The Road Inventory
of
Petrified Forest National Park
PEFO – 8430

national park service



Road Inventory Program

Prepared By:
Federal Highway Administration
Eastern Federal Lands Highway Division
Cycle 3

Petrified Forest National Park
in
Arizona

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INTRODUCTION

Background: In July 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 and short-range costs and programs to bring National Park Service (NPS) roads up to, or to maintain, designated standards, and to 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 re-established in the 1990's. The FLH completed two cycles of RIP data collection between 1994 and 2001. Cycle 1 data was collected in 44 large parks from 1994 to 1995. 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."

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 the 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 3: A third RIP cycle was initiated in 2001. Data was collected from March 2001 to July 2004, and is included in the Cycle 3 Reports. Cycle 3 includes 254 large and small parks with a combined total of 5,455 route miles.

In the Cycle 3 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 of 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.

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Petrified Forest National Park Summaries

Overall Park Mileage Summary

PARK TOTAL SUMMARY ITEMS	TOTAL	DATE
Paved ARAN Driven Route Miles	34.72	2/19/2003
Unpaved Estimated Route Miles	39.55	2/19/2003
Paved ARAN and Unpaved Route Miles	74.27	
Paved ARAN Driven Lane Miles	67.51	2/19/2003
Paved MRR Lane Miles	1.88	2/19/2003
Parking Lot Lane Miles	10.22	2/19/2003
Total Paved Lane Miles	79.61	

Notes: Total Paved Lane Miles includes the sum of Paved ARAN Driven Lane Miles, Paved MRR Lane Miles, and Parking Lot Lane Miles

Unpaved Route Miles are estimates, they have not been inventoried by the Roadway Inventory Program (RIP)

Petrified Forest National Park Summaries

Cost to Improve to "Excellent" Condition

SOURCE	WORK PERFORMED	COST PER MILE	INITIAL CONDITION
FHWA Awarded Projects	Surface Maintenance	$30,000	Excellent
FHWA Awarded Projects	3-R (Resurfacing)	$110,000	Good
FHWA Awarded Projects	3-R (Resurfacing, Restoration, and Rehabilitation) Projects	$560,000	Fair
FHWA Awarded Projects	4-R (Resurfacing, Restoration, Rehabilitation, and Reconstruction) Projects	$1,540,000	Poor

Based on the above table, the cost to improve ARAN driven paved road condition miles to "Excellent" PCR are:

Existing Condition	Existing Miles	Estimated Cost to Improve
Excellent	0.38	$11,400
Good	0.83	$91,300
Fair	19.31	$10,813,600
Poor	14.20	$21,868,000
Totals	**34.72**	**$32,784,300**

The above numbers include the 35% PE, CE and contingency costs and are national averages. The cost estimates were used in the calculations for the 2004 Reauthorization Bill to determine the level of funding required to bring all the NPS roads into a Pavement Condition Rating (PCR) of Good (85).

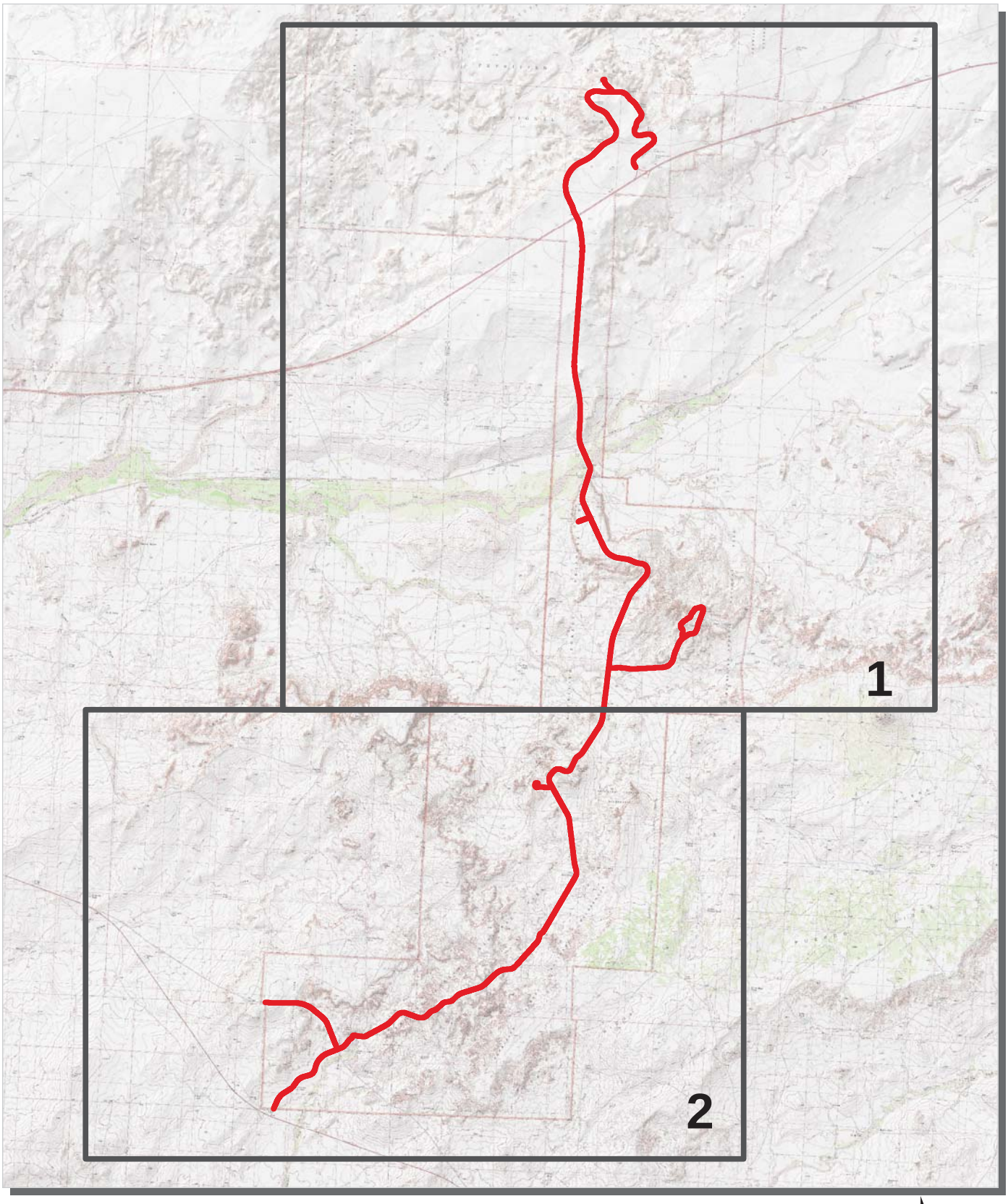
These numbers are for preliminary planning purposes only and should not be used for project level proposals. For park planning level analysis, apply your park multiplier for more accurate regional costs.

Petrified Forest National Park Summaries

Paved Route Miles and Percentages by Functional Class and PCR for ARAN Driven Paved Roads

F.C.	Pavement Condition Rating								TOTAL MILES
	Poor (<=60)		Fair (61-84)		Good (85-94)		Excellent (95-100)		
	MILES	%	MILES	%	MILES	%	MILES	%	
1	10.42	30.01%	16.92	48.73%	0.62	1.79%	0.32	0.92%	28.28
2	1.88	5.41%	2.39	6.88%	0.21	0.60%	0.06	0.17%	4.54
3									
4									
5									
6	1.90	5.47%							1.90
7									
8									
Totals	**14.20**	**40.90%**	**19.31**	**55.62%**	**0.83**	**2.39%**	**0.38**	**1.09%**	**34.72**

Petrified Forest National Park
Route Location
Key Map



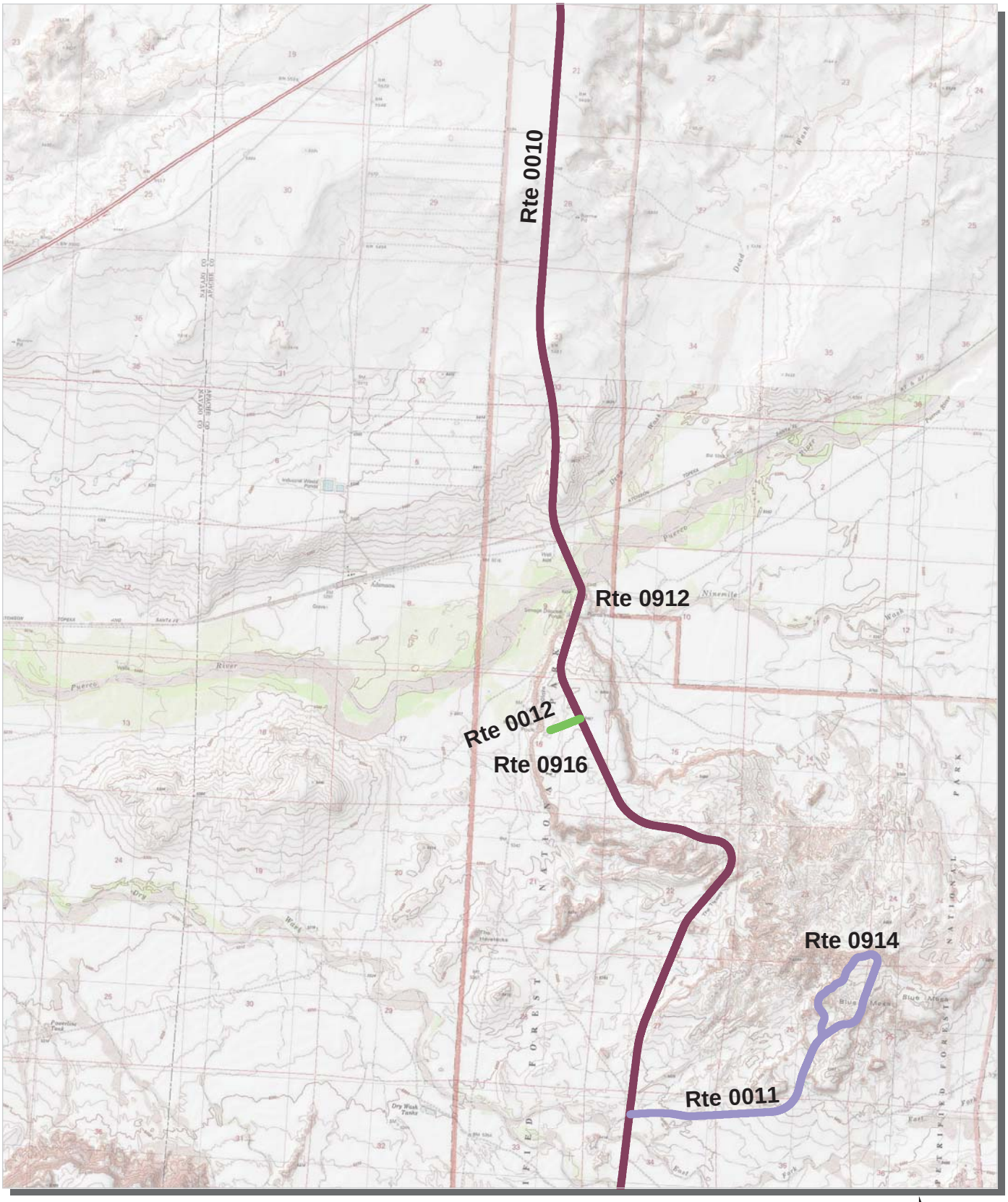
Park Owned Routes

4 2 0 4 Miles

N

3-1

Petrified Forest National Park
Route Location Map
Area Map 1

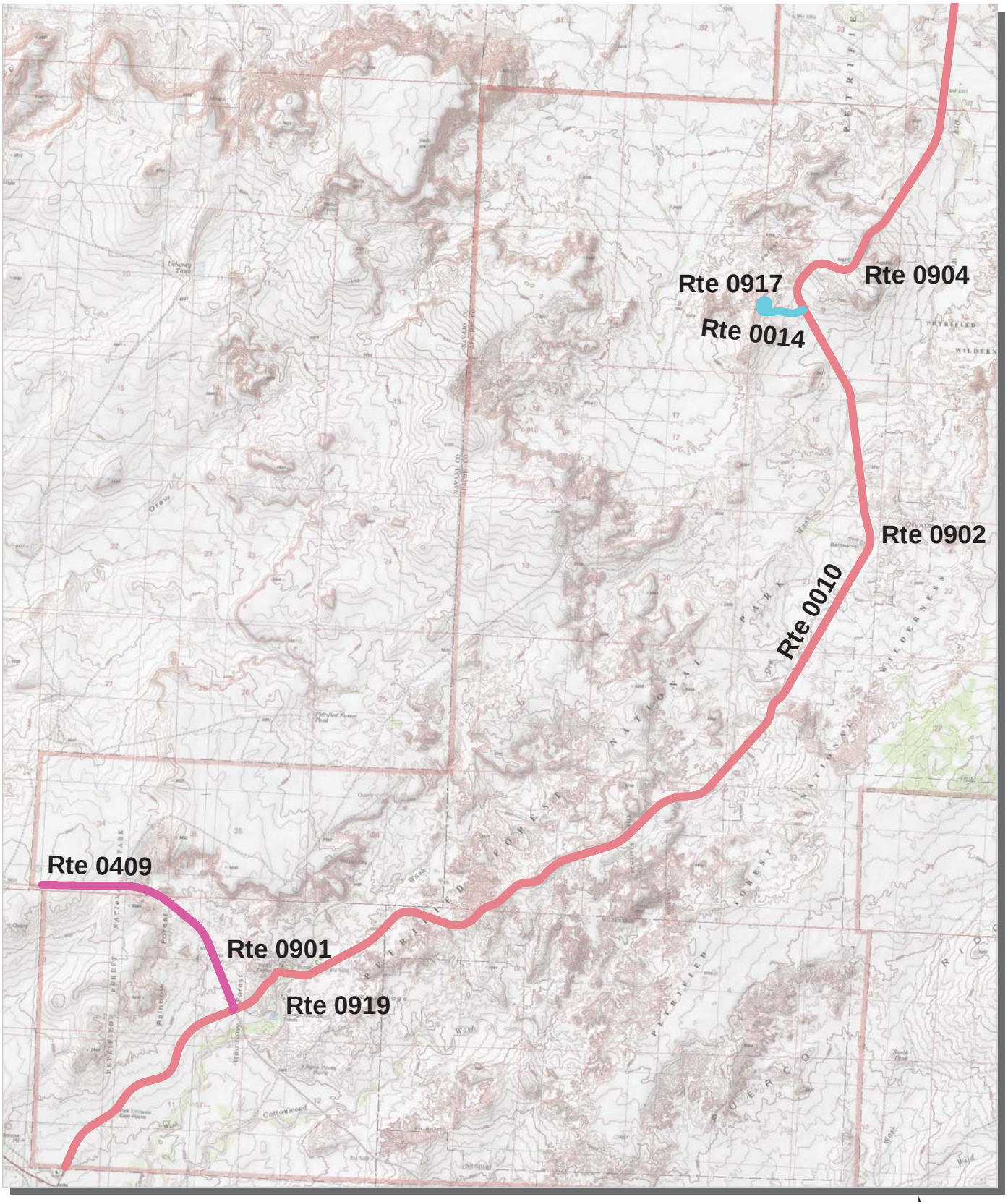


Unique colors used to differentiate routes

1 0.5 0 1 Miles

N

Petrified Forest National Park
Route Location Map
Area Map 2



Unique colors used to differentiate routes

1 0.5 0 1 Miles

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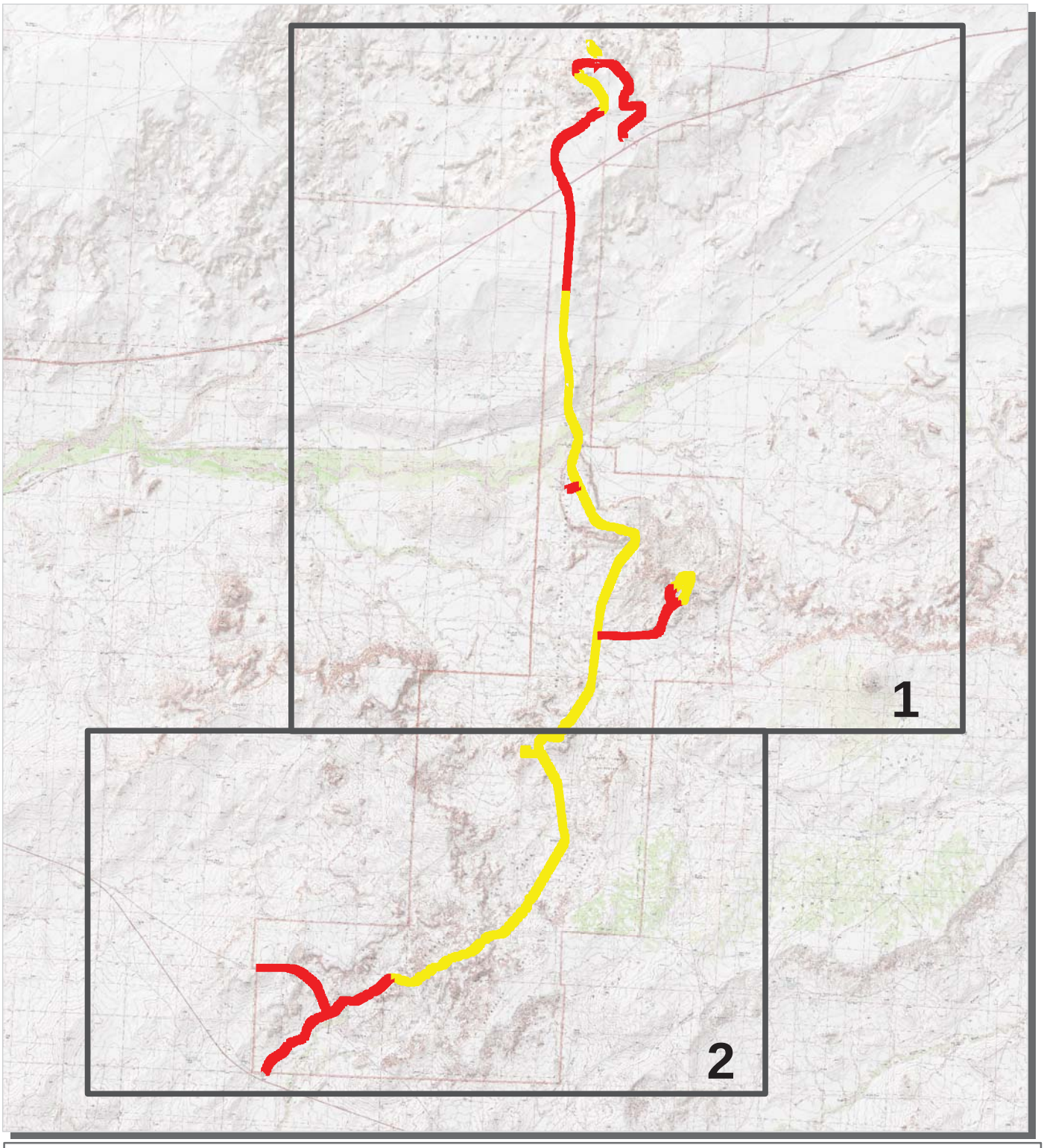
Petrified Forest National Park
Route Condition Key Map
PCR - Mile by Mile



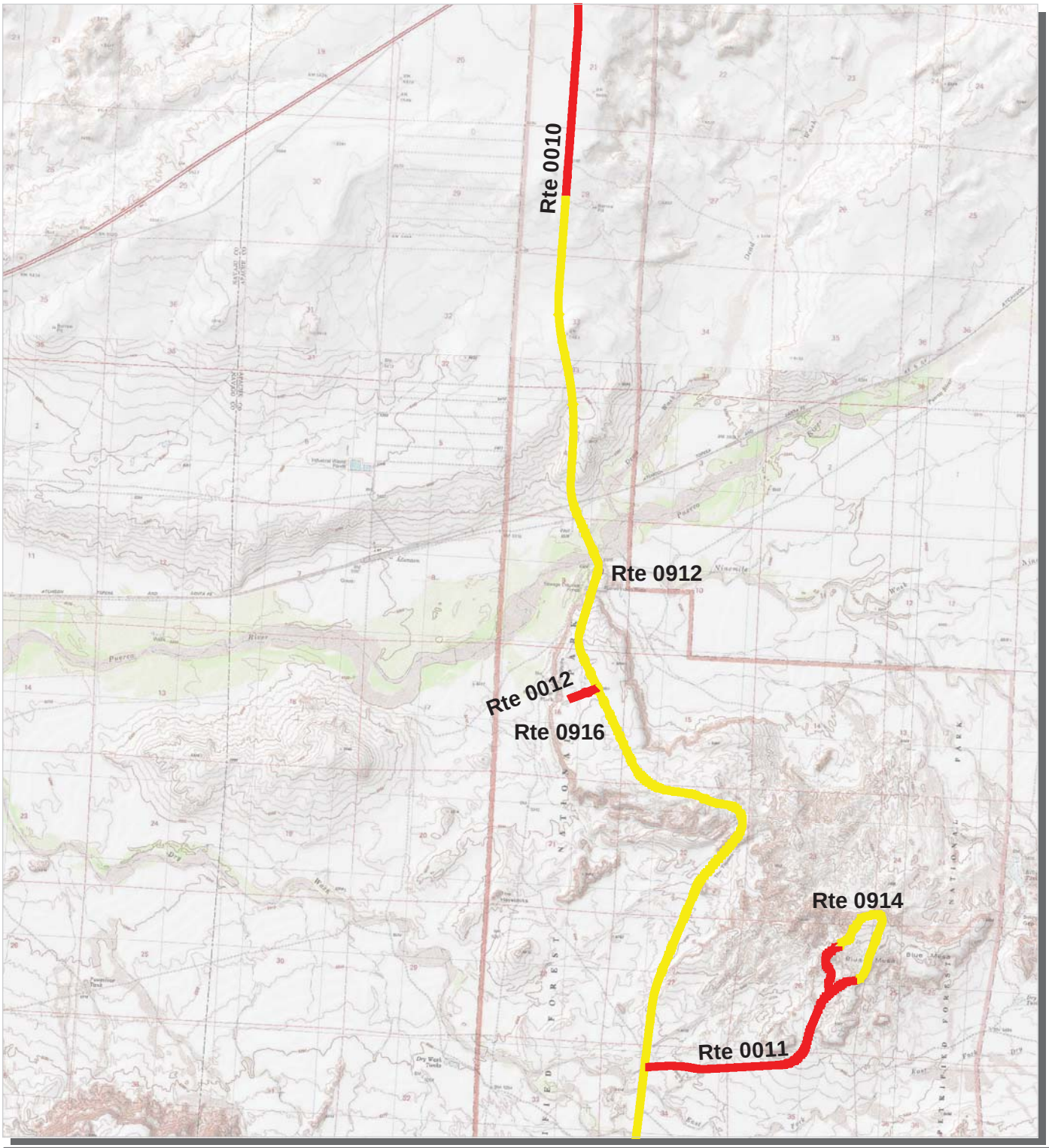
PCR	Poor	Fair	Good	Excellent
	(<=60)	(61 - 84)	(85 - 94)	(95 - 100)

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

3 1.5 0 3 Miles

N

Petrified Forest National Park
Route Condition Area Map 1
PCR - Mile by Mile



PCR	Poor	Fair	Good	Excellent
	(<=60)	(61 - 84)	(85 - 94)	(95 - 100)

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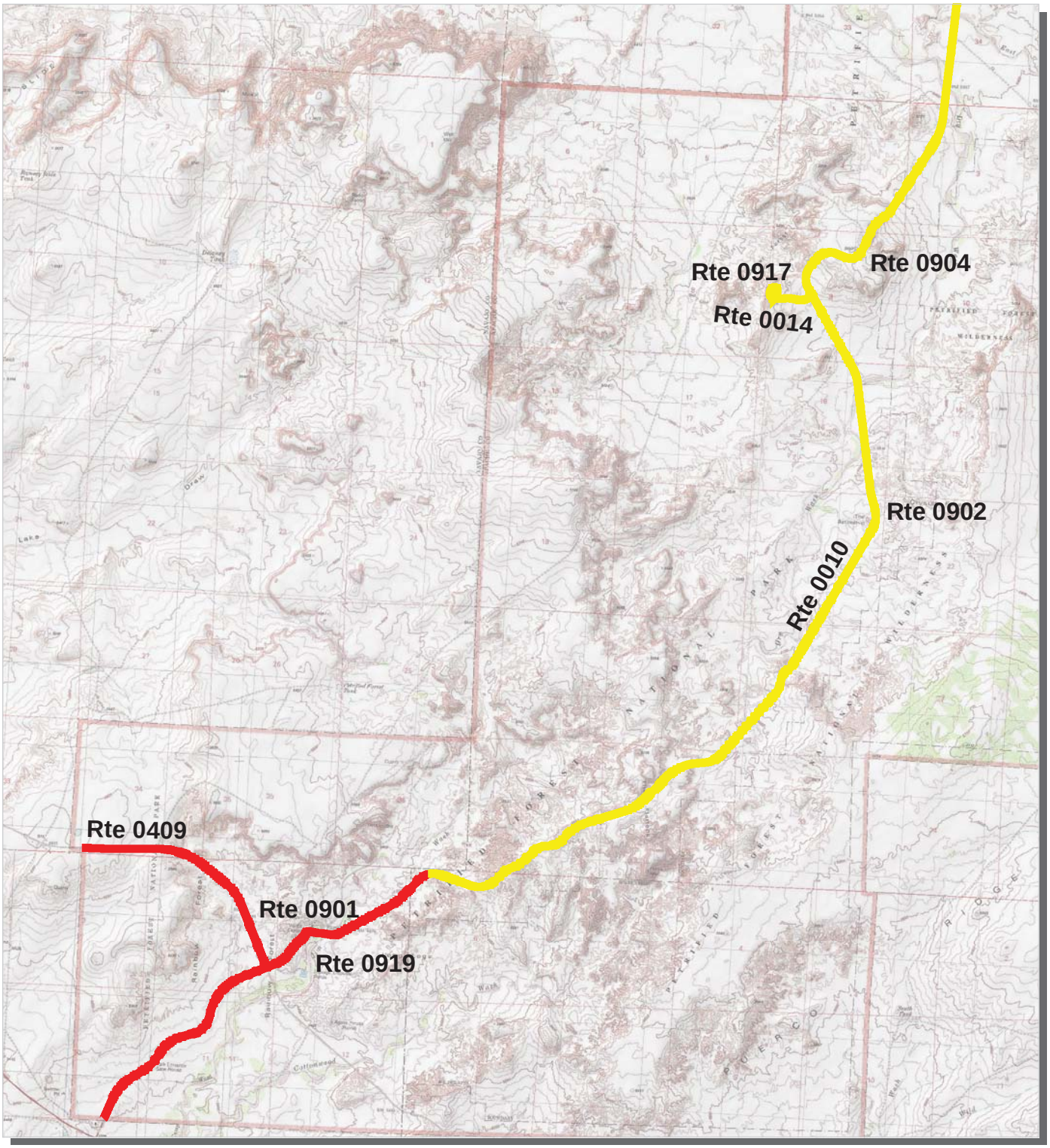
1 0.5 0 1 Miles

N

Petrified Forest National Park
Route Condition Area Map 2
PCR - Mile by Mile



PCR	Poor	Fair	Good	Excellent
	(<=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.

1 0.5 0 1 Miles

N

NPS/RIP Route ID Report

(Numerical By Route #)

Shading Color Key:
Red text denotes approx. mileage

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

PEFO

Petrified Forest National Park

Rte. #	FMSS Asset #	Route Name	Route Description From	Route Description To	Paved Miles	Un-Paved Miles	Rte. Lgth	Func. Class	Rte. Lanes	Manual Rated SQ/FT	Surf. Type
0010	74016	North-South Highway	From Painted Desert Entrance (I-40)	To South Entrance (US 180)	28.28	0.00	28.28	1	2	0	AS
0011	74031	Blue Mesa Road	From Route 0010 at MP 15.67	To End of Loop	3.44	0.00	3.44	2	2	0	OC
0012	74032	Newspaper Rock Road	From Route 0010 at MP 11.9	To Route 0916	0.25	0.00	0.25	2	2	0	OC
0014	74034	Jasper Forest Road	From Route 0010 at MP 18.5	To End of Loop	0.51	0.00	0.51	2	2	0	AS
0015	74035	Agate Bridge Road	From Route 0010 at MP 17.84	To Route 0904	0.16	0.00	0.16	2	2	8,105	OC
0200	74036	Chinde Point Access Road	From Route 0010 at MP 2.35	To Route 0903	0.34	0.00	0.34	2	2	0	OC
0400	74037	Old ROUTE 66	From	To	0.00	2.77	2.77	6	2	0	GR
0401	74038	Gravel Pit Road	From Route 0400	To Gravel Pit	0.00	0.50	0.50	6	2	0	GR
0402	74039	Painted Desert Spur Road #1	From Route 0400	To End	0.00	1.36	1.36	6	2	0	GR
0403	74040	Painted Desert Spur Road #2	From Route 0400	To End	0.00	0.36	0.36	6	2	0	GR
0404	74041	Northeast Fence Line Road	From Route 0400	To End	0.00	8.52	8.52	6	2	0	GR
0406	74044	South Pipeline Road	From Route 0409	To Route 0010	0.00	15.01	15.01	6	2	0	GR
0407	74045	North Pipeline Road #1	From	To	0.00	1.23	1.23	6	2	0	GR
0408	74046	North Pipeline Road #2	From	To	0.00	1.75	1.75	6	2	0	GR
0409	74042	Old Route 180 North	From Route 0010 at MP 26.53	To Horse Corral	1.90	0.00	1.90	6	2	0	OC
0410	74049	Lithodendron Wash Road	From	To	0.00	4.75	4.75	6	2	0	GR
0411	74058	Lithodendron Wash Road North	From	To	0.00	1.60	1.60	6	2	0	GR
0412	74050	Lithodendron Wash Spur	From	To	0.00	0.60	0.60	6	2	0	GR
0413	74066	Horse Corral Road	From	To	0.00	0.70	0.70	6	2	0	GR
0414	74068	Horse Corral Spur	From	To	0.00	0.40	0.40	6	2	0	GR
0415	74063	Painted Desert Residence Area	From Route 0010 at MP 0.55	To End	1.40	0.00	1.40	6	2	81,350	AS
0416	74070	South Residence Area	From Route 0901	To End	0.34	0.00	0.34	6	2	19,781	OC
0900	74073	Painted Desert Visitors Center	Adjacent to Route 0010 at MP 0.3		0.00	0.00	0.00	9		105,186	OC
0901	74076	South Area Museum and Picnic Parking	Adjacent to Route 0010 at MP 26.1		0.00	0.00	0.00	9		115,207	OC
0902	74080	Crystal Forest Parking	Adjacent to Route 0010 at MP 20.3		0.00	0.00	0.00	9		19,359	AS
0903	74081	Chinde Point Parking	At End of Route 0200		0.00	0.00	0.00	9		0	GR
0904	74086	Agate Bridge Parking	At End of Route 0015		0.00	0.00	0.00	9		18,285	OC
0905	74088	Tipani Point Parking	Adjacent to Route 0010 at MP 0.9		0.00	0.00	0.00	9		39,034	AS
0906	74092	Tawa Point Parking	Adjacent to Route 0010 at MP 1.8		0.00	0.00	0.00	9		30,350	AS
0907	74095	Kachina Point Parking	Adjacent to Route 0010 at MP 2.1		0.00	0.00	0.00	9		38,344	AS
0908	74101	Pintado Point Parking	Adjacent to Route 0010 at MP 3.0		0.00	0.00	0.00	9		16,855	AS

NPS/RIP Route ID Report

(Numerical By Route #)

Shading Color Key:
Red text denotes approx. mileage

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

PEFO

Petrified Forest National Park

Rte. #	FMSS Asset #	Route Name	Route Description From	Route Description To	Paved Miles	Un-Paved Miles	Rte. Lgth	Func. Class	Rte. Lanes	Manual Rated SQ/FT	Surf. Type
0909	74103	Nizhoni Point Parking	Adjacent to Route 0010 at MP 4.12		0.00	0.00	0.00	9		23,135	AS
0910	74105	Whipple Point Parking	Adjacent to Route 0010 at MP 4.34		0.00	0.00	0.00	9		20,474	AS
0911	74107	Lacey Point Parking	Adjacent to Route 0010 at MP 4.73		0.00	0.00	0.00	9		14,646	AS
0912	74110	Puerca Pueblo Parking	Adjacent to Route 0010 at MP 11.0		0.00	0.00	0.00	9		32,450	OC
0913	74113	North Entrance Parking Area	Just before Route 0010 starts at North Park Entrance		0.00	0.00	0.00	9		13,843	AS
0914	74120	Blue Mesa Loop Trail Parking	Adjacent to Route 0011 at MP 2.7		0.00	0.00	0.00	9		7,364	OC
0915	74130	Overlook Parking	Adjacent to Route 0010 at MP 1.6		0.00	0.00	0.00	9		7,319	AS
0916	74132	Newspaper Rock Parking Area	At End of Route 0012		0.00	0.00	0.00	9		24,380	OC
0917	74133	Jasper Forest Parking	Adjacent to Route 0014		0.00	0.00	0.00	9		20,927	AS
0919	74136	South Area Ranger Parking	Adjacent to Route 0010 at MP 26.13		0.00	0.00	0.00	9		4,524	OC
0920		Painted Desert Maintenance and Administration Area Parking	Adjacent to Route 0900 at End		0.00	0.00	0.00	9		41,850	OC
				Totals:	36.62	39.55	**76.17**			702,768	

NPS/RIP Route ID Report

(Numerical By Route #)

Shading Color Key:
Red text denotes approx. mileage

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

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 Invetoried 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.

Class 9 Boat Ramp - (Public and Administrative) Route Numbers 800-899.
Parking Area - (Public and Administrative) Route Numbers 900-1999.

****

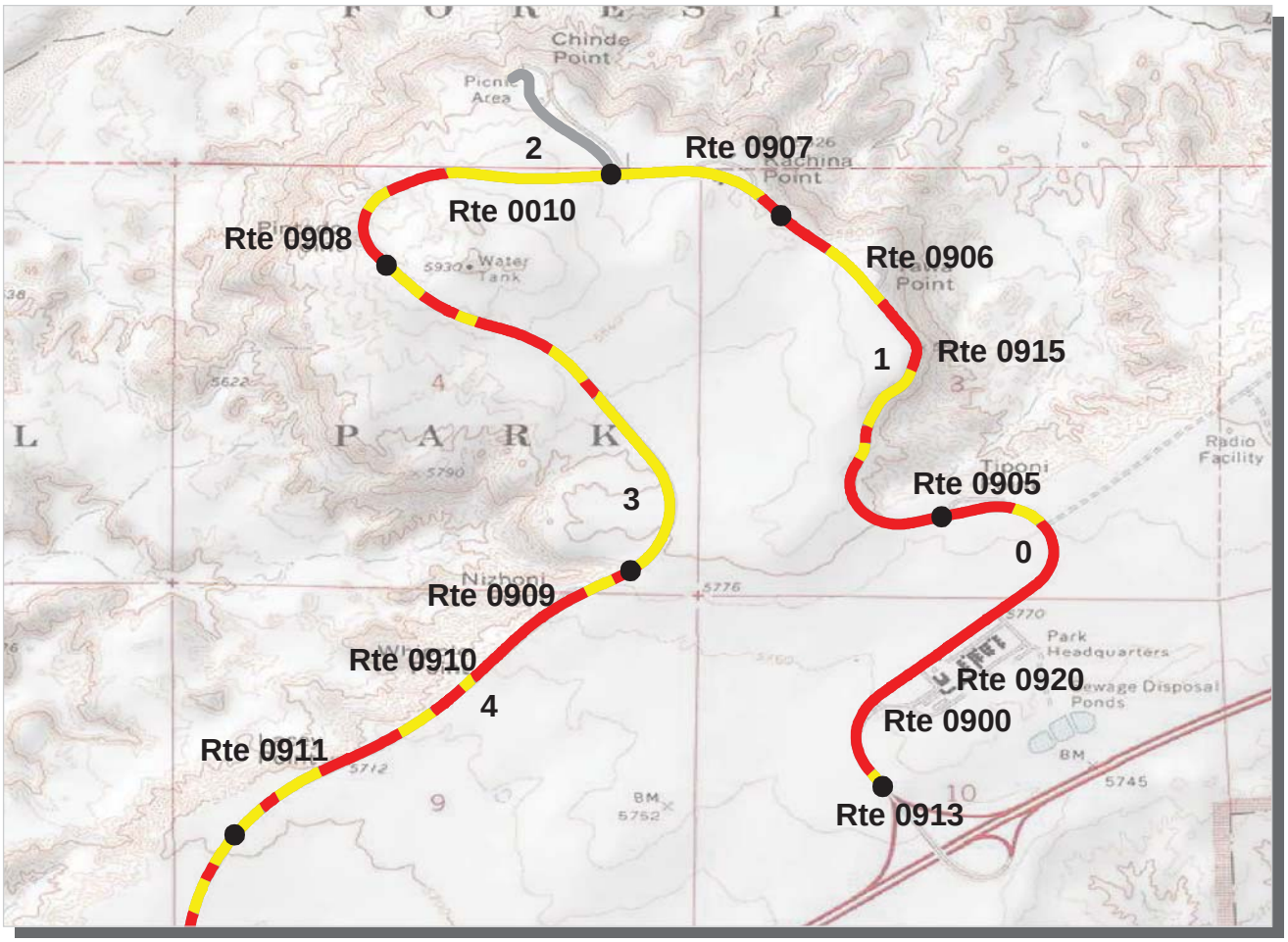
A park road system contains those roads within or giving access to a park or other unit of the NPS which are administered by the NPS, or by the Service in cooperation with other agencies. The assignment of a functional classification (FC) to a park road is not based on traffic volumes or design speed,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

ZZ Functional Class Routes were added from FMSS Database. Final Route Number and Functional Class will be established during Park visit for Cycle 4 data collection.

Surface Type Abbreviations:

AS - Asphaltic Concrete Pavement
CO - Portland Cement Concrete Pavement
NC - New Chip Seal Pavement (Under 5 Years)
OC - Old Chip Seal Pavement (5 Years and Greater)
SS - Slurry Seal Pavement
GR - Gravel Road Bed
BR - Brick or Pavers Road Bed
CB - Cobble Stone Road Bed
SA - Sand Road Bed
DT - Dirt or Native Material Road Bed
OT - Other Materials Road Bed



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

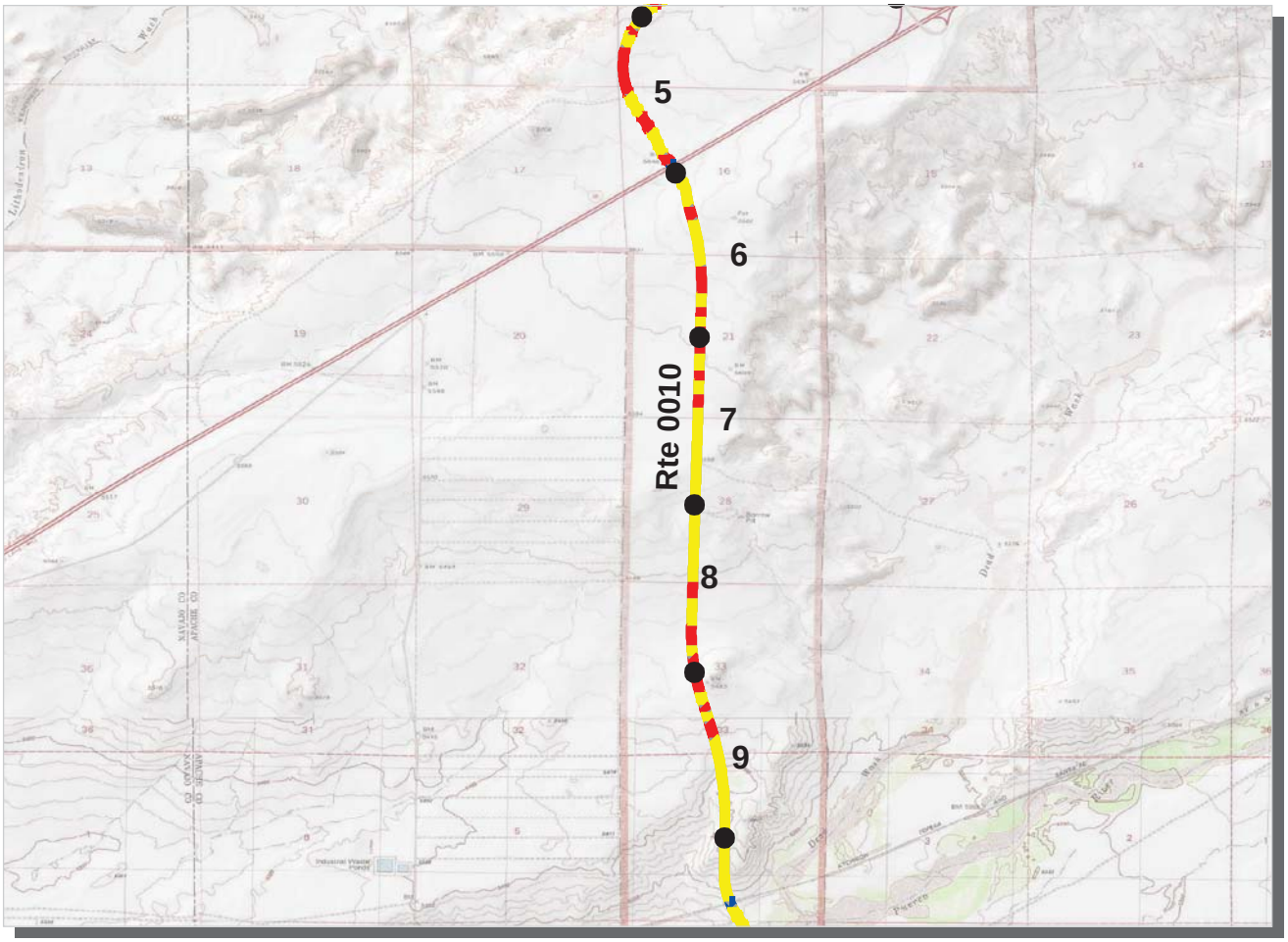
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0010 North-South Highway **TOTAL LENGTH: 28.28 Miles**

Section Number	0	1	2	3	4
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	23	21	21	20	22
Lane Width (ft)	13	11	10	10	11
Shoulder Width (ft)	7	4	3	5	0
Roadway Condition Information					
PCR (Pavement Condition Rating)	46	58	60	62	54
RCI (Roughness Condition Index)	77	95	97	99	65
SCR (Surface Condition Rating)	31	33	36	38	46
Alligator Cracking Index	98	99	100	99	99
Rutting Index	57	46	48	47	52
Patching Index	96	100	98	100	100
Tranverse Cracking Index	88	92	92	93	96
Longitudinal Cracking Index	88	94	96	96	97
Shoulder Condition Rating	GOOD	GOOD	GOOD	GOOD	N/A
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



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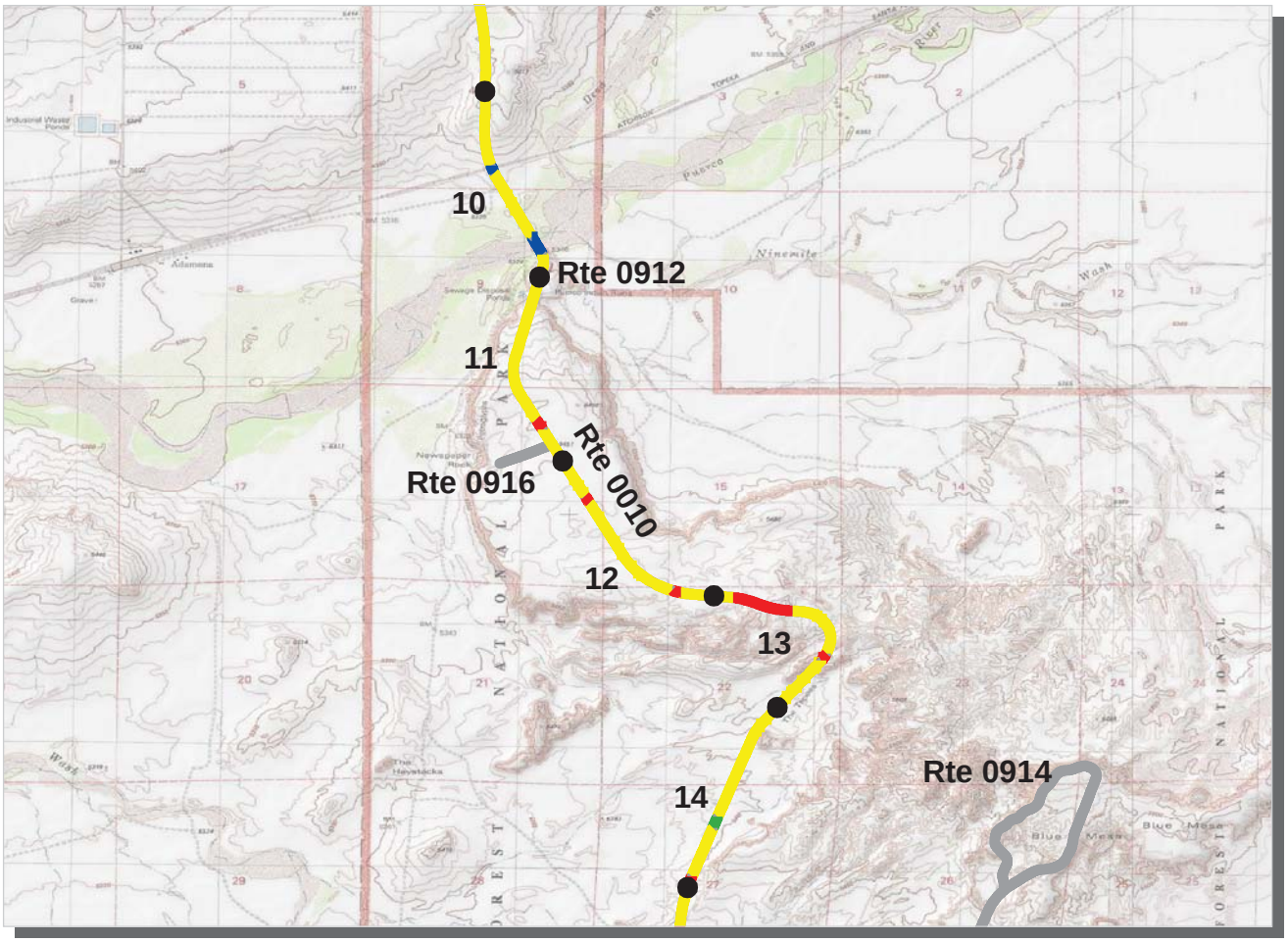
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0010 North-South Highway **TOTAL LENGTH: 28.28 Miles**

Section Number	5	6	7	8	9
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	20	20	19	20	20
Lane Width (ft)	11	10	10	10	10
Shoulder Width (ft)	4	4	3	3	4
Roadway Condition Information					
PCR (Pavement Condition Rating)	57	59	60	61	64
RCI (Roughness Condition Index)	77	85	88	88	93
SCR (Surface Condition Rating)	42	42	41	43	45
Alligator Cracking Index	99	99	99	99	100
Rutting Index	53	56	53	51	50
Patching Index	98	96	97	98	100
Tranverse Cracking Index	94	93	95	96	96
Longitudinal Cracking Index	96	96	94	97	98
Shoulder Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

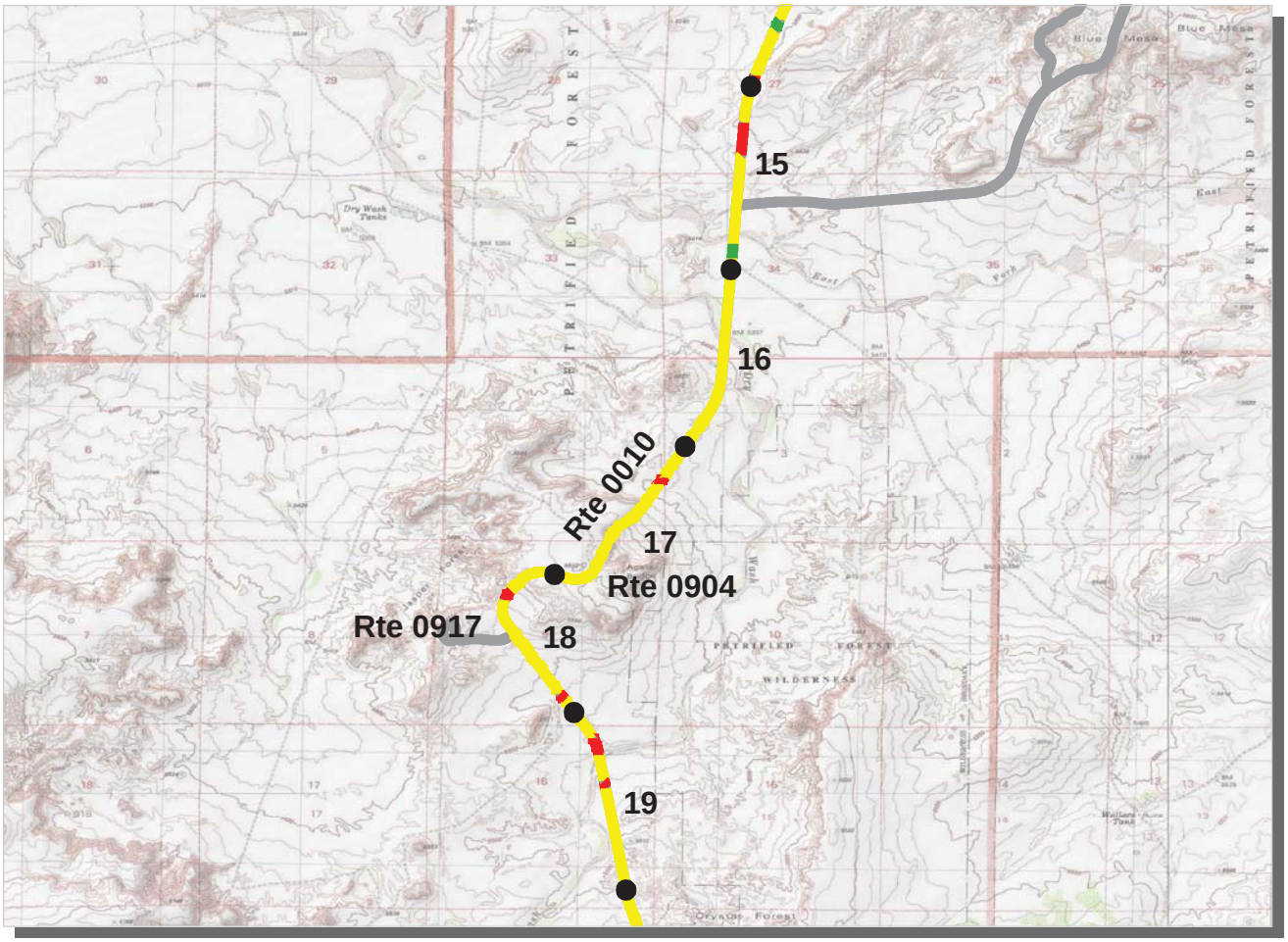
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0010 North-South Highway **TOTAL LENGTH: 28.28 Miles**

Section Number	10	11	12	13	14
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	19	21	21	20	20
Lane Width (ft)	10	10	10	9	10
Shoulder Width (ft)	4	6	3	4	4
Roadway Condition Information					
PCR (Pavement Condition Rating)	71	71	70	66	74
RCI (Roughness Condition Index)	91	91	92	76	91
SCR (Surface Condition Rating)	57	58	55	59	62
Alligator Cracking Index	100	100	100	100	99
Rutting Index	61	58	56	59	65
Patching Index	99	100	100	100	100
Tranverse Cracking Index	98	99	99	99	99
Longitudinal Cracking Index	98	99	99	99	98
Shoulder Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

Intermountain Region

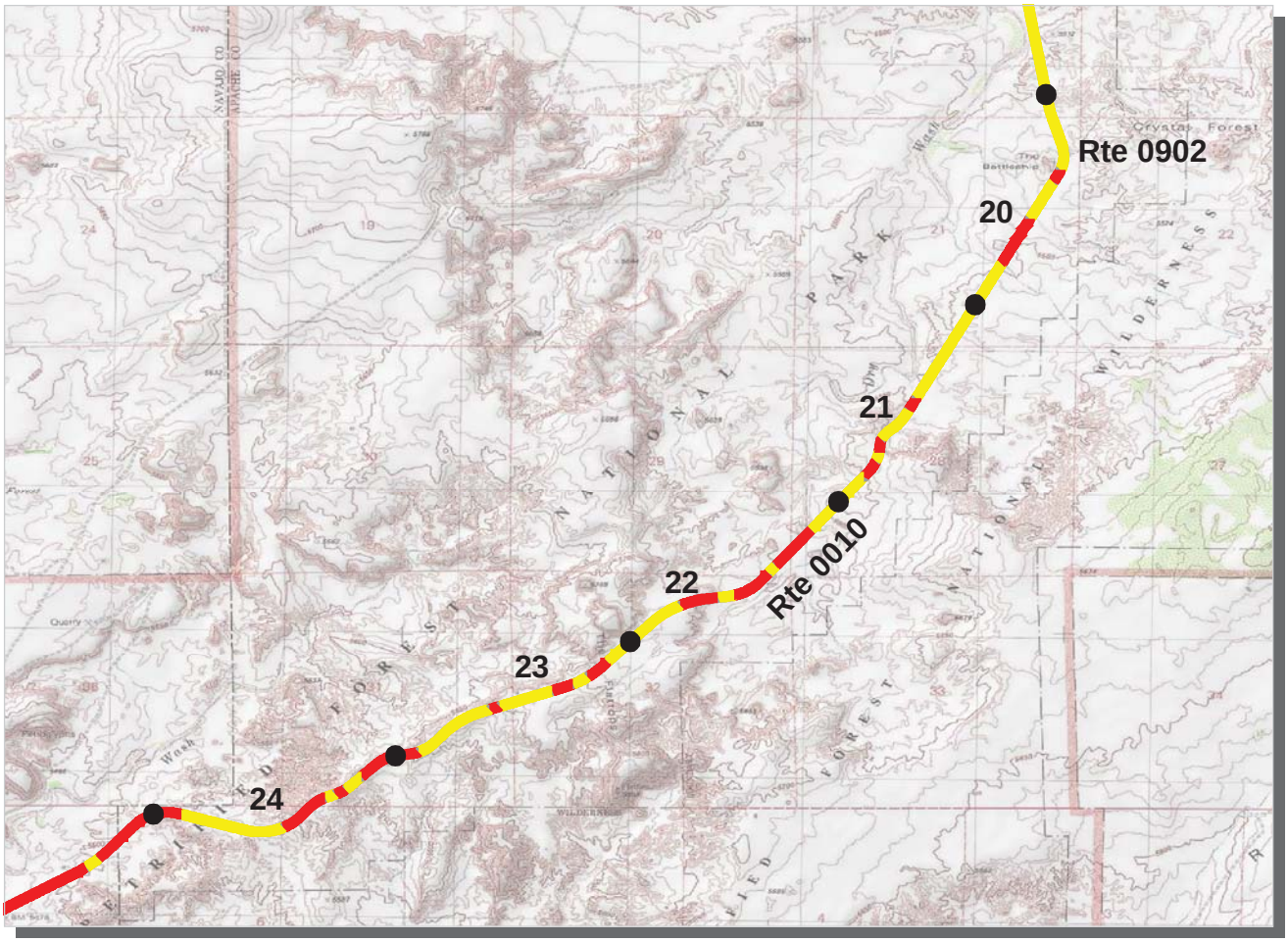
PEFO : Petrified Forest National Park

ROUTE: 0010 North-South Highway **TOTAL LENGTH: 28.28 Miles**

Section Number	15	16	17	18	19
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	20	20	20	19	20
Lane Width (ft)	10	10	10	9	10
Shoulder Width (ft)	3	4	4	5	5
Roadway Condition Information					
PCR (Pavement Condition Rating)	69	75	68	71	73
RCI (Roughness Condition Index)	85	93	83	83	86
SCR (Surface Condition Rating)	58	64	59	62	63
Alligator Cracking Index	100	99	100	100	99
Rutting Index	61	67	63	65	68
Patching Index	99	100	99	100	100
Tranverse Cracking Index	98	97	97	98	97
Longitudinal Cracking Index	98	99	98	98	98
Shoulder Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

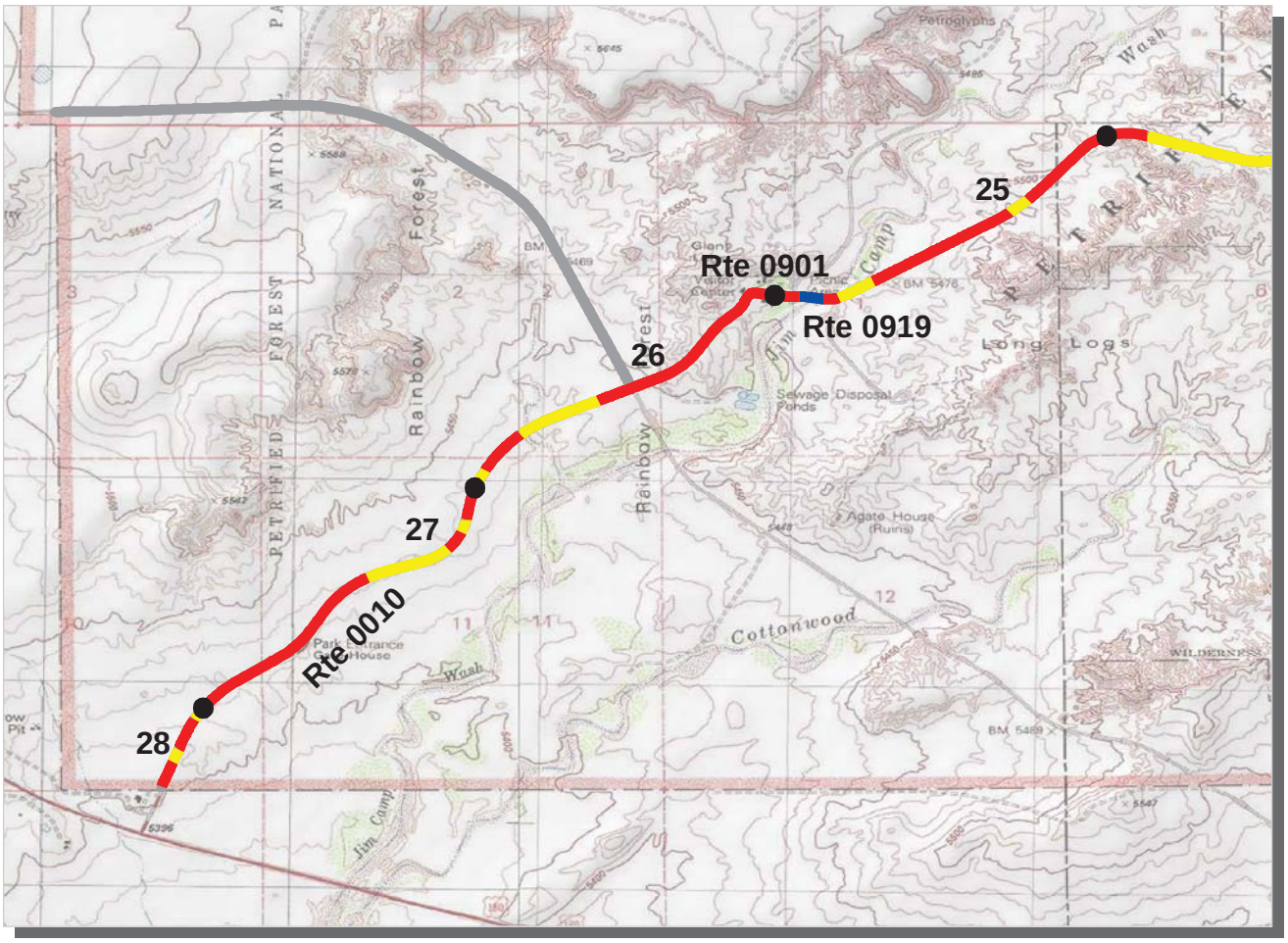
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0010 North-South Highway **TOTAL LENGTH: 28.28 Miles**

Section Number	20	21	22	23	24
Section Length (mi)	1.00	1.00	1.00	1.00	1.00
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	2	2	2
Paved Width (ft)	21	20	20	20	21
Lane Width (ft)	11	10	11	11	11
Shoulder Width (ft)	4	3	4	3	0
Roadway Condition Information					
PCR (Pavement Condition Rating)	65	66	62	62	62
RCI (Roughness Condition Index)	74	73	63	71	69
SCR (Surface Condition Rating)	58	61	60	57	57
Alligator Cracking Index	98	99	99	98	98
Rutting Index	67	68	69	68	70
Patching Index	100	99	99	99	99
Tranverse Cracking Index	97	97	96	95	95
Longitudinal Cracking Index	95	95	94	95	92
Shoulder Condition Rating	GOOD	GOOD	GOOD	GOOD	N/A
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	GOOD

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

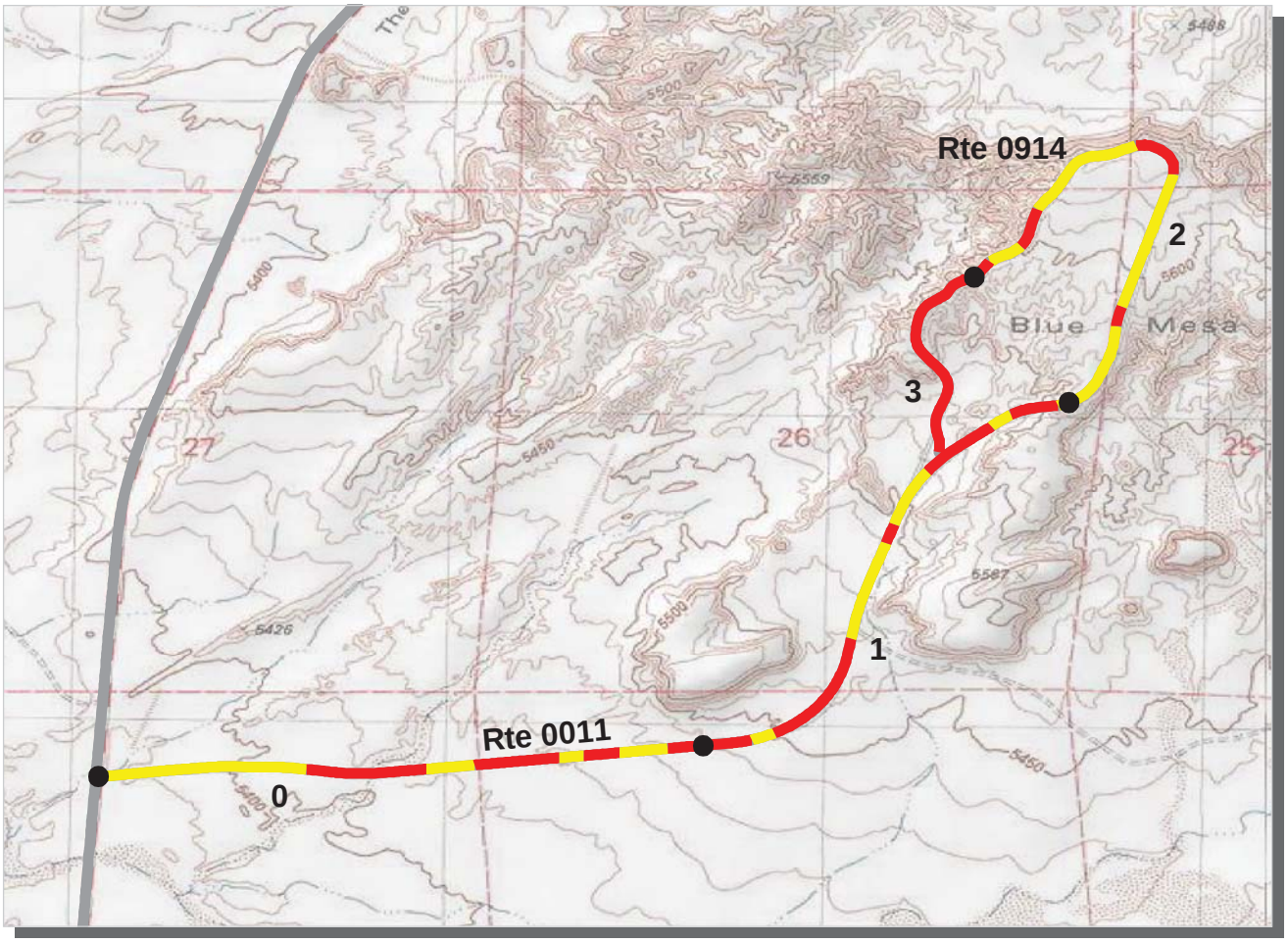
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0010 North-South Highway **TOTAL LENGTH: 28.28 Miles**

Section Number	25	26	27	28	
Section Length (mi)	1.00	1.00	1.00	0.28	
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	2	2	
Paved Width (ft)	21	20	20	23	
Lane Width (ft)	11	10	10	12	
Shoulder Width (ft)	0	4	3	3	
Roadway Condition Information					
PCR (Pavement Condition Rating)	52	47	52	53	
RCI (Roughness Condition Index)	61	64	68	54	
SCR (Surface Condition Rating)	45	39	44	52	
Alligator Cracking Index	98	95	99	100	
Rutting Index	63	57	54	60	
Patching Index	92	99	99	99	
Tranverse Cracking Index	96	94	97	98	
Longitudinal Cracking Index	94	90	92	94	
Shoulder Condition Rating	N/A	GOOD	GOOD	GOOD	
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

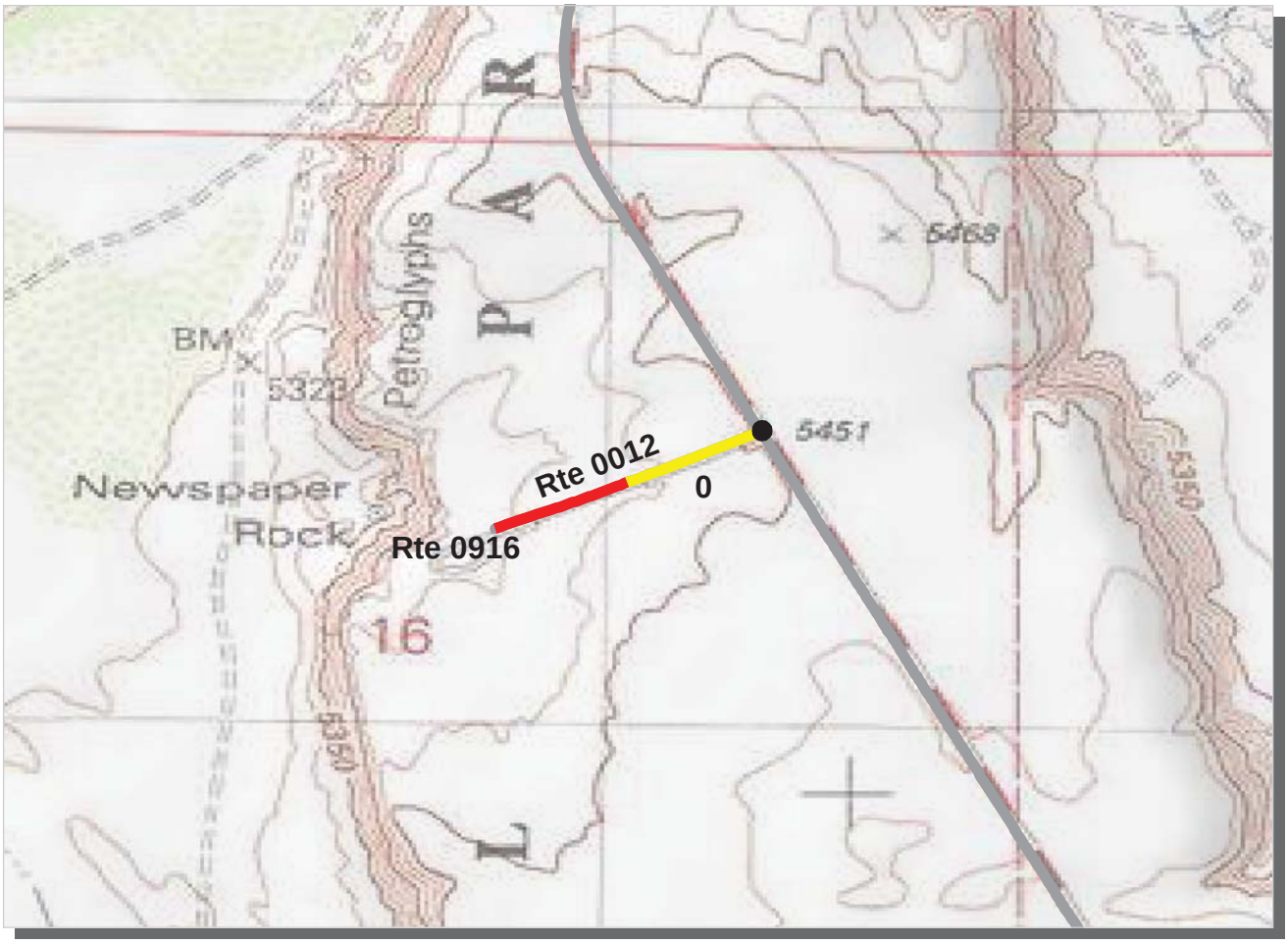
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0011 Blue Mesa Road **TOTAL LENGTH: 3.44 Miles**

Section Number	0	1	2	3	
Section Length (mi)	1.00	1.00	1.00	0.44	
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2	1	1	
Paved Width (ft)	22	24	16	14	
Lane Width (ft)	12	12	16	14	
Shoulder Width (ft)	0	0	0	0	
Roadway Condition Information					
PCR (Pavement Condition Rating)	60	60	63	50	
RCI (Roughness Condition Index)	76	73	76	58	
SCR (Surface Condition Rating)	51	52	54	46	
Alligator Cracking Index	100	100	99	99	
Rutting Index	55	56	56	48	
Patching Index	100	100	100	100	
Tranverse Cracking Index	96	97	98	98	
Longitudinal Cracking Index	99	99	99	99	
Shoulder Condition Rating	N/A	N/A	N/A	N/A	
Drainage Condition Rating	GOOD	GOOD	GOOD	GOOD	

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR	Poor	Fair	Good	Excellent
	(<=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.

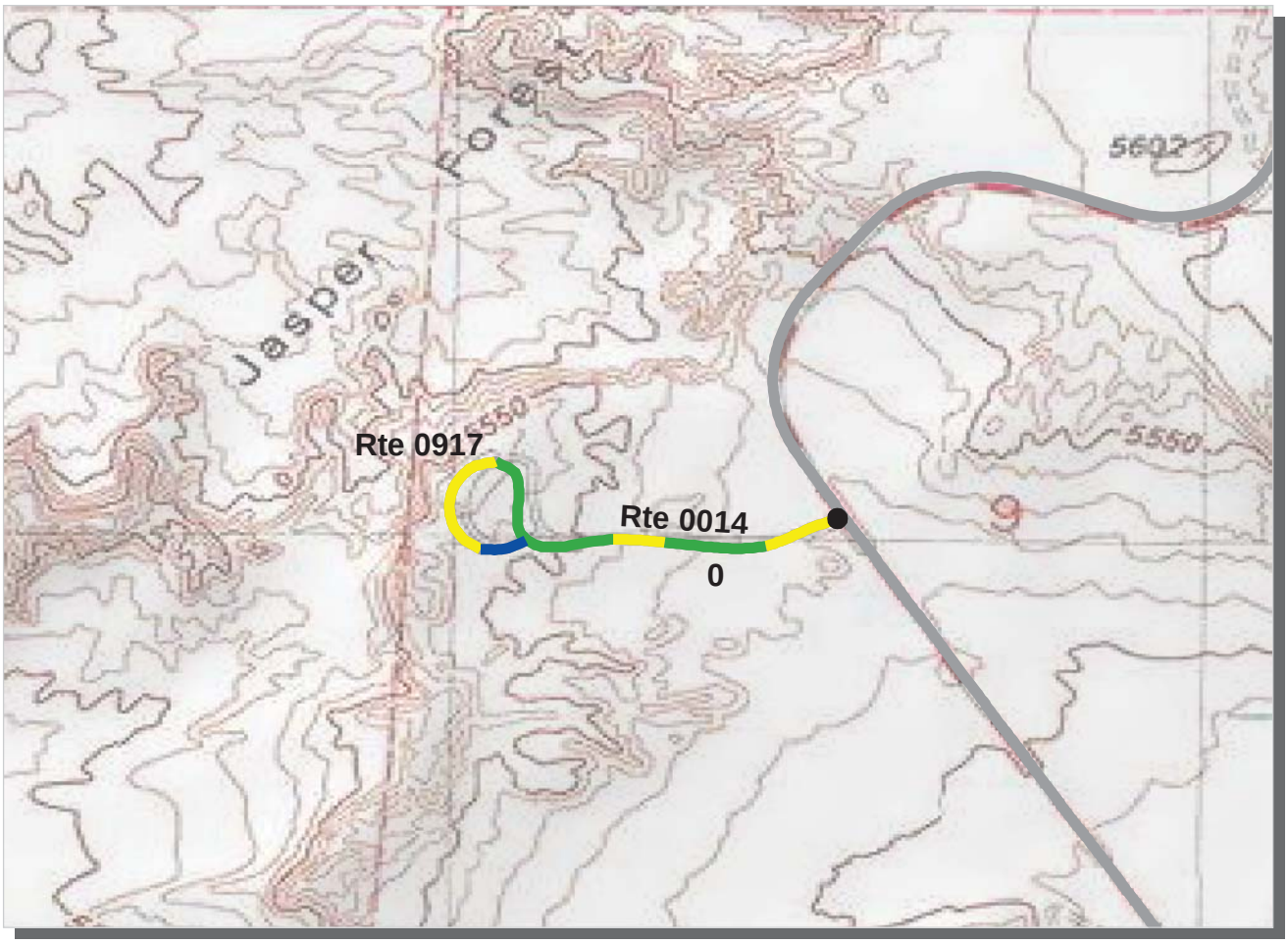
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0012 Newspaper Rock Road **TOTAL LENGTH: 0.25 Miles**

Section Number	0				
Section Length (mi)	0.25				
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	20				
Lane Width (ft)	10				
Shoulder Width (ft)	0				
Roadway Condition Information					
PCR (Pavement Condition Rating)	58				
RCI (Roughness Condition Index)	58				
SCR (Surface Condition Rating)	56				
Alligator Cracking Index	99				
Rutting Index	65				
Patching Index	100				
Tranverse Cracking Index	94				
Longitudinal Cracking Index	97				
Shoulder Condition Rating	N/A				
Drainage Condition Rating	GOOD				

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR	Poor	Fair	Good	Excellent
	(<=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.

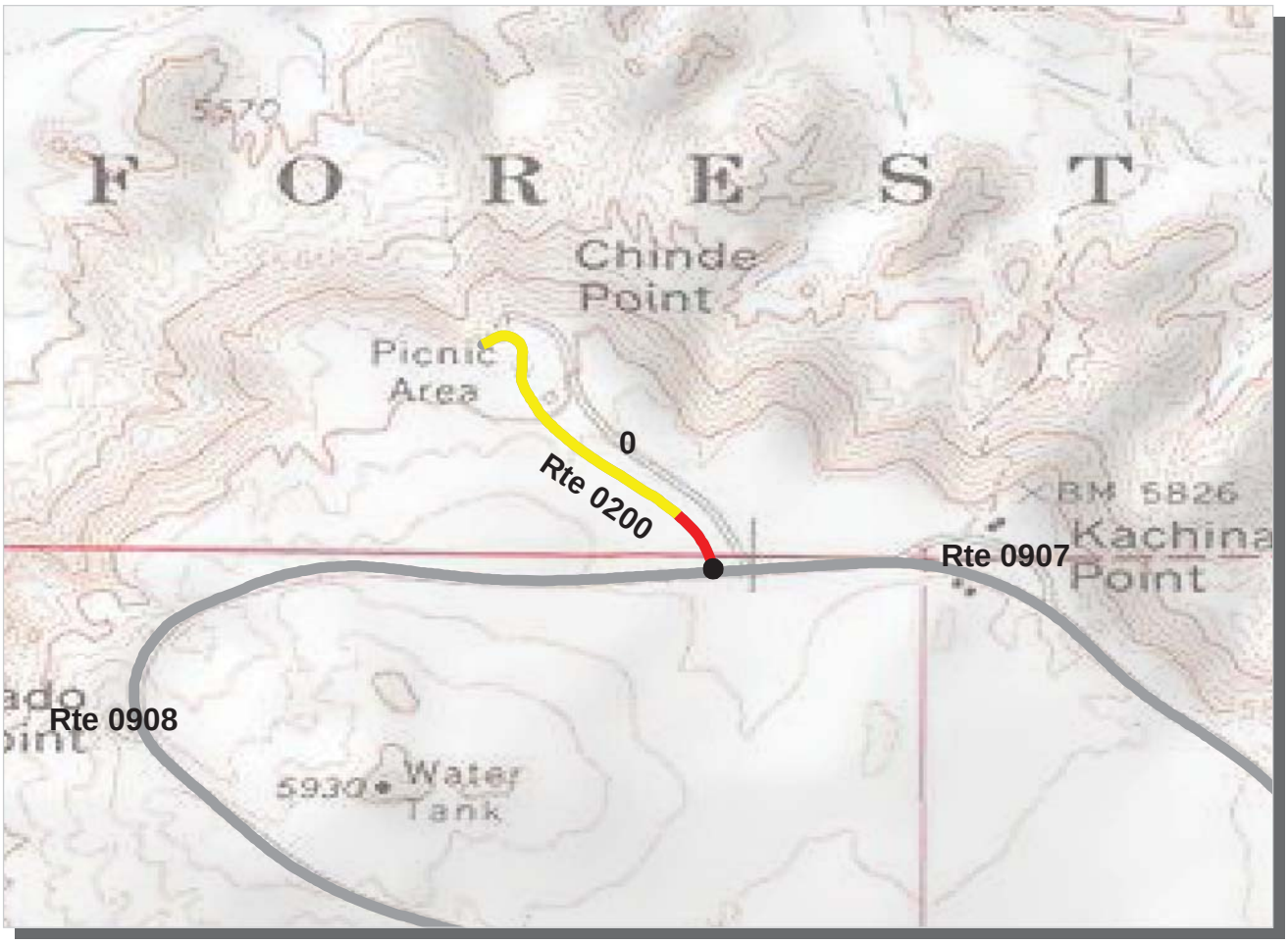
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0014 Jasper Forest Road **TOTAL LENGTH: 0.51 Miles**

Section Number	0				
Section Length (mi)	0.51				
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	22				
Lane Width (ft)	11				
Shoulder Width (ft)	0				
Roadway Condition Information					
PCR (Pavement Condition Rating)	83				
RCI (Roughness Condition Index)	70				
SCR (Surface Condition Rating)	88				
Alligator Cracking Index	100				
Rutting Index	88				
Patching Index	100				
Tranverse Cracking Index	99				
Longitudinal Cracking Index	100				
Shoulder Condition Rating	N/A				
Drainage Condition Rating	N/C				

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR Poor (<=60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100)

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

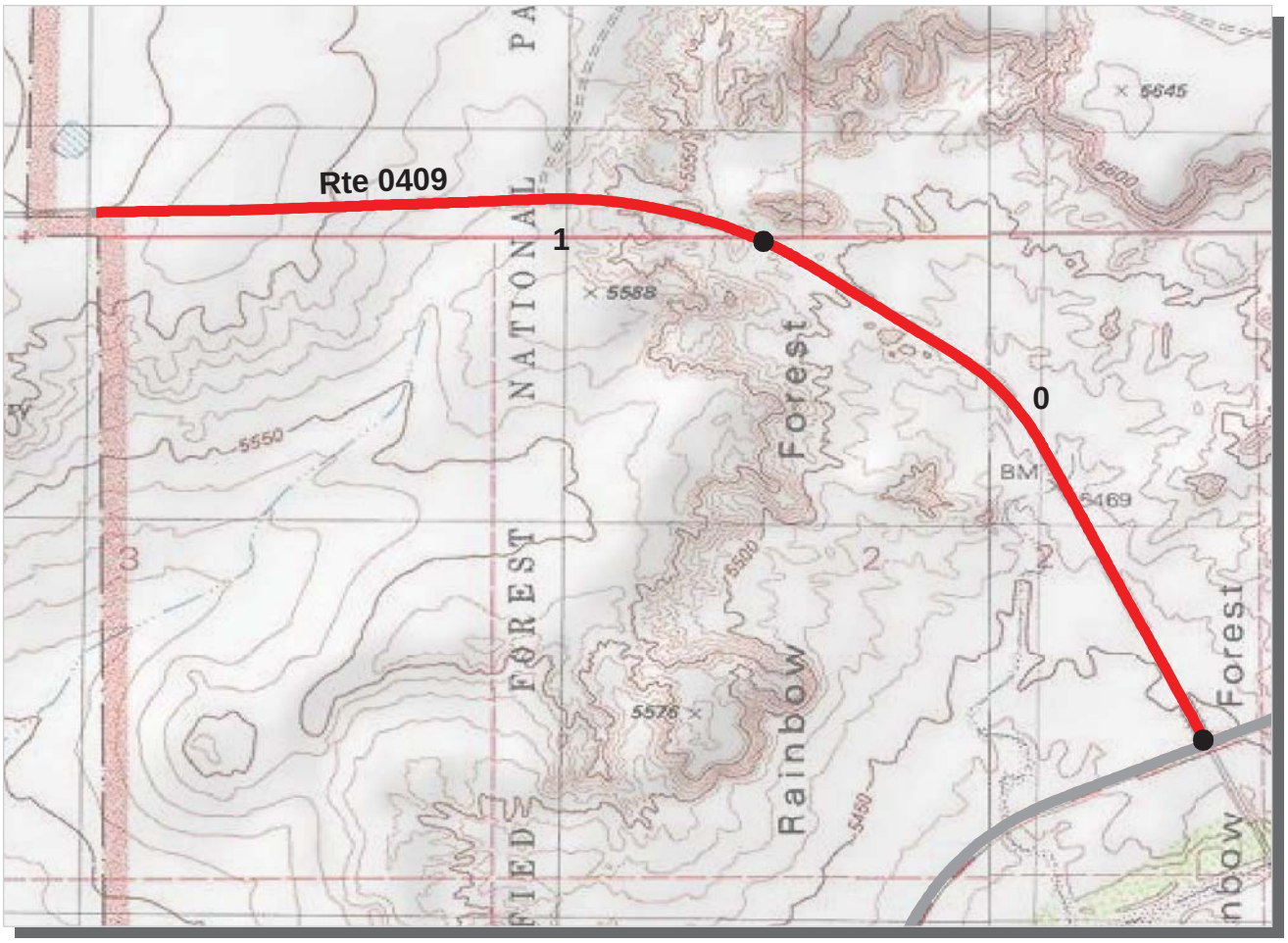
Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0200 Chinde Point Access Road **TOTAL LENGTH: 0.34 Miles**

Section Number	0				
Section Length (mi)	0.34				
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	21				
Lane Width (ft)	11				
Shoulder Width (ft)	0				
Roadway Condition Information					
PCR (Pavement Condition Rating)	68				
RCI (Roughness Condition Index)	89				
SCR (Surface Condition Rating)	58				
Alligator Cracking Index	99				
Rutting Index	64				
Patching Index	100				
Tranverse Cracking Index	96				
Longitudinal Cracking Index	98				
Shoulder Condition Rating	N/A				
Drainage Condition Rating	GOOD				

* NC designates data not collected NA designates not applicable

** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm



PCR	Poor	Fair	Good	Excellent
	(<=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.

Intermountain Region
PEFO : Petrified Forest National Park

ROUTE: 0409 Old Route 180 North **TOTAL LENGTH: 1.90 Miles**

Section Number	0	1			
Section Length (mi)	1.00	0.90			
AADT	**				
SADT	**				
ADT Date	**				
Cross Section Information					
Number of Lanes	2	2			
Paved Width (ft)	21	20			
Lane Width (ft)	11	10			
Shoulder Width (ft)	0	6			
Roadway Condition Information					
PCR (Pavement Condition Rating)	16	18			
RCI (Roughness Condition Index)	43	42			
SCR (Surface Condition Rating)	0	6			
Alligator Cracking Index	20	31			
Rutting Index	34	38			
Patching Index	84	98			
Tranverse Cracking Index	86	93			
Longitudinal Cracking Index	92	94			
Shoulder Condition Rating	N/A	GOOD			
Drainage Condition Rating	GOOD	GOOD			

* NC designates data not collected NA designates not applicable

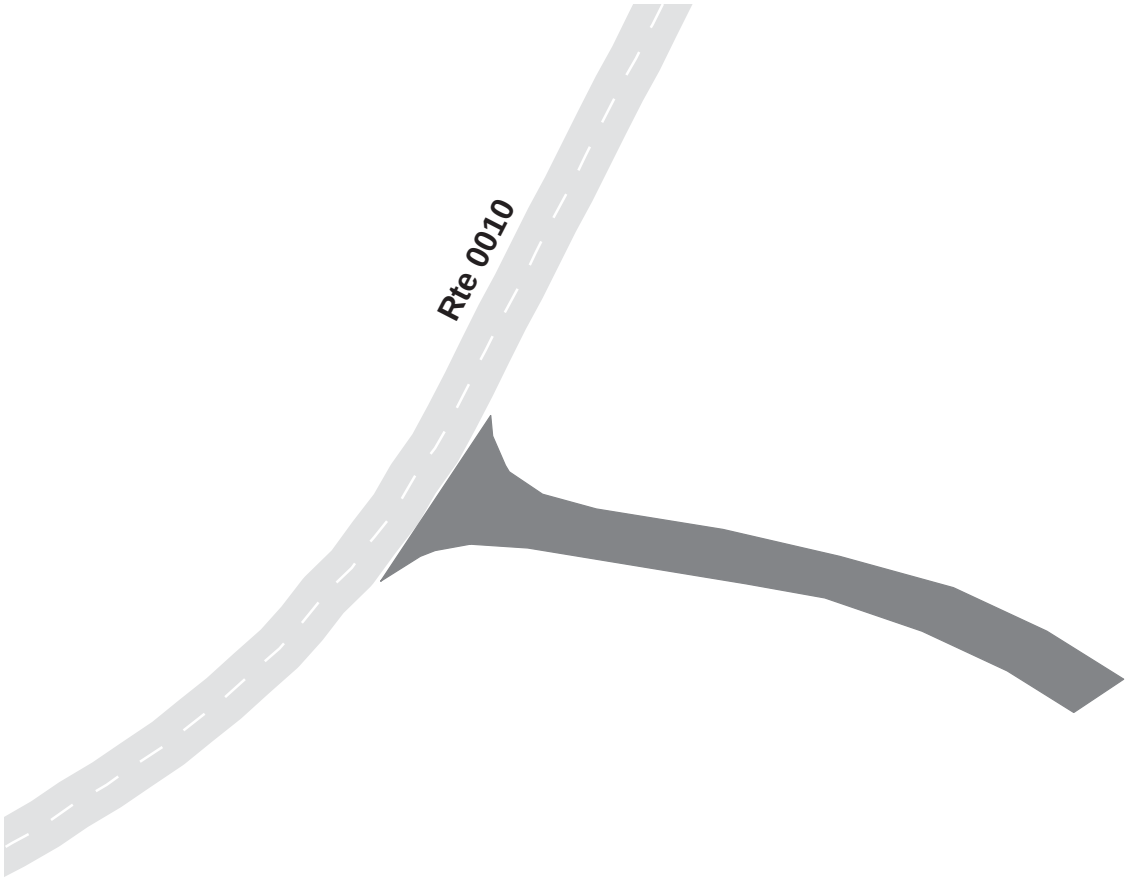
** See website for traffic data: http://www.efl.fhwa.dot.gov/nps/index.htm

ROUTE: 0409 Old Route 180 North

Petrified Forest National Park
Route 0015
Agate Bridge Road
From Route 0010 at MP 17.84

Route	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles *	Condition / PCR	Surface Type
0015	0.16	0.00	8105	0.14	FAIR / 73	OC

* Lane miles are based on 11' lane widths

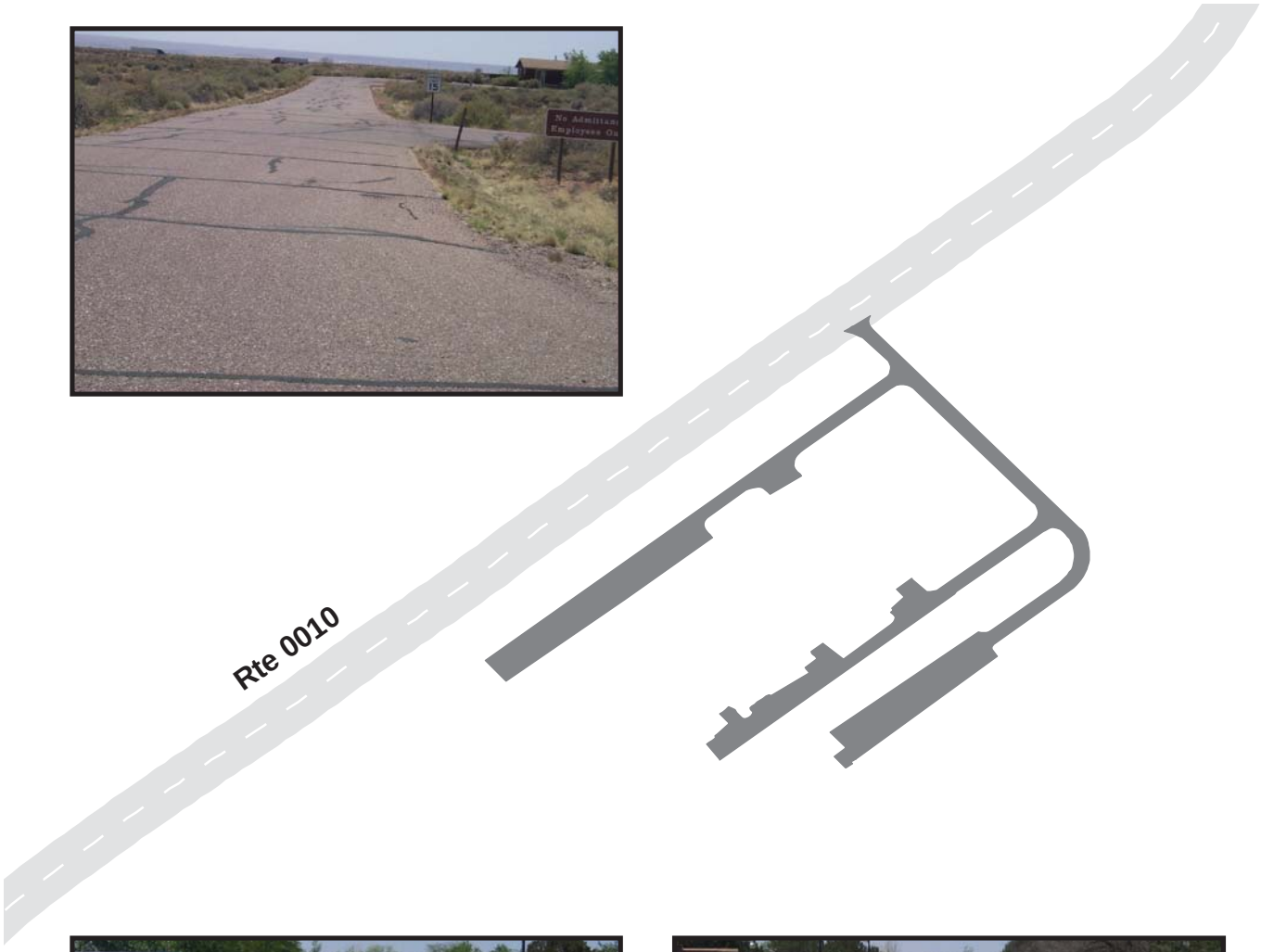


Petrified Forest National Park
Route 0415

Painted Desert Residence Area
From Route 0010 at MP 0.55

Route	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles *	Condition / PCR	Surface Type
0415	1.40	0.00	81350	1.40	POOR / 45	AS

* Lane miles are based on 11' lane widths



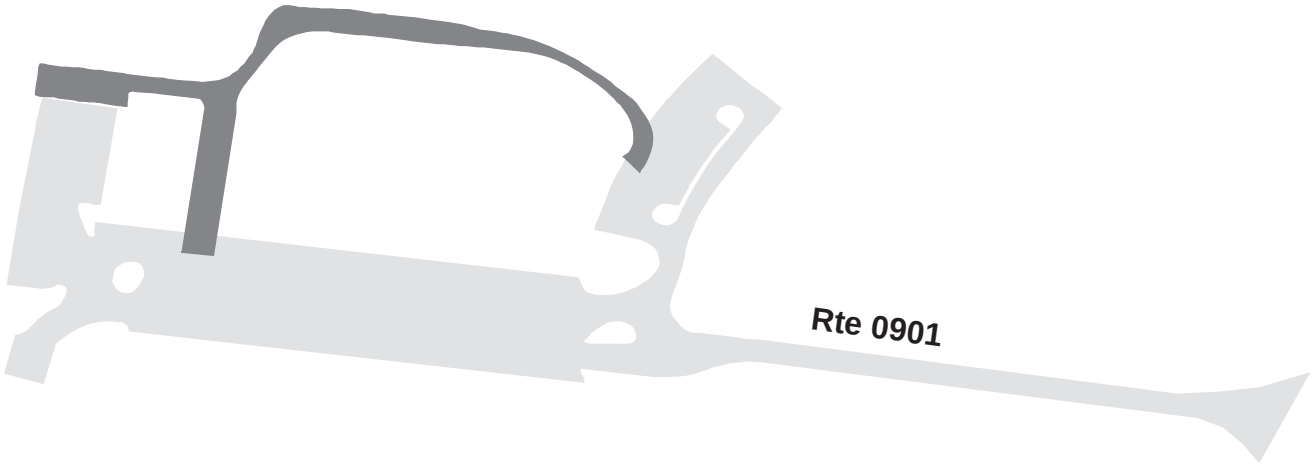
300 150 0 300
Feet

N

Petrified Forest National Park
Route 0416
South Residence Area
From Route 0901

Route	Length (mi)	Width (ft)	Area (sq ft)	Lane Miles *	Condition / PCR	Surface Type
0416	0.34	0.00	19781	0.34	FAIR / 73	OC

* Lane miles are based on 11' lane widths



300 150 0 300
Feet

N

Petrified Forest National Park
Route 0900

Painted Desert Visitors Center
Adjacent to Route 0010 at MP 0.3

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0900	Public	1/23/1999	105186	1.81	OC	GOOD / 90

* Lane miles are based on 11' lane widths

300 150 0 300
Feet

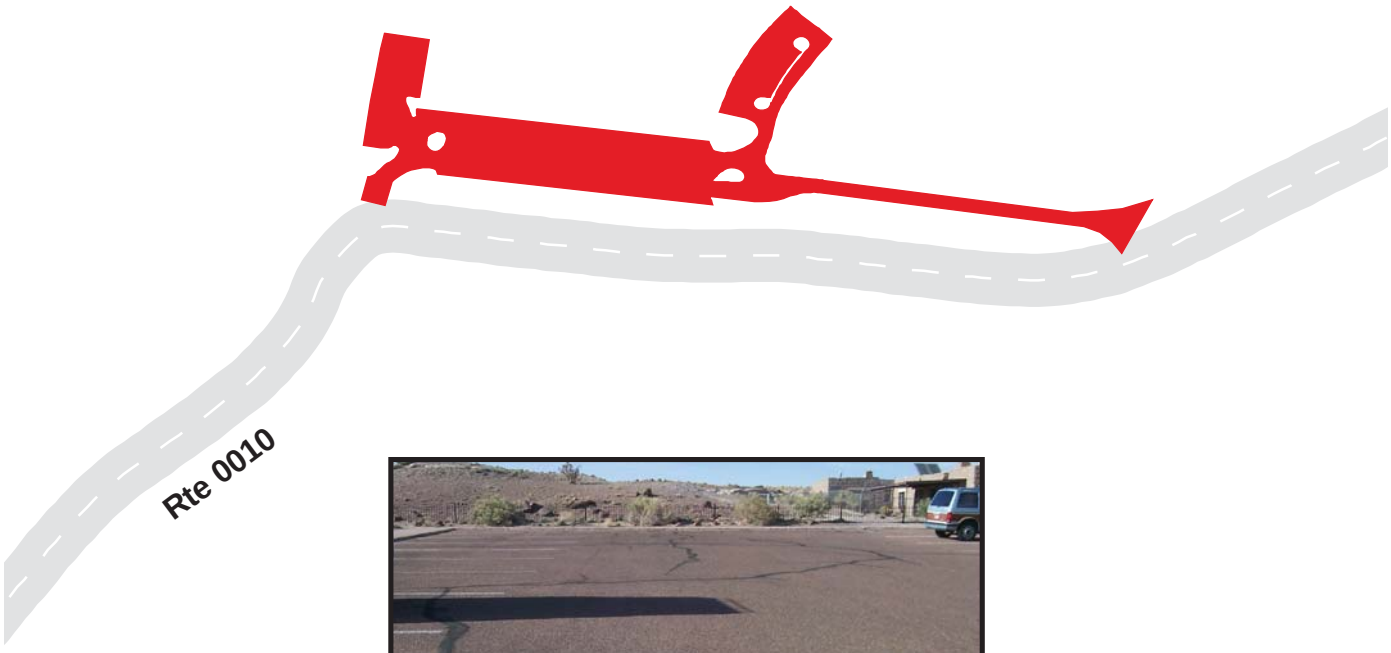
N

Petrified Forest National Park
Route 0901

South Area Museum And Picnic Parking
Adjacent to Route 0010 at MP 26.1

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0901	Public	1/23/1999	115207	1.98	OC	FAIR / 73

* Lane miles are based on 11' lane widths



500 250 0 500
Feet

N

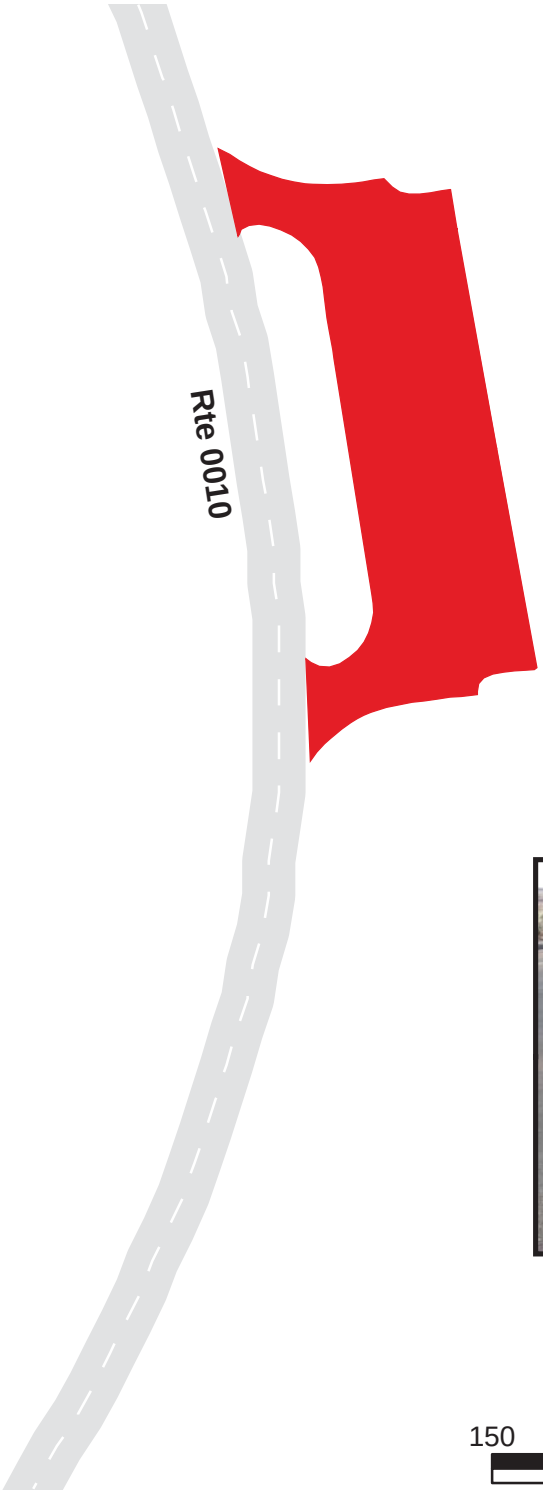
Petrified Forest National Park
Route 0902

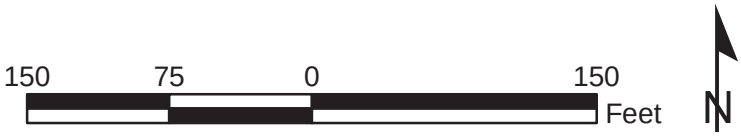
Crystal Forest Parking

Adjacent to Route 0010 at MP 20.3

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0902	Public	1/23/1999	19359	0.33	AS	FAIR / 73

* Lane miles are based on 11' lane widths

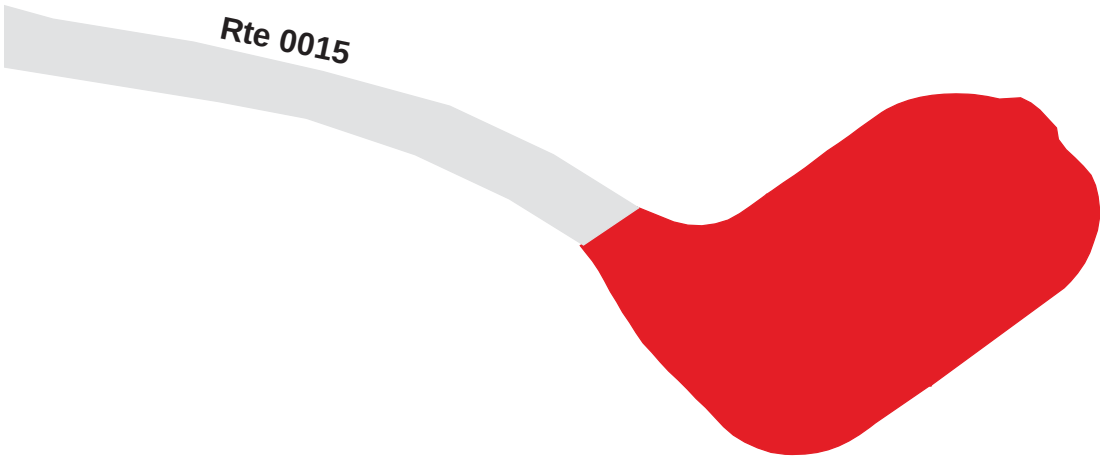




Petrified Forest National Park
Route 0904
Agate Bridge Parking
At End of Route 0015

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0904	Public	1/23/1999	18285	0.31	OC	FAIR / 73

* Lane miles are based on 11' lane widths



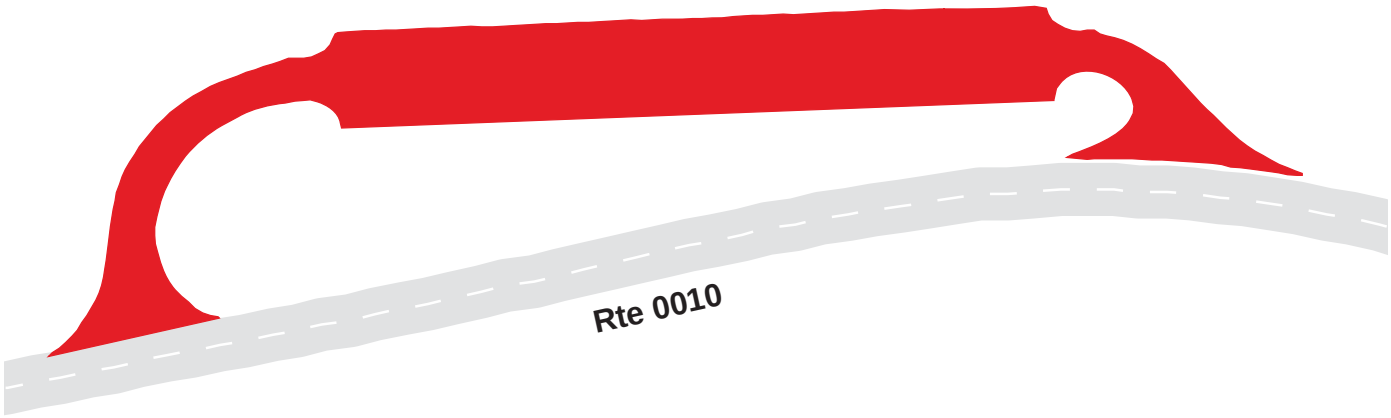
100 50 0 100
Feet

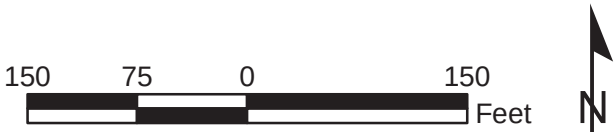
N

Petrified Forest National Park
Route 0905
Tipani Point Parking
Adjacent to Route 0010 at MP 0.9

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0905	Public	1/22/1999	39034	0.67	AS	POOR / 45

* Lane miles are based on 11' lane widths





Petrified Forest National Park
Route 0906

Tawa Point Parking

Adjacent to Route 0010 at MP 1.8

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0906	Public	1/22/1999	30350	0.52	AS	POOR / 45

* Lane miles are based on 11' lane widths

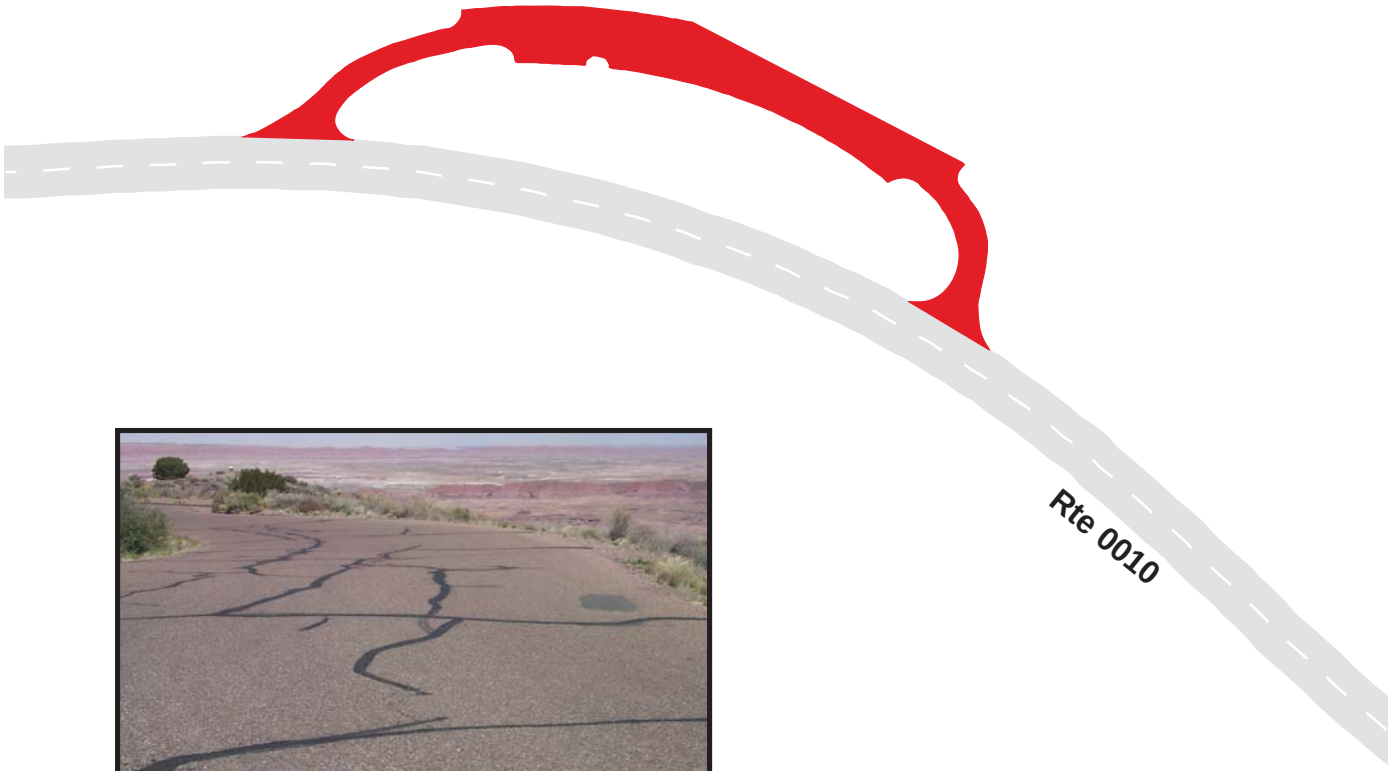
Petrified Forest National Park
Route 0907

Kachina Point Parking

Adjacent to Route 0010 at MP 2.1

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0907	Public	1/23/1999	38344	0.66	AS	POOR / 45

* Lane miles are based on 11' lane widths



200 100 0 200 Feet

N

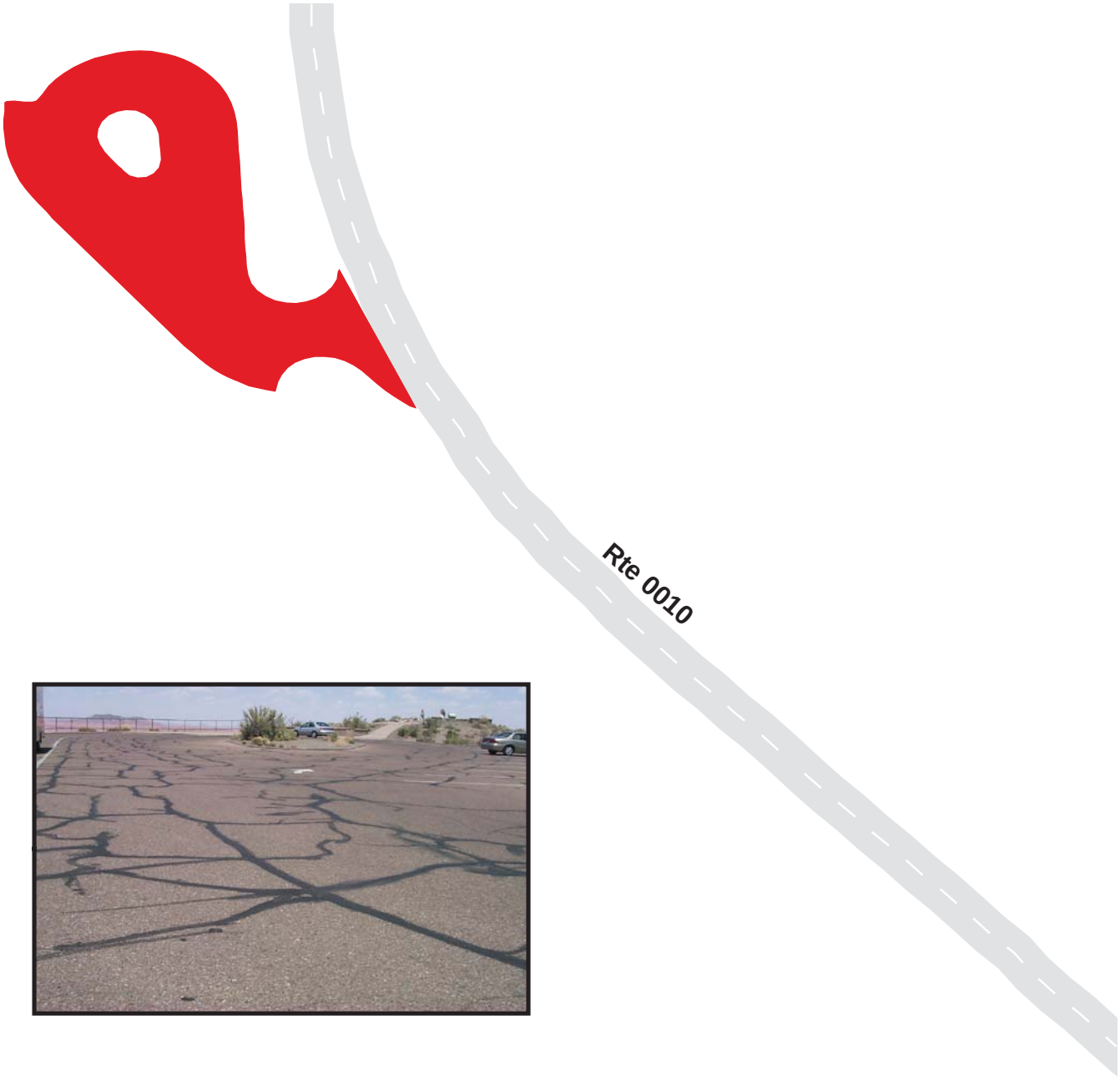
Petrified Forest National Park
Route 0908

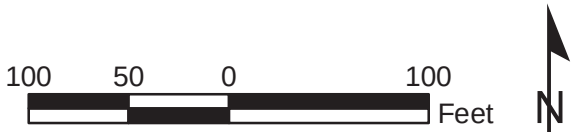
Pintado Point Parking

Adjacent to Route 0010 at MP 3.0

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0908	Public	1/23/1999	16855	0.29	AS	POOR / 45

* Lane miles are based on 11' lane widths

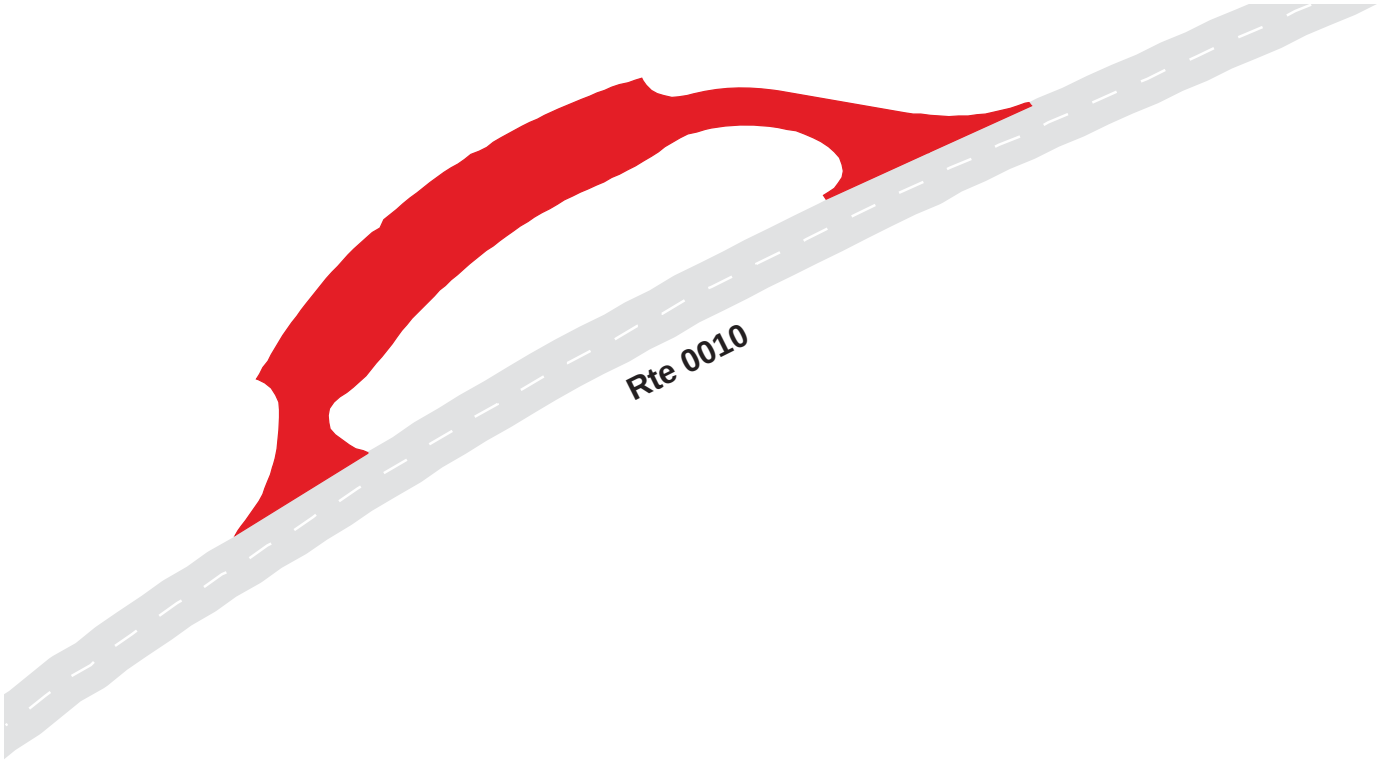


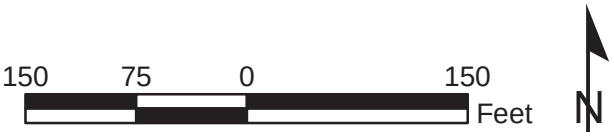


Petrified Forest National Park
Route 0909
Nizhoni Point Parking
Adjacent to Route 0010 at MP 4.12

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0909	Public	1/23/1999	23135	0.40	AS	FAIR / 73

* Lane miles are based on 11' lane widths





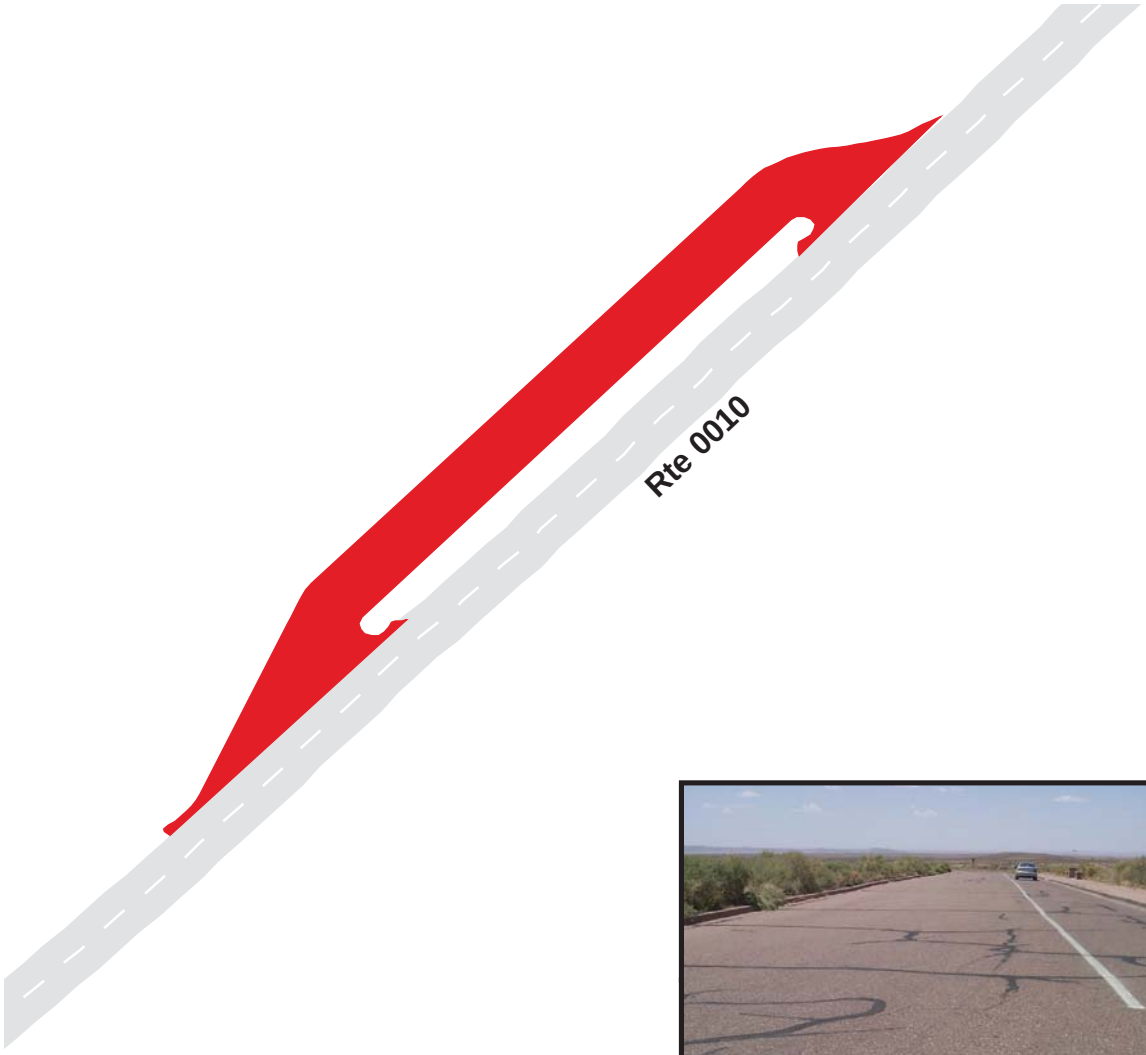
Petrified Forest National Park
Route 0910

Whipple Point Parking

Adjacent to Route 0010 at MP 4.34

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0910	Public	1/23/1999	20474	0.35	AS	FAIR / 73

* Lane miles are based on 11' lane widths



150 75 0 150

Feet

N

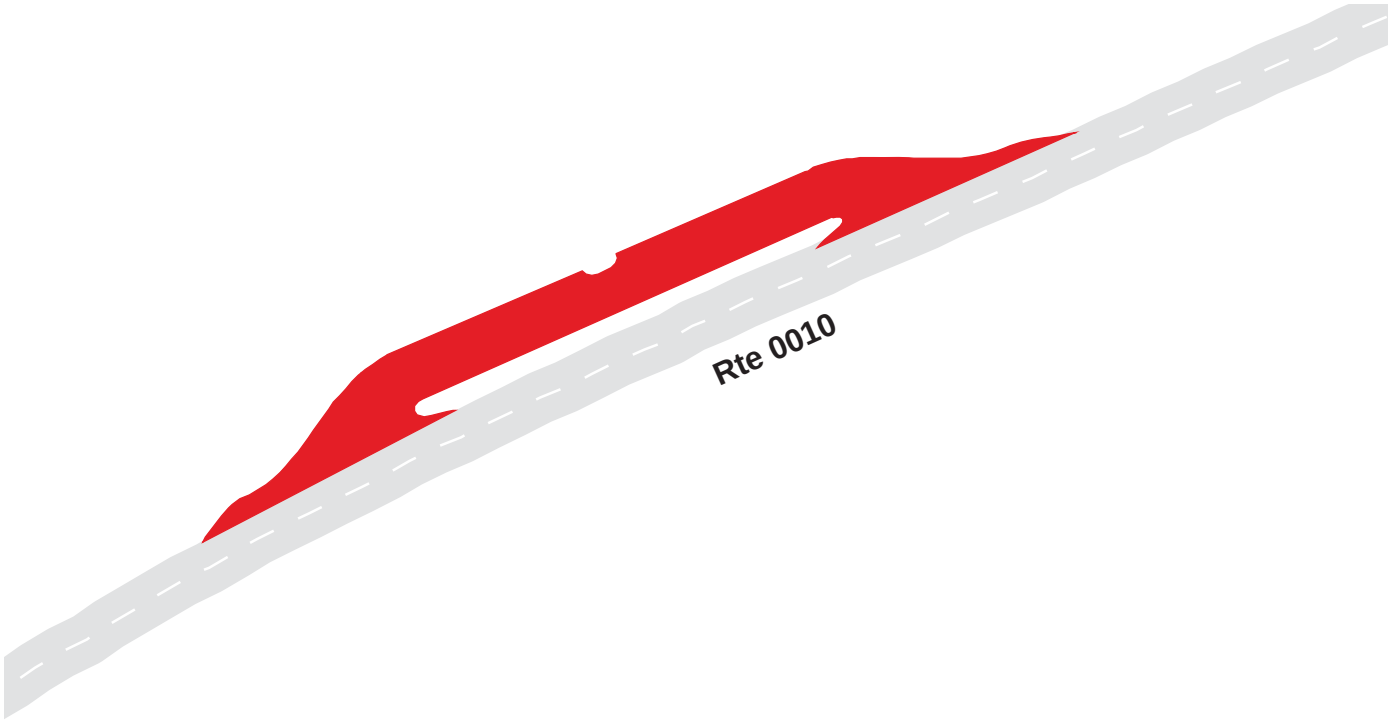
Petrified Forest National Park
Route 0911

Lacey Point Parking

Adjacent to Route 0010 at MP 4.73

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0911	Public	1/23/1999	14646	0.25	AS	FAIR / 73

* Lane miles are based on 11' lane widths



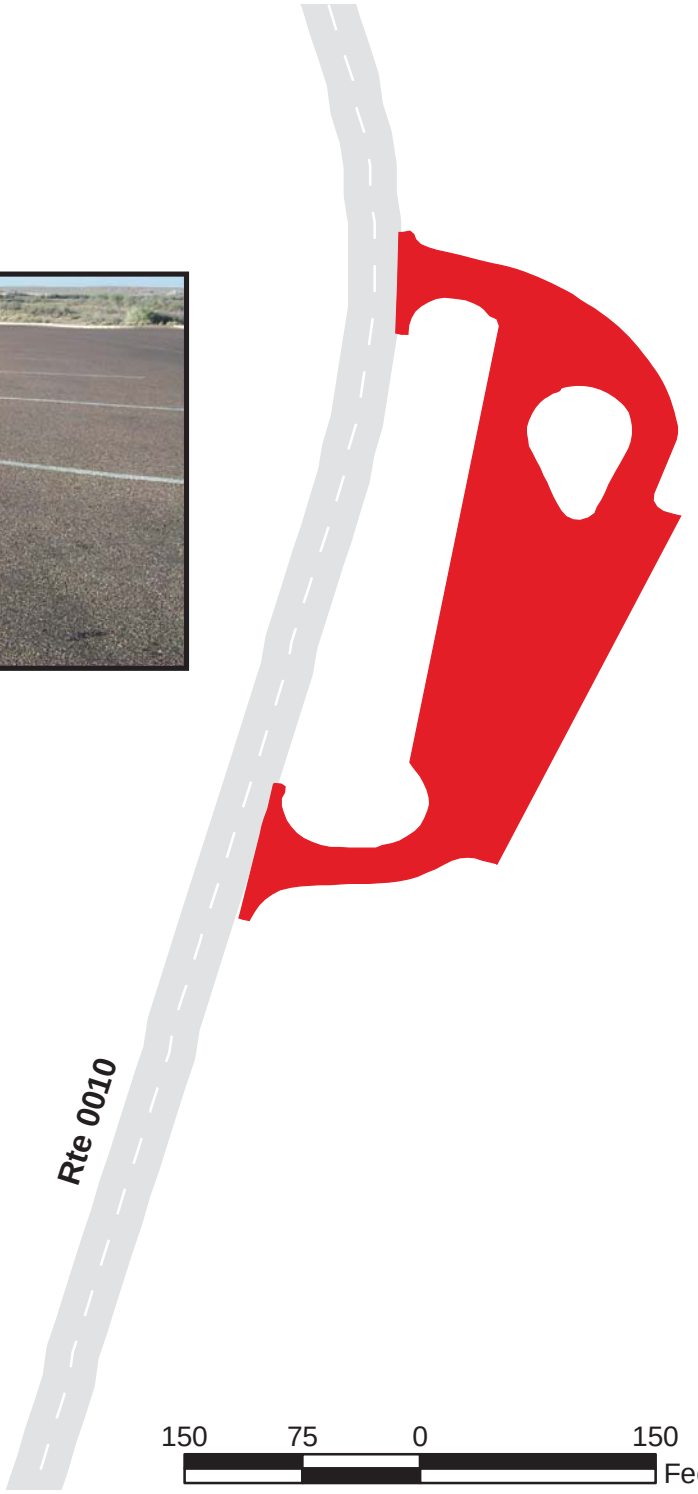
Petrified Forest National Park
Route 0912

Puerca Pueblo Parking

Adjacent to Route 0010 at MP 11.0

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0912	Public	1/23/1999	32450	0.56	OC	GOOD / 90

* Lane miles are based on 11' lane widths



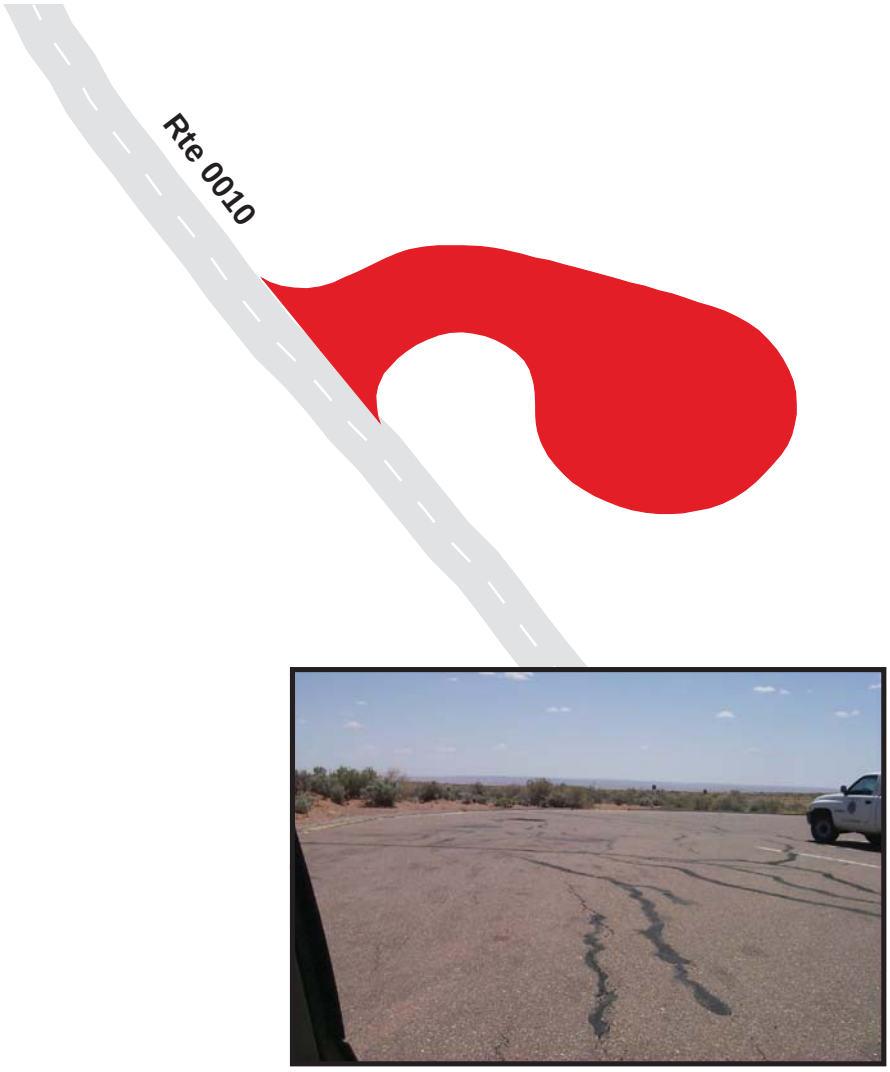
Petrified Forest National Park
Route 0913

North Entrance Parking Area

Just before Route 0010 starts at North Park Entrance

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0913	Public	1/23/1999	13843	0.24	AS	FAIR / 73

* Lane miles are based on 11' lane widths



100 50 0 100 Feet

N

Petrified Forest National Park
Route 0914

Blue Mesa Loop Trail Parking
Adjacent to Route 0011 at MP 2.7

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0914	Public	1/23/1999	7364	0.13	OC	GOOD / 90

* Lane miles are based on 11' lane widths

50 25 0 50
Feet

N

Petrified Forest National Park
Route 0915
Overlook Parking
Adjacent to Route 0010 at MP 1.6

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0915	Public	1/23/1999	7319	0.13	AS	POOR / 45

* Lane miles are based on 11' lane widths

70 35 0 70 Feet

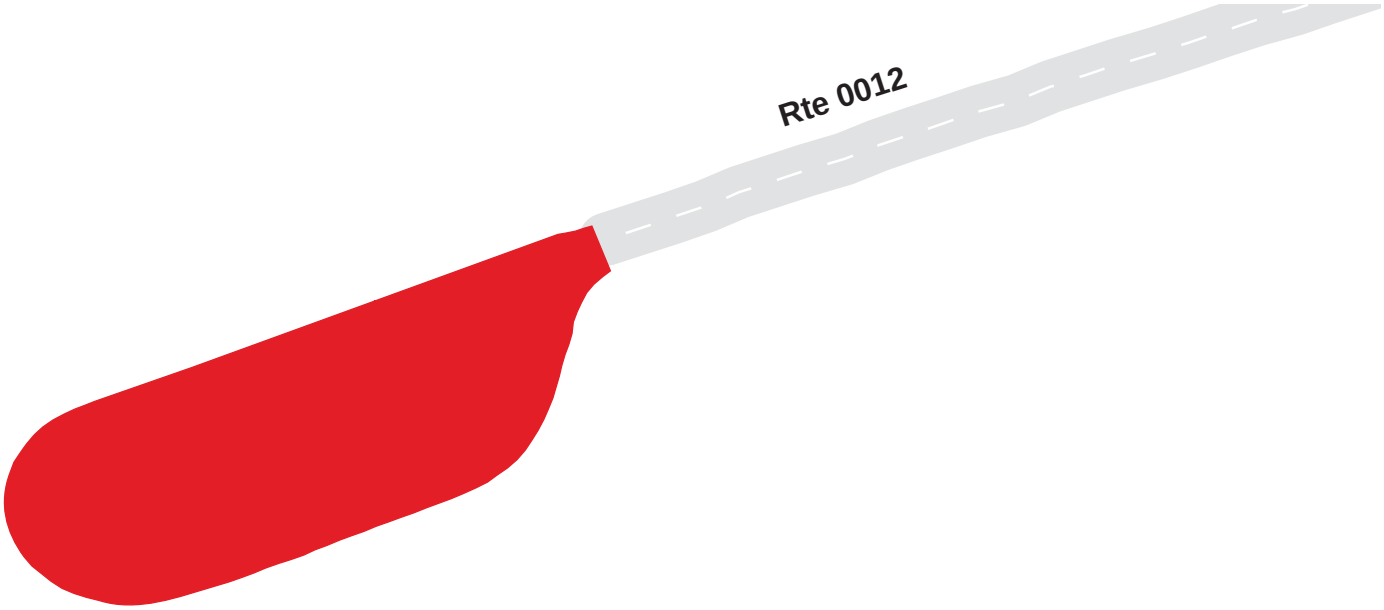
N

Petrified Forest National Park
Route 0916

Newspaper Rock Parking Area
At End of Route 0012

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0916	Public	1/23/1999	24380	0.42	OC	FAIR / 73

* Lane miles are based on 11' lane widths

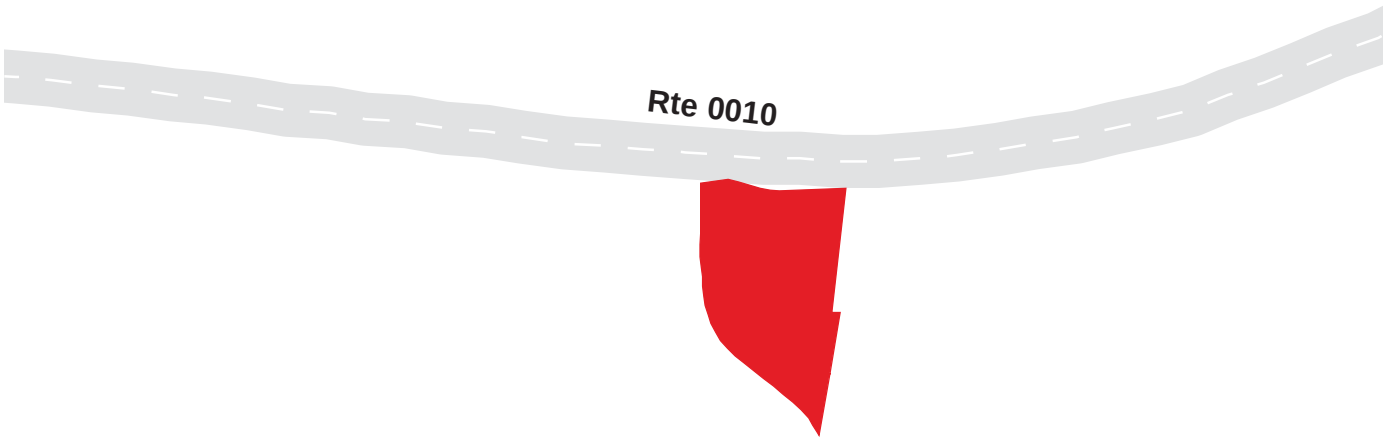


Petrified Forest National Park
Route 0919

South Area Ranger Parking
Adjacent to Route 0010 at MP 26.13

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0919	NonPublic	1/23/1999	4524	0.08	OC	FAIR / 73

* Lane miles are based on 11' lane widths

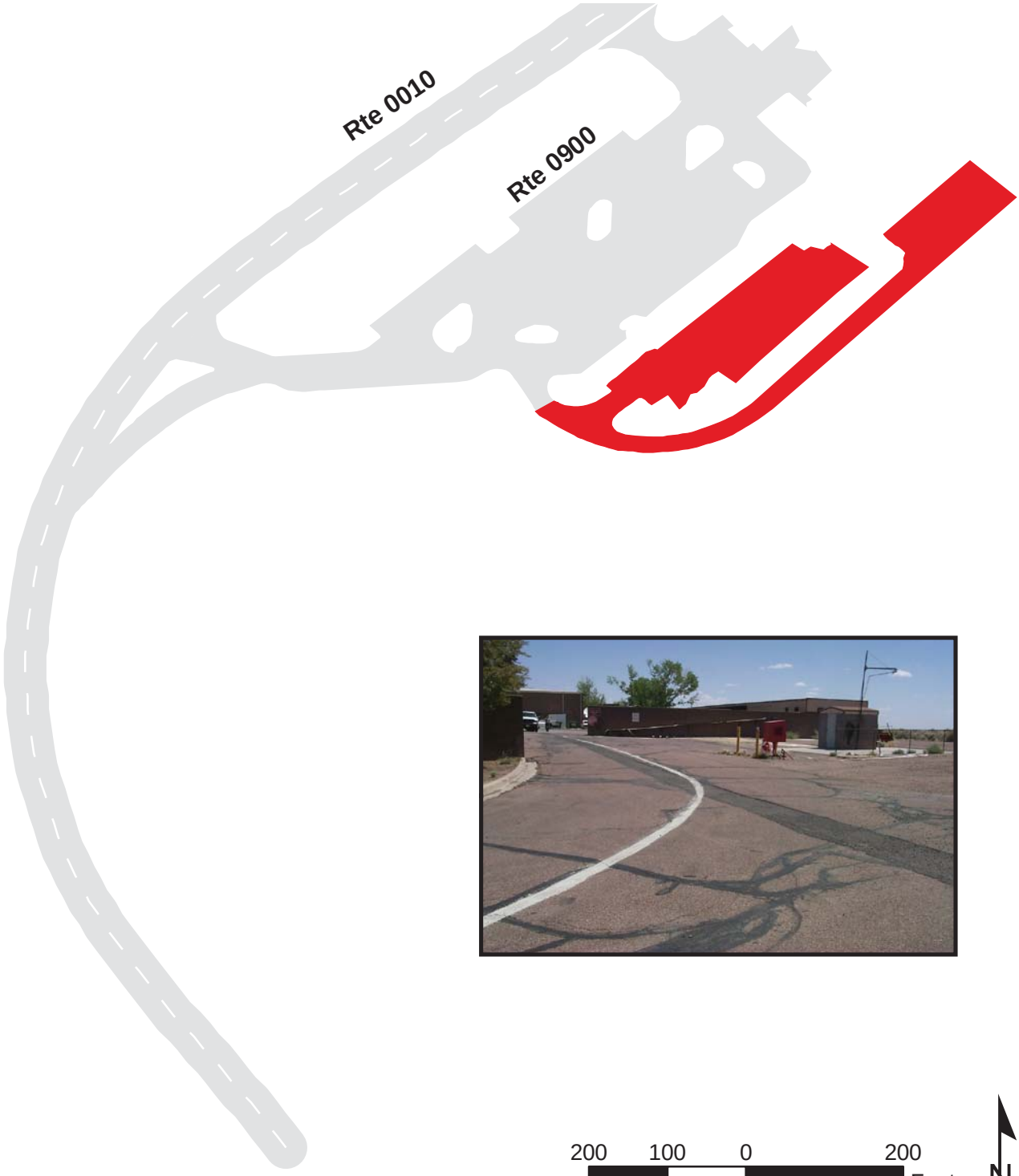


Petrified Forest National Park
Route 0920

Painted Desert Maintenance And Administration Area Parking
Adjacent to Route 0900 at End

Route	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type	Condition / PCR
0920	NonPublic	1/23/1999	41850	0.72	OC	POOR / 45

* Lane miles are based on 11' lane widths



PEFO: PARKWIDE MAINTENANCE FEATURES SUMMARY

FEATURE	*PARK TOTAL*	*UNIT*
BRIDGE	9	EACH
CATTLE GUARD	0	EACH
CULVERT	56	EACH
CURB	22,736	LINEAR FEET
DROP INLET	11	EACH
GUARD WALL	0	LINEAR FEET
GUARDRAIL	10,058	LINEAR FEET
INTERSECTION	79	EACH
LOW WATER CROSSING	0	EACH
OVERHEAD SIGN	0	EACH
PARK BOUNDARY	0	EACH
PAVED DITCH	0	LINEAR FEET
PULLOUT	9	EACH
RAILROAD CROSSING	0	EACH
RETAINING WALL	0	EACH
STATE BOUNDARY	0	EACH
TRAFFIC LIGHT	0	EACH
TUNNEL	0	EACH
TURNOUT	0	LINEAR FEET

PEFO: ROUTE MAINTENANCE FEATURES SUMMARY

FEATURE	ROUTE 0010 NORTH-SOUTH HIGHWAY	ROUTE 0011 BLUE MESA ROAD	ROUTE 0012 NEWSPAPER ROCK ROAD	ROUTE 0014 JASPER FOREST ROAD	ROUTE 0200 CHINDE POINT ACCESS	ROUTE 0409 OLD ROUTE 180 N	UNIT
BRIDGE	9	0	0	0	0	0	EACH
CATTLE GUARD	0	0	0	0	0	0	EACH
CULVERT	50	4	0	1	0	1	EACH
CURB	20,713	1,663	0	359	0	0	LINEAR FEET
DROP INLET	8	1	0	0	2	0	EACH
GUARD WALL	0	0	0	0	0	0	LINEAR FEET
GUARDRAIL	10,058	0	0	0	0	0	LINEAR FEET
INTERSECTION	54	5	3	5	5	7	EACH
LOW WATER CROSSING	0	0	0	0	0	0	EACH
OVERHEAD SIGN	0	0	0	0	0	0	EACH
PARK BOUNDARY	0	0	0	0	0	0	EACH
PAVED DITCH	0	0	0	0	0	0	LINEAR FEET
PULLOUT	4	5	0	0	0	0	EACH
RAILROAD CROSSING	0	0	0	0	0	0	EACH
RETAINING WALL	0	0	0	0	0	0	EACH
STATE BOUNDARY	0	0	0	0	0	0	EACH
TRAFFIC LIGHT	0	0	0	0	0	0	EACH
TUNNEL	0	0	0	0	0	0	EACH
TURNOUT	0	0	0	0	0	0	LINEAR FEET

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000			ROUTE BEGINS AT PAINTED DESERT NORTH ENTRANCE (I-40)
0.035	0.064	CURB	RIGHT	
0.194	0.194	INTERSECTION	RIGHT	RTE 900
0.205	0.230	CURB	RIGHT	
0.231	0.231	INTERSECTION	RIGHT	RTE 900
0.343	0.343	INTERSECTION	RIGHT	RTE 900
0.385	0.393	CURB	RIGHT	
0.387	0.400	CURB	LEFT	
0.394	0.399	CURB	RIGHT	
0.543	0.543	INTERSECTION	RIGHT	RTE 415
0.801	0.801	INTERSECTION	RIGHT	UNPAVED RTE
0.891	0.891	INTERSECTION	RIGHT	RTE 905
1.006	1.006	INTERSECTION	RIGHT	RTE 905
1.115	1.225	PULLOUT	RIGHT	
1.120	1.221	CURB	RIGHT	
1.127	1.127	INTERSECTION	LEFT	UNPAVED ROUTE
1.490	1.490	CULVERT	N/A	
1.580	1.629	CURB	RIGHT	
1.606	1.606	INTERSECTION	RIGHT	RTE 915
1.765	1.765	INTERSECTION	RIGHT	RTE 906
1.899	1.899	CULVERT	N/A	
2.104	2.104	INTERSECTION	RIGHT	RTE 907
2.109	2.109	INTERSECTION	LEFT	UNPAVED RTE
2.224	2.224	INTERSECTION	RIGHT	RTE 907
2.359	2.359	INTERSECTION	RIGHT	RTE 200
2.804	2.984	CURB	LEFT	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
2.956	2.956	INTERSECTION	RIGHT	RTE 908
3.102	3.102	INTERSECTION	LEFT	UNPAVED RTE
3.220	3.280	CURB	LEFT	
3.761	3.761	CULVERT	N/A	
3.866	3.866	INTERSECTION	LEFT	UNPAVED RTE
4.033	4.049	CURB	RIGHT	
4.109	4.109	INTERSECTION	RIGHT	RTE 909
4.187	4.187	INTERSECTION	RIGHT	RTE 909
4.323	4.323	INTERSECTION	RIGHT	RTE 910
4.409	4.409	INTERSECTION	RIGHT	RTE 910
4.735	4.735	INTERSECTION	RIGHT	RTE 911
4.802	4.802	INTERSECTION	RIGHT	RTE 911
5.484	5.484	INTERSECTION	RIGHT	UNPAVED RTE
5.790	5.926	GUARDRAIL	RIGHT	
5.802	5.922	GUARDRAIL	LEFT	
5.932	6.079	GUARDRAIL	RIGHT	
5.932	6.080	GUARDRAIL	LEFT	
5.933	5.970	BRIDGE	N/A	
6.068	6.089	CURB	RIGHT	
8.034	8.034	INTERSECTION	LEFT	UNPAVED RTE
10.288	10.577	GUARDRAIL	RIGHT	
10.291	10.584	GUARDRAIL	LEFT	
10.381	10.415	BRIDGE	N/A	
10.479	10.479	DROP INLET	LEFT	
10.576	10.576	DROP INLET	LEFT	
10.621	10.621	INTERSECTION	RIGHT	UNPAVED RTE
10.757	10.893	GUARDRAIL	RIGHT	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
10.760	10.774	CURB	RIGHT	
10.761	10.897	GUARDRAIL	LEFT	
10.762	10.774	CURB	LEFT	
10.774	10.774	DROP INLET	RIGHT	
10.777	10.875	BRIDGE	N/A	
10.897	10.897	INTERSECTION	RIGHT	
10.908	10.908	DROP INLET	RIGHT	
10.908	10.937	CURB	RIGHT	
10.931	10.931	INTERSECTION	LEFT	RTE 912
10.933	10.933	DROP INLET	RIGHT	
10.993	10.993	INTERSECTION	LEFT	RTE 912
11.900	11.900	INTERSECTION	RIGHT	RTE 012
12.184	12.184	CULVERT	N/A	
12.371	12.371	CULVERT	N/A	
12.474	12.474	CULVERT	N/A	
12.659	12.912	CURB	LEFT	
12.830	12.830	CULVERT	N/A	
13.290	13.350	CURB	LEFT	
13.349	13.422	CURB	RIGHT	
13.403	13.403	CULVERT	N/A	
13.507	13.648	CURB	RIGHT	
13.551	13.551	CULVERT	N/A	
13.583	13.583	CULVERT	N/A	
13.626	13.626	CULVERT	N/A	
13.716	13.716	CULVERT	N/A	
14.053	14.053	CULVERT	N/A	
14.053	14.118	PULLOUT	LEFT	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
14.211	14.211	CULVERT	N/A	
14.390	14.390	CULVERT	N/A	
14.442	14.442	CULVERT	N/A	
14.738	14.738	CULVERT	N/A	
14.833	14.833	CULVERT	N/A	
14.945	14.945	CULVERT	N/A	
15.021	15.021	CULVERT	N/A	
15.073	15.073	CULVERT	N/A	
15.330	15.330	CULVERT	N/A	
15.501	15.501	INTERSECTION	RIGHT	UNPAVED ROUTE
15.549	15.549	CULVERT	N/A	
15.643	15.643	INTERSECTION	LEFT	RTE 011
15.647	15.647	CULVERT	N/A	
15.790	15.826	GUARDRAIL	RIGHT	
15.795	15.830	GUARDRAIL	LEFT	
15.814	15.818	BRIDGE	N/A	
16.363	16.406	GUARDRAIL	RIGHT	
16.370	16.411	GUARDRAIL	LEFT	
16.376	16.397	BRIDGE	N/A	
16.537	16.537	INTERSECTION	RIGHT	UNPAVED ROUTE
16.676	16.676	CULVERT	N/A	
16.847	16.847	CULVERT	N/A	
17.273	17.273	CULVERT	N/A	
17.370	17.497	CURB	RIGHT	
17.381	17.381	CULVERT	N/A	
17.509	17.610	CURB	LEFT	
17.581	17.581	CULVERT	N/A	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
17.698	17.698	CULVERT	N/A	
17.790	17.790	INTERSECTION	LEFT	RTE 015
17.800	17.800	INTERSECTION	RIGHT	UNPAVED ROUTE
18.017	18.254	CURB	LEFT	
18.490	18.490	INTERSECTION	RIGHT	ROUTE 0014, JASPER FOREST RD
18.990	18.990	INTERSECTION	RIGHT	UNPAVED ROUTE
19.090	19.166	CURB	RIGHT	
19.254	19.289	GUARDRAIL	RIGHT	
19.258	19.289	GUARDRAIL	LEFT	
19.264	19.279	BRIDGE	N/A	
19.663	19.663	CULVERT	N/A	
19.787	19.787	CULVERT	N/A	
20.062	20.062	CULVERT	N/A	
20.201	20.220	CURB	LEFT	
20.225	20.225	INTERSECTION	LEFT	RTE 902
20.229	20.272	CURB	LEFT	
20.280	20.280	INTERSECTION	LEFT	RTE 902
20.299	20.369	CURB	RIGHT	
20.485	20.485	CULVERT	N/A	
20.569	20.569	CULVERT	N/A	
21.139	21.139	CULVERT	N/A	
21.279	21.279	CULVERT	N/A	
21.313	21.313	CULVERT	N/A	
21.447	21.447	CULVERT	N/A	
21.800	21.842	CURB	RIGHT	
21.830	21.886	CURB	LEFT	
21.845	21.845	CULVERT	N/A	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
22.130	22.174	GUARDRAIL	LEFT	
22.132	22.174	GUARDRAIL	RIGHT	
22.136	22.159	CURB	LEFT	
22.141	22.157	CURB	RIGHT	
22.144	22.156	BRIDGE	N/A	
22.163	22.196	CURB	RIGHT	
22.404	22.478	CURB	RIGHT	
22.419	22.458	CURB	LEFT	
22.648	22.648	CULVERT	N/A	
22.661	22.737	CURB	LEFT	
22.754	22.808	CURB	LEFT	
23.140	23.248	CURB	RIGHT	
23.635	23.803	CURB	LEFT	
23.859	23.899	CURB	RIGHT	
23.939	23.966	CURB	RIGHT	
24.006	24.066	CURB	LEFT	
24.018	24.089	CURB	RIGHT	
24.022	24.093	PULLOUT	RIGHT	
24.082	24.094	CURB	LEFT	
24.137	24.204	CURB	RIGHT	
24.210	24.252	CURB	RIGHT	
24.267	24.291	CURB	RIGHT	
24.307	24.410	CURB	LEFT	
24.438	24.681	CURB	RIGHT	
24.686	24.686	DROP INLET	RIGHT	
24.705	24.804	CURB	LEFT	
24.829	24.900	CURB	LEFT	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
24.907	24.997	CURB	LEFT	
25.034	25.034	CULVERT	N/A	
25.182	25.182	CULVERT	N/A	
25.287	25.401	CURB	RIGHT	
25.319	25.319	CULVERT	N/A	
25.402	25.402	DROP INLET	RIGHT	
25.716	25.750	CURB	RIGHT	
25.766	25.766	CULVERT	N/A	
25.832	25.994	CURB	LEFT	
25.865	25.865	INTERSECTION	LEFT	CLOSED ROAD - OLD LONG LOGS ROAD
25.880	25.952	GUARDRAIL	RIGHT	
25.889	25.927	BRIDGE	N/A	
25.892	25.980	GUARDRAIL	LEFT	
25.959	25.959	INTERSECTION	RIGHT	RTE 901
25.970	25.977	CURB	RIGHT	
26.002	26.002	INTERSECTION	LEFT	RTE 919
26.004	26.051	CURB	LEFT	
26.007	26.007	INTERSECTION	RIGHT	RTE 901
26.064	26.064	INTERSECTION	RIGHT	RTE 901
26.068	26.080	CURB	RIGHT	
26.084	26.084	INTERSECTION	RIGHT	RTE 901
26.104	26.104	CULVERT	N/A	
26.106	26.166	CURB	RIGHT	
26.146	26.146	CULVERT	N/A	
26.191	26.216	CURB	LEFT	
26.297	26.325	CURB	RIGHT	
26.331	26.331	DROP INLET	RIGHT	

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0010 : NORTH-SOUTH HIGHWAY

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
26.481	26.481	INTERSECTION	RIGHT	RTE 409
26.489	26.489	INTERSECTION	LEFT	
26.773	26.791	GUARDRAIL	RIGHT	
26.774	26.792	BRIDGE	N/A	
26.779	26.794	GUARDRAIL	LEFT	
27.494	27.494	CULVERT	N/A	
27.541	27.541	CULVERT	N/A	
27.689	27.706	CURB	LEFT	
27.715	27.715	INTERSECTION	LEFT	INSPECTION STATION
28.005	28.005	CULVERT	N/A	
28.157	28.174	PULLOUT	LEFT	
28.169	28.186	CURB	LEFT	
28.280	28.280			ROUTE ENDS AT SOUTH ENTRANCE (US 180)
28.288	28.288	INTERSECTION	LEFT	
28.292	28.292	INTERSECTION	RIGHT	
28.354	28.354	INTERSECTION	RIGHT	
28.363	28.363	INTERSECTION	LEFT	
28.418	28.418	INTERSECTION	RIGHT	TO SOUTH ENTRANCE (US 180)
28.430	28.430	INTERSECTION	LEFT	TO SOUTH ENTRANCE (US 180)

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0011 : BLUE MESA ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000			ROUTE BEGINS AT RTE 010 @ MP 15674
0.007	0.007	INTERSECTION	LEFT	RTE 010
0.008	0.008	INTERSECTION	RIGHT	RTE 010
0.027	0.027	CULVERT	N/A	
0.442	0.442	CULVERT	N/A	
0.798	0.798	CULVERT	N/A	
0.991	0.991	CULVERT	N/A	
1.734	1.734	INTERSECTION	LEFT	
1.762	1.762	INTERSECTION	LEFT	RTE 011, END OF LOOP
2.030	2.091	PULLOUT	RIGHT	
2.031	2.091	CURB	RIGHT	
2.080	2.108	CURB	LEFT	
2.135	2.168	PULLOUT	RIGHT	
2.136	2.167	CURB	RIGHT	
2.511	2.617	PULLOUT	RIGHT	
2.512	2.617	CURB	RIGHT	
2.685	2.741	CURB	RIGHT	
2.685	2.741	PULLOUT	RIGHT	
2.958	2.993	PULLOUT	RIGHT	
3.357	3.375	CURB	LEFT	
3.396	3.413	CURB	RIGHT	
3.416	3.416	DROP INLET	RIGHT	
3.440	3.440			ROUTE ENDS AT END OF LOOP
3.446	3.446	INTERSECTION	LEFT	END @ RTE 011, END OF LOOP

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0012 : NEWSPAPER ROCK ROAD

FROM MILEPOST	*TO MILEPOST*	*FEATURE*	*SIDE*	*COMMENT*
0.000	0.000			ROUTE BEGINS AT RTE 010 @ MP 11920
0.004	0.004	INTERSECTION	RIGHT	RTE 010
0.007	0.007	INTERSECTION	LEFT	RTE 010
0.250	0.250			ROUTE ENDS AT NEWSPAPER ROCK PARKING AREA (RTE 916)
0.254	0.254	INTERSECTION	LEFT	END ROUTE AT PARKING (RTE 916)

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0014 : JASPER FOREST ROAD

FROM MILEPOST	*TO MILEPOST*	*FEATURE*	*SIDE*	*COMMENT*
0.000	0.000			ROUTE BEGINS AT RTE 010 @ MP 18518
0.009	0.009	INTERSECTION	RIGHT	RTE 010
0.011	0.011	INTERSECTION	LEFT	RTE 010
0.255	0.255	INTERSECTION	LEFT	RTE 917
0.349	0.417	CURB	RIGHT	
0.387	0.387	INTERSECTION	RIGHT	RTE 917
0.499	0.499	CULVERT	N/A	
0.507	0.507	INTERSECTION	LEFT	END OF LOOP
0.510	0.510			ROUTE ENDS AT END OF LOOP

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0200 : CHINDE POINT ACCESS

FROM MILEPOST	*TO MILEPOST*	*FEATURE*	*SIDE*	*COMMENT*
0.000	0.000			ROUTE BEGINS AT RTE 010 @ MP 2361
0.005	0.005	INTERSECTION	RIGHT	RTE 010
0.007	0.007	INTERSECTION	LEFT	RTE 010
0.188	0.188	DROP INLET	RIGHT	
0.302	0.302	DROP INLET	RIGHT	
0.329	0.329	INTERSECTION	LEFT	
0.340	0.340			ROUTE ENDS AT PARKING AREA (RTE 903)
0.343	0.343	INTERSECTION	LEFT	END ROUTE AT PARKING (RTE 903)
0.343	0.343	INTERSECTION	RIGHT	END ROUTE AT PARKING (RTE 903)

PEFO: ROUTE MAINTENANCE FEATURES ROAD LOG

ROUTE 0409 : OLD ROUTE 180 N

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000			ROUTE BEGINS AT RTE 010 @ MP 26529
0.005	0.005	INTERSECTION	RIGHT	RTE 010
0.007	0.007	INTERSECTION	LEFT	RTE 010
0.447	0.447	CULVERT	N/A	
1.304	1.304	INTERSECTION	RIGHT	
1.755	1.755	INTERSECTION	LEFT	
1.860	1.860	INTERSECTION	LEFT	
1.887	1.887	INTERSECTION	RIGHT	
1.892	1.892	INTERSECTION	LEFT	HORSE CORRAL
1.900	1.900			ROUTE ENDS AT HORSE CORRAL

APPENDIX A: GLOSSARY OF TERMS AND ABBREVIATIONS

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
8430	Numeric Code for Petrified Forest National Park
AADT	Annually Adjusted Daily Traffic. Average daily traffic adjusted for the term period comprising 80% of annual visitation
CRS	Condition Rating Sheets. (Section 5)
Drainage Condition Rating	A visual rating (Good, Poor) of the drainage condition. (see Section 10)
Excellent	Excellent rating with an index value of 95 or greater
Fair	Fair rating with an index value between 61 and 84
Func. Class	Functional Classification (see Route ID, Section 4)
Good	Good rating with an index value between 85 and 94
IRI	International Roughness Index
Lane Width	Distance from road centerline to fogline, or from centerline to edge-of-pavement when no fogline exists
MRR	Manually Rated Route
NA	Not Applicable
NC	Not Collected
Paved Width	Distance from edge-of-pavement to edge-of-pavement
PCR	Pavement Condition Rating (see Section 10)
PEFO	Alpha Code for Petrified Forest National Park

Poor	Poor Rating with an index value of 60 or less
RCI	Roughness Condition Index
SADT	Seasonal Annual Daily Traffic. Average daily traffic for the total defined "season"
SCR	Surface Condition Rating (see Section 10)
Shoulder Condition Rating	Visual rating (Good, Poor) of the condition of shoulder. (see 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 1 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 ocurr 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.

Rating Index Formulas

Alligator Cracking Index = 100 - [40 * (%low/70 + %medium/30 + %high/10)]
Longitudinal Cracking Index = 100 - [40 * (%low/350 + %medium/200 + %high/75)]
Transverse Cracking Index = 100 – [(20 * (low/15.1 + medium/7.5)) + (40 * (high/1.9))]
Patching Index = 100 - [40 * (%patching / 80)]
Rutting Index: 100-[40*((low/160) + (med/80) + (high/40))]
Roughness Condition Index: (RCI) = $32 * [5 * e^{(-0.0041 * \text{average IRI})}]$

These 0.02 Distress Rating Index values are then averaged over one mile sections for the mile-by-mile Disitress Rating Indexes, Surface Condition Rating (SCR) and Pavement Condition Rating (PCR).

Surface Condition Rating (SCR) = 100 – [(100 – AC_INDEX) + (100 – LC_INDEX) + (100 – TC_INDEX) + (100 – PATCH_INDEX) + (100 – RUT_INDEX)]

Pavement Condition Rating (PCR) = (SCR * 0.60) + (RCI * 0.40)

NOTE: Collection of roughness data is dependant 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.

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

Excellent	97
Good	90
Fair	73
Poor	45

Drainage Condition Rating Definitions

Good: Minimal overall drainage problems. If funding were available for pavement maintenance, 25% or less is estimated to correct drainage deficiencies.

Poor: Problems exist that jeopardizes the integrity of the road in this section. If funding were available for pavement maintenance, 50% to 100% is estimated to correct drainage deficiencies.

Drainage Condition Rating Criteria

The following are examples of basic criteria to help the rater to identify the different drainage ratings. While in the field, many other flaws will be discovered, but these criteria should give a feel for where the flaws would apply in the ratings.

Good Drainage
Most water clears the road prism adequately with little concern of base saturation.

- X Pavement has minor deficiencies that interrupt water flow.
- X Shoulders are mostly adequate as they relate to surrounding terrain. Shoulder design generally coincides with the drainage design.
- X Curbs have deficiencies, but still function without erosion.
- X Down drains are placed properly, but show signs of some deterioration.
- X Culverts are adequate in numbers and size however, minor deficiencies are evident.
- X Ditches are not paved, but solid and have enough area to maintain and carry required volume of water.

Poor Drainage
This section has areas of inadequate drainage ability that is causing base saturation that could cause a road failure.

- X Pavement grade is irregular and holds dangerous amounts of water (hydroplaning is a concern), or shows massive alligator cracking.
- X Shoulder design induces ponding that encroaches on the pavement (drivers try to avoid ponds).
- X Portions of curbs are missing, allowing water to escape causing erosion.
- X Drop inlets, due to various reasons, are only able to drain 50% or less efficiently.
- X Down drains show signs of water exiting in areas by the down drain causing erosion.
- X Culverts are functionally deficient including size, installation, location, or grade giving water opportunity to saturate the road base.
- X Ditches allow water opportunity to saturate the road base through various reasons such as low places in ditch where design has not allowed for water to drain, little or no room in the road prism for a needed ditch, or water is disappearing within the ditch.

Shoulder Condition Rating Definitions

Good: The shoulder is generally in good functional condition.. If curbs are present, they are functional.

Poor: There is no shoulder because erosion has removed it. If curbs are present, they need to be replaced.

Shoulder Rating Criteria

The following are examples of basic criteria to help the rater to identify the different shoulder ratings. While in the field, many other flaws will be discovered, but these criteria should give a feel for where the flaws would apply in the ratings.

Good Shoulders

- X If shoulder is unpaved drop-offs are less than 1", but grading is required.
- X If shoulder is paved rut depth is less than 1/2", sealed cracks are present, and grading is required.
- X If curbs are present they are functional.

Poor Shoulder

- X If shoulder is unpaved drop-offs are greater than 4" and erosion has removed the shoulder.
- X If shoulder is paved rut depth is greater than 1". Open cracks are greater than 1/4" deep, and erosion has removed the shoulder.
- X If curbs are present they need replacement.
- X If curbs are present they need repairs, and there is erosion behind the curb.

APPENDIX C: DIGITAL IMAGE INFORMATION

All images collected in Cycle 3 are digital images. These images provide the best resolution for identifying sign inventories and pavement evaluations. The images can be viewed with an interactive software program called **Visi-Data**. Each park will have a copy of the Visi-Data program installed in the park for park personnel to access and use.

Only Cycle 3 data can be queried and reviewed using the Visi-Data software program. This program is a multimedia 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 trying to query. Associated digital right-of-way images from the either the LAN, USB port, individual DVD, or from the Visi-web application, can be presented along with the GPS locations.

APPENDIX D: METADATA

ARAN ROUTE GPS DATA

Background information of route spatial data.

GPS Records: GPS data for NPS routes is stored in the MS Access database for the park. The coordinates of the road traces are stored in the '**PMS_20**' table in the '**GPS_LAT**' and '**GPS_LON'** fields.

Data Collection Device:

Vehicle Information:	Ford Van
Type of GPS Unit:	NovAtel MiLLennium, 12 channel, dual frequency L1/L2, DGPS ready receiver w/MiLLennium 502 GPS antenna and OmniSTAR System 3000 LR
Inertial System:	Applanix POS LV

Accuracy: Expected ground accuracy is 1 meter *

*The above accuracy assumes good GPS mission planning resulting in maximum GPS satellite observation and ideal environmental conditions. Due to less than ideal satellite and environmental conditions, some routes may lack the expected ground accuracy.

Geographic Datum: WGS 1984

Post Collection GPS Correction: Due to unanticipated GPS collection inaccuracies, some route locations have been digitized using DOQQ's and other data sources.

FHWA – NPS Road Inventory Program
Cycle 3 Metadata for the Park Database

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

- Three canned reports are titled "Features in Good Condition", "Features in Fair Condition," and "Features in Poor Condition." These titles could be misleading. In Cycle 3, condition assessments have been conducted on **signs only**. Condition assessments have not been conducted on non-sign features, such as culverts, guardrails, pullouts, etc. Although the database and canned reports might report a default value of "good" for un-assessed features, these condition values are not valid for import into FMSS.
- Database records that show a concrete surface type sometimes include index values that seem to show a perfect roadway (e.g., a Pavement Condition Rating (PCR) of 100). The Road Inventory Program does not actually conduct condition assessments of concrete surfaces. The perfect values are just default values assigned to unassessed sections of pavement and do not represent an assessment of the roadway surface's quality.
- 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_Visidata 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.

- Most roadway features are collected relative to the primary direction lane of a roadway, using the primary-direction video. Signs are the only features collected using the opposite-direction video.

Key to Notes in Tables

(1): Note that only one value fits in field, so even if this value varies throughout the route, only one value is recorded here.
(2): Note that some MP values listed here are estimates recorded during the Route ID process for use by the data collection crew (e.g. "FROM ROUTE 0010 AT MILEPOST 30.3"). They are estimates only and are not expected to match the more accurate milepost values included elsewhere in the database in the BEG_MP, END_MP, and MP fields.
(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. Features along the side of a roadway that are measured using the Surveyor software might not be located very accurately. Surveyor is known to be most accurate when measuring quantities near the center of the video frame, as opposed to in the edges of the video image.
(5): Only signs are evaluated for condition. No other features' conditions are assessed, so "N/A" was originally intended to be the default value for unassessed features. However, some non-sign features do have condition ratings in the database. These are not accurate, because no assessment was ever done on non-sign features.
(6): Condition assessments are not conducted on concrete (CO) surface types. Perfect values for concrete road sections are default values and do not represent a condition assessment of the concrete surfaces.
(7): 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 resolution. 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
RIP_CYCLE	X	3, for data collection cycle 3	Route ID Meeting	FHWA Determination	100%
STATE	XX	State where route is located	Route ID Meeting	Park Input/FHWA Determination	Untested. (1)
PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	Untested
PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	Untested
RTE_NO	XXXXXX	Route number	Route ID Meeting	Park Input/FHWA Classification	Untested
RTE_NAME	(Text)	Route name	Route ID Meeting	Park Input	Untested. 50 characters fit in field
FUNCT_CLASS	X	Route functional classification	Route ID Meeting	Park Input/FHWA Classification	Untested
DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input/FHWA Determination	Untested
BEG_MP_EST	999.999 (miles)	Estimated starting MP	Route ID Meeting	Park Input/FHWA Determination	Estimated before data collected
END_MP_EST	999.999 (miles)	Estimated ending MP	Route ID Meeting	Park Input/FHWA Determination	Estimated before data collected
RTE_LENGTH	999.999 (miles)	Collected route length	ARAN Data Collection	Automatic Output	100%
FROM_DESC	(Text)	Beginning terminus of route	Route ID Meeting	Park Input/FHWA Determination	Estimated before data collected. (2)
TO_DESC	(Text)	Ending terminus of route	Route ID Meeting	Park Input/FHWA Determination	Estimated before data collected. (2)
NO_LANES	X	Number of lanes in route	ARAN Data Collection	Survey Crew Input	Untested. (1)
SURF_TYPE	XX	Surface type of route	ARAN Data Collection	Survey Crew Input	Untested. (1)
COMP_DIR	XX	Compass direction of route's primary lane (nearest cardinal direction)	Route ID Meeting	Park Input/FHWA Determination	Untested
COMMENTS	(Text)	Special information, if any	Contractor Post-processing	Contractor Input	Untested
FILENAME	XXXXXXXX	Filename of raw data files	ARAN Data Collection	Automatic Output	100%
SECTION	XXXXXX	Route section ID	Route ID Meeting/ARAN Data Collection	Survey Crew Input/Automatic Output	100%
FKEY	9999999	Unique record ID	Contractor Post-processing	Database Processing	100%
DATE	DD/MM/YY	Data collection date	ARAN Data Collection	Automatic Output	100%
BEG_MP	999.999 (miles)	Beginning MP collected	ARAN Data Collection	Automatic Output	100% (3)
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
RIP_CYCLE	X	3, for data collection cycle 3	Route ID Meeting	FHWA Determination	100%
STATE	XX	State where route is located	Route ID Meeting	Park Input/FHWA Determination	Untested. (1)
PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	Untested
PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	Untested
RTE_NO	XXXXXX	Route number	Route ID Meeting	Park Input/FHWA Classification	Untested
FUNCT_CLASS	X	Route functional class	Route ID Meeting	Park Input/FHWA Classification	Untested
DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input/FHWA Determination	Untested
MP	999.999 (miles)	Feature location along route	ARAN Data Collection/Contractor Post-processing	Survey Crew Input/Video Processing	Untested (4)
EVENT	XXXX	Event category of feature	Contractor Post-processing	Video Processing	Untested
EVENT_CODE	XXXX	Event sub-category of feature	Contractor Post-processing	Video Processing	Untested
EVENT_DESC	(Text)	Description of feature/contents of sign	Contractor Post-processing	Video Processing	Untested
MUTCD	"N/A"	N/A. Intended to be sign MUTCD code	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to N/A
CONDITION	XXX	Sign condition (G-D, F-R, P-R, N/A)	Contractor Post-processing	Video Processing	Untested (5)
COMMENT	(Text)	Sign label, intersecting route, etc.	Contractor Post-processing	Database Processing	Untested
OFFSET	"N/A"	N/A. Intended to be offset from pavement edge	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to N/A
SIDE	XXX	Side of route; "N/A" if not on one side	Contractor Post-processing	Video Processing	Untested
STR_NUMBER	XXXXXXXXXX	FHWA bridge structure number	FHWA Post-processing	Database Processing	Untested
GPS_LAT	"N/A"	N/A. Intended to be latitude coordinate	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to N/A
GPS_LON	"N/A"	N/A. Intended to be longitude coordinate	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to N/A
GPS_ELEV	"N/A"	N/A. Intended to be elevation	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to N/A
GPS_MODE	"N/A"	N/A. Intended to be GPS mode	Contractor Post-processing	Database Processing	Values inaccurate, defaulted to N/A
VIDEO	<*Park*>C03VID<#>	Removable USB video hard drive number	Contractor Post-processing	Database Processing	Untested
IMAGE	(Text)	Filename of .jpg image showing feature	Contractor Post-processing	Automatic Output	Untested
DATE	DD/MM/YY	Data collection date	ARAN Data Collection	Automatic Output	100%
FILENAME	XXXXXXXX	Filename of raw data files	ARAN Data Collection	Automatic Output	100%
SECTION	XXXXXX	Route section ID	Route ID Meeting/ARAN Data Collection	Survey Crew Input/Automatic Output	100%
FKEY	9999999	Unique record ID	Contractor Post-processing	Database Processing	100%
VISI_FROM	999999 (millimiles)	Raw MP of first video frame showing feature	Contractor Post-processing	Database Processing	Untested
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
IDKEY	(Text)	Unique record ID used by VisiData	Contractor Post-processing	Database Processing	Untested
MP_REF	(Text)	Range of mileage to play in VisiData	Contractor Post-processing	Database Processing	Untested

PMS_20, PMS_Mile & PMS_Visidata Tables Metadata:

FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
RIP_CYCLE	X	3, for data collection cycle 3	Route ID Meeting	FHWA Determination	100%
STATE	XX	State where route is located	Route ID Meeting	Park Input/FHWA Determination	Untested. (1)
PARK_ALPHA	XXXX	Park alpha code	Route ID Meeting	NPS References	Untested
PARK_NO	XXXX	Park numeric code	Route ID Meeting	NPS References	Untested
RTE_NO	XXXXXX	Route number	Route ID Meeting	Park Input/FHWA Classification	Untested
FUNCT_CLASS	X	Route functional class	Route ID Meeting	Park Input/FHWA Classification	Untested
DIRECTION	XXX	Survey lane: PRI (primary) or OPP (opposite)	Route ID Meeting	Park Input/FHWA Determination	Untested
BEG_MP	999.999 (miles)	MP at start of road interval described by database record	Contractor Post-processing	Database Processing	100% (3)
END_MP	999.999 (miles)	MP at end of road interval described by database record	Contractor Post-processing	Database Processing	100% (3)
INT_LENGTH	999.9 (ft)	Length of road interval as aggregated for data table	Contractor Post-processing	Database Processing	100%
RTE_LENGTH	999.999 (miles)	Collected route length	ARAN Data Collection	Automatic Output	100%
NO_LANES	X	Number of lanes in route	ARAN Data Collection	Survey Crew Input	Untested. (1)
LANE_NO	X	Data collection lane	Contractor Post-processing	Database Processing	Untested
WX_LANE_WIDTH	99.999 (ft)	WiseCrax (crack detection software) analysis width	Contractor Post-processing	Automatic Output	Untested
LANE_WIDTH	99.999 (ft)	Width of lane	Contractor Post-processing	Video Processing	Untested
PAVE_WIDTH	99.999 (ft)	Full pavement width	Contractor Post-processing	Video Processing	Untested
SHLD_WIDTH_L	99.999 (ft)	Left shoulder width	Contractor Post-processing	Video Processing	Untested
SHLD_WIDTH_R	99.999 (ft)	Right shoulder width	Contractor Post-processing	Video Processing	Untested
SHLD_COND_L	XXXX	Left shoulder condition	ARAN Data Collection	Survey Crew Input	Untested
SHLD_COND_R	XXXX	Right shoulder condition	ARAN Data Collection	Survey Crew Input	Untested
DRAIN_COND_L	XXXX	Left drainage condition	ARAN Data Collection	Survey Crew Input	Untested
DRAIN_COND_R	XXXX	Right drainage condition	ARAN Data Collection	Survey Crew Input	Untested
SURF_TYPE	XX	Surface type of route	ARAN Data Collection	Survey Crew Input	Untested. (1)
PCR	999	Pavement Condition Rating	Contractor Post-processing	Database Processing	100% for calculation (6)
RCI	999	Roughness Condition Index; -1 if invalid IRI	Contractor Post-processing	Database Processing	100% for calculation

FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
SCR	999	Surface Condition Rating	Contractor Post-processing	Database Processing	100% for calculation (6)
IRI_AVG	999.9 (inches/mile)	Average IRI	Contractor Post-processing	Database Processing	Untested
IRI_SD	999.9 (inches/mile)	IRI standard deviation	Contractor Post-processing	Database Processing	Untested
IRI_L	999.9 (inches/mile)	Left wheel path IRI	ARAN Data Collection	Automatic Output	Untested
IRI_R	999.9 (inches/mile)	Right wheel path IRI	ARAN Data Collection	Automatic Output	Untested
IRI_FLAG	0 or -1	-1 if invalid IRI data	Contractor Post-processing	Database Processing	Untested
RUT_INDEX	999	Rut index	Contractor Post-processing	Database Processing	100% for calculation (6)
RUT_AVG	99.99 (inches)	Average rut depth of both wheelpaths	Contractor Post-processing	Database Processing	Untested (6)
RUT_MAX	99.99 (inches)	Maximum rut depth of both wheelpaths	Contractor Post-processing	Database Processing	Untested (6)
RUT_SD	9.9	Rut depth standard deviation	Contractor Post-processing	Database Processing	Untested (6)
RUT_LOW	999 (%)	Percent of low severity ruts (on a 0-200% scale) in both wheelpaths	Contractor Post-processing	Database Processing	Untested (6)
RUT_MED	999 (%)	Percent of medium severity ruts (on a 0-200% scale) in both wheelpaths	Contractor Post-processing	Database Processing	Untested (6)
RUT_HI	999 (%)	Percent of high severity ruts (on a 0-200% scale) in both wheelpaths	Contractor Post-processing	Database Processing	Untested (6)
XFALL	999.9 (% slope)	Cross fall at start of road interval	ARAN Data Collection	Automatic Output	Precise but inaccurate. Not reported in Cycle 4
GRADE	999.9 (% slope)	Grade at start of road interval	ARAN Data Collection	Automatic Output	Precise but inaccurate. Not reported in Cycle 4
AC_INDEX	999	Alligator cracking index	Contractor Post-processing	Database Processing	100% for calculation (6)
AC_LOW	999.9999 (%)	Percent of WiseCrax measured lane area with low-severity alligator cracking	Contractor Post-processing	Automatic Output	(6) (7)
AC_MED	999.9999 (%)	Percent of WiseCrax measured lane area with medium-severity alligator cracking	Contractor Post-processing	Automatic Output	(6) (7)
AC_HI	999.9999 (%)	Percent of WiseCrax measured lane area with high-severity alligator cracking	Contractor Post-processing	Automatic Output	(6) (7)
LC_INDEX	999	Longitudinal cracking index	Contractor Post-processing	Database Processing	100% for calculation (6)
LC_LOW	999.99 (%)	Low-severity longitudinal cracking in lane as a percentage of road interval length	Contractor Post-processing	Automatic Output	(6) (7)
LC_MED	999.99 (%)	Medium-severity longitudinal cracking in lane as a percentage of road interval length	Contractor Post-processing	Automatic Output	(6) (7)
LC_HI	999.99 (%)	High-severity longitudinal cracking in lane as a percentage of road interval length	Contractor Post-processing	Automatic Output	(6) (7)
TC_INDEX	999	Transverse cracking index	Contractor Post-processing	Database Processing	100% for calculation (6)
TC_LOW	999.99 (cracks)	Count of low-severity transverse cracks, where one crack unit equals the WiseCrax measured lane width	Contractor Post-processing	Automatic Output	(6) (7)
TC_MED	999.99 (cracks)	Count of medium-severity transverse cracks, where one crack unit equals the WiseCrax measured lane width	Contractor Post-processing	Automatic Output	(6) (7)
TC_HI	999.99 (cracks)	Count of high-severity transverse cracks, where one crack unit equals the WiseCrax measured lane width	Contractor Post-processing	Automatic Output	(6) (7)
PATCH_INDEX	999	Patching index	Contractor Post-processing	Database Processing	100% for calculation (6)

FIELD	FORMAT	EXPECTED VALUE	SOURCE	VALIDATION	EXPECTED ACCURACY
PATCHING	999.9999 (%)	Percent of WiseCrax measured lane area affected by patching	Contractor Post-processing	Manual Pavement Video Processing	Untested (6)
GPS_LAT	999.999999	Latitude coordinate	ARAN Data Collection	Automatic Output	See GPS Metadata sheet distributed with data
GPS_LON	-999.999999	Longitude coordinate	ARAN Data Collection	Automatic Output	See GPS Metadata sheet distributed with data
GPS_ELEV	99999.9	Elevation	ARAN Data Collection	Automatic Output	See GPS Metadata sheet distributed with data
GPS_MODE	XXX	GPS mode during collection	ARAN Data Collection	Automatic Output	See GPS Metadata sheet distributed with data
VIDEO	<*Park*>C03VID<#>	Removable USB video hard drive number	Contractor Post-processing	Database Processing	Untested
IMAGE	(Text)	Filename of .jpg image showing road interval	Contractor Post-processing	Automatic Output	Untested
SPEED	999 (miles/hour)	Average ARAN speed during data collection	ARAN Data Collection	Automatic Output	Untested
BRIDGE_FLAG	0 or 1	Flag indicating presence of bridge in interval	ARAN Data Collection	Survey Crew Input	Untested
CONSTR_FLAG	0 or 1	Flag indicating construction in interval	ARAN Data Collection	Survey Crew Input	Untested
LANEDEV_FLAG	0 or 1	Flag indicating lane deviation in interval	ARAN Data Collection	Survey Crew Input	Untested
DATE	DD/MM/YY	Data collection date	ARAN Data Collection	Automatic Output	100%
NODISTRESS	0 OR 1	Flag indicating absence of pavement distress	Contractor Post-processing	Database Processing	100%
FILENAME	XXXXXXXX	Filename of raw data files	ARAN Data Collection	Automatic Output	100%
SECTION	XXXXXX	Route section ID	Route ID Meeting/ARAN Data Collection	Survey Crew Input/Automatic Output	100%
FKEY	9999999	Unique record ID	Contractor Post-processing	Database Processing	100%
VISI_FROM	999999 (millimiles)	Raw MP of first video frame in section	Contractor Post-processing	Database Processing	Untested
VISI_TO	999999 (millimiles)	Raw MP of last video frame in section	Contractor Post-processing	Database Processing	Untested
IDKEY	(Text)	Unique record ID used by VisiData	Contractor Post-processing	Database Processing	Untested
MP_REF	(Text)	Range of mileage to play in VisiData	Contractor Post-processing	Database Processing	Untested

Cycle 3 Shapefile Metadata

Metadata is provided for all shapefiles used for the creation of RIP report documents. The metadata for each shapefile associated with the park can be found in Section 10 of the PDF report provided on your park CD.

All shapefiles have the following spatial characteristics:

Geographic_Coordinate_Units: Decimal degrees
Spheroid: WGS 1984