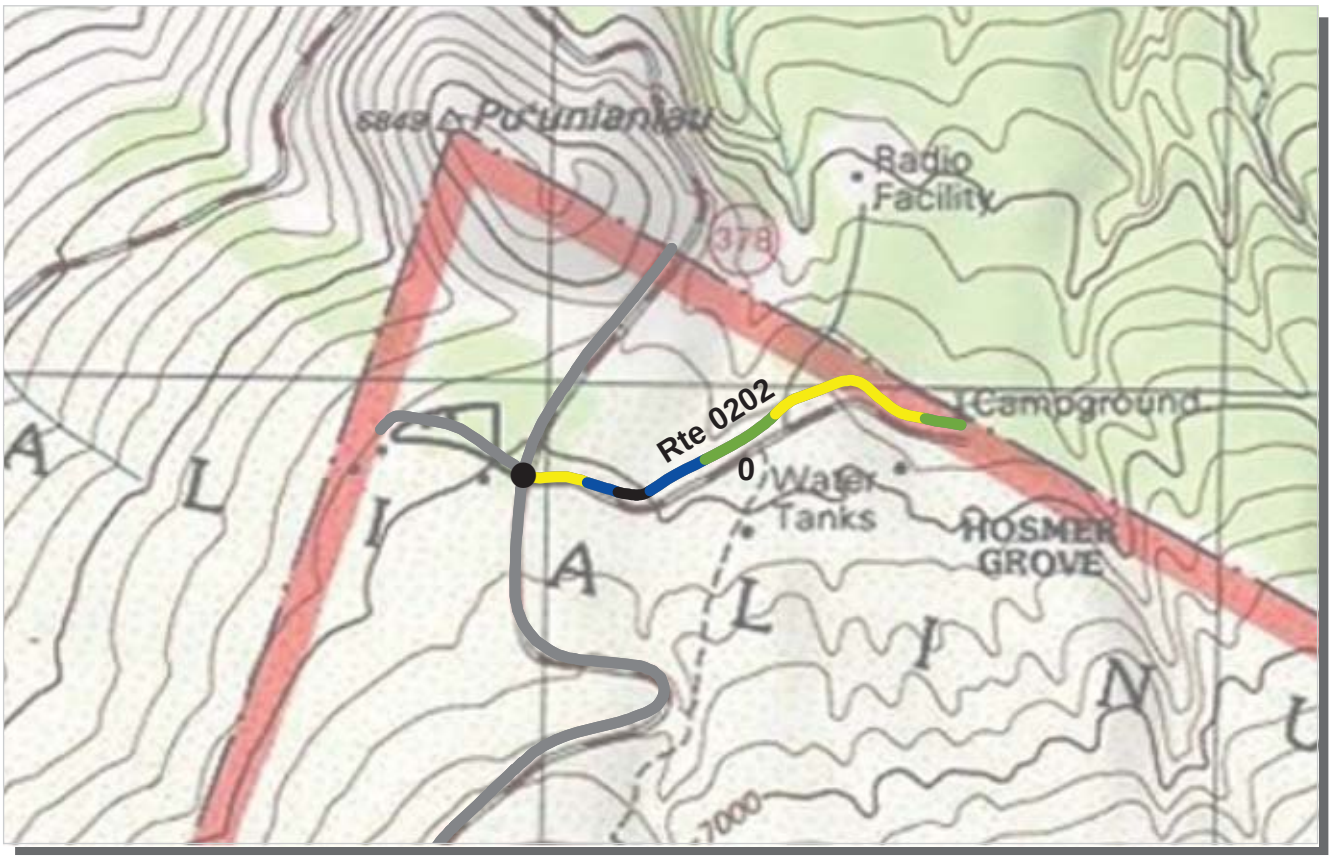
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0201 KALAHAKU OVERLOOK ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 0.25 Miles**

Section Number	0				
Section Length (mi)	0.25				
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	22				
Lane Width (ft)	10				
Shoulder Width Right (ft)	NC				
Shoulder Width Left (ft)	NC				
Roadway Condition Information					
SCR (Surface Condition Rating)	60				
PCR (Pavement Condition Rating)	65				
Distress Index Values					
Alligator Cracking Index	100				
Longitudinal Cracking Index	99				
Tranverse Cracking Index	96				
Patching Index	100				
Rutting Index	64				
Roughness Condition Index (RCI)	78				

NC - Not Collected



PCR Poor (<=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.

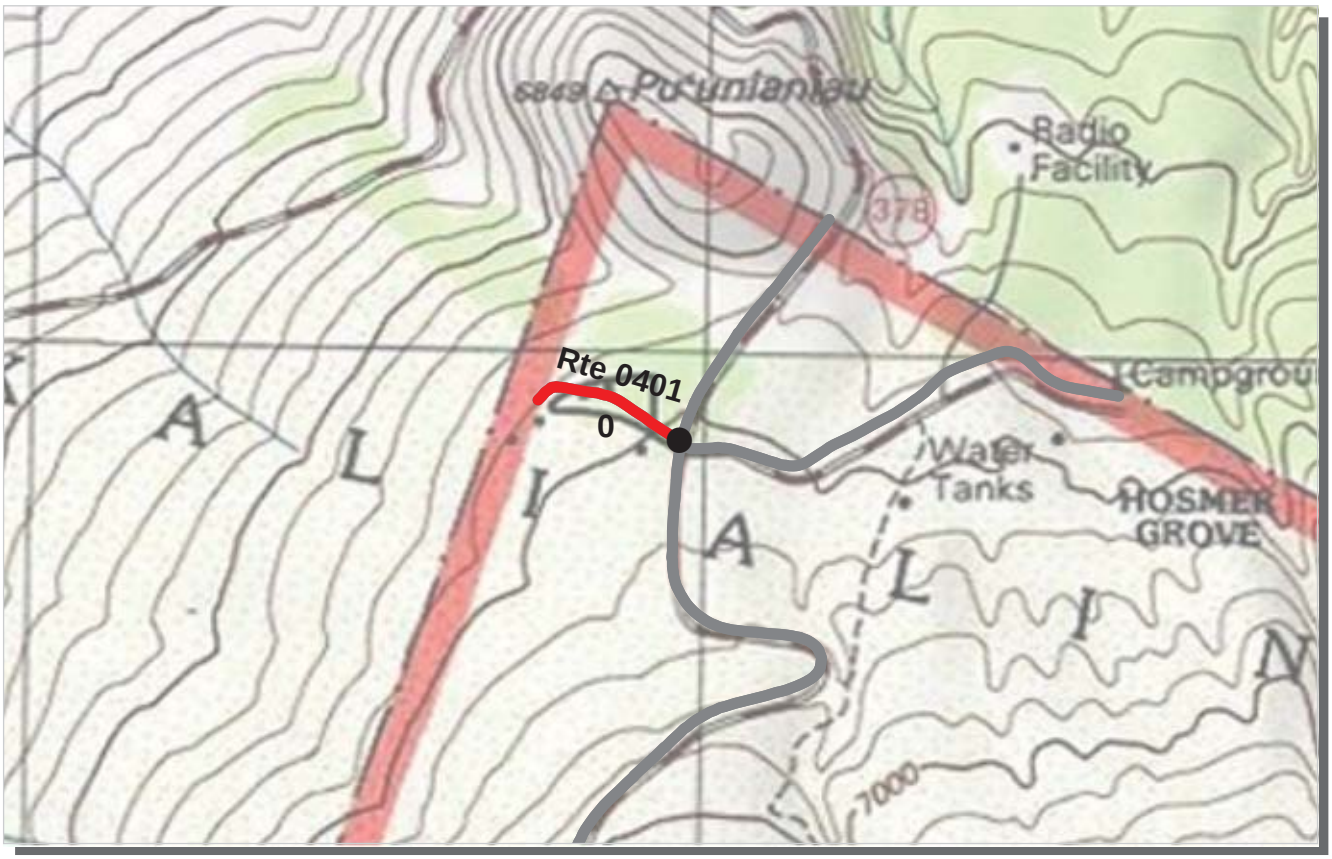
ROUTE: 0202 HOSMER GROVE ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 0.46 Miles**

Section Number	0				
Section Length (mi)	0.46				
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	18				
Lane Width (ft)	9				
Shoulder Width Right (ft)	NC				
Shoulder Width Left (ft)	NC				
Roadway Condition Information					
SCR (Surface Condition Rating)	92				
PCR (Pavement Condition Rating)	86				
Distress Index Values					
Alligator Cracking Index	100				
Longitudinal Cracking Index	100				
Tranverse Cracking Index	100				
Patching Index	100				
Rutting Index	92				
Roughness Condition Index (RCI)	65				

NC - Not Collected

ROUTE: 0202 HOSMER GROVE ROAD



PCR Poor (<=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 PU'U NIANIAU ROAD
HALE : HALEAKALA NATIONAL PARK

COLLECTED: 6/5/2008
PACIFIC WEST REGION **TOTAL LENGTH: 0.15 Miles**

Section Number	0				
Section Length (mi)	0.15				
Traffic					
AADT	Traffic data may be found at www.efl.fhwa.dot.gov Click on PROGRAMS / NPS Traffic Data (Note: Not all parks have traffic data)				
SADT					
ADT Date					
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	12				
Lane Width (ft)	12				
Shoulder Width Right (ft)	NC				
Shoulder Width Left (ft)	NC				
Roadway Condition Information					
SCR (Surface Condition Rating)	4				
PCR (Pavement Condition Rating)	7				
Distress Index Values					
Alligator Cracking Index	15				
Longitudinal Cracking Index	97				
Tranverse Cracking Index	80				
Patching Index	100				
Rutting Index	73				
Roughness Condition Index (RCI)	44				

NC - Not Collected

ROUTE: 0401 PU'U NIANIAU ROAD

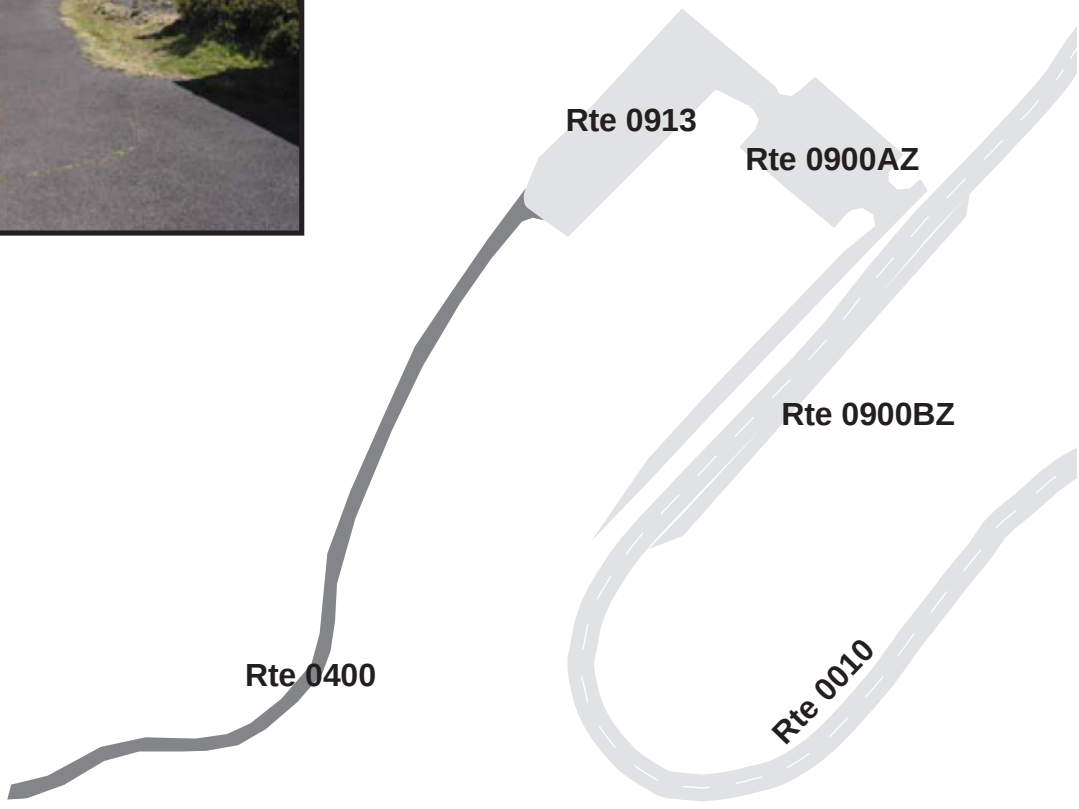
Haleakala National Park

Section 6
Manually Rated Paved Route Condition Rating Sheets (MRR)

HALEAKALA NATIONAL PARK
Route 0400
HEADQUARTERS RESIDENCE ROAD
FROM ROUTE 0913 (HEADQUARTERS EMPLOYEE PARKING LOT)
TO END

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0400	NONPUBLIC	3/7/2008		6,454	0.11	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	3	NO CURB AND GUTTER	NO CURB	FAIR/73

* Lane miles are based on 11' lane widths



190 95 0 190
Feet

N

HALEAKALA NATIONAL PARK
Route 0402
PU'U NIANIAU RESIDENCE ROAD
FROM ROUTE 0401 (PU'U NIANIAU ROAD) AT MP 0.04 (ON RIGHT)
TO END OF LOOP

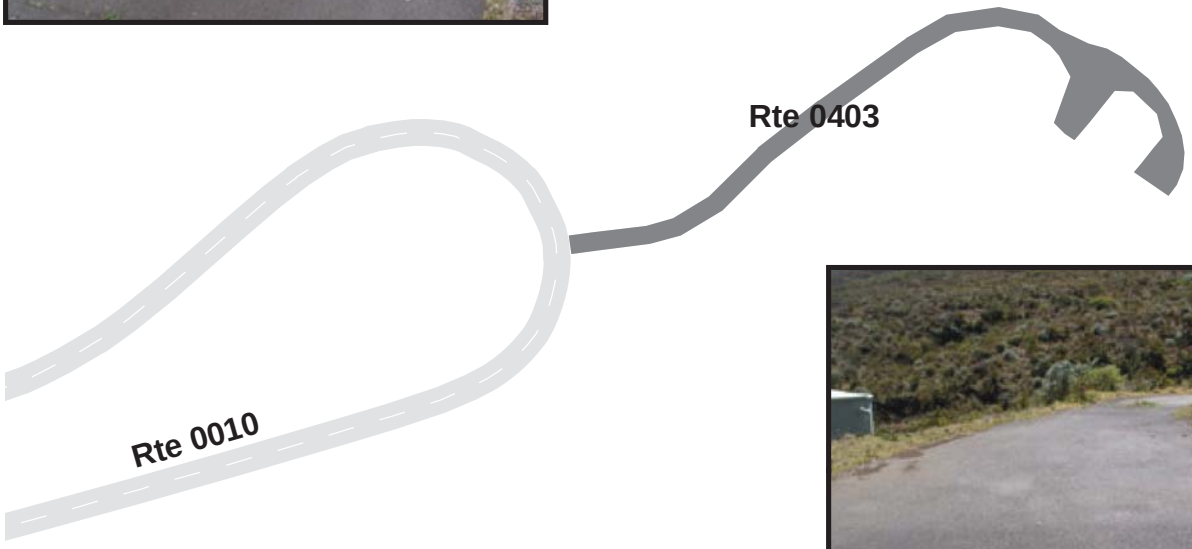
Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0402	NONPUBLIC	3/7/2008		9,842	0.17	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	1	NO CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths

HALEAKALA NATIONAL PARK
Route 0403
WATER CATCHMENT ROAD
FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 2.27 (ON LEFT)
TO WATER TANKS

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0403	NONPUBLIC	3/7/2008		7,169	0.12	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
1	0	1	0	NO CURB AND GUTTER	NO CURB	FAIR/73

* Lane miles are based on 11' lane widths



170 85 0 170
Feet

Haleakala National Park

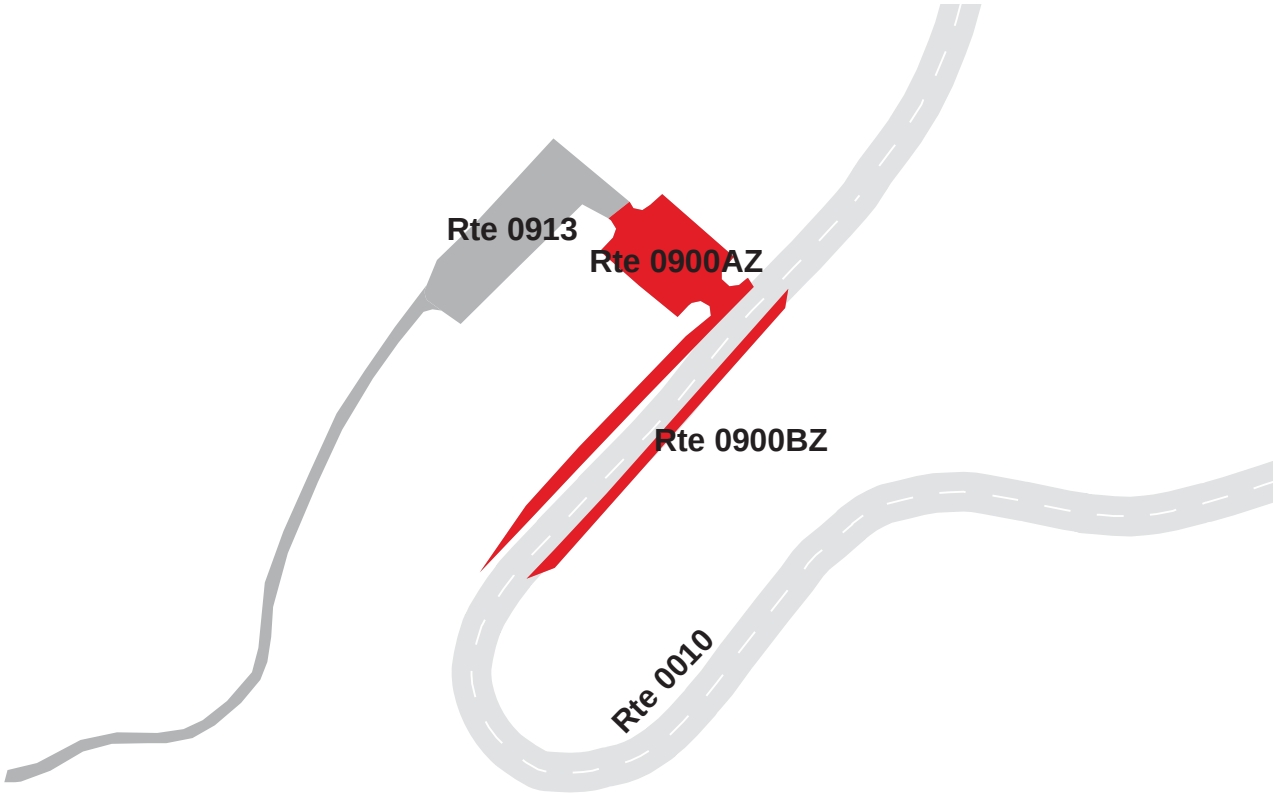
Section 7
Parking Area Condition Rating Sheets

HALEAKALA NATIONAL PARK
Route 0900ZZ
PARK HEADQUARTERS PARKING AREAS
ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.04 (ON LEFT AND RIGHT)

Summary Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0900ZZ	PUBLIC	3/7/2008		14,133	0.24	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	2	0	1	CONCRETE CURB AND GUTTER	NO CURB	SUMMARY/90

* Lane miles are based on 11' lane widths



240 120 0 240
Feet

N

HALEAKALA NATIONAL PARK
Route 0900AZ

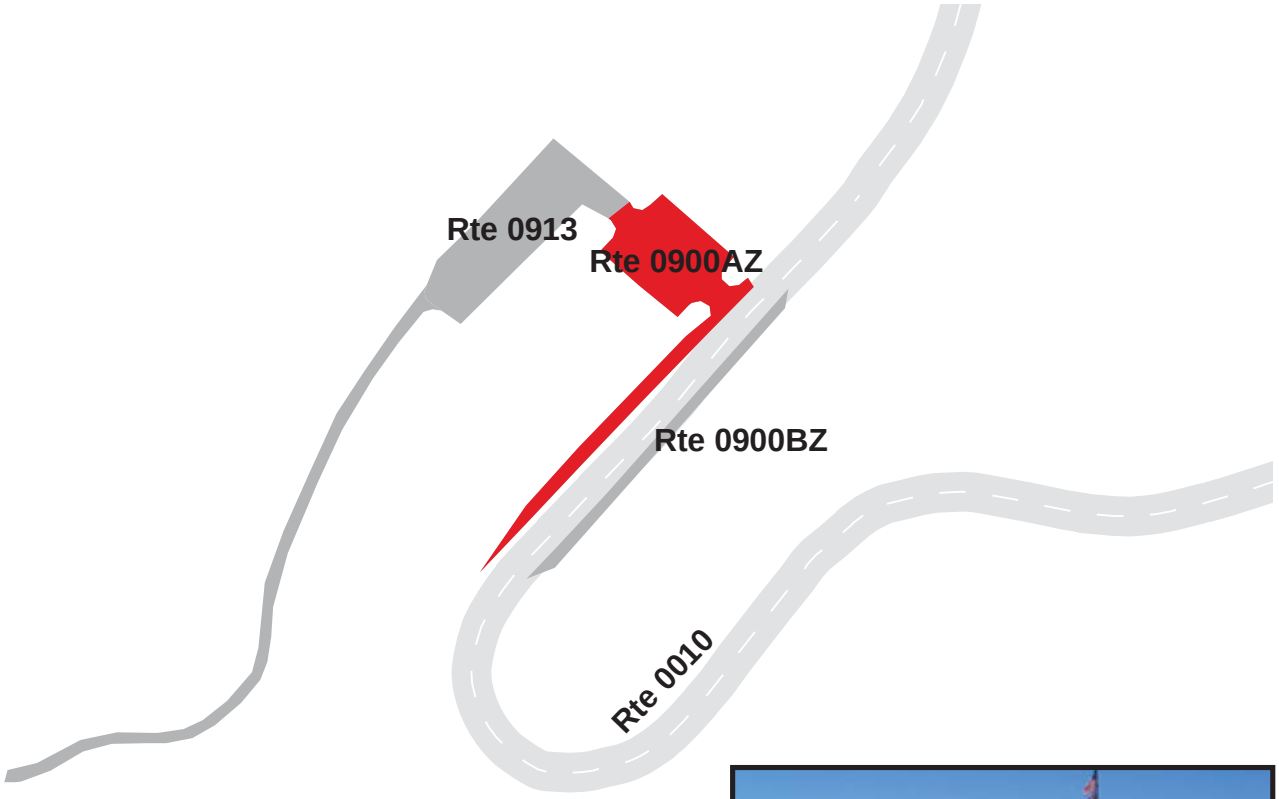
PARK HEADQUARTERS PARKING A

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

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0900AZ	PUBLIC	3/7/2008		11,074	0.19	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	2	0	1	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths



240 120 0 240
Feet

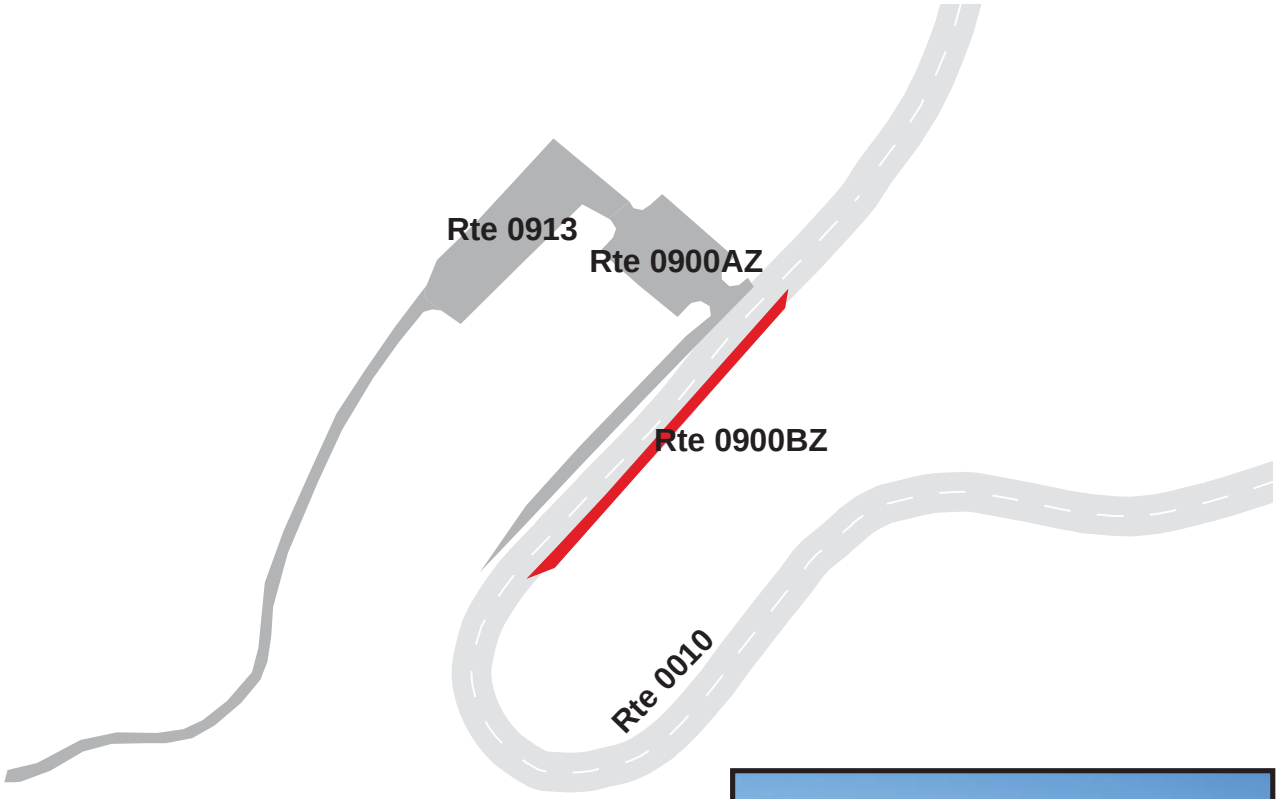
N

HALEAKALA NATIONAL PARK
Route 0900BZ
PARK HEADQUARTERS PARKING B
ADJACENT TO ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 1.06 (ON LEFT)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0900BZ	PUBLIC	3/7/2008		3,059	0.05	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths

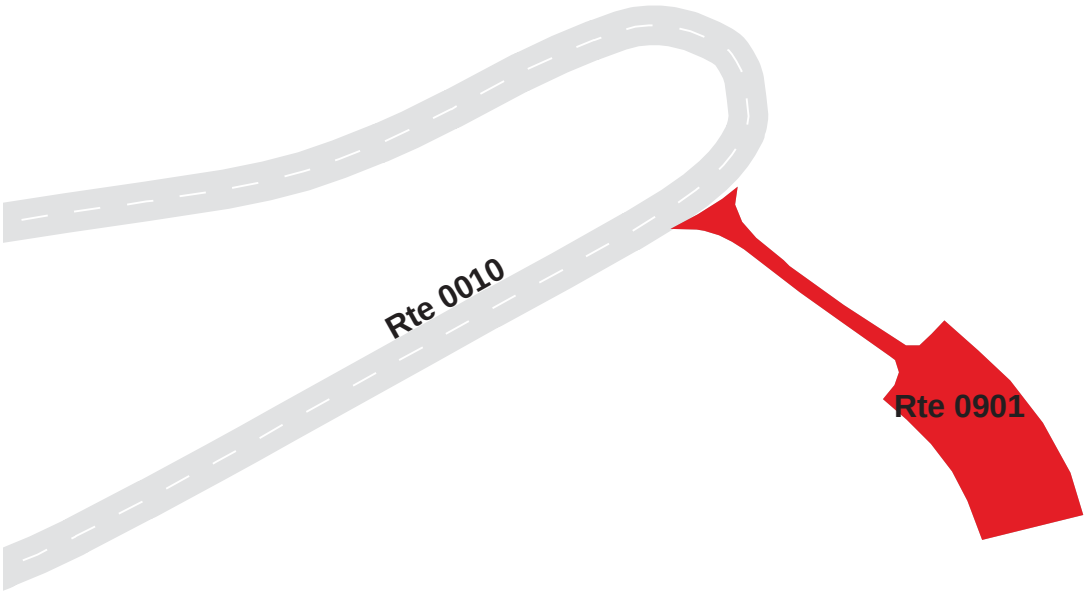


240 120 0 240
Feet

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 / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0901	PUBLIC	3/7/2008		12,041	0.21	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	FAIR/73

* Lane miles are based on 11' lane widths

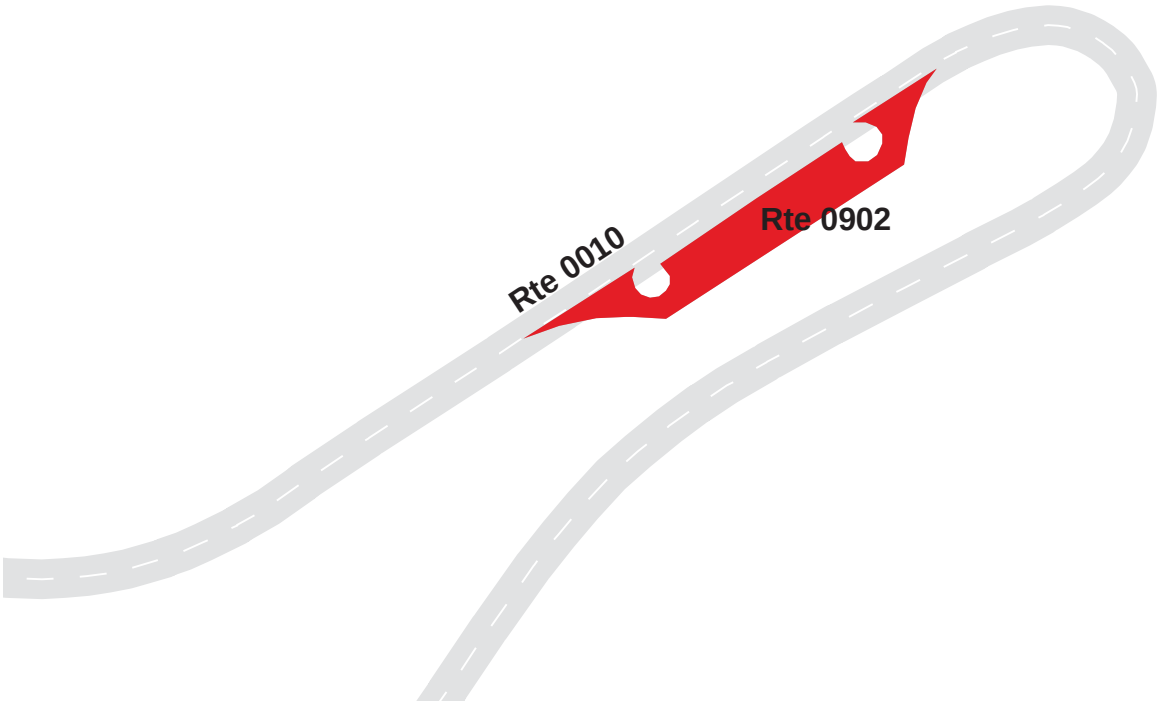


170 85 0 170
Feet

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 / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0902	PUBLIC	3/7/2008		8,290	0.14	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	ASPHALT CURB	FAIR/73

* Lane miles are based on 11' lane widths

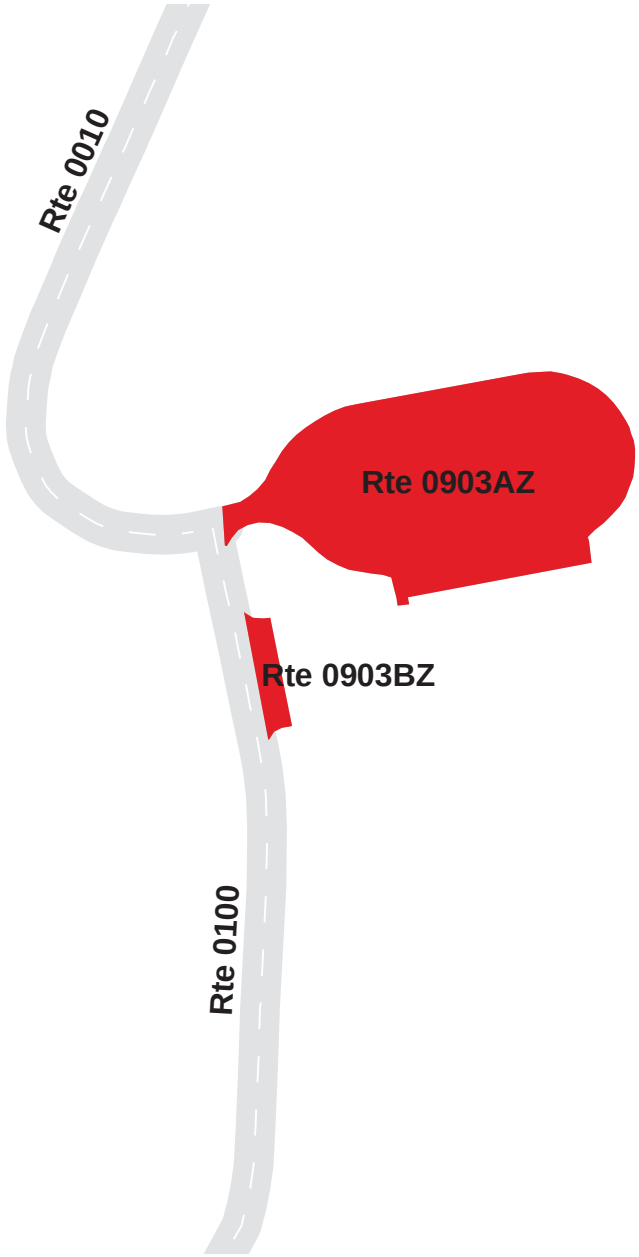


190 95 0 190
Feet

HALEAKALA NATIONAL PARK
Route 0903ZZ
HALEAKALA VISITOR CENTER PARKING AREAS (CRATER RIM)
FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT END AND BEGINING OF ROUTE 0100
TO PARKING
Summary Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0903ZZ	PUBLIC	3/7/2008		46,548	0.80	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	NO CURB AND GUTTER	NO CURB	SUMMARY/90

* Lane miles are based on 11' lane widths

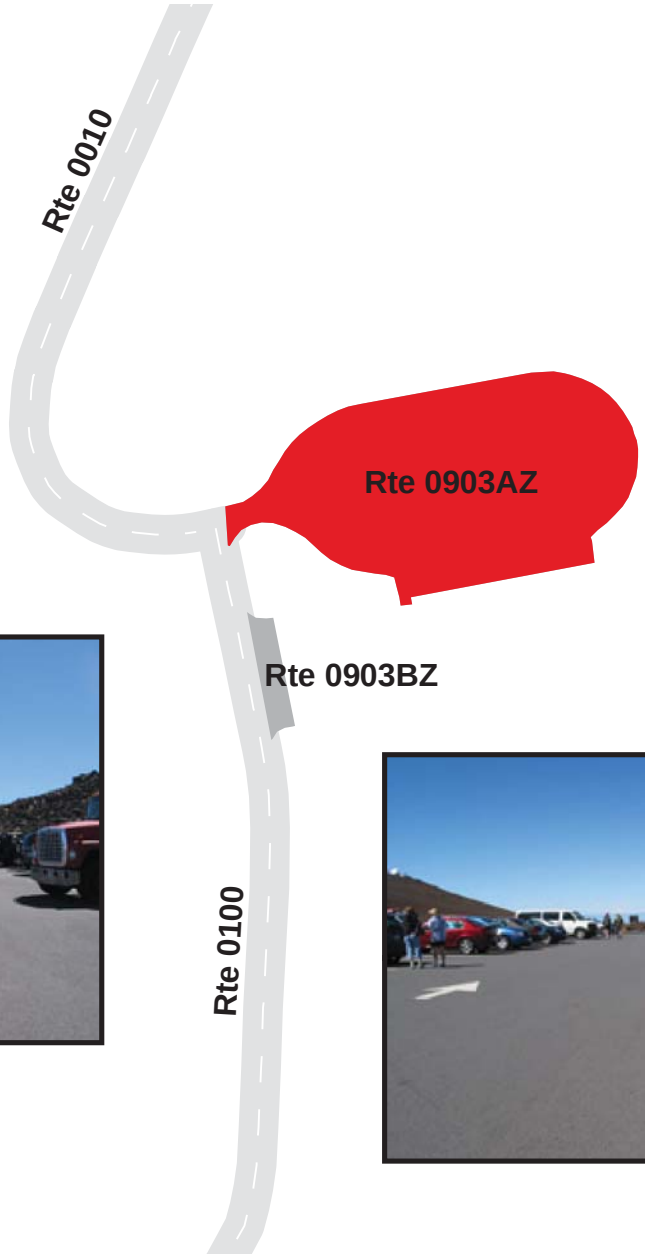


240 120 0 240
Feet

HALEAKALA NATIONAL PARK
Route 0903AZ
HALEAKALA VISITOR CENTER PARKING A (CRATER RIM)
FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT END
TO PARKING
Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0903AZ	PUBLIC	3/7/2008		44,491	0.77	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths

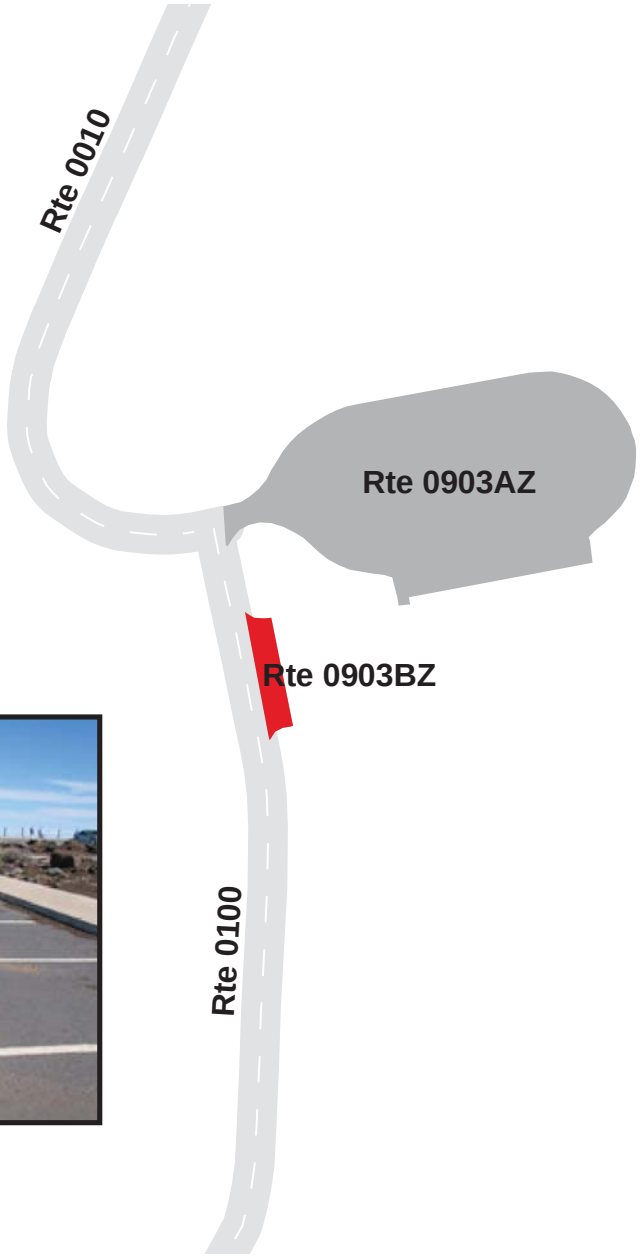


HALEAKALA NATIONAL PARK
Route 0903BZ
HALEAKALA VISITOR CENTER PARKING B (CRATER RIM)
ADJACENT TO ROUTE 0100 (RED HILL ROAD) AT MP 0.02 (ON LEFT)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0903BZ	PUBLIC	3/7/2008		2,057	0.04	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	NO CURB AND GUTTER	CONCRETE CURB	GOOD/90

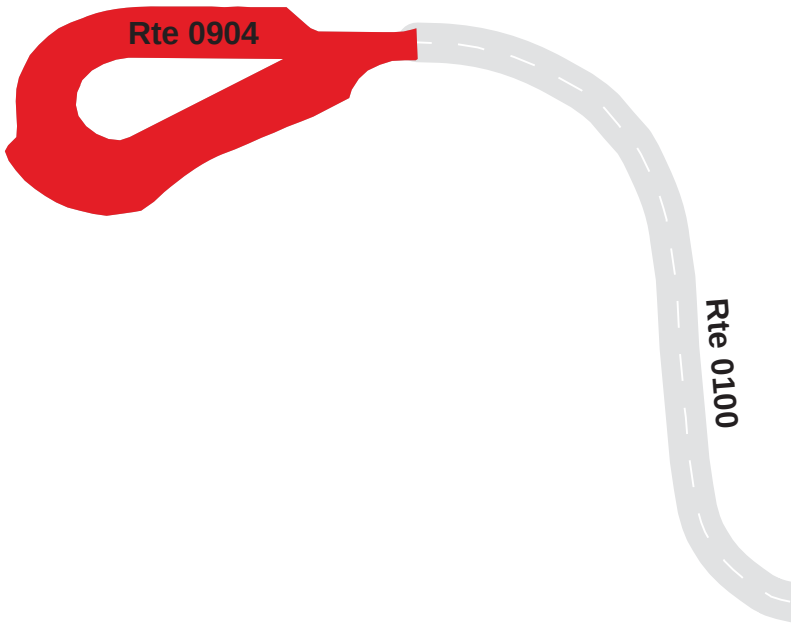
* Lane miles are based on 11' lane widths



HALEAKALA NATIONAL PARK
Route 0904
PU'U'ULA'ULA SUMMIT PARKING
FROM ROUTE 0100 (RED HILL ROAD) AT END
TO PARKING

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0904	NONPUBLIC	3/7/2008		22,617	0.39	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths

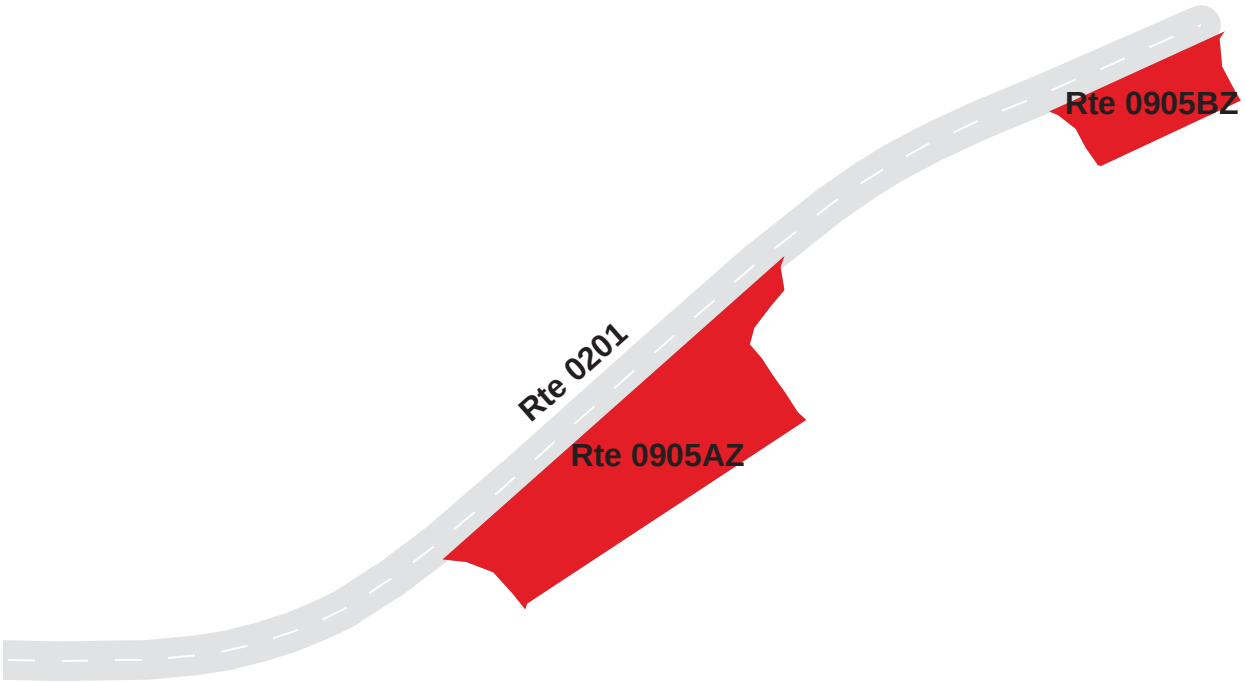


180 90 0 180
Feet

HALEAKALA NATIONAL PARK
Route 0905ZZ
KALAHAKU OVERLOOK PARKING AREAS
FROM ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20 (ON RIGHT)
TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24 (ON RIGHT)
Summary Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0905ZZ	PUBLIC	3/7/2008		5,366	0.09	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	SUMMARY/90

* Lane miles are based on 11' lane widths



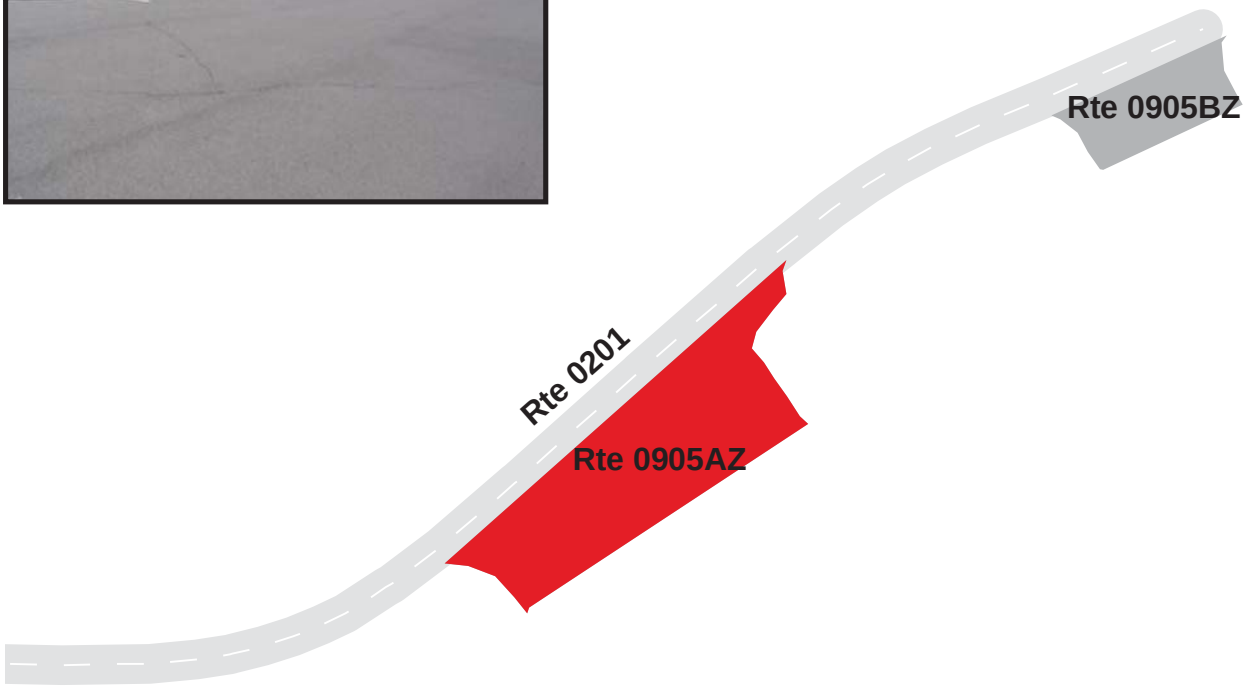
90 45 0 90 Feet

HALEAKALA NATIONAL PARK
Route 0905AZ
KALAHAKU OVERLOOK PARKING A
ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.20 (ON RIGHT)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0905AZ	PUBLIC	3/7/2008		4,195	0.07	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths



90 45 0 90
Feet

HALEAKALA NATIONAL PARK
Route 0905BZ
KALAHAKU OVERLOOK PARKING B
ADJACENT TO ROUTE 0201 (KALAHAKU OVERLOOK ROAD) AT MP 0.24 (ON RIGHT)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0905BZ	PUBLIC	3/7/2008		1,171	0.02	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	CONCRETE CURB AND GUTTER	NO CURB	GOOD/90

* Lane miles are based on 11' lane widths

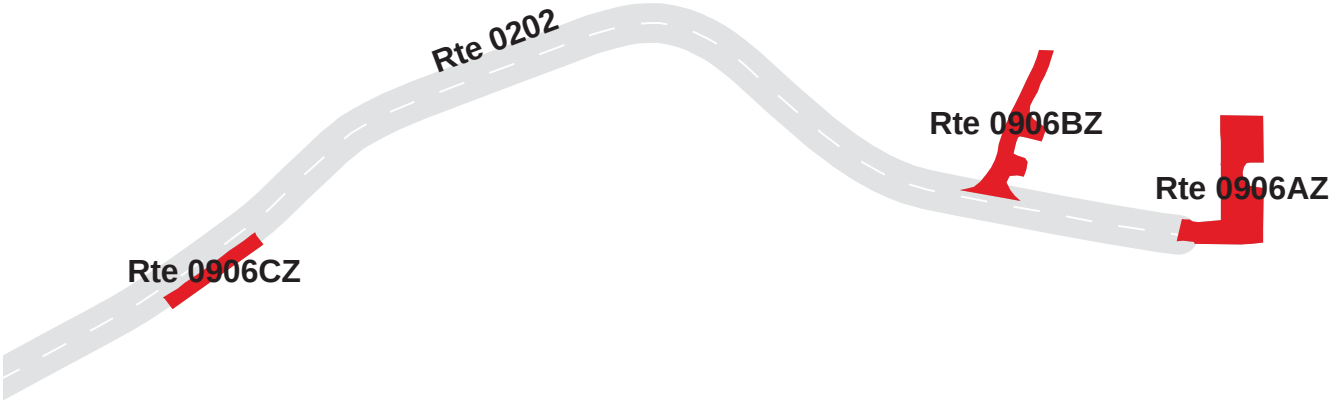
90 45 0 90
Feet

HALEAKALA NATIONAL PARK
Route 0906ZZ
HOSMER GROVE PARKING AREAS
ADJACENT TO AND AT END OF ROUTE 0202 (HOSMER GROVE ROAD)

Summary Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0906ZZ	PUBLIC	3/7/2008		12,434	0.22	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	NO CURB AND GUTTER	NO CURB	SUMMARY/93.25

* Lane miles are based on 11' lane widths

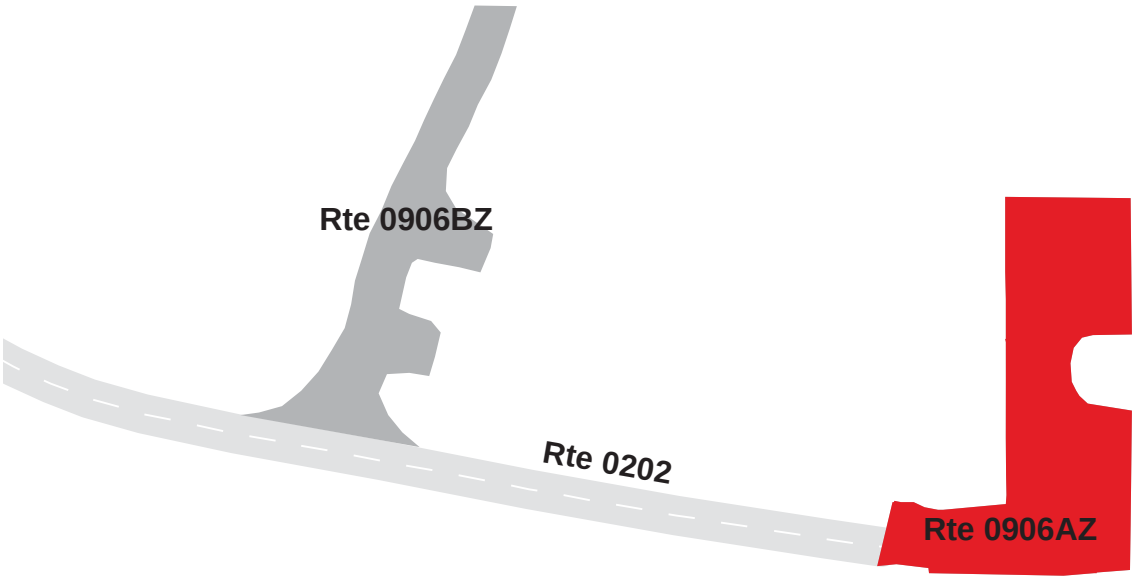


300 150 0 300
Feet

HALEAKALA NATIONAL PARK
Route 0906AZ
HOSMER GROVE PARKING A
FROM ROUTE 0202 (HOSMER GROVE ROAD) AT END
TO PARKING
Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0906AZ	PUBLIC	3/7/2008		6,660	0.12	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	NO CURB AND GUTTER	CONCRETE CURB	GOOD/90

* Lane miles are based on 11' lane widths



HALEAKALA NATIONAL PARK
Route 0906BZ
HOSMER GROVE PARKING B

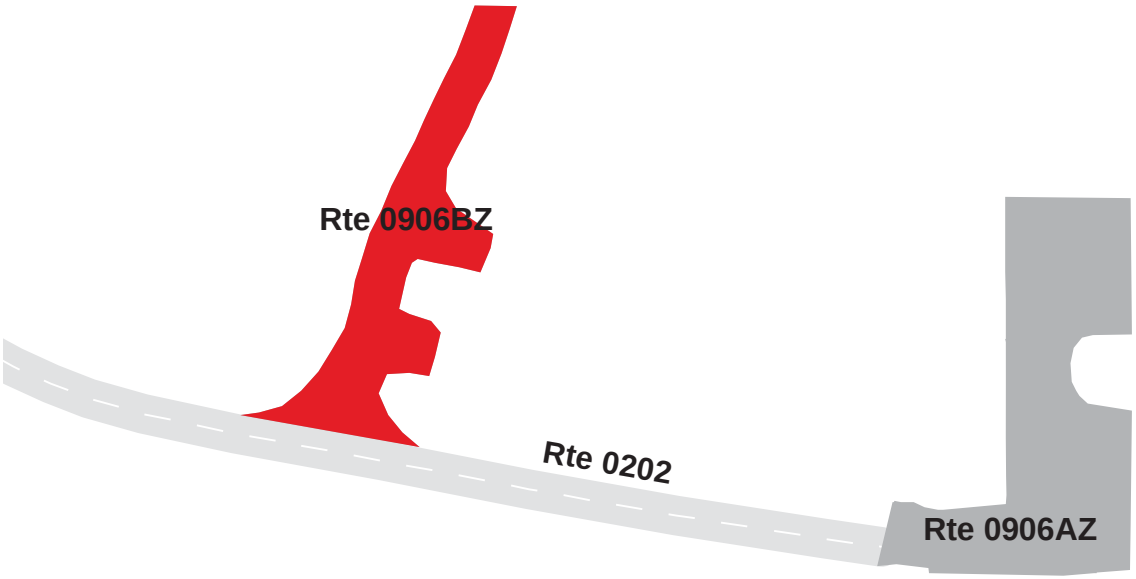
FROM ROUTE 0202 (HOSMER GROVE ROAD) AT MP 0.42 (ON LEFT)

TO PARKING

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0906BZ	PUBLIC	3/7/2008		3,997	0.07	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	NO CURB AND GUTTER	CONCRETE CURB	EXCELLENT/97

* Lane miles are based on 11' lane widths



HALEAKALA NATIONAL PARK
Route 0906CZ
HOSMER GROVE PARKING C
ADJACENT TO ROUTE 0202 (HOSMER GROVE ROAD) AT MP 0.23 (ON RIGHT)

Subcomponent Record

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0906CZ	PUBLIC	3/7/2008		1,778	0.03	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	0	NO CURB AND GUTTER	CONCRETE CURB	EXCELLENT/97

* Lane miles are based on 11' lane widths

100 50 0 100
Feet

HALEAKALA NATIONAL PARK
Route 0908
PU'U NIANIAU RESIDENCE PARKING
FROM ROUTE 0402 (PU'U NIANIAU RESIDENCE ROAD) AT END
TO PARKING

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0908	NONPUBLIC	3/7/2008		1,013	0.02	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	1	NO CURB AND GUTTER	NO CURB	EXCELLENT/97

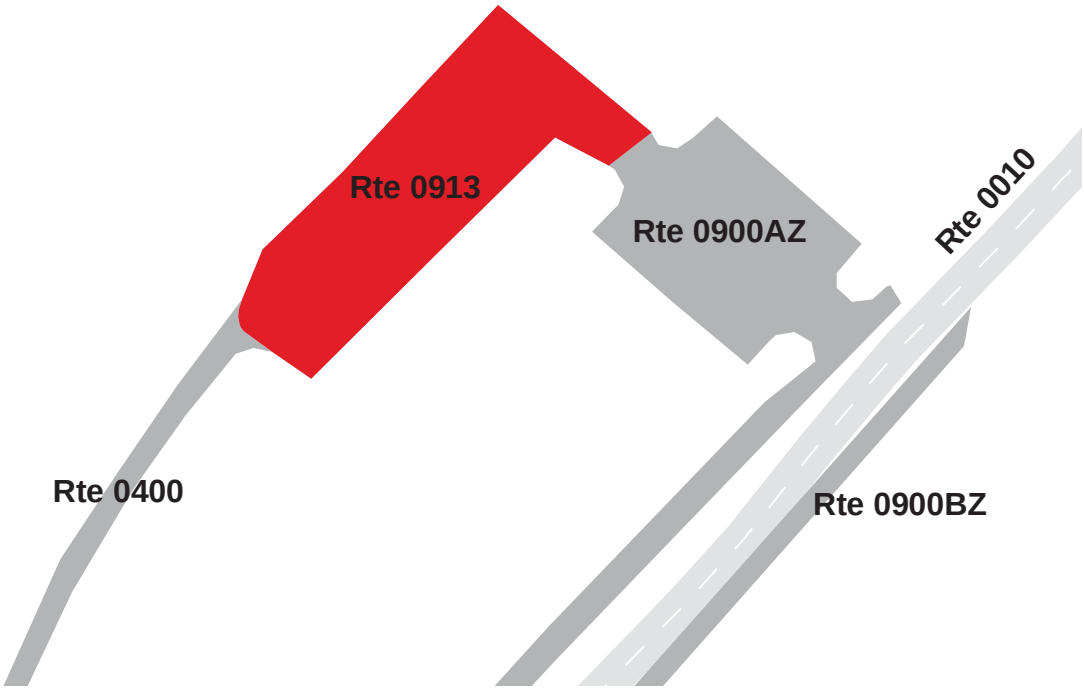
* Lane miles are based on 11' lane widths

60 30 0 60
Feet

HALEAKALA NATIONAL PARK
Route 0913
HEADQUARTERS EMPLOYEE PARKING LOT
FROM ROUTE 0900AZ (PARK HEADQUARTERS PARKING A)
TO ROUTE 0400 (HEADQUARTERS RESIDENCE ROAD)

Route Number	Public / NonPublic	Date Visited		Area (sq ft)	Lane Miles *	Surface Type
0913	PUBLIC	3/7/2008		10,523	0.18	AS
Culverts	**Drop Inlets**	**Gates**	**Fire Hydrants**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	2	NO CURB AND GUTTER	CONCRETE CURB	GOOD/90

* Lane miles are based on 11' lane widths



Haleakala National Park

Section 8
Parkwide / Route Maintenance
Features Summaries

HALE: PARKWIDE MAINTENANCE FEATURES SUMMARY

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 4, therefore the culvert and drop inlet count below includes those on ARAN-driven routes, Manually Rated Routes and in Paved Parking Areas.

FEATURE	LINEAR FEET	COUNT
BARRIER	797	--
BOLLARD	0	--
BRIDGE	--	1
CABLE	0	--
CATTLE GUARD	--	0
CULVERT	--	91
CURB	57,911	--
DROP INLET	--	4
FIRE HYDRANT	--	10
GATE	--	5
GUARD/GUIDE RAIL	0	--
GUARD/GUIDE WALL	797	--
INTERSECTION	--	36
LOW WATER CROSSING	42	1
MILE MARKER	--	18
OVERPASS	--	0
OVERHEAD SIGN	--	0
PARK BOUNDARY	--	2
PAVED DITCH	871	--
PULLOUT	--	8
RAILROAD CROSSING	--	0
RETAINING WALL	--	0
SIGN	--	144
STATE BOUNDARY	--	0
TEMPORARY BARRIER	0	--
TRAFFIC LIGHT	--	0
TUNNEL	--	0
TURNOUT	0	--

HALE: ROUTE MAINTENANCE FEATURES SUMMARY

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 ROAD	ROUTE 0401 PU'U NIANIAU ROAD	UNIT
BARRIER	797	0	0	0	0	0	LINEAR FEET
BOLLARD	0	0	0	0	0	0	LINEAR FEET
BRIDGE	1	0	0	0	0	0	EACH
CABLE	0	0	0	0	0	0	LINEAR FEET
CATTLE GUARD	0	0	0	0	0	0	EACH
CULVERT	86	0	1	3	0	0	EACH
CURB	52,008	5,364	0	491	48	0	LINEAR FEET
DROP INLET	1	1	0	0	0	0	EACH
FIRE HYDRANT	0	0	0	0	0	2	EACH
GATE	2	1	0	0	0	1	EACH
GUARD/GUIDE RAIL	0	0	0	0	0	0	LINEAR FEET
GUARD/GUIDE WALL	797	0	0	0	0	0	LINEAR FEET
INTERSECTION	12	5	4	5	6	4	EACH
LOW WATER CROSSING	0	0	0	0	1	0	EACH
LOW WATER CROSSING	0	0	0	0	42	0	LINEAR FEET
MILE MARKER	18	0	0	0	0	0	EACH
OVERHEAD SIGN	0	0	0	0	0	0	EACH
OVERPASS	0	0	0	0	0	0	EACH
PARK BOUNDARY	1	0	1	0	0	0	EACH
PAVED DITCH	871	0	0	0	0	0	LINEAR FEET
PULLOUT	8	0	0	0	0	0	EACH
RAILROAD CROSSING	0	0	0	0	0	0	EACH
RETAINING WALL	0	0	0	0	0	0	EACH
SIGN	123	6	5	2	6	2	EACH
STATE BOUNDARY	0	0	0	0	0	0	EACH
TEMPORARY BARRIER	0	0	0	0	0	0	LINEAR FEET
TRAFFIC LIGHT	0	0	0	0	0	0	EACH
TUNNEL	0	0	0	0	0	0	EACH
TURNOUT	0	0	0	0	0	0	LINEAR FEET

Notice: Culverts and drop inlets were marked by NPS and inventoried by RIP in Cycle 4, therefore the culvert and drop inlet count above includes those on ARAN-driven routes, Manually Rated Routes and in Paved Parking Areas.

HALE: STRUCTURE LIST

ROUTE NUMBER	FUNCTIONAL CLASS	MILEPOST START	MILEPOST END	FEATURE	STRUCTURE NUMBER
0010	1	1.614	1.626	BRIDGE	8290-001

Haleakala National Park

Section 9
Park Route Maintenance Features
Road Logs

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM NORTH PARK BOUNDARY
0.000	0.000	PARK BOUNDARY	N/A	
0.000	0.000	SIGN	RIGHT	REGULATORY, BEGIN STATE HIGHWAY
0.000	0.000	SIGN	RIGHT	WARNING, WATCH FOR BIKERS
0.000	0.000	INTERSECTION	N/A	PAVED ROUTE (HALEAKALA HIGHWAY)
0.007	0.078	CURB	RIGHT	
0.009	0.009	SIGN	RIGHT	GUIDE, ENTRANCE FEES
0.009	0.009	SIGN	RIGHT	GUIDE, PAY FEE AHEAD
0.031	0.069	PULLOUT	RIGHT	
0.068	0.068	SIGN	RIGHT	GUIDE, HALEAKALA NATIONAL PARK
0.078	0.078	SIGN	RIGHT	WARNING, STOP AHEAD
0.097	0.257	CURB	LEFT	
0.126	0.148	CURB	LEFT	
0.134	0.134	SIGN	LEFT	GUIDE, U.S. FEE AREA
0.136	0.136	SIGN	RIGHT	REGULATORY, STOP
0.136	0.136	SIGN	RIGHT	WARNING, NENE CROSSING
0.174	0.174	SIGN	RIGHT	GUIDE, STATION CLOSED PLEASE PAY HERE
0.193	0.193	SIGN	RIGHT	GUIDE, HOSMER GROVE CAMPGROUND
0.232	0.232	SIGN	RIGHT	WARNING, NENE CROSSING
0.232	0.232	SIGN	RIGHT	WARNING, NEXT 10 MILES
0.259	0.259	INTERSECTION	RIGHT	ROUTE 0401 (PU'U NIANIAU ROAD)
0.263	0.263	INTERSECTION	LEFT	ROUTE 0202 (HOSMER GROVE ROAD)
0.273	0.273	GATE	N/A	
0.298	0.298	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
0.325	0.325	SIGN	RIGHT	GUIDE, HOSMER GROVE CAMPGROUND
0.338	0.338	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
0.351	0.496	CURB	LEFT	
0.398	0.398	SIGN	RIGHT	GUIDE, WILDERNESS CAMPING PERMITS NEXT RIGHT
0.453	0.453	SIGN	RIGHT	REGULATORY, REDUCED SPEED AHEAD
0.465	0.465	SIGN	RIGHT	GUIDE, TURN ON HEADLIGHTS IN CLOUDS
0.489	0.489	SIGN	RIGHT	WARNING, 20 M.P.H.
0.489	0.489	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.489	0.656	CURB	RIGHT	
0.518	0.518	CULVERT	N/A	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.540	0.540	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.548	0.548	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.556	0.556	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.564	0.564	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.571	0.571	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.583	0.583	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.593	0.593	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.602	0.602	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.613	0.613	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.625	0.625	CULVERT	N/A	
0.641	0.737	CURB	LEFT	
0.650	0.650	SIGN	RIGHT	WARNING, 20 M.P.H.
0.650	0.650	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.725	0.725	CULVERT	N/A	
0.773	0.773	SIGN	RIGHT	GUIDE, VISITOR CENTER HEADQUARTERS RIGHT 0.3 MILES
0.780	0.780	MILE MARKER	RIGHT	
0.780	0.780	MILE MARKER	RIGHT	
0.806	0.806	CULVERT	N/A	
0.841	0.841	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.871	0.871	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.871	0.871	SIGN	RIGHT	WARNING, PED XING
0.880	0.880	CULVERT	N/A	
0.900	0.900	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
0.907	1.027	CURB	RIGHT	
0.918	0.937	CURB	LEFT	
0.925	0.925	SIGN	RIGHT	GUIDE, ELEV. 7000 FEET
0.964	0.964	CULVERT	N/A	
0.988	0.988	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
1.006	1.006	CULVERT	N/A	
1.025	1.025	SIGN	RIGHT	REGULATORY, PARKING
1.031	1.031	INTERSECTION	RIGHT	ROUTE 0900AZ (PARK HEADQUARTERS PARKING A)
1.032	1.032	SIGN	RIGHT	REGULATORY, PARKING
1.034	1.080	CURB-AND-GUTTER	RIGHT	
1.055	1.055	INTERSECTION	LEFT	ROUTE 0900BZ (PARK HEADQUARTERS PARKING B)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
1.081	1.081	GATE	N/A	
1.086	1.086	SIGN	RIGHT	WARNING, 20 M.P.H.
1.086	1.086	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
1.097	1.157	CURB	LEFT	
1.156	1.156	CULVERT	N/A	
1.161	1.187	CURB	LEFT	
1.170	1.232	CURB	RIGHT	
1.173	1.173	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
1.173	1.173	SIGN	RIGHT	WARNING, PED XING
1.187	1.187	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
1.200	1.200	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
1.220	1.245	CURB	LEFT	
1.225	1.225	SIGN	RIGHT	REGULATORY, SPEED LIMIT 15
1.239	1.239	CULVERT	N/A	
1.244	1.244	SIGN	RIGHT	WARNING, FALLING ROCK
1.247	1.344	CURB	LEFT	
1.294	1.294	CULVERT	N/A	
1.326	1.326	SIGN	RIGHT	GUIDE, VISITOR CENTER HEADQUARTERS LEFT 0.3 MILES
1.339	1.415	CURB	RIGHT	
1.360	1.360	CULVERT	N/A	
1.412	1.412	CULVERT	N/A	
1.415	1.499	PAVED DITCH	RIGHT	
1.437	1.453	GUARD/GUIDE WALL	LEFT	
1.437	1.454	PULLOUT	LEFT	
1.445	1.445	SIGN	LEFT	REGULATORY, NO STOPPING
1.499	1.564	CURB	RIGHT	
1.549	1.611	CURB	LEFT	
1.558	1.558	SIGN	RIGHT	WARNING, NARROW BRIDGE
1.612	1.626	GUARD/GUIDE WALL	LEFT	
1.612	1.612	SIGN	LEFT	WARNING, GRAPHIC SIGN, NO TEXT
1.613	1.613	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
1.613	1.627	GUARD/GUIDE WALL	RIGHT	
1.614	1.626	BRIDGE	N/A	8290-001 (HALEAKALA HIGHWAY BRIDGE)
1.626	1.654	CURB	LEFT	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
1.627	1.627	SIGN	LEFT	WARNING, GRAPHIC SIGN, NO TEXT
1.627	1.627	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
1.646	1.708	CURB	RIGHT	
1.650	1.650	CULVERT	N/A	
1.682	1.682	SIGN	RIGHT	WARNING, NARROW BRIDGE
1.706	1.706	CULVERT	N/A	
1.708	1.746	PAVED DITCH	RIGHT	
1.756	1.817	CURB	LEFT	
1.773	1.773	CULVERT	N/A	
1.795	2.002	CURB	RIGHT	
1.843	1.843	MILE MARKER	RIGHT	
1.845	1.845	MILE MARKER	RIGHT	
1.856	1.856	CULVERT	N/A	
1.985	2.070	CURB	LEFT	
1.996	1.996	CULVERT	N/A	
2.062	2.062	CULVERT	N/A	
2.062	2.143	CURB	RIGHT	
2.116	2.116	CULVERT	N/A	
2.126	2.216	CURB	LEFT	
2.198	2.198	CULVERT	N/A	
2.198	2.270	CURB	RIGHT	
2.205	2.205	SIGN	RIGHT	WARNING, 20 M.P.H.
2.205	2.205	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
2.250	2.250	CULVERT	N/A	
2.269	2.269	INTERSECTION	LEFT	ROUTE 0403 (WATER CATCHMENT ROAD)
2.277	2.348	CURB	RIGHT	
2.323	2.426	CURB	LEFT	
2.329	2.329	CULVERT	N/A	
2.355	2.355	SIGN	RIGHT	WARNING, 20 M.P.H.
2.355	2.355	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
2.426	2.426	CULVERT	N/A	
2.429	2.502	CURB	LEFT	
2.488	2.649	CURB	RIGHT	
2.499	2.499	CULVERT	N/A	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
2.502	2.539	PAVED DITCH	LEFT	
2.581	2.581	CULVERT	N/A	
2.601	2.793	CURB	LEFT	
2.625	2.625	CULVERT	N/A	
2.698	2.698	SIGN	RIGHT	WARNING, ICE ON ROAD
2.793	2.793	CULVERT	N/A	
2.799	2.871	CURB	LEFT	
2.855	2.855	MILE MARKER	RIGHT	
2.855	2.855	MILE MARKER	RIGHT	
2.858	3.030	CURB	RIGHT	
2.914	2.914	CULVERT	N/A	
2.920	2.920	SIGN	RIGHT	WARNING, SLOW VEHICLES MUST USE TURN OUT
2.944	2.944	CULVERT	N/A	
2.959	2.995	PULLOUT	RIGHT	
2.962	2.996	PULLOUT	LEFT	
2.976	2.976	SIGN	RIGHT	REGULATORY, NO PARKING ANY TIME
2.996	2.996	SIGN	RIGHT	WARNING, NENE CROSSING
3.001	3.207	CURB	LEFT	
3.041	3.041	SIGN	RIGHT	WARNING, SLOW VEHICLES MUST USE TURN OUT
3.201	3.299	CURB	RIGHT	
3.214	3.214	CULVERT	N/A	
3.259	3.492	CURB	LEFT	
3.342	3.342	SIGN	RIGHT	WARNING, 20 M.P.H.
3.342	3.342	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
3.353	3.353	CULVERT	N/A	
3.418	3.418	CULVERT	N/A	
3.485	3.775	CURB	RIGHT	
3.512	3.512	SIGN	RIGHT	WARNING, 20 M.P.H.
3.512	3.512	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
3.517	3.517	CULVERT	N/A	
3.591	3.591	CULVERT	N/A	
3.707	3.707	CULVERT	N/A	
3.753	3.854	CURB	LEFT	
3.798	3.798	CULVERT	N/A	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
3.810	4.047	CURB	RIGHT	
3.870	3.870	CULVERT	N/A	
3.881	3.881	MILE MARKER	RIGHT	
3.881	3.881	MILE MARKER	RIGHT	
3.977	3.977	CULVERT	N/A	
4.034	4.125	CURB	LEFT	
4.109	4.109	CULVERT	N/A	
4.121	4.187	CURB	RIGHT	
4.172	4.240	CURB	LEFT	
4.219	4.219	CULVERT	N/A	
4.229	4.313	CURB	RIGHT	
4.308	4.308	CULVERT	N/A	
4.315	4.315	SIGN	RIGHT	GUIDE, HIKER PICK-UP AREA 800 FT.
4.316	4.395	CURB	RIGHT	
4.374	4.498	CURB	LEFT	
4.432	4.432	CULVERT	N/A	
4.438	4.438	SIGN	RIGHT	GUIDE, HALEMAU'U TRAIL TURN LEFT 0.1 MI
4.460	4.460	SIGN	RIGHT	WARNING, 20 M.P.H.
4.460	4.460	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
4.467	4.498	PULLOUT	RIGHT	
4.467	4.688	CURB	RIGHT	
4.472	4.498	GUARD/GUIDE WALL	RIGHT	
4.502	4.502	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
4.526	4.526	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
4.526	4.526	SIGN	RIGHT	WARNING, PED XING
4.551	4.551	INTERSECTION	LEFT	ROUTE 0901 (HALEMAU'U TRAILHEAD PARKING)
4.556	4.556	SIGN	RIGHT	GUIDE, GRAPHIC SIGN, NO TEXT
4.558	4.558	SIGN	RIGHT	GUIDE, ELEV. 8000 FEET
4.598	4.598	SIGN	RIGHT	WARNING, 20 M.P.H.
4.598	4.598	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
4.616	4.616	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
4.616	4.616	SIGN	RIGHT	WARNING, PED XING
4.626	4.626	SIGN	RIGHT	GUIDE, HALEMAU'U TRAIL .1 MI
4.634	4.634	CULVERT	N/A	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
4.687	4.775	CURB	LEFT	
4.772	4.772	CULVERT	N/A	
4.777	4.856	CURB	LEFT	
4.817	4.817	SIGN	RIGHT	WARNING, NENE CROSSING
4.861	4.921	CURB	RIGHT	
4.879	4.879	MILE MARKER	RIGHT	
4.880	4.880	MILE MARKER	RIGHT	
4.884	4.884	CULVERT	N/A	
4.916	4.935	GUARD/GUIDE WALL	LEFT	
4.935	4.985	CURB	LEFT	
5.002	5.044	CURB	RIGHT	
5.014	5.014	CULVERT	N/A	
5.075	5.075	CULVERT	N/A	
5.076	5.177	CURB	LEFT	
5.199	5.217	GUARD/GUIDE WALL	LEFT	
5.214	5.333	CURB	RIGHT	
5.221	5.221	CULVERT	N/A	
5.322	5.477	CURB	LEFT	
5.459	5.459	CULVERT	N/A	
5.505	5.535	CURB	RIGHT	
5.564	5.564	CULVERT	N/A	
5.569	5.638	CURB	LEFT	
5.696	5.696	CULVERT	N/A	
5.737	5.754	CURB	RIGHT	
5.738	5.738	CULVERT	N/A	
5.751	5.812	CURB	LEFT	
5.801	5.801	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
5.829	5.879	CURB	RIGHT	
5.830	5.830	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
5.837	5.837	CULVERT	N/A	
5.887	5.892	GUARD/GUIDE WALL	LEFT	
5.893	6.123	CURB	LEFT	
5.903	5.903	CULVERT	N/A	
5.912	5.912	MILE MARKER	RIGHT	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
5.913	5.913	MILE MARKER	RIGHT	
5.926	5.926	CULVERT	N/A	
5.954	5.954	CULVERT	N/A	
5.966	5.966	SIGN	RIGHT	WARNING, AVOID BRAKE FAILURE USE LOW GEARS
5.966	5.966	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
6.008	6.008	CULVERT	N/A	
6.045	6.045	SIGN	RIGHT	WARNING, 20 M.P.H.
6.045	6.045	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
6.106	6.106	CULVERT	N/A	
6.123	6.134	GUARD/GUIDE WALL	LEFT	
6.134	6.184	CURB	LEFT	
6.189	6.189	SIGN	RIGHT	WARNING, 20 M.P.H.
6.189	6.189	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
6.205	6.283	CURB	RIGHT	
6.212	6.212	CULVERT	N/A	
6.259	6.332	CURB	LEFT	
6.289	6.296	GUARD/GUIDE WALL	RIGHT	
6.294	6.294	CULVERT	N/A	
6.416	6.416	CULVERT	N/A	
6.430	6.472	CURB	LEFT	
6.462	6.462	CULVERT	N/A	
6.466	6.520	CURB	RIGHT	
6.520	6.541	GUARD/GUIDE WALL	RIGHT	
6.539	6.560	CURB	LEFT	
6.543	6.814	CURB	RIGHT	
6.551	6.551	CULVERT	N/A	
6.619	6.619	CULVERT	N/A	
6.677	6.677	CULVERT	N/A	
6.816	6.850	PULLOUT	LEFT	
6.830	6.830	SIGN	LEFT	REGULATORY, UNABLE TO READ FROM VIDEO
6.899	6.899	MILE MARKER	RIGHT	
6.900	6.900	SIGN	RIGHT	WARNING, SLOW VEHICLES MUST USE TURN OUT
6.902	6.902	MILE MARKER	RIGHT	
6.922	6.922	CULVERT	N/A	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
6.970	6.970	CULVERT	N/A	
7.021	7.063	CURB	LEFT	
7.026	7.026	CULVERT	N/A	
7.061	7.160	CURB	RIGHT	
7.171	7.265	CURB	LEFT	
7.192	7.192	SIGN	RIGHT	GUIDE, LELEIWI OVERLOOK
7.196	7.196	CULVERT	N/A	
7.237	7.278	CURB	RIGHT	
7.237	7.237	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
7.237	7.237	SIGN	RIGHT	WARNING, 20 M.P.H.
7.263	7.263	SIGN	RIGHT	WARNING, PED XING
7.263	7.263	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
7.282	7.282	INTERSECTION	RIGHT	ROUTE 0902 (LELEIWI OVERLOOK PARKING)
7.292	7.326	CURB-AND-GUTTER	RIGHT	
7.321	7.321	SIGN	LEFT	GUIDE, UNABLE TO READ FROM VIDEO
7.331	7.331	INTERSECTION	RIGHT	ROUTE 0902 (LELEIWI OVERLOOK PARKING)
7.338	7.428	CURB	RIGHT	
7.347	7.347	CULVERT	N/A	
7.418	7.489	CURB	LEFT	
7.422	7.422	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
7.422	7.422	SIGN	RIGHT	WARNING, PED XING
7.445	7.445	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
7.445	7.445	SIGN	RIGHT	WARNING, 20 M.P.H.
7.463	7.463	SIGN	RIGHT	GUIDE, LELEIWI OVERLOOK PARKING
7.513	7.513	CULVERT	N/A	
7.528	7.562	CURB	RIGHT	
7.549	7.670	CURB	LEFT	
7.689	7.743	CURB	RIGHT	
7.692	7.692	CULVERT	N/A	
7.772	7.772	CULVERT	N/A	
7.775	7.801	CURB	LEFT	
7.828	7.828	CULVERT	N/A	
7.831	7.929	CURB	LEFT	
7.912	7.912	MILE MARKER	RIGHT	

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
7.913	7.913	MILE MARKER	RIGHT	
7.936	7.936	CULVERT	N/A	
7.971	7.971	SIGN	RIGHT	GUIDE, ELEV. 9000 FEET
8.004	8.004	CULVERT	N/A	
8.009	8.012	PAVED DITCH	LEFT	
8.012	8.027	CURB	LEFT	
8.086	8.086	CULVERT	N/A	
8.107	8.175	CURB	RIGHT	
8.172	8.172	CULVERT	N/A	
8.175	8.320	CURB	LEFT	
8.245	8.245	SIGN	RIGHT	WARNING, SLOW VEHICLES MUST USE TURN OUT
8.293	8.318	PULLOUT	RIGHT	
8.330	8.330	CULVERT	N/A	
8.371	8.417	CURB	RIGHT	
8.386	8.386	SIGN	RIGHT	WARNING, 20 M.P.H.
8.386	8.386	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
8.409	8.536	CURB	LEFT	
8.516	8.551	CURB	RIGHT	
8.540	8.540	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
8.540	8.540	SIGN	RIGHT	WARNING, 20 M.P.H.
8.570	8.570	CULVERT	N/A	
8.574	8.713	CURB	RIGHT	
8.679	8.679	SIGN	RIGHT	WARNING, 20 M.P.H.
8.679	8.679	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
8.706	8.706	SIGN	RIGHT	REGULATORY, GRAPHIC SIGN, NO TEXT
8.710	8.710	CULVERT	N/A	
8.713	8.716	PAVED DITCH	RIGHT	
8.716	8.784	CURB	RIGHT	
8.717	8.717	SIGN	LEFT	GUIDE, SUMMIT 2 MI
8.739	8.739	INTERSECTION	LEFT	ROUTE 0201 (KALAHAKU OVERLOOK ROAD)
8.779	8.779	SIGN	RIGHT	GUIDE, KALAHAKU OVERLOOK SILVERSWORD AREA
8.779	8.864	CURB	LEFT	
8.819	8.819	SIGN	RIGHT	WARNING, 20 M.P.H.
8.819	8.819	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010: HALEAKALA PARK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
8.864	8.889	PULLOUT	LEFT	
8.877	8.979	CURB	RIGHT	
8.889	8.906	CURB	LEFT	
8.932	8.932	MILE MARKER	RIGHT	
8.952	9.121	CURB	LEFT	
9.133	9.343	CURB	RIGHT	
9.262	9.262	CULVERT	N/A	
9.322	9.450	CURB	LEFT	
9.329	9.329	SIGN	RIGHT	WARNING, AVOID BRAKE FAILURE USE LOW GEARS
9.329	9.329	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
9.332	9.332	CULVERT	N/A	
9.421	9.538	CURB	RIGHT	
9.528	9.604	CURB	LEFT	
9.602	9.678	CURB	RIGHT	
9.664	9.681	CURB	LEFT	
9.679	9.679	CULVERT	N/A	
9.683	9.942	CURB	LEFT	
9.939	10.019	CURB	RIGHT	
9.954	9.954	MILE MARKER	RIGHT	
10.005	10.152	CURB	LEFT	
10.033	10.033	DROP INLET	LEFT	
10.136	10.322	CURB	RIGHT	
10.225	10.225	SIGN	RIGHT	REGULATORY, SPEED LIMIT 30
10.298	10.298	CULVERT	N/A	
10.301	10.530	CURB	LEFT	
10.414	10.414	CULVERT	N/A	
10.505	10.523	CURB	RIGHT	
10.528	10.528	INTERSECTION	RIGHT	ROUTE 0100 (RED HILL ROAD)
10.530	10.530	INTERSECTION	N/A	ROUTE 0903AZ (HALEAKALA VISITOR CENTER PARKING A (CRATER RIM))
10.530	10.530	SIGN	RIGHT	GUIDE, HALEAKALA VISITOR CENTER
10.530	10.530	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

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 10.53 (ON RIGHT)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0903AZ (HALEAKALA VISITOR CENTER PARKING A (CRATER RIM))
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.004	0.004	SIGN	RIGHT	REGULATORY, STOP
0.006	0.015	CURB	LEFT	
0.008	0.481	CURB	RIGHT	
0.012	0.012	SIGN	N/A	GUIDE, LOT FULL DO NOT ENTER
0.012	0.012	SIGN	N/A	REGULATORY, ROAD CLOSED
0.012	0.012	GATE	N/A	
0.023	0.023	INTERSECTION	LEFT	ROUTE 0903BZ (HALEAKALA VISITOR CENTER PARKING B (CRATER RIM))
0.037	0.142	CURB	LEFT	
0.038	0.038	DROP INLET	RIGHT	
0.142	0.219	CURB	LEFT	
0.219	0.423	CURB	LEFT	
0.427	0.427	INTERSECTION	LEFT	ROUTE 0200 (MAGNETIC PEAK SPUR ROAD)
0.432	0.563	CURB	LEFT	
0.435	0.435	SIGN	LEFT	GUIDE, SUMMIT
0.558	0.567	CURB	RIGHT	
0.560	0.560	SIGN	RIGHT	GUIDE, ELEV. 10,000 FEET
0.563	0.568	CURB-AND-GUTTER	LEFT	
0.567	0.570	CURB-AND-GUTTER	RIGHT	
0.570	0.570	INTERSECTION	N/A	ROUTE 0904 (PU'U'ULA'ULA SUMMIT PARKING)
0.570	0.570	SIGN	N/A	REGULATORY, KEEP RIGHT
0.570	0.570	ROUTE END	N/A	TO ROUTE 0904 (PU'U'ULA'ULA SUMMIT PARKING)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0200: MAGNETIC PEAK SPUR ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0100 (RED HILL ROAD) AT MP 0.43 (ON LEFT)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0100 (RED HILL ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0100 (RED HILL ROAD)
0.004	0.004	SIGN	RIGHT	REGULATORY, STOP
0.144	0.144	CULVERT	N/A	
0.199	0.199	INTERSECTION	LEFT	PAVED ROUTE (NON NPS)
0.199	0.199	SIGN	LEFT	GUIDE, HALEAKALA NATIONAL PARK
0.210	0.210	SIGN	RIGHT	GUIDE, HANG GLIDING OR OTHER RECREATIONAL ACTIVITIES PROHIBITED CONSERVATION PROPERTY REGULATIONS MONITORED
0.210	0.210	SIGN	RIGHT	GUIDE, NA OIWI HAWAI'I ALOHA AINA E KIPA MAIL
0.210	0.210	SIGN	RIGHT	GUIDE, AUTHORIZED ENTRY ONLY NO PRIVATE VEHICLES BEYOND THIS POINT
0.210	0.210	PARK BOUNDARY	N/A	
0.210	0.210	INTERSECTION	N/A	ROUTE 0200 (MAGNETIC PEAK SPUR ROAD)
0.210	0.210	ROUTE END	N/A	TO SOUTH PARK BOUNDARY (OBSERVATORY/PARK BOUNDARY FENCE)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0201: KALAHAKU OVERLOOK ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 8.74 (ON LEFT)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.008	0.008	SIGN	RIGHT	REGULATORY, STOP
0.026	0.026	CULVERT	N/A	
0.094	0.094	CULVERT	N/A	
0.146	0.146	CULVERT	N/A	
0.179	0.250	CURB	LEFT	
0.202	0.202	INTERSECTION	RIGHT	ROUTE 0905AZ (KALAHAKU OVERLOOK PARKING A)
0.219	0.241	CURB	RIGHT	
0.244	0.244	INTERSECTION	RIGHT	ROUTE 0905BZ (KALAHAKU OVERLOOK PARKING B)
0.250	0.250	SIGN	N/A	REGULATORY, NO PARKING ANY TIME
0.250	0.250	INTERSECTION	N/A	ROUTE 0201 (KALAHAKU OVERLOOK ROAD)
0.250	0.250	ROUTE END	N/A	TO ROUTE 0905ZZ (KALAHAKU OVERLOOK)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0202: HOSMER GROVE ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 0.26 (ON LEFT)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.004	0.004	SIGN	RIGHT	REGULATORY, STOP
0.029	0.029	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.094	0.114	LANE DEVIATION	N/A	
0.132	0.132	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.154	0.162	LOW WATER CROSSING	N/A	
0.168	0.168	SIGN	RIGHT	GUIDE, HOLUA 6.0 MILES CAMPGROUND 0.3 MILES
0.176	0.176	SIGN	RIGHT	WARNING, GRAPHIC SIGN, NO TEXT
0.231	0.231	INTERSECTION	RIGHT	ROUTE 0906CZ (HOSMER GROVE PARKING C)
0.274	0.274	INTERSECTION	LEFT	PAVED ROUTE (FAA SERVICE ROAD)
0.410	0.410	SIGN	RIGHT	REGULATORY, SPEED LIMIT 20
0.416	0.416	INTERSECTION	LEFT	ROUTE 0906BZ (HOSMER GROVE PARKING B)
0.429	0.438	CURB	LEFT	
0.460	0.460	INTERSECTION	N/A	ROUTE 0906AZ (HOSMER GROVE PARKING A)
0.460	0.460	ROUTE END	N/A	TO ROUTE 0906ZZ (HOSMER GROVE PARKING AREAS)

HALE: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0401: PU'U NIANIAU ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0010 (HALEAKALA PARK ROAD) AT MP 0.26 (ON RIGHT)
0.000	0.000	INTERSECTION	LEFT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.000	0.000	INTERSECTION	RIGHT	ROUTE 0010 (HALEAKALA PARK ROAD)
0.003	0.003	SIGN	RIGHT	REGULATORY, STOP
0.008	0.008	SIGN	RIGHT	REGULATORY, SERVICE AREA AUTHORIZED PERSONNEL ONLY
0.044	0.044	FIRE HYDRANT	RIGHT	
0.044	0.044	INTERSECTION	RIGHT	ROUTE 0402 (PU'U NIANIAU RESIDENCE ROAD)
0.083	0.083	FIRE HYDRANT	RIGHT	
0.150	0.150	GATE	N/A	RECTANGLE WITH HORIZONTAL BARS
0.150	0.150	INTERSECTION	N/A	ROUTE 0907 (PU'U NIANIAU MAINTENANCE YARD)
0.150	0.150	ROUTE END	N/A	TO ROUTE 0907 (PU'U NIANIAU MAINTENANCE YARD)

Haleakala National Park

Section 10
Appendix

APPENDIX A: GLOSSARY OF TERMS AND ABBREVIATIONS

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
AADT	(Annual Average Daily Traffic) The estimate of typical daily traffic on a road segment for all days of the week over the period of one year.
CRS	Condition Rating Sheets. (Section 5)
Excellent	Excellent rating with an index value of 95 or greater
Fair	Fair rating with an index value from 61 to 84
Func. Class	Funtional Classification (see Route ID, Section 4)
Good	Good rating with an index value from 85 to 94
IRI	International Roughness Index
Lane Width	Width from road centerline to fogline, or from centerline to edge-of-pavement when no fogline exists
MRR	Manually Rated Route
N/A	Not Applicable
NC	Not Collected
Paved Width	Width from edge-of-pavement to edge-of-pavement
PCR	Pavement Condition Rating (Appendix B, Section 10)
Poor	Poor Rating with an index value of 60 or less
RCI	Roughness Condition Index
SADT	(Seasonal Annual Daily Traffic) The AADT adjusted to represent just the period of the year containing 80 percent of the total annual traffic.
SCR	Surface Condition Rating (Appendix B, Section 10)
Shoulder Width	Distance from fogline to hinge point, or if no fogline, from edge-of-pavement to hinge point.

APPENDIX B: DESCRIPTION OF RATING SYSTEM

A numerical roadway rating system is used to describe the overall condition of the paved roadways and paved parking areas. In this system, a numerical rating between 0 and 100 is ascribed to each 0.02 miles of road. This numerical rating is called a Pavement Condition Rating (PCR). A "perfect" road, newly constructed with no surface distresses and a smooth surface, would be assigned a PCR rating of 100. Based on the type, severity, and extent of surface distresses points are deducted from 100 to arrive at the final PCR.

Data is collected on the following distresses and conditions:

- **Alligator Cracking** - a series of interconnecting cracks resembling alligator skin or chicken wire, which can occur anywhere in the lane.
- **Longitudinal Cracking** - cracks which are parallel to the pavement centerline or asphalt lay-down direction.
- **Transverse Cracking** - cracks perpendicular to the pavement centerline.
- **Pothole (patch)** - a bowl-shaped hole in the pavement surface. May be patched or not.
- **Rutting** - surface depressions in the wheel paths.
- **Roughness** is collected as International Roughness Index (IRI) and is used in the PCR formula. Roughness is measured in inches of vertical displacement of the vehicle per mile traveled.

A Distress Rating Index value is calculated for each of the individual distresses at the 0.02 mile, or every 105.6 feet.

Calculation of Index Values

Note: Index values < 0 default 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.
All severity protocols are taken from the SHRP Distress Identification Manual.

Condition Ranges for all Indices

Excellent	>=95
Good	>=85 and <95
Fair	>60 and <85
Poor	<=60

Alligator Crack Index

AC_INDEX = 100 – 40 * [(%LOW / 70) + (%MED / 30) + (%HI / 10)]

Where :

The values %LOW, %MED and %HI describe the percent of the total WX measured area that is affected by alligator cracking of each severity level. These values range from ≥ 0 to ≤ 100.

%LOW = (Total square area WX measured low severity alligator cracking) / (Section length * WX measured lane width)

%MED = (Total square area WX measured medium severity alligator cracking) / (Section length * WX measured lane width)
%HI = (Total square area WX measured high severity alligator cracking) / (Section length * WX measured lane width)

The denominators 70, 30, and 10 are the maximum allowable extents for the numerator value in the same units. For example, low severity alligator cracking totaling 70% of the measured section area would alone fail that section of road for this index.

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

Severity Levels:

Low severity alligator cracking describes an area of cracks with no or only a few connecting cracks; cracks are not spalled (cracked, broken, chipped, frayed along the cracks); pumping (water seepage from beneath the pavement through the cracks) is not evident. Any sealed alligator cracks are low severity alligator cracks, as long as the sealant is still in good condition. If the sealant has reopened, and the crack is visible and can be measured, the crack severity is assigned according to that measurement.

Medium severity alligator cracking describes an area of interconnected cracks forming a complete pattern; cracks may be slightly spalled; pumping is not evident.

High severity alligator cracking describes an area of moderately or severely spalled interconnected cracks forming a complete pattern; pieces may move when subjected to traffic; pumping may be evident.

Longitudinal Crack Index

LC_INDEX = 100 – 40 * [(%LOW / 350) + (%MED / 200) + (%HI / 75)]

Where:

The values %LOW, %MED and %HI describe the length of longitudinal cracking of each severity as a percent of the section length. These values are ≥ 0 and can exceed 100.

%LOW = (Total linear feet WX measured low severity longitudinal cracking) / (Section length in linear feet)
%MED = (Total linear feet WX measured medium severity longitudinal cracking) / (Section length in linear feet)
%HI = (Total linear feet WX measured high severity longitudinal cracking) / (Section length in linear feet)

The denominators 350, 200, and 75 are the maximum allowable extents for the numerator value in the same units. For example, medium severity longitudinal cracking with a total length that is 200% of the length of the section would alone fail that section of road for this index.

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

Severity Levels:

Low severity longitudinal cracks have a mean width ≤ ¼”, or are sealed cracks of indeterminate width whose sealant material is in good condition.

Medium severity longitudinal cracks have a mean width > ¼” and ≤ ¾”.

High severity longitudinal cracks have a mean width > ¾”.

Transverse Crack Index

TC_INDEX = 100 – {[20 * ((LOW / 15.1) + (MED / 7.5))] + [40 * (HI / 1.9)]}

Where:

The values LOW, MED and HI describe a count of the total number of transverse cracks of each severity level, where one transverse crack unit is equal to the WX measured lane width. These values are ≥ 0.

LOW = (Total linear feet WX measured low severity transverse cracking) / (WX measured lane width)
MED = (Total linear feet WX measured medium severity transverse cracking) / (WX measured lane width)
HI = (Total linear feet WX measured high severity transverse cracking) / (WX measured lane width)

The denominators 15.1, 7.5, and 1.9 are the maximum allowable extents for the numerator value in the same units. For example, high severity transverse cracking with a total length that amounts to 1.9 times the WX measured lane width would alone fail that section of road for this index.

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

Severity Levels:

Low severity transverse cracks have a mean width ≤ ¼", or are sealed cracks of indeterminate width whose sealant material is in good condition.

Medium severity transverse cracks have a mean width > ¼" and ≤ ¾".

High severity transverse cracks have a mean width > ¾".

Patching Index

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

Where:

The value %PATCHING describes the percent of the total WX measured area that is affected by patching. This value ranges from ≥ 0 to ≤ 100.

%PATCHING = (Total area WX measured patching) / (Section length * WX measured lane width)

The denominator 80 is the maximum allowable extent for the numerator value in the same units. Patching totaling 80% or more of the measured section area fails a section of road for this index.

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

There are no severity levels for patching.

Rutting Index

RUT_INDEX = 100 – 40 * [(%LOW / 160) + (%MED / 80) + (%HI / 40)]

Where:

10 ARAN rut depth measurements are taken per full .02 section for each of 2 wheel paths (left and right), resulting in a total of 20 measurements taken for both wheel paths. The values %LOW, %MED and %HI describe the number of ARAN rut depth measurements of both wheel paths in the section whose values are of each severity level, calculated as a percentage of the total number of ARAN rut depth measurements taken for a single wheel path in the section. These values range from ≥ 0 to ≤ 200.

%LOW = (Total number of ARAN measured low severity ruts in section for both wheel paths) / (Total number of ARAN rut measurements in section for a single wheel path)
%MED = (Total number of ARAN measured medium severity ruts in section for both wheel paths) / (Total number of ARAN rut measurements in section for a single wheel path)
%HI = (Total number of ARAN measured high severity ruts in section for both wheel paths) / (Total number of ARAN rut measurements in section for a single wheel path)

The denominators 160, 80, and 40 are the maximum allowable extents for the numerator value in the same units. For example, low severity ruts recorded in 16 of the 20 total readings (or 160% of a full wheel path's worth of readings) for a full .02 section would fail that section for this index.

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

Severity Levels:

Ruts with an ARAN measured depth < 0.20" are not included in the distress calculations.

Low severity ruts have an ARAN measured depth ≥ 0.20" and ≤ 0.49".

Medium severity ruts have an ARAN measured depth ≥ 0.50" and ≤ 0.99".

High severity ruts have an ARAN measured depth ≥ 1.00".

Roughness Condition Index

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

Where:

The value AVG IRI describes the average value of the Left IRI and Right IRI measurements for the section. This value can range from approximately 40 to over 1000.

AVG IRI = (ARAN measured Left IRI + ARAN measured Right IRI) / 2

There is no applicable threshold for failure for this index.

NOTE: Collection of roughness data is dependent on the data collection vehicle traveling at a minimum speed of 12 mph. In the event that a route cannot be safely traveled at this minimum speed, and results in no roughness data, the SCR only will be calculated.

Surface Condition Rating Index

SCR = 100 - [(100 - AC_INDEX) + (100 - LC_INDEX) + (100 - TC_INDEX) + (100 - PATCH_INDEX) + (100 - RUT_INDEX)]

Where:

See above for determinations of AC_INDEX, LC_INDEX, TC_INDEX, PATCH_INDEX and RUT_INDEX.

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

Pavement Condition Rating Index Asphaltic Concrete Pavement (AS)

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

Where:

See above for determinations of SCR and RCI.

The values 0.60 and 0.40 function as weights within the formula.

If SCR equals zero (which means that the road surface condition is very poor), then the formula simply reduces to: PCR = 0.40 * RCI.

If RCI equals zero (which means that this value was not available for some reason), then the formula becomes: PCR = SCR.

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

Pavement Condition Rating Index Portland Cement Concrete Pavement (CO)

Concrete PCR = -0.0012(IRI^2)+0.0499(IRI)+99.542

Where:

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

Parking Lot and Manually Rated Road Condition Rating

Surface Condition Distresses- Chip Seal:

Raveling – loss of surface rock chips revealing previous surface
Bleeding – asphalt or tar is bleeding through to the surface where surface looks slick with asphalt
Rutting
Potholes/Patching

Ratings - Chip Seal:

Excellent – None of the surface affected by the above (recently constructed)
Good – Less than 10% of surface affected by the above
Fair – Between 10% and 40% of surface affected by the above
Poor – More than 40% of surface affected by the above

Surface Condition - Asphalt:

Cracking of any type
Rutting
Potholes/Patching

Ratings - Asphalt:

Excellent – None of the surface affected by the above (recently constructed)
Good – Less than 10% of surface affected by the above
Fair – Between 10% and 40% of surface affected by the above
Poor – More than 40% of surface affected by the above

Index Values of Visual Ratings on Parking Lots and Manually Rated Roads

Under Construction 100

Excellent 97

Good 90

Fair 73

Poor 45

APPENDIX C: GENERAL INFORMATION ON RIP SYSTEMS

DMI (Distance Measuring Instrument)

The DMI (Distance Measuring Instrument) obtains road length measurements that are highly accurate (to 0.001 miles). The DMI is connected to the outside of the rear wheel on the driver's side, and is wired into the antilock braking system (ABS). The number of pulses recorded for each wheel rotation by the ABS is registered by the DMI, which transmits a measurement of distance traveled to the processing computers in the ARAN. The DMI distance measurements are the foundation to which all the other subsystems are tied.

Digital Image Information

All images collected in Cycle 4 are digital images in .jpg format. These images provide adequate resolution for identifying sign and feature inventories and pavement evaluations. The images can be viewed with an interactive software program called VisiData. Each park will receive a copy of the VisiData program. Cycle 4 data, as well as Cycle 3 data, can be viewed using the Visi-Data software program. This program is a data presentation and analysis tool that can be accessed either at the individual park, park region or at NPS headquarters. The data is organized in a hierarchical manner and presented in tabular and graphical formats. The user is able to perform queries and drill down through the data to find the particular information they are looking for. Associated digital right-of-way images from either the LAN, USB port, individual DVD can be presented along with GPS locations.

Right-of-way (ROW) Video

Three digital cameras are mounted above the vehicle's windshield that point directly forward and slightly to the left and right. These cameras each collect one image every 0.002 miles (10.56 feet) in the primary-direction lane, to give a panoramic field-of-view of about 160 degrees. (Forward-facing video from the center camera only is collected in the opposite-direction lane of travel.)

If data collection speed exceeds 35-40 mph, the network and storage computers may become overwhelmed and may begin to drop individual video frames. Occasional common video quality issues include sun glare and rapid changes between sunlight and shadow. The camera system is equipped with auto risers that sometimes cannot adjust quickly enough to collect optimal video images.

FHWA ARAN CAMERA SPECIFICATIONS **Forward-Facing Cameras (ROW)**	
Focal length	10 mm
Chip size	8.71mm X 6.90mm
Naming convention of each image	chainage.jpg
Image resolution	1300 X 1030
Image pixel size	depends on distance
Relative position of the GPS unit to each camera	2.104 meters from front-center rutbar to camera
The ARAN has a lever arm setting which tells the POS system where the center of the rutbar is with respect to the GPS antennas.	

Pavement Video

Pavement video images are collected by the data collection vehicle to use in later analysis to determine extents and severities of different types of pavement distress. The pavement in the primary-direction road lane is filmed continuously by two analog cameras attached to booms extended from the rear of the ARAN on the left and right sides. Strobe lights fire synchronously with the opening of the camera shutters to eliminate shadows and motion blur. The images from the two cameras overlap, and are stitched together in real time to create a continuous strip image of the pavement in the primary direction lane. This strip has a maximum width of 3.0 meters (actual width depends on pavement camera calibration) and is sectioned for ease of file management every 0.010 miles (52.8 feet).

The cameras both have a resolution of 640 x 480, making the threshold of visible pavement cracks about 3 mm. Because the cameras are triggered by time and not distance traveled, this subsystem requires a minimum operating speed of 6 mph, otherwise images are taken on top of one another and result in checkered or black pavement video.

FHWA ARAN CAMERA SPECIFICATIONS **Pavement Cameras**	
Image Pixel size	3.135 mm /side
Image Resolution	640 X 480
Area that images cover	1.5 m X 1.2 m
Full color or grayscale	grayscale
Vehicle speed limitations	80km/h
Aperture setting	Auto-iris
Exposure setting	1/50000

FHWA ARAN GPS & Inertial System

GPS is collected by a NovAtel MiLLenium, 12 channel, dual frequency L1/L2, DGPS ready receiver with a MiLLennium 502 GPS antenna. An OmniStar 3000 LR provides real-time differential correction. An Applanix POS/LV is the inertial system that fills in when GPS is unavailable. The antenna is mounted in the center of the roof, slightly toward the rear of the vehicle, but a lever arm is applied to place the operational location of GPS recording at the center of the rutbar on the front bumper of the vehicle. Expected accuracy under ideal conditions is sub meter.

GPS Collected on Manually Rated Routes

Parking areas and roads that are not fully drivable with the ARAN data collection vehicle are collected manually by field technicians. GPS is collected for these routes using GPS field data collection utilizes Trimble ProXRS or ProXH Receivers matched with Trimble TSC1 or Ranger handheld Data Loggers, connected to Trimble Hurricane Antennas giving sub meter accuracy in ideal conditions. This collection equipment has varied as technology has improved over the years of RIP data collection. Some GPS files collected as early as 1998 have been verified for accuracy and perpetuated through the current cycle of data collection.

GPS SHAPEFILES

Type of Route and Collection Shape Filename		
Roads driven by ARAN	Line	park_road_04.dbf/.shp/.shx
Parking Areas	Polygon	park_pkg_04.dbf/.shp/.shx
Roads Manually Rated as Lines (not in every park)	Line	park_mrl_04.dbf/.shp/.shx
Roads Manually Rated as Polygons (not in every park)	Polygon	park_mrp_04.dbf/.shp/.shx

• Datum for all GPS shapefiles is LL_WGS84_DD (Latitude Longitude _World Geodetic Survey 1984_Decimal Degrees)
• In filename, “park” is NPS four-letter alphabetic code.
• The source for route data required for data processing and report production is the PARK_RouteInfo.mdb.

Condition Photos Taken of Manually Rated Roads

One or more digital photos are taken by Canon Power Shot G2 4.0 Mega Pixel digital camera for each manually rated route in a National Park. They are stored in .jpg format named with the four-letter NPS park alphabetic code, route number, and the photo number assigned by the camera. For example, YOSE_0900_4434.jpg is the filename of the photo named 4434 by the camera that was taken of Yosemite National Park route 0900.

Scenic Photos

Scenic photos are taken by Canon Power Shot G2 4.0 Mega Pixel digital camera throughout each park and are named with the four-letter NPS park alphabetic code and the count of the photo taken in that park. For example, GRCA003.jpg is the filename of the third scenic photo taken in Grand Canyon National Park. The number of scenic photos provided will vary between parks.

APPENDIX D: METADATA

FHWA – NPS Road Inventory Program Cycle 4 Metadata

The purpose of these sheets is to provide users of the Road Inventory Program's data with data accuracies and tolerances to help users define ways in which the RIP data can and cannot be used. For further information on specifics of data collection equipment, data collection procedures, equipment calibrations, or quality control/quality assurance procedures, please contact Jim Kennedy, Project Manager, Data Quality Assurance, at 720-963-3560 or jim.kennedy@fhwa.dot.gov.

All Road Inventory Program data undergoes quality control and quality assurance testing. This document represents the known data accuracies and tolerances for the data collection equipment, data collection procedures, and data processing procedures currently in use. Many additional tests conducted on the park databases during the quality assurance phase to ensure data integrity are not listed as a part of this document. Before it is delivered, a park database undergoes a large set of table design consistency, field data format consistency, data completeness, uniqueness of key fields, data reasonableness, acceptable data range, within-field data consistency, between-field data consistency, and between-table data consistency tests. Additional data sampling checks are conducted to ensure proper data upload from raw files into the park database and to quality check the pavement crack analysis. Further information is detailed in the FHWA – NPS RIP Quality Assurance Manual, available upon request.

This description of metadata includes only the known accuracies with which a data field matches its expected value. The tables that follow this page show each database field's:

- Field – field name
- Format – data type and number of characters of field
- Expected Value – meaning of value assigned to field
- Source – when in process field value obtained
- Validation – how field value obtained
- Expected Accuracy – accuracy with which contents of field match Expected Value

Verifying and continually improving the accuracy of Road Inventory Program data is an ongoing goal of the Federal Highway Administration and the National Park Service. Field testing and post-collection analysis of ARAN (Automatic Road ANalyzer) -collected data will continue in Cycle 4. Data quality is expected to improve as the FHWA – NPS Road Inventory Program continues to operate, due to the fact that future data collection cycles will consist in large part of data updates. Also, technological improvements are expected to render the data increasingly consistent with actual roadway conditions as data collection cycles progress.

Specific Caveats

- MUTCD based on contents & colors of sign, not on size
- Database records that show a Portland Cement Concrete (CO) surface type sometimes include distress index values that seem to show a perfect roadway. Condition assessments on concrete pavements are not conducted for Alligator Cracking, Transverse or Longitudinal Cracking, Patching, or Rutting. Perfect values for concrete road sections for these indexes are default values and do not represent a condition assessment of the concrete surfaces.
- On the USB drive, in the Database folder, parks are provided with intersection lists and exceptions lists. These documents should be treated as raw files and are not accurate. Refer to the final database for accurately post-processed intersection data.
- Most roadway data is collected in the primary direction lane of a roadway. To save data storage space and to reduce data analysis efforts, the assumption was made that the paved surface condition of a route's primary lane adequately represents the surface condition of the full roadway. Therefore, in the database, opposite-direction records in the PMS_Tenth table do not include assessed values for roadway surface distresses. Values such as 0, N/A, -1, or a repeat of the primary-direction assessed value indicate that no assessment was performed. The PMS_20 and PMS_Mile tables simply exclude all opposite routes.

- Roadway Data is collected in intervals of 0.010 miles (52.8feet) constituting a "station".
- Most roadway features are collected relative to the primary direction lane of a roadway, using the primary-direction video and mileage. Signs and Mile Markers are the only features collected using the opposite-direction video with mileage location referenced to the primary direction lane of the roadway.
- Route_GPS table contains GPS positional information collected by the ARAN and post processed with Applanix POSPac Land 5.0 post-processing software. No manual adjustments have occurred on this table.
- Modifications to the Park_ROAD_04.dbf/.shp/.shx files may have been necessary for report esthetics.
- Modifications to the Park_PKG_04. dbf/.shp/.shx files may have been necessary for report esthetics.
- Cycle 4 utilizes the Microsoft Office 2003 suite of products and Crystal Reports XI for document and data file generation and reporting.
- All PDF files are in Adobe Acrobat 7.0 Professional format.
- All ArcGIS files are created using ESRI Version 9.x software.
- Thumbnail images are created at 1/10 original image size for Right-of-Way and Pavement Images.
- FHWA is investigating the rutting methodology and calculated values it currently reports. Equipment limitations and analysis methods may be over reporting, low severity rutting.

Key to Notes in Tables

(1): Note that only one value fits in field, so even if this value varies throughout the route, only predominant value is recorded here.
(2): Shoulder width is measured at route start and every half-mile along the route in the primary direction. Width is the entire width of the drivable shoulder, regardless of the presence or absence of pavement, from the fog line to the shoulder hinge point, or if no fog line exists, from the edge of pavement to the hinge point. Identification of shoulder hinge point can be problematic using video analysis. Some paved ditches may be mistakenly recorded as shoulders where the shoulder hinge point and change in slope are not easily distinguished from the video.
(3): Mileage is measured by the ARAN (Automatic Road ANalyzer) data collection vehicle out to the 0.001 decimal place. The DMI (distance measuring instrument) is very accurate, with extremely slight variations in measurement due to air temperature, tire inflation, curves, hills, and equipment calibration.
(4): Features are measured differently depending on whether they are visible in the forward-facing video of the roadway, but every feature milepost measurement depends on the baseline measurement of the data collection vehicle's mileage. The ARAN (Automatic Road ANalyzer) data collection vehicle's mileage is measured by the DMI (distance measuring instrument) out to the 0.001 decimal place. The DMI is very accurate, with extremely slight variations in measurement due to air temperature, tire inflation, curves, hills, and equipment calibration. If a feature will not be visible in the forward-facing video, its milepost is determined by the data collectors' key press tagging the milepost when the ARAN passes the feature. Key presses are entered into the ARAN software when the vehicle travels typically between 15 and 45 miles/hour, so a delay of a single second as the vehicle passes a feature would result in an inaccuracy of 0.004 miles (22 feet) to 0.012 miles (66 feet). If a feature is visible in the video, its milepost is determined during post-processing using a video measurement software called Surveyor.
(5): Condition assessments on concrete (PCC) pavements are not conducted for Alligator Cracking, Transverse or Longitudinal Cracking, Patching, or Rutting. Perfect values for concrete road sections for these indexes are default values and do not represent a condition assessment of the concrete surfaces.
(6): Roadway cracking presence, type, severity, and extent are determined by filming the roadway in the primary lane continuously with two overlapping analog cameras of 640 x 480 resolutions. The images from both cameras are stitched together in real time to create a continuous strip image of the roadway pavement in the primary lane. Cracks 3 mm or greater in width are visible in this video. A semi-automatic process running the WiseCrax software with additional input by human operators provides the cracking quantities recorded in these database fields. Quality checks have determined that a consistent 80% or better of the visible cracks are recorded.

Access Database Metadata

MASTER Table Metadata:

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
1	RIP_CYCLE	XX	4, for data collection cycle 4	Route ID Meeting	FHWA Determination	100% Referenced to other tables
2	STATE	XX	State where route is located	Route ID Meeting	Park Input / FHWA Determination	100%, Referenced to other tables (1)
3	PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	100%, Referenced to other tables
4	PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	100%, Referenced to other tables
5	RTE_NO	9999XXX	Route number	Route ID Meeting	Park Input / FHWA Classification	100%, Referenced to other tables
6	RTE_NAME	(Text)	Route name	Route ID Meeting	Park Input	100%, Referenced to other tables. 100 characters fit in field
7	FUNCT_CLASS	X	Route functional classification	Route ID Meeting	Park Input / FHWA Classification	100%, Referenced to other tables
8	DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input / FHWA Determination	100%,
9	BEG_MP_EST	999.999 (miles)	Estimated starting MP	Route ID Meeting	Park Input / FHWA Determination	Estimated before data collected
10	END_MP_EST	999.999 (miles)	Estimated ending MP	Route ID Meeting	Park Input / FHWA Determination	Estimated before data collected
11	RTE_LENGTH	999.999 (miles)	Collected route length	ARAN Data Collection	Automatic Output	100%
12	FROM_DESC	(Text)	Beginning terminus of route	Route ID Meeting	Park Input / FHWA Determination	100% Referenced to other tables
13	TO_DESC	(Text)	Ending terminus of route	Route ID Meeting	Park Input / FHWA Determination	100% Referenced to other tables
14	NO_LANES	X	Number of lanes in route	ARAN Data Collection	Survey Crew Input	Untested. (1)
15	SURF_TYPE	XX	Surface type of route	ARAN Data Collection	Survey Crew Input	100%, Referenced to other tables (1)
16	COMP_DIR	XX	Compass direction of route's primary lane (nearest cardinal direction)	Route ID Meeting	Park Input / FHWA Determination	Untested
17	COMMENTS	(Text)	Special information, if any	Contractor Post-processing	Contractor Input	Untested
18	FILENAME	(Text)	Filename of raw data files	ARAN Data Collection	Automatic Output	100%
19	SECTION	(Text)	Route section ID	Route ID Meeting/ARAN Data Collection	Survey Crew Input/Automatic Output	100%

20	FKEY	9999999	Unique record ID	Contractor Post-processing	Database Processing	100%
21	DATE	MM/DD/YY	Data collection date	ARAN Data Collection	Automatic Output	100%
22	BEG_MP	999.999 (miles)	Beginning MP collected	ARAN Data Collection	Automatic Output	100% (3)
23	END_MP	999.999 (miles)	Ending MP collected	ARAN Data Collection	Automatic Output	100% (3)

PMS_FEATURE Table Metadata:

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
1	RIP_CYCLE	XX	4, for data collection cycle 4	Route ID Meeting	FHWA Determination	100% Referenced to other tables
2	STATE	XX	State where route is located	Route ID Meeting	Park Input / FHWA Determination	Untested (1)
3	PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	100% Referenced to other tables
4	PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	100% Referenced to other tables
5	RTE_NO	9999XXX	Route number	Route ID Meeting	Park Input / FHWA Classification	100% Referenced to other tables
6	FMSS_EQUIP	XXXXXXX	Facility Management Software System Equipment number	NPS FMSS application	NPS References	Untested
7	FUNCT_CLASS	X	Route functional class	Route ID Meeting	Park Input / FHWA Classification	100% Referenced to other tables
8	DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input / FHWA Determination	100%
9	MP	999.999 (miles)	Feature location along route	ARAN Data Collection/Contractor Post-processing	Video Analysis	<=0.001 mile
10	BEG_MP	999.999 (miles)	Feature Beginning location along route	Contractor Post-processing	Video Analysis	<=0.001 mile
11	END_MP	999.999 (miles)	Feature Ending location along route	Contractor Post-processing	Video Analysis	<=0.001 mile
12	FEATURE_LENGTH	999.99 (Feet)	Linear Feature Length	Contractor Post-processing	Database Processing	100%
13	EVENT	XXXX	Event category of feature	Contractor Post-processing	Video Analysis	Untested
14	EVENT_CODE	XXXX	Event sub-category of feature	Contractor Post-processing	Video Analysis	Untested
15	FEATURE_TYPE	(Text)	Feature designation: LINEAR or POINT	Contractor Post-processing	Video Analysis	Untested
16	EVENT_DESC	(Text)	Description of feature/contents of sign	Contractor Post-processing	Video Analysis	Untested
17	MUTCD	(Text)	MUTCD Code of Sign	Contractor Post-processing	Database Processing	95%
18	CONDITION	“N/A”	Sign condition. N/A. Not to be populated	Contractor Post-processing	Video Analysis	Values inaccurate, defaulted to “N/A”
19	COMMENT	(Text)	Sign label, intersecting route, etc.	Contractor Post-processing	Database Processing	Untested
20	OFFSET	“N/A”	Offset from Road Edge. N/A. Not to be populated	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to “N/A”

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
21	SIDE	(Text)	Side of route relative to lane driven	Contractor Post-processing	Video Analysis	95%
22	STR_NUMBER	(Text)	FHWA bridge structure number	FHWA Post-processing	Database Processing	Untested
23	BARR_MAT	(Text)	Barrier Material Type	Contractor Post-processing	Video Analysis	Untested
24	BARR_TYPE	(Text)	Barrier Type	Contractor Post-processing	Video Analysis	Untested
25	BARR_POST_MAT	(Text)	Barrier Post Materials	Contractor Post-processing	Video Analysis	Untested
26	BARR_BEG_TERM	(Text)	Barrier Approach Treatment	Contractor Post-processing	Video Analysis	Untested
27	BARR_END_TERM	(Text)	Barrier End Treatment	Contractor Post-processing	Video Analysis	Untested
28	CURB_MAT	(Text)	Curb Material Type	Contractor Post-processing	Video Analysis	Untested
29	PAVED_DITCH_MAT	(Text)	Paved Ditch Material Type	Contractor Post-processing	Video Analysis	Untested (2)
30	GATE_MAT	(Text)	Gate Material Type	Contractor Post-processing	Video Analysis	Untested
31	GATE_STYLE	(Text)	Gate Style	Contractor Post-processing	Video Analysis	Untested
32	BEG_GPS_LAT	999.999999	GPS Latitude Co-ordinate (decimal degrees)	Contractor Post-processing	Video Analysis	<= 3.00 feet
33	BEG_GPS_LON	-999.999999	GPS Longitude Co-ordinate (-decimal degrees)	Contractor Post-processing	Video Analysis	<= 3.00 feet
34	BEG_GPS_ELEV	99999.9	GPS Elevation Feet	Contractor Post-processing	Video Analysis	Untested
35	BEG_GPS_MODE	(Text)	GPS Satellite Mode	Contractor Post-processing	Video Analysis	Untested
36	END_GPS_LAT	999.999999	GPS Latitude Co-ordinate (decimal degrees)	Contractor Post-processing	Video Analysis	<= 3.00 feet
37	END_GPS_LON	-999.999999	GPS Longitude Co-ordinate (-decimal degrees)	Contractor Post-processing	Video Analysis	<= 3.00 feet
38	END_GPS_ELEV	99999.9	GPS Elevation Feet	Contractor Post-processing	Video Analysis	Untested
39	END_GPS_MODE	(Text)	GPS Satellite Mode	Contractor Post-processing	Video Analysis	Untested
40	DATUM	(Text)	LL_WGS84_DD	Contractor Post-processing	Database Processing	100%
41	VIDEO	<*Park*>C04VID<#>	Removable USB video hard drive number	Contractor Post-processing	Database Processing	Untested
42	IMAGE	(Text)	Filename of .jpg image showing feature	Contractor Post-processing	Automatic Output	Untested
43	DATE	MM/DD/YY	Data collection date	ARAN Data Collection	Automatic Output	100%
44	FILENAME	(Text)	Filename of raw data files	ARAN Data Collection	Automatic Output	100%
45	SECTION	(Text)	Route section ID	Route ID Meeting/ARAN Data Collection	Survey Crew Input/Automatic Output	100%
46	FKEY	(Numeric)	Unique record ID	Contractor Post-processing	Database Processing	100%
47	VISI_FROM	999999 (millimiles)	Raw MP of first video frame showing feature	Contractor Post-processing	Database Processing	Untested
48	VISI_TO	999999 (millimiles)	Raw MP of last video frame showing feature	Contractor Post-processing	Database Processing	Untested

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
49	IDKEY	(Text)	Unique record ID used by VisiData	Contractor Post-processing	Database Processing	Untested
50	MP_REF	(Text)	Range of mileage to play in VisiData	Contractor Post-processing	Database Processing	Untested

List of Roadway Features

#	EVENT	EVENT_CODE	FEATURE_TYPE	EVENT_DESC	STRUCTURE #	COLLECTED BY
1	BRIDGE	BRDG	LINEAR	BRIDGE	ALWAYS	ARAN
2	CATTLE GUARD	CGD	POINT	CATTLE GUARD	-	VIDEO RATING
3	CONSTRUCTION	CNST	LINEAR	CONSTRUCTION WORK ZONE	-	ARAN
4	CULVERT	CUL	POINT	CULVERT	SOMETIMES	ARAN
5	CURB	CRBL	LINEAR	CURB ON LEFT	-	VIDEO RATING
	""	CRBR	LINEAR	CURB ON RIGHT	-	VIDEO RATING
6	CURB-AND-GUTTER	CAGL	LINEAR	CURB-AND-GUTTER ON LEFT	-	VIDEO RATING
	""	CAGR	LINEAR	CURB-AND-GUTTER ON RIGHT	-	VIDEO RATING
7	DROP INLET	DINL	POINT	DROP INLET ON LEFT	-	ARAN
	""	DINR	POINT	DROP INLET ON RIGHT	-	ARAN
8	GATE	GATE	POINT	GATE	-	VIDEO RATING
9	FIRE HYDRANT	FHDL	POINT	FIRE HYDRANT ON LEFT	-	VIDEO RATING
	""	FHDR	POINT	FIRE HYDRANT ON RIGHT	-	VIDEO RATING
10	GUARD/GUIDE WALL	GGWL	LINEAR	GUARD/GUIDE WALL ON LEFT	-	VIDEO RATING
	""	GGWR	LINEAR	GUARD/GUIDE WALL ON RIGHT	-	VIDEO RATING
11	GUARD/GUIDE RAIL	GGRL	LINEAR	GUARD/GUIDE RAIL ON LEFT	-	VIDEO RATING
	""	GGRR	LINEAR	GUARD/GUIDE RAIL ON RIGHT	-	VIDEO RATING
12	INTERSECTION	INTL	POINT	INTERSECTION ON LEFT	-	ARAN
	""	INTR	POINT	INTERSECTION ON RIGHT	-	ARAN
	""	INTN	POINT	INTERSECTION SIDE N/A	-	ARAN

13	LANE DEVIATION	LADV	LINEAR	LANE DEVIATION	-	ARAN
14	LOW WATER CROSSING	LWCR	LINEAR	LOW WATER CROSSING	SOMETIMES	VIDEO RATING
15	MILE MARKER	MML	POINT	MILE MARKER ON LEFT	-	VIDEO RATING
	""	MMR	POINT	MILE MARKER ON RIGHT	-	VIDEO RATING
16	OVERPASS	OPV	POINT	OVERPASS VEHICULAR	SOMETIMES	ARAN
	""	OPP	POINT	OVERPASS PEDESTRIAN	SOMETIMES	ARAN
	""	OPRX	POINT	OVERPASS RAILROAD CROSSING	SOMETIMES	ARAN
17	PARK BOUNDARY	PRK	POINT	PARK BOUNDARY	-	ARAN
18	PAVED DITCH	PVDL	LINEAR	PAVED DITCH ON LEFT	-	VIDEO RATING
	""	PVDR	LINEAR	PAVED DITCH ON RIGHT	-	VIDEO RATING
19	PULLOUT	PLOL	LINEAR	PULLOUT ON LEFT	-	VIDEO RATING
	""	PLOR	LINEAR	PULLOUT ON RIGHT	-	VIDEO RATING
20	RAILROAD CROSSING	RRX	POINT	RAILROAD CROSSING	-	VIDEO RATING
21	RETAINING WALL	RTWL	LINEAR	RETAINING WALL ON LEFT	-	VIDEO RATING
	""	RTWR	LINEAR	RETAINING WALL ON RIGHT	-	VIDEO RATING
22	ROUTE BEGIN	RBEG	POINT	ROUTE BEGIN	-	ARAN
23	ROUTE END	REND	POINT	ROUTE END	-	ARAN
24	SIGN	REGU, WARN, GUID, UNKN	POINT	DOCUMENT CONTENTS OF SIGN. (WHAT THE SIGN SAYS) FOR GRAPHICS ONLY SIGNS POPULATED WITH ("GRAPHIC SIGN, NO TEXT") FOR UNREADABLE TEXT POPULATED WITH ("UNABLE TO READ FROM VIDEO")	-	VIDEO RATING
25	STATE BOUNDARY	STB	POINT	STATE BOUNDARY	-	ARAN
26	TRAFFIC LIGHT	TRF	POINT	TRAFFIC LIGHT	-	VIDEO RATING
27	TUNNEL	TUN	LINEAR	TUNNEL	ALWAYS	ARAN

PMS_20, PMS_MILE, & PMS_TENTH Tables Metadata:

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
1	RIP_CYCLE	XX	4, for RIP data collection Cycle 4	Route ID Meeting	FHWA Determination	100% Referenced to other tables
2	STATE	XX	State where route is located	Route ID Meeting	Park Input/FHWA Determination	Untested. (1)
3	PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	100% Referenced to other tables
4	PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	100% Referenced to other tables
5	RTE_NO	9999XXX	Route number	Route ID Meeting	Park Input/FHWA Classification	100% Referenced to other tables
6	FUNCT_CLASS	X	Route functional class	Route ID Meeting	Park Input/FHWA Classification	100% Referenced to other tables
7	DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input/FHWA Determination	100%
8	BEG_MP	999.999 (miles)	MP at start of road interval described by database record	Contractor Post-processing	Database Processing	100% (3)
9	END_MP	999.999 (miles)	MP at end of road interval described by database record	Contractor Post-processing	Database Processing	100% (3)
10	INT_LENGTH	999.9 (ft)	Length of road interval as aggregated for data table	Contractor Post-processing	Database Processing	100%
11	RTE_LENGTH	999.999 (miles)	Collected route length	ARAN Data Collection	Automatic Output	100% (3)
12	NO_LANES	99	Number of lanes in route	ARAN Data Collection	Survey Crew Input	Untested. (1)
13	LANE_NO	99	Data collection lane	Contractor Post-processing	Database Processing	Untested
14	D_LANE_WIDTH	99.999 (ft)	WiseCrax (crack detection software) analysis width	Contractor Post-processing	Automatic Output	Untested
15	LANE_WIDTH	99.9 (ft)	Width of lane	Contractor Post-processing	Video Analysis	95%, <=1.0 foot
16	PAVE_WIDTH	99.9 (ft)	Full pavement width	Contractor Post-processing	Video Analysis	95%, <=1.0 foot
17	SHLD_WIDTH_L	99.9 (ft)	Left shoulder width	Contractor Post-processing	Video Analysis	95%, <=1.0 foot (2)
18	SHLD_WIDTH_R	99.9 (ft)	Right shoulder width	Contractor Post-processing	Video Analysis	95%, <=1.0 foot (2)
19	SHLD_COND_L	N/A	N/A. Intended to be Left shoulder condition	ARAN Data Collection	Survey Crew Input	Values inaccurate, defaulted to “N/A”
20	SHLD_COND_R	N/A	N/A. Intended to be Right shoulder condition	ARAN Data Collection	Survey Crew Input	Values inaccurate, defaulted to “N/A”
21	DRAIN_COND_L	N/A	N/A. Intended to be Left drainage condition	ARAN Data Collection	Survey Crew Input	Values inaccurate, defaulted to “N/A”
22	DRAIN_COND_R	N/A	N/A. Intended to be Right drainage condition	ARAN Data Collection	Survey Crew Input	Values inaccurate, defaulted to “N/A”

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
23	SURF_TYPE	XX	Surface type of route	ARAN Data Collection	Survey Crew Input	Untested. (1)
24	PCR	999	Pavement Condition Rating	Contractor Post-processing	Database Processing	100% for calculation (6)
25	RCI	999	Roughness Condition Index; -1 if invalid IRI	Contractor Post-processing	Database Processing	100% for calculation
26	SCR	999	Surface Condition Rating	Contractor Post-processing	Database Processing	100% for calculation (5) (6)
27	IRI_AVG	999.9 (inches/mile)	Average IRI	Contractor Post-processing	Database Processing	Untested
28	IRI_SD	999.9 (inches/mile)	IRI standard deviation	Contractor Post-processing	Database Processing	Untested
29	IRI_L	999.9 (inches/mile)	Left wheel path IRI	ARAN Data Collection	Automatic Output	Untested
30	IRI_R	999.9 (inches/mile)	Right wheel path IRI	ARAN Data Collection	Automatic Output	Untested
31	IRI_FLAG	0 or -1	-1 if invalid IRI data	Contractor Post-processing	Database Processing	Untested
32	RUT_INDEX	999	Rut index	Contractor Post-processing	Database Processing	100% for calculation (5)
33	RUT_AVG	99.99 (inches)	Average rut depth of both wheelpaths	Contractor Post-processing	Database Processing	Untested (5)
34	RUT_MAX	99.99 (inches)	Maximum rut depth of both wheelpaths	Contractor Post-processing	Database Processing	Untested (5)
35	RUT_SD	9.9	Rut depth standard deviation	Contractor Post-processing	Database Processing	Untested (5)
36	RUT_LOW	999 (%)	Percent of low severity ruts (on a 0-200% scale) in both wheelpaths	Contractor Post-processing	Database Processing	Untested (5)
37	RUT_MED	999 (%)	Percent of medium severity ruts (on a 0-200% scale) in both wheelpaths	Contractor Post-processing	Database Processing	Untested (5)
38	RUT_HI	999 (%)	Percent of high severity ruts (on a 0-200% scale) in both wheelpaths	Contractor Post-processing	Database Processing	Untested (5)
39	XFALL	999.9 (% slope)	Cross fall at start of road interval	ARAN Data Collection	Automatic Output	Untested
40	GRADE	999.9 (% slope)	Grade at start of road interval	ARAN Data Collection	Automatic Output	Untested
41	AC_INDEX	999	Alligator cracking index	Contractor Post-processing	Database Processing	100% for calculation (5) (6)
42	AC_LOW	999.9999 (%)	Percent of WiseCrax measured lane area with low-severity alligator cracking	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
43	AC_MED	999.9999 (%)	Percent of WiseCrax measured lane area with medium-severity alligator cracking	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
44	AC_HI	999.9999 (%)	Percent of WiseCrax measured lane area with high-severity alligator	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
			cracking			
45	LC_INDEX	999	Longitudinal cracking index	Contractor Post-processing	Database Processing	100% for calculation (5) (6)
46	LC_LOW	999.99 (%)	Low-severity longitudinal cracking in lane as a percentage of road interval length	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
47	LC_MED	999.99 (%)	Medium-severity longitudinal cracking in lane as a percentage of road interval length	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
48	LC_HI	999.99 (%)	High-severity longitudinal cracking in lane as a percentage of road interval length	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
49	TC_INDEX	999	Transverse cracking index	Contractor Post-processing	Database Processing	100% for calculation (5) (6)
50	TC_LOW	999.99 (cracks)	Count of low-severity transverse cracks, where one crack unit equals the WiseCrax measured lane width	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
51	TC_MED	999.99 (cracks)	Count of medium-severity transverse cracks, where one crack unit equals the WiseCrax measured lane width	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
52	TC_HI	999.99 (cracks)	Count of high-severity transverse cracks, where one crack unit equals the WiseCrax measured lane width	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
53	PATCH_INDEX	999	Patching index	Contractor Post-processing	Database Processing	100% for calculation (5) (6)
54	PATCHING	999.9999 (%)	Percent of WiseCrax measured lane area affected by patching	Contractor Post-processing	Pavement Video Analysis	As a Computed 95% Confidence Level (5) (6)
55	GPS_LAT	999.999999	Latitude coordinate	ARAN Data Collection	Automatic Output	<= 3.00 feet
56	GPS_LON	-999.999999	Longitude coordinate	ARAN Data Collection	Automatic Output	<= 3.00 feet
57	GPS_ELEV	99999.9	Elevation	ARAN Data Collection	Automatic Output	Untested
58	GPS_MODE	XXX	GPS Satellite Mode during collection	ARAN Data Collection	Automatic Output	Untested
59	DATUM	(Text)	LL_WGS84_DD	ARAN Data Collection	Database Processing	100%
60	VIDEO	<*Park*>C04VID<#>	Removable USB video hard	Contractor Post-processing	Database Processing	Untested

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
			drive number			
61	IMAGE	(Text)	Filename of .jpg image showing road interval	Contractor Post-processing	Automatic Output	Untested
62	SPEED	999 (miles/hour)	Average ARAN speed during data collection	ARAN Data Collection	Automatic Output	Untested
63	BRIDGE_FLAG	0 or 1	Flag indicating presence of bridge in interval	ARAN Data Collection	Survey Crew Input	Untested
64	CONSTR_FLAG	0 or 1	Flag indicating construction in interval	ARAN Data Collection	Survey Crew Input	Untested
65	LANEDEV_FLAG	0 or 1	Flag indicating lane deviation in interval	ARAN Data Collection	Survey Crew Input	Untested
66	DATE	MM/DD/YY	Data collection date	ARAN Data Collection	Automatic Output	100%
67	NODISTRESS	0 OR 1	Flag indicating absence of pavement distress	Contractor Post-processing	Database Processing	100%
68	FILENAME	(Text)	Filename of raw data files	ARAN Data Collection	Automatic Output	100%
69	SECTION	(Text)	Route section ID	Route ID Meeting/ARAN Data Collection	Survey Crew Input/Automatic Output	100%
70	FKEY	(Numeric)	Unique record ID	Contractor Post-processing	Database Processing	100%
71	CONTRACTOR1	(Numeric)	Raw MP of first video frame in section	Contractor Post-processing	Database Processing	Untested
72	CONTRACTOR2	(Numeric)	Raw MP of last video frame in section	Contractor Post-processing	Database Processing	Untested
73	CONTRACTOR3	(Text)	Unique record ID used by VisiData	Contractor Post-processing	Database Processing	Untested
74	CONTRACTOR4	(Text)	Range of mileage to play in VisiData	Contractor Post-processing	Database Processing	Untested

ROUTE_GPS table metadata:

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
1	RIP_CYCLE	XX	4, for RIP data collection Cycle 4	Route ID Meeting	FHWA Determination	100% referenced to other tables
2	STATE	XX	State where route is located	Route ID Meeting	Park Input/FHWA Determination	Untested
3	PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	100% Referenced to other tables
4	PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	100% Referenced to other tables
5	RTE_NO	9999XXX	Route number	Route ID Meeting	Park Input/FHWA Classification	100% Referenced to other tables
6	FUNCT_CLASS	X	Route functional classification	Route ID Meeting	Park Input/FHWA Classification	100% Referenced to other tables
7	RTE_NAME	(Text)	Route name	Route ID Meeting	Park Input	100% Referenced to other tables . 100 characters fit in field
8	LANE_NUMBER	99	Data collection lane	Contractor Post-processing	Database Processing	Untested
9	DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input/FHWA Determination	Untested
10	MP	999.999	Mile Post (at 0.01 record)	ARAN Data Collection, Contractor Post-processing	Survey Crew Input/GPS Processing	Untested (3)
11	GPS_LAT	999.999999	GPS Latitude Co-ordinate (decimal degrees)	ARAN Data Collection, Contractor Post-processing	Automatic Output	<= 3.00 feet
12	GPS_LON	-999.999999	GPS Longitude Co-ordinate (-decimal degrees)	ARAN Data Collection, Contractor Post-processing	Automatic Output	<= 3.00 feet
13	GPS_ELEV	99999.9	Elevation	ARAN Data Collection, Contractor Post-processing	Automatic Output	Untested
14	GPS_MODE	XXX	GPS Satellite Mode during collection	ARAN Data Collection, Contractor Post-processing	Automatic Output	Untested
15	XFALL	999.9	Cross Fall: % Slope at GPS Location (Caution, Data not Validated)	ARAN Data Collection, Contractor Post-processing	Automatic Output	Untested
16	GRADE	999.9	Grade: % Slope at GPS Location (Caution, Data not Validated)	ARAN Data Collection, Contractor Post-processing	Automatic Output	Untested
17	HEADING	999.9	Heading Relative to True North	ARAN Data Collection	Automatic Output	Untested
18	DATUM	(Text)	LL_WGS84_DD	ARAN Data Collection	Database Processing	Untested
19	FILENAME	(Text)	Filename of raw data files	ARAN Data Collection	Automatic Output	Untested
20	FKEY	9999999	Unique record ID	Contractor Post-processing	Database Processing	Untested

21	DATE	MM/DD/YY	ARAN Data Collection Date	ARAN Data Collection	Automatic Output	Untested
22	COMMENT	(Text)	Source of Any Digitized Data	ARAN Data Collection	Database Processing	Untested
23	CONTRACTOR1	(Numeric)	Visi_from	Contractor Post-processing	Database Processing	Untested
24	CONTRACTOR2	(Numeric)	Visi_to	Contractor Post-processing	Database Processing	Untested
25	CONTRACTOR3	(Text)	Visi_dir (ipdated to chapter 1)	Contractor Post-processing	Database Processing	Untested
26	CONTRACTOR4	(Text)	Comments/exceptions	Contractor Post-processing	Database Processing	Untested

FHWA "Route ID Program" Database
Database Name: ROUTEINFO.mdb
Table Name: ROUTE_ID

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
1	ROUTE_IDENT	XXXX-9999XXX	The Park's Alpha Code + "-" + RTE_NO (below).	Route ID Meeting	Automatic Output	100%, Reference source for all tables
2	RIP_CYCLE	99	4, for RIP data collection Cycle 4	Route ID Meeting	FHWA Determination	100%, Reference source for all tables
3	PARK_ALPHA	XXXX	Park Alpha Code	Route ID Meeting	NPS References	100%, Reference source for all tables
4	GROUP_ALPHA	XXXX	Group Alpha Code	Route ID Meeting	NPS References	100%, Reference source for all tables
5	PARK_NO	9999	Park Numeric Code	Route ID Meeting	NPS References	100%, Reference source for all tables
6	PARK_NAME	(text)	NPS Name of Park	Route ID Meeting	NPS References	100%, Reference source for all tables
7	RTE_NO	9999XXX	Route Number	Route ID Meeting	Park Input	100%, Reference source for all tables
8	RTE_NAME	(Text)	Route Name	Route ID Meeting	Park Input	100%, Reference source for all tables
9	FROM_DESC	(Text)	Beginning terminus of route	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
10	TO_DESC	(Text)	Ending terminus of route	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
11	INSP_DATE	MM/DD/YYYY	Collection Date	ARAN Data Collection	FHWA Determination	100%, Reference source for all tables
12	FUNCT_CLASS	XX	Functional Class	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
13	STATE	XX	State where route is located	Route ID Meeting	Park Input/FHWA Determination	Untested (1)
14	STATE2	XX	Additional State Park Route traverses	Route ID Meeting	Park Input/FHWA Determination	Untested (1)
15	FMSS_NO	(Text)	NPS's Facility Management Software System (FMSS) Asset number	Route ID Meeting	Park Input	100%, Reference source for all tables
16	FMSS_SUR_EQP	(Text)	FMSS Surface Equipment Number	Route ID Meeting	Park Input	Untested
17	M_DISTRICT	(Text)	Park Maintenance District Route resides in	Route ID Meeting	Park Input	100%, Reference source for all tables (1)
18	TOPOGRAPHY	(Text)	Predominate Terrain condition for	Route ID Meeting	FHWA Determination	100%, Reference source for all

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
			Route. (FLAT, ROLLING, MOUNTAINOUS, or URBAN)			tables (1)
19	POSTED_SPEED	99	Posted Speed Limit for Route (Value is Predominate Speed Limit along Route)	Route ID Meeting	Park Input/FHWA Determination	Untested (1)
20	ARAN_ROUTE	XXX	Yes/No	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
21	PARKING_AREA	XXX	Yes/No	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
22	CONCESSION	XXX	Yes/No	Route ID Meeting	Park Input	100%, Reference source for all tables
23	PAVED_MI	999.999	Paved mileage (to the nearest 0.001)	ARAN Data Collection	Automatic Output	100%, Reference source for all tables
24	UNPAVED_MI	999.999	Unpaved mileage (to the nearest 0.001)	Route ID Meeting	Automatic Output	100%, Reference source for all tables
25	RTE_LENGTH	999.999	Official Route Length	Contractor Post-processing	Automatic Output	100%, Reference source for all tables
26	SURF_TYPE	XX	Surface type (PAVED: AS (asphalt, includes composite), CO (concrete), BR (brick/pavers), CB (cobblestone), OT (other))	Route ID Meeting	Survey Crew Input	100%, Reference source for all tables (1)
27	UNPAVED	XXXX	Unpaved Route (Yes/No/Both)	Route ID Meeting	Automatic Output	100%, Reference source for all tables
28	UNPAVED_CAT	XXX	Unpaved Road Category	Route ID Meeting	Automatic Output	Untested
29	CURB	(Text)	Parking Area with Curb around perimeter.	Route ID Meeting	Park Input/FHWA Determination	Untested
30	CURB_GUTTER	(Text)	Parking Area with Curb and Gutter around perimeter.	Route ID Meeting	Park Input/FHWA Determination	Untested
31	ADJ_ROUTE	9999XXX	Route number	Route ID Meeting	Automatic Output	100%, Reference source for all tables
32	USER_ACCESS	(Text)	Access Designation for Parking	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
33	PHOTO_NO	(Text)	Photo or Image	Route ID Meeting	Survey Crew Input	100%, Reference source for all tables
34	PLOT_SIZE	(Text)	Unpaved Parking Area Size	Route ID Meeting	Automatic Output	100%, Reference source for all tables
35	SQ_FEET	999.999	Route Square Footage	Contractor Post-processing	Automatic Output	100%, Reference source for all tables
36	M_RATING	(Text)	Manual Rating	Route ID Meeting	Automatic Output	100%, Reference source for all tables

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
37	SQ_YARDS	999.999	Route Square Yardage	Contractor Post-processing	Automatic Output	100%, Reference source for all tables
38	LANES	XX	Route travel lanes	Route ID Meeting	Automatic Output	Untested (1)
39	PAVE_WIDTH	999.99	Pavement Width (Weighted average)	RIP Post-processing	Automatic Output	100% Referenced to other tables
40	LANE_MILES	999.999	Route Equivalent Lane Miles	RIP Post-processing	Automatic Output	100%, Reference source for all tables
41	AREA_MAP	(Text)	1 or 2-digit number	Contractor Post-processing	FHWA/Contractor Input	100%, Reference source for all tables
42	REMARKS	(Memo)	General remarks on Park route and data collection operations.	Contractor Post-processing	FHWA/Contractor Input	Untested
43	SUMMARY_REC	XXXX-9999XXX	ROUTE_IDENT of summary Park Asset	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
44	NPS_REGION	(Text)	Park Region	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
45	DIVISION	(Text)	FHWA Division	Route ID Meeting	Park Input/FHWA Determination	100%, Reference source for all tables
46	PCR	999.99	Route Weighted Average PCR value	RIP Post-processing	Automatic Output	100% Referenced to other tables
47	SCR	999.99	Route Weighted Average SCR value	RIP Post-processing	Automatic Output	100% Referenced to other tables
48	AADT	999	Average Adjusted Daily Traffic	RIP	Automatic Output	Untested
49	SADT	999	Seasonal Adjusted Daily Traffic	RIP	Automatic Output	Untested
50	ADT_DATE	MM/DD/YYYY	Traffic Date of Collection	RIP	Automatic Output	Untested
51	BEG_LAT	999.999999	Route Begin GPS Latitude Co-ordinate (decimal degrees)	ARAN Data Collection	Automatic Output	<= 3.00 feet, Referenced from other tables
52	BEG_LON	-999.999999	Route Begin GPS Longitude Co-ordinate (-decimal degrees)	ARAN Data Collection	Automatic Output	<= 3.00 feet, Referenced from other tables
53	BEG_ELEV	99999.9	Route Begin Elevation	ARAN Data Collection	Automatic Output	100% Referenced to other tables
54	BEG_MODE	XXX	Route Begin GPS Satellite Mode during collection	ARAN Data Collection	Automatic Output	100% Referenced to other tables
55	END_LAT	999.999999	Route End GPS Latitude Co-ordinate (decimal degrees)	ARAN Data Collection	Automatic Output	<= 3.00 feet, Referenced from other tables

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
56	END_LON	-999.999999	Route End GPS Longitude Co-ordinate (-decimal degrees)	ARAN Data Collection	Automatic Output	<= 3.00 feet, Referenced from other tables
57	END_ELEV	99999.9	Route End Elevation	ARAN Data Collection	Automatic Output	100% Referenced to other tables
58	END_MODE	XXX	Route End GPS Satellite Mode during collection	ARAN Data Collection	Automatic Output	100% Referenced to other tables
59	DATUM	(Text)	LL_WGS84_DD	ARAN Data Collection	Automatic Output	100% Referenced to other tables
60	CHILD_ROUTE	XXX	Yes/No	Route ID Meeting	Automatic Output	100% Reference source for all tables
61	CULVERT_CNT	999	Route Culvert Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
62	DROP_INLET_CNT	999	Route Drop Inlet Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
63	GATE_CNT	999	Route Gate Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
64	TRAFLIGHT_CNT	999	Route Traffic Light Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
65	SIGN_CNT	999	Route Sign Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
66	LWCROSS_CNT	999	Route Low Water Crossing Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
67	BRIDGE_CNT	999	Route Bridge Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
68	TUNNEL_CNT	999	Route Tunnel Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
69	PULLOUT_CNT	999	Route Pullout Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
70	INTERSEC_CNT	999	Route Intersection Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
71	ST_BNDRY_CNT	999	Route State Boundary Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
72	PRK_BNDRY_CNT	999	Route Park Boundary Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
73	RETWALL_CNT	999	Route Retaining Wall Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
74	RR_CROSS_CNT	999	Route RR Crossing Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
75	CATTLE_CNT	999	Route Cattle Guard Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
76	OVHDSIGN_CNT	999	Route Overhead Sign Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
77	MILEMARK_CNT	999	Route Mile Marker Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
78	FHYD_CNT	999	Route Fire Hydrant Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
79	OVERPASS_CNT	999	Route Overpass Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
80	CABLE_TLNG	9999.999 (ft)	Route Total Length Cable Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
81	GDRAIL_TLNG	9999.999 (ft)	Route Total Length Guard/Guide Rail Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
82	GDWALL_TLNG	9999.999 (ft)	Route Total Length Guard/Guide Wall Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
83	TEMP_BARR_TLNG	9999.999 (ft)	Route Total Length Temporary Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
84	BOLLARD_TLNG	9999.999 (ft)	Route Total Length Bollard Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
85	BARRIER_TLNG	9999.999 (ft)	Route Total Length All Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
86	CURB_TLNG	9999.999 (ft)	Route Total Length Curbing (excludes Parking Areas)	RIP Post-processing	Automatic Output	100% Referenced to other tables
87	LWCROSS_TLNG	9999.999 (ft)	Route Total Length Low Water Crossings	RIP Post-processing	Automatic Output	100% Referenced to other tables
88	PAVDITCH_TLNG	9999.999 (ft)	Route Total Length Paved Ditch	RIP Post-processing	Automatic Output	100% Referenced to other tables (2)
89	TURNOUT_TLNG	9999.999 (ft)	Route Total Length Turnouts	RIP Post-processing	Automatic Output	100% Referenced to other tables
90	LANE_NUMBER	99	Number of Lane Tested	RIP Post-processing	Automatic Output	100% Referenced to other tables
91	LOCAL_FACTOR	9.9999	Park Location Factor	NPS Partner	Automatic Output	100% Reference source for all tables
92	E_ZONE	XXX	Route Environmental Zone	FHWA HPMA	Automatic Output	100% Reference source for all tables
93	PAVEMENT_DM	$99,999,999.99	Pavement Deferred Maintenance	FHWA HPMA	Automatic Output	100% Reference source for all tables
94	CRV	$99,999,999.99	Current Replacement Value	RIP Post-processing	Automatic Output	100% Reference source for all tables

Database Name: ROUTEINFO.mdb
Table Name: PARK_TOTALS

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
1	RIP_CYCLE	99	4, for RIP data collection Cycle 4	Route ID Meeting	FHWA Determination	100% Referenced to other tables
2	PARK_ALPHA	XXXX	Park Alpha Code	Route ID Meeting	FHWA Determination	100% Referenced to other tables
3	GROUP_ALPHA	XXXX	Group Alpha Code	Route ID Meeting	NPS References	100% Referenced to other tables
4	PARK_NO	9999	Park Numeric Code	Route ID Meeting	NPS References	100% Referenced to other tables
5	PARK_NAME	XXXX	NPS Name of Park	Route ID Meeting	NPS References	100% Referenced to other tables
6	INSP_DATE	MM/DD/YYYY	Date that data was collected in the park (completion date).	Route ID Meeting and ARAN Data Collection	FHWA Determination	100% Referenced to other tables
7	NPS_REGION	XXXX	Park Region	Route ID Meeting	Park Input	100% Referenced to other tables
8	DIVISION	XXXX	FHWA Division	Route ID Meeting	FHWA Determination	100% Referenced to other tables
9	T_PAVED_MI	999.999	Total Park Paved Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
10	T_UNPAVED_MI	999.999	Total Park Unpaved Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
11	T_ROUTE_MILES	999.999	Total Park Route Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
12	T_ARAN_DRIVEN	999.999	Total Park ARAN Driven Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
13	T_ARAN_LMILES	999.999	Total Park ARAN Lane Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
14	T_CONCESS_PAVED	999.999	Total Park Concession Paved Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
15	T_CONCESS_UNPAVED	999.999	Total Park Concession Unpaved Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
16	T_PRK_PAVEDSQFT	999.999	Total Park Parking Paved Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables
17	T_PRK_UNPAVEDSQFT	999.999	Total Park Parking Unpaved Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables
18	T_CPRK_PAVEDSQFT	999.999	Total Park Concession Parking Paved Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
19	T_CPRK_UNPAVEDSQFT	999.999	Total Park Concession Parking Unpaved Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables
20	T_PARKING_SQFT	999.999	Total Park Parking Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables
21	T_PARKING_LMILES	999.999	Total Park Parking Equivalent Lane Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
22	T_MRR_SQFT	999.999	Total Park Manually Rated Road Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables
23	T_CMRR_SQFT	999.999	Total Park Concession Manually Rated Road Square Feet	RIP Post-processing	Automatic Output	100% Referenced to other tables
24	T_MRR_LMILES	999.999	Total Park Manually Rated Road Equivalent Lane Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
25	T_LMILES	999.999	Total Park Lane Miles	RIP Post-processing	Automatic Output	100% Referenced to other tables
26	T_CULVERT_CNT	999	Total Park Culvert Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
27	T_DROP_INLET_CNT	999	Total Park Drop Inlet Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
28	T_GATE_CNT	999	Total Park Gate Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
29	T_TRAFLIGHT_CNT	999	Total Park Traffic light Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
30	T_SIGN_CNT	999	Total Park Sign Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
31	T_LWCROSS_CNT	999	Total Park Low Water Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
32	T_BRIDGE_CNT	999	Total Park Bridge Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
33	T_TUNNEL_CNT	999	Total Park Tunnel Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
34	T_PULLOUT_CNT	999	Total Park Pullout Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
35	T_INTERSEC_CNT	999	Total Park Intersections Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
36	T_ST_BNDRY_CNT	999	Total Park State Boundaries Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
37	T_PRK_BNDRY_CNT	999	Total Park Boundaries Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
38	T_RETWALL_CNT	999	Total Park Retaining Wall Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
39	T_RR_CROSS_CNT	999	Total Park RR Crossing Count	RIP Post-processing	Automatic Output	100% Referenced to other

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
						tables
40	T_CATTLE_CNT	999	Total Park Cattle Guard Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
41	T_OVHDSIGN_CNT	999	Total Park Overhead Sign Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
42	T_MILEMARK_CNT	999	Total Park Mile Marker Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
43	T_FHYD_CNT	999	Total Park Fire Hydrant Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
44	T_OVERPASS_CNT	999	Total Park Overpass Count	RIP Post-processing	Automatic Output	100% Referenced to other tables
45	T_CABLE_TLNG	9999.999 (ft)	Total Length Park Cable Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
46	T_GDRAIL_TLNG	9999.999 (ft)	Total Length Park Guard/Guide Rail Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
47	T_GDWALL_TLNG	9999.999 (ft)	Total Length Park Guard/Guide Wall Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
48	T_TEMP_BARR_TLNG	9999.999 (ft)	Total Length Park Temporary Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
49	T_BOLLARD_TLNG	9999.999 (ft)	Total Length Park Bollard Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
50	T_BARRIER_TLNG	9999.999 (ft)	Total Length All Park Barriers	RIP Post-processing	Automatic Output	100% Referenced to other tables
51	T_CURB_TLNG	9999.999 (ft)	Total Length Park Curbing	RIP Post-processing	Automatic Output	100% Referenced to other tables
52	T_LWCROSS_TLNG	9999.999 (ft)	Total Length Park Low Water Crossings	RIP Post-processing	Automatic Output	100% Referenced to other tables
53	T_PAVDITCH_TLNG	9999.999 (ft)	Total Length Park Paved Ditches	RIP Post-processing	Automatic Output	100% Referenced to other tables (2)
54	T_TURNOUT_TLNG	9999.999 (ft)	Total Length Park Turnouts	RIP Post-processing	Automatic Output	100% Referenced to other tables
55	PARK_PCR	99.99	Overall Park PCR Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
56	PARK_RCI	99.99	Overall Park RCI Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
57	PARK_SCR	99.99	Overall Park SCR Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
58	PARK_RUT_INDEX	99.99	Overall Park Rutting Index Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
59	PARK_AC_INDEX	99.99	Overall Park Alligator Cracking Index Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables

	FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
60	PARK_LC_INDEX	99.99	Overall Park Longitudinal Cracking Index Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
61	PARK_TC_INDEX	99.99	Overall Park Transverse Cracking Index Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
62	PARK_PATCH_INDEX	99.99	Overall Park Patching Index Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables
63	PARK_CONC_PCR	99.99	Overall Park Concession PCR Rating	RIP Post-processing	Automatic Output	100% Referenced to other tables

Business Practices for Route Numbering and Roadway Asset Identification

Introduction and Background:
Beginning in November 2006, inventory and condition information gathered by the Federal Highway Administration (FHWA) has been stored in FMSS to enable NPS to report Deferred Maintenance (DM) and Current Replacement Value (CRV) for NPS paved roads, paved parking areas, bridges, and tunnels. The NPS Roads Working Group (RWG) has been tasked with developing and implementing the procedures necessary to transfer DM and CRV from FHWA's databases to NPS' Facility Management Software System (FMSS).

Current business practices for roadway definition in national parks involve face-to-face meetings between FHWA personnel and individual park staff known as "Route ID" meetings. These meetings have been ongoing for several years and have been performed within the context of the Road Inventory Program (RIP) executed mainly by FHWA. The primary focus of these meetings has been on defining roadway static information such as route names, numbers, functional class, etc. The FHWA personnel are the primary individuals responsible for implementing the RIP and the route ID meetings are an integral and fundamental part of that process. The RIP process provides route numbers for each individual road and parking area in each park. After the route ID meetings establish a given park's roadway asset base, various types of condition and inventory data are collected either manually or with a data collection van that drives each individual road with an individual route number.

The FMSS requires asset numbers as unique identifiers for all asset types including roadways. **The current practice is that all roadways that are assigned a route number at route ID, also are defined as assets and therefore also receive an FMSS asset number** (Route names and functional classes are also collaboratively assigned during the face-to-face route ID meetings). This practice began midway through the third RIP data collection cycle (ending in 2003) and was further reinforced during an asset alignment process conducted in the summer of 2006. The alignment process ensured that each route number in RIP and each asset number in FMSS were matched to the correct road and parking area.

Issue Statement:
As a result of various pre-existing business practices associated with the RIP, which predates FMSS by several years, route numbers are assigned for routes that are often very small. In tandem with the current business practice that all routes with route numbers are considered assets, this has caused a proliferation of asset numbers within FMSS. Over the past year, the RWG has learned that this business practice has significantly increased time and resources that parks must dedicate to administering FMSS data entry and management. This additional work effort is due to the fact that tying FMSS asset records to the more detailed, granular RIP route numbers has generated numerous new assets that require additional database and work order management. This has led to a situation where assets are not being defined the way they are managed.

The following proposed practices seek to create an asset definition process that is dictated by to how road assets are managed at the park level, not according to the pre-existing practices used in RIP for collecting detailed road information. RIP practices assign route numbers mainly based on how data are collected and driven with a data collection device. These procedures will disassociate the driving of roads with the data collection van from the process of assigning them asset status. **The end goal is to only assign asset numbers based on how parks manage their facilities within guidelines set up within FMSS and herein.** Driving the road with the data collection van allows for the collection of higher quality data as well as the ability to view road segments with video viewing software (Visidata). By de-linking driving the roads with the assignment of "asset status", we are able to get the best quality data without the proliferation of assets that has serious negative ramifications for managing roadways in parks using asset management tools.

Proposed Actions:

1. Make a distinction within the route number field in the RIP database between those route numbers that represent assets, those that are subcomponents of assets and those that are groups of sub-components. The route number field in the RIP database will be expanded from 6 to 7 characters. The additional character will denote the asset status of the route in question. Combined routes will be designated with a double "zz", while subcomponents will be designated with one "z". Whenever possible, a combined route should use the lowest route number to be combined as the combined route number.
2. Only show assets, whether a group of subcomponents or a single component, on the Route ID report. Assets that are composed of subcomponents will have "zz" in the route number. Individual routes will have no additional characters in the route number. Subcomponents (designated in RIP with a "z") will not be listed on the route ID report. Only assign asset numbers to those routes listed on the route ID report.
3. Provide a separate reporting function (other than the Route ID report) to identify and display information for route numbers not representing assets. Specific reporting requirements and format TBD.
4. Add a new field to the RIP database to indicate the "asset status" of a route number. The flag will have three possible values:
    a. Asset with no subcomponents.
    b. Asset with subcomponents.
    c. Non-asset (i.e. subcomponent).

    Both a change in the route number and a new "asset ID" field in the RIP database are recommended. It is easier to perform queries and other database manipulations using a separate field instead of a character within the route number field. The character in the route number field allows for rapid identification of the asset status of a road without having to access the database as a whole. Even thought non-asset routes will not be included in the route ID report (the primary location for parks to view road information in RIP), there are many other reports as well as the Visidata application where the route number is

displayed. In these cases, the character in the route number will clearly identify the asset status of the roadway.

5. Focus asset definition practices on NPS asset management needs. Create roadway assets based on how parks manage these assets within the following guidelines:
    a. Individual road segments (asset subcomponents) may be combined into a single asset**. Note that all the attributes of individual subcomponents (paved area, equipment, work orders, etc) will be included in the combined asset.**
    b. In general, combination should be used in complex circulatory environments such as campground areas, housing and other administrative areas, maintenance areas, etc.
    c. Public and non-public segments may not be combined.
    d. Segments with differing functional classes may not be combined.
    e. Discrete parking areas may be combined into a single asset where they service the same facility or resource and are within walking distance of each other.
    f. Parking areas and roads may not be combined. This includes short road segments that may be near or adjacent to parking areas. See 5h below for exceptions to this.
    g. Where the primary purpose of a road is to provide access to a parking area, and that road segment is approximately 0.25 miles in length or shorter, the access road should be considered part of the parking area (Note that this is an existing RIP business practice).
    h. Particularly long routes may be divided into multiple assets based on how a park manages the roadway network. This should not be confused with the use of sub-components listed in 5a.
    i. Roads that are actively managed by concession operations may not be combined with those managed by the NPS.

Discussion:
The first four items listed above are actions required by FHWA RIP to allow for the adoption of the practices shown in 5a-i. The following will provide additional direction and examples for guidelines listed.

<u>Individual road segments (asset subcomponents) may be combined into a single asset.</u>
Where previous route ID practices have generated more assets (routes) than are practical from an asset management standpoint, small, discrete road lengths may be designated as asset subcomponents and then combined into a larger single asset. A subcomponent is NOT an FMSS term. Subcomponents will be used in RIP to indicate which routes are small, drivable individual road segments and which routes may include these segments. Once a piece of road is designated a subcomponent of another route, it will no longer have any individual identity in FMSS. Only those routes listed on the RIP Route ID report will have asset numbers in FMSS. As stated in business rule 2 above, subcomponents will not be listed on the route ID. The quantity information (length, area) will be included into the larger route of which they are a part. See Figures 1 and 2 for an example of how existing assets may be combined using subcomponents. Note that

subcomponents will have an identity in the RIP database and, if driven by RIP team, may be referenced in RIP reports, Visidata, or other RIP documentation.

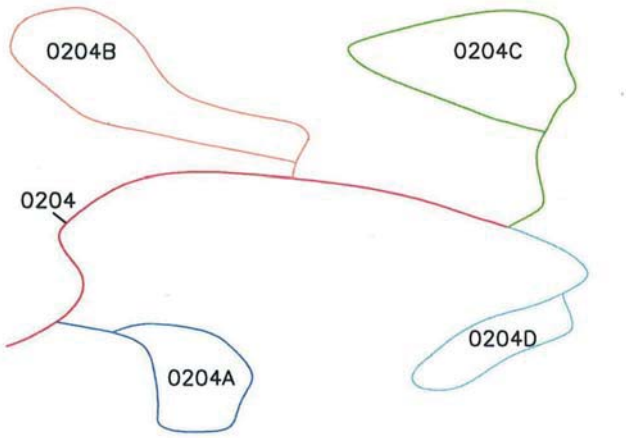


Figure 1: Campground with five routes and five assets

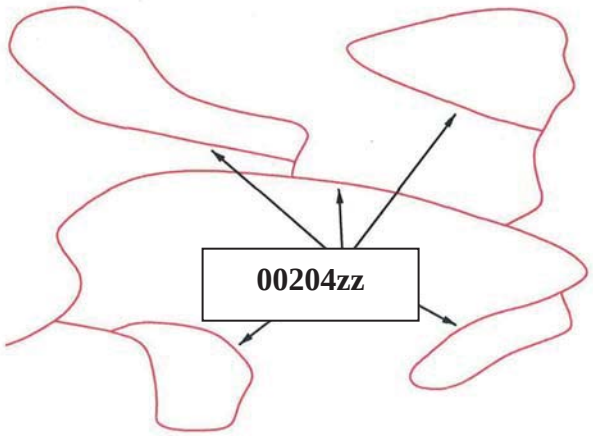


Figure 2: Campground with all loops combined into one route and one asset. This has eliminated four assets.

In general, combination should occur in complex circulatory environments such as campground areas, housing and other administrative areas, maintenance areas, etc.

Typically these complex situations are where too many assets have been used to define roadways. Combining simple "point A to point B" roads that are clearly defined and provide access to different facilities or locations may not be done.

Public and non-public segments may not be combined. Roads that are posted as closed to the public or are intended as administrative access only (maintenance areas, housing areas, fire roads, etc) can not be combined with roads open to the public.

Segments with differing functional classes may not be combined. The roadway functional class is found on the Route ID report. Functional class indicates the type of circulatory function a given road provides. Functional class is used in a variety of applications (engineering, safety, funding) so it is important to maintain the correct functional class attributes of individual roads/assets. There are some cases where functional class was erroneously assigned in prior Route ID meetings such as where campground loops have a different functional class than the campground road. Functional classes of individual roads may be modified to correct discrepancies. The functional class definitions may not be modified.

Discrete parking areas may be combined into a single asset where they service the same facility or resource and are within walking distance of each other. These combined areas should be maintained as one asset. There are many instances where small (5-10 space), discrete parking areas have been separated into individual assets even though they provide parking for the same area or facility. These may be combined into a single asset. Figures 3 and 4 shows examples of combining parking areas.

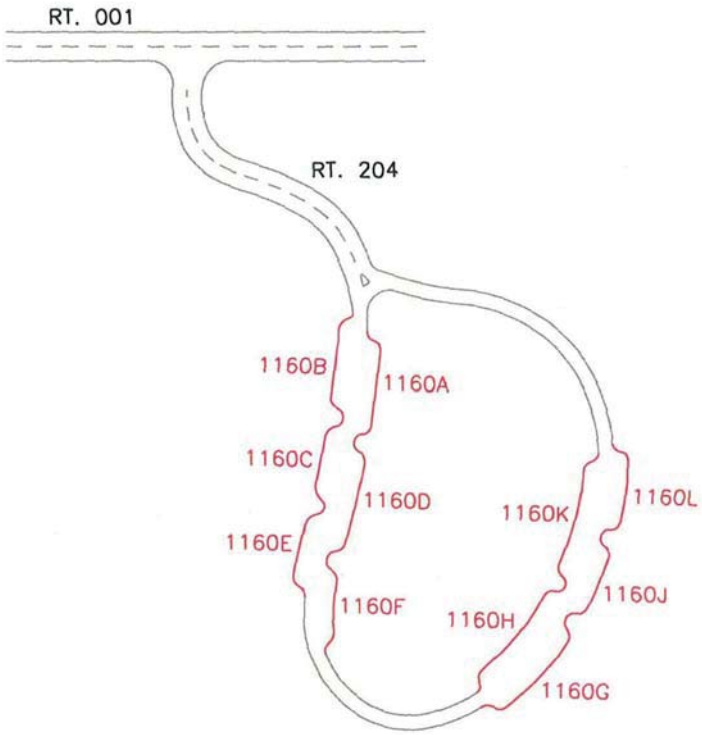


Figure 3: Parking with access route 204 and multiple parking areas (1160 A-L). Currently, this parking area is 12 routes and 12 assets (one 1100 asset and 11 1300 assets).

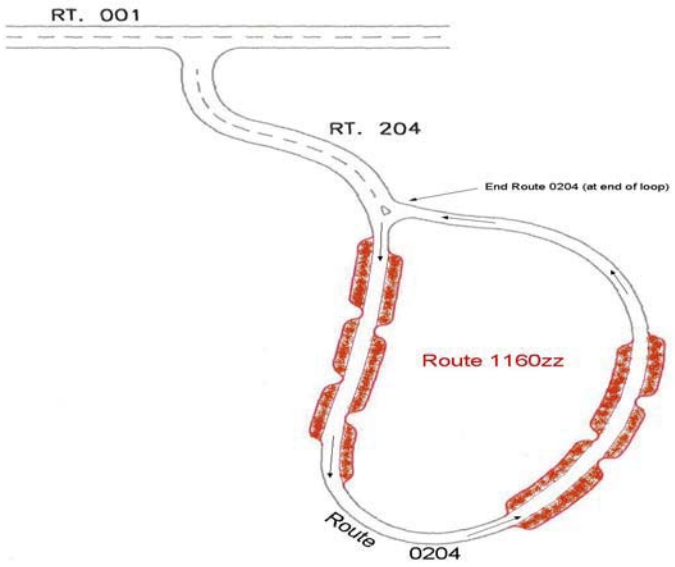


Figure 4: Parking with access route 204 and one parking area 1160zz. Route 204 is assumed longer than 0.25 miles. There are now 2 assets (one 1100 asset, one 1300 asset) instead of 12.

Parking areas and roads may not be combined. Parking areas and roads are tracked as separate asset types (1300 vs. 1100) in FMSS and as such should not be combined except in situations described by 5g. In Figure 5, Route 207 is a spur road from the main route running through parking area 1102. Since the spur road continues through and beyond the parking area, it will remain a separate route.

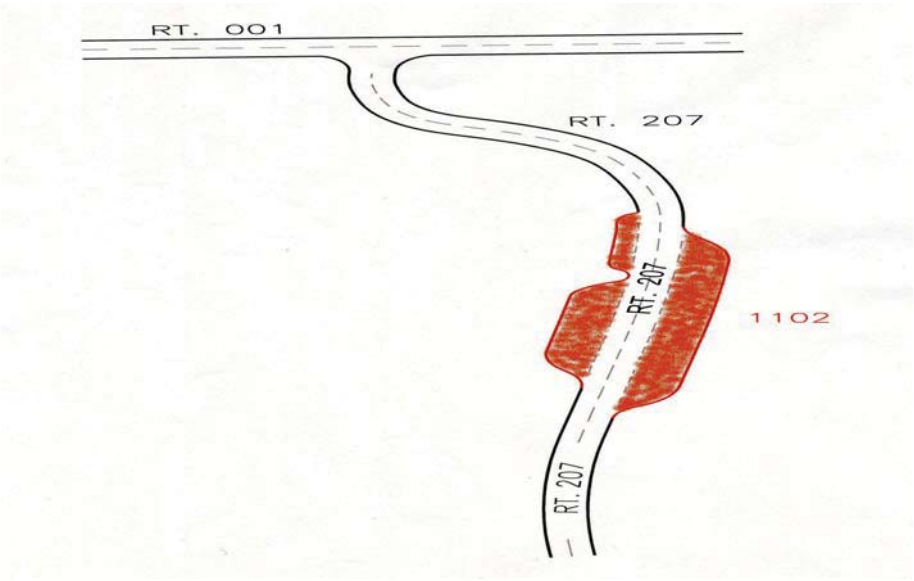


Figure 5: Parking with access route 207 running through and continuing beyond parking 1102. This access route cannot be considered a part of the parking area and two routes and two assets continue to exist.

Where the primary purpose of a road is to provide access to a parking area, and that road segment is less than 0.25 miles in length, the access road should be considered part of the parking area. See Figures 8. Where a road continues on past a parking area to another facility or destination, even if it is less than 0.25 miles to the initial parking area, the road and parking area may not be combined.

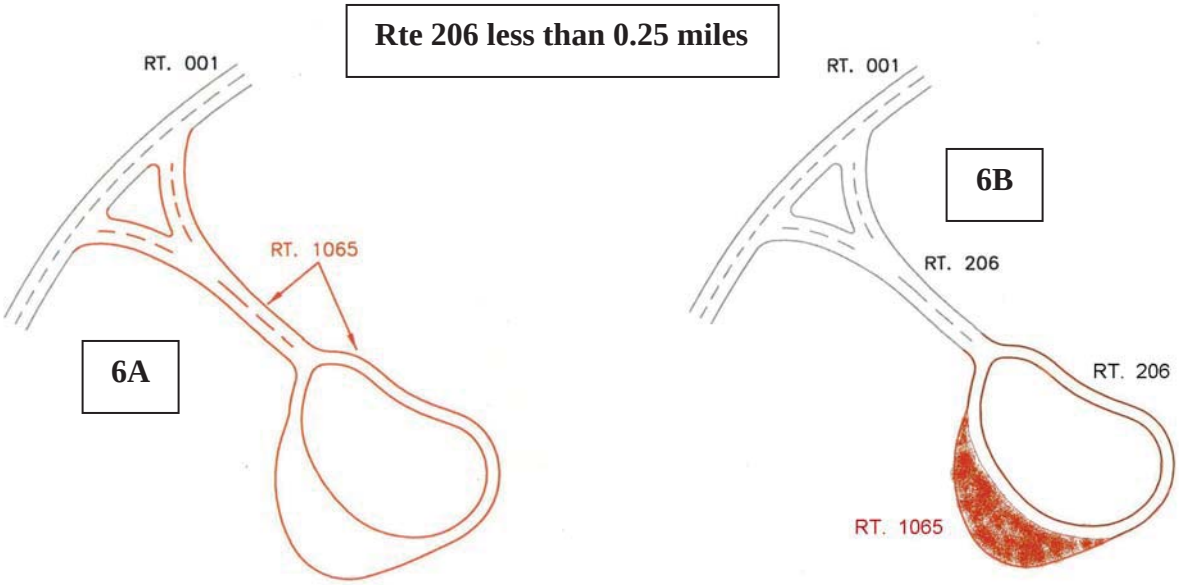


Figure 6: Since the access route is less than .25 miles in length and the only use of the access is to the parking, one route for both the access and the parking area can be established.

Particularly long routes may be divided into multiple assets based on how a park manages the roadway network. This should not be confused with the use of sub-components listed in 5a. Routes like the Blue Ridge Parkway or the Yellowstone Grand Loop may not lend themselves to management as a single asset by virtue of their length. Often management districts are created for sections of these routes and maintenance activities occur primarily within these districts. Parks may break routes up into separate assets during the Route ID process if the road is managed as discrete sections. This should only be done for very long roads.

The following example illustrates a complex road system and how the proposed business practice and several of the guidelines could be applied to create fewer assets that are consistent with local management.

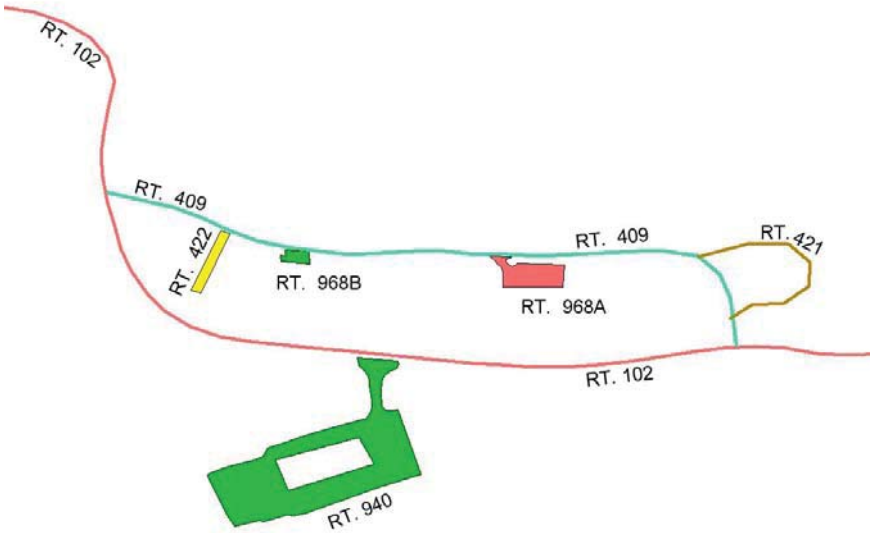


Figure 7 – Current Housing area access configuration. Route 409 is less than 0.25 miles long.

The area serviced by Routes 409, 421, 422, 968A, and 968B is all employee housing. Route 940 provides access to visitor services and not to the housing area. Routes may be combined to create assets that reflect local management. Routes 409, 421, and 422 are all the same functional class, provide access to one type of activity (housing) and are all posted as non-public. These routes may be combined. They should not be combined with any parking areas even though they are all less than 0.25 miles long. This is because their main function is not to provide access to parking. Routes 968A and B provide parking for access to the same facility (housing). Even though these discrete areas may provide parking to different housing units, it's reasonable to manage them as a single asset. They may also be combined.

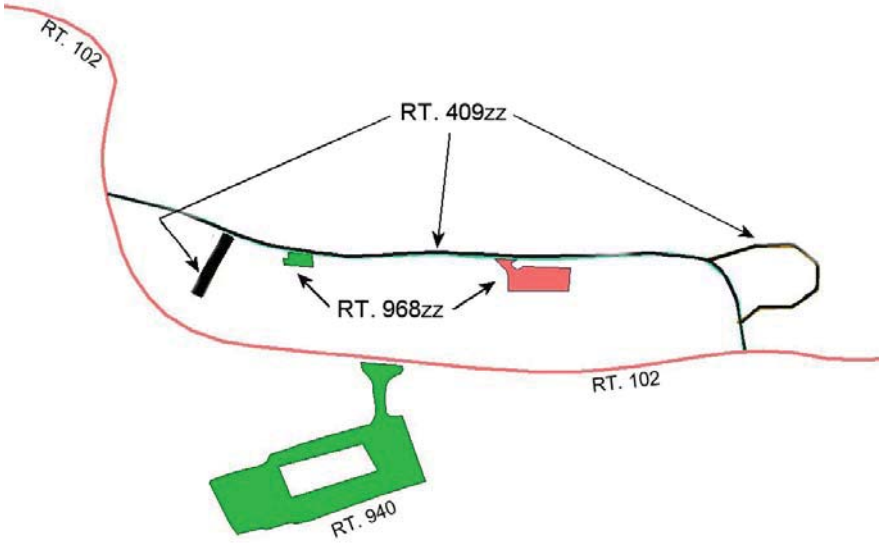


Figure 8 – Combined housing area access configuration – Parking and road assets combined to eliminate 3 assets.