Federal Lands Highway

Road Inventory Program

Road Inventory and Condition Assessment

North Cascades National Park

NOCA - 9470

Cycle 5 Report

Prepared By: Federal Highway Administration
Road Inventory Program (RIP)
Data Collected: 09/2010
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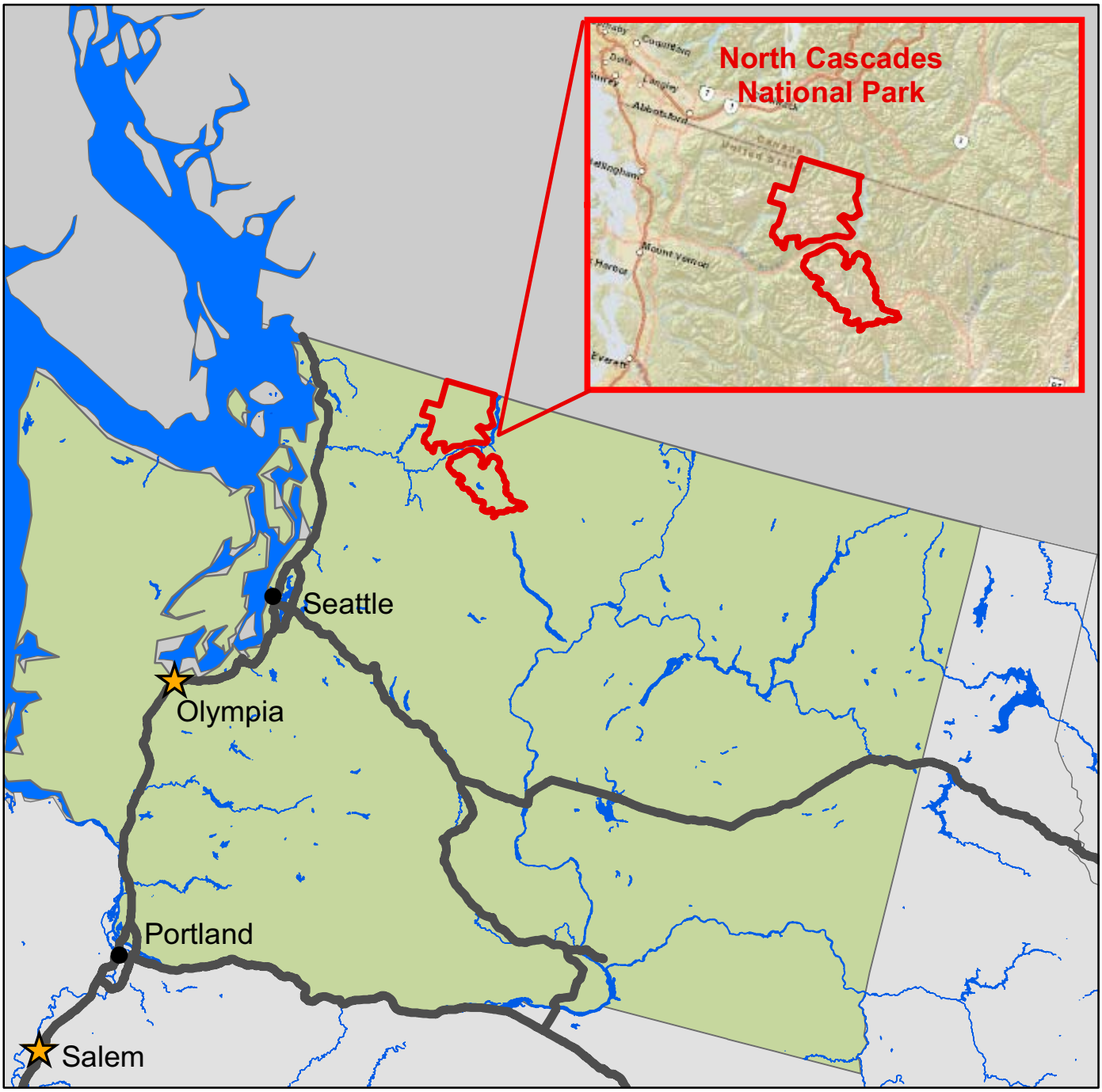
North Cascades National Park
in
Washington



DCV = Data Collection Vehicle

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INTRODUCTION

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

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

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

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

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

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

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

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

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

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

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

Respectfully,

FHWA RIP Team

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Section 2
Park Route Inventory

North Cascades National Park

Federal Lands Highway
Road Inventory Program

Cycle 5 NPS/RIP Route ID Report

Shading Color Key: White = Paved Routes, DCV Driven | Yellow = Unpaved Routes, DCV not Driven | Blue = All Paved Parking Areas | Green = All Unpaved Parking Areas
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*Unpaved route data was obtained from NPS and was not inventoried by the Road Inventory Program (RIP).

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*** Only Functional Class 1, 2, & 7 routes, and previously uncollected routes were collected in Cycle 5

NOCA

NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0010A	**5**	**18118**		**STEHEKIN VALLEY ROAD (PAVED SECTION)**	**FROM ROUTE 0918A (STEHEKIN BOAT LANDING PARKING A) AND 0918B (STEHEKIN BOAT LANDING PARKING B)**	**TO ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))**	**STEHEKIN**	**4.31**	**0.00**	**4.31**	**1**	**368,232**	**AS**	**6**
0010B	NC	18121		STEHEKIN VALLEY ROAD (UNPAVED SECTION)	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0965 (CARWASH FALLS (END OF STEHEKIN VALLEY ROAD) PARKING)	STEHEKIN	0.00	17.19	17.19	1	0	GR	
0100A	**5**	**60333**		**COMPANY CREEK ROAD (PAVED SECTION)**	**FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 4.3**	**TO ROUTE 0100B (COMPANY CREEK ROAD (UNPAVED SECTION))**	**STEHEKIN**	**0.06**	**0.00**	**0.06**	**2**	**5,296**	**AS**	**6**
0100B	NC	18010		COMPANY CREEK ROAD (UNPAVED SECTION)	FROM ROUTE 0100A (COMPANY CREEK ROAD (PAVED SECTION))	TO END AT PRIVATE PROPERTY (DRIVEWAY)	STEHEKIN	0.00	2.47	2.47	2	0	GR	
0101	**5**	**17490**		**CASCADE RIVER ROAD**	**FROM WEST PARK BOUNDARY**	**TO CASCADE PASS TRAILHEAD PARKING**	**SKAGIT**	**1.21**	**3.94**	**5.15**	**1**	**87,874**	**AS**	**4**
0102	NC	17625		HOZOMEEN ROAD	FROM US/CANADA BORDER	TO END	SKAGIT	0.00	2.28	2.28	2	0	GR	
0103	NC	17895		BUCKNER ORCHARD ACCESS ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END	STEHEKIN	0.00	0.50	0.50	2	0	GR	
0104	NC	18139		RAINBOW FALLS ACCESS ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END OF LOOP	STEHEKIN	0.00	0.15	0.15	2	0	GR	
0105	**5**	**46862**		**ENVIRONMENTAL LEARNING CENTER ACCESS ROAD**	**FROM ROUTE 5001 (DIABLO DAM ACCESS ROAD)**	**TO END OF PAVEMENT AT SOUR DOUGH CREEK**	**SKAGIT**	**0.19**	**0.00**	**0.19**	**2**	**0**	**AS**	**2**
0106	NC	105662		HOZOMEEN EAST LANDING BOAT LAUNCH SPUR	FROM EAST LANDING FUEL AREA	TO EAST LANDING BOAT LAUNCH	SKAGIT	0.00	0.45	0.45	2	0	GR	
0107	NC	105663		HOZOMEEN GOVERNMENT DOCK ROAD	FROM ROUTE 0102 (HOZOMEEN ROAD)	TO GOVERNMENT DOCK BOAT LAUNCH AND SHELTER	SKAGIT	0.00	0.33	0.33	2	0	GR	
0108	NC	105644		OLSON CREEK ROAD	FROM RANGER STATION ROAD	TO NPS PROPERTY LINE	SKAGIT	0.00	0.26	0.26	2	0	GR	
0109	NC	105656		GORGE LAKE CAMPGROUND ACCESS ROAD	FROM FOGLINE ON DIABLO ROAD	TO END OF ROAD AT ROMTEC	SKAGIT	0.00	0.09	0.09	2	0	GR	

Cycle 5 NPS/RIP Route ID Report

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NOCA

NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0110	NC	105746		HIGH BRIDGE GARAGE ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT GARAGE	STEHEKIN	0.00	0.03	0.03	2	0	GR	
0200	**5**	**28520**		**COLONIAL CREEK CAMPGROUND ACCESS SOUTH**	**FROM INTERSECTION OF ROUTE 5000 (STATE HIGHWAY 20) AND ROUTE 0209A (COLONIAL CREEK CAMPGROUND NORTH LOOP A)**	**TO ROUTE 0200A (COLONIAL CREEK CAMPGROUND LOOP A)**	**SKAGIT**	**0.20**	**0.00**	**0.20**	**2**	**0**	**AS**	**2**
0200A	4	60409		COLONIAL CREEK CAMPGROUND LOOP A	FROM ROUTE 0914 (COLONIAL CREEK CAMPGROUND ACCESS PARKING)	TO ROUTE 0914 (COLONIAL CREEK CAMPGROUND ACCESS PARKING)	SKAGIT	0.53	0.00	0.53	3	0	AS	2
0200B	4	60410		COLONIAL CREEK CAMPGROUND LOOP B	FROM ROUTE 0200A (COLONIAL CREEK CAMPGROUND LOOP A) AT MP 0.28	TO ROUTE 0200A (COLONIAL CREEK CAMPGROUND LOOP A)	SKAGIT	0.24	0.00	0.24	3	0	AS	2
0200C	4	107959		COLONIAL CREEK CAMPGROUND LOOP C	FROM ROUTE 0200A (COLONIAL CREEK CAMPGROUND LOOP A) AT MP 0.20	TO ROUTE 0200A (COLONIAL CREEK CAMPGROUND LOOP A)	SKAGIT	0.08	0.00	0.08	3	0	AS	2
0200D	4	107960		COLONIAL CREEK CAMPGROUND LOOP D	FROM ROUTE 0200C (COLONIAL CREEK CAMPGROUND LOOP C) AT MP 0.02	TO ROUTE 0200C (COLONIAL CREEK CAMPGROUND LOOP C)	SKAGIT	0.03	0.00	0.03	3	0	AS	2
0201	**5**	**44086**		**GOODELL CREEK CAMPGROUND ACCESS ROAD**	**FROM ROUTE 5000 (STATE HIGHWAY 20)**	**TO ROUTE 0201A (GOODELL CREEK CAMPGROUND LOOP A) ON RIGHT**	**SKAGIT**	**0.20**	**0.00**	**0.20**	**2**	**0**	**AS**	**1**
0201A	4	60417		GOODELL CREEK CAMPGROUND LOOP A	FROM ROUTE 0201 (GOODELL CREEK CAMPGROUND ACCESS ROAD)	TO END OF LOOP	SKAGIT	0.27	0.00	0.27	3	0	AS	1
0201B	4	60416		GOODELL CREEK CAMPGROUND LOOP B	FROM ROUTE 0201A (GOODELL CREEK CAMPGROUND LOOP A)	TO ROUTE 0205 (RAFT LAUNCH LOOP)	SKAGIT	0.16	0.00	0.16	3	0	AS	1
0202	**5**	**17457**		**NEWHALEM CREEK CAMPGROUND ACCESS ROAD**	**FROM ROUTE 5000 (STATE HIGHWAY 20)**	**TO ROUTE BEGINNING OF ROUTE 0208 (NEWHALEM CREEK CAMP TENDER STATION)**	**SKAGIT**	**0.10**	**0.00**	**0.10**	**2**	**0**	**AS**	**1**

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NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0203	NC	17482		THORNTON LAKES ROAD	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO TRAILHEAD	SKAGIT	0.00	4.88	4.88	4	0	GR	
0204	**5**	**46858**		**NORTH CASCADES VISITOR CENTER ACCESS ROAD**	**FROM ROUTE 0208 (NEWHALEM CREEK CAMP TENDER STATION) AT MP 0.09**	**TO END OF LOOP**	**SKAGIT**	**0.72**	**0.00**	**0.72**	**2**	**0**	**AS**	**1**
0205	4	60521		RAFT LAUNCH LOOP	FROM ROUTE 0201 (GOODELL CREEK CAMPGROUND ACCESS ROAD) AT MP 0.04 ON RIGHT	TO ROUTE 0201 (GOODELL CREEK CAMPGROUND ACCESS ROAD)	SKAGIT	0.04	0.00	0.04	3	0	AS	1
0206	4	60564		NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS A AND B	FROM ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.02	TO ROUTE 0210A (NEWHALEM CREEK CAMPGROUND LOOP A)	SKAGIT	0.06	0.00	0.06	3	0	AS	1
0207	4	60565		NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS C AND D	FROM ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.02	TO END OF PAVEMENT	SKAGIT	0.12	0.00	0.12	3	0	AS	1
0208	4	60570		NEWHALEM CREEK CAMP TENDER STATION	FROM END OF ROUTE 0202 (NEWHALEM CREEK CAMPGROUND ACCESS ROAD) AT MP 0.10	TO END OF LOOP	SKAGIT	0.17	0.00	0.17	3	0	AS	1
0209A	4	60411		COLONIAL CREEK CAMPGROUND NORTH LOOP A	FROM INTERSECTION OF ROUTE 5000 (STATE HIGHWAY 20) AND ROUTE 0200 (COLONIAL CREEK CAMPGROUND ACCESS SOUTH)	TO ROUTE 5000 (STATE HIGHWAY 20)	SKAGIT	0.44	0.00	0.44	3	0	AS	2
0209B	4	60412		COLONIAL CREEK CAMPGROUND NORTH LOOP B	FROM ROUTE 0209A (COLONIAL CREEK CAMPGROUND NORTH LOOP) AT MP 0.14	TO ROUTE 0209A (COLONIAL CREEK CAMPGROUND NORTH LOOP A)	SKAGIT	0.04	0.00	0.04	3	0	AS	2
0210A	4	60566		NEWHALEM CREEK CAMPGROUND LOOP A	FROM INTERSECTION OF ROUTE 0206 (NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS A AND B) AND ROUTE 0210B (NEWHALEM CREEK CAMPGROUND LOOP B) AT MP 0.06	TO END OF LOOP	SKAGIT	0.31	0.00	0.31	3	0	AS	1

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0210B	4	60567		NEWHALEM CREEK CAMPGROUND LOOP B	FROM INTERSECTION OF ROUTE 0206 (NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS A AND B) AND 0210A (NEWHALEM CREEK CAMPGROUND LOOP A) AT MP 0.06	TO END OF LOOP	SKAGIT	0.24	0.00	0.24	3	0	AS	1
0210C	4	60568		NEWHALEM CREEK CAMPGROUND LOOP C	FROM INTERSECTION OF ROUTE 0207 (NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS C AND D) AND BEGINNING OF ROUTE 0210D (NEWHALEM CREEK GROUP CAMPGROUND LOOP D) AT MP 0.04	TO INTERSECTION OF ROUTE 0207 (NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS C AND D) AND END OF ROUTE 0210D (NEWHALEM CREEK GROUP CAMPGROUND LOOP C)	SKAGIT	0.42	0.00	0.42	3	0	AS	1
0210D	4	60569		NEWHALEM CREEK GROUP CAMPGROUND LOOP D	FROM INTERSECTION OF ROUTE 0207 (NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS C AND D) AND BEGINNING OF ROUTE 0210C (NEWHALEM CREEK CAMPGROUND LOOP C) AT MP 0.04	TO INTERSECTION OF ROUTE 0207 (NEWHALEM CREEK CAMPGROUND ACCESS TO LOOPS C AND D) AND END OF ROUTE 0210C (NEWHALEM CREEK CAMPGROUND LOOP C)	SKAGIT	0.17	0.00	0.17	3	0	AS	1
0211	NC	46867		UPPER GOODELL CREEK GROUP CAMPGROUND ACCESS ROAD	FROM ROUTE 0407 (NEWHALEM GRAVEL STORAGE ROAD)	TO END	SKAGIT	0.00	0.70	0.70	3	0	GR	
0212	NC	46866		LOWER GOODELL CREEK GROUP CAMPGROUND ACCESS ROAD	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO END	SKAGIT	0.00	0.39	0.39	3	0	GR	
0213	NC	60414		COPPER CREEK ROAD	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO RIVER	SKAGIT	0.00	0.29	0.29	3	0	GR	
0214	NC	60325		HARLEQUIN CAMPGROUND	FROM ROUTE 0100B (COMPANY CREEK ROAD (UNPAVED SECTION))	TO END	STEHEKIN	0.00	0.17	0.17	4	0	OT	
0215	NC	46871		NEWHALEM TRAILHEAD ROAD SOUTH	FROM ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD)	TO TRAILHEAD	SKAGIT	0.00	1.44	1.44	2	0	GR	
0216	NC	46868		NEWHALEM FIRING RANGE ROAD	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO END	SKAGIT	0.00	0.33	0.33	6	0	GR	

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0217	NC	105736		GOLDEN WEST VISITOR CENTER/HOUSE THAT JACK BUILT ROAD	FROM ROUTE 0402 (GOLDEN WEST ACCESS ROAD) AT GOLDEN WEST VISITOR CENTER)	TO END AT HOUSE THAT JACK BUILT	STEHEKIN	0.00	0.03	0.03	3	0	GR	
0218	NC	105737		STEHEKIN LANDING LONG TERM PARKING LOT ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END AT LONG TERM PARKING	STEHEKIN	0.00	0.05	0.05	4	0	GR	
0219	NC	105744		STEHEKIN RAFT PUT-IN ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT RIVER BANK PARKING	STEHEKIN	0.00	0.06	0.06	4	0	GR	
0220	NC	105745		BULLION CAMP ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT CAMPGROUND END	STEHEKIN	0.00	0.07	0.07	4	0	GR	
0221	NC	105747		HIGH BRIDGE CAMP ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT HIGH BRIDGE CAMPGROUND	STEHEKIN	0.00	0.07	0.07	3	0	GR	
0222	NC	105748		TUMWATER CAMP ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT TUMWATER CAMP	STEHEKIN	0.00	0.01	0.01	3	0	GR	
0223	NC	105666		HOZOMEEN CAMPGROUND LOWER LOOP ROAD	FROM ROUTE 0102 (HOZOMEEN ROAD) SOUTH	TO ROUTE 0102 (HOZOMEEN ROAD) NORTH	SKAGIT	0.00	0.22	0.22	3	0	GR	
0224	NC	105667		HOZOMEEN CAMPGROUND UPPER LOOP ROAD	FROM ROUTE 0102 (HOZOMEEN ROAD)	TO END OF LOOP (GAME CABIN)	SKAGIT	0.00	0.22	0.22	3	0	GR	
0225	NC	105729		HOZOMEEN WINNEBAGO FLATS CAMPGROUND LOOP	FROM ROUTE 0102 (HOZOMEEN ROAD) NORTH	TO ROUTE 0102 (HOZOMEEN ROAD) SOUTH	SKAGIT	0.00	0.12	0.12	3	0	GR	
0226	NC	105730		HOZOMEEN BASKETBALL COURT LOOP	FROM ROUTE 0102 (HOZOMEEN ROAD) NORTH	TO ROUTE 0102 (HOZOMEEN ROAD) SOUTH	SKAGIT	0.00	0.07	0.07	4	0	GR	
0227	NC	105645		MARBLEMOUNT POWER LINE ACCESS ROAD	FROM ROUTE 0108 (OLSON CREEK ROAD)	TO POWER LINE ROAD	SKAGIT	0.00	0.16	0.16	4	0	GR	
0228	NC	105652		NEWHALEM REARING PONDS ACCESS ROAD	FROM GATE AT ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	TO REARING PONDS	SKAGIT	0.00	1.16	1.16	6	0	GR	
0229	NC	105655		ELC WATER TREATMENT BUILDING SPUR	FROM MANHOLE ON ROUTE 0430 (ELC/NCI ROADS)	TO WATER TREATMENT BUILDING	SKAGIT	0.00	0.05	0.05	4	0	GR	

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0230	NC	105659		ELC DEER CREEK/DRAINFIELD ROAD	FROM FORK AT ROUTE 0431 (ELC WATER TANK ROAD) AND ROUTE 0430 (ELC/NCI ROADS)	TO END OF DRAINFIELD PERIMETER	SKAGIT	0.00	0.32	0.32	4	0	GR	
0231	NC	105660		ELC BUSTER BROWN ROAD	FROM ROUTE 0230 (ELC DEER CREEK/DRAINFIELD ROAD)	TO BUSTER BROWN FLATS	SKAGIT	0.00	0.81	0.81	6	0	GR	
0232	NC	105732		COLONIAL CREEK CAMPGROUND WATER TANK ROAD	FROM GATE ADJACENT TO ROUTE 5000 (STATE HIGHWAY 20)	TO WATER TANK VALVE BOX	SKAGIT	0.00	0.18	0.18	6	0	GR	
0233	NC	105657		GORGE LAKE NO-CAMPING ROAD	FROM FOGLINE ON DIABLO ROAD	TO END	SKAGIT	0.00	0.04	0.04	3	0	GR	
0400	**5**	**60548**		**STEHEKIN TREATMENT PLANT HILL ROAD**	**FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 0.2**	**TO END AT WASTE WATER TREATMENT PLANT**	**STEHEKIN**	**0.06**	**0.00**	**0.06**	**5**	**3,767**	**AS**	**6**
0401	4	107961		NORTH CASCADES VISITOR CENTER SERVICE ROAD	FROM ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.47	TO END AND ROUTE 0916 (NORTH CASCADES VISITOR CENTER SERVICE PARKING) ON LEFT	SKAGIT	0.07	0.00	0.07	5	0	AS	1
0402	NC	17787		GOLDENWEST ACCESS ROAD	FROM ROUTE 0918A (STEHEKIN BOAT LANDING PARKING A) ROUTE 0918B (STEHEKIN BOAT LANDING PARKING B) AT END OF ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END AT GOLDEN WEST VISITOR CENTER PARKING	STEHEKIN	0.00	0.80	0.80	5	0	GR	
0403	NC	60522		RAINBOW PIT ACCESS ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END OF LOOP	STEHEKIN	0.00	0.08	0.08	6	0	GR	
0404	NC	60343		AIRPORT, BONEYARD AND MAINTENANCE ACCESS LOOP	FROM ROUTE 0405 (COMPANY CREEK GRAVEL PIT ACCESS ROAD)	TO ROUTE 0100B (COMPANY CREEK ROAD (UNPAVED SECTION)	STEHEKIN	0.00	0.20	0.20	5	0	GR	
0405	NC	60347		COMPANY CREEK GRAVEL PIT ACCESS ROAD	FROM ROUTE 0100B (COMPANY CREEK ROAD (UNPAVED SECTION))	TO END	STEHEKIN	0.00	0.50	0.50	5	0	GR	
0406	NC	60348		MAINTENANCE YARD ACCESS ROAD	FROM ROUTE 0100B (CAMPANY CREEK ROAD (UNPAVED SECTION))	TO END OF LOOP	STEHEKIN	0.00	0.17	0.17	5	0	GR	
0407	NC	17439		NEWHALEM GRAVEL STORAGE ROAD	FROM END OF PAVEMENT ON DOT ACCESS ROAD	TO END OF LOOP	SKAGIT	0.00	0.40	0.40	5	0	GR	

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NOCA

NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0408	NC	105733		STEHEKIN WATER RESERVOIR/ANTENNA ROAD	FROM ROUTE 0409 (GOLDEN WEST VISITOR CENTER CABINS ROAD)	TO END	STEHEKIN	0.00	0.12	0.12	6	0	NV	
0409	NC	105734		GOLDEN WEST VISITOR CENTER CABINS ROAD	FROM ROUTE 0402 (GOLDEN WEST ACCESS ROAD)	TO END AT UPPER PUBLIC PARKING	STEHEKIN	0.00	0.09	0.09	5	0	GR	
0410	NC	105735		CORRAL-TO-FIRE-CACH E ROAD	FROM ROUTE 0402 (GOLDEN WEST ACCESS ROAD) AT GOLDEN WEST VISITOR CENTER	TO END AT CORRAL	STEHEKIN	0.00	0.11	0.11	5	0	GR	
0411	NC	105738		STEHEKIN SILVER BAY ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END OF NPS LINE	STEHEKIN	0.00	0.03	0.03	2	0	GR	
0412	NC	105739		STEHEKIN CASTLE ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO END AT LOOP END	STEHEKIN	0.00	0.15	0.15	5	0	GR	
0413	NC	105740		STEHEKIN COMMUNITY HALL ROAD	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.10	0.10	3	0	GR	
0414	NC	105741		BUCKNER POWDER HOUSE ROAD	FROM ROUTE 0103 (BUCKNER ORCHARD ACCESS ROAD)	TO END AT POWDER HOUSE	STEHEKIN	0.00	0.12	0.12	6	0	GR	
0415	NC	105742		TOLBER SPUR ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT RIVERSIDE CHANNEL, OLD BRIDGE SITE	STEHEKIN	0.00	0.13	0.13	4	0	GR	
0416	NC	105743		STEHEKIN SHOOTING RANGE ROAD	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO END AT SHOOTING RANGE PARKING	STEHEKIN	0.00	0.10	0.10	4	0	GR	
0417	NC	105750		STEHEKIN YACC SPUR ROAD	FROM ROUTE 0404 (AIRPORT, BONEYARD AND MAINTENANCE ACCESS LOOP)	TO END AT YACC RESIDENCES	STEHEKIN	0.00	0.04	0.04	4	0	GR	
0418	NC	105751		STEHEKIN BONEYARD SPUR ROAD	FROM ROUTE 0404 (AIRPORT, BONEYARD AND MAINTENANCE ACCESS LOOP)	TO END AT BONEYARD LOOP	STEHEKIN	0.00	0.09	0.09	4	0	GR	
0419	NC	105752		STEHEKIN CARPENTER SHOP ROAD	FROM ROUTE 0100B (COMPANY CREEK ROAD (UNPAVED SECTION))	TO END AT CARPENTER SHOP	STEHEKIN	0.00	0.03	0.03	5	0	GR	
0420	NC	105664		HOZOMEEN STORAGE AREA ROAD	FROM HOZOMEEN GOVERNMENT DOCK ROAD	TO GRAVEL STORAGE	SKAGIT	0.00	0.01	0.01	6	0	GR	

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NOCA

NORTH CASCADES NATIONAL PARK

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0421	NC	105665		HOZOMEEN WATER TANK ROAD	FROM ROUTE 0102 (HOZOMEEN ROAD)	TO WATER TANK	SKAGIT	0.00	0.04	0.04	6	0	GR	
0422	NC	105728		HOZOMEEN HOUSING COMPOUND LOOP	FROM ROUTE 0102 (HOZOMEEN ROAD) NORTH	TO ROUTE 0102 (HOZOMEEN ROAD) SOUTH	SKAGIT	0.00	0.14	0.14	5	0	GR	
0423	NC	105646		MARBLEMOUNT BONEYARD LOOP ROAD	FROM ROUTE 0108 (OLSON CREEK ROAD)	TO ROUTE 0108 (OLSON CREEK ROAD)	SKAGIT	0.00	0.05	0.05	6	0	GR	
0424	NC	105647		MARBLEMOUNT NORTH PASTURE ROAD	FROM ROUTE 0423 (MARBLEMOUNT BONEYARD LOOP ROAD)	TO END	SKAGIT	0.00	0.15	0.15	6	0	GR	
0425	NC	105648		MARBLEMOUNT HELISPOT ROAD	FROM ROUTE 0108 (OLSON CREEK ROAD)	TO HELISPOT	SKAGIT	0.00	0.03	0.03	6	0	GR	
0426	NC	105649		MARBLEMOUNT BARN ROAD	FROM NOCA COMPOUND PAVED ROAD	TO ROUTE 0108 (OLSON CREEK ROAD)	SKAGIT	0.00	0.05	0.05	5	0	GR	
0427	NC	105650		RICHMYER GRAVEL STORAGE ROAD	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO END	SKAGIT	0.00	0.08	0.08	6	0	GR	
0428	NC	105651		NEWHALEM WAREHOUSE LOOP ROAD	FROM END OF PAVEMENT AT WSDOT FACILITY	TO END OF LOOP	SKAGIT	0.00	0.14	0.14	5	0	GR	
0429	NC	105653		NEWHALEM TRAILER COURT ROAD	FROM ROUTE 0407 (NEWHALEM GRAVEL STORAGE ROAD)	TO BEGINNING OF PAVEMENT AT WSDOT FACILITY	SKAGIT	0.00	0.16	0.16	5	0	GR	
0430	NC	105654		ELC/NCI ROADS	FROM MAIN ENTRY GATE AT ELC	TO FORK AT ROUTE 431 (ELC WATER TANK ROAD) AND ROUTE 230 (ELC DEER CREEK/DRAINFIELD ROAD)	SKAGIT	0.00	0.32	0.32	6	0	GR	
0431	NC	105658		ELC WATER TANK ROAD	FROM FORK A ROUTE 0430 (ELC/NCI ROADS) AND ROUTE 0230 (ELC DEER CREEK/DRAINFIELD ROAD)	TO WATER TANK ENCLOSURE	SKAGIT	0.00	0.10	0.10	6	0	GR	
0432	NC	105731		COLONIAL CREEK CAMPGROUND BOATHOUSE ROAD	FROM GATE ADJACENT TO THUNDER KNOB TRAIL PARKING	TO PAVED PAD FOR BOATHOUSE	SKAGIT	0.00	0.04	0.04	6	0	GR	
0433	NC	106843		BURN PILE LOOP ROAD	FROM ROUTE 0404 (AIRPORT, BONEYARD AND MAINTENANCE ACCESS ROAD)	TO END OF LOOP	STEHEKIN	0.00	0.13	0.13	5	0	GR	
0434	NC	28521		STEHEKIN RANGER STATION REAR ACCESS ROAD	FROM ROUTE 0400 (STEHEKIN TREATMENT PLANT HILL ROAD)	TO BEHIND OLD RANGER STATION PARKING	STEHEKIN	0.00	0.10	0.10	6	0	GR	

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NOCA

NORTH CASCADES NATIONAL PARK

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0435A	4	107962		MARBLEMOUNT COUNCIL OAK DRIVE	FROM ROUTE 0108 (OLSON CREEK ROAD) AND ROUTE 0900B (MARBLEMOUNT WILDERNESS OFFICE PARKING)	TO DEAD END AT END OF PAVEMENT	SKAGIT	0.32	0.00	0.32	5	0	AS	1
0435B	4	107963		MARBLEMOUNT COUNCIL OAK SPUR	FROM ROUTE 0435A (MARBLEMOUNT COUNCIL OAK DRIVE) AT MP 0.13	TO ROUTE 0435A (MARBLEMOUNT COUNCIL OAK DRIVE)	SKAGIT	0.03	0.00	0.03	5	0	AS	1
0436	NC	105661		HAPPY LANDING ROAD	FROM ROUTE 0437 (ROSS HAUL ROAD)	TO END AT PIT TOILET	SKAGIT	0.00	0.06	0.06	6	0	GR	
0437	NC	114732		ROSS HAUL ROAD	FROM DIABLO LAKE GOVERNMENT DOCK	TO LANDING ON ROSS LAKE	SKAGIT	0.00	0.90	0.90	6	0	GR	
0900A	4	16690		MARBLEMOUNT ADMINISTRATIVE PUBLIC PARKING	FROM RANGER STATION ROAD	TO RANGER STATION ROAD	SKAGIT	0.00	0.00	0.00		5,867	AS	1
0900B	**5**	**60418**		**MARBLEMOUNT WILDERNESS OFFICE PARKING**	**FROM RANGER STATION ROAD**	**TO ROUTE 0108 (OLSON CREEK ROAD) AND ROUTE 0435A (MARBLEMOUNT COUNCIL OAK DRIVE)**	**SKAGIT**	**0.00**	**0.00**	**0.00**		**6,171**	**AS**	**1**
0900C	4	108073		MARBLEMOUNT ADMINISTRATIVE PRIVATE PARKING	FROM ROUTE 0435A (MARBLEMOUNT COUNCIL OAK DRIVE) AT MP 0.03	TO PARKING	SKAGIT	0.00	0.00	0.00		7,892	AS	1
0900D	4	108074		MARBLEMOUNT SHOP PARKING	FROM ROUTE 0435A (MARBLEMOUNT COUNCIL OAK DRIVE) AT MP 0.05	TO PARKING	SKAGIT	0.00	0.00	0.00		13,510	AS	1
0901	4	60552		WEST ENTRANCE SIGN PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20) AT NPS ENTRANCE SIGN	TO ROUTE 5000 (STATE HIGHWAY 20)	SKAGIT	0.00	0.00	0.00		5,708	AS	1
0902A	4	114649		GOODELL CREEK RAFT LAUNCH PARKING A	ADJACENT TO ROUTE 0201 (GOODELL CREEK CAMPGROUND ACCESS ROAD) AT MP 0.1		SKAGIT	0.00	0.00	0.00		2,327	AS	1
0902B	4	108075		GOODELL CREEK RAFT LAUNCH PARKING B	ADJACENT TO ROUTE 0205 (RAFT LAUNCH LOOP) AT MP 0.1		SKAGIT	0.00	0.00	0.00		1,758	AS	1
0903A	4	17427		NORTH CASCADES VISITOR CENTER PARKING A	ADJACENT TO ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.6		SKAGIT	0.00	0.00	0.00		4,570	AS	1

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NORTH CASCADES NATIONAL PARK

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0903B	4	60510		NORTH CASCADES VISITOR CENTER PARKING B	ADJACENT TO ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.6		SKAGIT	0.00	0.00	0.00		4,668	AS	1
0903C	4	60512		NORTH CASCADES VISITOR CENTER PARKING C	ADJACENT TO ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.6		SKAGIT	0.00	0.00	0.00		2,715	AS	1
0903D	4	60514		NORTH CASCADES VISITOR CENTER PARKING D	FROM ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD) AT MP 0.6	TO ROUTE 0204 (NORTH CASCADES VISITOR CENTER ACCESS ROAD)	SKAGIT	0.00	0.00	0.00		8,178	AS	1
0904	4	43978		GORGE CREEK OVERLOOK TRAILHEAD PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 123.2 ON RIGHT	TO ROUTE 5000 (STATE HIGHWAY 20)	SKAGIT	0.00	0.00	0.00		28,842	AS	2
0905	4	60402		GORGE CREEK PHOTO-OP PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 123.35 ON RIGHT	TO ROUTE 5000 (STATE HIGHWAY 20)	SKAGIT	0.00	0.00	0.00		12,545	AS	2
0906	4	46856		DIABLO LAKE OVERLOOK	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 131.5 ON LEFT	TO PARKING	SKAGIT	0.00	0.00	0.00		56,390	AS	2
0907	4	17541		INTERPRETIVE PULLOUT DIABLO LAKE	ADJACENT TO ROUTE 5000 (STATE HIGHWAY 20) AT MP 133		SKAGIT	0.00	0.00	0.00		17,165	AS	2
0908	4	17561		ROSS DAM TRAILHEAD PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 134.25 ON LEFT	TO PARKING	SKAGIT	0.00	0.00	0.00		11,766	AS	3
0909	4	38579		HAPPY CREEK NATURE TRAIL PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 134 ON RIGHT	TO PARKING	SKAGIT	0.00	0.00	0.00		9,726	AS	3
0910A	4	17563		ROSS LAKE OVERLOOK A	ADJACENT TO ROUTE 5000 (STATE HIGHWAY 20) AT MP 134 ON LEFT		SKAGIT	0.00	0.00	0.00		9,586	AS	3
0910B	4	60523		ROSS LAKE OVERLOOK B	ADJACENT TO ROUTE 5000 (STATE HIGHWAY 20) AT MP 134 ON LEFT		SKAGIT	0.00	0.00	0.00		4,684	AS	3
0911	NC	60358		EAST ENTRANCE SIGN PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO PARKING	SKAGIT	0.00	0.00	0.00		44,585	OT	
0912	4	60419		NEWHALEM CREEK RANGER PARKING	ADJACENT TO ROUTE 0208 (NEWHALEM CREEK CAMP TENDER STATION) AT MP 0.1		SKAGIT	0.00	0.00	0.00		901	AS	1

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NORTH CASCADES NATIONAL PARK

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0913	4	60562		NEWHALEM CREEK DUMP STATION	FROM ROUTE 0208 (NEWHALEM CREEK CAMP TENDER STATION) AT MP 0.1	TO ROUTE 0208 (NEWHALEM CREEK CAMP TENDER STATION)	SKAGIT	0.00	0.00	0.00		5,129	AS	1
0914	4	60407		COLONIAL CREEK CAMPGROUND ACCESS PARKING	FROM ROUTE 0200 (COLONIAL CREEK CAMPGROUND ACCESS SOUTH) AT MP 0.1	TO ROUTE 200A (COLONIAL CREEK CAMPGROUND LOOP A)	SKAGIT	0.00	0.00	0.00		78,334	AS	2
0915	4	60408		COLONIAL CREEK CAMPGROUND DUMPSTATION	FROM ROUTE 0200 (COLONIAL CREEK CAMPGROUND ACCESS SOUTH) AT MP 0.2	TO ROUTE 0200 (COLONIAL CREEK CAMPGROUND ACCESS SOUTH)	SKAGIT	0.00	0.00	0.00		9,364	AS	2
0916	4	60516		NORTH CASCADES VISITOR CENTER SERVICE PARKING	ADJACENT TO ROUTE 0401 (NORTH CASCADES VISITOR CENTER SERVICE ROAD) AT MP 0.1		SKAGIT	0.00	0.00	0.00		1,167	AS	1
0916B	NC			NORTH CASCADES VISITOR CENTER SERVICE PARKING (UNPAVED SECTION)	ADJACENT TO ROUTE 0401 (NORTH CASCADES VISITOR CENTER SERVICE ROAD)		SKAGIT	0.00	0.00	0.00		0	GR	
0917	NC	60528		STEHEKIN RANGER STATION REAR PARKING	FROM ROUTE 0434 (STEHEKIN RANGER STATION REAR ACCESS ROAD)	TO PARKING	STEHEKIN	0.00	0.00	0.00		800	GR	
0918A	**5**	**17812**		**STEHEKIN BOAT LANDING PARKING A**	**ADJACENT TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 0.02**		**STEHEKIN**	**0.00**	**0.00**	**0.00**		**6,427**	**AS**	**6**
0918B	**5**	**46865**		**STEHEKIN BOAT LANDING PARKING B**	**ADJACENT TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 0.02**		**STEHEKIN**	**0.00**	**0.00**	**0.00**		**1,795**	**AS**	**6**
0919	NC	60540		THORNTON LAKES TRAILHEAD PARKING	FROM ROUTE 0203 (THORNTON LAKES ROAD)	TO PARKING	SKAGIT	0.00	0.00	0.00		300	GR	
0920A	NC	17564		EAST BANK TRAILHEAD PARKING A	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 138	TO PARKING	SKAGIT	0.00	0.00	0.00		1,000	GR	
0920B	NC	60413		EAST BANK TRAILHEAD PARKING B	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 138	TO PARKING	SKAGIT	0.00	0.00	0.00		669	GR	
0921	NC	17492		CASCADE PASS TRAILHEAD PARKING	FROM ROUTE 0101 (CASCADE PASS ROAD)	TO PARKING	SKAGIT	0.00	0.00	0.00		1,176	GR	

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0922	NC	60354		ENVIRONMENTAL LEARNING CENTER / DIABLO LAKE TRAILHEAD PARKING	FROM ROUTE 0105 (ENVIRONMENTAL LEARNING CENTER ACCESS ROAD)	TO ROUTE 0105 (ENVIRONMENTAL LEARNING CENTER ACCESS ROAD)	SKAGIT	0.00	0.00	0.00		1,676	GR	
0926	4	81120		FIELDS POINT PARKING	FROM NAMES LANE	TO PARKING	STEHEKIN	0.00	0.00	0.00		205,307	AS	5
0927	NC	17560		PYRAMID LAKE TRAILHEAD PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20) AT MP 127	TO PARKING	SKAGIT	0.00	0.00	0.00		3,996	GR	
0928	NC	105758		UPPER GOODELL CAMPGROUND DAY USE PARKING	FROM ROUTE 0211 (UPPER GOODELL CREEK GROUP CAMPGROUND ACCESS ROAD)	TO ROUTE 0211 (UPPER GOODELL CREEK GROUP CAMPGROUND ACCESS ROAD)	SKAGIT	0.00	0.00	0.00		720	GR	
0929	NC	105783		STEHEKIN BUS/GAS PUMP PARKING	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		750	GR	
0930	NC	105785		STEHEKIN SUMMER BARGE LANDING PARKING	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		7,020	GR	
0931	NC	105788		COURTNEY LOG CABIN PARKING A	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		1,840	GR	
0932	NC	105794		STEHEKIN HIGH BRIDGE PARKING	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	STEHEKIN	0.00	0.00	0.00		2,100	GR	
0933	NC	105795		STEHEKIN MAINTENANCE YARD PARKING	FROM ROUTE 0406 (MAINTENANCE YARD ACCESS ROAD)	TO ROUTE 0406 (MAINTENANCE YARD ACCESS ROAD)	STEHEKIN	0.00	0.00	0.00		3,800	GR	
0934	NC	105765		JOHNSON CABIN PARKING	FROM ROUTE 0101 (CASCADE PASS ROAD)	TO ROUTE 0101 (CASCADE PASS ROAD)	SKAGIT	0.00	0.00	0.00		600	GR	
0935	NC	105766		VALUE MINES PARKING	FROM ROUTE 0101 (CASCADE PASS ROAD)	TO ROUTE 0101 (CASCADE PASS ROAD)	SKAGIT	0.00	0.00	0.00		1,900	GR	
0936	NC	105769		THORNTON PARKING LEFT	FROM ROUTE 0203 (THORNTON LAKES ROAD)	TO ROUTE 0203 (THORNTON LAKES ROAD)	SKAGIT	0.00	0.00	0.00		1,008	GR	
0937	NC	105781		STEHEKIN GOLDEN WEST PARKING	FROM ROUTE 0402 (GOLDEN WEST ACCESS ROAD)	TO ROUTE 0402 (GOLDEN WEST ACCESS ROAD)	STEHEKIN	0.00	0.00	0.00		1,480	GR	
0938	NC	105784		STEHEKIN POST OFFICE PARKING	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		3,927	GR	

Cycle 5 NPS/RIP Route ID Report

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NOCA

NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0939	NC	105791		STEHEKIN COMMUNITY HALL PARKING	FROM ROUTE 0413 (STEHEKIN COMMUNITY HALL ROAD)	TO ROUTE 0413 (STEHEKIN COMMUNITY HALL ROAD)	STEHEKIN	0.00	0.00	0.00		1,380	GR	
0940	NC	105753		COW HEAVEN TRAILHEAD PARKING	FROM ROUTE 0108 (OLSON CREEK ROAD)	TO ROUTE 0108 (OLSON CREEK ROAD)	SKAGIT	0.00	0.00	0.00		640	GR	
0941	NC	105755		NEWHALEM FIRING RANGE PARKING	FROM ROUTE 0216 (NEWHALEM FIRING RANGE ROAD)	TO ROUTE 0216 (NEWHALEM FIRING RANGE ROAD)	SKAGIT	0.00	0.00	0.00		800	GR	
0942	NC	105763		BOUNDARY PARKING	FROM ROUTE 0101 (CASCADE PASS ROAD)	TO ROUTE 0101 (CASCADE PASS ROAD)	SKAGIT	0.00	0.00	0.00		760	GR	
0943	NC	105764		COUNTY TURNAROUND PARKING	FROM ROUTE 0101 (CASCADE PASS ROAD)	TO ROUTE 0101 (CASCADE PASS ROAD)	SKAGIT	0.00	0.00	0.00		2,200	GR	
0944	NC	105777		HOZOMEEN HOUSING COMPOUND PARKING	FROM ROUTE 0422 (HOZOMEEN HOUSING COMPOUND LOOP)	TO ROUTE 0422 (HOZOMEEN HOUSING COMPOUND LOOP)	SKAGIT	0.00	0.00	0.00		4,050	GR	
0945	NC	105786		STEHEKIN LANDING LONG-TERM PARKING	FROM ROUTE 0218 (STEHEKIN LANDING LONG TERM PARKING LOT ROAD)	TO ROUTE 0218 (STEHEKIN LANDING LONG TERM PARKING LOT ROAD)	STEHEKIN	0.00	0.00	0.00		13,296	GR	
0946	NC	105789		COURTNEY LOG CABIN PARKING B	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		900	GR	
0947	NC	105792		STEHEKIN OLD SCHOOL PARKING	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		1,925	GR	
0948	NC	105797		BUCKNER PACKING SHED PARKING	FROM ROUTE 0103 (BUCKNER ORCHARD ACCESS ROAD)	TO ROUTE 0103 (BUCKNER ORCHARD ACCESS ROAD)	STEHEKIN	0.00	0.00	0.00		600	GR	
0949	NC	105754		OLSON CREEK ROAD PARKING	FROM ROUTE 0108 (OLSON CREEK ROAD)	TO ROUTE 0108 (OLSON CREEK ROAD)	SKAGIT	0.00	0.00	0.00		1,250	GR	
0950	NC	105761		NEWHALEM WATER TANK PARKING	FROM ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	TO ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	SKAGIT	0.00	0.00	0.00		1,800	GR	
0951	NC	105780		COLONIAL CAMPGROUND NORTH WALK-IN SITES PARKING	FROM ROUTE 0209A (COLONIAL CREEK CAMPGROUND NORTH LOOP A)	TO ROUTE 0209A (COLONIAL CREEK CAMPGROUND NORTH LOOP A)	SKAGIT	0.00	0.00	0.00		1,176	GR	
0952	NC	105782		STEHEKIN FIRE CACHE PARKING	FROM ROUTE 0402 (GOLDEN WEST ACCESS ROAD)	TO ROUTE 0402 (GOLDEN WEST ACCESS ROAD)	STEHEKIN	0.00	0.00	0.00		1,200	GR	

Cycle 5 NPS/RIP Route ID Report

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NOCA

NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0953	NC	105787		STEHEKIN WASTEWATER TREATMENT PLANT PARKING	FROM ROUTE 0400 (STEHEKIN TREATMENT PLANT HILL ROAD)	TO ROUTE 0400 (STEHEKIN TREATMENT PLANT HILL ROAD)	STEHEKIN	0.00	0.00	0.00		840	GR	
0954	NC	105793		STEHEKIN RAINBOW FALLS PARKING	FROM ROUTE 0104 (RAINBOW FALLS ACCESS ROAD)	TO ROUTE 0104 (RAINBOW FALLS ACCESS ROAD)	STEHEKIN	0.00	0.00	0.00		1,900	GR	
0955	NC	105799		TUMWATER CAMP PARKING	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	STEHEKIN	0.00	0.00	0.00		500	GR	
0956	NC	105757		UPPER GOODELL PICKETT ACCESS PARKING	FROM ROUTE 0211 (UPPER GOODELL CREEK GROUP CAMPGROUND ACCESS ROAD)	TO ROUTE 0211 (UPPER GOODELL CREEK GROUP CAMPGROUND ACCESS ROAD)	SKAGIT	0.00	0.00	0.00		720	GR	
0957	NC	105762		NEWHALEM REARING PONDS PARKING	FROM ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	TO ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	SKAGIT	0.00	0.00	0.00		480	GR	
0958	NC	105770		LOWER THORNTON (BULLETIN BOARD) PARKING RIGHT	FROM ROUTE 0203 (THORNTON LAKES ROAD)	TO ROUTE 0203 (THORNTON LAKES ROAD)	SKAGIT	0.00	0.00	0.00		800	GR	
0959	NC	105756		NEWHALEM FIRING RANGE GATE PARKING	FROM ROUTE 0216 (NEWHALEM FIRING RANGE ROAD)	TO ROUTE 0216 (NEWHALEM FIRING RANGE ROAD)	SKAGIT	0.00	0.00	0.00		448	GR	
0960	NC	105759		NEWHALEM WAREHOUSE PARKING	FROM ROUTE 0428 (NEWHALEM WAREHOUSE LOOP ROAD)	TO ROUTE 0428 (NEWHALEM WAREHOUSE LOOP ROAD)	SKAGIT	0.00	0.00	0.00		3,000	GR	
0961	NC	105768		ELC/NCI PARKING	FROM ROUTE 0430 (ELC/NCI ROADS)	TO ROUTE 0430 (ELC/NCI ROADS)	SKAGIT	0.00	0.00	0.00		4,480	GR	
0962	NC	105772		HOZOMEEN EAST LANDING BOAT LAUNCH PARKING	FROM ROUTE 0106 (HOZOMEEN EAST LANDING BOAT LAUNCH SPUR)	TO ROUTE 0106 (HOZOMEEN EAST LANDING BOAT LAUNCH SPUR)	SKAGIT	0.00	0.00	0.00		2,500	GR	
0963	NC	105779		THUNDER KNOB TRAILHEAD PARKING	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO ROUTE 5000 ROUTE 5000 (STATE HIGHWAY 20)	SKAGIT	0.00	0.00	0.00		4,800	GR	
0964	NC	105796		STEHEKIN YACC YARD PARKING	FROM ROUTE 0417 (STEHEKIN YACC SPUR ROAD)	TO ROUTE 0417 (STEHEKIN YACC SPUR ROAD)	STEHEKIN	0.00	0.00	0.00		640	GR	
0965	NC	105800		CARWASH FALLS (END OF STEHEKIN VALLEY ROAD) PARKING	FROM ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	TO ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))	STEHEKIN	0.00	0.00	0.00		700	GR	

Cycle 5 NPS/RIP Route ID Report

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NOCA

NORTH CASCADES NATIONAL PARK

Rte. No.	Cycle Collected	FMSS No.	Concess Route	Route Name	Route Description From	Route Description To	Maint. District	Paved Miles	Un-Paved Miles	Total Route Length	Func. Class	Manual Rated SQ/FT	Surf. Type	Area Maps
0966	NC	105760		NEWHALEM CREEK TRAILHEAD PARKING	FROM ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	TO ROUTE 0215 (NEWHALEM TRAILHEAD ROAD SOUTH)	SKAGIT	0.00	0.00	0.00		1,760	GR	
0967	NC	105767		GORGE LAKE BOAT LAUNCH PARKING	FROM ROUTE 0109 (GORGE LAKE CAMPGROUND ACCESS ROAD)	TO ROUTE 0109 (GORGE LAKE CAMPGROUND ACCESS ROAD)	SKAGIT	0.00	0.00	0.00		1,600	GR	
0968	NC	105775		HOZOMEEN WILLOW LAKE PARKING	FROM ROUTE 0224 (HOZOMEEN CAMPGROUND UPPER LOOP ROAD)	TO ROUTE 0224 (HOZOMEEN CAMPGROUND UPPER LOOP ROAD)	SKAGIT	0.00	0.00	0.00		1,600	GR	
0969	NC	105776		HOZOMEEN RANGER STATION PARKING	FROM ROUTE 0102 (HOZOMEEN ROAD)	TO ROUTE 0102 (HOZOMEEN ROAD)	SKAGIT	0.00	0.00	0.00		2,000	GR	
0970	NC	105778		HOZOMEEN WINNEBAGO FLATS LAUNCH RAMP PARKING	FROM ROUTE 0225 (HOZOMEEN WINNEBAGO FLATS CAMPGROUND LOOP)	TO ROUTE 0225 (HOZOMEEN WINNEBAGO FLATS CAMPGROUND LOOP)	SKAGIT	0.00	0.00	0.00		4,350	GR	
0971	NC	105798		BUCKNER HOUSE PARKING	FROM ROUTE 0103 (BUCKNER ORCHARD ACCESS ROAD)	TO ROUTE 0103 (BUCKNER ORCHARD ACCESS ROAD)	STEHEKIN	0.00	0.00	0.00		1,210	GR	
0972	NC	105771		COPPER CREEK ROAD PARKING	FROM ROUTE 0213 (COPPER CREEK ROAD)	TO ROUTE 0213 (COPPER CREEK ROAD)	SKAGIT	0.00	0.00	0.00		4,500	GR	
0973	NC	105773		HOZOMEEN GOVERNMENT DOCK PARKING	FROM ROUTE 0107 (HOZOMEEN GOVERNMENT DOCK ROAD)	TO ROUTE 0107 (HOZOMEEN GOVERNMENT DOCK ROAD)	SKAGIT	0.00	0.00	0.00		720	GR	
0974	NC	105774		HOZOMEEN GOVERNMENT DOCK BOAT LAUNCH PARKING	FROM ROUTE 0107 (HOZOMEEN GOVERNMENT DOCK ROAD)	TO ROUTE 0107 (HOZOMEEN GOVERNMENT DOCK ROAD)	SKAGIT	0.00	0.00	0.00		12,480	GR	
0975	NC	105790		STEHEKIN RAINBOW LOOP TRAIL PARKING	FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION))	STEHEKIN	0.00	0.00	0.00		720	GR	
0976	NC	17499		ELDORADO PARKING	FROM ROUTE 0101 (CASCADE PASS ROAD)	TO ROUTE 0101 (CASCADE PASS ROAD)	SKAGIT	0.00	0.00	0.00		6,300	GR	
5000	4			STATE HIGHWAY 20	FROM WEST BOUNDARY AT END OF BACON CREEK BRIDGE (APPROX MP 112)	TO EAST BOUNDARY AT SIGN (APPROX MP 141)	SKAGIT	30.25	0.00	30.25		0	AS	1,2,3
5001	4			DIABLO DAM ACCESS ROAD	FROM ROUTE 5000 (STATE HIGHWAY 20)	TO BEGIN ROUTE 0105/ CITY LIGHT BOAT HOUSE	SKAGIT	1.01	0.00	1.01		0	AS	2

Cycle 5 NPS/RIP Route ID Report

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CYCLE 5 COLLECTED SUMMARY TOTALS FOR NORTH CASCADES NATIONAL PARK

CYCLE 5 COLLECTED ROUTE TOTALS

DCV Driven Route Miles	1.41
Manually Rated Route Miles	5.63
TOTAL PARK ROUTE MILES COLLECTED IN CYCLE 5	7.04
Manually Rated Routes (SQFT)	465,169

* CYCLE 5 COLLECTED PARKING AREA TOTALS

Paved Parking (SQFT)	14,393

CYCLE 5 COLLECTED CONCESSION TOTALS

Concession Paved Route Miles	0.00
Concession Paved Parking Area SQFT	0
Concession Manually Rated Rotes SQFT	0

CYCLE 5 COLLECTED WEIGHTED AVERAGE PARK VALUES

DCV Driven PCR	89
**Manually Rated Routes PCR	76
**Parking PCR	61
***Total Equivalent Lane Miles	11.21

TOTAL PARK SUMMARY FOR NORTH CASCADES NATIONAL PARK

ROUTE TOTALS

TOTAL PAVED PARK ROUTE MILES	10.78
TOTAL PAVED PARKING (SQFT)	522,492

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

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

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

Cycle 5 NPS/RIP Route ID Report

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General Park Road Functional Classification Table

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

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

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

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

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

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

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

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

****

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

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

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

Surface Type Abbreviations:

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

ROUTE IDENTIFICATION CHANGES TO PAVED ROUTES FROM PREVIOUS CYCLE - NOCA

ROUTES MODIFIED FROM PREVIOUS INVENTORY:			
Route #	**Route Name**	**Type of Modification**	**Comments**
0010A	STEHEKIN VALLEY ROAD (PAVED SECTION)	ROUTE SPLIT	ROUTE 0010 WAS SPLIT INTO 0010A AND 0010B (PAVED AND UNPAVED SECTIONS)
0100A	COMPANY CREEK ROAD (PAVED SECTION)	ROUTE SPLIT	ROUTE 0100 WAS SPLIT INTO 0100A AND 0100B (PAVED AND UNPAVED SECTIONS)
0900B	MARBLEMOUNT WILDERNESS OFFICE PARKING	SQ FEET CHANGE	SHAPE MODIFIED TO EXCLUDE UNPAVED SECTIONS. A PORTION WAS ALSO REMOVED AS PART OF ROUTE 0435A.

Section 3
Park Summary Information

North Cascades National Park

Federal Lands Highway
Road Inventory Program

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

F.C.	Pavement Condition Rating (PCR)								TOTAL MILES
	Poor (0-60)		Fair (61-84)		Good (85-94)		Excellent (95-100)		
	MILES	%	MILES	%	MILES	%	MILES	%	
1									
2	0.04	2.84%	0.34	24.11%	0.52	36.88%	0.51	36.17%	**1.41**
3									
4									
5									
6									
7									
8									
Totals	**0.04**	**2.84%**	**0.34**	**24.11%**	**0.52**	**36.88%**	**0.51**	**36.17%**	**1.41**

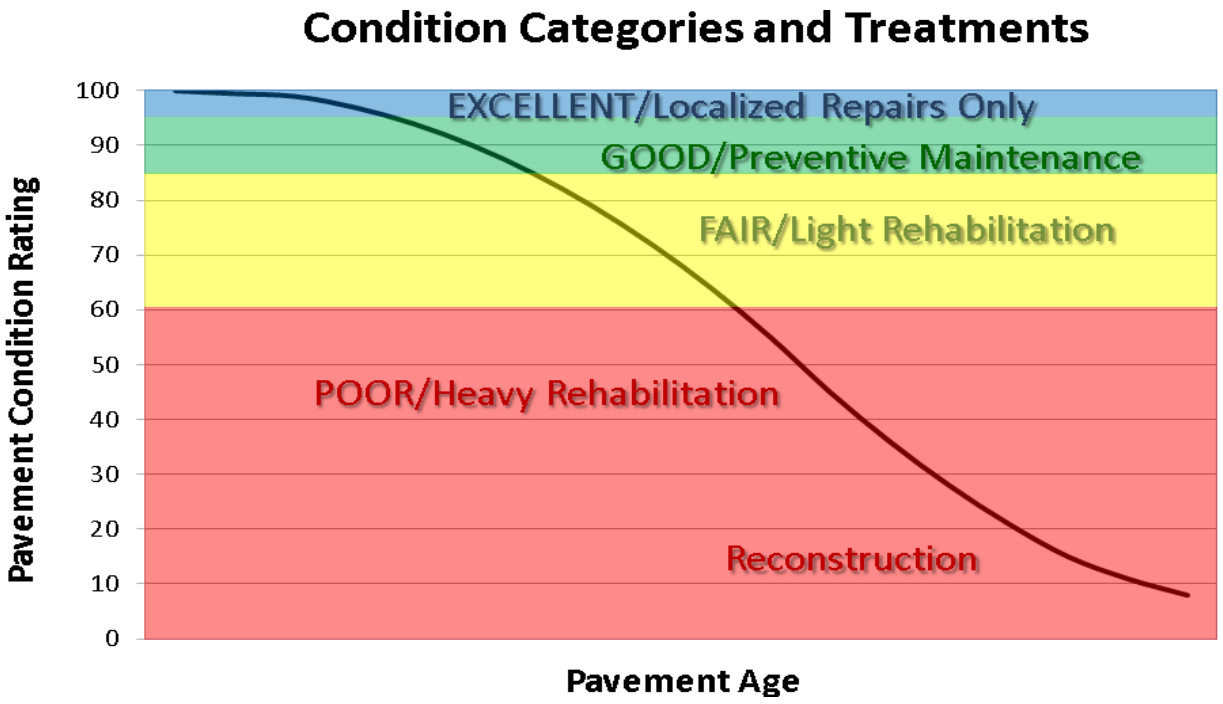
Note: **The information in this table is derived from the PMS_20 table in the Park database, which only contains processed data from routes collected with the Data Collection Vehicle (DCV). Information for Manually Rated Routes (MRR) and Parking Areas is not reported in this table. Only Functional Class 1, 2, & 7 routes, and any new routes not previously collected by RIP, are collected in Large Parks.**

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

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

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

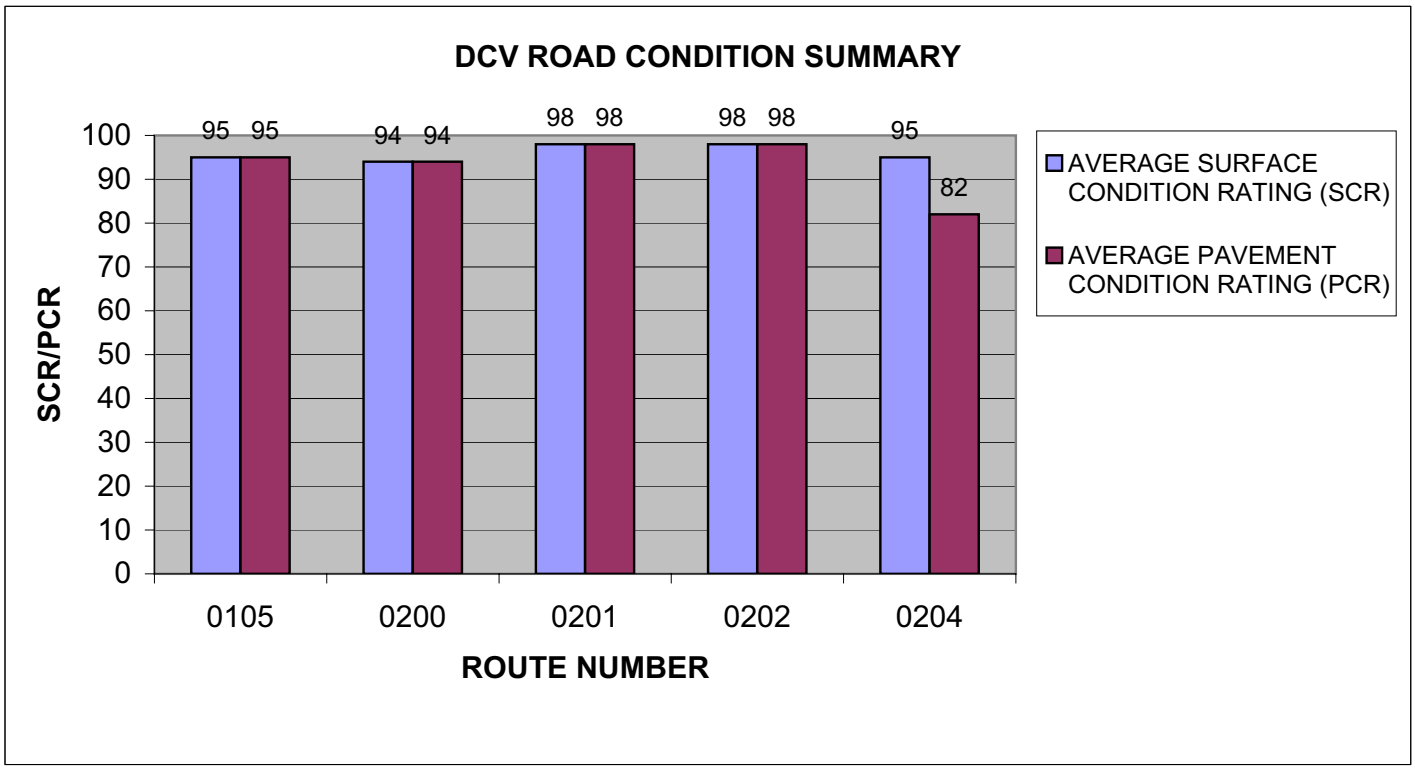
At this time, specific Maintenance and Rehabilitation activities should be evaluated and recommended at the project level. Site-specific conditions that influence treatment type should be determined based on performing a subsurface investigation and/or pavement condition survey, and not be based solely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



NOCA: DCV ROAD CONDITION SUMMARY

DCV - Data Collection Vehicle

ROUTE NUMBER	ROUTE NAME	FUNCT CLASS	ROUTE LENGTH	SURFACE TYPE	AVERAGE SURFACE CONDITION RATING (SCR)	AVERAGE PAVEMENT CONDITION RATING (PCR)
0105	ENVIRONMENTAL LEARNING CENTER ACCESS ROAD	2	0.19	ASPHALT	95	95
0200	COLONIAL CREEK CAMPGROUND ACCESS SOUTH	2	0.20	ASPHALT	94	94
0201	GOODELL CREEK CAMPGROUND ACCESS ROAD	2	0.20	ASPHALT	98	98
0202	NEWHALEM CREEK CAMPGROUND ACCESS ROAD	2	0.10	ASPHALT	98	98
0204	NORTH CASCADES VISITOR CENTER ACCESS ROAD	2	0.72	ASPHALT	95	82

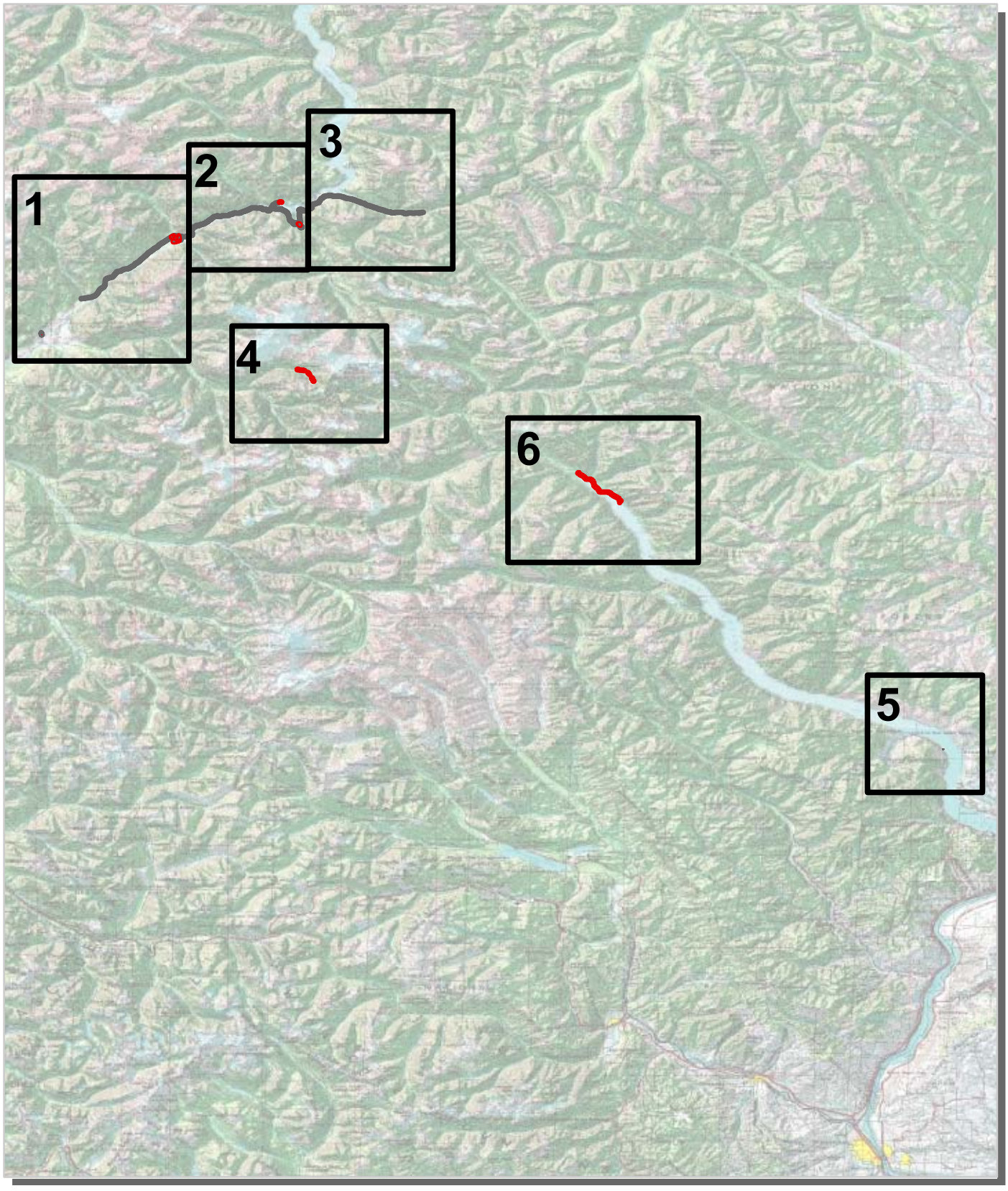


Section 4
Park Route Location Maps

North Cascades National Park

Federal Lands Highway
Road Inventory Program

North Cascades National Park
Route Location Map
Key Map



Cycle 5 Collected Routes

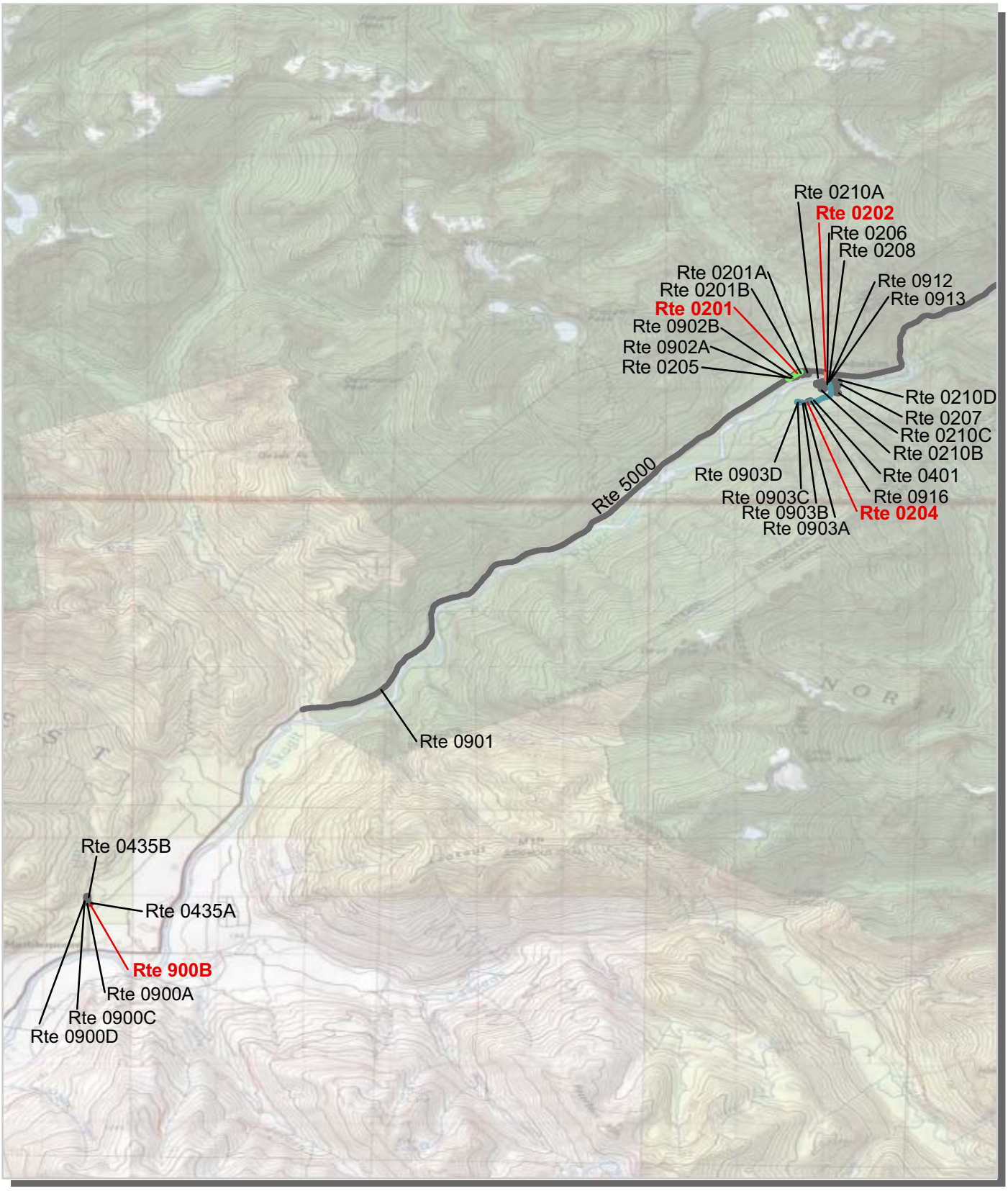
Routes Collected in Previous Cycle

10 5 0 10

Miles

N

North Cascades National Park
Route Location Map
Area 1



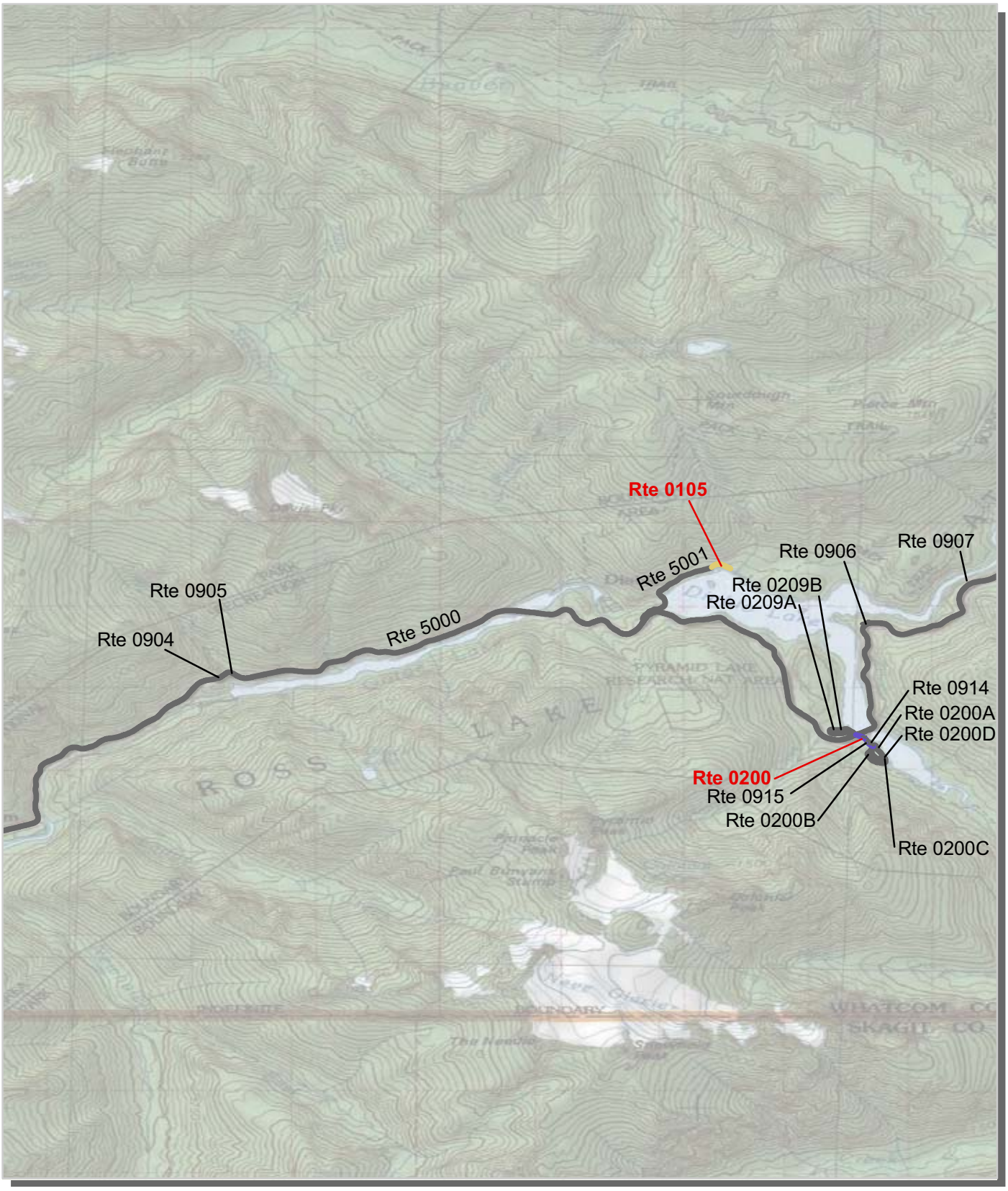
Unique colors used to differentiate routes

Routes Collected in Previous Cycle

2 1 0 2
Miles

N

North Cascades National Park
Route Location Map
Area 2



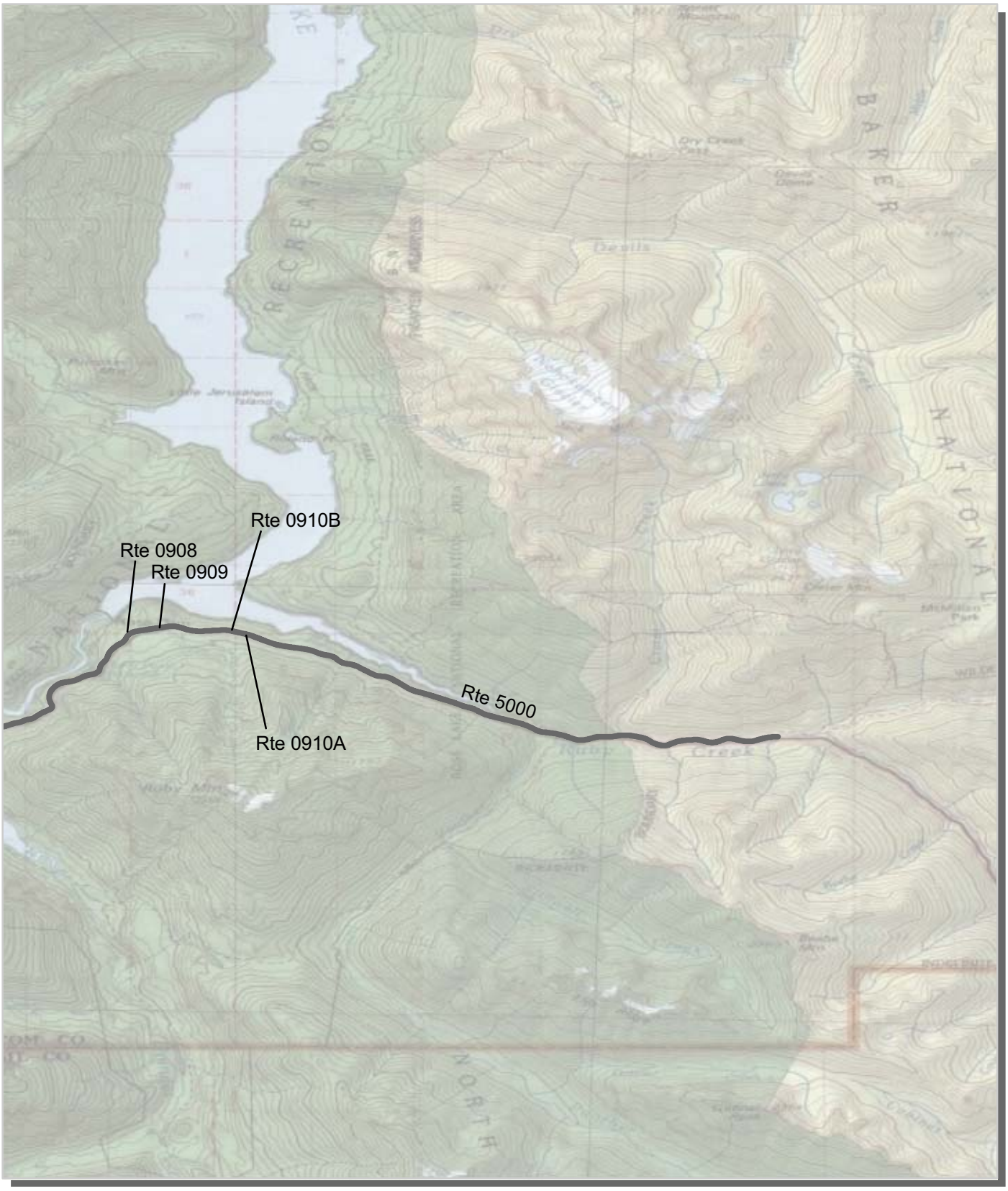
Unique colors used to differentiate routes

Routes Collected in Previous Cycle

2 1 0 2 Miles

N

North Cascades National Park
Route Location Map
Area 3



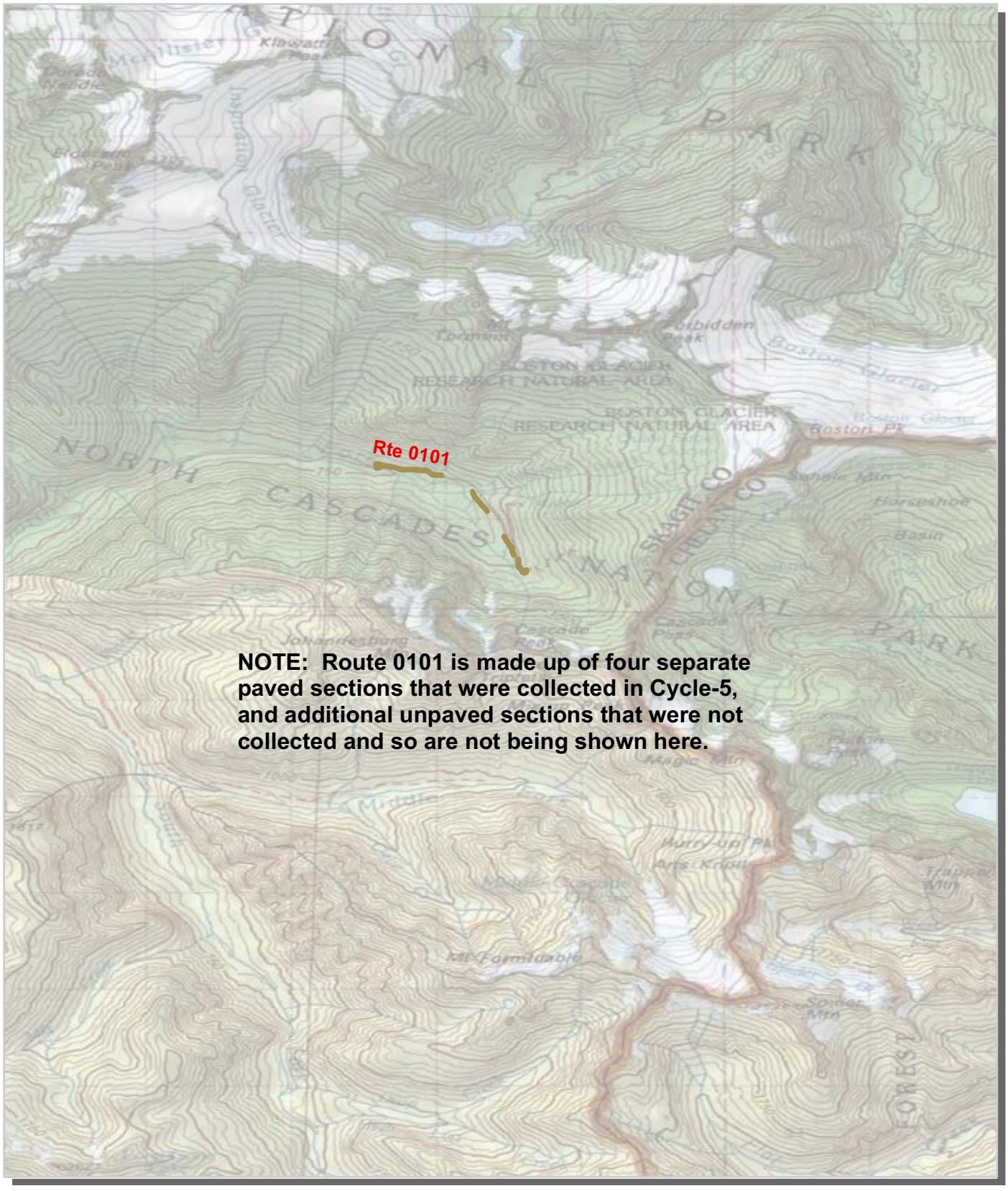
Unique colors used to differentiate routes

Routes Collected in Previous Cycle

2 1 0 2
Miles

N

North Cascades National Park
Route Location Map
Area 4



Unique colors used to differentiate routes

Routes Collected in Previous Cycle

1 0.5 0 1 Miles

N

North Cascades National Park
Route Location Map
Area 5

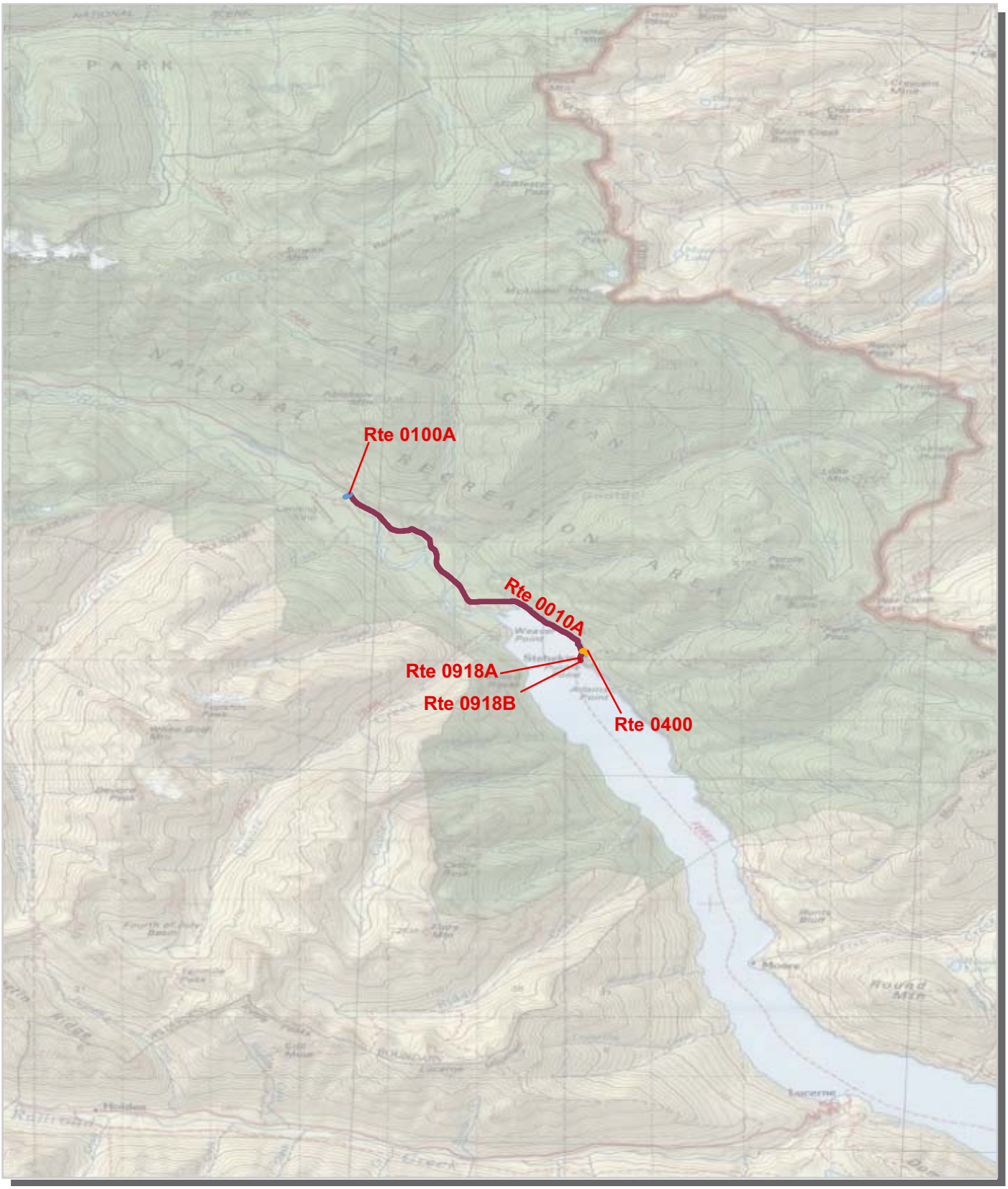
Unique colors used to differentiate routes

Routes Collected in Previous Cycle

1 0.5 0 1 Miles

N

North Cascades National Park
Route Location Map
Area 6



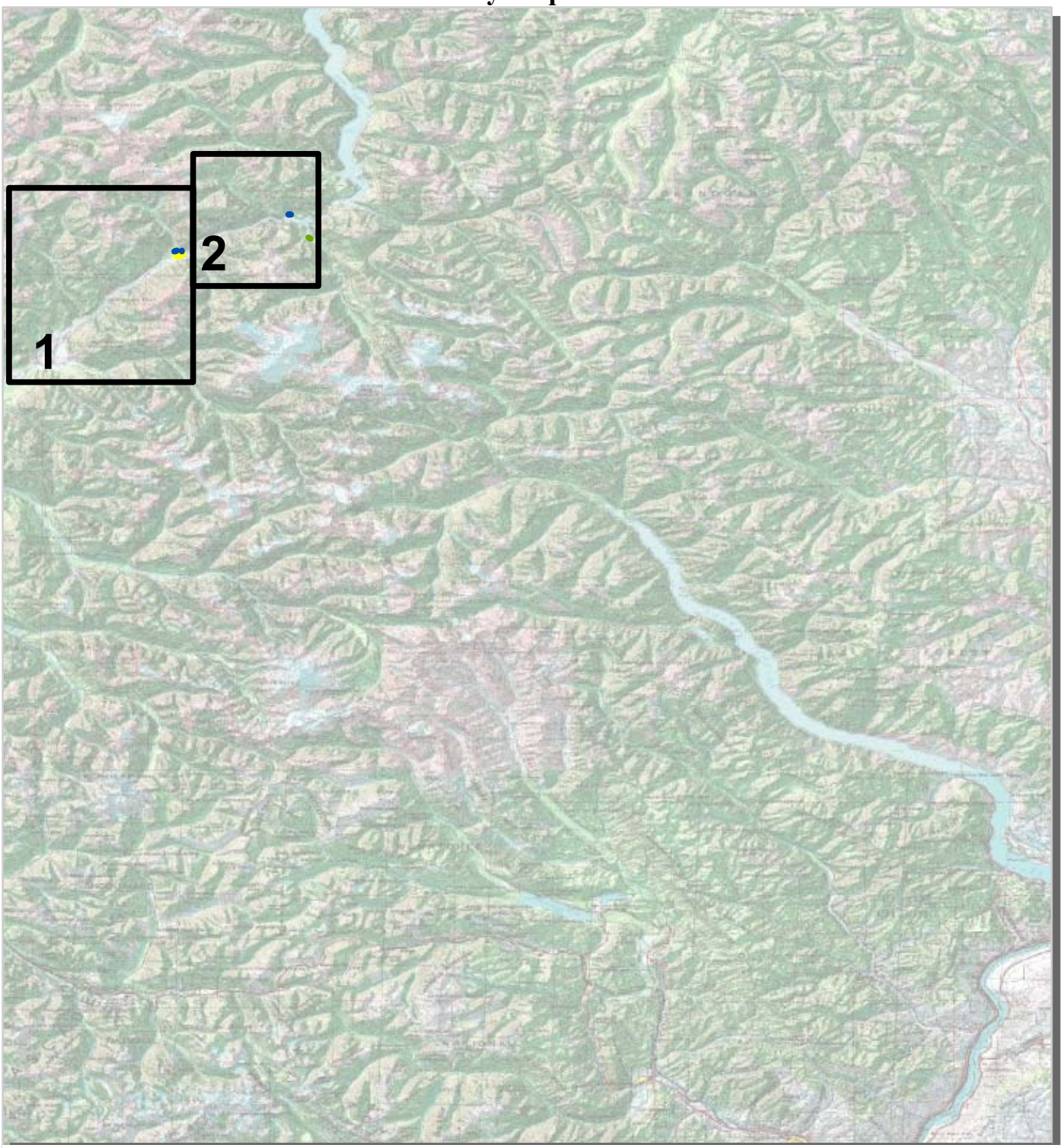
Unique colors used to differentiate routes

Routes Collected in Previous Cycle

2 1 0 2
Miles

N

North Cascades National Park
Route Condition Map
PCR - Mile by Mile
Key Map



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

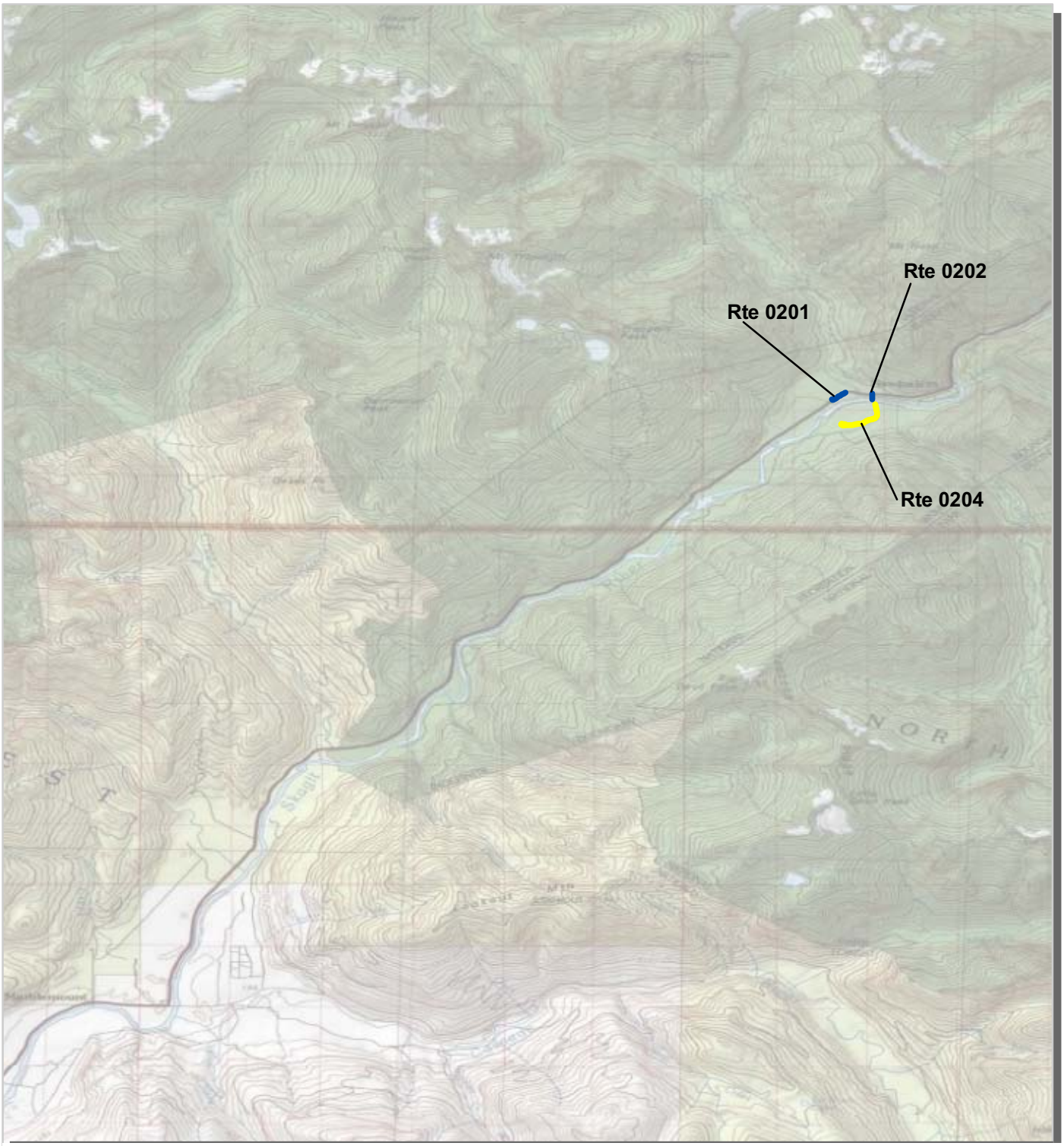
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

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

10 5 0 10 Miles

N

North Cascades National Park
Route Condition Map
PCR - Mile by Mile
Area 1



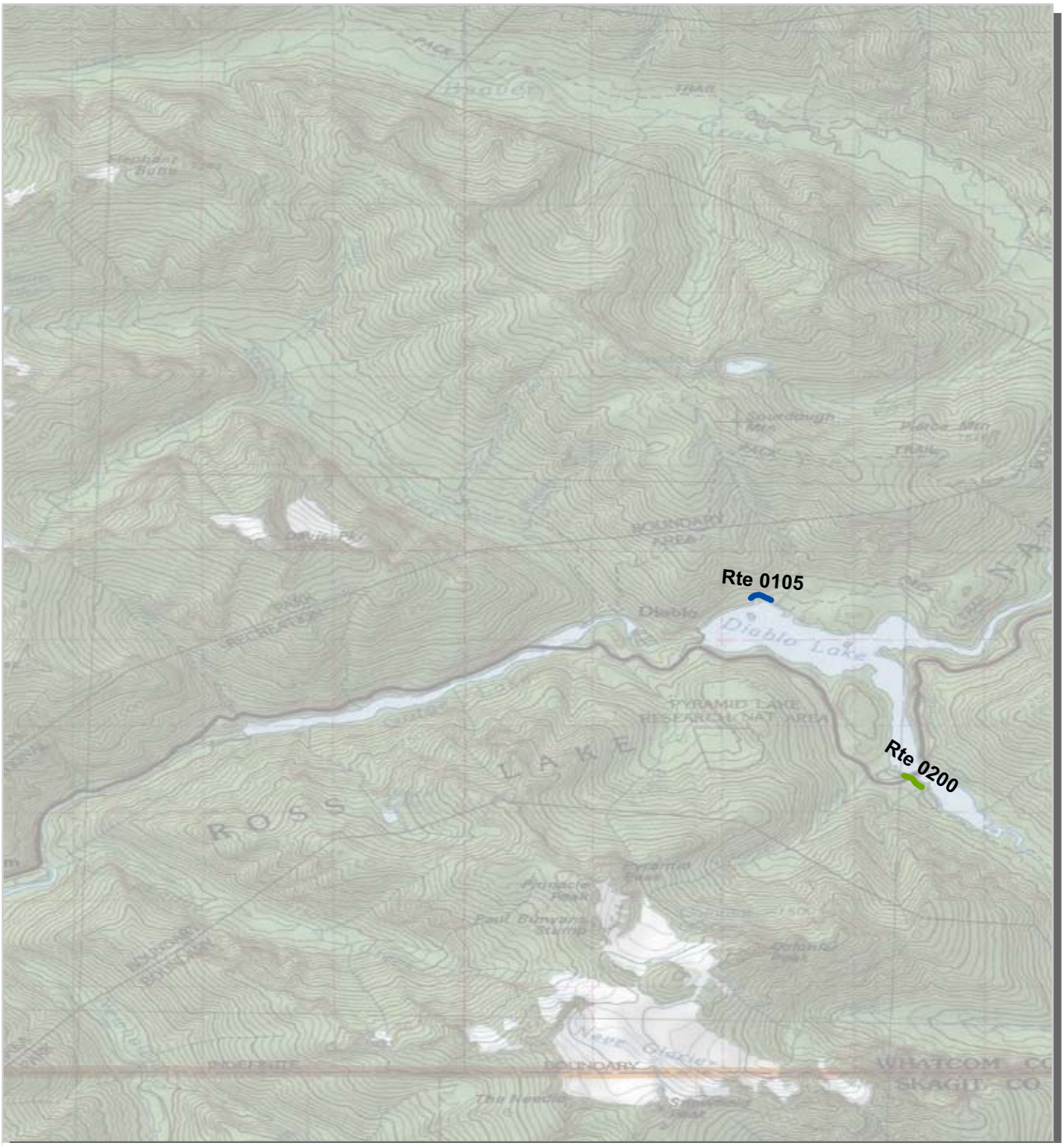
PCR Poor (0 - 60) Fair (61 - 84) Good (85 - 94) Excellent (95 - 100) No Data

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

2 1 0 2 Miles

N

North Cascades National Park
Route Condition Map
PCR - Mile by Mile
Area 2



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

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

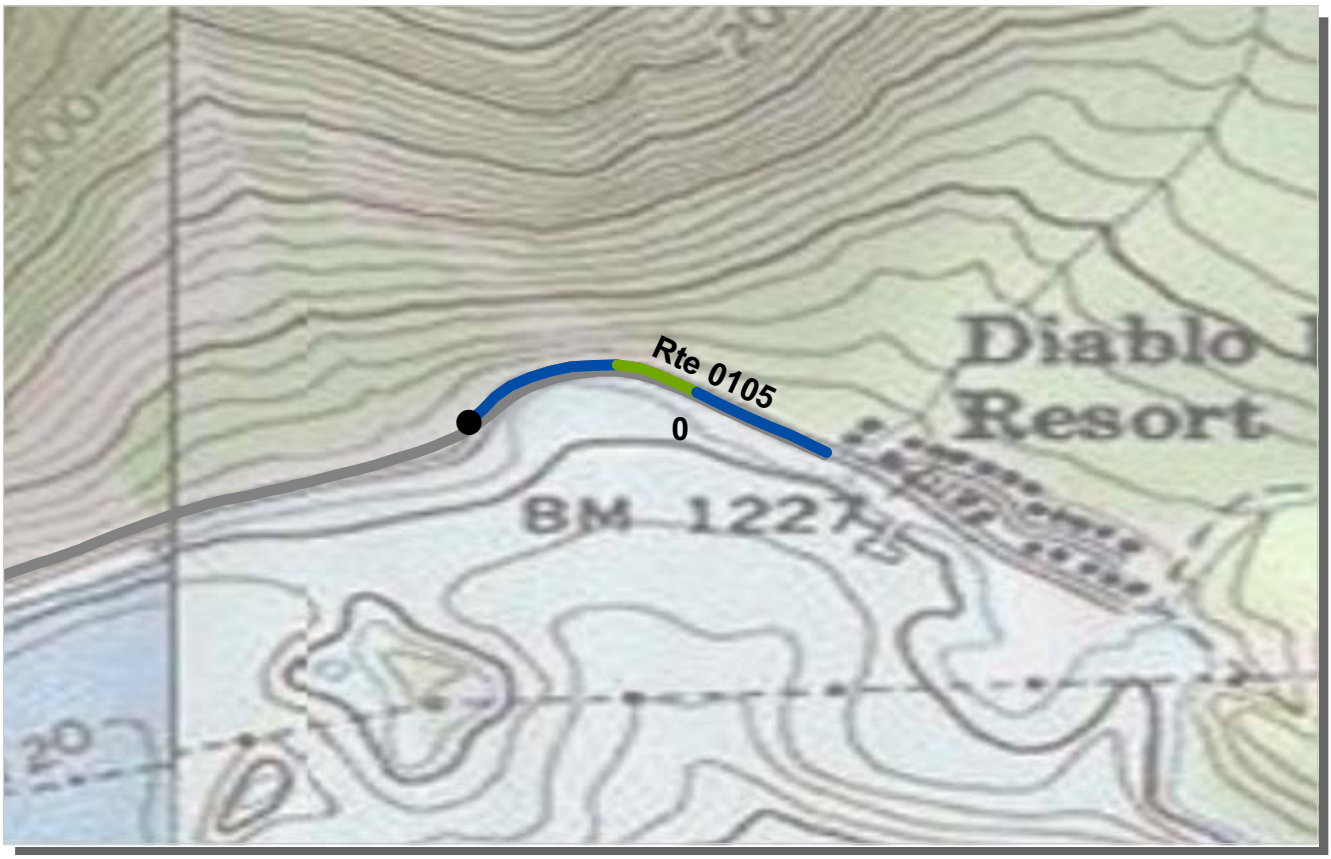
1 0.5 0 1
Miles

N

Section 5
Paved Route
Condition Rating Sheets

North Cascades National Park

Federal Lands Highway
Road Inventory Program



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

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

ROUTE: 0105 ENVIRONMENTAL LEARNING CENTER ACCESS ROAD
NOCA : NORTH CASCADES NATIONAL PARK

COLLECTED: 9/16/2010
PACIFIC WEST REGION **TOTAL LENGTH: 0.19 Miles**

Section Number	0				
Section Length (mi)	0.19				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	20				
Lane Width (ft)	10				
Roadway Condition Information					
SCR (Surface Condition Rating)	95				
PCR (Pavement Condition Rating)	95				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	95				
Roughness Condition Index (RCI)	NC				

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

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

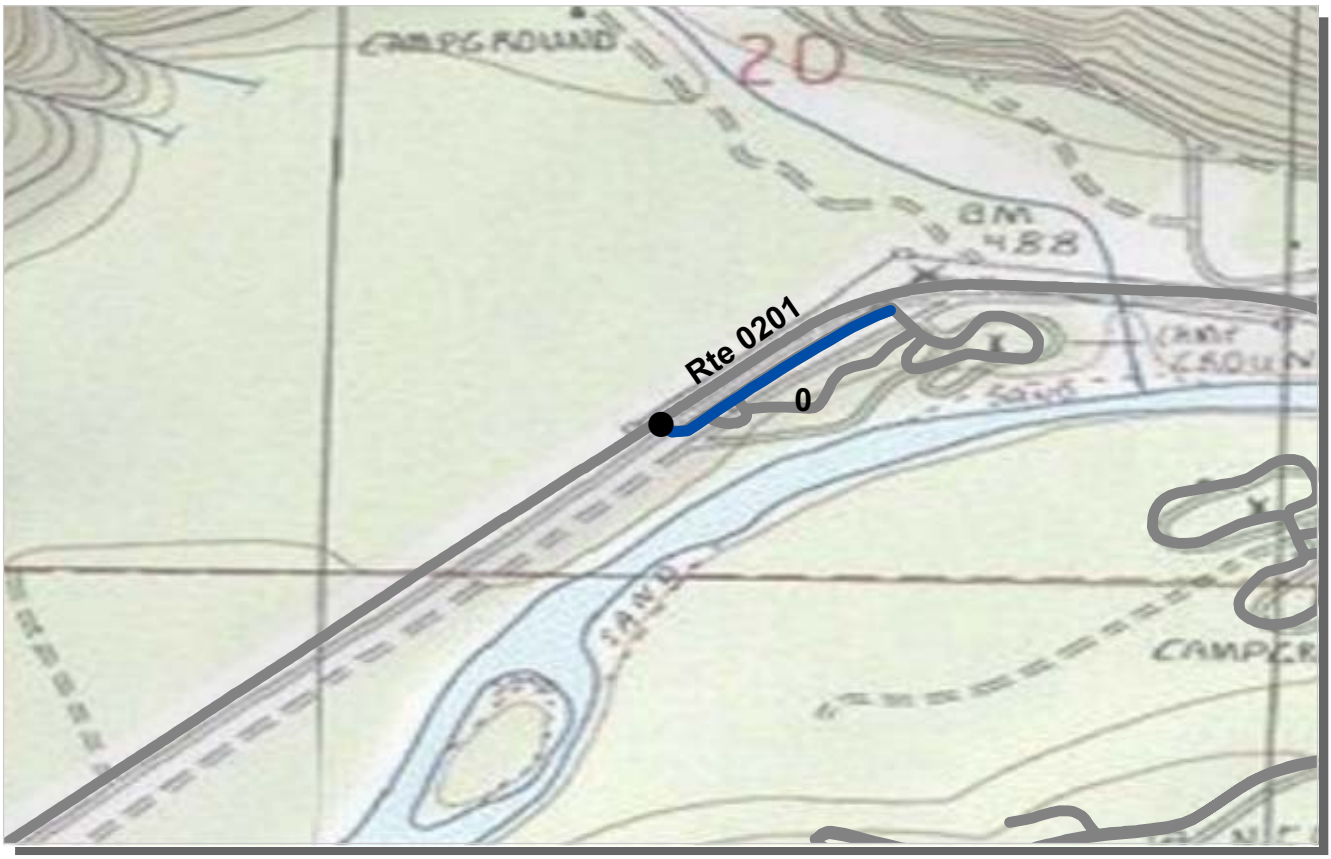
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0200 COLONIAL CREEK CAMPGROUND ACCESS SOUTH
NOCA : NORTH CASCADES NATIONAL PARK

COLLECTED: 9/16/2010
PACIFIC WEST REGION **TOTAL LENGTH: 0.20 Miles**

Section Number	0				
Section Length (mi)	0.20				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	17				
Lane Width (ft)	12				
Roadway Condition Information					
SCR (Surface Condition Rating)	94				
PCR (Pavement Condition Rating)	94				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	94				
Roughness Condition Index (RCI)	NC				

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



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

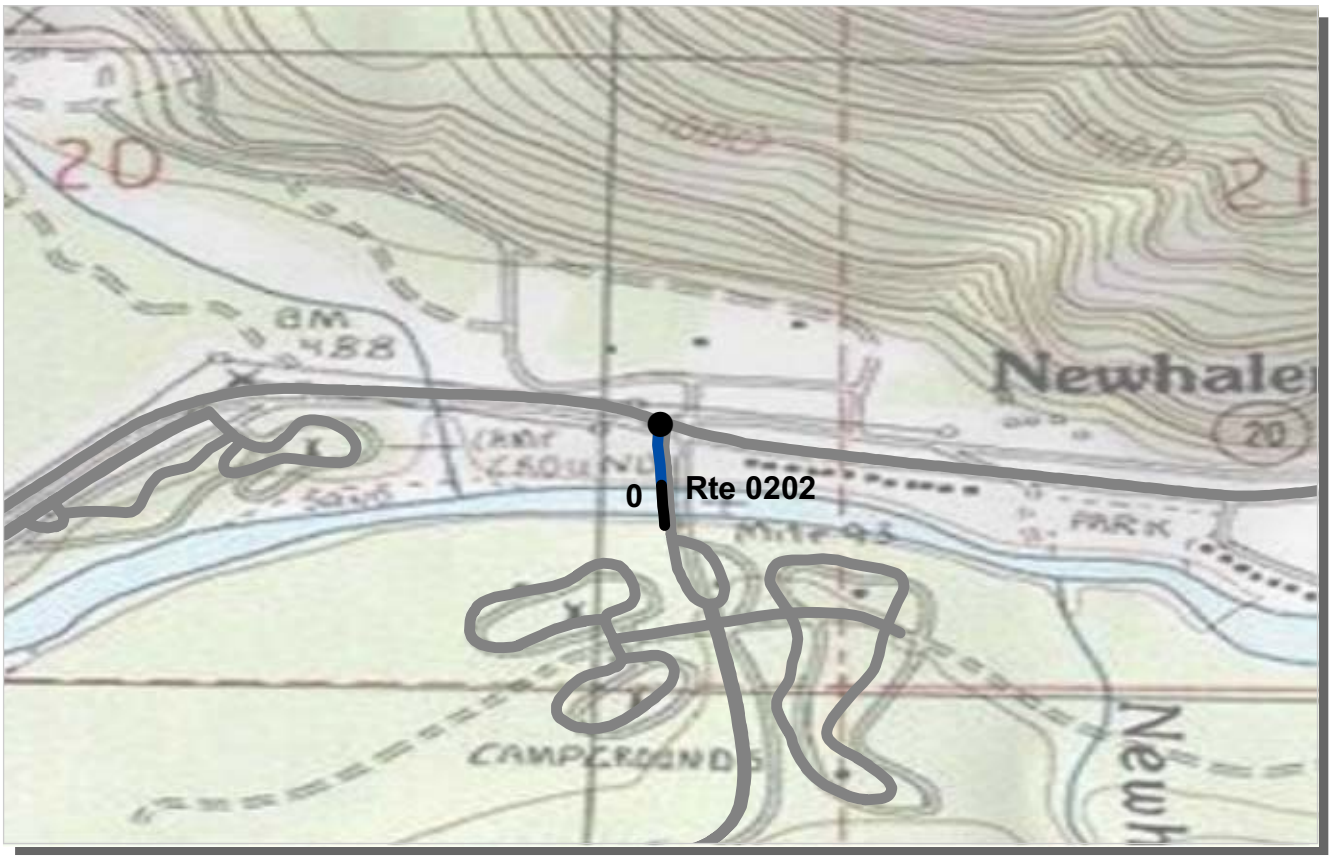
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0201 GOODELL CREEK CAMPGROUND ACCESS ROAD
NOCA : NORTH CASCADES NATIONAL PARK

COLLECTED: 9/16/2010
PACIFIC WEST REGION **TOTAL LENGTH: 0.20 Miles**

Section Number	0				
Section Length (mi)	0.20				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	25				
Lane Width (ft)	12				
Roadway Condition Information					
SCR (Surface Condition Rating)	98				
PCR (Pavement Condition Rating)	98				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	98				
Roughness Condition Index (RCI)	NC				

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



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

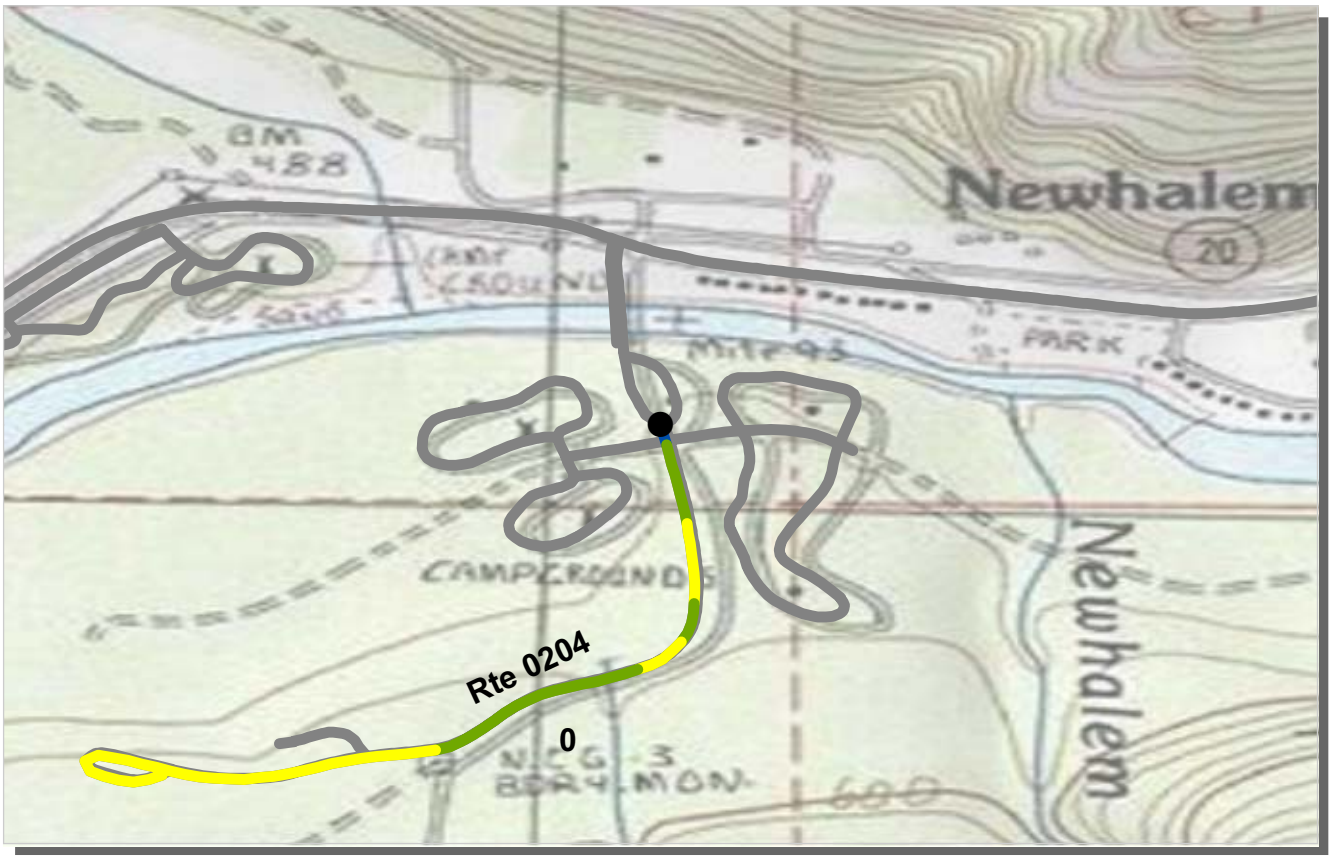
* If the PCR rating is not available for a section, the SCR rating will be displayed. See appendix for definitions and formulas.

ROUTE: 0202 NEWHALEM CREEK CAMPGROUND ACCESS ROAD
NOCA : NORTH CASCADES NATIONAL PARK

COLLECTED: 9/16/2010
PACIFIC WEST REGION **TOTAL LENGTH: 0.10 Miles**

Section Number	0				
Section Length (mi)	0.10				
Cross Section Information					
Number of Lanes	1				
Paved Width (ft)	22				
Lane Width (ft)	15				
Roadway Condition Information					
SCR (Surface Condition Rating)	98				
PCR (Pavement Condition Rating)	98				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	98				
Roughness Condition Index (RCI)	NC				

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



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

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

ROUTE: 0204 NORTH CASCADES VISITOR CENTER ACCESS ROAD
NOCA : NORTH CASCADES NATIONAL PARK

COLLECTED: 9/16/2010
PACIFIC WEST REGION **TOTAL LENGTH: 0.72 Miles**

Section Number	0				
Section Length (mi)	0.72				
Cross Section Information					
Number of Lanes	2				
Paved Width (ft)	24				
Lane Width (ft)	12				
Roadway Condition Information					
SCR (Surface Condition Rating)	95				
PCR (Pavement Condition Rating)	82				
Distress Index Values					
Structural Crack Index	100				
Transverse Cracking Index	100				
Patching Index	100				
Rutting Index	95				
Roughness Condition Index (RCI)	63				

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

Section 6
Manually Rated Paved Route Condition Rating Sheets

North Cascades National Park

Federal Lands Highway
Road Inventory Program

NORTH CASCADES NATIONAL PARK
Route 0010A
STEHEKIN VALLEY ROAD (PAVED SECTION)

FROM ROUTE 0918A (STEHEKIN BOAT LANDING PARKING A) AND 0918B (STEHEKIN BOAT LANDING PARKING B)
TO ROUTE 0010B (STEHEKIN VALLEY ROAD (UNPAVED SECTION))

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Paved Length (mi)	Paved Width (ft)
0010A	PUBLIC	8/5/2010	368,232	6.34	4.31	16.2
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
1	0	0	NO CURB AND GUTTER	NO CURB	FAIR/73	AS

* Lane miles are based on 11' lane widths

1 0.5 0 1 Miles

N

NORTH CASCADES NATIONAL PARK
Route 0100A
COMPANY CREEK ROAD (PAVED SECTION)
FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 4.3
TO ROUTE 0100B (COMPANY CREEK ROAD (UNPAVED SECTION))

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Paved Length (mi)	Paved Width (ft)
0100A	PUBLIC	8/5/2010	5,296	0.09	0.06	17
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO CURB AND GUTTER	NO CURB	FAIR/73	AS

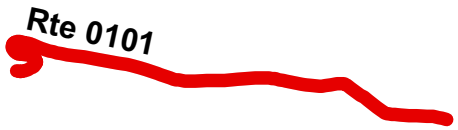
* Lane miles are based on 11' lane widths

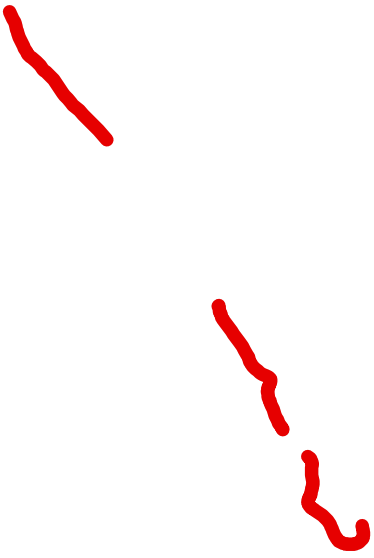
NORTH CASCADES NATIONAL PARK
Route 0101
CASCADE RIVER ROAD
FROM WEST PARK BOUNDARY
TO CASCADE PASS TRAILHEAD PARKING

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Paved Length (mi)	Paved Width (ft)
0101	PUBLIC	8/4/2010	87,874	1.51	1.21	13.8
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
3	0	1	NO CURB AND GUTTER	NO CURB	GOOD/90	AS

* Lane miles are based on 11' lane widths

NOTE: Route 0101 is made up of four separate paved sections that were collected in Cycle-5, and additional unpaved sections that were not collected and so are not being shown here.

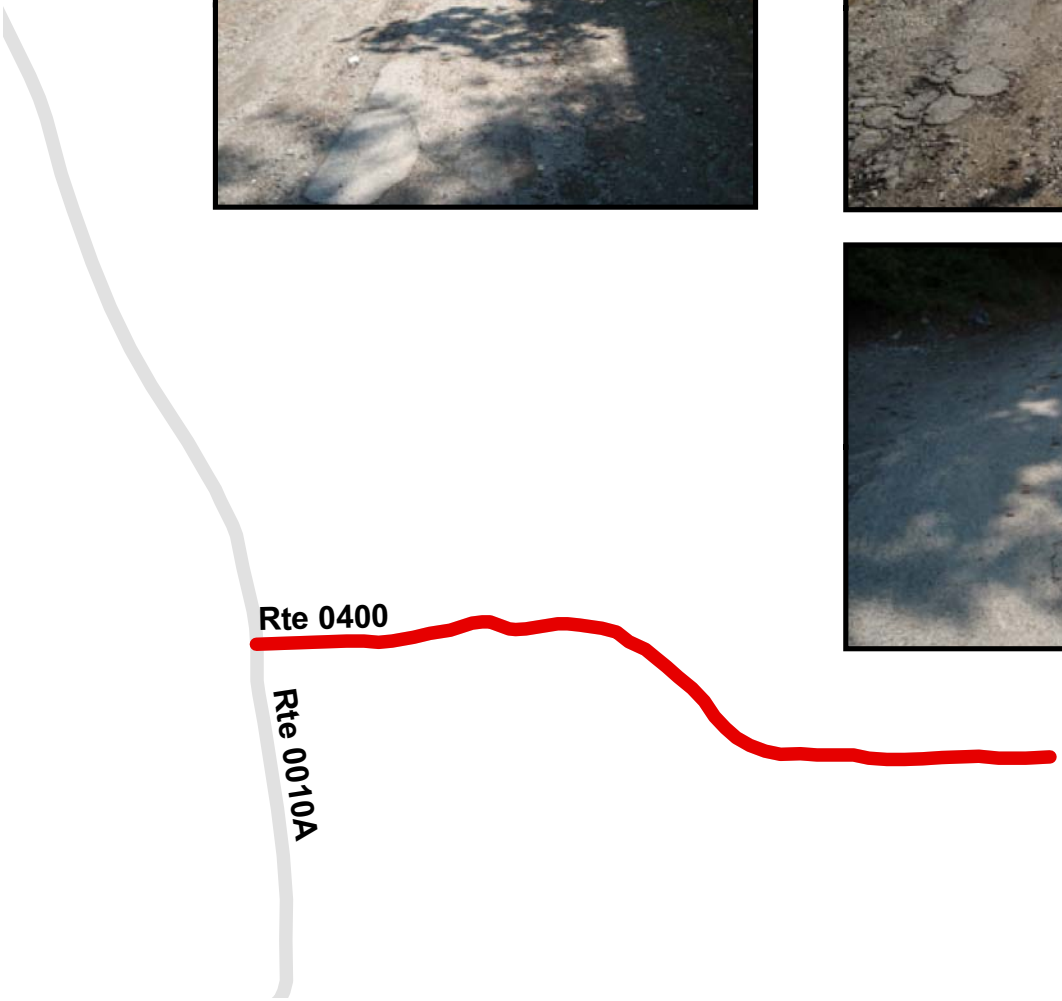




NORTH CASCADES NATIONAL PARK
Route 0400
STEHEKIN TREATMENT PLANT HILL ROAD
FROM ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 0.2
TO END AT WASTE WATER TREATMENT PLANT

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Paved Length (mi)	Paved Width (ft)
0400	PUBLIC	8/5/2010	3,767	0.07	0.06	12.3
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**	**Surface Type**
0	0	0	NO CURB AND GUTTER	NO CURB	POOR/45	AS

* Lane miles are based on 11' lane widths



190 95 0 190 Feet

Section 7
Parking Area
Condition Rating Sheets

North Cascades National Park

Federal Lands Highway
Road Inventory Program

NORTH CASCADES NATIONAL PARK
Route 0900B
MARBLEMOUNT WILDERNESS OFFICE PARKING

FROM RANGER STATION ROAD

TO ROUTE 0108 (OLSON CREEK ROAD) AND ROUTE 0435A (MARBLEMOUNT COUNCIL OAK DRIVE)

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0900B	NONPUBLIC	8/4/2010	6,171	0.11	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	NO CURB	POOR/45

* Lane miles are based on 11' lane widths

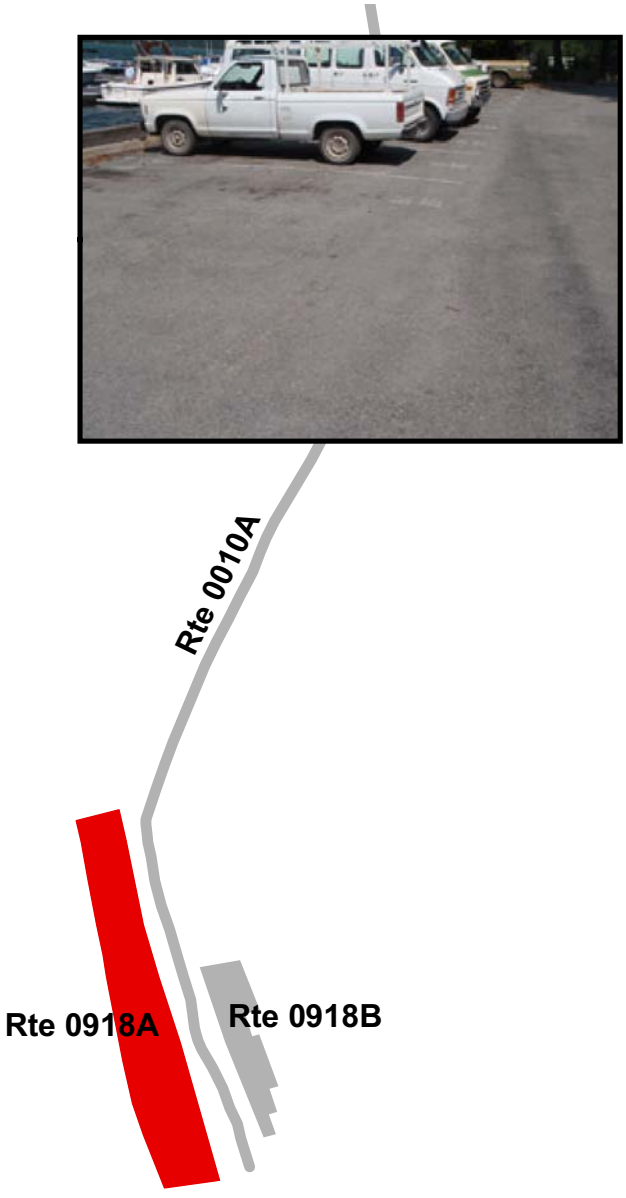
190 95 0 190 Feet

N

NORTH CASCADES NATIONAL PARK
Route 0918A
STEHEKIN BOAT LANDING PARKING A
ADJACENT TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 0.02

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0918A	PUBLIC	8/5/2010	6,427	0.11	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	WOOD CURB	FAIR/73

* Lane miles are based on 11' lane widths



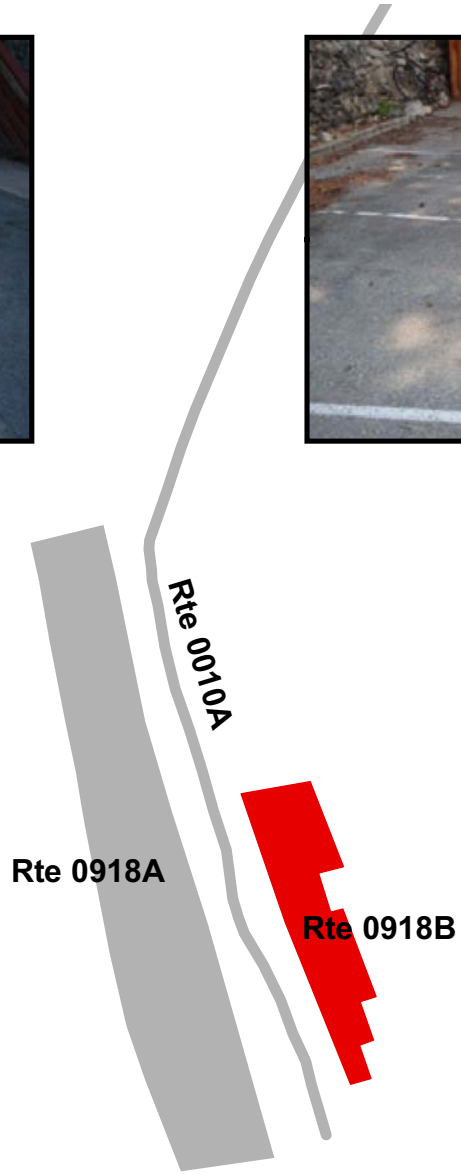
310 155 0 310 Feet

N

NORTH CASCADES NATIONAL PARK
Route 0918B
STEHEKIN BOAT LANDING PARKING B
ADJACENT TO ROUTE 0010A (STEHEKIN VALLEY ROAD (PAVED SECTION)) AT MP 0.02

Route Number	Public / NonPublic	Date Visited	Area (sq ft)	Lane Miles *	Surface Type
0918B	PUBLIC	8/5/2010	1,795	0.03	AS
Culverts	**Drop Inlets**	**Gates**	**Curb & Gutter**	**Curb**	**PCR**
0	0	0	NO CURB AND GUTTER	CONCRETE CURB	FAIR/73

* Lane miles are based on 11' lane widths



200 100 0 200 Feet

N

Section 8
Route Maintenance Features Summaries

North Cascades National Park

Federal Lands Highway
Road Inventory Program

DCV ROUTE MAINTENANCE FEATURES SUMMARY

This park is classified as a Large Park. Therefore, in Cycle 5, no features asset inventory was conducted unless the route was modified or previously uncollected by RIP.

Section 9
Route Maintenance Features
Road Logs

North Cascades National Park

Federal Lands Highway
Road Inventory Program

ROUTE MAINTENANCE FEATURES ROAD LOGS

This park is classified as a Large Park. Therefore, in Cycle 5, no features asset inventory was conducted unless the route was modified or previously uncollected by RIP.

Section 10
Appendix

North Cascades National Park

Federal Lands Highway
Road Inventory Program

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

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

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

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

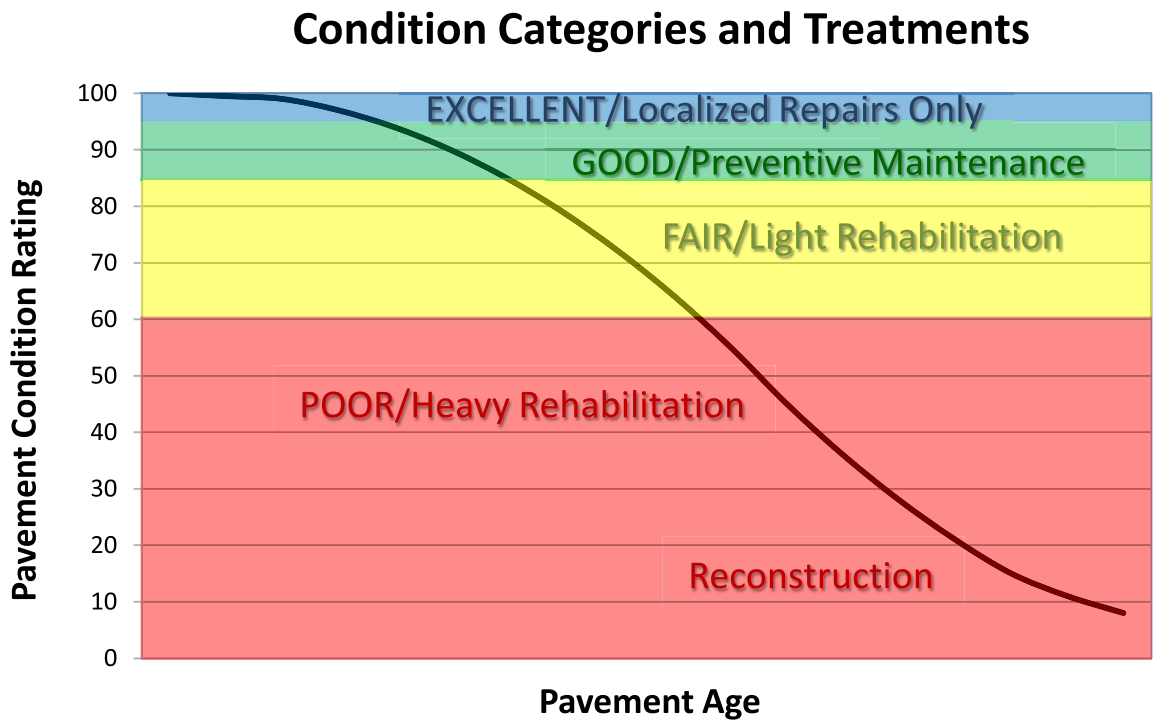
The changes that were implemented were endorsed by management at both the FHWA and NPS. In order to show the effectiveness of these changes, several sites were ground truth tested to ensure that an improvement was achieved between the relationship of PCR and the actual Maintenance and Rehabilitation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

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

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

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

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



DESCRIPTION OF RATING SYSTEM

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

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

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

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

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

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

SURFACE DISTRESSES

Surface Condition Rating - SCR

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

Surface distresses determined from digital images

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

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

- Rutting

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

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

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

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

Roughness Condition Index - RCI

Additional condition data measured by DCV (lasers and accelerometers)

- Roughness (IRI)

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

Pavement Condition Rating - PCR

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

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

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

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

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

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

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

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

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

TABLE 1: Distress Summary

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

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

ALLIGATOR CRACKING

Description

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

Severity Levels

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

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

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

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

TABLE 2: Alligator Crack Severity Levels

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

LONGITUDINAL CRACKING

Description

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

Severity Levels

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

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

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

TRANSVERSE CRACKING

Description

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

Severity Levels

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

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

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

PATCHING AND POTHOLES

Description

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

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

Severity Levels

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

RUTTING

Description

Rutting is a longitudinal surface depression in the wheelpath.

Severity Levels

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

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

HIGH
Ruts with a measured depth ≥ 1.00"

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

ROUGHNESS

Description

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

Severity Levels

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

TABLE 3: IRI

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

INDEX FORMULAS

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

Alligator Crack Index

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

Where:

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

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

Percent of total area is computed as:

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

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

Longitudinal Crack Index

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

Where:

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

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

Percent of interval length is computed as:

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

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

Structural Crack Index

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

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

Transverse Crack Index

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

Where:

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

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

Number of cracks is computed as:

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

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

Patching Index

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

Where:

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

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

Percent of total area is computed as:

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

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

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

Rutting Index

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

Where:

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

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

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

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

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

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

Roughness Condition Index (Asphalt)

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

Where:

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

Average IRI is computed as:

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

There is no applicable threshold for failure for this index.

Roughness Condition Index (Concrete)

RCI = $-0.0012(\text{IRI}^2) + 0.0499(\text{IRI}) + 99.542$

For concrete, PCR = RCI

Surface Condition Rating Index

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

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

Where:

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

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

Data Collection Vehicle Subsystems

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

CAMERAS

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

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

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

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

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

DMI (Distance Measuring Instrument)

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

ROUGHNESS (IRI)

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

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

RUTTING

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

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

GPS & INERTIAL SYSTEMS

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

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

GPS on Manually Rated Roads (MRR)

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

Geodatabase – Background and Metadata

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

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

GLOSSARY OF TERMS AND ABBREVIATIONS

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