Federal Lands Highway
Road Inventory Program

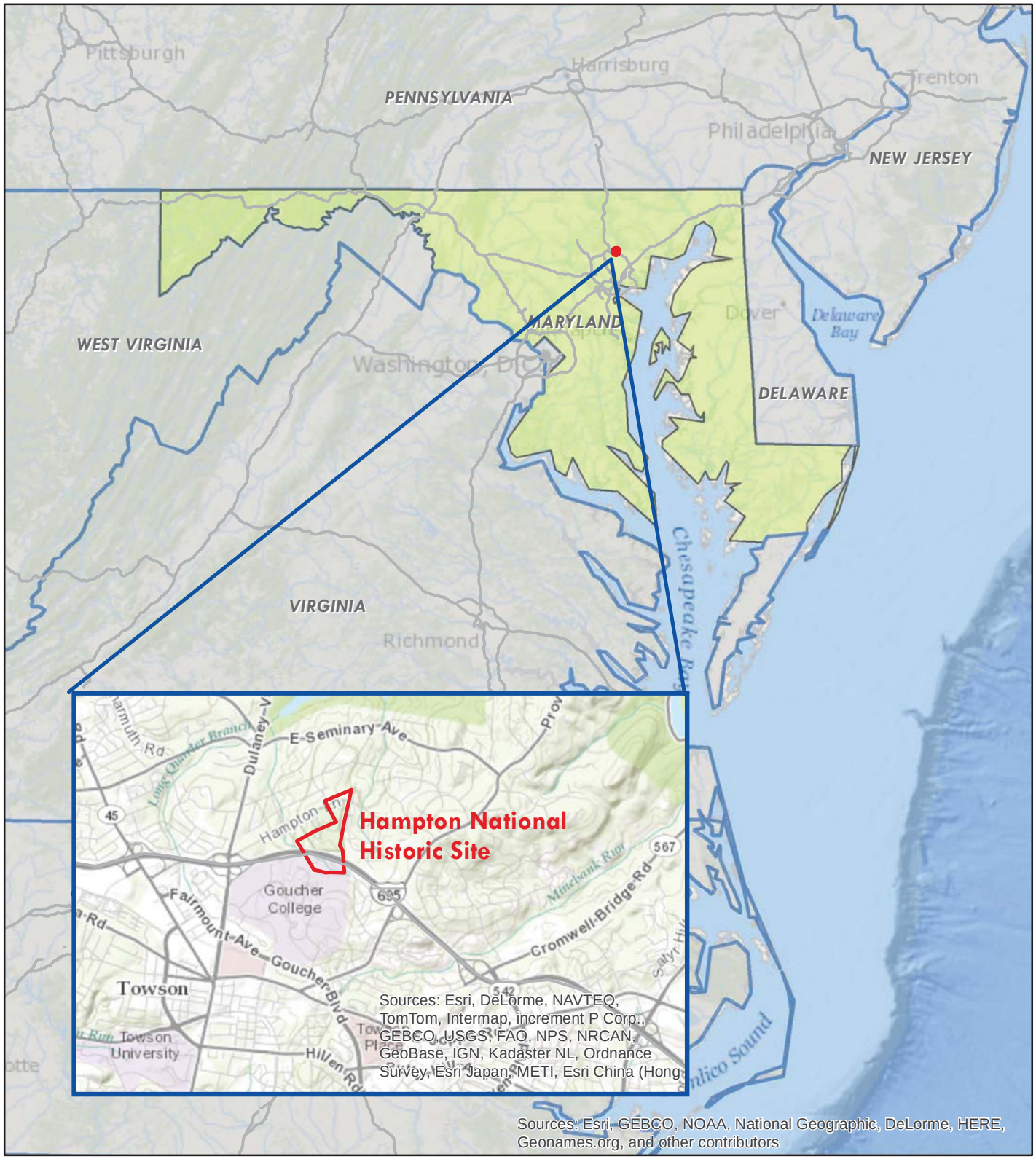
Road Inventory and Condition Assessment

Hampton National Historic Site
HAMP

Cycle 5 Report

Prepared By: Federal Highway Administration
Road Inventory Program (RIP)
Data Collected: 07/2014
Report Date: 10/2014

Hampton National Historic Site
in
Maryland



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Section 1
Introduction

Hampton National Historic Site

Federal Lands Highway
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INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

Respectfully,

FHWA RIP Team

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Sterling, VA 20166
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Section 2
Park Route Inventory

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

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

** DCV - Data Collection Vehicle NC - Not Collected

HAMP

HAMPTON NATIONAL HISTORIC SITE

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0010ZZ	**5**	**27585**		**MAIN ENTRANCE ROAD**	**FROM HAMPTON LANE (NON NPS)**	**TO END OF LOOP**	**N/A**	**0.33**	**0.00**	**0.33**	**1**	**34,953**	**AS**	**1**
0200	NC	27427		EAST ROAD	FROM HAMPTON LANE (NON NPS)	TO ROUTE 0402 (HISTORIC ENTRANCE DRIVE)	N/A	0.00	0.23	0.23	3		GR	
0202	NC	27425		CEMETERY ROAD	FROM ROUTE 0200 (EAST ROAD)	TO END OF LOOP AT CEMETERY	N/A	0.00	0.19	0.19	3		GR	
0400	**5**	**27429**		**FARM ROAD**	**FROM HAMPTON LANE (NON NPS)**	**TO ST. FRANCIS ROAD (NON NPS)**	**N/A**	**0.09**	**0.14**	**0.22**	**1**	**4,937**	**AS**	**1**
0402	NC	27426		HISTORIC ENTRANCE DRIVE	FROM HAMPTON LANE (NON NPS)	TO END OF LOOP	N/A	0.00	0.32	0.32	6		GR	
0403	NC	107558		LONG BARN ROAD	FROM ROUTE 0400 (FARM ROAD)	TO END AT BARN	N/A	0.00	0.04	0.04	6		GR	
0404	NC	27428		WEST SERVICE ROAD	FROM HAMPTON LANE (NON NPS)	TO MAINTENANCE AREA POLE BARN	N/A	0.00	0.17	0.17	6		NV	
0900	**5**	**107554**		**MANSION SERVICE AREA PARKING**	**FROM ROUTE 0010ZZ (MAIN ENTRANCE ROAD)**	**TO ROUTE 0010ZZ (MAIN ENTRANCE ROAD)**	**N/A**	**0.00**	**0.00**	**0.00**		**11,566**	**AS**	**1**
0902	**5**	**104709**		**GARDEN / MAINTENANCE AREA**	**FROM ROUTE 0010ZZ (MAIN ENTRANCE ROAD)**	**TO MAINTENANCE AREA**	**N/A**	**0.00**	**0.00**	**0.00**		**8,528**	**AS**	**1**
0903	**5**	**94406**		**LOWER VISITOR PARKING LOT**	**FROM ROUTE 0010ZZ (MAIN ENTRANCE ROAD)**	**TO ROUTE 0010ZZ (MAIN ENTRANCE ROAD)**	**N/A**	**0.00**	**0.00**	**0.00**		**19,102**	**AS**	**1**
0904	NC	107556		CARRIAGE DISPLAY PARKING	ADJACENT TO ROUTE 0200 (EAST ROAD)		N/A	0.00	0.00	0.00		1,460	GR	
0905	NC	107555		FARMHOUSE PARKING	FROM ROUTE 0400 (FARM ROAD)	TO PARKING	N/A	0.00	0.00	0.00		1,500	GR	
0907	**5**	**115871**		**TOUR BUS PARKING**	**ADJACENT TO ROUTE 0010ZZ (MAIN ENTRANCE ROAD)**		**N/A**	**0.00**	**0.00**	**0.00**		**2,680**	**AS**	**1**

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

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

** DCV - Data Collection Vehicle NC - Not Collected

CYCLE 5 SUMMARY TOTALS FOR HAMPTON NATIONAL HISTORIC SITE

CYCLE 5 ROUTE TOTALS

DCV Driven Route Miles	0.00
Manually Rated Route Miles	0.42
TOTAL PARK ROUTE MILES COLLECTED IN CYCLE 5	0.42
Manually Rated Routes (SQFT)	0.00
TOTAL UNPAVED PARK ROUTE MILES	1.09

CYCLE 5 CONCESSION TOTALS

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

* CYCLE 5 PARKING AREA TOTALS

Paved Parking (SQFT)	41,876
Unpaved Parking (SQFT)	2,960
TOTAL PARKING (SQFT)	44,836

CYCLE 5 WEIGHTED AVERAGE PARK VALUES

DCV Driven PCR	N/A
**Manually Rated Routes PCR	76
**Parking PCR	84
***Total Equivalent Lane Miles	1.41

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

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

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

Cycle 5 NPS/RIP Route ID Report

Shading Color Key:
Red text denotes approx. mileage

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

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

** DCV - Data Collection Vehicle NC - Not Collected

General Park Road Functional Classification Table

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

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

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

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

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

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

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

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

****

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

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

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

Surface Type Abbreviations:

AS - Asphaltic Concrete Pavement

CO - Portland Cement Concrete Pavement

BR - Brick or Pavers Road Bed

CB - Cobble Stone Road Bed

GR - Gravel Road Bed

SA - Sand Road Bed

NV - Native or Dirt Material Road Bed

OT - Other Materials Road Bed

NPS/RIP Subcomponent Details for HAMP

Shading Color Key:
Red text denotes approx. mileage

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

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

HAMP

HAMPTON NATIONAL HISTORIC SITE

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0010ZZ	27585	5	MAIN ENTRANCE ROAD	FROM HAMPTON LANE (NON NPS)	TO END OF LOOP		1	0.33	0.00	0.33	34,953

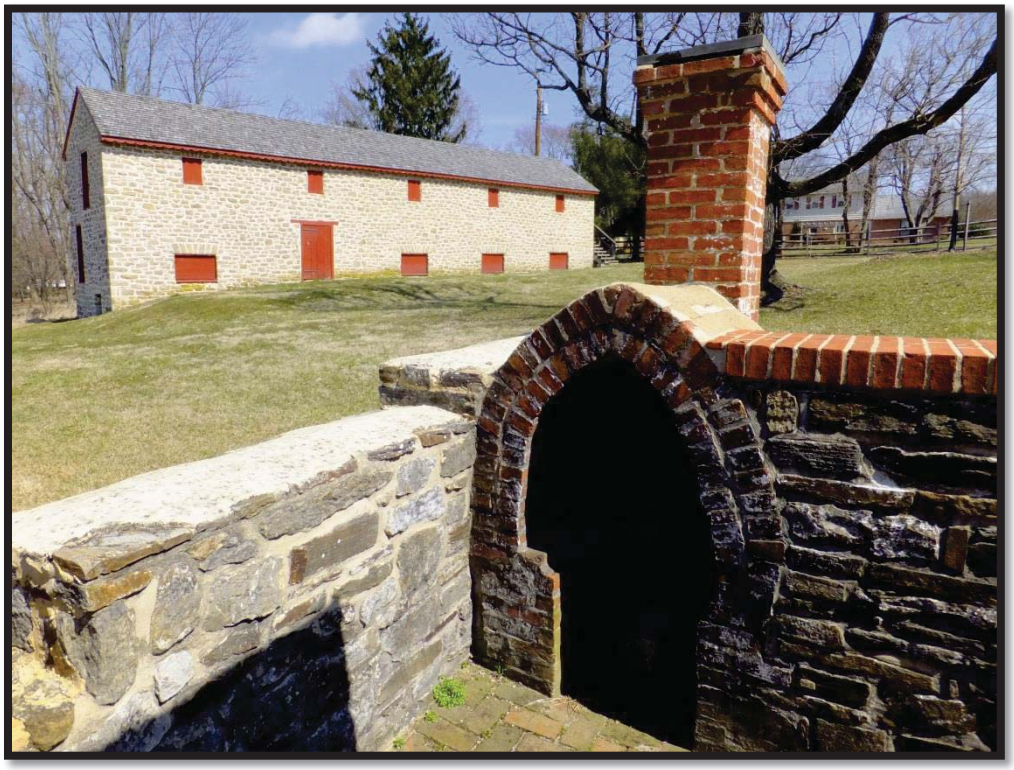
HAMP-0010ZZ Subcomponent Breakdown

Rte. No.	FMSS No.	Cycle Collected	Route Name	Route Description From	Route Description To	Concess Route	Func. Class	Paved Miles	Un-Paved Miles	Total Route Length	Manual Rated SQ/FT
0010AZ	27585	5	MAIN ENTRANCE ROAD A	FROM HAMPTON LANE (NON NPS)	TO ROUTE 0900 (MANSION SERVICE AREA PARKING)		1	0.24	0.00	0.24	25,555
0010BZ	27585	5	MAIN ENTRANCE ROAD B	FROM ROUTE 0900 (MANSION SERVICE AREA PARKING)	TO ROUTE 0010AZ (MAIN ENTRANCE ROAD A)		1	0.09	0.00	0.09	9,398

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - HAMP

ROUTES MODIFIED FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Modification**	**Comments**
0010ZZ	MAIN ENTRANCE ROAD	REALIGNED	CYCLE 3 ROUTE 0010 WAS REALIGNED (NOW ROUTE 0010AZ) AND COMBINED WITH THE REALIGNED PORTION OF ROUTE CYCLE 3 ROUTE 0900 (NOW ROUTE 0010BZ) IN CYCLE 5.
0903	LOWER VISITOR PARKING LOT	RECONSTRUCTED	ROUTE 0903 WAS RELOCATED AND RECONSTRUCTED. ROUTE NAME CHANGED FROM "LOWER PARKING".
0907	TOUR BUS PARKING	RECONSTRUCTED	ROUTE 0907 WAS RELOCATED AND RECONSTRUCTED.
OTHER CHANGES FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Change**	**Comments**
0400	FARM ROAD	OTHER	ROUTE 0400 WAS EXTENDED IN CYCLE 5 TO INCLUDE A PAVED SEGMENT AT THE END. FUNCTIONAL CLASS CHANGED FROM 5 TO 1 SINCE IT IS A MAIN ACCESS ROUTE TO THE PARK. ROUTE NAME CHANGED FROM "FARMHOUSE ROAD".
0900	MANSION SERVICE AREA PARKING	SQ FEET CHANGE	A PORTION OF CYCLE 3 ROUTE 0900 (THE EXIT ROAD FROM THE UPPER PARKING LOT) WAS REALIGNED AND TRANSFERRED TO ROUTE 0010ZZ IN CYCLE 5 (IT IS NOW ROUTE 0010BZ). ROUTE NAME CHANGED FROM "UPPER PARKING".

Section 3
Park Summary Information



Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

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

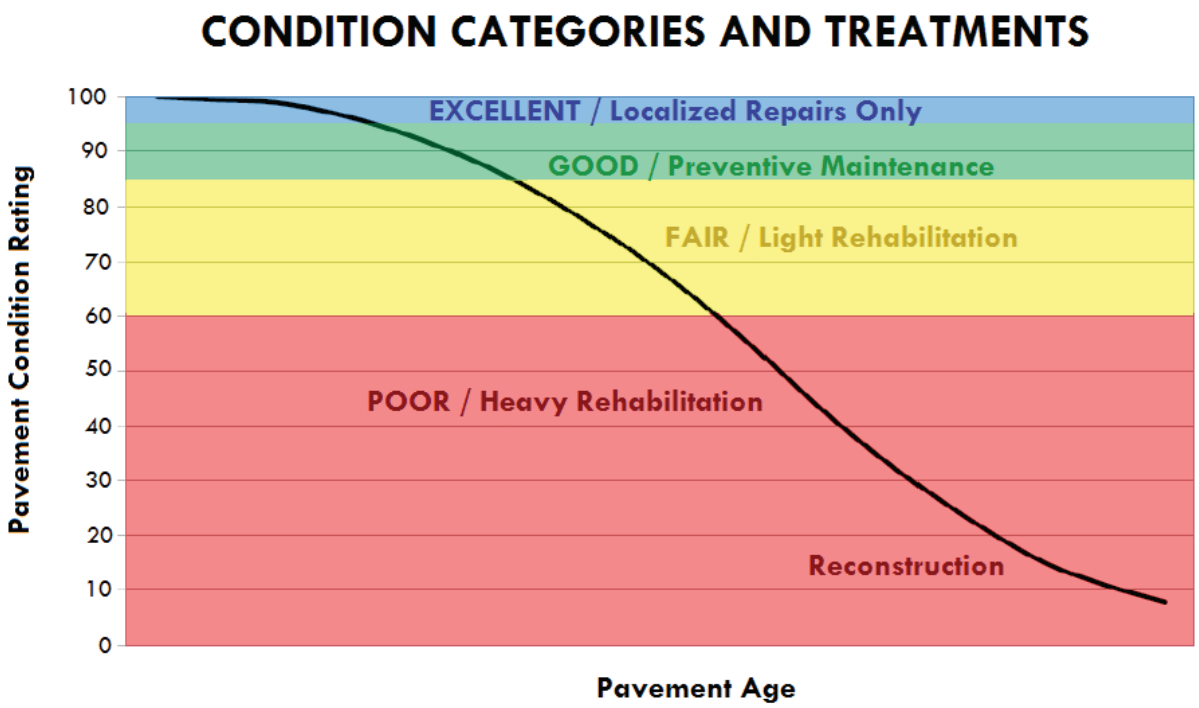
Functional Class	Pavement Condition Rating (PCR)								Total Miles
	POOR 0-60		FAIR 61-84		GOOD 85-94		EXCELLENT 95-100		
	Miles	%	Miles	%	Miles	%	Miles	%	
1	0.14	33.65%	0.03	7.21%	0	0%	0.25	59.13%	**0.42**
2									
3									
4									
5									
6									
7									
8									
Totals	**0.14**	**33.65%**	**0.03**	**7.21%**	**0**	**0%**	**0.25**	**59.13%**	**0.42**

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

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

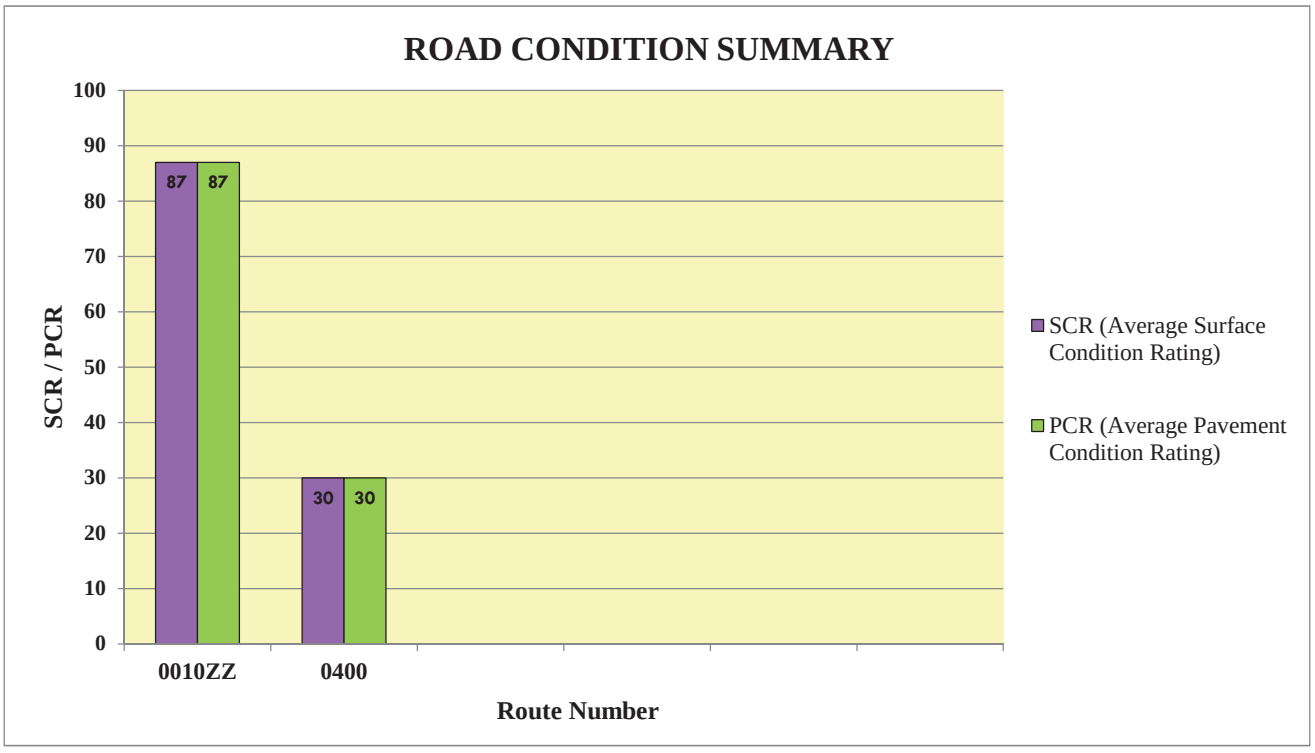
- Excellent/New: PCR of 95-100. Pavements in this range will require only spot repairs
- Good: PCR of 85-94. Pavements in this range will likely be candidates for Preventive Maintenance. Examples include Chip and Slurry Seals, Micro Surfacing and Thin Overlays.
- Fair: PCR of 61-84. Pavements in this range will likely be candidates of Light Rehabilitation (L3R). Examples include single-lift overlays up to 2.5 inches in total thickness, milling and overlays.
- Poor: PCR of 0-60. Pavements in this range will likely be candidates of Heavy Rehabilitation or Reconstruction (H3R or 4R). Examples include Pulverization, Multiple Lift Overlays, and Reconstruction.

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



HAMP: ROAD CONDITION SUMMARY

ROUTE NUMBER	ROUTE NAME	FUNCTIONAL CLASS	PAVED LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0010ZZ	MAIN ENTRANCE ROAD	1	0.33	ASPHALT	87	87
0400	FARM ROAD	1	0.09	ASPHALT	30	30

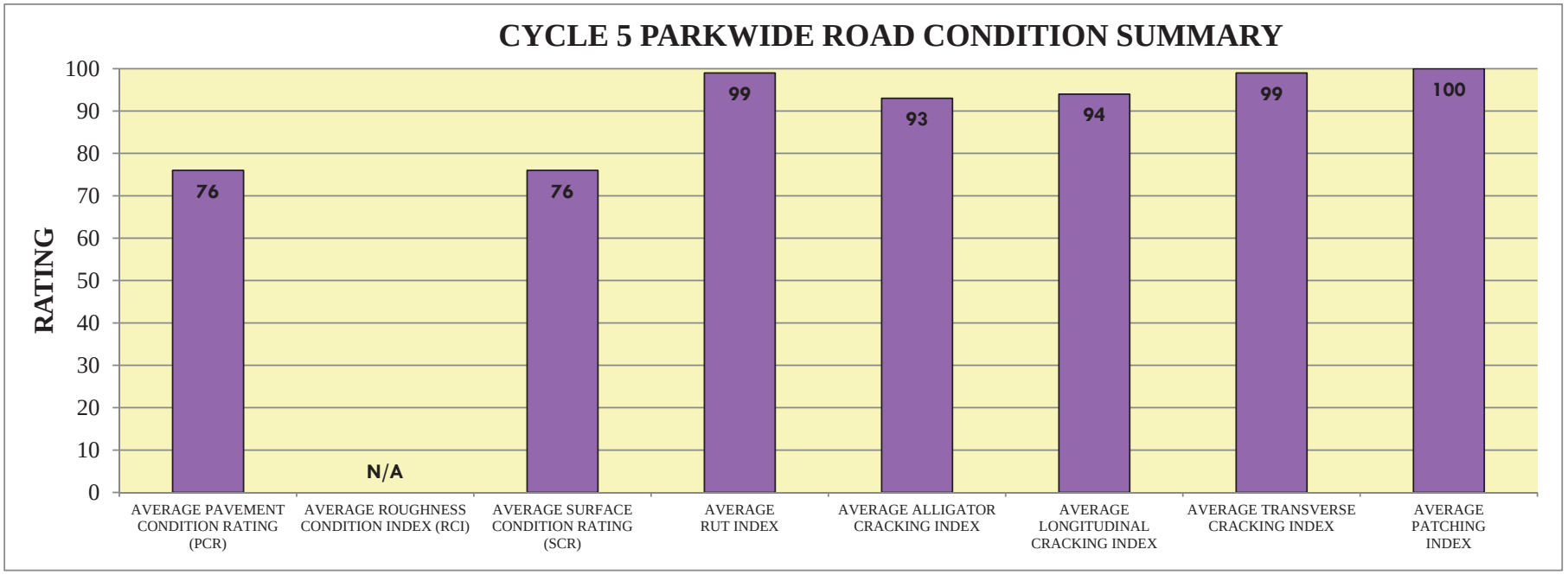


Date Collected 07/30/2014

HAMP: PARKWIDE ROAD 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
76	N/A	76	99	93	94	99	100

Roughness data is only collected on routes with lengths greater than 0.5 miles and a posted speed limit of 25 MPH or greater.



Date Collected 07/30/2014

Section 4
Park Route Location Maps

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

Hampton National Historic Site

Route Location Map
Key Map

Miles

0 0.05 0.1 0.2 0.3 0.4

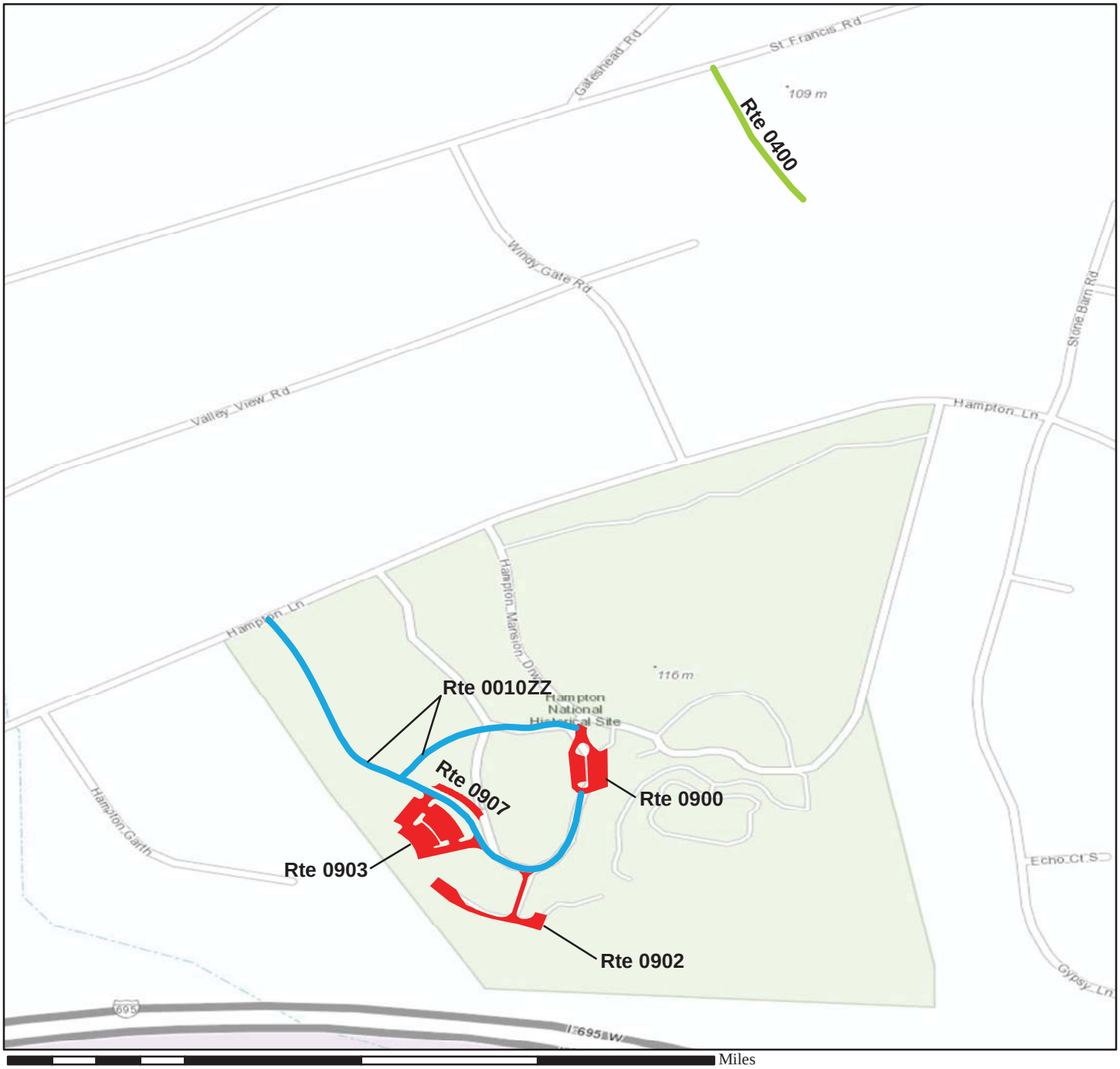
Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Cycle 5 Collected Routes

N

Hampton National Historic Site

Route Location Map
Area 1



Miles

0 0.05 0.1 0.2 0.3 0.4

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Cycle 5 Collected Routes

N

Hampton National Historic Site

Route Condition Map
PCR - Mile By Mile
Key Map

Miles

0 0.05 0.1 0.2 0.3 0.4

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Route Condition Legend – Pavement Condition Rating (PCR)

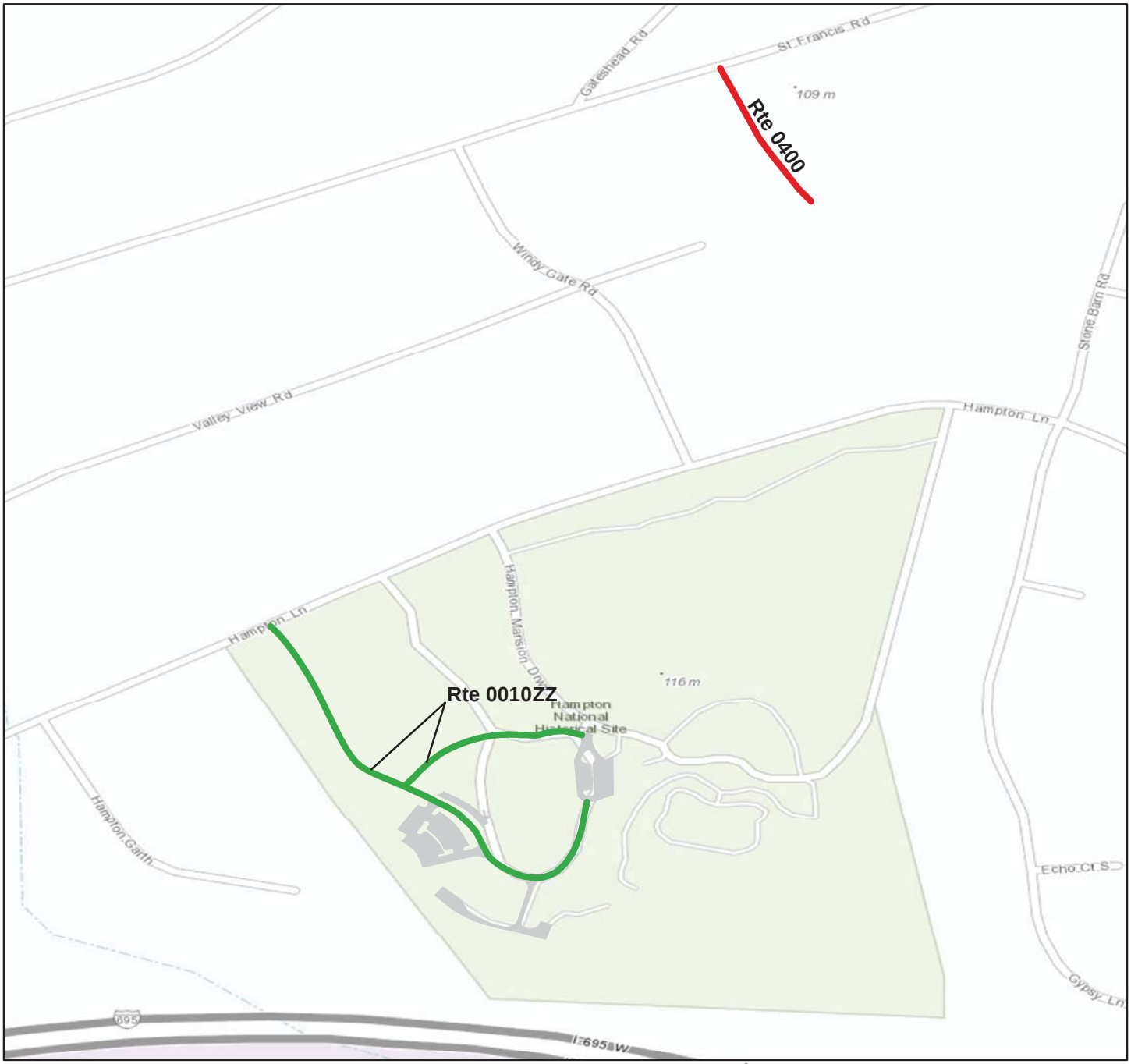
Poor **(0 - 60)** Fair **(61- 84)** Good **(85 - 94)** Excellent **(95 - 100)** No Data

See Appendix for definitions and formulas

N

Hampton National Historic Site

Route Condition Map
PCR - Mile By Mile
Area 1



Miles

0 0.05 0.1 0.2 0.3 0.4

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas

N

Section 5
Paved Route
Condition Rating Sheets

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

PAVED ROUTE CONDITION RATING SHEETS

Due to construction projects at Hampton National Historic Site, the RIP Data Collection Vehicle (DCV) did not visit the park in Cycle 5 to collect pavement condition data. Therefore, there is nothing to report in Section 5.

Manual methods were used in place of the DCV to rate the condition of the paved roads after the construction project was completed. These ratings can be found in Section 6 of this Report.

Section 6
Manually Rated Paved Route Condition Rating Sheets

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

Hampton National Historic Site
ROUTE 0010ZZ: MAIN ENTRANCE ROAD

SUMMARY ROUTE

Manual Rating

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas

N

Inspection Date: 7/30/2014	**Section Number**					
Paved Length (Miles): 0.33	**Section Length (MI)**					
Surface Type: ASPHALT	**Route Summary**					
Roadway Condition Information						
Pavement Condition Rating (PCR)	87					
Surface Condition Rating (SCR)	87					
Roughness Condition Index (RCI)	N/A					
Distress Index Values						
Structural Crack Index	87					
Transverse Cracking Index	100					
Patching Index	100					
Rutting Index	93					
International Roughness Index (IRI)	N/A					
Lane &Width Information						
Number of Lanes	2					
Paved Width (ft)	20					
Lane Width (ft)	10					

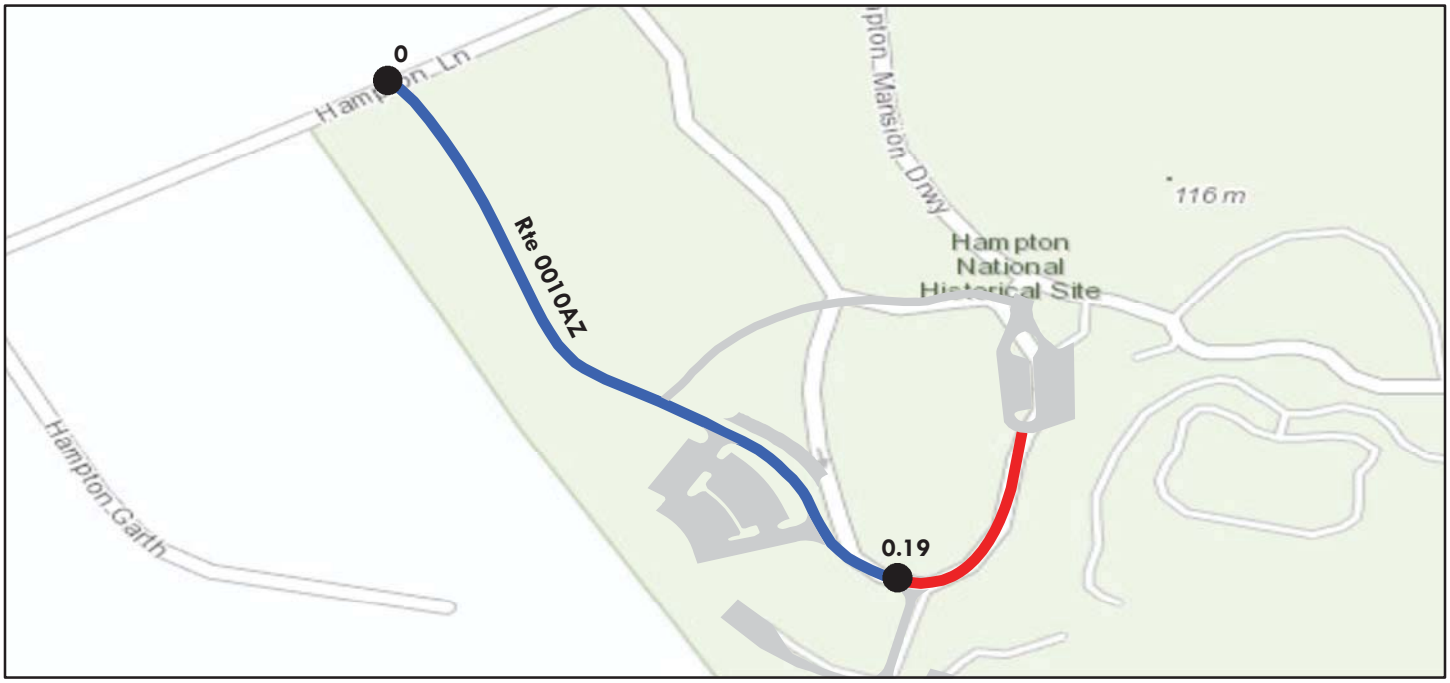
The condition shown on this page reflects the overall condition; it might not reflect individual subcomponent ratings.

Hampton National Historic Site

ROUTE 0010AZ: MAIN ENTRANCE ROAD A

SUBCOMPONENT OF ROUTE 0010ZZ

Manual Rating



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas

N

Inspection Date: 7/30/2014	**Section Number**	0	0.19			
Paved Length (Miles): 0.24	**Section Length (MI)**	0.19	0.05			
Surface Type: ASPHALT	**Route Summary**					
Roadway Condition Information						
Pavement Condition Rating (PCR)	86	100	37			
Surface Condition Rating (SCR)	86	100	37			
Roughness Condition Index (RCI)	N/A	N/A	N/A			
Distress Index Values						
Structural Crack Index	86	100	37			
Transverse Cracking Index	100	100	99			
Patching Index	100	100	100			
Rutting Index	91	100	61			
International Roughness Index (IRI)	N/A	N/A	N/A			
Lane &Width Information						
Number of Lanes	2	2	2			
Paved Width (ft)	20	20	20			
Lane Width (ft)	10	10	10			

Hampton National Historic Site
ROUTE 0010AZ: MAIN ENTRANCE ROAD A
Condition Photos

HAMP_0010AZ_8385.JPG

HAMP_0010AZ_8386.JPG

HAMP_0010AZ_8388.JPG

HAMP_0010AZ_8394.JPG

HAMP_0010AZ_8395.JPG

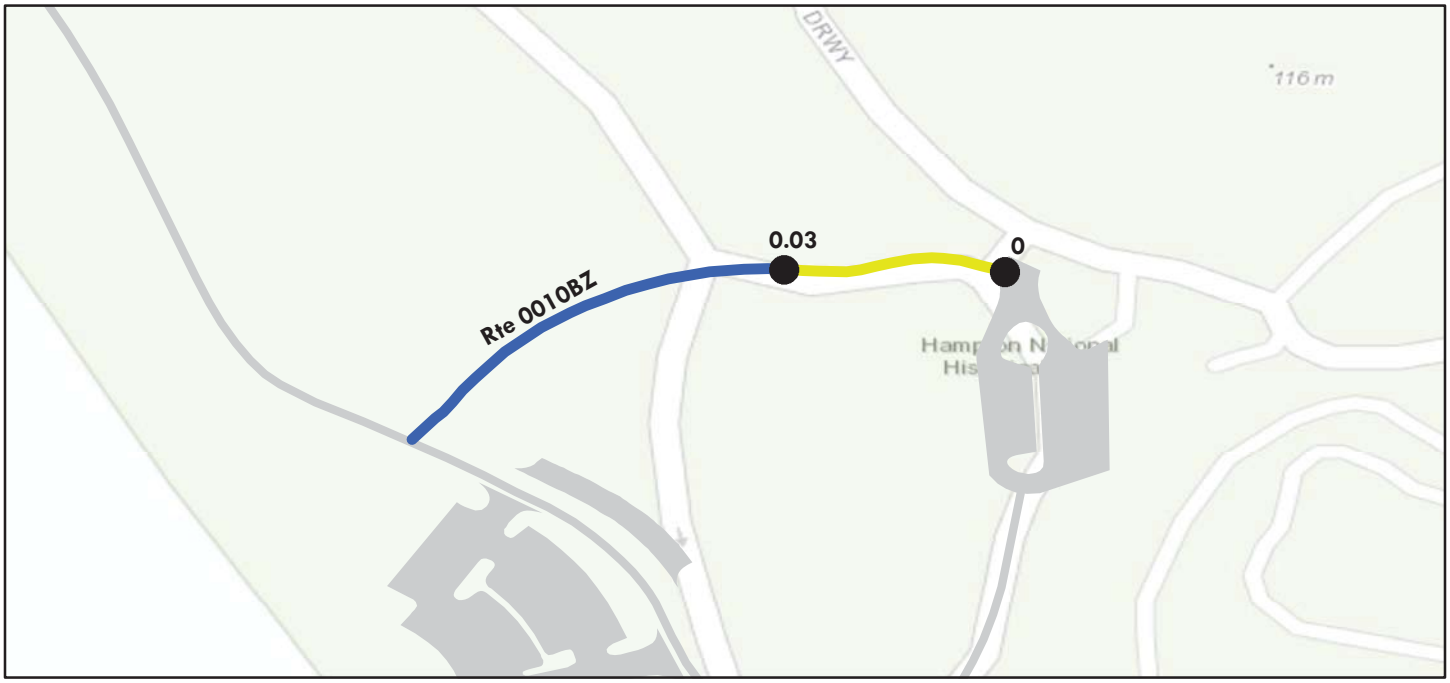
HAMP_0010AZ_8396.JPG

Hampton National Historic Site

ROUTE 0010BZ: MAIN ENTRANCE ROAD B

SUBCOMPONENT OF ROUTE 0010ZZ

Manual Rating



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas

N

Inspection Date: 7/30/2014	**Section Number**	0	0.03			
Paved Length (Miles): 0.09	**Section Length (MI)**	0.03	0.06			
Surface Type: ASPHALT	**Route Summary**					
Roadway Condition Information						
Pavement Condition Rating (PCR)	91	74	100			
Surface Condition Rating (SCR)	91	74	100			
Roughness Condition Index (RCI)	N/A	N/A	N/A			
Distress Index Values						
Structural Crack Index	91	74	100			
Transverse Cracking Index	99	98	100			
Patching Index	100	100	100			
Rutting Index	100	100	100			
International Roughness Index (IRI)	N/A	N/A	N/A			
Lane &Width Information						
Number of Lanes	2	2	2			
Paved Width (ft)	20	20	20			
Lane Width (ft)	10	10	10			

Hampton National Historic Site
ROUTE 0010BZ: MAIN ENTRANCE ROAD B
Condition Photos

HAMP_0010BZ_8403.JPG

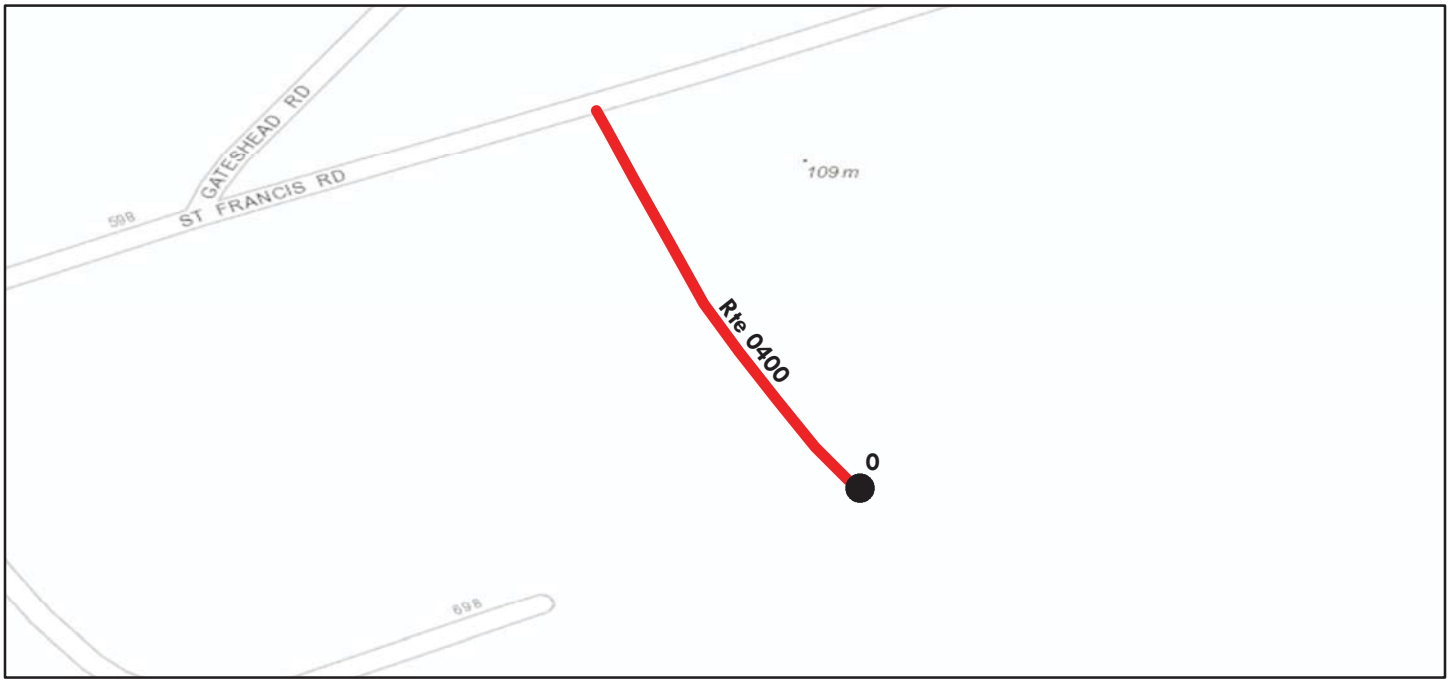
HAMP_0010BZ_8404.JPG

HAMP_0010BZ_8405.JPG

HAMP_0010BZ_8406.JPG

Hampton National Historic Site
ROUTE 0400: FARM ROAD

Manual Rating



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas

N

Inspection Date: 7/30/2014	**Section Number**	0				
Paved Length (Miles): 0.09	**Section Length (MI)**	0.09				
Surface Type: ASPHALT	**Route Summary**					
Roadway Condition Information						
Pavement Condition Rating (PCR)	30	30				
Surface Condition Rating (SCR)	30	30				
Roughness Condition Index (RCI)	N/A	N/A				
Distress Index Values						
Structural Crack Index	N/A	N/A				
Transverse Cracking Index	53	53				
Patching Index	53	53				
Rutting Index	53	53				
International Roughness Index (IRI)	N/A	N/A				
Lane &Width Information						
Number of Lanes	2	2				
Paved Width (ft)	17	17				
Lane Width (ft)	8.5	8.5				

Hampton National Historic Site
ROUTE 0400: FARM ROAD
Condition Photos

HAMP_0400_8423.JPG

HAMP_0400_8424.JPG

HAMP_0400_8425.JPG

HAMP_0400_8428.JPG

HAMP_0400_8434.JPG

HAMP_0400_8436.JPG

Section 7
Parking Area
Condition Rating Sheets

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

Hampton National Historic Site
ROUTE 0900: MANSION SERVICE AREA PARKING

Manual Rating

FROM ROUTE 0010ZZ (MAIN ENTRANCE ROAD)

TO ROUTE 0010ZZ (MAIN ENTRANCE ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
7/30/2014	107554	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
11,566	0.20	6	DO NOTHING

Curb Type	Curb & Gutter Type
CONCRETE CURB	CONCRETE CURB AND GUTTER

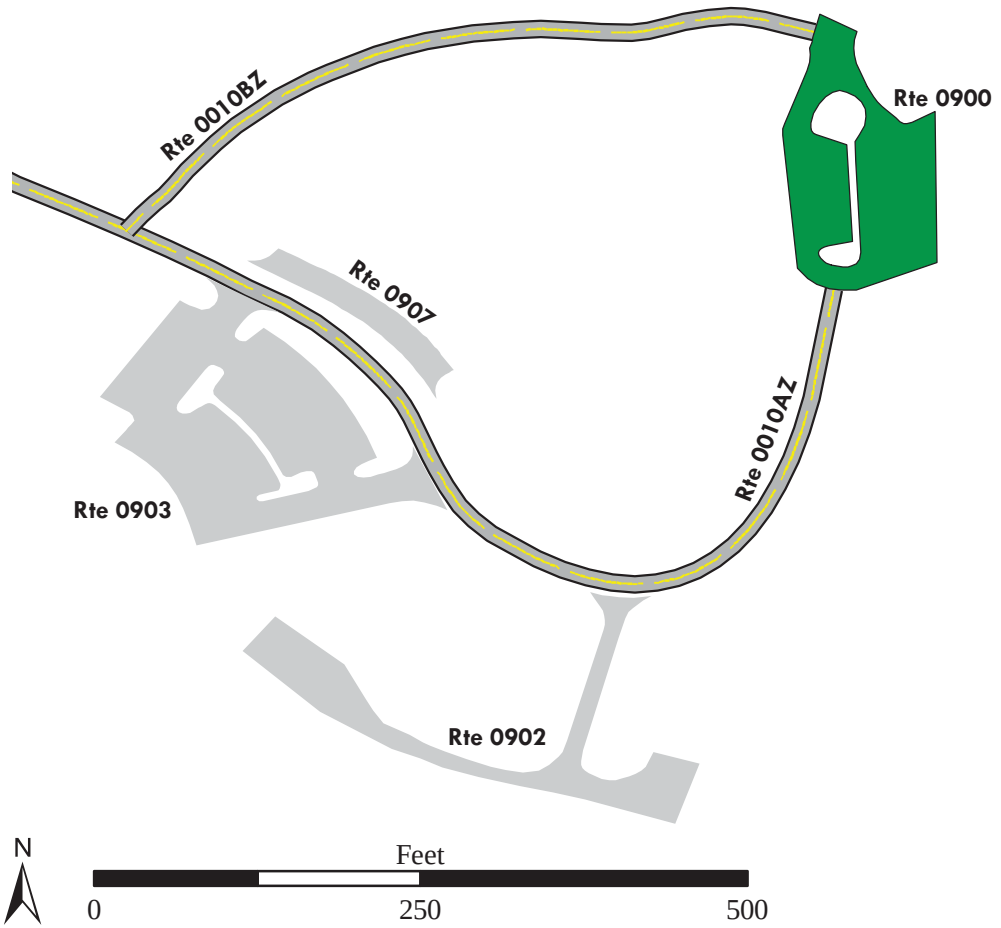
Culverts	Drop Inlets	Gates
1	1	0

Pavement Recommendation	Condition Rating / PCR
PREVENTIVE MAINTENANCE	GOOD / 90

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas



Hampton National Historic Site
ROUTE 0902: GARDEN / MAINTENANCE AREA

Manual Rating

FROM ROUTE 0010ZZ (MAIN ENTRANCE ROAD)

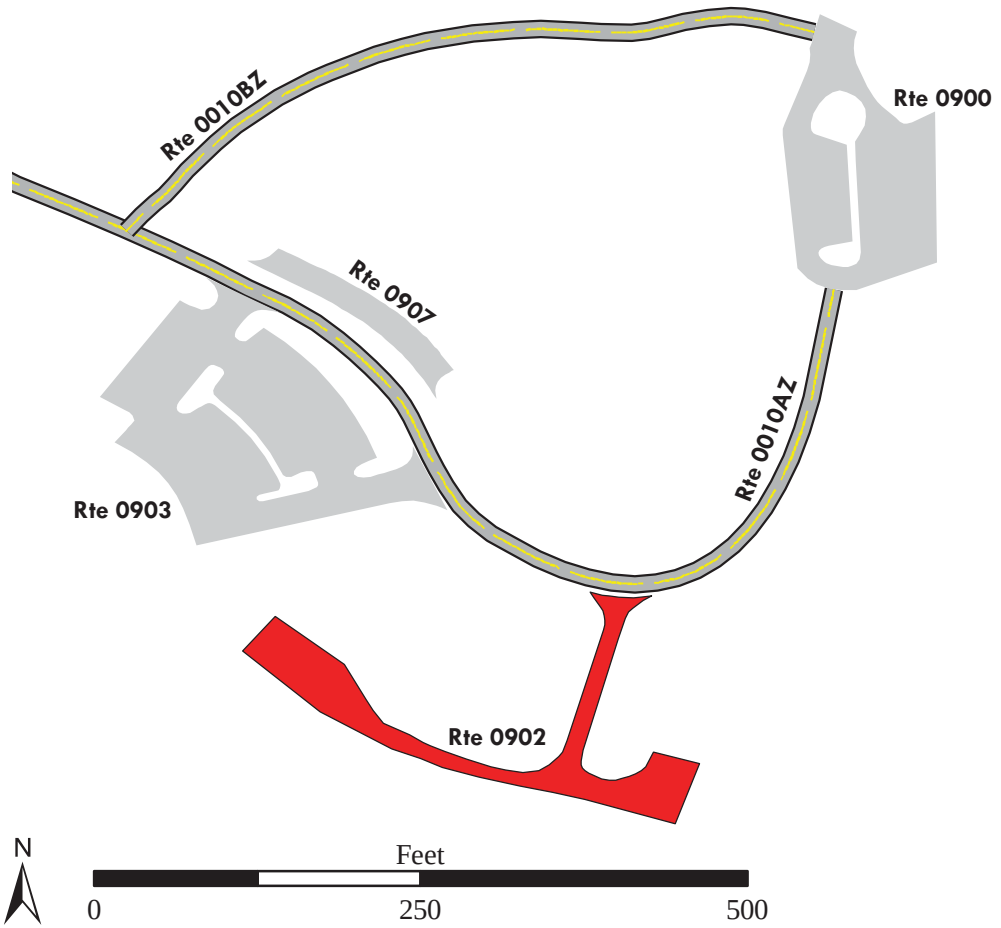
TO MAINTENANCE AREA

Inspection Date	FMSS Number	User Access	Surface Type
7/30/2014	104709	NONPUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
8,528	0.15	NOT APPLICABLE	NOT APPLICABLE
Curb Type		**Curb & Gutter Type**	
NO CURB		NO CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
1	2	0	
Pavement Recommendation		**Condition Rating / PCR**	
HEAVY 3R TREATMENTS		POOR / 45	

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas



Hampton National Historic Site
ROUTE 0903: LOWER VISITOR PARKING LOT

Manual Rating

FROM ROUTE 0010ZZ (MAIN ENTRANCE ROAD)

TO ROUTE 0010ZZ (MAIN ENTRANCE ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
7/30/2014	94406	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
19,102	0.33	NOT APPLICABLE	DO NOTHING

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

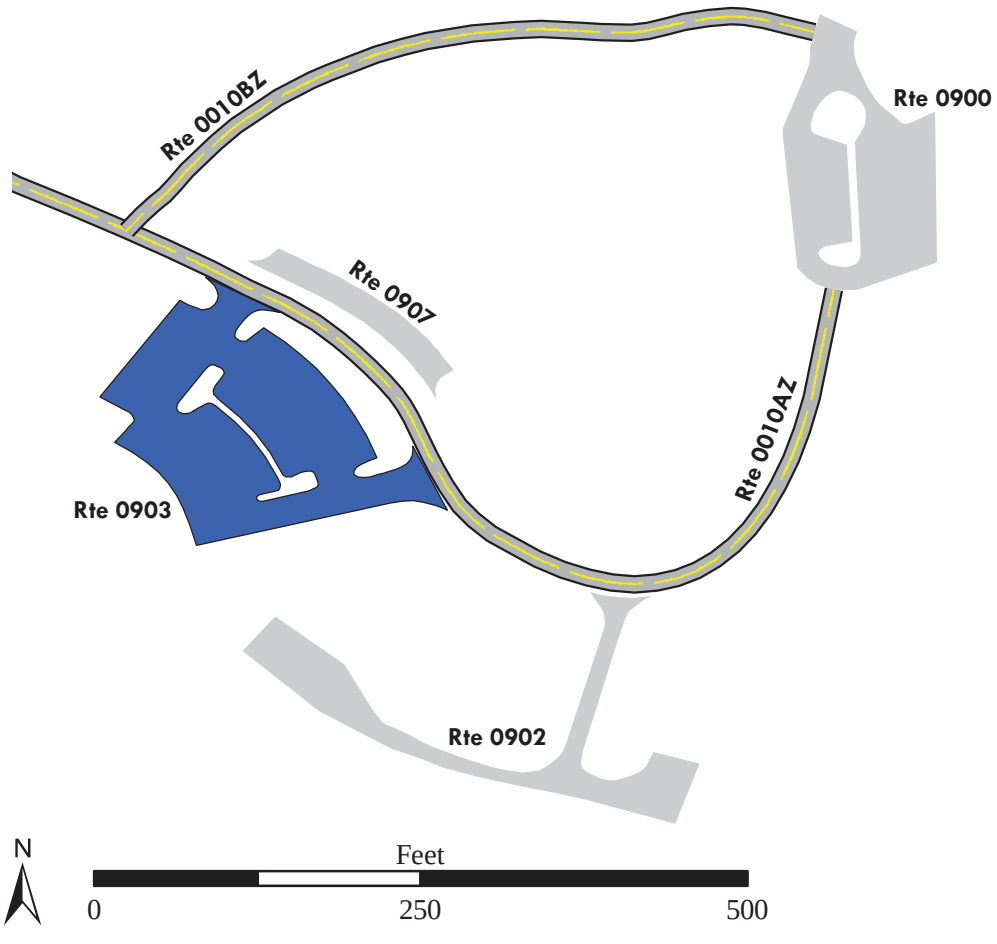
Culverts	Drop Inlets	Gates
1	2	0

Pavement Recommendation	Condition Rating / PCR
DO NOTHING	EXCELLENT / 97

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas



Hampton National Historic Site
ROUTE 0907: TOUR BUS PARKING

Manual Rating

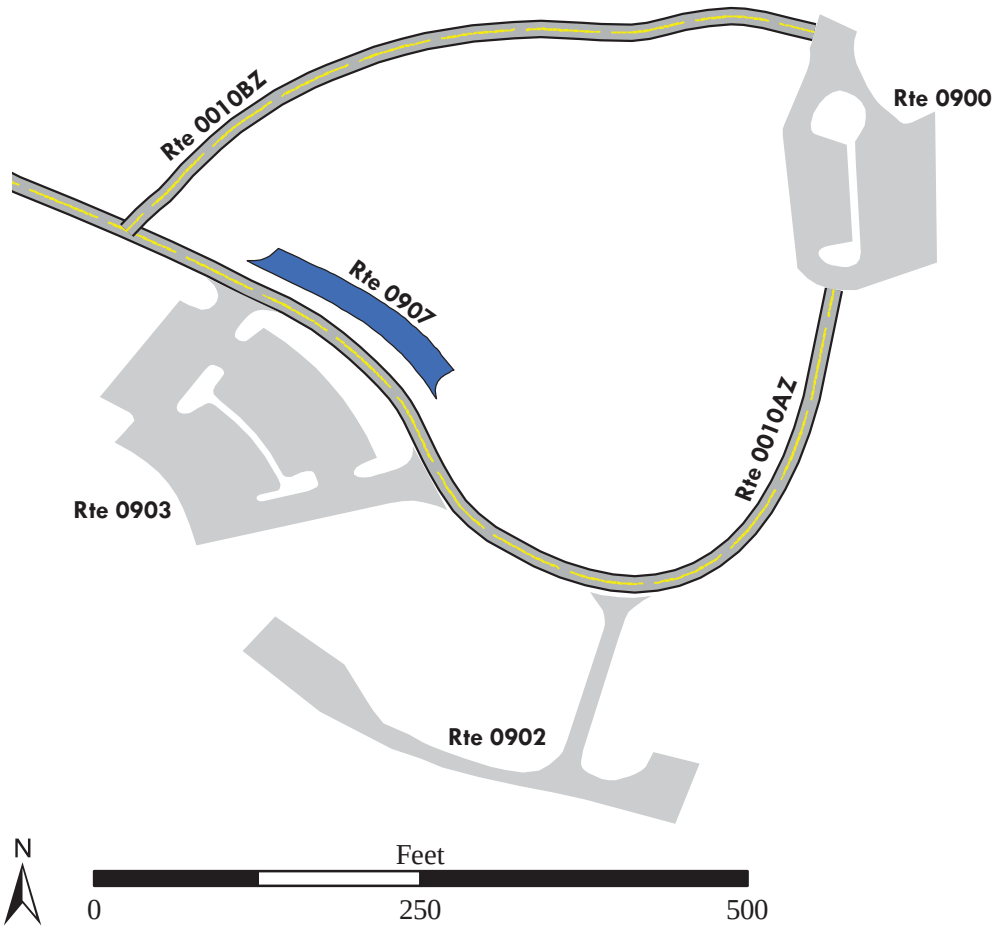
ADJACENT TO ROUTE 0010ZZ (MAIN ENTRANCE ROAD)

Inspection Date	FMSS Number	User Access	Surface Type
7/30/2014	115871	PUBLIC	ASPHALT
Area (Sq. Ft.)	**Lane Miles (11' Widths)**	**Curb Reveal (Inches)**	**Curb Recommendation**
2,680	0.05	NOT APPLICABLE	DO NOTHING
Curb Type		**Curb & Gutter Type**	
NO CURB		CONCRETE CURB AND GUTTER	
Culverts	**Drop Inlets**	**Gates**	
0	0	0	
Pavement Recommendation		**Condition Rating / PCR**	
DO NOTHING		EXCELLENT / 97	

Route Condition Legend – Pavement Condition Rating (PCR)

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

See Appendix for definitions and formulas



Section 8
Route Maintenance Features Summaries

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

HAMP: PARKWIDE MAINTENANCE FEATURES SUMMARY

Includes PKG Routes collected in Cycle 5

Note: ALL features were inventoried by RIP along paved roads. ONLY culverts, drop inlets, and gates were collected in Parking areas. The features totals are reflected below.

FEATURE	LINEAR FEET	COUNT
BRIDGE	--	0
CATTLE GUARD	--	0
CULVERT	--	3
CURB	164	--
DROP INLET	--	8
GATE	--	2
GUARD/GUIDE RAIL	0	--
CABLE	0	--
NON-CABLE	0	--
GUARD/GUIDE WALL	0	--
BOLLARD	0	--
TEMPORARY BARRIER	0	--
NON TEMP/BOLLARD	0	--
INTERSECTION	--	17
LOW WATER CROSSING	--	0
LOW WATER CROSSING	0	--
MILE MARKER	--	0
OVERPASS	--	0
PARK BOUNDARY	--	1
PAVED DITCH	0	--
PULLOUT	--	2
PULLOUT	153	--
RAILROAD CROSSING	--	0
RETAINING WALL	--	0
RETAINING WALL	0	--
SIGN	--	11
STATE BOUNDARY	--	0
TRAFFIC LIGHT	--	0
TUNNEL	--	0
TUNNEL	0	--

Date Collected: 07/2014

HAMP: ROUTE MAINTENANCE FEATURES SUMMARY

NOTE: Features are collected only along paved roads.

FEATURE	ROUTE 0010ZZ MAIN ENTRANCE ROAD	ROUTE 0400 FARM ROAD	UNIT
BRIDGE	0	0	EACH
CATTLE GUARD	0	0	EACH
CULVERT	0	0	EACH
CURB	164	0	LINEAR FEET
DROP INLET	3	0	EACH
GATE	1	1	EACH
GUARD/GUIDE RAIL	0	0	LINEAR FEET
CABLE	0	0	LINEAR FEET
NON-CABLE	0	0	LINEAR FEET
GUARD/GUIDE WALL	0	0	LINEAR FEET
BOLLARD	0	0	LINEAR FEET
TEMPORARY BARRIER	0	0	LINEAR FEET
NON TEMP/BOLLARD	0	0	LINEAR FEET
INTERSECTION	11	6	EACH
LOW WATER CROSSING	0	0	EACH
LOW WATER CROSSING	0	0	LINEAR FEET
MILE MARKER	0	0	EACH
OVERPASS	0	0	EACH
PARK BOUNDARY	0	1	EACH
PAVED DITCH	0	0	LINEAR FEET
PULLOUT	2	0	EACH
PULLOUT	153	0	LINEAR FEET
RAILROAD CROSSING	0	0	EACH
RETAINING WALL	0	0	EACH
RETAINING WALL	0	0	LINEAR FEET
SIGN	6	5	EACH
STATE BOUNDARY	0	0	EACH
TRAFFIC LIGHT	0	0	EACH
TUNNEL	0	0	EACH
TUNNEL	0	0	LINEAR FEET

Date Collected: 07/2014

HAMP: STRUCTURE LIST

No data available for this section.

Section 9
Route Maintenance Features Road Logs

Hampton National Historic Site

Federal Lands Highway
Road Inventory Program

HAMP: ROUTE MAINTENANCE FEATURES ROAD LOG
ROUTE 0010AZ: MAIN ENTRANCE ROAD A

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM HAMPTON LANE (NON NPS)
0.000	0.000	INTERSECTION	LEFT	HAMPTON LANE (NON NPS)
0.000	0.000	INTERSECTION	RIGHT	HAMPTON LANE (NON NPS)
0.005	0.005	SIGN	LEFT	REGULATORY, STOP
0.006	0.006	SIGN	RIGHT	GUIDE, GROUNDS OPEN; VEHICLES: 8:30AM - 5:00PM; PEDESTRIANS: SUNRISE - SUNSET
0.011	0.011	GATE	N/A	N/A
0.032	0.048	PULLOUT	LEFT	PAVED PULLOUT
0.046	0.046	SIGN	LEFT	GUIDE, HAMPTON NATIONAL HISTORIC SITE
0.108	0.108	SIGN	LEFT	REGULATORY, DO NOT ENTER
0.110	0.110	INTERSECTION	LEFT	ROUTE 0010BZ (MAIN ENTRANCE ROAD B)
0.112	0.112	SIGN	LEFT	REGULATORY, DO NOT ENTER
0.127	0.127	INTERSECTION	RIGHT	ROUTE 0903 (LOWER VISITOR PARKING LOT)
0.139	0.139	INTERSECTION	LEFT	ROUTE 0907 (TOUR BUS PARKING)
0.141	0.154	PULLOUT	RIGHT	PAVED PULLOUT
0.161	0.161	INTERSECTION	RIGHT	ROUTE 0903 (LOWER VISITOR PARKING LOT)
0.190	0.190	INTERSECTION	RIGHT	ROUTE 0902 (GARDEN / MAINTENANCE AREA)
0.211	0.242	CURB	LEFT	CONCRETE CURB
0.242	0.242	INTERSECTION	N/A	ROUTE 0900 (MANSION SERVICE AREA PARKING)
0.242	0.242	ROUTE END	N/A	TO ROUTE 0900 (MANSION SERVICE AREA PARKING)

Date Collected: 07/2014

HAMP: ROUTE MAINTENANCE FEATURES ROAD LOG
ROUTE 0010BZ: MAIN ENTRANCE ROAD B

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM ROUTE 0900 (MANSION SERVICE AREA PARKING)
0.000	0.000	INTERSECTION	N/A	ROUTE 0900 (MANSION SERVICE AREA PARKING)
0.051	0.051	DROP INLET	LEFT	N/A
0.075	0.075	DROP INLET	LEFT	N/A
0.084	0.084	DROP INLET	LEFT	N/A
0.087	0.087	SIGN	RIGHT	REGULATORY, STOP
0.089	0.089	INTERSECTION	RIGHT	ROUTE 0010AZ (MAIN ENTRANCE ROAD A)
0.089	0.089	INTERSECTION	LEFT	ROUTE 0010AZ (MAIN ENTRANCE ROAD A)
0.089	0.089	ROUTE END	N/A	TO ROUTE 0010AZ (MAIN ENTRANCE ROAD A)

HAMP: ROUTE MAINTENANCE FEATURES ROAD LOG
ROUTE 0400: FARM ROAD

FROM MILEPOST	TO MILEPOST	FEATURE	SIDE	COMMENT
0.000	0.000	ROUTE BEGIN	N/A	FROM HAMPTON LANE (NON NPS)
0.000	0.000	INTERSECTION	LEFT	HAMPTON LANE (NON NPS)
0.000	0.000	INTERSECTION	RIGHT	HAMPTON LANE (NON NPS)
0.000	0.138	INTERSECTION	N/A	ROUTE 0400 (FARM ROAD) UNPAVED SECTION; NO FEATURES COLLECTED
0.141	0.141	SIGN	RIGHT	GUIDE, RESERVED PARKING FOR PEOPLE WITH DISABILITIES
0.141	0.141	SIGN	RIGHT	GUIDE, PARKING AREA
0.168	0.168	INTERSECTION	LEFT	ROUTE 0905 (FARMHOUSE PARKING)
0.177	0.177	SIGN	LEFT	GUIDE, GROUNDS OPEN; VEHICLES: 8:30AM - 5:00PM; PEDESTRIANS: SUNRISE - SUNSET
0.180	0.180	PARK BOUNDARY	N/A	N/A
0.180	0.180	SIGN	LEFT	GUIDE, PARK BOUNDARY
0.180	0.180	GATE	N/A	N/A
0.180	0.180	SIGN	N/A	REGULATORY, NO PARKING ANY TIME (ON GATE)
0.223	0.223	INTERSECTION	LEFT	ST. FRANCIS ROAD (NON NPS)
0.223	0.223	INTERSECTION	RIGHT	ST. FRANCIS ROAD (NON NPS)
0.223	0.223	ROUTE END	N/A	TO ST. FRANCIS ROAD (NON NPS)

Date Collected: 07/2014

Section 10
Appendix

Hampton National Historic Site

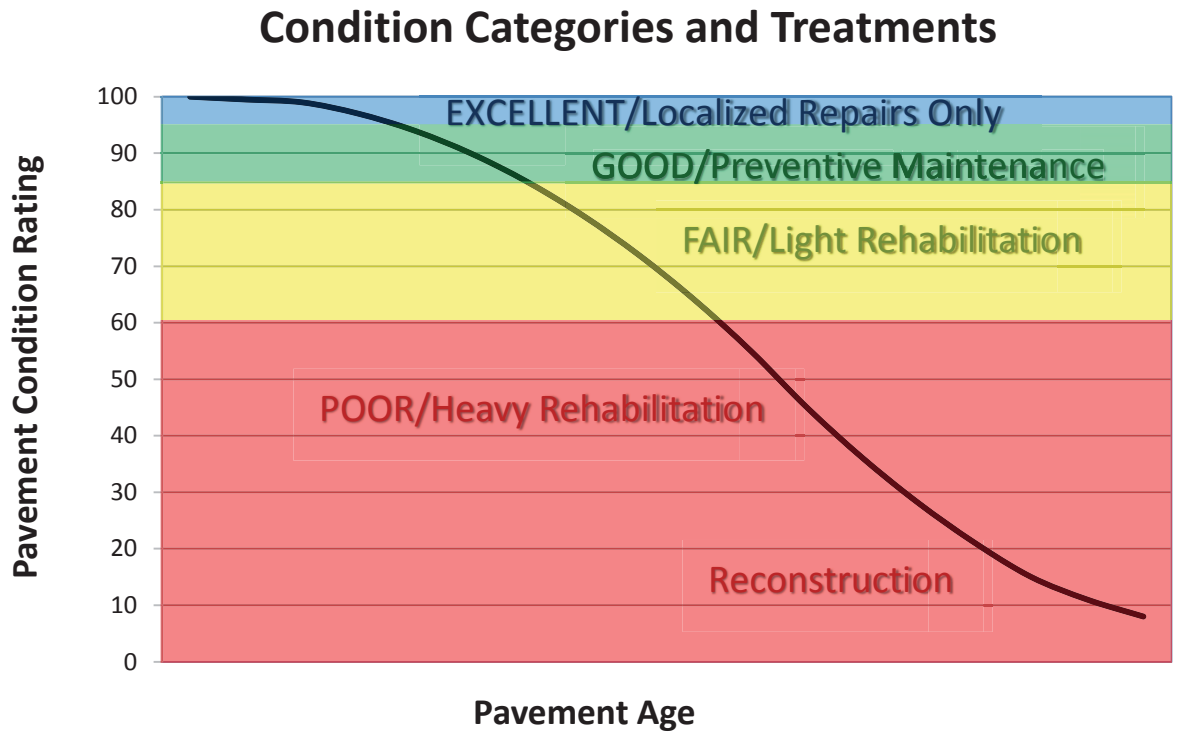
Federal Lands Highway
Road Inventory Program

Explanation of the Condition Descriptions

The Pavement Condition Rating (PCR) can be used to indicate the place in the Pavement Life Cycle and the types of treatments that should be considered now and into the future.

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

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



Description of Manual Rating Methods

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

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

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

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

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

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

Visual Inspection Method for Manually Rating Secondary Roads

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

Rating Section Lengths

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

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

Rating Criteria

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

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

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

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

Distress Measurement Method for Manually Rating Primary Roads

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

Rating Section Lengths

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

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

Manual Distress Measurements

Alligator Cracking

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

Longitudinal Cracking

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

Transverse Cracking

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

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

Patching and Potholes

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

Rutting

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

Roughness

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

Index Formulas for Distress Measurement Method:

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

Alligator Crack Index for Manual Rating:

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

Where:

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

Longitudinal Crack Index for Manual Rating:

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

Where:

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

Transverse Crack Index for Manual Rating:

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

Where:

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

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

Patching Index for Manual Rating:

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

Where:

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

Rutting Index for Manual Rating:

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

Where:

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

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

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

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

Rating Criteria:

Asphalt Parking Distress Types

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

Concrete Parking Distress Types

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

Curb Inspection and Treatments

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

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

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

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

Glossary of Terms and Abbreviations

TERM OR ABBREVIATION	DESCRIPTION OR DEFINITION
AC	Alligator Cracking
CRS	Condition Rating Sheets (Section 5)
Curb Recommendation	Curb remediation based on overall percentage of curb distress
Curb Reveal	Height of curb exposed from gutter flow line to top of curb
DCV	Data Collection Vehicle
Excellent	Excellent rating with an index value of 95 to 100
Fair	Fair rating with an index value from 61 to 84
FUNCT_CLASS	Functional Classification (see Route ID, Section 2)
Good	Good rating with an index value from 85 to 94
IRI	International Roughness Index
HPMA	Highway Pavement Management Application
Lane Width	Width from road centerline to fogline, or from centerline to edge- of-pavement when no fogline exists
LC	Longitudinal Cracking
MRR	Manually Rated Route
MRL	Manually Rated Line
MRP	Manually Rated Polygon
N/A	Not Applicable
NC	Not Collected
PATCH	Patching and Potholes
Paved Width	Width from edge-of-pavement to edge-of-pavement
PCR	Pavement Condition Rating
PKG	Parking Area
Poor	Poor rating with an index value of 0 to 60
RCI	Roughness Condition Index
SC	Structural Cracking
SCR	Surface Condition Rating
TC	Transverse Cracking

GPS on Manually Rated Roads (MRR)

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

Geodatabase – Background and Metadata

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