VOLUME II

Yellowstone National Park

PARKWIDE
ROAD ENGINEERING STUDY

1986

PREPARED FOR THE NATIONAL PARK SERVICE

BY

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
WESTERN DIRECT FEDERAL DIVISION
610 EAST FIFTH STREET
VANCOUVER, WASHINGTON 98661-3893

VOLUME II

PARKWIDE ROAD ENGINEERING STUDY

OF THE

Yellowstone National Park

ROAD SYSTEM

FINAL REPORT

JULY 1987

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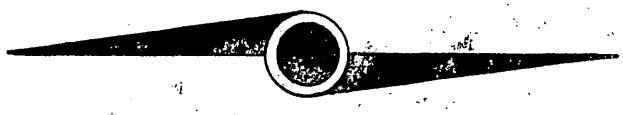

100 GRANT

#3239J:1
Map: Pg. IV-229
Photos: Pgs. IV-231 to IV-234

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 100 et al; Name: Grant Village Complex

Route Location:
On the east side of Route 14 (South Entrance Road) along the southwest shore of the West Thumb of Yellowstone Lake.

Purpose/Function:
The Grant Village Complex is a newly constructed visitor accommodation facility. It is primarily oriented to the accommodation of overnight visitors.

TABLE 100-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
100	Grant Road	1.80	Public Access	II	75.0-100.0	91.3-99.1
200	Grant Campground Road	3.61	Campground Access	III	68.8	82.3
201	Grant Marina Road	1.05				
	MP 0.00 to MP 0.91	0.91	Marina Access and Parking	II	75.0	83.6
	MP 0.91 to MP 1.05	0.14	Breakwater Access	V	75.0	83.6
267	Grant Visitor Center and Restaurant Loop	0.37	Public Access	III	N/R	N/R
414	Grant East Residence and Sewage Plant Service Road	0.34	Service Road			
	MP 0.00 to MP 0.21	0.21	Residence Access	V	81.3	97.5
	MP 0.21 to MP 0.34	0.13	Service Road	VI	81.3	97.5
420	Grant Residence Service Road	0.45	Residence Road	V	81.3	97.5
424	Grant Restaurant and Post Office Service Road	0.31	Service Road	VI	87.5	100.6
425	Grant Water Storage Tank Service Road	0.59	Service Road	VI	68.8	96.3
426	Grant Sewage Lift Station Service Road	0.66	Service Road	VI	68.8	96.3
427	Grant Concessioner Employee Housing Service Road	0.38	Residence Road	V	68.8	96.3
428	Grant Concessioner Trailer Park Service Road	0.10	Residence Road	V	43.8	86.6
454	Grant Water Supply Intake Road	0.10	Service Road	VI	N/R	N/R
904	Grant Visitor Center and Post Office Parking Area	0.21	Public Parking	III	N/R	N/R
905	Grant Picnic Area Parking	0.15	Public Parking	III	N/R	N/R
907	Grant Service Station Road	0.21				
	MP 0.00 to MP 0.10	0.10	Public Access	III	N/R	N/R
	MP 0.10 to MP 0.21	0.11	Service Road	VI	N/R	N/R
908	Grant Ranger Station Pkng Area	0.06	Public Parking	III	N/R	N/R
909	Grant Boat Launch Parking Area	0.15	Public Parking	III	N/R	N/R
947	Grant Store and Lodging Roads	0.60	Public Access	III	N/R	N/R
948	Grant Camper Service Road	0.06	Service Road	III	N/R	N/R

N/R = Not Rated

Topography: Flat to Rolling

Vegetation:
Moderate to heavy Lodgepole Pine forest with light understory.

BRIDGES AND MAJOR STRUCTURES:

Route:	100	100	200
Name:	Grant Village A	Grant Village B	Grant Village C
BIP Number:	1570-031P	1570-032P	1570-033P
Location MP:	1.27	1.40	0.29
Type of Structure:	9 Span Treated Timber Trestle With Wood Deck	4 Span Treated Timber Trestle With Wood Deck	9 Span Treated Timber Trestle With Wood Deck
Structure Length(ft):	208	92	207
Deck Width c to c (ft):	24.3	24.3	24.2
Sidewalks/curbs, type:	Wood	Wood	Wood
Sidewalks/curbs, width(ft):	3.8Rt Side Only	3.8Rt Side Only	4.0Rt Side Only
Rails, type:	Wood Rail &Post	Wood Rail &Post	Wood Rail &Post
General Condition:	Good-Railings do not conform to current safety design criteria.	Good-Railings do not conform to current safety design criteria.	Good-Railings do not conform to current safety design criteria.

SPECIAL PROBLEMS OR FEATURES:

The Grant Village Complex is a newly developed public accommodation facility. Most of the routes within the complex have been recently constructed or are under construction. The condition of paved roadways and parking areas with some exceptions is, therefore, good to excellent.

PRINCIPAL ROAD NEEDS:

Routes 100, 200, 201, 267, 424, 427, 904, 909, and 947 are newly paved and are in good to excellent condition. No immediate needs are identified. Long range needs will involve application of a bituminous plant mix overlay within a 10 to 12 year period.

Routes 420, 905, 907, 908, and 948 have older, low to intermediate type pavements and will require a bituminous plant mix overlay within a short range (5 to 10 year) period.

Routes 414, 425, 426, and 454 are semi-primitive service roads which are to be maintained in their present condition.

Construction of Route 428 has been deferred pending an NPS decision on disposition of the proposed Concessioner Trailer Park.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

Environmental impacts of the Grant Village development are identified in the Environmental Assessment for the Development Concept Plan prepared by NPS and dated June 1979. No additional environmental issues and concerns are envisioned from the road improvements proposed in this report.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

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SCOPE OF WORK:

A long-range (future) bituminous plant mix overlay of roads and parking areas is proposed for Routes 100, 200, 201, 267, 424, 427, 904, 909, and 947. Short-range to intermediate-range bituminous plant mix overlays are proposed for Routes 420, 905, 907, 908, and 948. No work is proposed for Routes 414, 425, 426, and 454.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Application of bituminous plant mix overlays to roads and parking areas at an appropriate point in time will maintain the facilities in a serviceable and functional condition.

#3239J:5

TABLE 100-2
EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
100	Grant Road	19-32	19-32	2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	25
200	Grant Campground Road	12-20	12-20	1-2	Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	15
201	Grant Marina Road	20-26	20-26	2	Bituminous Plant Mix	Good	Good	Good	Fair	Good	Good	25
267	Grant Visitor Center and Restaurant Loop	20	20	2	Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	15
414	Grant East Resident and Sewage Plant Service Road	20	14	1	Gravel	Good	Good	Fair	Poor	Fair	Fair	15
420	Grant Residence Service Road	19-20	19-20	2	Bituminous Plant Mix	Good	Good		Poor	Fair	Fair	15
424	Grant Restaurant and Post Office Service Road	15	15	1	Bit Surface Treatmnt	Good	Good	Good	N/A	Good	Good	5
425	Grant Water Storage Tank Service Road	14	14	1	Gravel	Good	Good	Fair	N/A	Fair	Good	15
426	Grant Sewage Lift Sta Serv Rd	16	12	1	Gravel	Good	Good	Poor	N/A	Fair	Fair	25
427	Grant Concessioner Employee Housing Service Road	28	22	2	Bituminous Plant Mix	Good	Good	Good(New)	Good	Good	Good	15
428	Grant Concessioner Trailer Park Service Road				Not Constructed							
454	Grant Water Supply Intake Rd	17	12	1	Gravel	Good	Good	Fair	Poor	Fair	Fair	25
904	Grant Visitor Center and Post Office Parking Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	15
905	Grant Picnic Area Parking	20	20	2	Bituminous Plant Mix	Good	Good	Fair	N/A	Good	Good	15
907	Grant Service Station Road	22		2	Bit Surface Treatmnt	Good	Good	Poor	N/A	Fair	Good	15
908	Grant Ranger Station Pkng Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Fair	N/A	Fair	Good	15
909	Grant Boat Launch Pkng Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	15
947	Grant Store and Lodging Roads	20	20	2	Bituminous Plant Mix	Good	Good	Good	Fair	Good	Good	15
948	Grant Camper Service Road	N/A	N/A		Sealed Bit Plant Mix	Good	Good	Fair	N/A	Fair	Good	15

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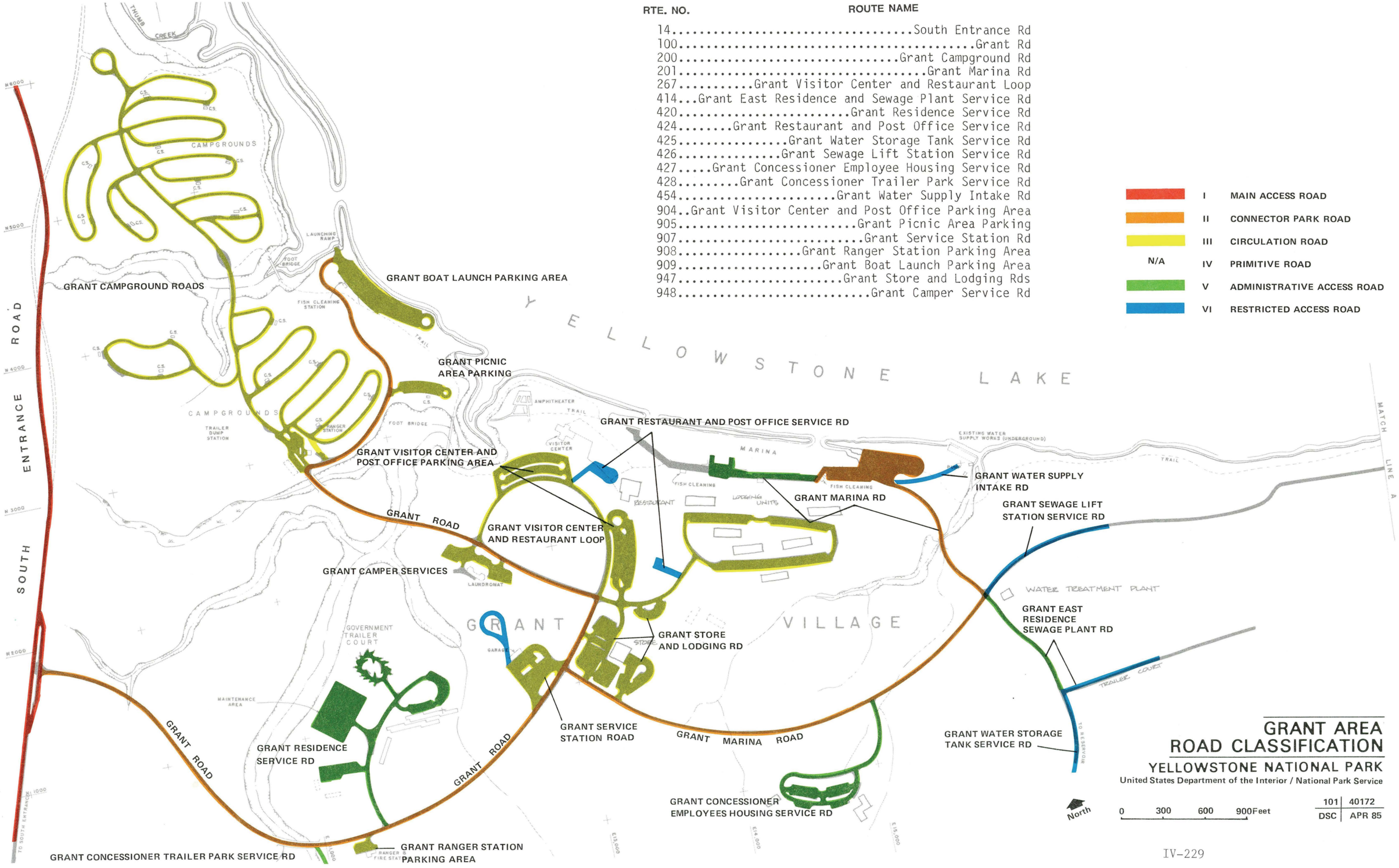
TABLE 100-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
100	Grant Road	Main Roadway	Future BPM Overlay	10,000	20,000	119,000	8,000	16,000	43,000	32,000	248,000
200	Grant CG Roads	Access Rds & Pkng	Future BPM Overlay		5,000	234,000	40,000	28,000	77,000	58,000	442,000
201	Grant Marina Rd	Main Roadway	Future BPM Overlay		5,000	94,000	5,000	10,000	29,000	21,000	164,000
267	Grant Visitor Ctr & Restaurant Loop	Access & Parking	Future BPM Overlay		5,000	50,000	4,000	6,000	16,000	12,000	93,000
414	Grant E Res &Sewage Plant Serv Rd	Service Road	No Work Proposed								
420	Grant Res Serv Rd	Service Rd & Pkng	BPM Overlay		5,000	38,000	3,000	5,000	13,000	10,000	74,000
424	Grant Restaurant&PO Service Road	Service Rd & Pkng	No Work Proposed								
425	Grant Water Storage Tank Serv Rd	Service Road	No Work Proposed								
426	Grant Sewage Lift Station Serv Rd	Service Road	No Work Proposed								
427	Grant Conc Employ Housing Serv Rd	Service Rd & Pkng	No Work Proposed								
428	Grant Conc Trailer Park Serv Rd	Service Road	No Work Proposed (Under Construction)								
454	Grant Water Supply Intake Rd	Service Road	No Work Proposed								
904	Grant Vstr Cntr &PO Parking Area	Parking Areas	Future BPM Overlay (Estimate Included with Route 267)								
905	Grant Picnic Area Parking	Access Rd & Pkng	BPM Overlay			7,000	1,000	1,000	2,000	2,000	13,000
907	Grant Serv Sta Rd	Approaches & Pkng	BPM Overlay			37,000	3,000	1,000	10,000	8,000	59,000
908	Grant Ranger Sta Parking Area	Approaches & Pkng	BPM Overlay			10,000	1,000	1,000	3,000	2,000	17,000
909	Grant Boat Launch Parking Area	Parking Area	Future BPM Overlay			41,000	3,000	4,000	12,000	9,000	69,000
947	Grant Store and Lodging Roads	Access Rds & Pkng	Future BPM Overlay			126,000	9,000	14,000	37,000	28,000	214,000
948	Grant Camper Service Road	Rd Approaches &Pkng	Future BPM Overlay			22,000	2,000	2,000	7,000	5,000	38,000
			TOTAL COST	10,000	40,000	778,000	79,000	88,000	249,000	187,000	1,431,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.

RTE. NO.	ROUTE NAME
14	South Entrance Rd
100	Grant Rd
200	Grant Campground Rd
201	Grant Marina Rd
267	Grant Visitor Center and Restaurant Loop
414	Grant East Residence and Sewage Plant Service Rd
420	Grant Residence Service Rd
424	Grant Restaurant and Post Office Service Rd
425	Grant Water Storage Tank Service Rd
426	Grant Sewage Lift Station Service Rd
427	Grant Concessioner Employee Housing Service Rd
428	Grant Concessioner Trailer Park Service Rd
454	Grant Water Supply Intake Rd
904	Grant Visitor Center and Post Office Parking Area
905	Grant Picnic Area Parking
907	Grant Service Station Rd
908	Grant Ranger Station Parking Area
909	Grant Boat Launch Parking Area
947	Grant Store and Lodging Rds
948	Grant Camper Service Rd

	I	MAIN ACCESS ROAD
	II	CONNECTOR PARK ROAD
	III	CIRCULATION ROAD
N/A	IV	PRIMITIVE ROAD
	V	ADMINISTRATIVE ACCESS ROAD
	VI	RESTRICTED ACCESS ROAD



GRANT AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101	40172
DSC	APR 85

GRANT VILLAGE COMPLEX

ROUTE 100

MP 1.04 Approaching Camper Services Area

MP 1.39 Bridge and Campgroundd Entrance

ROUTE 200

MP 0.00 Campground Entrance

MP 0.10 Trailer Dump Station

Typical Campground Loop

GRANT VILLAGE COMPLEX

ROUTE 201

MP 1.12 Grant Marina Parking Area

ROUTE 267

MP 0.19 Approaching Visitors Center Grant Vicinity

ROUTE 414

East Residence (Trailer) Area

ROUTE 420

MP 0.12 Approaching Government Housing Area

ROUTE 425

MP 0.48 Approaching Water Storage Tank

GRANT VILLAGE COMPLEX

ROUTE 904

Parking Area at Post Office (Under Construction)

ROUTE 907

Service Station Parking Area

MP 0.89 Service Station

ROUTE 909

MP 0.13 Boat Launch Parking Area

Marina Area

GRANT VILLAGE COMPLEX

ROUTE 947

MP 0.38 Lodging Parking Area (Under Construction)

MP 0.99 Hamilton Store Parking Area

ROUTE 948

MP 1.18 Grant Camper Services Parking Area

100 +

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Map: Pg. IV-129
Photos: Pg. IV-239

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route Nos. 101 & 463; Name: Reese Creek Area Roads

Route No. (RIP): 101; Reese Creek Road
463; Stephens Creek Road

Route 101 Length: 4.50 miles; Milepost 0.00 to Milepost 4.50
Route 463 Length: 1.23 miles; Milepost 0.00 to Milepost 1.23

Route Location:
From the intersection with Route 11 (MP 0.00) at the North Entrance Station at Gardiner to the North Boundary of the park.

Purpose/Function:
Route 101 provides minor public access to a wildlife (antelope) viewing area. It also serves as an access route between Gardiner and private land holdings outside of the northwesterly park boundary. It is maintained by Park County, Montana, under agreement with NPS.

Route 463 is an access road to a former ranch inholding which is now used as an administrative service area.

Functional classification:
Route 101 1984 NPS Standard Class: II (Connector Park) Road
Route 463 1984 NPS Standard Class: VI (Restricted) Road

Topography: Rolling

Vegetation:
Sparse, low growing, arid to semi-arid vegetation dominated by sagebrush and grasses.

ROUTE 101:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 150 vehicles
Passenger Cars and Pickups: 82%; Buses and Trucks: 4%
Recreational Vehicles: 14%; Bicycle Use: Very Light
Projected Average Daily Traffic (2005): 240 vehicles
Roadway Width (shoulder to shoulder): 18 ft.
Pavement/Surfacing Width: 18 ft.; Type: Gravel; Condition: Fair
Base/Subgrade Cond: Good; Drainage Cond: Poor to Fair - No Roadside Ditches
Shoulder Width: 0 ft.; Shoulder Cond: N/A
Posted Speed Limit: 45 mph; Ave. Oper. Speed: 35 mph
Horizontal Alignment: Good; Vertical Alignment: Good

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 43.8; Adjusted OSR: 58.8
Roadside Condition: Good - Open and Unobstructed

SPECIAL PROBLEMS OR FEATURES:
This road enjoys limited visitor use. The park management strategy is to maintain it as a semi-primitive facility to control excessive use which could result in damage to a fragile resource area.

PRINCIPAL ROAD NEEDS:
Improve drainage characteristics and provide an all-weather roadway surface.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
Because of the sparse vegetation, lack of top soil, and arid climatic conditions, visitor use of this area must be controlled.

BRIDGES AND MAJOR STRUCTURES:

Name:	Reese Creek
BIP Number:	None
Location MP:	4.47
Type of Structure:	7x12 Steel Pipe Arch Culvert
Structure Length(ft):	12
Deck Width c to c (ft):	20
Sidewalks/curbs, type:	Log
Sidewalks/curbs, width(ft):	N/A
Rails, type:	None
General Condition:	Good. Structure does not have safety rails or approach guardrails.

ROUTE 463:

EVALUATION OF EXISTING ROADWAY:
Existing Average Daily Traffic (1985): 25 vehicles (Restricted Road)
Projected Average Daily Traffic (2005): 25 vehicles
Roadway Width (shoulder to shoulder): 12-15 ft.
Pavement/Surfacing Width: 12-15 ft.; Type: Gravel;
Condition: Fair, Semi-Primitive Road

Base/Subgrade Cond:	Good;	Drainage Cond:	Poor-Fair
Shoulder Width:	0 ft.;	Shoulder Cond:	N/A
Posted Speed Limit:	None mph;	Ave. Oper. Speed:	25 mph
Horizontal Alignment:	Satisfactory;	Vertical Alignment:	Satisfactory

Road Improvement Study (RIP) Segment Nos.: Not Rated
Roadside Condition: Satisfactory

SPECIAL PROBLEMS OR FEATURES:
None identified.

PRINCIPAL ROAD NEEDS:
None identified. The park management strategy provides for maintaining the road in its present condition.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
None identified.

TYPES OF IMPROVEMENTS:
Resurfacing _____ Rehabilitation X(Rte 101) Reconstruction _____
New Construction _____ No Improvement X(Rte 463) Maintenance Seal Coat ___

SCOPE OF WORK:
Route 101: Recondition roadway; widen roadway to provide a 20 foot surface width; resurface with crushed gravel; install safety guardrails at Reese Creek Bridge; and install new cattle guard at park boundary.

Route 463: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:
_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS:

Proposal:	Route 101	1984 NPS Stds.
Roadway Width (ft):	20	20
Lane Width (ft):	9	9
No. of Traffic Lanes:	2	2
Shldr Width (ft/side):	1	1
Shldr Bicycle Lanes:	None	None
Design Speed (mph):	35	35

ESTIMATE OF COST:	Route 101
Roadway Width (ft)	20
Clearing	$
Landscaping	23,000
Grading	55,000
Drainage	68,000
Structures	
Surfacing/Paving	142,000
Safety & Traffic Cont	14,000
Mobilization 10%	30,000
Incidental Items 25%	83,000
Construction Subtotal	415,000
Constr Engr (FHWA) 15%	62,000
Total Estimated Cost	$ 477,000
Cost Per Mile	$ 106,000
Prelim Engr (FHWA) 15%	$ 62,000
For Materials Source Inside Park, Deduct	$ N/A

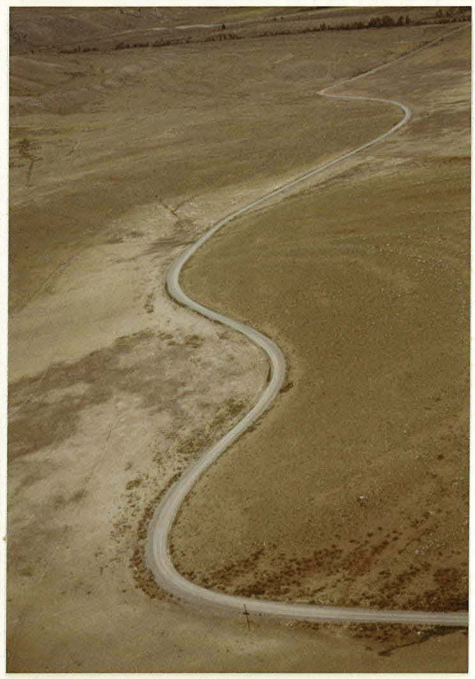
Note: Cost estimates are rounded to nearest $1,000.

BENEFITS/RESULTS:
Safety and utility of the facility will be enhanced. Semi-primitive character of the road will be retained.

REESE CREEK AREA ROADS

ROUTE 101

MP 1.52 Typical Condition Reese Creek Road Facing West



Aerial View, MP 3.50 Reese Creek Vicinity

MP 4.47 Reese Creek Culvert

ROUTE 463

MP 0.59 Stephens Creek Road, Facing South

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Map: Pg. IV-245
Photos: Pgs. IV-247 to IV-248

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. 102 et al; Name: Cave Falls Vicinity Roads

Route No. (RIP): 102; Cave Falls Road
213; Bechler Ranger Station Road
955; Cave Falls Campground

Route 102 Length: 1.19 miles; Milepost 0.00 to Milepost 1.19
Route 213 Length: 1.38 miles; Milepost 0.00 to Milepost 1.38
Route 955 Length: 0.22 mile; Milepost 0.00 to Milepost 0.22

Route Location:
In the extreme southwest corner of the park. These routes are only accessible from the vicinity of Ashton, Idaho, via Idaho State Route 47 and the Falls River (county) road.

Purpose/Function:
Route 102 - Public Access to Cave Falls and Cave Falls Campground
Route 213 - Access to Bechler Ranger Station and Trailhead
Route 955 - Campground Circulation and Parking

Functional classification:
Route 102 1984 NPS Standard Class: II (Connector Park) Road
Route 213 1984 NPS Standard Class: II (Connector Park) Road
Route 955 1984 NPS Standard Class: III (Special Purpose Park) Road

Topography: Rolling

Vegetation:
Moderate to heavy Lodgepole Pine forest.

SPECIAL PROBLEMS OR FEATURES:
These routes access an area of exceptional beauty in a remote area of the park. Visitor use is limited by the remote location.

PRINCIPAL ROAD NEEDS:
Rehabilitate pavement structure. Improve the load carrying capability of the roadway structure and parking areas.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
There will be a minor temporary disturbance and changes in vegetation along the roadsides with some permanent loss of vegetation in areas of shoulder widening. There will be a slight increase in the visual scale of the roadway relative to the landscape.

ROUTE 102:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 100 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 120 vehicles
Roadway Width (shoulder to shoulder): 19 ft.
Pavement/Surfacing Width: 16 ft.; Type: Bituminous Plant Mix;
Condition: Fair to Poor

Base/Subgrade Cond:	Fair	Drainage Cond:	Fair
Shoulder Width:	1.5 ft.	Shoulder Cond:	Poor
Posted Speed Limit:	Not Posted mph	Ave. Oper. Speed:	25 mph
Horizontal Alignment:	Fair	Vertical Alignment:	Fair

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 68.8; Adjusted OSR: 68.6
Roadside Condition:
Fair - Minor encroaching vegetation obstructs sight distance in some areas.

ROUTE 213:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 50 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Low
Projected Average Daily Traffic (2005): 60 vehicles
Roadway Width (shoulder to shoulder): 12 ft.
Pavement/Surfacing Width: 12 ft.; Type: Gravel; Condition: Fair

Base/Subgrade Cond:	Fair	Drainage Cond:	Fair
Shoulder Width:	0 ft.	Shoulder Cond:	N/A
Posted Speed Limit:	25 mph	Ave. Oper. Speed:	25 mph
Horizontal Alignment:	Good	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 25.0; Adjusted OSR: 40.9
Roadside Condition: Satisfactory for a low speed semi-primitive facility.

ROUTE 955:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 50 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Low
Projected Average Daily Traffic (2005): 60 vehicles
Roadway Width (shoulder to shoulder): 14 ft.
Pavement/Surfacing Width: 14 ft.; Type: Bituminous Plant Mix;
Condition: Poor

Base/Subgrade Cond:	Fair	Drainage Cond:	Fair
Shoulder Width:	0 ft.	Shoulder Cond:	N/A
Posted Speed Limit:	15 mph	Ave. Oper. Speed:	10 mph
Horizontal Alignment:	Fair	Vertical Alignment:	Poor

Road Improvement Study (RIP) Segment Nos.: Not Rated
Roadside Condition: Satisfactory

TYPES OF IMPROVEMENTS:

Resurfacing ____ Rehabilitation X(Rtes. 102 and 955) Reconstruction ____
New Construction ___ No Improvement X(Route 213) Maintenance Seal Coat __

SCOPE OF WORK:

Route 102 - Alternative 1: Recondition roadway and repair base failure areas; restore and improve drainage; resurface and pave with bituminous plant mix to obtain a 20 to 22 foot wide paved surface.

Alternative 2: Recondition roadway and repair base failure areas; restore and improve drainage; resurface and pave with bituminous plant mix to obtain a 14 foot wide paved surface (no widening). Alternate 2 will provide a one-lane roadway with intervisible passing turnouts.

Route 213 - No work is proposed. The park management strategy provides for maintaining this facility in its present semi-primitive condition.

Route 955 - Resurface and pave road and parking areas.

PROBABLE ENVIRONMENTAL CLEARANCE:

____	Environmental Impact Statement	
X	Environmental Assessment	Alternative 1
X	Categorical Exclusion	Alternative 2

ALTERNATIVES:

Road Standards:

	Route 102		Route 955	1984
Alternative:	Alt. 1	Alt. 2		NPS Stds.
Roadway Width (ft):	20-22	14	14	22
Lane Width (ft):	10	14	14	10 *
No. of Traffic Lanes:	2	1	1	2
Shldr Width (ft/side):	0-1	0	0	1
Shldr Bicycle Lanes:	No	No	No	
Design Speed (mph):	35	35	15	35

*Adjusted for tour bus and recreational vehicle use.

ESTIMATES OF COST:

	Route 102	
	Alt. 1	Alt. 2
Roadway Width (ft)	20-22	14
Clearing	$ 12,000	$ 5,000
Landscaping	22,000	20,000
Grading	178,000	22,000
Drainage	18,000	15,000
Structures		
Surfacing/Paving	166,000	114,000
Safety & Traffic Cont	9,000	9,000
Mobilization 10%	41,000	19,000
Incidental Items 25%	111,000	51,000
Construction Subtotal	557,000	255,000
Constr Engr (FHWA) 15%	84,000	38,000
Total Estimated Cost	$ 641,000**	$ 293,000**
Cost Per Mile	$ 539,000	$ 246,000
Prelim Engr (FHWA) 10%	$ 56,000	$ 26,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A

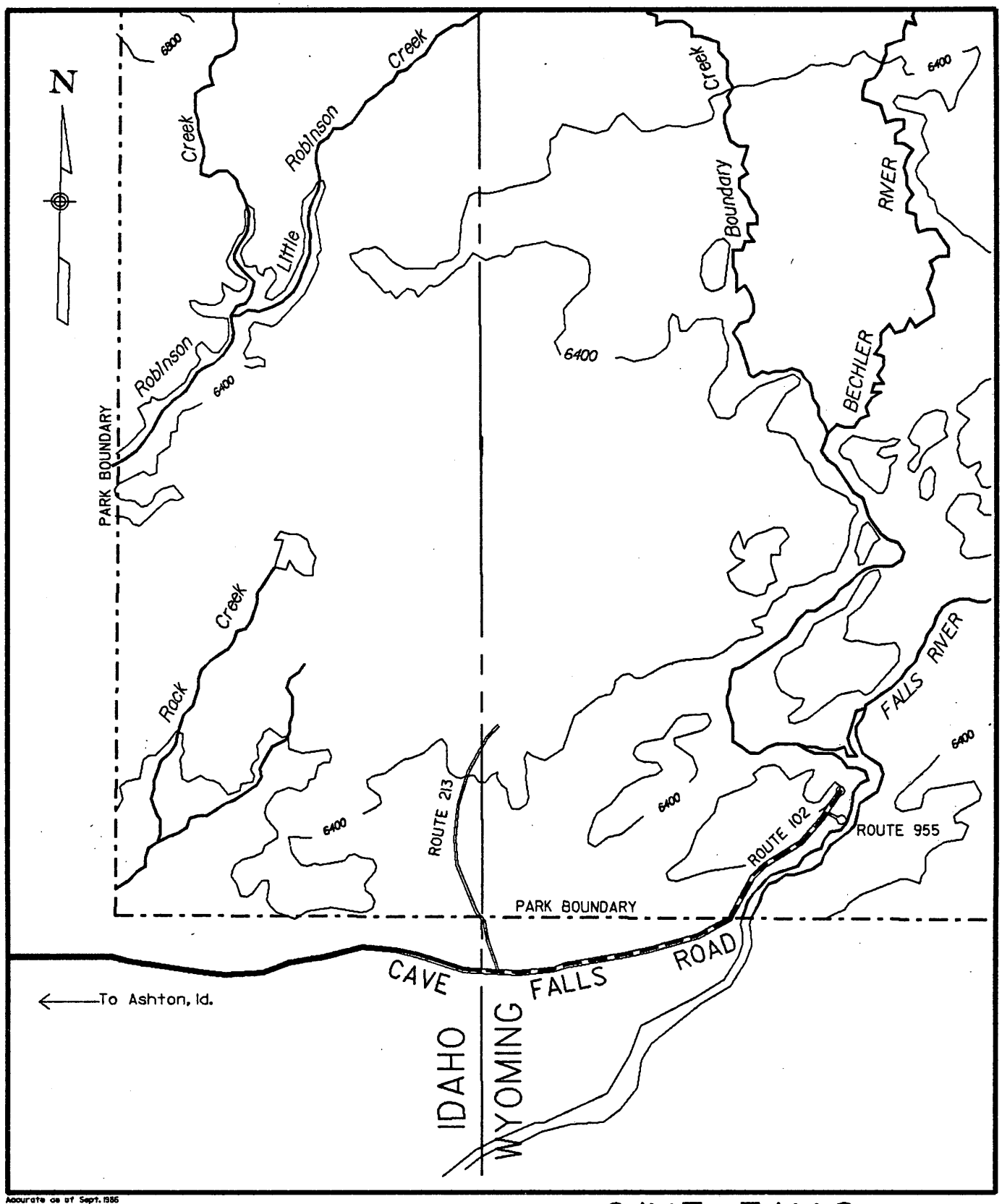
Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 3 Inch Depth Bituminous Plant Mix Pavement
**For resurfacing and paving Route 955, Cave Falls Campground, add $37,000.

BENEFITS/RESULTS:

Both alternatives for improvement of Route 102 will improve riding qualities and extend the pavement service life.

Alternative 1 features a widened roadway which will enhance safety by providing two traffic lanes.

YELLOWSTONE NATIONAL PARK
PARKWIDE ROAD ENGINEERING STUDY



Accurate as of Sept. 1985

ROUTE NO.	ROUTE NAME	REPORT PAGE
102	Cave Falls Rd.	IV-241
213	Bechler Ranger Station Rd.	IV-241
955	Cave Falls Campground	IV-241

CAVE FALLS VICINITY ROADS

0 ½ 1 2 Miles

5000 0 5000 10000 Feet

SCALE

CAVE FALLS AREA ROADS

ROUTE 102

MP 0.00 Park Entrance

MP 0.12 Typical Roadway Condition

MP 0.93 Access Picnic Area

MP 1.09 Loop at End of Road

CAVE FALLS AREA ROADS

ROUTE 213

MP 0.16 Park Entrance

MP 0.44 Typical Roadway Condition

MP 1.43 Ranger Station Area

103 CANYON

#3244J:1
Map: Pg. IV-255
Photos: Pgs. IV-257 to IV-262

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 103 et al; Name: Canyon Village and Yellowstone Falls Complex

Route Location:

Adjacent to the west rim of the Grand Canyon of the Yellowstone River in the north central park area.

Purpose/Function:

Visitor accommodation for the prime park attractions of the Upper and Lower Yellowstone Falls and the Grand Canyon of the Yellowstone River.

TABLE 103-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
103	Canyon Village Road*	0.31	Public Access	II	87.5	95.6
108	South Rim Drive	1.75	Scenic Road			
	MP 0.00 to MP 1.40	1.40		II	68.8	89.9
	MP 1.40 to MP 1.75	.35		III	68.8	89.9
205	Canyon Cabins Area Roads*	2.47	Overnight Accommodations			
	MP 0.00 to MP 0.30	0.30		II	87.5	91.3
	MP 0.30 to MP 2.47	2.17		III	87.5	91.3
214	Upper Falls Road	0.42	Scenic Road			
	MP 0.00 to MP 0.24	0.24		II	56.3	83.6
	MP 0.24 to MP 0.42	0.18		III	56.3	83.6
	MP 0.00 to MP 0.05	.05	Emergency River Access	VI	56.3	83.6
217	Inspiration Point Road	0.89	Access to Scenic Overlook			
	MP 0.00 to MP 0.73	0.73		II	56.3	80.4
	MP 0.73 to MP 0.89	0.16		III	56.3	80.4
221	Canyon Campground Roads	3.48	Campground Access	III	62.5	84.2
412	Canyon Water Treatment/Sewage Plant Service Road	1.26	Service Road	VI	62.5	84.9
415	Canyon Water Tank Service Road	0.28	Service Road	VI	68.8	91.4
433	Canyon Residence Area Service Road	1.24	Residence Road			
	MP 0.00 to MP 1.11	1.11		V	62.5	89.8
	MP 1.11 to MP 1.24	.13		VI	62.5	89.8
445	Canyon Residence Spur Road	0.41	Residence Road	V	62.5	86.7
447	Canyon Old Camp Road	0.41	Service Road	VI	68.8	88.2
468	Canyon Concessioner Area Service Road	0.27	Service Road	V	N/R	N/R
503	North Rim Drive	1.86	Scenic Road	II	N/R	N/R
914	Canyon Horse Corral and Parking Area	0.70				
	MP 0.00 to MP 0.20	0.20	Public Access and Parking	III	N/R	N/R
	MP 0.20 to MP 0.70	0.50	Administrative Access	VI	N/R	N/R
915	Uncle Tom's Parking Area	0.14	Public Parking	III	N/R	N/R
929	Canyon Visitor Center Parking Area	0.23	Public Parking	III	N/R	N/R
930	Canyon Laundry Parking Area	0.13	Public Parking	III	N/R	N/R
950	Canyon Service Station	0.08	Public Access	III	N/R	N/R

N/R = Not Rated
*Modifications of road configuration are being considered under a revised Development Concept Plan (1987).

Topography: Rolling to Mountainous

Vegetation:
Moderate to heavy Lodgepole Pine forest with light understory interspersed with open meadowland.

BRIDGES AND MAJOR STRUCTURES:

	Route 18
Name:	Chittenden Memorial Bridge
BIP Number:	1570-020P
Location MP:	0.04
Type of Structure:	Single Span Concrete Deck Arch
Structure Length(ft):	148
Deck Width c to c (ft):	26.3
Sidewalks/curbs, type:	Concrete
Sidewalks/curbs, width(ft):	3.7 Rt & Lt
Rails, type:	Concrete
General Condition:	Good

SPECIAL PROBLEMS OR FEATURES:
The canyon area is a prime visitor attraction which enjoys heavy day use and provides limited overnight accommodations.

PRINCIPAL ROAD NEEDS:
(Public Use Routes)

Age and condition of routes varies greatly. Three major visitor accommodation routes manifest rampant pavement and base failure, and are in critical need of repair. These are Route 214 (Upper Falls Road), Route 217 (Inspiration Point Road), and Route 503 (North Rim Drive).

Public use routes which have aging pavements and are recommended for major rehabilitation subject to park management objectives are Route 205 (Canyon Cabins Area Roads) and Route 221 part (Canyon Campground old portion, Loops A through E).

Public use routes which are in fair condition and are recommended for an intermediate range bituminous plant mix overlay are Route 103 (Canyon Village Road), Route 914 (Canyon Horse Corrals Road, paved portion), Route 929 (Canyon Visitors Center Parking), Route 930 (Canyon Laundry Parking), and Route 950 (Canyon Service Station).

Route 108 (South Rim Drive) and Route 915 (Uncle Tom's Parking Area) are in good condition, but are recommended for a bituminous plant mix overlay in 10 to 12 years.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
No changes in roadway widths or cross section are proposed. However, there is a need for minor selective thinning and clearing along Routes 217 and 503 to improve sight distance and enhance visual quality. Except for this, there are no identified potential environmental impacts.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	X
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

1. Reconstruct on existing alignment, resurface, and pave: Routes 205, 214, 217, 221 part (Loops A through E), 433, 445, and 503.

2. Bituminous plant mix overlay of existing paved surfaces: Routes 103, 221 part (Loops F through L), 468, 914 (Main Access Road and Parking), 929, 930, and 950.

3. Future (long-range) bituminous plant mix overlay: Routes 108 and 915.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	Routes 205, 214, 217, 503
X	Categorical Exclusion	All Other Routes

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconstruction of the deteriorated major visitor access routes for the Upper Falls, North Rim, and Inspiration Point, and selective bituminous plant mix overlays on other routes will improve the quality of the visitor experience, enhance safety, improve riding qualities, and extend the pavement service life.

#3244J:5

TABLE 103-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	CONDITION ALIGNMENT HORIZONTAL	CONDITION ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
103	Canyon Village Road	27	27	2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	25
108	South Rim Drive	28	28	2	Bituminous Plant Mix	Satisfac	Satisfac	Good	Good	Good	Good	25
205	Canyon Cabins Area Roads	20-28	20-28	2	Bituminous Plant Mix	Satisfac	Satisfac	Poor	Poor	Poor	Good	15
214	Upper Falls Road	24	24		Bituminous Plant Mix	Satisfac	Satisfac	Poor	Fair	Fair	Good	15
217	Inspiration Point Road	24-27	24	2	Bituminous Plant Mix	Satisfac	Satisfac	Poor	Poor	Poor	Poor	25
221	Canyon Campground Roads	28	22	2	Bituminous Plant Mix	Satisfac	Satisfac	Good-Poor	Fair	Good 1/	Good	15
412	Canyon Water Treatment/Sewage Plant Service Road	12-14	12	1	Bit Plant Mix Gravel	Satisfac	Satisfac	Fair	Good	Good	Good	25
415	Canyon Water Tank Service Rd	12	12	1	Gravel	Satisfac	Satisfac	Good	Good	Good	Good	25
433	Canyon Residence Area ServRds	20-24	20-24	2	Bit Surf Treat Gravl	Satisfac	Satisfac	Poor	Poor	Fair	None	15
445	Canyon Residence Spur Roads	15	15	1	Bit Surf Treat Gravl	Satisfac	Satisfac	Poor	None	Fair	None	15
447	Canyon Old Camp Road	12-14	12-14	1	Gravel	Satisfac	Satisfac	Fair-Poor	None	Good	Good	15
468	Canyon Concessioner Area Service Roads	20	20	2	Bit Surface Treatmnt	Satisfac	Satisfac	Fair	Poor	Good	Good	15
503	North Rim Drive	20	20		Bituminous Plant Mix	Satisfac	Satisfac	Poor	Poor	Poor	Fair	25
914	Canyon Horse Corral and Parking Area	28	28	2	Bituminous Plant Mix	Satisfac	Satisfac	Poor	Poor	Good	Good	25
915	Uncle Tom's Parking Area	28	28	2	Bituminous Plant Mix	Satisfac	Satisfac	Good	N/A	Good	Good	15
929	Canyon Visitor Ctr Pkng Area				Bituminous Plant Mix	Satisfac	Satisfac	Fair	N/A	Fair	Good	15
930	Canyon Laundry Parking Area				Sealed Bit Plant Mix	Satisfac	Satisfac	Fair	N/A	Fair	Good	15
950	Canyon Service Station				Sealed Bit Plant Mix	Satisfac	Satisfac	Fair	N/A	Fair	Good	15

1/ - Loops A-E Are Poor

TABLE 103-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
103	Canyon Village Rd	Main Roadway	BPM Overlay	3,000	5,000	35,000	2,000	5,000	13,000	9,000	72,000
108	South Rim Drive	Main Road & Parking	Future BPM Overlay	10,000	30,000	182,000	28,000	25,000	69,000	52,000	396,000
205	Canyon Cabins	Circulation Roads &	Reconstruct on Existing	10,000	71,000	641,000	112,000	83,000	229,000	172,000	1,318,000
	Area Roads	Parking	Alignment								
214	Upper Falls Road	Access Rd&Pkng Area	Reconstruct on Exist Align	5,000	14,000	108,000	23,000	15,000	41,000	31,000	237,000
217	Inspiration Pt Rd	Access Road & Pkng	Reconstruct on Exist Align	29,000	76,000	261,000	19,000	39,000	106,000	80,000	610,000
221	Canyon CG Roads	Old Sect(Loops A-E)	Reconstruct	5,000	28,000	282,000	29,000	34,000	95,000	71,000	544,000
		New Sect(Loops F-L)	Future BPM Overlay		10,000	131,000	6,000	15,000	41,000	30,000	233,000
412	Cnyn Water Treat/	Service Rds & Pkng	No Work Proposed								
	Sew Plant Serv Rd										
415	Canyon Water Tank	Service Rds & Pkng	No Work Proposed								
	Service Road										
433	Canyon Residence	Service Rds & Pkng	Recondit, Resurface, & Pave		20,000	221,000	3,000	24,000	67,000	50,000	385,000
	Area Service Rd										
445	Cnyn Res Spur Rd	Service Rd & Pkng	Recondit, Resurface, & Pave		11,000	113,000	2,000	13,000	35,000	26,000	200,000
447	Cnyn Old Camp Rd	Service Road	No Work Proposed								
468	Canyon Concession	Service Rd & Pkng	BPM Overlay		2,000	43,000	2,000	5,000	13,000	10,000	75,000
	Area Service Road										
503	North Rim Drive	Loop Drive & Pkng	Reconstruct on Exist Align	52,000	145,000	538,000	87,000	82,000	226,000	170,000	1,300,000
914	Cnyn Horse Corral	Access Rd & Pkng	BPM Overlay(Paved Areas Only)		3,000	18,000	1,000	2,000	6,000	5,000	35,000
	& Parking Area										
915	Uncle Tom's Pkng	Approaches & Pkng	BPM Overlay		2,000	45,000	3,000	5,000	14,000	10,000	79,000
	Area										
929	Canyon Visitor	Parking Areas	BPM Overlay		15,000	71,000	3,000	9,000	25,000	18,000	141,000
	Center Pkng Area										
930	Canyon Laundry	Parking Areas	BPM Overlay		2,000	16,000	1,000	2,000	5,000	4,000	30,000
	Parking Area										
950	Canyon Serv Sta	Approaches & Pkng	BPM Overlay		2,000	18,000	1,000	2,000	6,000	4,000	33,000
			TOTAL COST	114,000	436,000	2,723,000	322,000	360,000	991,000	742,000	5,688,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.

RTE. NO.

10.....Grand Loop Rd
16.....Norris Canyon Rd
103.....Canyon Village Rd
108.....South Rim Drive*
205.....Canyon Cabins Area Rd
214.....Upper Falls Rd
217.....Inspiration Point Road*
221.....Canyon Campground Rd
412..Canyon Water Treatment/Sewage Plant Service Rd
415.....Canyon Water Tank Service Rd
433.....Canyon Residence Area Service Rd
434.....Grebe Lake Service Rd
445.....Canyon Residence Spur Rd
447.....Canyon Old Camp Rd
468.....Canyon Concessioner Area Service Rd
503.....North Rim Drive
914.....Canyon Horse Corral and Parking Area
915.....Uncle Tom's Parking Area*
929.....Canyon Visitor Center Parking Area
930.....Canyon Laundry Parking Area
950.....Canyon Service Station

*Shown on Route 10, Segment F map.

CANYON RESIDENCE SPUR RD
CANYON RESIDENCE AREA SERVICE RD
CANYON OLD CAMP RD
CANYON SERVICE STATION
CANYON VILLAGE ROAD
CANYON WATER TANK SERVICE RD
CANYON CAMPGROUND RD
CANYON HORSE CORRAL PARKING AREA ROADS
CANYON WATER TREATMENT SEWAGE PLANT SERVICE RD
CANYON JUNCTION
NORRIS CANYON ROAD
CANYON VISITOR CENTER PARKING AREA
CANYON LAUNDRY PARKING AREA
NORTH RIM DRIVE
CANYON CONCESSIONER AREA SERVICE RD
CANYON CABINS AREA RD
GREEB LAKE SERVICE RD
CANYON WATER TREAT/SEWAGE PLANT SERVICE RD
GRAND LOOP ROAD

I MAIN ACCESS ROAD
II CONNECTOR PARK ROAD
III CIRCULATION ROAD
N/A IV PRIMITIVE ROAD
V ADMINISTRATIVE ACCESS ROAD
VI RESTRICTED ACCESS ROAD

CANYON AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North 0 300 600 900 Feet

101 | 40169
DSC | APR 85

MP 0.00 South Rim Drive and
Chittenden Memorial Bridge

Chittenden Memorial Bridge and
Yellowstone River

MP 1.18 Raveling Roadway Cut Slopes

MP 1.43 Approaching Artist Point
Parking Area

CANYON VILLAGE AND YELLOWSTONE FALLS COMPLEX

ROUTE 205

MP 0.37 Base Failure Under Roadway and Curb

MP 0.56 Parking Area

Roadway Failure in Cabins Area

ROUTE 214

MP 0.15 Typical Road Condition

MP 0.41 Parking Area

CANYON VILLAGE AND YELLOWSTONE FALLS COMPLEX

ROUTE 217

MP 0.26 Roadway Failure

MP 0.79 Parking Area

ROUTE 221

MP 0.56 Entrance

Typical Road in New Area

Typical Road in Older Area

CANYON VILLAGE AND YELLOWSTONE FALLS COMPLEX

ROUTE 412

Approach to Sewage Treatment Plant

ROUTE 433

MP 0.71 Facing North, Canyon Residence Area

MP 0.92 Facing South, Canyon Residence Area

ROUTE 445

MP 0.00 Entrance to Canyon Residence Spur

CANYON VILLAGE AND YELLOWSTONE FALLS COMPLEX

ROUTE 915

MP 0.01 Approach to Uncle Tom's Parking Area

ROUTE 929

Entrance to Canyon Visitor Center Parking Area

ROUTE 930

Canyon Laundry Parking Area

ROUTE 950

Canyon Service Station Parking Area

CANYON VILLAGE AND YELLOWSTONE FALLS COMPLEX

ROUTE 503

MP 1.01 Roadway Base Failure

MP 1.28 Lookout Point Parking Area

MP 1.33 Charter Busses Stopped on Roadway

ROUTE 914

MP 0.00 Entrance Road to Canyon Horse Corral Area

MP 0.20 Canyon Horse Corral Area

#3214J:1
Map: Pg. IV-85
Photos: Pg. IV-267

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route Nos. 107 & 257; Name: Gull Point Area Roads

Route No. (RIP): 107; Gull Point Drive
257; Gull Point Picnic Area Road

Route 107 Length: 2.03 miles; Milepost 0.00 to Milepost 2.03
Route 257 Length: 0.30 mile; Milepost 0.00 to Milepost 0.30

Route Location:
On the west shore of Yellowstone Lake, south of Bridge Bay Campground. The route extends from an intersection with Route 10, Grand Loop Road, (MP 84.60) and Natural Bridge Road southeasterly to another intersection with Route 10 (MP 83.03).

Purpose/Function:
Route 107 - Scenic Loop, Access to Beaches on Yellowstone Lake
Route 257 - Gull Point Picnic Area

Functional classification:
Route 107 1984 NPS Standard Class: II (Connector Park) Road
Route 257 1984 NPS Standard Class: III (Special Purpose Park) Road

Topography: Flat

Vegetation:
Heavy Lodgepole Pine forest with open understory.

ROUTE 107:

EVALUATION OF EXISTING ROADWAY:
Existing Average Daily Traffic (1985): 500 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Moderate
Projected Average Daily Traffic (2005): 610 vehicles
Roadway Width (shoulder to shoulder): 27 ft.
Pavement/Surfacing Width: 20 ft.; Type: Bituminous Plant Mix;
Condition: Poor

Base/Subgrade Cond:	Fair-Poor ;	Drainage Cond:	Fair-Poor
Shoulder Width:	2-3.5 ft.;	Shoulder Cond:	Fair
Posted Speed Limit:	35 mph;	Ave. Oper. Speed:	15-25 mph
Horizontal Alignment:	Fair ;	Vertical Alignment:	Fair

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 68.8; Adjusted OSR: 88.2

Roadside Condition:
Fair. There is minor encroaching vegetation which limits sight distance in some areas.

ROUTE 257:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 100 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 0%
Recreational Vehicles: 12%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 130 vehicles
Roadway Width (shoulder to shoulder): 16-20 ft.
Pavement/Surfacing Width: 14 ft.; Type: Bituminous Surface Treatment;
Condition: Poor

Base/Subgrade Cond:	Fair-Good ;	Drainage Cond:	None
Shoulder Width:	1-3 ft.;	Shoulder Cond:	Poor
Posted Speed Limit:	mph;	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Satisfactory;	Vertical Alignment:	Satisfactory

Road Improvement Study (RIP) Segment Nos.: Not Identified
1983 RIP Structural CSR: Not Rated; Adjusted OSR: Not Rated
Roadside Condition: Satisfactory (Primitive Picnic area)

SPECIAL PROBLEMS OR FEATURES:

Gull Point Drive is a portion of a former alignment of the Grand Loop Highway which has been adapted for use as a scenic loop drive. It provides access to a semi-primitive portion of the Yellowstone Lake shoreline. A portion of the road which crosses an arm of Yellowstone Lake was partially inundated by high water in 1986. The high water destroyed a section of retaining wall and forced temporary closure of the road (see photographs on Page IV-267).

PRINCIPAL ROAD NEEDS:

Route 107 - Correct areas of base and subgrade failure. Abate progressive pavement structure deterioration and restore riding quality of the existing roadway. Improve roadway safety characteristics for motor vehicles, bicycles, and pedestrians.

Route 257 - The park management strategy calls for maintaining this facility in a primitive state.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified.

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 107 - Selectively thin and clear roadside vegetation by partial removal of small trees, undergrowth, and brush to improve sight distance; repair isolated base failure areas; reinforce retaining walls and raise roadway grade at Yellowstone Lake; surface and pave with bituminous plant mix; overlay paved turnouts and surface and pave unsurfaced turnouts with bituminous plant mix; and upgrade roadway regulatory and guide signs to conform to NPS and MUTCD standards.

Route 257 - The park management strategy calls for maintaining this picnic area as a primitive facility. However, an estimate is furnished for surfacing and paving existing roads, parking areas, and pads.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS:

Alternative:	Route 107	Route 257	1984 NPS Stds. (Route 107)
Roadway Width (ft):	24	14	24
Lane Width (ft):	10	14	10 *
No. of Traffic Lanes:	2	1	2
Shldr Width (ft/side):	2	0	2
Shldr Bicycle Lanes:	No	No	No
Design Speed (mph):	35	15	35

*Adjusted for tour bus and recreational vehicle use.

ESTIMATES OF COST:

	Route 107	Route 257
Roadway Width (ft)	24	14
Clearing	$ 10,000	$ 5,000
Landscaping	34,000	10,000
Grading	20,000	12,000
Drainage	5,000	5,000
Structures		
Surfacing/Paving	447,000*	22,000*
Safety & Traffic Cont	9,000	16,000
Mobilization 10%	53,000	7,000
Incidental Items 25%	145,000	19,000
Construction Subtotal	723,000	96,000
Constr Engr (FHWA) 15%	108,000	14,000
Total Estimated Cost	$ 831,000	$ 110,000
Cost Per Mile	$ 409,000	$ N/A
Prelim Engr (FHWA) 10%	$ 72,000	$ 10,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 3 Inch Depth Bituminous Plant Mix Pavement

BENEFITS/RESULTS:

A reconditioned roadway will improve riding qualities and extend the pavement service life. Quality of the visitor experience will be improved.

Surfacing and paving the access road and parking areas of the Gull Point Picnic Area (Route 257) will improve visual quality of the facility and attract greater public use.

GULL POINT AREA ROADS

ROUTE 107

MP 0.13 Roadway Flooded by Yellowstone Lake (June 1986)

MP 0.15 Retaining Wall Along Yellowstone Lake

MP 0.55 Facing Northwest, Roadway Flooded by Yellowstone Lake

MP 1.31 Entrance to Gull Point Picnic Area (Route 257)

ROUTE 257

MP 0.20 Gull Point Picnic Area

109 BRIDGE BAY

#3249J:1
Map: Pg. IV-273
Photos: Pg. IV-275

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 109 et al; Name: Bridge Bay Complex

Route Location:
Along the western shore of Yellowstone Lake in the central park area.

Purpose/Function:
The Bridge Bay Complex is a major visitor accommmodation facility. It consists of a large campground and Marina with Concessioner operated commercial services.

TABLE 109-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
109	Bridge Bay Road	0.57	Public Access	II	68.8	89.8
215	Bridge Bay Campground Road	3.15	Campground Circulation	III	68.8	82.0
431	Lake Transfer Station Road	0.10	Service Road	VI	68.8	89.8
448	Bridge Bay Water Treatment Service Road	0.23	Service Road	VI	N/R	N/R
941	Bridge Bay Marina Parking Area	0.28	Public Marina Parking	III	N/R	N/R
942	Bridge Bay Parking Area and Lift Station Road	0.29				
	MP 0.00 to MP 0.13	0.13	Public Access	II	N/R	N/R
	MP 0.13 to MP 0.21	0.08	Public Parking	III	N/R	N/R
	MP 0.21 to MP 0.29	0.08	Service Road	VI	N/R	N/R

N/R = Not Rated

Topography: Flat to Rolling

Vegetation:
Moderate to heavy Lodgepole Pine forest with light to moderate understory.

SPECIAL PROBLEMS OR FEATURES:
No special problems identified. Road and parking facilities are functional and have adequate capacity for current use.

PRINCIPAL ROAD NEEDS:
Internal road and parking facilities are in generally good condition and will require only a future bituminous plant mix overlay (in 10 to 12 years) to maintain the facilities in good condition. An exception is Loop A of Route 215, Bridge Bay Campground, which requires rehabilitation.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
None identified.

TYPES OF IMPROVEMENTS:
Resurfacing X Rehabilitation X(Rte 215 Loop A Only) Reconstruction ___
New Construction _____ No Improvement _____ Maintenance Seal Coat ___

SCOPE OF WORK:
Route 215, Bridge Bay Campground - Recondition, resurface, and pave campground, Loop A roads, and parking areas.

Routes 109, 215 (remainder), Route 941, and Route 942 - Bituminous plant mix overlay (future).

PROBABLE ENVIRONMENTAL CLEARANCE:
_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS: No changes in standards are proposed.

BENEFITS/RESULTS:
Reconstruction of Route 215, Loop A, will bring all elements of the Bridge Bay Campground road system up to good condition. A future bituminous plant mix overlay of all other paved roadways and parking areas will extend the roadway service life, improve function, and maintain a high quality visitor experience.

#3249J:4

TABLE 109-2

EVALUATION OF EXISTING ROADWAYS

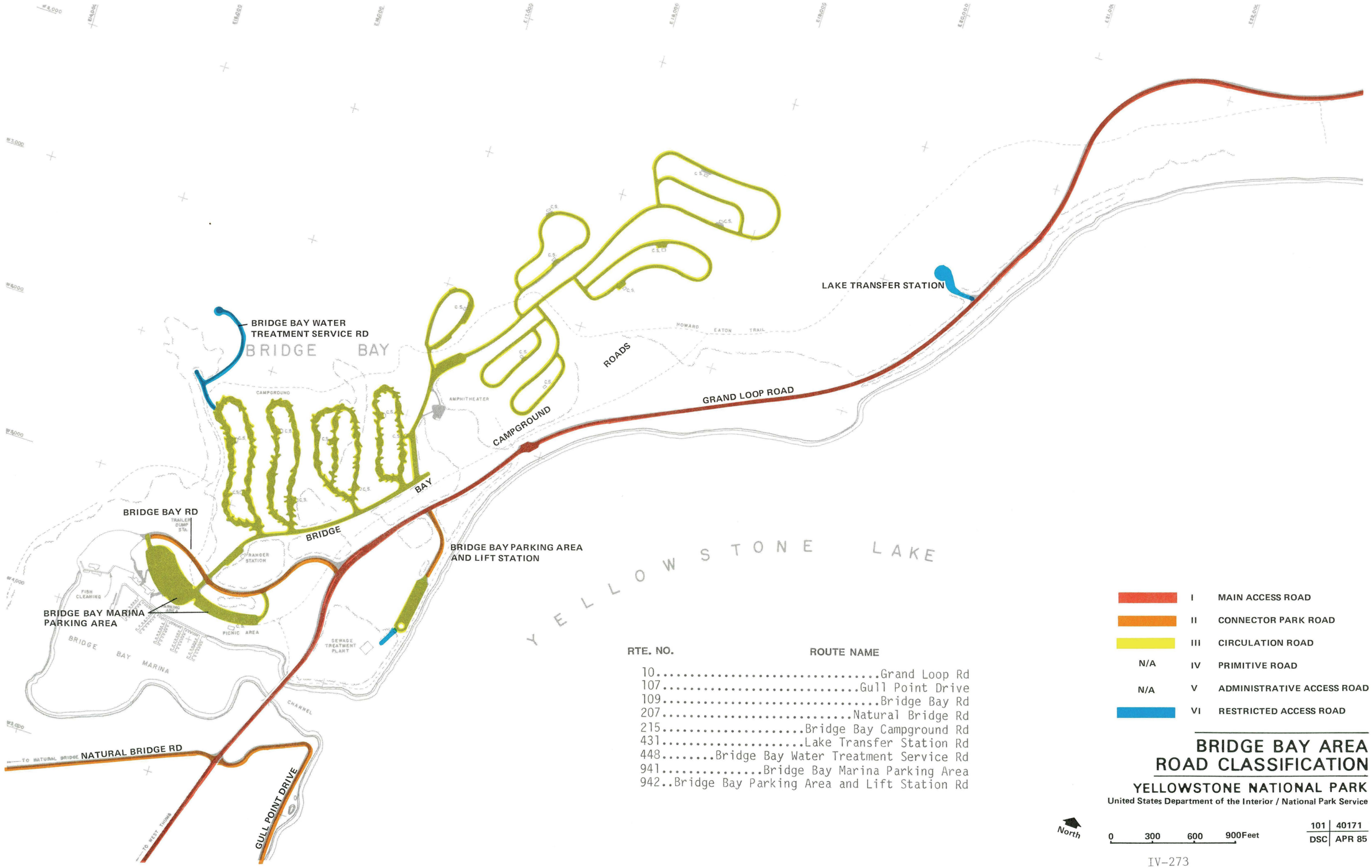
PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
109	Bridge Bay Road	28-30	22		Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	15
215	Bridge Bay Campground Roads											
	Loop A	12-22	12-22	1-2	Bituminous Plant Mix	Good	Good	Poor	Poor	Fair	Good	15
	Loops B Through J	12-22	12-22	1-2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	15
431	Lake Transfer Station Road	15	15		Gravel			Fair		Good		15
448	Bridge Bay Water Treatment Service Road	10	10	1	Gravel	Fair	Fair	Fair	N/A	Good	Good	25
941	Bridge Bay Marina Parking Area	N/A	N/A	N/A	Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	5-15
942	Bridge Bay Parking Area and Lift Station Road	24	24	2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	25

3249J:5

TABLE 109-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
109	Bridge Bay Road	Main Access Road	Future BPM Overlay	3,000	4,000	23,000	1,000	3,000	9,000	6,000	49,000
215	Bridge Bay CG Rd	CG Roads & Parking	Reconstruct Loop A	5,000	27,000	457,000	45,000	53,000	147,000	110,000	844,000
			BPM Overlay Remainder								
431	Lk Transfer StaRd	Access Rd & Pkng	Recondition, Surface & Pave		10,000	34,000	1,000	5,000	13,000	10,000	73,000
448	Bridge Bay Water Treatment Serv Rd	Access Road	No Work Proposed								
941	Bridge Bay Marina Parking Area	Parking Areas	Future BPM Overlay	5,000	8,000	67,000	2,000	8,000	23,000	17,000	130,000
942	Bridge Bay Pkng Area &Lift Sta Rd	Public Access Rd & Parking	Future BPM Overlay		1,000	26,000	1,000	3,000	8,000	6,000	45,000
			TOTAL COST	13,000	50,000	607,000	50,000	72,000	200,000	149,000	1,141,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.



RTE. NO.	ROUTE NAME
10	Grand Loop Rd
107	Gull Point Drive
109	Bridge Bay Rd
207	Natural Bridge Rd
215	Bridge Bay Campground Rd
431	Lake Transfer Station Rd
448	Bridge Bay Water Treatment Service Rd
941	Bridge Bay Marina Parking Area
942	Bridge Bay Parking Area and Lift Station Rd

	I	MAIN ACCESS ROAD
	II	CONNECTOR PARK ROAD
	III	CIRCULATION ROAD
N/A	IV	PRIMITIVE ROAD
N/A	V	ADMINISTRATIVE ACCESS ROAD
	VI	RESTRICTED ACCESS ROAD

BRIDGE BAY AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101	40171
DSC	APR 85

BRIDGE BAY COMPLEX

ROUTE 109

Bridge Bay Campground Entrance

ROUTE 215

MP 0.86 Typical Road, Bridge Bay Campground

Bridge Bay Campground Loop "A"

ROUTE 941

Bridge Bay Marina Parking Area

110 LAKE

#3263J:1
Map: Pg. IV-281
Photos: Pgs. IV-283 to IV-285

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 110 et al; Name: Lake Hotel and Lodge Complex

Route Location:
On the northwest shore of Yellowstone Lake in the central area of the park.

Purpose/Function:
The Lake Hotel and Lodge Complex is a major concessioner-operated public accommodation facility. Special public services including a hospital are located here in addition to NPS administrative offices.

TABLE 110-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
110	Lake Road*	1.43	Primary Access to Lake Development	II	42.8-93.8	70.6-97.0
216	Lake Lodge Road	1.72				
	MP 0.00 to MP 0.14	0.14	Access to Accommodations	II	87.5	95.6
	MP 0.14 to MP 1.72	1.58	Overnight Accommodations	III	43.8	74.3
232	Lake Hotel Cabins Road	0.63	Public Access	III	81.3	86.7
402	Lake Employee Dormitory Service Road	0.41	Residence Road	V	75.0	92.8
403	Lake Residence Area Road	0.86	Residence Road	V	56.3	85.2
432	Lake Residence Area Service Rd	0.49	Service Road	VI	68.8	89.8
455	Lake Residence Water Tank Service Road	0.30	Service Road	VI	N/R	N/R
466	Lake Administrative Road	0.19	Administrative Road	V	N/R	N/R
472	Old Lake Water Intake Road	0.20	Service Road	VI	N/R	N/R
479	Lake Boat House Service Road	0.10	Service Road	VI	N/R	N/R
486	Lake Lodge Dorm Road	0.30	Residence Road	V	N/R	N/R
900	Lake Ranger Station Road	0.02	Administrative Road	V	N/R	N/R
901	Lake Hotel Front Entrance Loop*	0.10	Public Access	III	N/R	N/R
910	Lake Store and Service Station Parking Area	0.12	Public Parking	III	N/R	N/R
911	Lake Hotel and Post Office Parking Area	0.04	Public Parking	III	N/R	N/R
912	Lake Hospital Parking Area	0.15	Public Parking	III	N/R	N/R
935	Lake Lodge Pump Station Service Road	0.04	Service Road	VI	N/R	N/R
936	Lake Log Cabins Road	0.11	Public Access	V	N/R	N/R

N/R = Not Rated
*Modifications of road configuration are being considered under a revised Development Concept Plan (1987).

Topography: Flat to Rolling

Vegetation:
Moderate to heavy Lodgepole Pine forest with light understory interspersed with open meadowland.

SPECIAL PROBLEMS OR FEATURES:

The Lake Hotel, Lake Ranger Station, Log Cabin, and other buildings in the complex area are structures of historical significance.

PRINCIPAL ROAD NEEDS:

Abate progressive pavement structure deterioration and restore riding quality of the existing roadway by application of bituminous plant mix overlays on paved areas at an appropriate point in time, or by reconstructing paved surfaces which are seriously deteriorated. Selectively surface and pave gravel surface administrative roads and parking areas.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified. No changes in roadway location or geometrics are proposed. No impacts on historically significant facilities are anticipated.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	X
New Construction		No Improvement		Maintenance Seal Coat	

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
	Environmental Assessment	
X	Categorical Exclusion	All Work Proposed

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconditioning, resurfacing, and bituminous plant mix overlays will increase vehicular capacity and improve roadway safety characteristics. Visual quality of the facility will be enhanced. Quality of the visitor experience will be improved.

#3263J:4

TABLE 110-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
110	Lake Road MP 0.00 to MP 0.79	28-32	24-30	2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	25
	MP 0.79 to MP 1.43	24-32	22-26	2	Bituminous Plant Mix	Satisfac	Good	Poor	Poor	Fair	Fair	25
216	Lake Lodge Road	20-22	20-22	2	Bituminous Plant Mix	Satisfac	Satisfac	Fair-Good	Fair	Good	Good	25
232	Lake Hotel Cabins Road	20-26	20-26	2	BPM & BST	Satisfac	Satisfac	Poor-BST / Good-BPM	None	Good	Good	15
402	Lake Employee Dorm Service Rd	24	24	2	Bituminous Plant Mix	Satisfac	Satisfac	Good	Fair	Good	Good	15
403	Lake Residence Area Road	24	24	2	BPM - Main Road	Satisfac	Satisfac	Good-Main	Fair-Poor	Good	Good	15
		20	20	1	BST & Gravel-Loop	Satisfac	Satisfac	Poor-Loop	Fair-Poor	Good	Good	15
432	Lake Residence Area Serv Road	10-12	10-12		None	Satisfac	Satisfac	N/A	None	Fair	None	15
455	Lk Res Water Tank Service Rd	12	12		Gravel	Good	Poor	Fair	None	Poor	Poor	10
466	Lake Administrative Road	12-20	12-20		BPM Gravel	Good	Good	Fair-Good	Fair	Good	Good	15
472	Old Lake Water Intake Road	12	12		Gravel	Good	Good	Poor	Poor	Fair	Fair	Restricted
479	Lake Boathouse Service Road	20	20		Bituminous Plant Mix	Good	Good	Poor	Poor	Fair	Fair	Restricted
486	Lake Lodge Dorm Road	23	23		None	Good	Good	Poor	Poor	Poor	Poor	5
900	Lake Ranger Station Road	N/A	N/A		Bituminous Plant Mix	Good	Good	Fair	N/A	Fair	Good	10
901	Lake Hotel Front Ent Loop	15-18	18-20		Bituminous Plant Mix	Good	Good	Poor	Poor	Fair	Good	10
910	Lake Store and Service Station Parking Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Fair	N/A	Fair	Good	10
911	Lake Hotel & PO Parking Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Fair	N/A	Fair	Good	10
912	Lake Hospital Parking Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Fair	N/A	Fair	Good	10
935	Lk Lodge Pump Station Serv Rd	16	12		Gravel	Good	Good	Fair	Poor	Fair	Fair	Restricted
936	Lake Log Cabins Road	12	12		None	Good	Good	Fair	N/A	Fair	Fair	15

NOTES: BPM = Bituminous Plant Mix.
BST = Bituminous Surface Treatment.

TABLE 110-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
110	Lake Road	Access MP 0.00-0.79	Reinforce Shldrs & Overlay	10,000	43,000	273,000	6,000	33,000	91,000	68,000	524,000
		MP 0.79-1.43	Recondition, Surface & Pave								
216	Lake Lodge Road	Roads & Parking	BPM Overlay-Old Areas Only	5,000	12,000	246,000	20,000	28,000	78,000	58,000	447,000
232	LkHotel Cabins Rd	Road & Parking	BPM Overlay	2,000	8,000	91,000	15,000	12,000	32,000	24,000	184,000
402	Lake Employee Dorm Service Road	Road & Parking	BPM Overlay Paved Rds &Pkng Surf & Pave Gravel Rds&Pkng		25,000	86,000	3,000	11,000	31,000	23,000	179,000
403	Lake Residence Area Road	Residence Rd & Pkng	BPM Overlay Paved Rds& Pkng Surf & Pave Gravel Rds&Pkng		25,000	163,000	4,000	19,000	53,000	40,000	304,000
432	Lake Residence Area Service Road	Road & Parking	Primitive Rd-No Work Prop								
455	Lk Res Water Tank Service Road	Road	Primitive Rd-No Work Prop								
466	Lake Admin Road	Road & Parking	New Pavement-No Work Prop								
472	Old Lake Water Intake Road	Road	Restricted Rd-No Work Prop								
479	Lake Boathouse Service Road	Road	Restricted Rd-No Work Prop								
486	Lk Lodge Dorm Rd	Road & Parking	Surface and Pave		11,000	52,000	1,000	6,000	18,000	13,000	101,000
900	Lk Ranger Sta Rd	Rd Apprs & Parking	Recondition, Surface & Pave	1,000	3,000	8,000	1,000	1,000	4,000	3,000	21,000
901	Lake Hotel Front Entrance Loop	Road & Parking	Recondition, Surface & Pave	2,000	2,000	28,000	1,000	3,000	9,000	7,000	52,000
910	Lk Store & Serv Station Pkng Area	Rd Apprs & Parking	Recondition, Surface & Pave	1,000	5,000	19,000	1,000	3,000	7,000	5,000	41,000
911	Lk Hotel & Post Office Pkng Area	Rd Apprs & Parking	Future BPM Overlay		2,000	49,000	3,000	5,000	15,000	11,000	85,000
912	Lk Hospital Parking Area	Rd Apprs & Parking	Future BPM Overlay	1,000	3,000	11,000	1,000	2,000	5,000	3,000	26,000
935	Lk Lodge Pump Station Serv Road	Road	Primitive Rd-No Work Prop								
936	Lk Log Cabins Rd	Road & Parking	Primitive Rd-No Work Prop								
			TOTAL COST	22,000	139,000	1,026,000	56,000	123,000	343,000	255,000	1,964,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.

RTE. NO.	ROUTE NAME
10	Grand Loop Rd
110	Lake Rd
216	Lake Lodge Rd
232	Lake Hotel Cabins Rd
402	Lake Employee Dormitory Service Rd
403	Lake Residence Area Rd
432	Lake Residence Area Service Rd
455	Lake Residence Water Tank Service Rd
466	Lake Administrative Rd
472	Old Lake Water Intake Rd
479	Lake Boat House Service Rd
486	Lake Lodge Dorm Rd
900	Lake Ranger Station Rd
901	Lake Hotel Front Entrance Loop
910	Lake Store and Service Station Parking Area
911	Lake Hotel and Post Office Parking Area
912	Lake Hospital Parking Area
935	Lake Lodge Pump Station Service Rd
936	Lake Log Cabins Rd

	I	MAIN ACCESS ROAD
	II	CONNECTOR PARK ROAD
	III	CIRCULATION ROAD
N/A	IV	PRIMITIVE ROAD
	V	ADMINISTRATIVE ACCESS ROAD
	VI	RESTRICTED ACCESS ROAD

LAKE DEVELOPMENT AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101 | 40174
DSC | APR 85

LAKE HOTEL AND LODGE COMPLEX

ROUTE 110

MP 0.35 Entrance Road

MP 0.66 Entrance Road

ROUTE 216

MP 0.01 Lake Lodge Entrance

MP 0.03 Lake Lodge Vicinity

ROUTE 232

Lake Hotel Cabins Area

LAKE HOTEL AND LODGE COMPLEX

ROUTE 402

Lake Dormitory Parking Area

Lake Trailer Residence Area

ROUTE 403

MP 0.00 Entrance to Lake Residence Area

MP 0.19 Lake Residence Area

MP 0.60 Lake Maintenance Yard

LAKE HOTEL AND LODGE COMPLEX

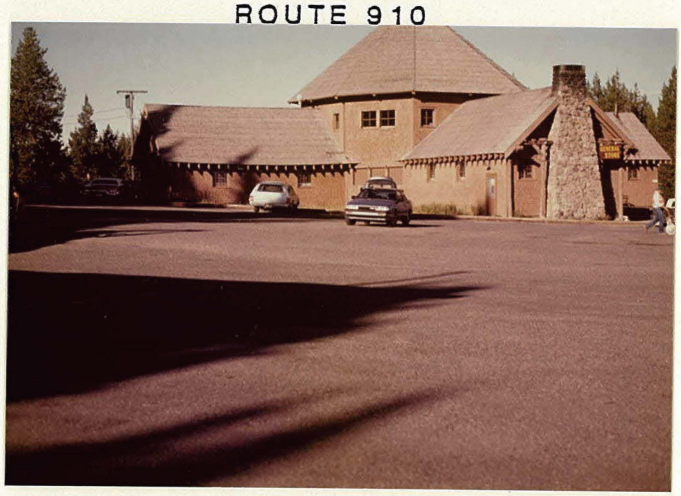
ROUTE 455

Lake Residence Water Intake Service Road

ROUTE 486

Lake Lodge Dormitory Service Road

ROUTE 910



Hamilton Store and Service Station Parking Area

ROUTE 911

Parking Area

Parking Area

111 FISHING BR

#3265J:1
Map: Pg. IV-291
Photos: Pg. IV-293

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 111 et al; Name: Fishing Bridge Complex

Route Location:
In the central park area on the north shore of Yellowstone Lake and adjacent to the Yellowstone River.

Purpose/Function:
The Fishing Bridge Complex contains major overnight visitor accommodation facilities consisting of a campground and trailer park. It also provides limited commercial services and features a visitor center and museum.

TABLE 111-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
111	Fishing Bridge Frontage Road	0.31	Facilities Access	II	43.6	70.6
222	Fishing Bridge Campground Road	2.60	Public Access	III	31.3	50.0
459	Fishing Bridge Cabin Area Roads	0.92	To Be Deleted	V	N/R	N/R
465	Fishing Bridge Service Road	1.41	Service Road			
	MP 0.00 to MP 0.48	0.48		V	N/R	N/R
	MP 0.48 to MP 1.41	0.93		VI	N/R	N/R
473	Pelican Creek Fish Trap Service Road	1.15	Restricted Service Road	VI	N/R	N/R
913	Fishing Bridge Visitor Center Parking Area	0.20				
	MP 0.00 to MP 0.10	0.10	Public Parking	III	N/R	N/R
	MP 0.10 to MP 0.20	0.10	Access to Ranger Station	VI	N/R	N/R
937	Fishing Bridge Recreational Vehicle Park	3.65				
	MP 0.00 to MP 0.12	0.12	Public Access	II	N/R	N/R
	MP 0.12 to MP 3.65	3.53	RV Park Circulation	III	N/R	N/R

N/R = Not Rated

Topography: Flat

Vegetation:
Heavy Lodgepole Pine forest with light to heavy understory interspersed with areas of open meadowland.

SPECIAL PROBLEMS OR FEATURES:

The Fishing Bridge area is identified as a prime Grizzly Bear habitat area. Portions of the public accommodation facilities in the cabins area have been phased out to reduce the impact of human intrusion. A study is in process to assess the feasibility of phasing out part or all of the remaining overnight accommodation and commercial service facilities, and related employee accommodations.

PRINCIPAL ROAD NEEDS:

Actual needs are dependent upon a decision on the disposition of remaining public accommodations. Assuming that the campground, RV park, store, garage, and service station will remain, there will be a long-term need to preserve roadways and parking areas which are appurtenant to these installations.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

Human intrusion upon prime habitat of a threatened omnivore (Grizzly Bear) is a major environmental concern. A related concern is the life threatening nature of human-bear encounters.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

For the purposes of this report, it is assumed that the visitors center, campground, RV park, and commercial services will be retained at least on an interim basis, but will not be expanded. It is also assumed that the lodge, cabins, and employee service roads will either be eliminated or maintained as restricted primitive roads. The scope of work described in Table III-2 is based upon these assumptions.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
	Environmental Assessment	
X	Categorical Exclusion	All Work Described in Table III-2

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconditioning, resurfacing, and bituminous plant mix overlays of roadways and parking areas to be retained will improve riding qualities and extend the pavement service life.

#3265J:4

TABLE III-2
EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
111	Fishing Bridge Frontage Road	20	20	2	Bituminous Plant Mix	Good	Good	Poor	Poor	Good	Good	15
222	Fishing Bridge Campground Rd	12-22	12-22	1-2	Bituminous Plant Mix	Good	Good	Poor	Poor	Fair-Good	Poor	15
459	Fishing Bridge Cabin Area Rds	12-20	12-20	1-2	Bit Surface Treatmnt	Good	Good	Fair-Poor	Poor	Good	Fair-Good	15
465	Fishing Bridge Service Road	12-14	12-14	1	Gravel	Fair	Good	Fair-Poor	None	Fair	Poor	15
473	Pelican Cr Fish Trap Serv Rd	14-16	14-16	1	Gravel	Satisfac	Satisfac	Poor	Poor	Fair	Poor	Restricted
913	Fishing Bridge Visitor Center Parking Area	30-36	30-36	2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	10
937	Fishing Bridge Recreational Vehicle Park	20-36	20-36	2	Bituminous Plant Mix	Good	Good	Good	Good	Fair	Good	15

3265J:5

TABLE III-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK: RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
111	FB Frontage Road	Road & Concess Pkng	BPM Overlay	5,000	15,000	107,000	7,000	13,000	37,000	28,000	212,000
222	FB Campground Rd	Road & Parking	Recondition, Resurf & Pave	10,000	108,000	574,000	10,000	70,000	193,000	145,000	1,110,000
459	FB Cabin Area Rds	Roads & Parking	To Be Deleted - Obliterate								
465	FB Service Road	Road & Parking	No Work Proposed								
473	Pelican Cr Fish Trap Service Rd	Road	No Work Proposed								
913	FB Visitor Center Parking Area	Road & Parking	Recondition, Resurf & Pave	5,000	15,000	71,000	7,000	10,000	27,000	20,000	155,000
937	FB Recreational Vehicle Park	Road & Parking	BPM Overlay	15,000	15,000	121,000	8,000	16,000	44,000	33,000	252,000
			TOTAL COST	35,000	153,000	873,000	32,000	109,000	301,000	226,000	1,729,000

NOTES: FB = Fishing Bridge
BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.

RTE. NO.	ROUTE NAME
13	East Entrance Rd
111	Fishing Bridge Frontage Rd
222	Fishing Bridge Campground Rd
459	Fishing Bridge Cabin Area Rds
465	Fishing Bridge Service Rd
473	Pelican Creek Fish Trap Service Rd
913	Fishing Bridge Visitor Center Parking Area
937	Fishing Bridge Recreational Vehicle Park

TO SEWAGE TREATMENT PLANT

HOWARD EATON TRAIL TO CANYON VILLAGE

YELLOWSTONE RIVER

SERVICE ROAD

SEASONAL EMPLOYEES

TRAILER SITES

FISHING BRIDGE

FISHING BRIDGE RECREATIONAL VEHICLE PARK

VISITOR TRAILER VILLAGE

FISHING BRIDGE CABIN AREA RDS

CONCESSION BLDG & LAUNDRY

TRAILER DUMP STATION

FISHING BRIDGE

STORE

DORM

ICED

BOILER

CAFETERIA

SHOWERS & LAUNDRY

RANGER STATION

TO LAKE JUNCTION 300 FEET

FISHING BRIDGE FRONTAGE RD

FISHING BRIDGE CAMPGROUND RD

CAMPGROUND

SEPTIC TANKS

TRAILER DUMP STATION

AMPHITHEATER

VISITOR CENTER & MUSEUM

FISHING BRIDGE VISITOR CENTER PARKING AREA

YELLOWSTONE LAKE

PELICAN CREEK FISHTRAP SERVICE RD

EAST ENTRANCE ROAD

TO EAST ENTRANCE (COOK, WYO)

PELICAN CREEK

	I	MAIN ACCESS ROAD
	II	CONNECTOR PARK ROAD
	III	CIRCULATION ROAD
N/A	IV	PRIMITIVE ROAD
	V	ADMINISTRATIVE ACCESS ROAD
	VI	RESTRICTED ACCESS ROAD

FISHING BRIDGE AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101 | 40170
DSC | APR 85

FISHING BRIDGE COMPLEX

ROUTE 111

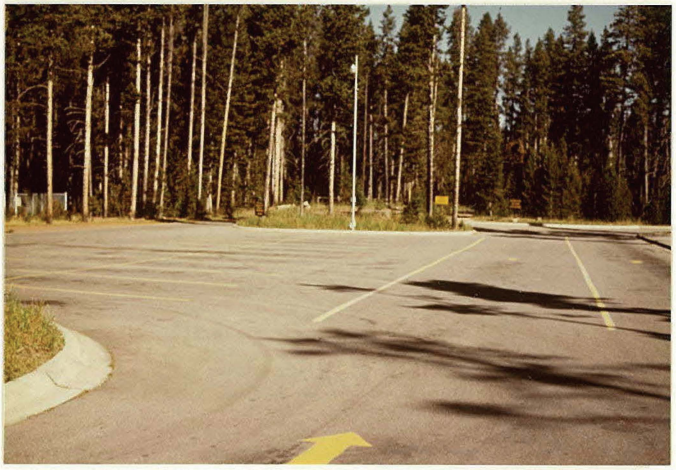
Fishing Bridge Frontage Road

ROUTE 222

Typical Road Condition Fishing Bridge Campground

ROUTE 937

RV Parking Area



Parking Area at Entrance

200 +

#3215J:1
Map: Pg. IV-183
Photos: Pg. IV-299

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 202; Name: Lewis Lake Campground Roads

Route 202 Length: 0.81 mile; Milepost 0.00 to Milepost 0.81

Route Location:
At MP 10.06 on Route 14, South Entrance Road, on the east shore of Lewis Lake.

Purpose/Function:
Public Access and Parking

Functional classification:
1984 NPS Standard Class:
MP 0.00-0.08: II (Connector Park) Road (Access Road)
MP 0.08-0.81: III (Special Purpose Park) Rd (Circulation Rds & Parking)

Topography: Rolling

Vegetation:
Moderate to heavy Lodgepole Pine forest with light understory.

ROUTE 202:

EVALUATION OF EXISTING ROADWAY:
Length: 0.81 mile; Milepost 0.00 to Milepost 0.81
Existing Average Daily Traffic (1985): 200 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 250 vehicles
Pavement/Surfacing Width: Access Roads - 20 ft.
Circulation Roads - 12 ft.
Type: Bituminous Plant Mix; Condition: Fair

Base/Subgrade Cond:	Fair ;	Drainage Cond:	Fair-Poor
Shoulder Width:	0-2 ft.;	Shoulder Cond:	Fair-Poor
Posted Speed Limit:	15 mph;	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Satisfactory;	Vertical Alignment:	Satisfactory

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 68.8; Adjusted OSR: 94.8
Roadside Condition: Fair - Minor Encroaching Vegetation in Some Areas

SPECIAL PROBLEMS OR FEATURES:
Visitor facilities contain a mix of paved and gravel surfaced areas.

PRINCIPAL ROAD NEEDS:
Recondition paved roadways and parking areas and upgrade gravel roads, parking, and pads to provide an all-weather surface.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
There will be a minor temporary disturbance and changes in vegetation along the roadsides with some permanent loss of vegetation in areas of shoulder widening. Temporary adverse visual impacts will be created by the construction.

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:
Recondition and widen access roads; surface and pave gravel roads, parking areas, and camp pads; and apply a bituminous plant mix overlay on paved roads and parking areas.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS:

	Access Roads	One-Way Loop Roads	1984 NPS Stds. Access Roads
Roadway Width (ft):	24	12	24
Lane Width (ft):	10	12	10 *
No. of Traffic Lanes:	2	1	2
Shldr Width (ft/side):	2	0	2
Shldr Bicycle Lanes:	No	No	No
Design Speed (mph):	25	15	25

*Adjusted for tour bus and recreational vehicle use.

ESTIMATE OF COST:

Clearing		$ 10,000
Landscaping		28,000
Grading		25,000
Drainage		10,000
Structures		
Surfacing/Paving		154,000*
Safety & Traffic Cont		61,000
Mobilization	10%	29,000
Incidental Items	25%	79,000
Construction Subtotal		396,000
Constr Engr (FHWA)	15%	59,000
Total Estimated Cost		$ 455,000
Cost Per Mile		$ N/A
Prelim Engr (FHWA)	10%	$ 40,000
For Materials Source Inside Park, Deduct		$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2-3 Inch Depth Bituminous Plant Mix Overlay/Pavement

BENEFITS/RESULTS:

Reconditioning and upgrading of surfacing and paving of roads and parking areas will improve riding qualities and extend the pavement service life. Visual quality of the facility will be enhanced. Quality of the visitor experience will be improved.

LEWIS LAKE CAMPGROUND ROADS

ROUTE 202

MP 0.21 Lewis Lake Campground Walk-In Parking Area

Lewis Lake Campground Parking and Boat Launch Area

#3218J:1
Map: Pg. IV-129
Photos: Pg. IV-303

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 203; Name: North Entrance Concessioner Service Road

Route 203 Length: 0.31 mile; Milepost 0.00 to Milepost 0.31

Route Location:
Route 203 - In the vicinity of the north park entrance at Gardiner, Montana.

Purpose/Function:
Route 203 - Service roads and parking areas for concessioner facilities. Designated as the public access route (North Entrance Road) in winter.

Functional classification:
Route 203 1984 NPS Standard Class: II (Connector Park) Road

Topography: Flat

Vegetation:
Open, sparse, low growing, arid to semi-arid vegetation dominated by sagebrush and grasses.

ROUTE 203:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 200 vehicles
Passenger Cars and Pickups: 85%; Buses and Trucks: 5%
Recreational Vehicles: 10%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 250 vehicles
Roadway Width (shoulder to shoulder): 26-64 ft.
Pavement/Surfacing Width: 22-64 ft.; Type: Bituminous Plant Mix;
Condition: Fair

Base/Subgrade Cond:	Fair-Good ;	Drainage Cond:	Fair-Poor
Shoulder Width:	1-2 ft.;	Shoulder Cond:	Poor
Posted Speed Limit:	25 mph;	Ave. Oper. Speed:	25-35 mph
Horizontal Alignment:	Satisfactory;	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment Nos.: 1
1980 RIP Structural CSR: 93.8; Adjusted OSR: 97.0
Roadside Condition: No Obstructions

SPECIAL PROBLEMS OR FEATURES:

It is under consideration for designation as the principal route for all northbound traffic exiting the park. The Roosevelt Arch would then handle southbound public traffic only.

PRINCIPAL ROAD NEEDS:

Rehabilitate pavement structure to abate progressive pavement structure deterioration and restore riding quality of the existing roadway.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified. This route serves an area which has primarily industrial characteristics.

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Bituminous plant mix overlay of existing paved roads and parking areas. A supplemental estimate is provided for surfacing and paving gravel parking areas in the Concessioner Service Complex.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

ESTIMATES OF COST:

	Paved Roads & Parking Areas	Surface & Pave Graveled Parking Areas
Clearing	$	$
Landscaping		
Grading	15,000	20,000
Drainage		30,000
Structures		
Surfacing/Paving	20,000*	123,000
Safety & Traffic Cont	1,000	6,000
Mobilization 10%	4,000	18,000
Incidental Items 25%	10,000	49,000
Construction Subtotal	50,000	246,000
Constr Engr (FHWA) 15%	8,000	37,000
Total Estimated Cost	$ 58,000	$ 283,000**
Cost Per Mile	$ 161,000	$ N/A
Prelim Engr (FHWA) 10%	$ 5,000	$ 25,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay/Pavement
**Not Eligible For FLHP Funding

BENEFITS/RESULTS:

A bituminous plant mix overlay of the existing paved road and parking areas will improve riding qualities and extend the pavement service life.

Surfacing and paving of graveled roadways and parking areas in the concessioner service area will provide all-weather surfaces. Ruts, mud holes, soft spots, and traffic generated dust will be eliminated. Overall appearance of the area will be improved.

NORTH ENTRANCE CONCESSIONER SERVICE ROAD

ROUTE 203

MP 0.16 North Entrance Concessioner Service Road

MP 0.25 Unpaved Parking Area

204 MAMMOTH

#3287J:1
Map: Pg. IV-309
Photos: Pgs. IV-311 to IV-315

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 204 et al; Name: Mammoth Hot Springs Complex

Route Location:
In the northwest area of the park near the Gardner River.

Purpose/Function:
The Mammoth Hot Springs is a major visitor attraction. In addition, the park headquarters, administrative offices, and major services and support services are located here.

TABLE 204-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
204	Mammoth Store/Hotel/Cabins Rds	1.18	Public Access and Parking	III	62.5	72.0
206	Mammoth Campground Roads	1.28	Campsite Access and Parking	III	50.0	68.1
223	Mammoth Headquarters Administration Office Road	0.20	Public Access to Park Headquarters and Visitor Center	III	87.5	92.6
228	Mammoth Rental Horse Access Road	0.27	Public Access to Horse Rental Area	II	25.0	49.5
405	Mammoth Residence Area Service Roads	1.71	Residence Access	V	68.8	89.7
406	Mammoth Administrative Service Roads	1.21	Service Roads and Parking	V	68.8	78.9
407	Mammoth Trailer Court Service Roads	0.82	Access to Trailer Court	V	68.8	75.8
408	Mammoth Lower Residence Service Roads	1.54	Employee Residence and Service Access			
	MP 0.00 to MP 1.00	1.00		IV	31.3	53.9
	MP 1.00 to MP 1.54	0.54		VI		
413	Mammoth Concessioner Residence Road	0.14	Residence Access	III	52.5	85.3
441	Mammoth Cemetery Spur	1.62	Cemetery Access	VI	N/R	N/R
452	Mammoth Concessioner Service Rd	0.17	Service Road	V	N/R	N/R
453	Mammoth Water Treatment Plant Service Road	0.84	Service Road	V	N/R	N/R
480	Mammoth Substation Service Road	0.17	Service Road	VI	N/R	N/R
485	Glenn Creek Water Intake Service Road	0.10	Water Intake Access	VI	N/R	N/R
903	Lower Mammoth Terrace Parking Area	0.13	Public Parking	III	N/R	N/R
940	Mammoth Photo Shop Parking Area	0.10	Public Parking	III	N/R	N/R

N/R = Not Rated

Topography: Rolling to Mountainous

Vegetation:
Open, sparse, low growing, arid to semi-arid vegetation dominated by sagebrush and grasses with transition zone vegetation dominated by Lodgepole Pine in the higher elevation areas.

SPECIAL PROBLEMS OR FEATURES:

Most public use and administrative roads and parking areas in the Mammoth Headquarters vicinity are in relatively poor condition due to age and use.

PRINCIPAL ROAD NEEDS:

Abate progressive pavement structure deterioration and restore riding quality of the existing roadway. Correct areas of base and subgrade failure. Improve the load carrying capability of the roadway structure. Control surface drainage by installation of storm sewer systems.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

The Mammoth Headquarters area has unique historical significance relating to the founding of the park and its administration as a military post. The area also contains some of the park's major thermal features. Road improvements must be planned to protect both the historical and natural elements of the environment.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Routes 204 and 406: Upgrade public and major administrative facilities by installation of curbs and storm sewers. Recondition, resurface, and pave roads and parking areas.

Routes 206, 405, 407, 408, and 413: Recondition roadways, surface and pave graveled roads and parking. Resurface and pave other roads.

Routes 223 and 903: Overlay roadways and parking areas with bituminous plant mix.

Route 453: Recondition roadway, resurface with gravel.

Route 485: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
X	Environmental Assessment
	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Upgrading of public use and major administrative roads in the visitor accommodation and park headquarters areas will extend roadway service life, reduce maintenance costs, and improve overall visual quality.

#3287J:4

TABLE 204-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
204	Mammoth Store/Hotel/Cabins Rds	20-24	20-24	2	Bituminous Plant Mix	Satisfac	Good	Poor	Poor	Good	Poor	15
206	Mammoth Campground Roads	12-22	12-22	1	Bituminous Plant Mix	Good	Good	Poor-Fair	Poor	Fair	Fair	15
223	Mammoth HQ Admin Office Road	28-34	28-34	2	Bituminous Plant Mix	Good	Good	Fair	Fair	Good	Good	15
228	Mammoth Rental Horse Access Rd	14	14	1	Gravel	Good	Good	Fair	None	Fair	Fair	15
405	Mammoth Residence Area Serv Rds	17-22	12-18	2	BPM, BST	Fair	Fair	Fair-Poor	Poor	Fair	Fair	15-25
406	Mammoth Admin Service Roads	16-40	16-40	2	BPM, Gravel	Satisfac	Satisfac	Fair-Poor	Fair-Poor	Fair	Poor	15
407	Mammoth Trailer Court Serv Rds	22-25	22-25	2	BPM, BST	Good	Good	Fair*Poor	Poor	Fair	Fair	15
408	Mammoth Lower Res Serv Rds	10-22	10-18	1-2	BST, Native	Poor	Satisfac	Poor	Poor	Fair	Good-Fair	10-15
413	Mammoth Concessioner Res Rd	24	24	2	Bituminous Plant Mix	Good	Good	Poor	Fair	Fair	Fair	15
441	Mammoth Cemetery Spur	10	10	1	Native Primitive	Poor	Fair	Poor	None	Poor	Poor	10-15
452	Mammoth Concessioner Serv Rd	12	12	1	Gravel	Satisfac	Good	Fair	None	Fair	Fair	10-15
453	Mammoth Water Treatment Plant Service Road	12	12	1	Gravel	Poor	Poor	Poor-Good	None	Fair	Poor	15-25
480	Mammoth Substation Service Rd	12	12	1	Gravel	Fair	Poor	Fair-Poor	None	Fair-Poor	None	10-15
485	Glenn Creek Water Intake Service Road	12	12	1	Gravel	Fair	Fair	Fair-Poor	None	Fair-Poor	None	10-15
903	Lower Mammoth Terrace Pkng Ar	N/A	N/A	N/A	Sealed BPM	Satisfac	Good	Fair	N/A	Fair	Fair	10-15
940	Mammoth Photo Shop Pkng Area	N/A	N/A	N/A	Bituminous Plant Mix	Satisfac	Good	Fair	N/A	Fair	Fair	10-15

NOTES: BPM = Bituminous Plant Mix.
BST = Bituminous Surface Treatment.

*Route 407 Access Road and YCC Road have "fair" pavement condition ratings. Roads within the trailer court and storage areas have "poor" pavement condition ratings.

TABLE 204-3
ESTIMATES OF COSTS

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
204	Mammoth Store/ Hotel/Cabins Rds	Roads & Parking	Curbs, Storm Sewer, Resurface, & Pave	10,000	248,000	301,000	109,000	67,000	184,000	138,000	1,057,000
206	Mammoth CG Rds	Roads & Parking	Recondition, Resurf, & Pave	10,000	32,000	221,000	35,000	30,000	82,000	62,000	472,000
223	Mammoth HQ Admin Office Road	Road & Parking	Future BPM Overlay		3,000	19,000	1,000	2,000	6,000	5,000	36,000
228	Mammoth Rental Horse Access Road	Road & Parking	No Work Proposed								
405	Mammoth Residence Area Service Rds	Road, Parking, & Driveways	Surface & Pave Gravel Areas BPM Overlay		24,000	110,000	8,000	14,000	39,000	29,000	224,000
406	Mammoth Administrative Serv Rds	Roads & Pkng Areas	Curbs, Storm Sewer, Resurface, & Pave		196,000	428,000	34,000	66,000	181,000	136,000	1,041,000
407	Mammoth Trailer Court Service Rds	Rds & Pkng (Trailer Court & YCC)	BPM Overlay Paved Areas Surface & Pave Graveled Areas		24,000	88,000	4,000	12,000	32,000	24,000	184,000
408	Mammoth Lower Residence Serv Rds	Corral & Transfer Station Roads	Recondition, Surface & Pave	2,000	23,000	104,000	3,000	13,000	36,000	27,000	208,000
413	Mam Conc Res Rd	Road & Parking	Recondition, Resurf, & Pave		6,000	28,000	1,000	4,000	10,000	7,000	56,000
441	Mam Cemetery Spur	Road	Primitive Road - No Work Proposed								
452	Mam Conc Serv Rd	Private Driveway	No Work Proposed								
453	Mam Wtr Treatment Plant Service Rd	Road & Parking	Recondition, Resurf(Gravel)		8,000	25,000	2,000	4,000	10,000	7,000	56,000
480	Mammoth Substation Serv Rd	Primitive Road	No Work Proposed								
485	Glenn Cr. Water Intake Serv. Rd.	Primitive Road	No Work Proposed								
903	Lower Mammoth Terrace Pkng Area	Rd Approaches & Parking	BPM Overlay	5,000	4,000	11,000	6,000	3,000	7,000	5,000	41,000
940	Mammoth Photo Shop Parking Area	Rd Approaches & Parking	Not Operating - No Work Proposed								
			TOTAL COST	27,000	576,000	1,360,000	205,000	219,000	597,000	447,000	3,431,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.

CONSOLIDATED COST ESTIMATE OF STREET IMPROVEMENTS AT MAMMOTH

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
10H	Grand Loop Road	0.46 Mile Road	Curbs, Sidewalk, Storm Sewer, Resurface, & Pave	13,000	147,000	100,000	9,000	27,000	74,000	55,000	425,000*
11	North Entrance	0.94 Mile Road	Curbs, Storm Sewer, Resurface, & Pave	17,000	365,000	301,000	14,000	70,000	192,000	144,000	1,103,000*
204	Mammoth Store/ Hotel/Cabins Rds	Roads & Parking	Curbs, Storm Sewer, Resurface, & Pave	10,000	248,000	301,000	109,000	67,000	184,000	138,000	1,057,000**
406	Mammoth Administrative Serv Rds	Roads & Pkng Areas	Curbs, Storm Sewer, Resurface, & Pave		196,000	428,000	34,000	66,000	181,000	136,000	1,041,000**
			TOTAL COST	40,000	956,000	1,130,000	166,000	230,000	631,000	473,000	3,626,000

*These costs are also included in the cost estimates for Route 10, Segment H, or for Route 11, Segment 1.
**These costs are also included in the cost estimates for the Mammoth Complex (Table 204-3).

RTE. NO.	ROUTE NAME
10	Grand Loop Rd
204	Mammoth Store/Hotel/Cabins Rd
206	Mammoth Campground Rd
223	Mammoth Headquarters Administration Office Rd
228	Mammoth Rental Horse Access Rd
405	Mammoth Residence Area Service Rd
406	Mammoth Administrative Service Rd
407	Mammoth Trailer Court Service Rd
408	Mammoth Lower Residence Service Rd
413	Mammoth Concessioner Residence Service Rd
441	Mammoth Cemetery Spur
452	Mammoth Concessioner Service Rd
453	Mammoth Water Treatment Plant Service Rd
480	Mammoth Substation Service Rd
500	Mammoth Gardiner High Rd
502	Bunsen Peak Loop Rd
903	Lower Mammoth Terrace Parking Area
940	Mammoth Photo Shop and Parking

MAMMOTH ADMINISTRATIVE ROADS

MAMMOTH LOWER RESIDENCE SERVICE RD

MAMMOTH RESIDENCE AREA SERVICE RD

MAMMOTH ADMINISTRATIVE RD

MAMMOTH HEADQUARTERS ADMINISTRATIVE OFFICE RD

MAMMOTH PHOTO SHOP & PARKING AREA

MAMMOTH CONCESSIONER RESIDENCE SERVICE RD

MAMMOTH GARDNER HIGH RD

MAMMOTH STORE/ HOTEL/CABINS RD

MAMMOTH SUBSTATION RD

MAMMOTH CONCESSIONER SERVICE RD

LOWER MAMMOTH TERRACE PARKING AREA

MAMMOTH RENTAL HORSES ACCESS RD

MAMMOTH WATER TREATMENT PLANT SERVICE RD

MAMMOTH TRAILER COURT SERVICE RD

BUNSEN PEAK LOOP

MAMMOTH CONCESSIONER RESIDENCE

NORTH ENTRANCE ROAD

GRAND LOOP ROAD

I	MAIN ACCESS ROAD
II	CONNECTOR PARK ROAD
III	CIRCULATION ROAD
IV	PRIMITIVE ROAD
V	ADMINISTRATIVE ACCESS ROAD
VI	RESTRICTED ACCESS ROAD

MAMMOTH HOT SPRINGS AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101	40167
DSC	APR 85

MAMMOTH HOT SPRINGS COMPLEX

ROUTE 204

Aerial View Mammoth Hotel, Store, and Cabins Area

Aerial View Park Headquarters (Upper Center)

Entrance to Cabins Area

Mammoth Cabins Area

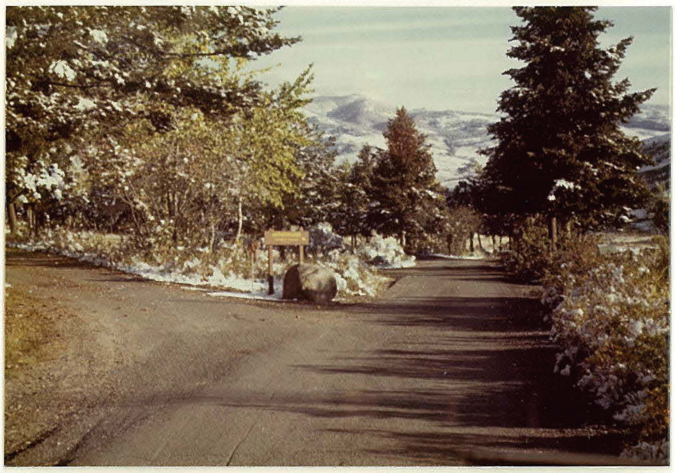
Employee Dormitory Parking Area

MP 0.68 Parking Area Behind Hotel

MAMMOTH HOT SPRINGS COMPLEX

ROUTE 206

MP 0.00 Mammoth Campground Entrance



MP 0.26 Campground Loop Roads

ROUTE 223

MP 0.09 Typical Road Condition at Park Headquarters

ROUTE 228

MP 0.08 Typical Road Condition, Mammoth Rental Horse Area

ROUTE 405

MP 0.41 Approach to Mammoth Residence Area

Mammoth Residence Area

MAMMOTH HOT SPRINGS COMPLEX

ROUTE 406

Headquarters Parking Area

Administrative Parking Area

Park Headquarters Complex

Maintenance Area

Maintenance Area

MAMMOTH HOT SPRINGS COMPLEX

ROUTE 407

Typical Trailer Residence Area Road

Youth Conservation Corps Parking Area

ROUTE 408

Service Road, Mammoth Residence Area

ROUTE 413

Facing South Toward Mammoth Terrace

MAMMOTH HOT SPRINGS COMPLEX

ROUTE 453

Typical Road Condition in Winter

Typical Road Condition

MP 0.81 Mammoth Water Treatment Plant Parking Area

ROUTE 480

Parking Area, Lower Mammoth Terrace Vicinity

ROUTE 903

Facing East to Store, Hotel, and Cabins Complex

#3219J:1
Map: Pg. IV-85
Photos: Pg. IV-321

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. 207 et al; Name: Natural Bridge Area Roads

Route No. (RIP): 207; Natural Bridge Road
467; Arnica Creek - Natural Bridge Service Road

Route 207 Length: 1.21 miles; Milepost 0.00 to Milepost 1.21
Route 467 Length: 7.50 miles; Milepost 0.00 to Milepost 7.50

Route Location:
South of Bridge Bay Campground extending westerly and southerly from the Grand Loop Road.

Purpose/Function:
Route 207 - Public access to a point of interest known as the Natural Bridge.

Route 467 - Service road access to a cross park primary electric power transmission line.

Functional classification:
Route 207 1984 NPS Standard Class:
MP 0.00 to MP 1.08 - II (Connector Park) Road
MP 1.08 to MP 1.21 - III (Special Purpose Park) Road
Route 467 1984 NPS Standard Class: VI (Restricted) Road

Topography: Rolling

Vegetation:
Heavy Lodgepole Pine forest with moderate understory.

ROUTE 207:
EVALUATION OF EXISTING ROADWAY:
Existing Average Daily Traffic (1985): 150 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 200 vehicles
Roadway Width (shoulder to shoulder): 16 ft.
Pavement/Surfacing Width: 16 ft.; Type: Bituminous Plant Mix;
Condition: Very Poor

Base/Subgrade Cond:	Fair ;	Drainage Cond:	Fair
Shoulder Width:	0 ft.;	Shoulder Cond:	Poor
Posted Speed Limit:	25 mph;	Ave. Oper. Speed:	25 mph
Horizontal Alignment:	Fair ;	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 25.0; Adjusted OSR: 51.1
Roadside Condition:
Poor. Major sight distance problems are prevalent due to narrow clearing limits.

ROUTE 467:

EVALUATION OF EXISTING ROADWAY:

Length: 7.50 miles; Milepost 0.00 to Milepost 7.50
Existing Average Daily Traffic (1985): 10 vehicles
Passenger Cars and Pickups: 0%; Buses and Trucks: 100%
Recreational Vehicles: 0%; Bicycle Use: N/A
Projected Average Daily Traffic (2005): 10 vehicles
Roadway Width (shoulder to shoulder): 10-15 ft.
Pavement/Surfacing Width: 0 ft.; Type: Native ;
Condition: Very poor (impassable). Road is maintained only when necessary to gain service access to power line. Otherwise, it remains closed.

Base/Subgrade Cond:	Poor ;	Drainage Cond:	Poor
Shoulder Width:	0 ft.;	Shoulder Cond:	N/A
Posted Speed Limit:	0 mph;	Ave. Oper. Speed:	5 mph
Horizontal Alignment:	Poor ;	Vertical Alignment:	Poor

Road Improvement Study (RIP) Segment Nos.: Not Rated
Roadside Condition: Satisfactory for use.

SPECIAL PROBLEMS OR FEATURES:

The Natural Bridge is a geological point of interest which is a minor park attraction. The poor condition of the access road is a deterrent to public use of the road.

PRINCIPAL ROAD NEEDS:

Abate progressive pavement structure deterioration and restore riding quality of the existing roadway.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

There will be a slight increase in the visual scale of the roadway relative to the landscape by selective road edge clearing.

TYPES OF IMPROVEMENTS:

Resurfacing ____	Rehabilitation ____	Reconstruction X
New Construction ____	No Improvement ____	Maintenance Seal Coat ____

SCOPE OF WORK:

Route 207 - Selectively thin and clear roadside vegetation by partial removal of small trees, undergrowth, and brush to improve sight distance. Recondition roadway. Reshape roadway and ditches. Improve drainage. Provide a two-way, single lane roadway with intervisible passing turnouts. Surface and pave with bituminous plant mix. An alternative estimate is provided for a two lane bituminous plant mix paved roadway.

Route 467 - No work proposed. The park management strategy provides for keeping the roadway closed to all vehicular travel except as necessary for maintenance of the electric power transmission line.

PROBABLE ENVIRONMENTAL CLEARANCE:

____	Environmental Impact Statement
__X__	Environmental Assessment
____	Categorical Exclusion

ROAD STANDARDS:

	Route 207		1984
	One Lane	Two Lane	NPS Stds.
Roadway Width (ft):	14	24	14
Lane Width (ft):	1	10	1
No. of Traffic Lanes:	1	2	1
Shldr Width (ft/side):	0	2	0
Shldr Bicycle Lanes:	No	No	No
Design Speed (mph):	25	25	25

ESTIMATES OF COST:

	Route 207	
	One Lane	Two Lane
Roadway Width (ft)	14	24
Clearing	$ 5,000	$ 5,000
Landscaping	10,000	10,000
Grading	41,000	53,000
Drainage	8,000	19,000
Structures		
Surfacing/Paving	173,000*	235,000*
Safety & Traffic Cont	4,000	5,000
Mobilization 10%	24,000	33,000
Incidental Items 25%	66,000	90,000
Construction Subtotal	331,000	450,000
Constr Engr (FHWA) 15%	50,000	67,000
Total Estimated Cost	$ 381,000	517,000
Cost Per Mile	$ 315,000	427,000
Prelim Engr (FHWA) 10%	$ 33,000	45,000

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 3" Inch Depth Bituminous Plant Mix Pavement

BENEFITS/RESULTS:

Improvement of Route 207 as either a single lane paved road with intervisible passing turnouts or as a two lane paved road will improve riding qualities and extend the pavement service life. Safety, utility, and the visual quality of the facility will be enhanced. Quality of the visitor experience will be improved. The two lane alternative will accommodate public traffic with less congestion and improved safety characteristics.

NATURAL BRIDGE AREA ROADS

ROUTE 207

MP 0.88 Loop at Road End, Natural Bridge Vicinity

#3317J:1
Map: Pg. IV-49
Photos: Pgs. IV-329 to IV-330

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 208 et al; Name: Fountain Freight Road Vicinity

Route Location:
Near the confluence of Nez Perce Creek with the Firehole River in the west central area of the park.

Purpose/Function:
The Fountain Freight Road provides access to minor recreational facilities and trailheads along the Firehole River. The Ojo Caliente Road, Nez Perce Picnic Area, Feather Lake Picnic Area, and Goose Lake Picnic Area are appurtenant recreation oriented facilities.

TABLE 208-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
208	Fountain Freight Road	2.93	Access to Routes 265, 916, 933, and 934	III	37.5 - 93.8	58.8 - 97.0
265	Ojo Caliente Road	0.36	Recreational Access to Firehole River			
	MP 0.00 to MP 0.34	0.34		II	N/R	N/R
	MP 0.34 to MP 0.36	0.02		III	N/R	N/R
916	Nez Perce Picnic Area	0.11	Public Access to Picnic Area	III	N/R	N/R
933	Feather Lake Picnic Area Road	0.47	Public Access to Picnic Area			
	MP 0.00 to MP 0.42	0.42		III	N/R	N/R
	MP 0.42 to MP 0.47	0.05		IV	N/R	N/R
934	Goose Lake Picnic Area Road	0.14	Public Access to Picnic Area	III	N/R	N/R

N/R = Not Rated

Topography: Flat

Vegetation:
Open meadowland with scattered stands of Lodgepole Pine.

BRIDGES AND MAJOR STRUCTURES:

Name:	Nez Perce Creek	Firehole River
BIP Number:	1570-013P	1570-014P
Location MP:	0.05	1.22
Type of Structure:	2 Span Precast Reinf Concrete Channel Beam	Single Span Precast Pre-stressed Concrete Girder
Structure Length(ft):	72	75
Deck Width c to c (ft):	24	16
Sidewalks/curbs, type:	Concrete Curbs	Concrete
Sidewalks/curbs, width(ft):	6 Inches	1.5
Rails, type:	None	Steel
General Condition:	Physical condition is good. Load bearing capacity has been questioned. Temporary timber bents are in place at center of each span to support deck structures.	Good (New 1984)

SPECIAL PROBLEMS OR FEATURES:

The Fountain Freight Road formerly was a major park route. It was bypassed by the present Grand Loop Road. It is now closed (gated) at MP 2.93. The extension beyond that point to the Fountain Freight Trailhead (Route 246) is now designated as a trail. However, it is traversable by vehicle in case of emergency.

PRINCIPAL ROAD NEEDS:

Route 208: MP 0.00 to MP 1.67 - Provide a bridge crossing of Nez Perce Creek with improved structural capacity and safety characteristics. Abate progressive pavement structure deterioration and restore riding quality of the existing roadway. MP 1.67 to MP 2.93 - Rehabilitate gravel surfacing.

Route 265, Route 933, and Route 934: Rehabilitate gravel surfaced roads and parking areas.

Route 916: Upgrade roadway and parking areas to provide paved all-weather surfaces.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

The Fountain Freight Road has historical significance as a part of the pioneer stage route to the Old Faithful Area and through the park. It also has significance as the site of minor incidents in the Nez Perce War during August 1876.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 208: From MP 0.00 to MP 1.67, repair base failures. Overlay roadway and parking areas with bituminous plant mix. From MP 1.67 to MP 1.82, remove old pavement. From MP 1.67 to MP 2.93 (end of route), recondition roadway and parking areas and resurface with gravel. A separate estimate is presented for replacement of the Nez Perce Creek Bridge.

Route 265, Route 933, and Route 934: Recondition roadways and parking areas and resurface with gravel.

Route 916: Recondition roadway and parking areas and surface and pave with bituminous plant mix.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Replacement of the Nez Perce Creek Bridge on Route 208 will provide a structure with improved structural capacity and safety characteristics.

A bituminous plant mix overlay of the paved portions of Route 208 will improve riding qualities and extend the pavement service life. Rehabilitation and resurfacing of the gravel surfaced portion of Route 208, as well as Routes 265, 933, and 934, will improve structural and riding characteristics. Safety and utility of the facility will be enhanced. Semi-primitive character of the road will be retained. Upgrading of Route 916 to provide paved all-weather surfaces will encourage increased visitor use due to its proximity to the Grand Loop Road.

#3317J:5

TABLE 208-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
208	Fountain Freight Road											
	Segment 1 MP 0.00 to 1.67	18-21	16-19	1	Bituminous Plant Mix	Good	Good	Fair-Good	Fair	Fair	Good	25
	Segment 2 MP 1.67 to 2.93	16	16	1	Gravel	Good	Good	Fair	Fair	Good	Good	25
265	Ojo Caliente Road	14	14		Semi-Primitive Gravl	Good	Good	Fair	None	Fair	Fair	15
916	Nez Perce Picnic Area	12	12	1	Semi-Primitive Gravl	Good	Good	Poor	None	Good	Good	15
933	Feather Lake Picnic Area Road	12	12	1	Semi-Primitive Gravl	Poor	Good	Poor	None	Poor	Poor	15
934	Goose Lake Picnic Area Road	14	14	1	Semi-Primitive Gravl	Fair	Good	Poor	None	Fair	Fair	15

3317J:6

TABLE 208-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
208	Fountain Frt Road	MP 0.05 Nez PerceCr	Remove and Replace Bridge	5,000:	154,000:	10,000:	6,000:	18,000:	48,000:	36,000:	277,000
	Segment 1	MP 0.00 to MP 1.67	BPM Road and Parking Areas	8,000:	13,000:	94,000:	7,000:	12,000:	34,000:	25,000:	193,000
	Segment 2	MP 1.67 to MP 2.93	Recondition&Resurf w/Gravel:	6,000:	11,000:	50,000:	3,000:	7,000:	19,000:	14,000:	110,000
265	Ojo Caliente Road	Road & Parking	Recondition&Resurf w/Gravel:	3,000:	5,000:	17,000:	6,000:	3,000:	9,000:	6,000:	49,000
916	Nez Perce Pcnc Ar	Road & Parking	Recon, Surf & Pave (BPM)	2,000:	8,000:	18,000:	1,000:	3,000:	8,000:	6,000:	46,000
933	Feather Lake Picnic Area Road	Road & Parking	Recondition&Resurf w/Gravel:	7,000:	17,000:	20,000:	1,000:	5,000:	13,000:	9,000:	72,000
934	Goose Lake Picnic Area Road	Road & Parking	Recondition&Resurf w/Gravel:	3,000:	9,000:	7,000:	1,000:	2,000:	6,000:	4,000:	32,000
			TOTAL COST	34,000:	217,000:	216,000:	25,000:	50,000:	137,000:	100,000:	779,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

FOUNTAIN FREIGHT ROAD VICINITY

ROUTE 208

Aerial View, Firehole River Bridge and Route 265 (Ojo Caliente Road) in Foreground

MP 0.05 Nez Perce Bridge Southbound

MP 1.19 New Firehole River Bridge

MP 1.23 Facing North New Firehole River Bridge

Aerial View, Turnout at MP 1.63

MP 1.82 Facing South, End of Pavement

FOUNTAIN FREIGHT ROAD VICINITY

ROUTE 265

MP 0.23 Typical Roadway Condition

ROUTE 916

Picnic Area Entrance

ROUTE 933

MP 0.14 Semi-Primitive Gravelled Road

MP 0.42 Picnic Area

210 MADISON

#3321J:1
Map: Pg. IV-335
Photos: Pg. IV-337

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 210 et al; Name: Madison Area Roads

Route Location:
At the confluence of the Gibbon and Firehole Rivers (head of the Madison River) in the west central area of the park.

Purpose/Function:
The Madison Campground, Museum, and related facilities are major visitor attractions for overnight camping and day use.

TABLE 210-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
210	Madison Campground Roads	2.66	Public Access and Parking	III	62.5	67.6
416	Madison Water Tank Service Road	0.20	Service Road	VI	N/R	N/R
457	Madison Residence and Maintenance Area	0.44	Service Road	V	N/R	N/R
462	Madison Wastewater Treatment Plant Road	0.22	Service Road	VI	N/R	N/R
924	Madison Museum and Amphitheater Parking Area	0.20	Public Parking	III	N/R	N/R

N/R = Not Rated

Topography: Flat to Rolling

Vegetation:
Dense stands of Lodgepole Pine with open meadowland and riverine wetland vegetation along the watercourses.

SPECIAL PROBLEMS OR FEATURES:

Meadowlands at the confluence of the Gibbon and Firehole Rivers are prime wildlife viewing areas.

PRINCIPAL ROAD NEEDS:

Routes 210 and 924: No short-term needs identified. Future bituminous plant mix overlays will satisfy long-term requirements.

Route 457: No short-term needs identified. Long-term needs will be satisfied by upgrading roads and parking in the trailer residence area and a future bituminous plant mix overlay.

Routes 416 and 462: None identified. Roads should remain primitive to discourage unauthorized use.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconditioning of roadways and parking areas along with bituminous plant mix overlays applied at an appropriate future time (6 to 10 years) will improve riding qualities and extend the pavement service life.

#3321J:4

TABLE 210-2

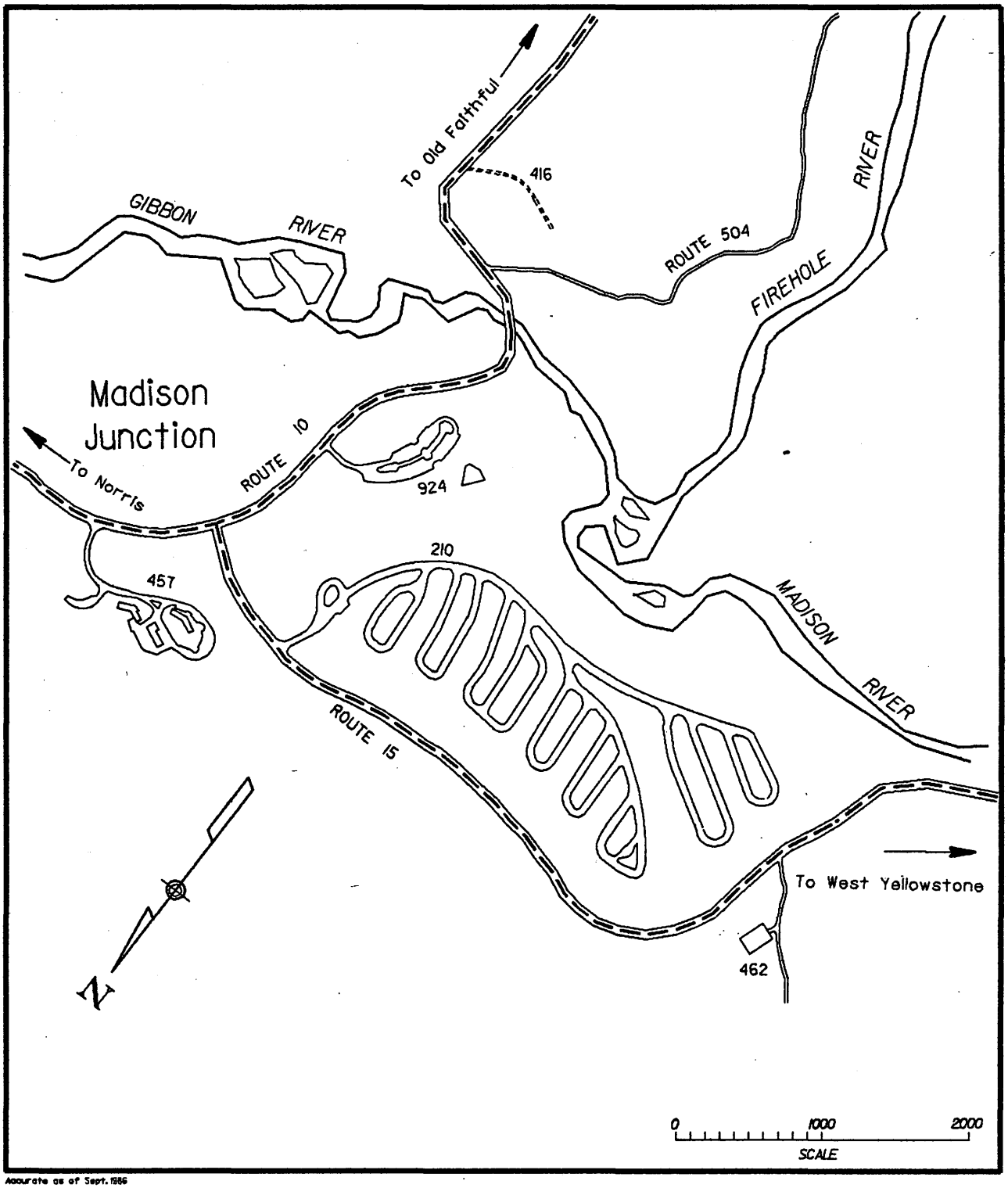
EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
210	Madison Campground Roads	12-24	12-24	1-2	Bituminous Plant Mix	Good	Good	Fair	Fair	Good	Good	15
416	Madison Water Tank Service Rd	12	12	1	Partially Graveled	Fair	Fair	Poor	N/A	Fair	Fair	10
457	Madison Residence and Maintenance Area	20-24	20-24	2	Bituminous Plant Mix	Good	Good	Good	Fair	Fair	Good	15
462	Madison Wastewater Treatment Plant Road	12	12	1	Gravel	Good	Good	Poor	N/A	Good	Poor	15
924	Madison Museum and Amphitheater Parking Area	42	32	2+ Pkng	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	15

TABLE 210-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
210	Madison CG Roads	Roads & Parking	Recond Rds & BPM Overlay	5,000	15,000	189,000	13,000	22,000	61,000	46,000	351,000
416	Madison Water Tank Service Road	Road	Maintain As Primitive Road								
457	Madison Residence &Maintenance Area	Roads & Parking	Recond Rds & BPM Overlay		7,000	42,000	3,000	5,000	14,000	11,000	82,000
462	MadisonWastewater Treatment Plnt Rd	Road	Maintain As Primitive Road								
924	Madison Museum & Amphitheater Parking Area	Rd Approaches &Pkng	Future BPM Overlay	1,000	4,000	17,000	1,000	2,000	6,000	5,000	36,000
			TOTAL COST	6,000	26,000	248,000	17,000	29,000	81,000	62,000	469,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.



Accurate as of Sept. 1986

ROUTES

ROUTE NO.	ROUTE NAME	REPORT PAGE
210	Madison Campground Rd.	IV-331
416	Madison Water Tank Service Rd.	IV-331
457	Madison Residence and Maintenance Area	IV-331
462	Madison Wastewater Treatment Plant Rd.	IV-331
924	Madison Museum and Amphitheater Parking Area	IV-331

MADISON JUNCTION

MADISON AREA ROADS

ROUTE 210

Typical Campground Loop Road

ROUTE 457

Maintenance Area

Administrative Parking Area

ROUTE 462

MP 0.05 Typical Road Condition

#3323J:1
Map: Pg. IV-15
Photos: Pgs IV-345 to IV-346

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 211 et al; Name: Routes Appurtenant to Route 10, Segment A

Route Location:
Along the northwesterly portion of Route 10, the Grand Loop Road, between Mammoth and Norris Junction in the northwest park area.

Purpose/Function:
Minor visitor facilities access and service roads.

TABLE 211-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	AQJ OSR
211	Indian Creek Campground Road	1.33	Access & Campground Circulation		81.3-100.0	79.4-100.0
	MP 0.00 to MP 0.43	0.43	Public Access to Campground	II		
	MP 0.43 to MP 1.13	0.70	Campground Circulation	III		
	MP 0.00 to MP 0.20	0.20	Service Road	VI		
212	Sheepeater Cliff Road	0.27	Access to Point of Interest			
	MP 0.00 to MP 0.25	0.25	Access to Point of Interest	II	N/R	N/R
	MP 0.25 to MP 0.27	0.02	Parking	III	N/R	N/R
226	Beaver Ponds Picnic Area Road	0.12	Public Access to Picnic Area	III	87.5	82.3
227	Apollinaris Spring Picnic Area Road	0.18	Access to Picnic Area	III	87.5	86.6
264	Hoodoos Loop Road	0.24	Access to Point of Interest	III	N/R	N/R
409	Mammoth Water Intake Service Rd	0.90	Service Road	VI	50.0	82.0
411	Snowpass Trailhead Service Road	0.84	Access & Service for Trailhead	VI	12.5	61.9
931	Obsidian Cliff Parking Area	0.06	Point of Interest Parking	III	N/R	N/R

N/R = Not Rated

Topography: Rolling to Mountainous

Vegetation:
Low growing, arid to semi-arid vegetation dominated by sagebrush, grasses, and Lodgepole Pine forest with light understory.

BRIDGES AND MAJOR STRUCTURES:

	Route 211
Name:	Obsidian Creek Bridge
BIP Number:	T570-004
Location MP:	0.11
Type of Structure:	Single Span Steel Girder With Wood Deck
Structure Length(ft):	38
Deck Width c to c (ft):	14
Sidewalks/curbs, type:	None
Sidewalks/curbs, width(ft):	N/A
Rails, type:	Wrought Iron Post and Lattice
General Condition:	Poor - Limited load capacity and life expectancy due to age and condition. Railings do not conform to current safety standards.

SPECIAL PROBLEMS OR FEATURES:

The Obsidian Creek Bridge on Route 211 is approaching critical condition because of age. Structural capacity is also restricted.

PRINCIPAL ROAD NEEDS:

Route 211: Recondition campground loop roads and provide a new bridge. Overlay access road at an appropriate point in time.

Routes 212, 226, and 227: Upgrade roadways to improve ride, appearance, and to extend the service life.

Routes 264 and 931: Provide a future bituminous plant mix overlay when needed.

Routes 409 and 411: No work proposed. The park management strategy provides for maintaining these facilities in a semi-primitive to primitive condition.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified. No changes in roadway geometrics are proposed.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 211: Replace the Obsidian Creek Bridge with a new structure. Overlay main access road with bituminous plant mix. Recondition, resurface, and pave campground loop roads.

Routes 212, 226, and 227: Recondition, resurface, and pave roadways and parking areas with bituminous plant mix.

Routes 264 and 931: Future bituminous plant mix overlay (the cost for Route 931 improvement is included in the estimates for Route 10, Segment A).

Routes 409 and 411: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconditioning, resurfacing, and bituminous plant mix overlays of campground and public point of interest access roads will preserve and protect the roadways, extend roadway service life, and improve both the visual quality and quality of the visitor experience. Replacement of the Obsidian Creek Bridge on Route 211 will provide greater structural capacity and extended service life. A lower profile, aesthetically designed bridge will better fit the park setting than the present utilitarian steel structure.

#3323J:5

TABLE 211-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
211	Indian Creek Campground Road											
	Access Road	20	20	2	Bituminous Plant Mix	Good	Good	Good	Fair	Good	Good	15-25
	Loop Roads	14	14	1	BST	Good	Good	Poor	None	Poor	Fair	15
	Service Road	12	12	1	Primitive	Satisfac	Satisfac	None	N/A	Good	Good	10
212	Sheepeater Cliff Road	16	14	1	Bituminous Plant Mix	Good	Good	Fair-Poor	Poor	Fair	Fair	15
226	Beaver Ponds Picnic Area Road	12-20	12-20	1-2	BST & Gravel	Fair	Good	Poor	Poor	Fair	Poor	15
227	Apollinaris Spring Picnic Area Road	12-16	12-16	1	BST & Gravel	Fair	Good	Poor	Poor	Fair	Poor	15
264	Hoodoos Loop Road	14	14	1	Bituminous Plant Mix	Good	Good	Good	None	Good	Good	10-15
409	Mammoth Water Intake Serv Rd	14	14	1	GravelSemi-Primitive	Satisfac	Satisfac	Fair	N/A	Good	Fair	15-25
411	Snowpass Trailhead Serv Rd	10	N/A	1	None Primitive Road	Satisfac	Satisfac	None	N/A	Poor	Poor	10-15
931	Obsidian Cliff Parking Area	N/A	N/A	N/A	Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	5-10

NOTE: BST = Bituminous Surface Treatment

3323J:6

TABLE 211-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
211	Indian Creek Campground Road	Road & Parking	BPM Overlay Access Road Reconstruct CG Loops	5,000	*87,000	111,000	42,000	25,000	68,000	51,000	389,000
212	SheepeaterCliff R	Road & Parking	Recond, Surf, & Pave BPM	5,000	5,000	31,000	2,000	4,000	12,000	9,000	68,000
226	Beaver Ponds Picnic Area Road	Road & Parking	Recond, Surf, & Pave BPM	2,000	4,000	19,000	1,000	3,000	7,000	5,000	41,000
227	ApollinarisSpring Picnic Area Road	Road & Parking	Recond, Surf, & Pave BPM	2,000	4,000	26,000	1,000	3,000	9,000	7,000	52,000
264	Hoodoos Loop Road	Road & Parking	Future BPM Overlay	1,000	2,000	5,000	1,000	1,000	3,000	2,000	15,000
409	Mammoth Water Intake Serv Road	Road	No Work Proposed								
411	SnowpassTrailhead Service Road	Road	No Work Proposed								
931	Obsidian Cliff Parking Area	Parking Area	BPM Overlay, Included With Route 10, Segment A								
			TOTAL COST	15,000	102,000	192,000	47,000	36,000	99,000	74,000	565,000

NOTES: *Includes $69,000 for bridge replacement.
BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Non public use roads are not eligible for FLHP funding.
Cost estimates are rounded to nearest $1,000.

Aerial View of Campground

MP 0.11 Obsidian Creek Bridge

MP 0.58 Typical Campground Loop Road

ROUTES APPURTENANT TO ROUTE 10, SEGMENT A

ROUTE 212

MP 0.22 Parking at Road End

ROUTE 226

MP 0.05 Picnic Area Loop

ROUTE 227

MP 0.18 Typical Road Condition

218 NORRIS

#3329J:1
Map: Pg. IV-351
Photos: Pgs. IV-353 to IV-354

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 218 et al; Name: Norris Area Roads

Route Location:
In the vicinity of Norris Geyser Basin near the junction of Route 10, the Grand Loop Road, and Route 16, the Norris to Canyon Road, in the northwest central park area.

Purpose/Function:
Public access to visitor facilities and service roads.

TABLE 218-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
218	Norris Picnic Area Roads	0.41				
	MP 0.00 to MP 0.29	0.29	Public Access	II	93.8	94.1
	MP 0.29 to MP 0.41	0.12	Circulation and Parking	III	93.8	94.1
219	Norris Campground Roads	1.30				
	MP 0.00 to MP 0.41	0.41	Public Access	II	75.0	75.8
	MP 0.41 to MP 1.30	0.89	Circulation and Parking	III	75.0	75.8
220	Norris Geyser Basin Road	0.72				
	MP 0.00 to MP 0.25	0.25	Public Access	II	93.8	95.8
	MP 0.25 to MP 0.71	0.47	Geyser Basin Circulation & Pkng	III	93.8	95.8
404	Norris Administrative Service Road	0.41	Service Road	V	100.0	100.0
435	Norris Water Tank Service Road	1.38	Service Road	VI	56.3	83.3
474	Norris Water Well Access Road	0.39	Service Road	VI	N/R	N/R
475	Norris Water Pump Station Service Road	0.11	Service Road	VI	N/R	N/R

N/R = Not Rated

Topography: Rolling to Mountainous

Vegetation:
Heavy Lodgepole Pine forest with light understory and open meadowland and riverine wetland vegetation along the Gibbon River.

SPECIAL PROBLEMS OR FEATURES:
The Norris Geyser Basin and adjoining areas are unique and spectacular natural areas. They are prime visitor attractions.

PRINCIPAL ROAD NEEDS:
Route 218 and Route 404 (Access Road): No needs identified.

Route 219: Future bituminous plant mix overlay.

Route 220: Rehabilitate pavement structure on access road and overlay roadway and parking areas.

Route 404: Recondition, resurface, and pave roads and parking in residence and maintenance areas.

Route 435: Recondition surface with gravel.

Routes 474 and 475: None identified (primitive roads).

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
None identified, other than minor public inconvenience and delays during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:
Route 219: Future bituminous plant mix overlay.

Route 220: Repair isolated base failure areas and overlay pavement with bituminous plant mix.

Route 404 Residence and Maintenance Area: Recondition roadway. Reshape roadway and ditches. Surface and pave with bituminous plant mix.

Route 435: Clear and reshape roadway and ditches. Install culverts. Surface with gravel.

PROBABLE ENVIRONMENTAL CLEARANCE:
_____ Environmental Impact Statement
_____ Environmental Assessment
X Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:
Reconditioning of roadways and bituminous plant mix overlays will improve riding qualities and extend the pavement service life. Visual quality of the facility will be enhanced. Quality of the visitor experience will be improved.

#3329J:4

TABLE 218-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
218	Norris Picnic Area Roads	24	24	2	Bituminous Plant Mix	Good	Good	Good	Fair	Good	Good	15
219	Norris Campground Roads	20	20		Bituminous Plant Mix	Good	Good	Good	Fair	Good	Good	15
220	Norris Geyser Basin Road	26	26	2	Bituminous Plant Mix	Good	Good	Good	Fair	Good	Good	15
404	Norris Admin Service Road	24-31	24-25	2	BPM - BST	Good	Good	Good-Poor	Fair	Good	Good	15
435	Norris Water Tank Serv Road	12	12	1	Gravel	Poor	Poor	Poor-None	None	Good	Good	15-25
474	Norris Water Well Access Rd	12	12	1	Gravel	Satisfac	Satisfac					10-15
475	Norris Water Pump Sta Serv Rd	12	12	1	Gravel	Satisfac	Satisfac					

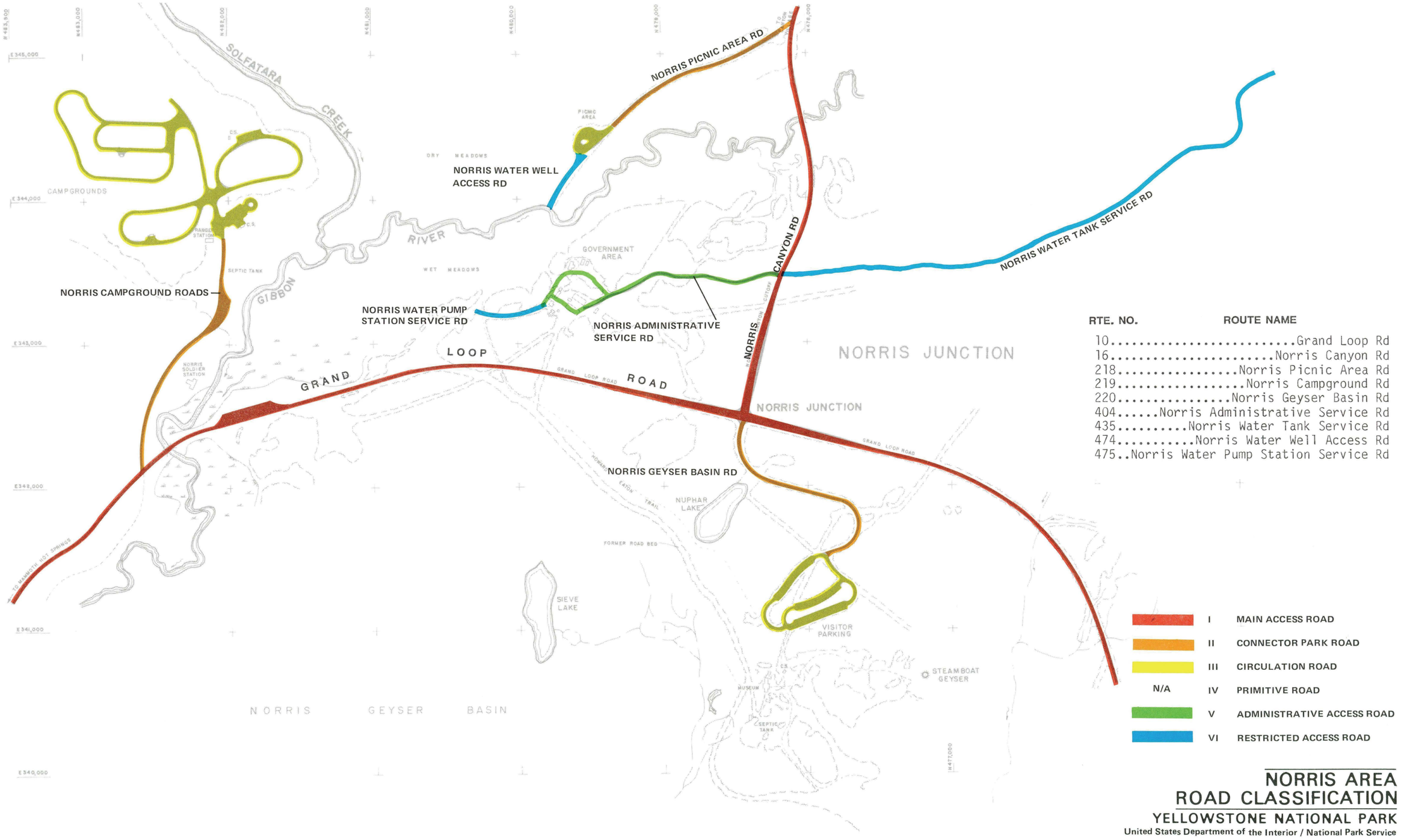
NOTES: BPM = Bituminous Plant Mix
BST = Bituminous Surface Treatment

3329J:5

TABLE 218-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
218	NorrisPcncAreaRds	Road & Parking	Good Condition-No Work Proposed								
219	Norris CG Roads	Road & Parking	Future BPM	5,000	5,000	92,000	26,000	13,000	35,000	26,000	202,000
220	Norris Geyser Basin Road	Road & Parking	Repair Base, BPM	1,000	7,000	77,000	7,000	9,000	25,000	19,000	145,000
404	NorrisAdminServRd	Access Road	Good Condition-No Work Proposed								
		Maintenance Area	Resurface & Pave Rds & Pkng		11,000	79,000	2,000	9,000	25,000	19,000	145,000
435	Norris Water Tank Service Road	Road	Recondition & Surf w/Gravel		125,000	27,000	2,000	15,000	42,000	32,000	243,000
474	Norris Water Well Access Road	Road	Primitive Road-No Work Proposed								
475	Norris Water Pump Station Serv Road	Road	Primitive Road-No Work Proposed								
			TOTAL COST	6,000	148,000	275,000	37,000	46,000	127,000	96,000	735,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.



RTE. NO.	ROUTE NAME
10	Grand Loop Rd
16	Norris Canyon Rd
218	Norris Picnic Area Rd
219	Norris Campground Rd
220	Norris Geyser Basin Rd
404	Norris Administrative Service Rd
435	Norris Water Tank Service Rd
474	Norris Water Well Access Rd
475	Norris Water Pump Station Service Rd

	I	MAIN ACCESS ROAD
	II	CONNECTOR PARK ROAD
	III	CIRCULATION ROAD
N/A	IV	PRIMITIVE ROAD
	V	ADMINISTRATIVE ACCESS ROAD
	VI	RESTRICTED ACCESS ROAD

NORRIS AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101	40173
DSC	APR 85

NORRIS AREA ROADS

ROUTE 218

MP 0.28 Typical Road Condition

ROUTE 219

MP 0.28 Entrance Parking Area

MP 0.32 Typical Road Condition

NORRIS AREA ROADS

ROUTE 220

MP 0.06 Entrance Road

MP 0.40 Parking Area

Aerial View Parking Area

ROUTE 404

MP 0.15 Access Road

MP 0.25 Norris Residence Area

#3235J:1
Map: Pg. IV-31
Photos: Pg. IV-359

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. 224 et al; Name: Routes appurtenant to Route 10, Segment B

Route No. (RIP): 224; Gibbon Falls Picnic Area Road
225; Gibbon Meadows Picnic Area Road
410; Gibbon Meadows Service Road

Route 224 Length: 0.15 mile; Milepost 0.00 to Milepost 0.15
Route 225 Length: 0.10 mile; Milepost 0.00 to Milepost 0.10
Route 410 Length: 0.13 mile; Milepost 0.00 to Milepost 0.13

Route Location:
Appurtenant routes to the Grand Loop Road (Route 10) between Norris and Madison junctions.

Route 224 - On the east side of Route 10 (MP 29.85) and south of Gibbon Falls.

Route 225 - On the west side of Route 10 (MP 24.14) on the north edge of Gibbon Meadows.

Route 410 - On the east side of Route 10 (MP 24.26) near Gibbon Meadows.

Purpose/Function:
Route 224 - Public Access to the Gibbon Falls Picnic Area
Route 225 - Public Access to the Gibbon Meadows Picnic Area
Route 410 - Service Road to Storage Area (former pit site)

Functional classification:
Route 224 1984 NPS Standard Class: III (Special Purpose Park) Road
Route 225 1984 NPS Standard Class: III (Special Purpose Park) Road
Route 410 1984 NPS Standard Class: VI (Restricted) Road

Topography: Flat to Mountainous

Vegetation:
Moderate to heavy Lodgepole Pine forest with light understory interspersed with open meadowland.

ROUTE 224:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 200 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 250 vehicles
Roadway Width (shoulder to shoulder): 12-14 ft.
Pavement/Surfacing Width: 12-14 ft.; Type: Bituminous Surface Treatment;
Condition: Poor
Base/Subgrade Cond: Fair ; Drainage Cond: Poor
Shoulder Width: 0 ft.; Shoulder Cond:
Posted Speed Limit: mph; Ave. Oper. Speed: 15 mph
Horizontal Alignment: ; Vertical Alignment:
Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: Not Rated; Adjusted OSR: Not Rated
Roadside Condition: Good

ROUTE 225:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 150 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 180 vehicles
Roadway Width (shoulder to shoulder): 25 ft.
Pavement/Surfacing Width: 25 ft.; Type: Bituminous Plant Mix;
Condition: Good
Base/Subgrade Cond: Good ; Drainage Cond: Good
Shoulder Width: 1.5 ft.; Shoulder Cond: Good
Posted Speed Limit: 15 mph; Ave. Oper. Speed: 15 mph
Horizontal Alignment: Good ; Vertical Alignment: Good

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: Not Rated; Adjusted OSR: Not Rated
Roadside Condition: Good

ROUTE 410:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): Less Than 10 vehicles
Projected Average Daily Traffic (2005): Less Than 10 vehicles
Roadway Width (shoulder to shoulder): 12 ft.
Pavement/Surfacing Width: 12 ft.; Type: Gravel; Condition: Fair
Base/Subgrade Cond: Fair ; Drainage Cond: Fair
Shoulder Width: 0 ft.; Shoulder Cond: N/A
Posted Speed Limit: mph; Ave. Oper. Speed: 10 mph
Horizontal Alignment: Satisfactory; Vertical Alignment: Good

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: Not Rated; Adjusted OSR: Not Rated
Roadside Condition: Good

SPECIAL PROBLEMS OR FEATURES:
None identified.

PRINCIPAL ROAD NEEDS:
Route 224 - Rehabilitate pavement structure.

Route 225 - Future bituminous plant mix overlay.

Route 410 - None identified. The park management strategy provides for maintaining the road in its present primitive condition.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
None identified, except for minor public inconvenience during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:
Route 224 - Grade and drain, recondition roadway, and surface and pave with bituminous plant mix.

Route 225 - Overlay pavement with bituminous plant mix.

Route 410 - No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

ESTIMATES OF COST:

	Route 224	Route 225
Clearing	$	$
Landscaping	3,000	1,000
Grading	4,000	2,000
Drainage	2,000	
Structures		
Surfacing/Paving	20,000*	10,000
Safety & Traffic Cont	1,000	1,000
Mobilization 10%	3,000	1,000
Incidental Items 25%	8,000	4,000
Construction Subtotal	41,000	19,000
Constr Engr (FHWA) 15%	6,000	3,000
Total Estimated Cost	$ 47,000	$ 22,000
Cost Per Mile	$ N/A	$ N/A
Prelim Engr (FHWA) 10%	$ 4,000	$
For Materials Source Inside Park, Deduct	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 3 Inch Depth Bituminous Plant Mix Pavement

BENEFITS/RESULTS:

Route 224 - Rehabilitation of roadways and parking areas in the Gibbon Falls Picnic Area will improve riding qualities and extend the pavement service life. Visual quality of the facility will be enhanced. Quality of the visitor experience will be improved.

Route 225 - A future bituminous plant mix overlay of the Gibbon Meadows Picnic Area will improve riding qualities and extend the pavement service life.

ROUTE 224

Picnic Area Loop

#3330J:1
Map: Pg. IV-85
Photos: Pg. IV-365

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 229 et al; Name: Routes appurtenant to Route 10, Segment E

Route Location:
Adjacent to Route 10, the Grand Loop Road, between West Thumb and Fishing Bridge in the central park area.

Purpose/Function:
Minor public facilities and service roads

TABLE 229-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
229	Spruce Forest Picnic Area Road	0.29	Public Access and Parking	III	68.8	74.3
230	Dot Island Picnic Area Road	0.11	Public Access and Parking	III	68.8	74.3
231	Sand Point Picnic Area Road	0.16	Public Access and Parking	III	68.8	74.3
430	Little Thumb Creek Borrow Pit Service Road	0.36	Service Road	VI	43.8	80.0
469	Duck Lake Service Road	0.25	Service Road	VI	N/R	N/R
484	Pumice Point Service Road	0.23	Service Road	VI	N/R	N/R
906	Pumice Point Parking Area	0.06	Public Access and Parking	III	N/R	N/R

N/R = Not Rated

Topography: Rolling

Vegetation:
Lodgepole Pine forest with light to moderate understory with areas of open meadowland.

SPECIAL PROBLEMS OR FEATURES:
None identified.

PRINCIPAL ROAD NEEDS:
The minor picnic areas and visitor parking areas appurtenant to Route 10 will require future bituminous plant mix overlays.

No needs other than periodic maintenance are identified on service roads.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified, other than minor public inconvenience which will be experienced during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Routes 229, 230, 231, and 906: Future bituminous plant mix overlays, timed to coincide with overlay of the adjacent section of Route 10.

Routes 430, 469, and 484: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

- ____ Environmental Impact Statement
- ____ Environmental Assessment
- X Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

ESTIMATES OF COST:

	Route 229 SpruceForest Picnic Area	Route 230 Dot Island Picnic Area	Route 231 Sand Point Picnic Area	Route 906 Pumice Point Parking Area
Clearing	$	$	$	$
Landscaping	1,000	1,000	1,000	1,000
Grading	1,000	1,000	1,000	1,000
Drainage				
Structures				
Surfacing/Paving	12,000*	6,000*	16,000*	16,000*
Safety & Traffic Cont	1,000	1,000	1,000	1,000
Mobilization 10%	2,000	1,000	2,000	2,000
Incidental Items 25%	4,000	3,000	5,000	5,000
Construction Subtotal	2,000	13,000	26,000	26,000
Constr Engr (FHWA) 15%	3,000	2,000	4,000	4,000
Total Estimated Cost	$ 24,000	$ 15,000	$ 30,000	$ 30,000
Cost Per Mile	$ N/A	$ N/A	$ N/A	$ N/A
Prelim Engr (FHWA) 10%	$ 2,000	$ 2,000	$ 3,000	$ 3,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay

BENEFITS/RESULTS:

Future bituminous plant mix overlays will improve riding qualities and extend the pavement service life.

#3330J:4

TABLE 229-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
229	Spruce Forest Picnic Area Rd	22			Bituminous Plant Mix							
230	Dot Island Picnic Area Road	30	24		Bituminous Plant Mix			Good				
231	Sand Point Picnic Area Road	25-55			Bituminous Plant Mix			Good				
430	Little Thumb Creek Borrow Pit Service Road	12			Gravel			Very Poor				
469	Duck Lake Service Road	12	12	1	Gravel	Poor	Poor	Fair	N/A	Fair	Poor	10
484	Pumice Point Service Road	12-16			Bituminous Plant Mix			Good				
906	Pumice Point Parking Area	20			Bituminous Plant Mix			Good				

ROUTES APPURTENANT TO ROUTE 10, SEGMENT E

ROUTE 229

MP 0.24 Typical Road Condition

ROUTE 231

MP 0.05 Parking Area

ROUTE 469

MP 0.00 Gate at Junction with Route 10

MP 0.02 Road Entrance

ROUTE 484

Gravelled Service Road

#3331J:1
Map: Pg. IV-115
Photos: Pg. IV-371

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 233 et al; Name: Routes Appurtenant to Route 10, Segment G

Route Location:
Adjacent to Route 10, the Grand Loop Road, between Canyon junction and Tower junction in the north central park area.

Purpose/Function:
Route 238 (Chittenden Road) provides public access to the Mt. Washburn Overlook (MP 1.36). It continues to the Mt. Washburn lookout tower as a restricted service road. Other routes provide access to minor public use areas adjacent to the Grand Loop Road.

TABLE 233-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
233	Dunraven Picnic Area Road	0.14	Public Access to Dunraven Picnic Area	III	81.3	85.2
238	Chittenden Road	4.37				
	MP 0.00 to MP 1.45	1.45	Public Access to Scenic Overlook	II	18.8	40.9
	MP 1.45 to MP 4.37	2.92	Administrative Access to Fire Lookout	VI	18.8	40.9
255	Cascade Lake Trailhead and Picnic Area Road	0.19	Public Access to Trailhead and Picnic Area	III	75.0	83.6
489	Old Canyon Water Intake Service Road	0.11	Service Road	VI	N/R	N/R
921	Antelope Creek Picnic Area	0.08	Public Access to Antelope Creek	III	N/R	N/R
922	Dunraven Summit Picnic Area	0.03	Public Access to Summit Picnic Area	III	N/R	N/R

N/R = Not Rated

Topography: Mountainous

Vegetation:
Transition zone vegetation dominated by Lodgepole Pine on the lower mountain slopes with sparse low growing, arid to semi-arid vegetation dominated by sagebrush and grasses at higher elevations.

SPECIAL PROBLEMS OR FEATURES:

Route 238: Chittenden Road provides access to an overlook which provides an exceptional view of the north park area and the Absaroka Mountains.

PRINCIPAL ROAD NEEDS:

Routes 233, 238, 255, and 921: Upgrade roadways and parking areas to provide improved visitor accommodation. Upgrade the restricted portion of Route 238 to provide improved service road access to the lookout tower at the summit of Mt. Washburn.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified. No changes in road or parking area geometrics are proposed.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Routes 233, 238 (Public Access Portion MP 0.00 to MP 1.45), 255, and 921: Recondition roadways and parking areas, resurface, and pave with bituminous plant mix.

Route 238 (Service Road Portion MP 1.45 to MP 4.37): Recondition roadway and surface with gravel.

Route 922: Bituminous plant mix overlay. The cost estimate is included in the estimate for Route 10, Subsegment G-1.

Route 489: Primitive Road. Scheduled to be obliterated and revegetated.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconditioning of public roadways and parking areas will improve riding qualities and extend the pavement service life. Visual quality of the facilities will be enhanced. Quality of the visitor experience will be improved.

Surfacing of the service road portion of Route 238 will improve access to the Mt. Washburn lookout for government vehicles.

#3331J:4

TABLE 233-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
233	Dunraven Picnic Area Road	12	12	1	BST	Fair	Fair	Poor	None	Fair	Fair	15
238	Chittenden Road			1				Poor		Good		15
	MP 0.00 to MP 1.45	19	18	1	Gravel (Old BST)	Fair	Fair	Poor	Poor	Poor	Poor	25
	MP 1.45 to MP 4.37	10-12	N/A	1	Native	Poor	Poor	None	N/A	Poor(Rough)	Poor	10-15
255	Cascade Lake Trailhead and Picnic Area Road	12	12	1	BST	Fair	Fair	Poor	None	Good	Good	15
489	Old Canyon Water IntakeServRd	10	N/A	1	Native	Poor	Poor	None	N/A	Poor	Poor	10
921	Antelope Creek Picnic Area	20	20	2	Gravel	Good	Good	Fair	Poor	Fair	Good	15
922	Dunraven Summit Picnic Area	N/A	N/A	N/A	BST	Good	Good	Fair	N/A	Fair	Fair	0-10

NOTE: BST = Bituminous Surface Treatment

3331J:5

TABLE 233-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
233	Dunraven Picnic Area Road	Road & Parking	Recond, Surf, & Pave BPM Surface & Pave Service Rds	5,000	12,000	22,000	5,000	4,000	12,000	9,000	69,000
238	Chittenden Road										
	MP 0.00 to 1.45	Road & Parking	Recond, Surf, & Pave BPM	1,000	49,000	165,000	1,000	22,000	60,000	45,000	343,000
	MP 1.45 to 4.37	Service Road	Recond & Surface w/Gravel		33,000	78,000	1,000	11,000	31,000	23,000	177,000
255	Cascade Lk Trail-head & Picnic Area Road	Road & Parking	Recond, Surf, & Pave BPM	2,000	5,000	31,000	5,000	4,000	12,000	9,000	68,000
489	Old Canyon Water Intake Service Rd	Road	No Work Proposed								
921	Antelope Creek Picnic Area	Road & Parking	Recond, Surf, & Pave BPM		2,000	32,000	1,000	4,000	10,000	7,000	56,000
922	Dunraven Summit Picnic Area	Parking	Overlay (Estimate Included in Route 10, Subsegment G-1)								
			TOTAL COST	8,000	101,000	328,000	13,000	45,000	125,000	93,000	713,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

ROUTES APPURTENANT TO ROUTE 10, SEGMENT G

ROUTE 233

MP 0.05 Typical Road Condition

ROUTE 238

MP 0.71 Typical Rough and Rutted Roadway

MP 1.37 Mt. Washburn Lookout Parking Area

MP 2.24 Service Road to Lookout Mt. Washburn Vicinity

MP 4.24 Service Road Near Mt. Washburn Summit

#3332J:1
Map: Pg. IV-99
Photos: Pg. IV-377

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 234 et al; Name: Routes Appurtenant to Route 10, Segment F

Route Location:
Adjacent to Route 10, the Grand Loop Road, between Fishing Bridge junction and Canyon junction in the central park area.

Purpose/Function:
Access to public facilities and service roads.

TABLE 234-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
234	Buffalo Ford Picnic Area Road	0.32	Picnic and Fishing Access	III	N/R	N/R
458	Otter Creek Service Road	0.59	Service Road	VI	N/R	N/R
470	Fishing Bridge Water Intake Service Road	0.27	Service Road	VI	N/R	N/R
481	Fishing Bridge Microwave Service Road	0.20	Service Road	VI	N/R	N/R
917	Mud Volcano Parking Area	0.21	Public Parking Area	III	N/R	N/R
939	Cascade Picnic Area	0.18	Public Access and Parking	III	N/R	N/R

N/R = Not Rated

Topography: Rolling

Vegetation:
Transition zone vegetation dominated by Lodgepole Pine and riverine wetland vegetation along the Yellowstone River and tributaries. Low growing, arid to semi-arid vegetation dominated by sagebrush and grasses in the uplands of Hayden Valley.

BRIDGES AND MAJOR STRUCTURES:

	Route 458
Name:	Otter Creek
BIP Number:	None Assigned
Location MP:	0.20
Type of Structure:	Single Span Concrete Flat Slab
Structure Length(ft):	22
Deck Width c to c (ft):	23
Sidewalks/curbs, type:	Concrete
Sidewalks/curbs, width(ft):	0.50
Rails, type:	Wood
General Condition:	Very poor. Severe spalling of weather exposed concrete surfaces evident. Wood railings are deteriorated.

SPECIAL PROBLEMS OR FEATURES:

The Buffalo Ford Picnic Area provides access to the Yellowstone River for fishermen.

The Mud Volcano and adjacent thermal features are outstanding visitor attractions. Hayden Valley is a prime wildlife viewing area.

PRINCIPAL ROAD NEEDS:

Upgrading of roads and parking for Routes 234 and 939 is needed for improved visitor accommodation. A future bituminous plant mix overlay of Route 917 is identified as a long-range need.

The Otter Creek Service Road (Route 458) is being phased out under the park management strategy. No road needs are therefore identified. Routes 470 and 481 are primitive service roads. No needs are identified.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

These facilities are located in an area of unique and sensitive natural resource values. Encroachment into undisturbed areas must be avoided. During the period of construction there will be minor inconvenience to the public.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	X
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Routes 234 and 939: Recondition, resurface, and repave roadways and parking areas.

Route 917: Apply a future bituminous plant mix overlay, timed to coincide with overlay of the adjacent section of the Grand Loop Road.

Routes 458, 470, and 481: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	Routes 234 and 939
X	Categorical Exclusion	Route 917

ROAD STANDARDS:

	Routes 234 and 939 Access Road	Routes 234 and 939 Loop Roads	1984 NPS Stds.
Roadway Width (ft):	20	12	20-12
Lane Width (ft):	9	12	9-12
No. of Traffic Lanes:	2	1	2-1
Shldr Width (ft/side):	1	0	1-0
Shldr Bicycle Lanes:	No	No	No
Design Speed (mph):	25	15	25-15

ESTIMATES OF COST:

	Route 234	Route 917	Route 939
Clearing	$	$	$
Landscaping	2,000		2,000
Grading	10,000	2,000	3,000
Drainage	3,000		1,000
Structures			
Surfacing/Paving	100,000*	37,000**	29,000*
Safety & Traffic Cont	13,000	2,000	2,000
Mobilization 10%	13,000	4,000	4,000
Incidental Items 25%	35,000	11,000	10,000
Construction Subtotal	176,000	56,000	51,000
Constr Engr (FHWA) 15%	26,000	8,000	8,000
Total Estimated Cost	$ 202,000	$ 64,000	$ 59,000
Cost Per Mile	$ 631,000	$ N/A	$ N/A
Prelim Engr (FHWA) 10%	$ 18,000	$ 6,000	$ 5,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 3 Inch Depth Bituminous Plant Mix Pavement
**Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay

BENEFITS/RESULTS:

Upgrading, surfacing, and paving of roadways and parking areas of Routes 234 and 939 will improve visitor accommodation and the quality of the visitor experience.

Future bituminous plant mix overlay of Route 917 at an appropriate point in time will extend the pavement service life.

#3332J:5

TABLE 234-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
234	Buffalo Ford Picnic Area Road	14-18	14-18	1	Bituminous SurfTreat	Good	Good	Very Poor		Fair	Poor	15
458	Otter Creek Service Road	20	20	2	Bituminous SurfTreat	Fair	Good	Poor	Poor	Fair-Good	Fair	25
470	Fishing Bridge Water Intake Service Road	10	N/A	1	Native	Satisfac	Good	None	N/A	Fair	Poor	10-15
481	Fishing Br Microwave Serv Rd	10	N/A	1	Native	Satisfac	Poor	None	N/A	Poor	Poor	10-15
917	Mud Volcano Parking Area	20-Apprs	Good	N/A	Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	5-10
939	Cascade Picnic Area											
	Access Road	27	25	2	Bituminous SurfTreat	Good	Good	Poor	Poor	Fair	Fair	15
	Loop Road	10	10	1	Bituminous SurfTreat	Fair	Good	Poor	None	Fair	Fair	10

ROUTES APPURTENANT TO ROUTE 10, SEGMENT F

ROUTE 234

Access Road

ROUTE 917

Parking Area and Walkways

#3337J:1
Map: Pg. IV-129
Photos: Pgs. IV-383 to IV-384

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 235 et al; Name: Routes Appurtenant to Route 10, Segment H

Route Location:
Adjacent to Route 10, the Grand Loop Road, between Tower-Roosevelt junction and Mammoth in the north park area.

Purpose/Function:
Visitor access to minor visitor facilities, points of interest, and service roads.

TABLE 235-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
235	Petrified Tree Road	0.57	Public Access and Parking	III	100.0	104.6
236	Hellroaring Creek Trailhead	0.25	Access and Parking	III	81.3	85.2
444	Frog Rock Pit Road	1.09	Service Road	VI	87.5	99.1
456	Blacktail Creek Service Road	0.54	Service Road	VI	N/R	N/R
508	Blacktail Plateau Drive	6.88	Scenic Loop Road	IV	43.8	66.5

N/R = Not Rated

Topography: Mountainous

Vegetation:
Mixed transition zone vegetation dominated by Lodgepole Pine and open sagebrush covered land with Aspen groves.

SPECIAL PROBLEMS OR FEATURES:
The variety of vegetation and terrain types in this area contribute to the exceptional visual quality of this semi-primitive park area.

PRINCIPAL ROAD NEEDS:
Route 235: Abate progressive pavement structure deterioration and restore riding quality of the existing roadway.

Route 236: Upgrade roadway to provide all-weather pavement surfaces for public use traffic.

PRINCIPAL ROAD NEEDS (Continued):

Route 508: Rehabilitate roadway and resurface as a one lane, one way scenic loop.

Routes 444 and 456: No needs identified. The park management strategy provides for maintaining these roads at present levels of development.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified. No changes in roadway geometrics are proposed.

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation	X	Reconstruction	X
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 235: Repair base failure areas; enlarge turnaround at road's end for recreational vehicles; resurface and pave parking area. Overlay roadway with bituminous plant mix.

Route 236: Reconstruct roadway and parking area; surface and pave with bituminous plant mix.

Routes 444 and 456: No work proposed.

Route 508: Reconstruct roadway by grading, draining, and surfacing with gravel.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	Routes 236 and 508
X	Categorical Exclusion	Route 235

ROAD STANDARDS:

	Route 235	Route 236 & Route 508	1984 NPS Standards (Low Volume Roads) One Lane Rd	Two Lane Rd
Roadway Width (ft):	20	14	14	20-22
Lane Width (ft):	9	14	14	9-10 *
No. of Traffic Lanes:	2	1	1	2
Shldr Width (ft/side):	1	0	0	1
Shldr Bicycle Lanes:	No	No	No	No
Design Speed (mph):	25	25	25-35	25-35

*Adjusted for tour bus and recreational vehicle use.

BENEFITS/RESULTS:

Reconditioning of Route 235 will increase vehicular capacity and improve roadway safety characteristics. Visual quality of the facility will be enhanced.

Upgrading, surfacing, and paving of Route 236 and reconstructing Route 508 with gravel surfacing will provide improved park visitor accommodation. Vehicle load carrying capacity of the roadway surfacing structure will be increased. Visitor use will increase. Quality of the visitor experience will be improved.

#3337J:4

TABLE 235-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
235	Petrified Tree Road	20	18	2	Bituminous Plant Mix	Fair	Fair	Fair	Fair	Fair	Fair	25
236	Hellroaring Creek TrailheadRd	12	12	1	Native	Poor	Poor	None	N/A	Poor	Poor	10-15
444	Frog Rock Pit Road	14-16	14	1	Gravel	Good	Good	Good	Fair	Good	Good	25
456	Blacktail Creek Service Road	11	11	1	Native	Satisfac	Satisfac	None	N/A	Fair	Poor	10-15
508	Blacktail Plateau Drive	12-14	None	1	Primitive	Fair-Poor	Fair-Poor	N/A	N/A	Fair	Poor	25

3337J:5

TABLE 235-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 5-10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
235	Petrified Tree Rd	Road & Parking Area	BPM Overlay, Resuf&PavePkng	3,000	7,000	46,000	8,000	6,000	18,000	13,000	101,000
236	Hellroaring Creek Trailhead Road	Road & Parking Area	Reconstruct, Surf&Pave BPM	2,000	8,000	17,000	1,000	3,000	8,000	6,000	45,000
444	Frog Rock Pit Rd	Road	Maintain Only - No Work Proposed								
456	Blacktail Creek Service Road	Road	Primitive Road - No Work Proposed								
508	Blacktail Plateau Drive	Road & Turnouts	Reconstruct, Surf & Gravel	81,000	852,000	164,000*	59,000	116,000	318,000	239,000	1,829,000
			TOTAL COST	86,000	872,000	824,000	81,000	98,000	491,000	368,000	2,820,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

*Estimate based on 3 inch depth gravel surfacing.

ROUTES APPURTENANT TO ROUTE 10, SEGMENT H

ROUTE 235

MP 0.50 Approaching Parking Area at Petrified Tree

ROUTE 236

MP 0.17 Typical Primitive Road Condition

ROUTE 456

MP 0.15 Gated Service Road

ROUTES APPURTENANT TO ROUTE 10, SEGMENT H

ROUTE 508

MP 0.51 Typical Unsurfaced Roadway

MP 2.73 Typical Road Condition

MP 6.86 Exit at Route 10

237 TOWER

#3339J:1
Map: Pg. IV-389
Photos: Pgs. IV-391 to IV-392

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 237 et al; Name: Tower-Roosevelt Area Roads

Route Location:
In the vicinity of Tower Falls and the Roosevelt Lodge in the north park area.

Purpose/Function:
Access to visitor accommodations, parking areas, and service roads.

TABLE 237-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
237	Roosevelt Lodge Roads	1.51	Visitor Access to Lodge & Cabins			
	MP 0.00 to MP 0.18	0.18	Public Access	II	100.0	105.3
	MP 0.18 to MP 1.28	1.10	Cabin Access and Parking	III	100.0	105.3
	MP 1.28 to MP 1.34	0.06	Primitive Road	IV	100.0	105.3
	MP 1.34 to MP 1.51	0.17	Service Road	V	100.0	105.3
256	Tower Ranger Station Road	0.21	Administrative Access	V	100.0	100.0
259	Tower Campground Loop	0.83	Visitor Access to Campground			
	MP 0.00 to MP 0.53	0.53	Access to Campground	II	43.8	71.9
	MP 0.53 to MP 0.83	0.30	Circulation in Campground	III	43.8	71.9
476	Old Dunraven Service Road	1.99	Service Road	VI	N/R	N/R
487	Tower Water Tank Service Road	0.20	Service Road	VI	N/R	N/R
902	Tower Junction Service Station	0.14	Service Road	III	N/R	N/R
920	Tower Falls Parking Area	0.05	Public Parking	III	N/R	N/R

N/R = Not Rated

Topography: Mountainous

Vegetation:
Open sagebrush covered land, Aspen groves, and transition zone vegetation dominated by Lodgepole Pine in the uplands.

SPECIAL PROBLEMS OR FEATURES:

The Tower Falls Campground Roads and related facilities are located in an area of very steep topography.

PRINCIPAL ROAD NEEDS:

Route 235: Correct areas of base and subgrade failure. Rehabilitate pavement structure of the roadway.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified. No changes in road widths or geometrics are proposed. There will be minor inconvenience to park visitors during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 237: Resurface cabins area roads with gravel; overlay lodge parking area with bituminous plant mix. No work proposed on entrance road.

Route 256: Overlay paved areas and surface and pave gravel areas with bituminous plant mix.

Route 259: Overlay access loop road and employee service road and parking areas with bituminous plant mix. Surface and pave campground roads, parking areas, and pads.

Route 902: Overlay approaches and parking area with bituminous plant mix.

Route 920: Overlay (estimate included in Route 10, Segment G-3).

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	Routes 237, 256, and 259
X	Categorical Exclusion	Route 902

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Resurfacing and paving of Route 237 (Roosevelt Lodge Cabins Area), Route 256 (Tower Ranger Station Service Area), and Route 259 (Tower Campground Area) will improve safety and utility of the facilities. Traffic generated dust will be eliminated. Visual quality of the facility will be enhanced. Visitor use will increase.

Bituminous plant mix overlays of paved roads and parking areas will improve riding qualities and extend the pavement service life.

#3339J:4

TABLE 237-2
EVALUATION OF EXISTING ROADWAYS

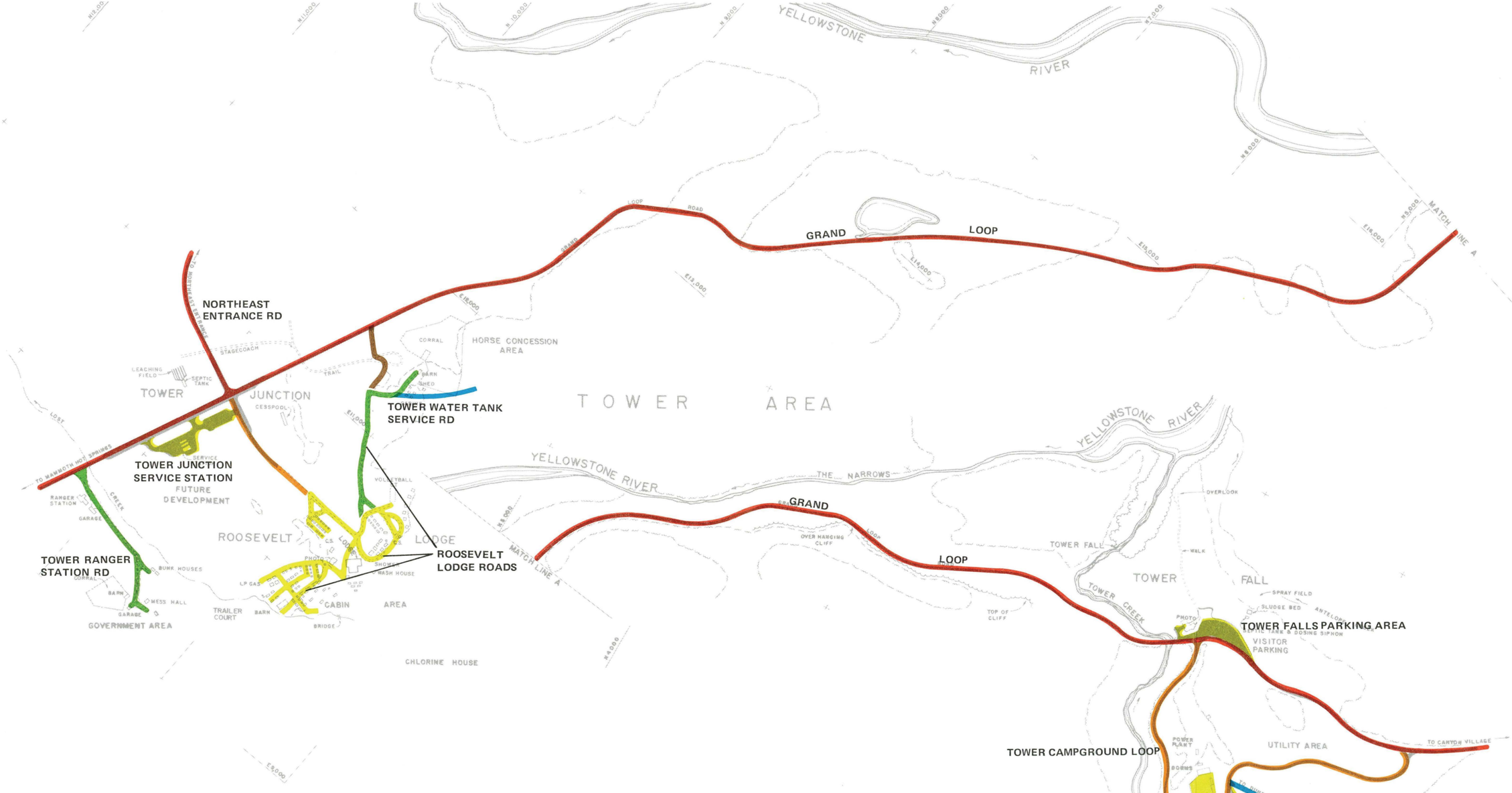
PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	CONDITION ALIGNMENT HORIZONTAL	CONDITION ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
237	Roosevelt Lodge Roads											
	Access Road	20	20	2	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	15
	Cabins Area Roads	14	14	1	Gravel & Native	Poor	Poor	Poor	N/A	Fair	Poor	10
256	Tower Ranger Station Road											
	Access Road	26	24	2	Bituminous SurfTreat	Good	Good	Fair	Fair	Fair	Fair	15
	Service Area Roads	16	12	1	Gravel	Fair	Good	Fair	Fair	Fair	Fair	10-15
259	Tower Campground Loop											
	Access Road	15-17	15-17	1	Bituminous Plant Mix	Fair	Fair	Fair	Poor	Fair	Good	15
	Campground Roads	12	12	1	Gravel	Poor	Fair	Poor	None	Poor	Poor	10
476	Old Dunraven Service Road	12	N/A	1	Native-NotMaintained	Poor	Poor	None	None	Poor	Poor	10
487	Tower Water Tank Service Road	12	N/A	1	Native	Fair	Poor	None	None	Poor	Fair	10
902	Tower Junction Service Station	N/A	N/A	N/A	Bituminous SurfTreat	N/A	N/A	Fair	N/A	Good	Good	10
920	Tower Falls Parking Area	N/A	N/A	N/A	Bituminous Plant Mix	N/A	N/A	Fair	N/A	Good	Good	10-15

3339J:5

TABLE 237-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
237	RooseveltLodgeRds	Lodge Parking Area	BPM Overlay			5,000		1,000	2,000	1,000	9,000
		Cabins Roads	Resurface with Gravel	1,000	5,000	25,000	5,000	3,000	9,000	7,000	55,000
256	Tower RangerStaRd	Road & Pkng Areas	Resurface & Pave BPM		5,000	59,000	1,000	7,000	18,000	14,000	104,000
259	Tower CG Loop	Access Road	BPM Overlay	2,000	6,000	19,000	2,000	3,000	8,000	6,000	46,000
		Campground Loop	Resurface & Pave BPM	2,000	4,000	49,000	9,000	6,000	18,000	13,000	101,000
		Employee Serv Area	BPM Overlay		3,000	5,000	1,000	1,000	3,000	2,000	15,000
476	Old Dunraven Service Road	Road	Primitive Road - No Work Proposed								
487	Tower Water Tank Service Road	Road	Primitive Road - No Work Proposed								
902	Tower Jct ServSta	Rd Apprs & Parking	BPM Overlay		2,000	15,000	1,000	2,000	5,000	4,000	29,000
920	Tower Falls Parking Area		BPM Overlay (Estimate Included with Route 10)								
			TOTAL COST	5,000	25,000	177,000	19,000	23,000	63,000	47,000	359,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.



RTE. NO.	ROUTE NAME
10	Grand Loop Rd
12	Northeast Entrance Rd
237	Roosevelt Lodge Rds
256	Tower Ranger Station Rd
259	Tower Campground Loop
476	Old Dunraven Service Rd
487	Tower Water Tank Service Rd
902	Tower Junction Service Station
920	Tower Falls Parking Area

	I	MAIN ACCESS ROAD
	II	CONNECTOR PARK ROAD
	III	CIRCULATION ROAD
	IV	PRIMITIVE ROAD
	V	ADMINISTRATIVE ACCESS ROAD
	VI	RESTRICTED ACCESS ROAD

TOWER-ROOSEVELT AREA ROAD CLASSIFICATION

YELLOWSTONE NATIONAL PARK

United States Department of the Interior / National Park Service

North

0 300 600 900 Feet

101	40168
DSC	APR 85

TOWER-ROOSEVELT AREA ROADS

ROUTE 237

Lodge and Parking Area

Service Road at Stagecoach Area

ROUTE 256

MP 0.05 Ranger Station Parking Area

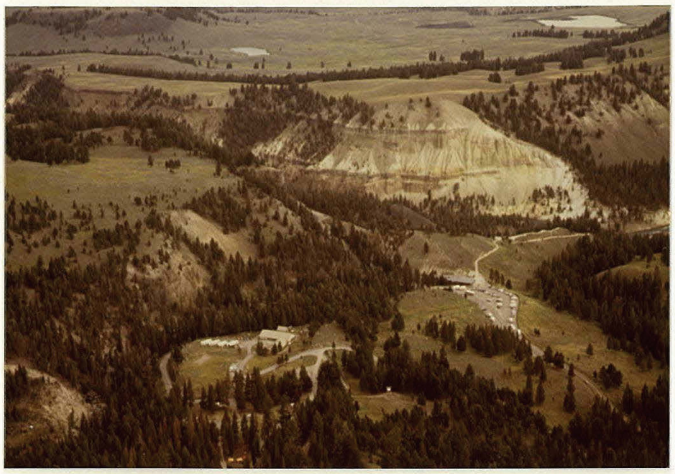
MP 0.14 Housing Area

ROUTE 476

MP 0.00 Service Road (Howard Eaton Trail)

TOWER-ROOSEVELT AREA ROADS

ROUTE 259



Aerial View, Campground and
Administrative Areas at Lower Left
Tower Falls Parking Area Center Right

MP 0.00 Entrance to Loop Road

MP 0.29 Patched Roadway

MP 0.60 Administrative Area

MP 0.56 Primitive Campground Road

#3341J:1
Map: Pg. IV-67
Photos: Pgs. IV-397 to IV-398

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 239 et al; Name: Routes Appurtenant to Route 10, Segment D

Route Location:
Along Route 10, the Grand Loop Road, between Old Faithful and West Thumb in the central southwest park area.

Purpose/Function:
Public access to minor visitor attractions and picnic areas, and service roads.

TABLE 239-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
239	Lone Star Geyser Trailhead and Service Road	2.42				
	MP 0.00 to MP 0.08	0.08	Trailhead Parking	II	81.3	85.2
	MP 0.08 to MP 2.42	2.34	Restricted Serv Rd & Public Use Trail	VI	81.3	85.2
240	Spring Creek Picnic Area Road	0.13	Public Access to Spring Creek Picnic Area	III	81.3	85.2
241	DeLacy Creek Picnic Area Road	0.11	Public Access to DeLacy Creek Picnic Area	III	81.3	85.2
242	Divide Picnic Area Road	0.14	Public Access to Divide Picnic Area	III	81.3	85.2
421	Old Faithful Water Supply Service Road	0.16	Service Road	VI	Not Rated	
423	Dry Creek Service Road	4.23	Service Road	VI	43.8	88.2

Topography: Mountainous

Vegetation:
Lodgepole Pine forest with moderate understory.

BRIDGES AND MAJOR STRUCTURES:

Name:	Lone Star Bridge (Route 239)
BIP Number:	1570-066S
Location MP:	0.55
Type of Structure:	Single Span Prestressed Reinf Concrete T Beams
Structure Length(ft):	53
Deck Width c to c (ft):	8
Sidewalks/curbs, type:	None
Sidewalks/curbs, width(ft):	N/A
Rails, type:	Treated Log
General Condition:	Good (new). Geometrics and railings are adequate for trail and restricted vehicular use.

SPECIAL PROBLEMS OR FEATURES:

These facilities are appurtenant to one of the most heavily traveled sections of the Grand Loop Road.

PRINCIPAL ROAD NEEDS:

Routes 239 (Trailhead Parking), 240, 241, and 242: Upgrade roadways and parking areas to provide paved all-weather surfaces.

Routes 239 (Trail and Service Road Area), 421, and 423: No improvement proposed. The park management strategy provides for maintaining these roads as semi-primitive facilities.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

No significant issues identified. There will be some inconvenience to park visitors during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing _____	Rehabilitation _____	Reconstruction __X__
New Construction _____	No Improvement _____	Maintenance Seal Coat ___

SCOPE OF WORK:

Routes 239 (Trailhead Parking Area), 240, 241, and 242: Recondition existing roadways and parking areas, surface and pave with bituminous plant mix.

Routes 239 (Trail and Service Road Area), 421, and 423: Maintain as semi-primitive graveled roads. Allow paved areas to revert to gravel surfaces.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Upgrading of roads and parking areas in the public use picnic and trailhead areas will provide improved visitor accommodation. Ruts, mud holes, soft spots, and traffic generated dust will be eliminated. Quality of the visitor experience will be improved. Visual quality of the facility will be enhanced. Visitor use will increase.

#3341J:4

TABLE 239-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
239	Lone Star Geyser Trailhead and Service Road	14	12-14	1	Gravel & Old BPM	Fair	Poor	Poor	Poor	Fair-Poor	Poor	15-25
240	Spring Creek Picnic Area Road	20	20	2	Gravel	Good	Good	Poor	None	Fair	Fair	15
241	DeLacy Creek Picnic Area Road	24	24	2	Gravel	Good	Good	Fair	Fair	Fair	Good	15
242	Divide Picnic Area Road	24	24	2	Bituminous SurfTreat	Good	Good	Poor	Poor	Fair	Fair	15
421	Old Faithful Water Supply Service Road	16	16	1	Gravel	Poor	Poor	Fair	None	Fair	Fair	15
423	Dry Creek Service Road	14	12-14	1	Gravel & Old BPM	Fair	Fair	Poor	N/A	Poor	Poor	15-25

NOTE: BPM = Bituminous Plant Mix

3341J:5

TABLE 239-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

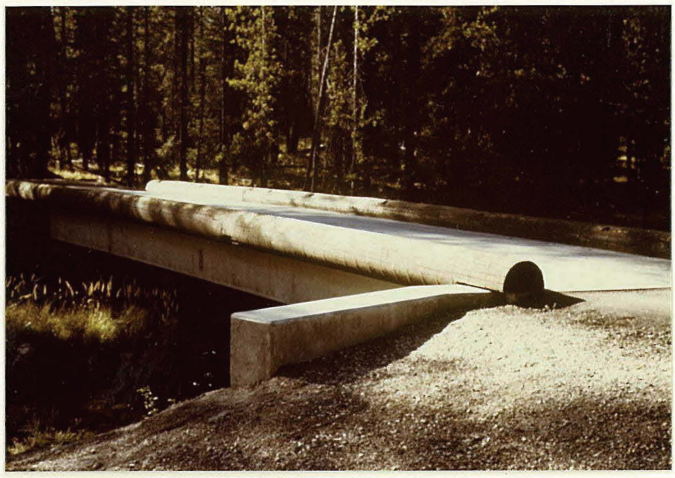
PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
239	Lone Star Geyser Trailhead &ServRd	Trailhead Pkng Area	Recond, Surf & Pave BPM	2,000	4,000	27,000	10,000	4,000	12,000	9,000	68,000
240	Spring Creek Picnic Area Road	Roads & Parking	Recond, Surf & Pave BPM	5,000	7,000	30,000	4,000	5,000	13,000	10,000	74,000
241	DeLacy Creek Picnic Area Road	Roads & Parking	Recond, Surf & Pave BPM	5,000	7,000	29,000	4,000	5,000	13,000	9,000	72,000
242	Divide Picnic Area Road	Roads & Parking	Recond, Surf & Pave BPM	5,000	5,000	22,000	4,000	4,000	10,000	8,000	58,000
421	OF Water Supply Service Road	Road	Maintain Only - No work proposed								
423	Dry Creek Serv Rd	Road	Maintain Only - No Work Proposed								
			TOTAL COST	17,000	23,000	108,000	22,000	18,000	48,000	36,000	272,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

ROUTES APPURTENANT TO ROUTE 10, SEGMENT D

ROUTE 239

MP 0.00 Trailhead Parking Area



MP 0.54 Service Road Bridge Across Firehole River

MP 1.80 Typical Service Road and Trail to Lone Star Geyser

ROUTE 240

Approach to Picnic Area

ROUTES APPURTENANT TO ROUTE 10, SEGMENT D

ROUTE 241

Picnic Loop Road and Parking

ROUTE 242

Approach to Picnic Area

ROUTE 421

MP 0.00 Road Entrance

#3342J:1
Map: Pg. IV-183
Photos: Pg. IV-403

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 243 et al; Name: Routes Appurtenant to Route 14, South Entrance Road

Route Location:
Adjacent to Route 14, the South Entrance Road, between a junction with Route 10, the Grand Loop Road, at West Thumb and the south park boundary.

Note: Route 202, Lewis Lake Campground Road is covered in a separate report.

Purpose/Function:
Public access to minor public use facilities and trailheads, and service roads.

TABLE 243-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
243	Snake River Picnic Area Road	0.20	Access to Picnic Area	III	93.8	85.3
436	Grant Substation Service Road	0.25	Service Road	VI	93.8	102.1
437	Grant Incinerator Service Road	0.40	Service Road	VI	93.8	102.1
460	South Entrance Pit Road	0.20	Service Road	VI	N/R	N/R
461	Lewis Lake Pit Road	0.15	Service Road	VI	N/R	N/R
938	Snake River Ranger Station	0.31	South Entrance Ranger Station	V	N/R	N/R
946	Heart Lake Trailhead	0.09	Public Access to Trailhead	III	N/R	N/R
949	Shoshone Lake Trailhead	0.15	Public Access to Trailhead	III	N/R	N/R

N/R = Not Rated

Topography: Mountainous

Vegetation:
Dense Lodgepole Pine forest with moderate understory, open meadowland, and riverine wetland vegetation along the watercourses.

SPECIAL PROBLEMS OR FEATURES:

The South Entrance Road is one of the most heavily traveled access roads into the park.

PRINCIPAL ROAD NEEDS:

Routes 243, 437, 938, 946, and 949: Upgrade roadways and parking areas to provide all-weather paved surfaces.

Routes 436, 460, and 461: No needs are identified. The park management strategy provides for maintaining these routes in a primitive or semi-primitive condition.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

No significant issues are identified. There will be some inconvenience to local area park visitors during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing _____	Rehabilitation _____	Reconstruction ___X___
New Construction _____	No Improvement _____	Maintenance Seal Coat ___

SCOPE OF WORK:

Routes 243, 437, 938, 946, and 949: Recondition roadways and parking areas. Resurface and pave with bituminous plant mix.

Routes 436, 460, and 461: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
__X__ Environmental Assessment
_____ Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Upgrading of public facility roads and parking areas will provide improved service to the park visitor. Ruts, mud holes, soft spots, and traffic generated dust will be eliminated. Visual quality of the facilities will be enhanced. Quality of the visitor experience will be improved. Visitor use will increase.

#3342J:4

TABLE 243-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
243	Snake River Picnic Area Road	12	12	1	Gravel			Fair		Fair	None	15
436	Grant Substation Service Road	12	12	1	Gravel	Fair	Fair	Fair-Poor	N/A	Fair	None	15
437	Grant Incinerator Service Rd	12-18		1	Gravel			Fair-Poor		Fair		15
460	South Entrance Pit Road	12-18		1	Gravel			Fair-Poor		Fair		15
461	Lewis Lake Pit Road	12-18		1	Gravel			Fair-Poor		Fair		15
938	Snake River Ranger Station	12		1	Bituminous SurfTreat			Fair		Fair	None	15
946	Heart Lake Trailhead	12-14		1	Gravel			Fair		Fair		15
949	Shoshone Lake Trailhead	10-12		1	Gravel & BST			Poor		Fair		15

NOTE: BST = Bituminous Surface Treatment.

TABLE 243-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
243	Snake River Picnic Area Road	Roads & Parking	Recond, Surf, & Pave BPM	5,000	10,000	21,000	4,000	4,000	11,000	8,000	63,000
436	Grant Substation Service Road	Road	Semi-Primitive Road - No Work Proposed								
437	Grant Incinerator Service Road	Road	Recond, Surf, & Pave BPM		8,000	82,000	2,000	9,000	25,000	19,000	145,000
460	South Ent Pit Rd	Road	Primitive Road - No Work Proposed								
461	Lewis Lake Pit Rd	Road	Primitive Road - No Work Proposed								
938	Snake Rvr RngrSta	Roads & Parking	Recond, Surf, & Pave BPM		4,000	33,000	1,000	4,000	10,000	8,000	60,000
946	Heart Lk Trlhd	Road & Parking	Recond, Surf, & Pave BPM	1,000	2,000	14,000	1,000	2,000	5,000	4,000	29,000
949	Shoshone Lk Trlhd	Roads & Parking	Recond, Surf, & Pave BPM	1,000	2,000	16,000	1,000	2,000	6,000	4,000	32,000
			TOTAL COST	7,000	26,000	166,000	9,000	21,000	57,000	43,000	329,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

ROUTES APPURTENANT TO SOUTH ENTRANCE ROAD

ROUTE 243

MP 0.23 Picnic Area Parking

ROUTE 938

MP 0.05 Access Road to Residence Area

ROUTE 949

MP 0.10 Trailhead Parking Area

#3346J:1
Map: Pg. IV-49
Photos: Pgs. IV-411 to IV-412

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 244 et al; Name: Routes Appurtenant to Route 10, Segment C

Route Location:
Adjacent to Route 10, the Grand Loop Road, between Madison Junction and the Old Faithful Interchange in the central southwest park area.

Purpose/Function:
Public parking at major thermal areas, public access to minor visitor facilities, and service roads.

TABLE 244-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
244	Firehole River Picnic Area Road	0.15	Public Access to Firehole River Picnic Area	III	81.3	85.2
246	Fountain Freight Trailhead Road	1.72				
	MP 0.00 to MP 0.14	0.14	Public Access	III	50.0	60.3
	MP 0.14 to MP 2.09	1.95	Trail	VI	N/R	N/R
258	Whiskey Flats Picnic Area Road	0.17				
	MP 0.00 to MP 0.13	0.13	Public Access	II	N/R	N/R
	MP 0.13 to MP 0.17	0.04	Picnic Loop	III	N/R	N/R
417	Mesa Service Road	1.27		VI	68.8	99.7
418	Nez Perce Patrol Cabin Service Road	0.75		VI	56.3	91.4
419	Nez Perce Creek Trailhead Service Road	2.20		VI	56.3	88.2
440	Firehole River Maintenance Yard Service Road	0.21		VI	81.3	91.3
925	Fountain Paint Pots Parking Area	0.18		III	N/R	N/R
926	Midway Geyser Basin Parking Area	0.10		III	N/R	N/R
927	Biscuit Basin Parking Area	0.19		III	N/R	N/R
928	Black Sand Basin Parking Area	0.13				
	MP 0.00 to MP 0.10	0.10	Public Access	II	N/R	N/R
	MP 0.10 to MP 0.13	0.03	Parking Area	III	N/R	N/R

N/R = Not Rated

Topography: Rolling to Mountainous

Vegetation:
Open meadowland with light to heavy transition zone vegetation dominated by Lodgepole Pine in upland areas and riverine wetland vegetation along the Firehole River and tributaries. Vegetation is suppressed by toxic minerals and high temperatures in thermal areas.

BRIDGES AND MAJOR STRUCTURES:

	Route 246
Name:	Firehole River
BIP Number:	1570-060S
Location MP:	0.09
Type of Structure:	Single Span Steel Truss Bridge With Wood Deck
Structure Length(ft):	67
Deck Width c to c (ft):	16
Sidewalks/curbs, type:	None
Sidewalks/curbs, width(ft):	N/A
Rails, type:	None (Thru Truss)
General Condition:	Fair. Deck has been replaced by park maintenance.

SPECIAL PROBLEMS OR FEATURES:

This area contains some of the principal thermal features and wildlife viewing areas in the park.

Route 246, the Fountain Freight Trailhead Road, is significant as a remnant of the historic Fountain Freight Road, an early wagon access route to the Old Faithful area. The 1.95 mile portion of this route between the Firehole River Bridge and the end of Route 208, the present Fountain Freight Road, is classified as a trail although it is still capable of carrying emergency vehicles. See report, page IV-323, for information on Route 208.

PRINCIPAL ROAD NEEDS:

Routes 244, 246, and 258: Upgrade roadways and parking areas to provide all-weather paved surfaces.

Routes 925, 926, 927, and 928: No short-term needs identified. Long-range needs are bituminous plant mix overlays in 6 to 10 years.

Routes 417, 418, 419, and 440: No needs identified. The park management strategy provides for maintaining these routes in primitive or semi-primitive condition.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

No significant issues identified. There will be some inconvenience to the public during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	X
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Routes 244, 246, and 258: Recondition roadways and parking areas; surface and pave with bituminous plant mix. A supplementary estimate is also included for replacement of the Firehole River Bridge.

Routes 925, 926, 927, and 928: Apply a bituminous plant mix overlay at an appropriate point in time.

Routes 417, 418, 419, and 440: No work proposed other than periodic maintenance.

#3346J:3

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Upgrading of graveled roadways and parking areas in the semi-primitive picnic areas will provide improved public accommodation. Ruts, mud holes, soft spots and traffic generated dust will be eliminated. Quality of the visitor experience will be improved. Visual quality of the facility will be enhanced.

Future bituminous plant mix overlays at the major thermal area parking facilities will extend the pavement service life and maintain the visual quality of the facilities.

TABLE 244-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
244	Firehole River Picnic Area Rd	16	16	1	Gravel	Fair	Good	Poor-Fair	None	Fair	Fair	15
246	Fountain Freight Trailhead Rd	16	16	1	Gravel	Fair	Good	Poor	None	Fair	None	15
258	Whiskey Flats Picnic Area Rd	12-15	12-15	1	Gravel	Fair	Good	Good	None	Good	Good	15
417	Mesa Service Road	14-16	N/A	1	Native	Fair	Fair	Poor	None	Fair	Poor	15-25
418	Nez Perce Patrol Cabin Service Road	14	N/A	1	Native	Fair	Good	Poor	N/A	Fair	Poor	15-25
419	Nez Perce Cr Trlhd Service Rd	10-16	N/A	1	Native	Good	Good	Fair-Poor	None	Fair	None	15-25
440	Firehole Rvr Maint YardServRd	12	N/A	1	Native	Fair	Good	Fair	None	Fair	None	15
925	Fountain Paint Pots Pkng Area	N/A	N/A		Bituminous Plant Mix	Good	Good	Fair	N/A	Fair	Good	10-15
926	Midway Geyser Basin Pkng Area	20	20	2 Entry	Bituminous Plant Mix	Good	Good	Good	N/A	Good	Good	10-15
927	Biscuit Basin Parking Area	20	20	2 Entry	Bituminous Plant Mix	Good	Good	Good	N/A	Fair	Fair	15
928	Black Sand Basin Parking Area	28	28	2 Entry	Bituminous Plant Mix	Good	Good	Good	Good	Good	Good	15

3346J:6

TABLE 244-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
244	Firehole River Picnic Area Rd	Road & Parking	Recond, Surf, & Pave BPM	5,000	6,000	23,000	1,000	4,000	10,000	7,000	56,000
246	Fountain Freight Trailhead Road	Road & Parking Bridge	Recond, Surf, & Pave BPM Construct New Bridge	1,000 5,000	2,000 95,000*	21,000 18,000	1,000 4,000	3,000 12,000	7,000 34,000	5,000 25,000	40,000 193,000
258	Whiskey Flats Picnic Area Road	Road & Parking	Recond, Surf, & Pave BPM	5,000	3,000	25,000	4,000	4,000	10,000	8,000	59,000
417	Mesa Service Road	Road	No Work Proposed								
418	Nez Perce Patrol Cabin Service Rd	Road	No Work Proposed								
419	Nez Perce Creek Trailhead Serv Rd	Road	No Work Proposed								
440	Firehole River Maint Yrd Serv Rd	Road & Parking	No Work Proposed								
925	Fountain Paint Pots Pkng Area	Rd Apprs & Parking	Future BPM Overlay	1,000	2,000	30,000	2,000	4,000	10,000	7,000	56,000
926	Midway Geyser Basin Pkng Area	Rd Apprs & Parking	Future BPM Overlay	1,000	2,000	19,000	1,000	2,000	6,000	5,000	36,000
927	Biscuit Basin Parking Area	Rd Apprs & Parking	Future BPM Overlay	1,000	2,000	16,000	1,000	2,000	5,000	4,000	31,000
928	Black Sand Basin Parking Area	Rd Apprs & Parking	Future BPM Overlay	1,000	2,000	19,000	1,000	2,000	6,000	5,000	36,000
			TOTAL COST	15,000	19,000	153,000	11,000	21,000	54,000	41,000	314,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

*Includes $73,000 for new bridge.

ROUTES APPURTENANT TO ROUTE 10, SEGMENT C

ROUTE 244

MP 0.04 Entrance to Picnic Area

ROUTE 246

MP 0.07 Trailhead Parking Area and Trail Bridge

ROUTE 258

MP 0.10 Picnic Area Entrance

ROUTE 418

MP 0.60 Patrol Cabin and Road End

ROUTE 419

MP 1.28 Eastbound Primitive Road

ROUTES APPURTENANT TO ROUTE 10, SEGMENT C

ROUTE 925

Parking Area

ROUTE 926

Parking Area

ROUTE 927

Parking Area

ROUTE 928

Parking Area

#3348J:1
Map: Pg. IV-191
Photos: Pgs. IV-417 to IV-418

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 245 et al; Name: Routes Appurtenant to Route 15, West Entrance Road

Route Location:
Adjacent to Route 15, the West Entrance Road, between Madison junction and the park boundary at West Yellowstone.

Purpose/Function:
Minor public facilities access and service roads.

TABLE 245-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
245	Madison Fishing Access Road	1.96				
	MP 0.00 to MP 1.67	1.67	Fishing Areas Access	IV	N/R	N/R
	MP 1.67 to MP 1.96	0.29	Gaging Station Service Road	VI	N/R	N/R
261	Madison Riverside Access Road	0.20	Fishing Area Access	III	N/R	N/R
262	Madison River Loop Road	1.10	Recreation Access Loop	II	N/R	N/R
438	West Entrance Administrative Service Road	1.88	Access to West Entrance Administrative Area	V	93.8	91.1
439	Soldier Pit Service Road	0.32	Access to Rifle Range	VI	81.3	92.6

N/R = Not Rated

Topography: Flat to Rolling

Vegetation:
Open meadows and riverine wetland vegetation along the watercourses with transition zone vegetation dominated by Lodgepole Pine in the uplands.

SPECIAL PROBLEMS OR FEATURES:
The Madison River has major significance as a recreational fishery.

PRINCIPAL ROAD NEEDS:
Route 245: No needs identified. The park management strategy provides for maintaining this popular fishing access as a semi-primitive facility.

Routes 261 and 262: Future bituminous plant mix overlay at an appropriate point in time to maintain the facilities in serviceable condition.

Route 438: Abate progressive pavement structure deterioration and restore riding quality of the existing roadway.

Route 439: Restricted Road. Maintain only.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
No significant issues are identified. There will be minor inconvenience to the public during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:
Routes 245 and 439: No work proposed.

Routes 261 and 262: Future bituminous plant mix overlay.

Route 438: Recondition roadways and parking areas; resurface and pave with bituminous plant mix.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:
Future bituminous plant mix overlays of Routes 261 and 262 will improve riding qualities and extend the pavement service life.

Rehabilitation of roadway and parking areas of Route 438 will extend the utility and service life and increase the vehicle load carrying capacity of the pavement and surfacing structure.

#3348J:4

TABLE 245-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
245	Madison Fishing Access Road	12-16	12-16	1	Semi-Primitive Gravl	Good	Fair	Fair	N/A	Good	None	15-25
261	Madison Riverside Access Road	22	20	2	Sealed BPM	Good	Good	Good	Good	Good	Good	15
262	Madison River Loop Road	24	18	2	Bituminous Plant Mix	Good	Good	Fair-Good	Fair	Good	Good	25
438	West Entr Admin Service Road											
	Access Roads	22-28	20-24	2	Bituminous Plant Mix	Good	Good	Poor	Poor	Good	Fair	25
	Trailer Loop Road	24	20	2	Bituminous Plant Mix	Good	Good	Poor	Poor	Good	Fair	10
	Stable Road	12-14	12-14	1	BST (Part)	Good	Good	Poor	None	Good	Poor	10-15
					Gravel (Part)							
439	Soldier Pit Service Road	12	12	1	Gravel	Good	Good	Poor-Fair	N/A	Fair	None	15

NOTES: BPM = Bituminous Plant Mix.
BST = Bituminous Surface Treatment.

TABLE 245-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 5-10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
245	Madison Fishing Access Road	Road & Parking	No Work Proposed								
261	Madison Riverside Access Road	Road & Parking	Future BPM Overlay	2,000	3,000	11,000	1,000	2,000	5,000	4,000	28,000
262	Madison River Loop Road	Road & Parking	Future BPM Overlay	6,000	6,000	56,000	4,000	7,000	20,000	15,000	114,000
438	West Entrance Admin Serv Road	Service Rds & Pkng	Recond, Resurface, & Pave		28,000	243,000	7,000	28,000	76,000	57,000	439,000
439	Soldier PitServRd	Road	No Work Proposed								
			TOTAL COST	8,000	37,000	310,000	12,000	37,000	101,000	76,000	581,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

ROUTES APPURTENANT TO WEST ENTRANCE ROAD

ROUTE 245

MP 1.30 Approaching Parking Area

ROUTE 261

MP 0.10 Entrance to Parking Area

ROUTE 262

MP 0.13 Typical Road Condition

ROUTES APPURTENANT TO WEST ENTRANCE ROAD

ROUTE 438

MP 0.54 Horse Barn Service Road at Right

MP 0.76 Concessioner Parking Area

ROUTE 439

Semi-Primitive Access Road

#3350J:1
Map: Pg. IV-151
Photos: Pgs. IV-423 to IV-425

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 248 et al; Name: Routes Appurtenant to Route 12, Northeast Entrance Road

Route Location:
Along Route 12, the Northeast Entrance Road, between Tower junction and the park boundary near Silver Gate, Montana.

Purpose/Function:
Minor public use facilities and service roads.

TABLE 248-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
248	Yellowstone River Picnic Area Road	0.08	Public Access to Picnic Area			
	MP 0.00 to MP 0.03	0.03	Public Access	II	93.8	89.8
	MP 0.03 to MP 0.08	0.05	Public Parking	III	93.8	89.8
249	Crystal Creek Road	0.62	Primitive Service Road	VI	68.8	91.3
250	Slough Creek Campground Road	2.50	Public Access and Parking			
	MP 0.00 to MP 1.94		Public Access	II	43.8	63.5
	MP 1.94 to MP 2.41		Campground Circulation	III	43.8	63.5
	MP 2.41 to MP 2.50		Restricted	VI	N/R	N/R
251	Lamar Picnic Area Road	0.18	Public Access to Picnic Area	II	87.5	86.6
252	Pebble Creek Campground Road	0.60	Public Access and Parking			
	MP 0.00 to MP 0.17	0.17	Public Access	II	87.5	86.6
	MP 0.17 to MP 0.60	0.43	Campground Circulation	III	87.5	86.6
253	Warm Creek Picnic Area Road	0.15	Public Access to Warm Creek Picnic Area	III	87.5	91.4
442	Lamar Residence Road	0.31	Access to Lamar Ranger Station Residence Area	IV	93.8	102.1
443	Northeast Entrance Residence Service Road	0.13	Access to Northeast Entrance Residence Area	V	81.3	101.2
919	Yellowstone River Overlook	0.33	River Overlook	III	N/R	N/R

N/R = Not Rated

Topography: Rolling to Mountainous

Vegetation:
Open meadowland and open sagebrush flats with isolated Lodgepole Pine groves in the uplands and Cottonwood groves along the watercourses with transition zone vegetation dominated by Lodgepole Pine near the east park boundary.

SPECIAL PROBLEMS OR FEATURES:

The Northeast Entrance Road is kept open all year to provide access to Cooke City, Montana. Routes included in this report, however, are subject to winter closure.

PRINCIPAL ROAD NEEDS:

Routes 248, 250, 251, 253, 443, and 919: Upgrade roadways and parking areas to provide all-weather paved surfaces.

Route 252: Upgrade roadways and parking areas with a bituminous plant mix overlay.

Routes 249 and 442: No needs identified. Route 249 has been obliterated and revegetated. The park management strategy provides for maintaining Route 442 as a primitive facility.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

No significant environmental impacts are identified.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	X
New Construction		No Improvement	X	Maintenance Seal Coat	

SCOPE OF WORK:

Routes 248, 250, 253, 443, and 919: Recondition roadways and parking areas; surface and pave with bituminous plant mix.

Routes 249 and 442: No work proposed.

Route 251: Relocate access road and improve the intersection with Route 12; provide embankment protection along the Lamar River; reconstruct roadway and parking areas; surface and pave with bituminous plant mix.

Route 252: Overlay roadways and parking areas with plant mix.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	All routes except Route 252
X	Categorical Exclusion	Route 252

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Upgrading of roadway and parking area surfaces will increase vehicular capacity and improve roadway safety characteristics. Traffic generated dust will be eliminated. Visitor use will increase. Visual quality of the facility will be enhanced. Quality of the visitor experience will be improved.

#3350J:4

TABLE 248-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	CONDITION ALIGNMENT HORIZONTAL	CONDITION ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
248	Yellowstone Rvr Picnic Area R	14-22	14-22	1-2	Gravel & BPM	Fair	Fair	Poor	Poor	Fair	Fair	15
249	Crystal Creek Road	11	N/A	1	Native	Good	Good	Poor	N/A	Poor	None	15
250	Slough Creek Campground Road	16-18	14-16	1	Gravel & Native	Fair	Good	Poor	Poor	Fair	None	25
251	Lamar Picnic Area Road	12	12	1	Gravel	Poor	Fair	Poor	N/A	Fair	None	10
252	Pebble Creek Campground Road	16	16	1	Bituminous SurfTreat	Good	Good	Fair	Fair	Good	Good	25
253	Warm Creek Picnic Area Road	14	N/A	1	Gravel (Primitive)	Poor	Fair	Poor	N/A	Fair	Good	10
442	Lamar Residence Road	12	12	1	Gravel	Good	Good	Fair	N/A	Good	None	15
443	NE Ent Residence Service Road	14-20	14-20	1-2	Gravel	Good	Good	Good	Fair	Good	Good	15
919	Yellowstone River Overlook	N/A	N/A	N/A	Gravel	Fair	Good	Fair	N/A	Fair	Fair	10

NOTE: BPM = Bituminous Plant Mix.

3350J:5

TABLE 248-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 5-10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
248	Yellowstone River Picnic Area Road	Road & Parking	Recond, Surf, & Pave BPM	1,000	4,000	12,000	4,000	2,000	6,000	4,000	33,000
249	Crystal Creek Rd	Road	Road Closed To All Traffic and Obliterated - 1987								
250	Slough Cr CG Road	Road & ParkingAreas	Recond, Surf, & Pave BPM	6,000	54,000	131,000	7,000	20,000	55,000	41,000	314,000
251	Lamar Pcnc Area R	Road & ParkingAreas	Reconstr, Surf, & Pave BPM	3,000	39,000	22,000	1,000	7,000	18,000	14,000	104,000
252	Pebble Cr CG Road	Road & ParkingAreas	Overlay BPM	3,000	23,000	35,000	10,000	7,000	20,000	15,000	113,000
253	WarmCr PcncAreaRd	Road & Parking	Recond, Surf, & Pave BPM	3,000	7,000	21,000	3,000	3,000	9,000	7,000	53,000
442	Lamar Residence R	Road	Primitive Road - No Work Proposed								
443	NE Entr Res ServR	Road & ParkingAreas	Recond, Surf, & Pave BPM		3,000	30,000	1,000	3,000	9,000	7,000	53,000
919	Yellowstone River Overlook	Road & Parking	Recond, Surf, & Pave BPM	1,000	2,000	5,000	1,000	1,000	3,000	2,000	15,000
			TOTAL COST	17,000	132,000	256,000	27,000	43,000	120,000	90,000	685,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Administrative roads are not eligible for FLHP funding.

ROUTES APPURTENANT TO NORTHEAST ENTRANCE ROAD

ROUTE 248

Typical Road Condition in Picnic Area

ROUTE 249

MP 0.14 Primitive Unsurfaced Road

ROUTE 250

Aerial View Facing North Up Slough Creek, Route 12 in Foreground

MP 0.91 Poor Roadway Drainage

MP 2.22 Approaching Campground Area

ROUTES APPURTENANT TO NORTHEAST ENTRANCE ROAD

ROUTE 251

MP 0.05 Road Entrance

ROUTE 252

MP 0.15 Campground Entrance

ROUTE 253

MP 0.09 Typical Roadway Condition

ROUTE 442

Aerial View of Residence Area

Typical Roadway Condition

ROUTE 443

MP 0.11 Typical Road Condition in Residence Area

ROUTE 919

MP 0.33 Parking Area at Road End

#3355J:1
Map: Pg. IV-167
Photos: Pg. IV-431

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 254 et al; Name: Routes Appurtenant to Route 13, East Entrance Road

Route Location:
Adjacent to Route 13, the East Entrance Road, between a junction with Route 10, the Grand Loop Road, near Fishing Bridge and the east park boundary east of Sylvan Pass.

Purpose/Function:
Minor public use area access and parking and service roads.

TABLE 254-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
254	Lake Butte Overlook Road	0.85				
	MP 0.00 to MP 0.77	0.77	Public Access	II	43.8	63.7
	MP 0.77 to MP 0.85	0.08	Public Parking	III	43.8	63.7
260	Park Point Trailhead and Parking Area Road	0.16	Public Access to Trailhead	III	N/R	N/R
263	Pelican Creek Trailhead Road	2.80				
	MP 0.00 to MP 0.27	0.27	Public Access to Trailhead	II	N/R	N/R
	MP 0.27 to MP 2.80	2.53	Service Road	VI	N/R	N/R
471	Cub Creek Service Road	0.13	Access to Stockpile and Storage	VI	N/R	N/R
477	East Entrance Residence Service Road	0.19	Residence Service	V	N/R	N/R
923	Middle Creek Picnic Area Road	0.06	Public Access and Parking	III	N/R	N/R
943	Sylvan Lake Picnic Area	0.05	Public Access and Parking	III	N/R	N/R
944	Eleanor Lake Picnic Area	0.03	Public Access and Parking	III	N/R	N/R
945	Butte Springs Picnic Area Road	0.24	Public Access and Parking	III	N/R	N/R

N/R = Not Rated

Topography: Mountainous

Vegetation:
Predominantly Lodgepole Pine forest with moderate understory with riverine and palustrine wetland vegetation along watercourses and low areas, and Alpine transition zone vegetation in the Sylvan Pass area.

SPECIAL PROBLEMS OR FEATURES:

The Lake Butte Overlook Road is a paved road in critically poor condition. All other routes in this report are unpaved primitive or semi-primitive facilities.

PRINCIPAL ROAD NEEDS:

Route 254: This route is in critically poor condition. There is a need to restore the roadway to a safe and serviceable condition with all-weather paved surfaces.

Routes 260, 477, 923, 943, 944, and 945: Upgrade roadways and parking areas to provide paved all-weather surfaces.

Routes 263 and 471: No needs identified. The park management strategy provides for maintenance as semi-primitive facilities.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

No significant issues identified. There will be some public inconvenience during the period of construction.

TYPES OF IMPROVEMENTS:

Resurfacing	____	Rehabilitation	X	Reconstruction	____
New Construction	____	No Improvement	____	Maintenance Seal Coat	___

SCOPE OF WORK:

Routes 254, 477, 923, 943, 944, and 945: Recondition roadways and parking areas; resurface and pave with bituminous plant mix.

Route 260: Recondition roadway and parking area and surface with crushed gravel.

Routes 263 and 471: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

____	Environmental Impact Statement
____	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

BENEFITS/RESULTS:

Reconditioning of public use roadways and parking areas will improve safety and utility of the facilities. Ruts, mud holes, and soft spots will be eliminated. Visual quality of the facilities will be enhanced. Quality of the visitor experience will be improved. Visitor use will increase.

Upgrading of roadways and parking areas in the East Entrance Residence area will provide improved all-weather access and improve the appearance of the area.

#3355J:4

TABLE 254-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	ALIGNMENT HORIZONTAL	ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
254	Lake Butte Overlook Road	20-21	20	2	Paved BST	Fair	Fair	Very Poor	Poor	Fair-Poor	Fair	15-25
260	Park Point Trailhead and Parking Area Road	10	N/A	1	Native	Poor	Poor	N/A	None	Poor	Poor	10-15
263	Pelican Creek Trailhead Road	12	12	1	Gravel	Good	Good	Fair	None	Fair	Fair	15
471	Cub Creek Service Road	12	12	1		Fair	Good	Poor	None	Fair	Poor	10-15
477	E Ent Residence Service Road	14	14	1	Gravel	Fair	Good	Poor	Poor	Fair-Good	Poor	15
923	Middle Creek Picnic Area Road	10	N/A	1	Gravel - Native	Poor	Fair	Poor	None	Fair	Poor	0-10
943	Sylvan Lake Picnic Area	10-20	10-20	1-2	Gravel	Poor	Fair	Poor	Poor	Fair	Poor	0-10
944	Eleanor Lake Picnic Area	N/A	N/A	N/A	Gravel Parking Area	N/A	N/A	Fair	N/A	Fair	Poor	0- 5
945	Butte Springs Picnic Area Rd	18	18	2	Native (Sand)	Fair	Good	N/A	N/A	Good	Fair	10

NOTE: BST = Bituminous Surface Treatment.

3355J:5

TABLE 254-3
ESTIMATES OF COSTS
PUBLIC USE ROADS AND PARKING

PARK: RTE NO	ROUTE NAME	AREA	SCOPE OF WORK	LANDSCAPE	MISC CONSTR	SURFACING & PAVING	SAFETY & TRAF CONT	MOB 10%	INCID ITEMS 25%	CONSTR ENGR 15%	CONSTR COST ($)
254	Lake Butte Overlook Road	Road & Parking	Recond, Resurf, & Pave BPM	5,000	25,000	137,000	21,000	19,000	52,000	39,000	298,000
260	Park Point Trlhd & Pkng Area Road	Road & Parking	Recond & Surface (Gravel)	2,000	3,000	5,000	1,000	1,000	3,000	2,000	17,000
263	Pelican Cr TrlhdR	Road & Parking	No Work Proposed								
471	Cub Creek Serv Rd	Road	No Work Proposed								
477	E Ent Residence Service Road	Road & Parking	Recond, Surf, & Pave BPM		3,000	19,000	1,000	2,000	6,000	5,000	36,000
923	Middle Creek Picnic Area Road	Roads & Parking	Reconstr, Surf, & Pave BPM	1,000	3,000	11,000	3,000	2,000	5,000	4,000	29,000
943	Sylvan Lake Picnic Area Road	Roads & Parking	Recond, Surf, & Pave BPM	1,000	1,000	15,000	1,000	2,000	5,000	4,000	29,000
944	Eleanor Lake Picnic Area	Parking Area	Recond, Surf, & Pave BPM	1,000	1,000	11,000	1,000	1,000	4,000	19,000	38,000
945	Butte Springs Picnic Area Road	Rd Apprs & Parking	Reconstr, Surf, & Pave BPM	1,000	6,000	57,000	16,000	8,000	22,000	17,000	127,000
			TOTAL COST	11,000	42,000	255,000	44,000	35,000	97,000	90,000	574,000

NOTES: BPM = Bituminous Plant Mix (Estimates based upon 3 inch depth for pavements and 2 inch depth for overlays.)
Cost estimates are rounded to nearest $1,000.
Non public use roads are not eligible for FLHP funding.

ROUTES APPURTENANT TO EAST ENTRANCE ROAD

ROUTE 254

MP 0.46 Potholed Roadway

MP 0.82 Parking Area

ROUTE 260

Primitive Parking Area

ROUTE 471

MP 0.00 Road Entrance

ROUTE 477

MP 0.00 Approach to Residence Area

ROUTE 945

Informal Picnic Area on Yellowstone Lake

#3356J:1
Map: Pg. IV-199
Photos: Pg. IV-437

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 266 et al; Name: Routes Appurtenant to Route 16, Norris to Canyon Road

Route Location:
Adjacent to Route 16 between Norris junction and Canyon junction.

Purpose/Function:
Public access to trailhead (Route 266) and restricted service roads.

TABLE 266-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
266	Grebe Lake Trailhead Road	0.05	Public Access to Grebe Lake Trailhead	III*	N/R	N/R
434	Grebe Lake Service Road	2.77	Service Road	VI	43.8	89.9
478	Ice Lake Service Road	0.17	Service Road	VI	N/R	N/R
482	Norris Pit Road	0.30	Service Road	VI	N/R	N/R
483	Norris Substation Service Road	0.06	Service Road	VI	N/R	N/R

*Road ahead of MP 0.05 is now restricted and classified as a trail.
N/R = Not Rated
Note: The evaluation for Route 435, Norris Water Tank Service Road is included in the report for Route 218 et al, Norris Vicinity roads.

Topography: Mountainous

Vegetation:
Heavy Lodgepole Pine forest with light to moderate understory.

SPECIAL PROBLEMS OR FEATURES:
With the exception of the short public use section of Route 266, all roads in this report are restricted service roads.

PRINCIPAL ROAD NEEDS:
Route 266: Future bituminous plant mix overlay. No needs are identified on other routes. The park management strategy provides for their maintenance as restricted primitive service roads.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:
None identified.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:
Route 266: Future bituminous plant mix overlay.

Routes 434, 478, 482, and 483: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement
	Environmental Assessment
X	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

ESTIMATE OF COST:

	Route 266
Clearing	$
Landscaping	1,000
Grading	2,000
Drainage	
Structures	
Surfacing/Paving	6,000*
Safety & Traffic Cont	4,000
Mobilization 10%	1,000
Incidental Items 25%	4,000
Construction Subtotal	18,000
Constr Engr (FHWA) 15%	3,000
Total Estimated Cost	$ 21,000
Cost Per Mile	$ N/A
Prelim Engr (FHWA) 10%	$ 2,000
For Materials Source Inside Park, Deduct	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay.

BENEFITS/RESULTS:
A future bituminous plant mix overlay of Route 266 timed with the future bituminous plant mix overlay of adjacent Route 16 will maintain the quality of the facility and extend the service life of the pavement.

#3356J:4

TABLE 266-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	CONDITION ALIGNMENT HORIZONTAL	CONDITION ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
266	Grebe Lake Trailhead Road	24	24	2	Bituminous Plant Mix	Good	Good	Fair-Good	Good	Good	Good	10
434	Grebe Lake Service Road	14	14	1	Gravel/BPM	Good	Good	Poor	Poor	Fair	Good	15-25
478	Ice Lake Service Road	14	14	1	Gravel	Fair	Fair	Poor	None	Poor	Poor	15
482	Norris Pit Road	18	18	2	Gravel	Good	Good	Good	None	Good	Good	25
483	Norris Substation Service Rd	12	N/A	1	Native	Fair	Good	None	None	Fair	Poor	5-10

NOTE: BPM = Bituminous Plant Mix.

ROUTE 434

MP 0.00 Gated Approach to Route 10

500 +

#3359J:1
Map: Pg. IV-129
Photos: Pgs. IV-441 to IV-442

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 500; Name: Mammoth Gardiner High Road

Route Length: 3.95 miles; Milepost 0.00 to Milepost 3.95

Route Location:
Paralleling the North Entrance Road from Mammoth Hot Springs to Gardiner, Montana, from Route 11 (MP 4.73) to Route 204 (MP 0.25).

Purpose/Function:
Primitive scenic route. This route formerly was a stage road which provided the only access into the park from the north entrance at Gardiner.

Functional classification:
1984 NPS Standard Class IV (Primitive Park) Road

Topography: Mountainous

Vegetation:
Low growing, arid to semi-arid vegetation dominated by sagebrush and grasses with isolated stands of Lodgepole Pine, Aspen, and other deciduous species along watercourses in the higher areas.

ROUTE 500:

EVALUATION OF EXISTING ROADWAY:
Existing Average Daily Traffic (1985): 25 vehicles
Passenger Cars and Pickups: 90%; Buses and Trucks: 0%
Recreational Vehicles: 10%; Bicycle Use: None
Projected Average Daily Traffic (2005): 30 vehicles
Roadway Width (shoulder to shoulder): 12-16 ft.
Pavement/Surfacing Width: 12-16 ft.; Type: Dirt and Gravel;
Condition: Poor

Base/Subgrade Cond:	Fair ;	Drainage Cond:	Poor
Shoulder Width:	None ft.;	Shoulder Cond:	N/A
Posted Speed Limit:	Not Posted mph;	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Poor ;	Vertical Alignment:	Poor

Road Improvement Study (RIP) Segment No.: 1
1983 RIP Structural CSR: 37.5; Adjusted OSR: 68.6
Roadside Condition: Good - Open and Unobstructed

SPECIAL PROBLEMS OR FEATURES:
This road provides an exceptional view of the Gardiner-Absaroka Mountain areas and a wildlife range (principally antelope), however, in its present condition, it is not suited for substantial vehicular use.

PRINCIPAL ROAD NEEDS:

None identified. The park management strategy provides for maintaining the road in its present condition. However, a special route study is being proposed to investigate alternative alignments for the relocation of Route 11, the North Entrance Road. As a part of that study, the feasibility of relocating Route 11 on the general alignment of the Mammoth Gardiner High Road will be investigated. See Part III.B., "North Entrance Road Route Study" on Page III-9 of this report.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified with present road use.

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation		Reconstruction	
New Construction		No Improvement	X	Maintenance Seal Coat	

SCOPE OF WORK:

No work proposed under the present park management strategy. Possible upgrading as a major park access road will be based upon the results of the proposed route study and related environmental clearance documents.

PROBABLE ENVIRONMENTAL CLEARANCE:

None required for present park management strategy.

BENEFITS/RESULTS:

Maintaining the road in its present primitive condition provides limited public opportunity to visit a unique area of the park. The historical character of the old stage road is preserved.

MAMMOTH GARDINER HIGH ROAD
ROUTE 500

MP 0.03 Gate at Mammoth

MP 1.00 Vicinity, Southbound

MP 1.50 Vicinity, Northbound

MP 1.85 Southbound

MP 1.95 Facing North

MAMMOTH GARDINER HIGH ROAD

ROUTE 500

Aerial View, MP 2.00 High Road Vicinity Route 11 and Gardner River in Background

MP 2.15 Moose Near Roadway

Aerial View, MP 3.00 Vicinity, Facing Unstable Area on Route 11 in Background

MP 3.34 Northbound Facing Gardiner

#3359J:3
Map: Pg. IV-15
Photos: Pg. IV-447

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 501; Name: Mammoth Terrace Loop Drive

Route Length: 1.60 miles; Milepost 0.00 to Milepost 1.60

Route Location:
South of Mammoth Hot Springs off the Grand Loop, Route 10 (MP 2.01).

Purpose/Function:
Public access to thermal features and parking areas at the upper Mammoth Terrace.

Functional classification:
1984 NPS Standard Class III (Special Purpose Park) Road

Topography: Mountainous

Vegetation:
Lodgepole Pine forest with light understory. Vegetation has been suppressed or destroyed by high temperatures and minerals in the immediate vicinity of active thermal areas.

ROUTE 501:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 1,200 vehicles
Passenger Cars and Pickups: 88.2%; Buses and Trucks: 0.5%
Recreational Vehicles: 11.3%; Bicycle Use: Moderate
Projected Average Daily Traffic (2005): 1,500 vehicles
Roadway Width (shoulder to shoulder): 12-14 ft. (One Way Loop Road)
Pavement/Surfacing Width: 12 ft.; Type: Bituminous Plant Mix;
Condition: Part of road has been overlayed and is in good condition; remainder is poor.

Base/Subgrade Cond:	Poor ;	Drainage Cond:	Fair
Shoulder Width:	0-2 ft.;	Shoulder Cond:	Poor (Gravel)
Posted Speed Limit:	15 mph;	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Restricted ;	Vertical Alignment:	Poor

Road Improvement Study (RIP) Segment No.: 1
1983 RIP Structural CSR: 43.8; Adjusted OSR: 71.2
Roadside Condition:
Satisfactory for the conditions of low speed, one way operation.

SPECIAL PROBLEMS OR FEATURES:
This route accesses a major public point of interest. It is a popular stop for tour buses. It contains sharp curvature, steep grades, and is a narrow single lane, one way roadway. It satisfactorily accommodates traffic most of the time, but is subject to closure when weather is poor and the road is slippery.

PRINCIPAL ROAD NEEDS:

Correct areas of base and subgrade failure. Improve roadway safety characteristics for motor vehicles, bicycles, and pedestrians. Future bituminous plant mix overlay. Minor improvements in alignment, grades, and width are needed to improve the safety characteristics for tour buses and other vehicles.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

This route traverses the Upper Mammoth Terrace and is in close proximity to unique thermal areas. Encroachment must be held to a minimum.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation	X	Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Alternative 1: Repair isolated base failure areas; improve alignment and grade in critically deficient areas; improve passing turnouts, improve drainage; and resurface and pave with bituminous plant mix.

Alternative 2: Repair isolated base failure areas; improve alignment and grade in critically deficient areas; widen roadway to provide adequate width on curves for tour buses and recreation vehicles; improve drainage; and resurface and pave with bituminous plant mix.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	Alternatives 1 and 2
	Categorical Exclusion	

ALTERNATIVES:

Road Standards:

Alternative:	1	2	1984 NPS Stds.
Roadway Width (ft):	12	14	14
Lane Width (ft):	12	14	14 *
No. of Traffic Lanes:	1	1	1
Shldr Width (ft/side):	0	0	0
Shldr Bicycle Lanes:	No	No	No
Design Speed (mph):	15	15	15

*Adjusted for tour bus and recreational vehicle use.

ESTIMATES OF COST:

	Alt. 1	Alt. 2
Roadway Width (ft)	12	14
Clearing	$ 5,000	$ 5,000
Landscaping	8,000	8,000
Grading	42,000	53,000
Drainage	10,000	10,000
Structures		
Surfacing/Paving	196,000*	222,000*
Safety & Traffic Cont	46,000	46,000
Mobilization 10%	31,000	34,000
Incidental Items 25%	85,000	95,000
Construction Subtotal	423,000	473,000
Constr Engr (FHWA) 15%	63,000	71,000
Total Estimated Cost	$ 486,000	$ 544,000
Cost Per Mile	$ 304,000	$ 340,000
Prelim Engr (FHWA) 10%	$ 42,000	$ 47,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 4 Inch Depth Bituminous Plant Mix Pavement

BENEFITS/RESULTS:

Reconstruction of the road with appropriate safety improvements including relief of critical curves and grades will improve riding qualities, extend the pavement service life, and improve the roadway safety characteristics. Conformance to National Park Standards for park roads will optimize roadway safety characteristics, reduce traffic congestion, and enhance the park visitor experience.

MAMMOTH TERRACE LOOP DRIVE

ROUTE 501 .

Aerial View, Upper Terrace Parking Area

MP 0.24 Typical Road Condition

MP 0.32 Parking Area

#3359J:6
Map: Pg. IV-15
Photos: Pg. IV-453

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 502; Name: Bunsen Peak Loop Road

Route Length: 5.88 miles; Milepost 0.00 to Milepost 5.88

Route Location:
South of Mammoth on the east side of Route 10, the Grand Loop. The route is entered at Route 10 (MP 4.79) and circles Bunsen Peak. It ends at a connection with Route 407, Mammoth Trailer Court Service Road, at a point 1.30 miles south of Mammoth.

Purpose/Function:
One way, primitive scenic loop drive with access to an overlook of Osprey Falls on the Gardner River.

Functional classification:
1984 NPS Standard Class IV (Primitive Park) Road

Topography: Flat transitioning to very rugged mountainous

Vegetation:
Open sagebrush covered land, Aspen groves, and transition zone vegetation dominated by dense stands of Lodgepole Pine on the east and north slopes of Bunsen Peak.

ROUTE 502:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 50 vehicles
Passenger Cars and Pickups: 95%; Buses and Trucks: 0%
Recreational Vehicles: 5%; Bicycle Use: None
Projected Average Daily Traffic (2005): 60 vehicles
Projected traffic on upper section if it is upgraded between Route 10 at MP 4.79 and the Osprey Falls Overlook at MP 3.45 will be 1,500 vehicles.
Roadway Width (shoulder to shoulder): 10-12 ft.
Pavement/Surfacing Width: 10-12 ft.; Type: Native;
Condition: Poor

Base/Subgrade Cond:	Fair	Drainage Cond:	Culverts in Major Drains Only
Shoulder Width:	0 ft.	Shoulder Cond:	
Posted Speed Limit:	mph	Ave. Oper. Speed:	5-25 mph
Horizontal Alignment:	Severely Restricted	Vertical Alignment:	Severely Restricted

Grades exceed 20 percent in the Sheepeater Canyon area.

Road Improvement Study (RIP) Segment Nos.: 1 and 2
1983 RIP Structural CSR: 18.8 - 25.0; Adjusted OSR: 39.2 - 62.1
Roadside Condition: Satisfactory For Primitive Road Use

BRIDGES AND MAJOR STRUCTURES:

Name:	Canyon Creek
BIP Number:	Not Listed
Location MP:	5.24
Type of Structure:	Single Span Log Stringer With Wood Deck
Structure Length(ft):	15
Deck Width c to c (ft):	14
Sidewalks/curbs, type:	Log Curbs
Sidewalks/curbs, width(ft):	8 Inches
Rails, type:	None
General Condition:	Very poor. Primitive log and plank structure.

SPECIAL PROBLEMS OR FEATURES:

This route is characterized by narrow roadway, sharp switchback curves, and steep downgrades on the east and north flanks of Bunsen Peak in the Sheepeater Canyon area (MP 3.08 to MP 5.40). The balance of the route traverses gentle terrain.

PRINCIPAL ROAD NEEDS:

The park management strategy provides for maintaining this road as a primitive low public use facility. However improved public access to an overlook of Osprey Falls is a perceived need. There is also a need for replacement of the Canyon Creek Bridge at MP 5.24.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified for the "primitive facility" alternative. Upgrading of the upper portion of the road to a new Osprey Falls overlook will cause the permanent loss of some roadside vegetation and increase the visual scale of the roadway relative to the landscape. It will also increase human intrusion into a remote park area.

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation		Reconstruction	X
New Construction		No Improvement	X	Maintenance Seal Coat	

SCOPE OF WORK:

Alternative 1: Replace Canyon Creek Bridge with an arch culvert. No other work proposed. Route to be maintained as a primitive facility.

Alternative 2: Upgrade a portion of the route between MP 0.00 and MP 3.45 by widening, surfacing, paving, and construction of an overlook parking area at Osprey Falls.

PROBABLE ENVIRONMENTAL CLEARANCE:

X	Environmental Impact Statement	Alternative 2
	Environmental Assessment	
X	Categorical Exclusion	Alternative 1

ALTERNATIVES:

Road Standards:

Alternative:	1	2	1984 NPS Stds.
Milepost to Milepost	0.00 - 5.88	0.00 - 3.45	
Roadway Width (ft):	10-12	30	30
Lane Width (ft):	10-12	12	12 *
No. of Traffic Lanes:	1	2	2
Shldr Width (ft/side):	None	3	3
Shldr Bicycle Lanes:	No	No	No
Design Speed (mph):	10-25	35	35

*Adjusted for tour bus and recreational vehicle use.

ESTIMATES OF COST:

	Alt. 1 Replace Canyon Creek Bridge	Alt. 2 Construct Osprey Falls Overlook & Access Road
Roadway Width (ft)	10-12	30
Clearing	$	$ 59,000
Landscaping	1,000	46,000
Grading	6,000	260,000
Drainage		55,000
Structures	10,000	
Surfacing/Paving	5,000	986,000*
Safety & Traffic Cont	3,000	62,000
Mobilization 10-5%	3,000	73,000
Incidental Items 25%	7,000	385,000
Construction Subtotal	35,000	1,926,000
Constr Engr (FHWA) 15%	5,000	289,000
Total Estimated Cost	$ 40,000	$2,215,000
Cost Per Mile	$ N/A	$ 642,000
Prelim Engr (FHWA) 10%	$ 4,000	$ 193,000
For Materials Source Inside Park, Deduct	$ N/A	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 4 Inch Depth Bituminous Plant Mix Pavement

BENEFITS/RESULTS:

Alternative 1: Replacement of the Canyon Creek Bridge will preserve the utility of the route and retain its primitive character.

Alternative 2: Upgrading of the road as an access to a new Osprey Falls Overlook would provide greater opportunity for the general public to enjoy one of the obscure scenic wonders of the park. Public safety and the quality of the visitor experience would be enhanced.

BUNSEN PEAK LOOP ROAD

ROUTE 502

MP 0.03 Eastbound From Route 10

MP 2.54 Typical Primitive Road Condition

MP 3.65 Osprey Falls Overlook Vicinity

MP 4.25 Northbound Facing Gardner River

MP 4.70 Steep Grade

MP 5.23 Glen Creek Bridge

#3359J:9
Map: Pg. IV-49
Photos: Pg. IV-457

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 504; Name: Firehole Canyon Drive

Route Length: 2.20 miles; Milepost 0.00 to Milepost 2.20

Route Location:
South of Madison junction adjacent to the Firehole River in the west central park area.

Purpose/Function:
One way scenic loop drive through the gorge of the Firehole River Canyon.

Functional classification:
1984 NPS Standard Class II (Connector Park) Road

Topography:
Abrupt mountainous area. The route traverses the east wall of the Firehole Canyon Gorge.

Vegetation:
Transition zone vegetation dominated by Lodgepole Pine with moss and lichen along the walls of the gorge.

ROUTE 504:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 1,300 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 2%
Recreational Vehicles: 10%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 1,600 vehicles
Roadway Width (shoulder to shoulder): 23 ft.
Pavement/Surfacing Width: 21 ft.; Type: Bituminous Plant Mix;
Condition: Good

Base/Subgrade Cond:	Good ;	Drainage Cond:	Good
Shoulder Width:	2 ft.;	Shoulder Cond:	Good
Posted Speed Limit:	25 mph;	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	;	Vertical Alignment:	

Road Improvement Study (RIP) Segment No.: 1
1983 RIP Structural CSR: 56.3; Adjusted OSR: 76.8
Roadside Condition:
Poor, an abrupt drop-off along outboard pavement edge through the gorge area is a recognized safety problem.

SPECIAL PROBLEMS OR FEATURES:
The Firehole Canyon Gorge is a unique park resource. This route is a popular visitor attraction.

PRINCIPAL ROAD NEEDS:

While the pavement is currently in good condition, a future bituminous plant mix overlay will be needed at an appropriate point in time. Safety railings along the river exposed road edge in the gorge area are also needed.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

The Firehole Canyon Gorge is an area of spectacular visual quality. Safety railings along the road edge must be designed to satisfy safety requirements in a visually acceptable way.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Install safety railings; apply a future bituminous plant mix overlay at an appropriate point in time.

PROBABLE ENVIRONMENTAL CLEARANCE:

	Environmental Impact Statement	
X	Environmental Assessment	Safety Railings Only
	Categorical Exclusion	

ROAD STANDARDS: No changes in road standards are proposed.

ESTIMATE OF COST:

Roadway Width (ft)	21
Clearing	$
Landscaping	11,000
Grading	13,000
Drainage	
Structures	
Surfacing/Paving	126,000*
Safety & Traffic Cont	199,000
Mobilization 10%	35,000
Incidental Items 25%	96,000
Construction Subtotal	480,000
Constr Engr (FHWA) 15%	72,000
Total Estimated Cost	$ 552,000
Cost Per Mile	$ 251,000
Prelim Engr (FHWA) 10%	$ 48,000
For Materials Source Inside Park, Deduct	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay

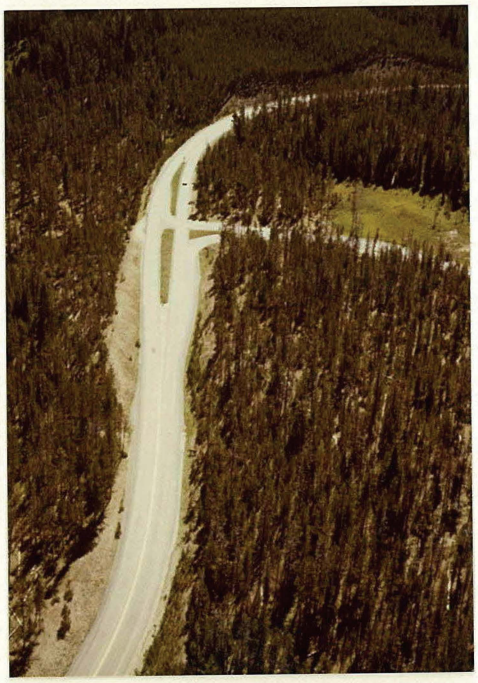
BENEFITS/RESULTS:

Installation of protective safety barriers along the exposed pavement edge will improve safety characteristics of the roadway and serve both vehicles and pedestrians.

A future bituminous plant mix overlay applied at an appropriate point in time will improve riding qualities and extend the pavement service life.

FIREHOLE CANYON ROAD

ROUTE 504



Aerial View, Road Entrance at Route 10

MP 0.35 Entering Firehole Canyon

MP 0.99 Parking Area in Firehole Canyon

MP 1.39 Firehole Canyon Area

#3359J:11
Map: Pg. IV-49
Photos: Pg. IV-463

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route Nos. 505 & 446; Name: Firehole Lake Area Roads

Route No. (RIP): 505; Firehole Lake Drive
446; Firehole Lake Service Road

Route 505 Length: 3.32 miles; Milepost 0.00 to Milepost 3.32
Route 446 Length: 0.45 miles; Milepost 0.00 to Milepost 0.45

Route Location:
On the east side of the Grand Loop Road between MP 43.40 Route 10 = MP 0.00 Route 505 and MP 3.32 Route 505 = MP 42.37 Route 10. Route 446 is a service road which intersects Route 505 at MP 2.82. These routes are situated approximately midway between Norris junction and Old Faithful in the west central park area.

Purpose/Function:
Route 505: Public access to the Great Fountain Geyser, Firehole Lake, White Dome Geyser, and associated thermal features.

Route 446: Service road access to a storage and service area.

Functional classification:
Route 505 - 1984 NPS Standard Class II (Connector Park) Road
Route 446 - 1984 NPS Standard Class VI (Restricted) Road

Topography: Flat to Rolling

Vegetation:
Open meadowland with transition zone vegetation dominated by Lodgepole Pine in adjacent upland areas. Vegetation is suppressed in the immediate vicinity of thermal features.

ROUTE 505:

EVALUATION OF EXISTING ROADWAY:
Existing Average Daily Traffic (1985): 1,200 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 1,500 vehicles
Roadway Width (shoulder to shoulder): 20-26 ft.
Pavement/Surfacing Width: 20-21 ft.; Type: Bituminous Plant Mix;
Condition: MP 0.0 to MP 1.28 Fair-Good; MP 1.28 to MP 3.32 - Poor

Base/Subgrade Cond:	Fair	Drainage Cond:	Fair-Poor
Shoulder Width:	0-3 ft.	Shoulder Cond:	Poor
Posted Speed Limit:	25 mph	Ave. Oper. Speed:	25 mph
Horizontal Alignment:	Satisfactory	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment No.: 1
1983 RIP Structural CSR: 62.5; Adjusted OSR: 86.7
Roadside Condition: Good - Open and Unobstructed

ROUTE 446:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 10 vehicles
Passenger Cars and Pickups: 50%; Trucks: 50%
Recreational Vehicles: 0%; Bicycle Use: None
Projected Average Daily Traffic (2005): 10 vehicles
Roadway Width (shoulder to shoulder): 10-12 ft.
Pavement/Surfacing Width: 10-12 ft.; Type: Gravel
Condition: Semi-Primitive

Base/Subgrade Cond:	Fair	Drainage Cond:	Fair-Poor
Shoulder Width:	0 ft.	Shoulder Cond:	N/A
Posted Speed Limit:	None mph	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Good	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment No.: 1
1983 RIP Structural CSR: 84.5; Adjusted OSR: 97.1
Roadside Condition: Satisfactory For Use

BRIDGES AND MAJOR STRUCTURES:

There are no bridges or major structures on these routes. However, on Route 505 between MP 1.31 and MP 2.21 (White Dome Geyser vicinity), there are six low profile multiple barrel culvert structures in thermal surface flow areas. Five of the six culverts are multiple span structures ranging in length from 10 to 30 feet with deck widths of 24 feet +. These five structures are composite short concrete pier structures with wood decks. The decks are in a deteriorating (poor) condition. The sixth structure is a twin barrel corrugated metal culvert pipe in satisfactory structural condition.

SPECIAL PROBLEMS OR FEATURES:

Firehole Lake Drive accesses an area of intense thermal activity which contains unique thermal features. The roadway is located in close proximity to thermal areas.

PRINCIPAL ROAD NEEDS:

Route 505: Restore the structural integrity of drainage structures; improve turnouts and parking areas; abate progressive pavement structure deterioration and restore riding quality of the existing roadway. Blend roadway slopes into the terrain in thermal areas.

Route 446: No needs identified. The park management strategy provides for maintaining this facility as a primitive road.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

The existing roadway is in close proximity or actually traverses some of the unique thermal areas. Sensitive treatment of the transition zone between roadway and resource should be improved to enhance visual quality.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 505: Replace wood deck structures on special culverts with concrete slab decks. Contour grade roadway embankment and cut slopes to provide a natural transition from roadway to terrain. Repair isolated base failures and overlay roadway with bituminous plant mix.

Route 446: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

____	Environmental Impact Statement
X	Environmental Assessment
____	Categorical Exclusion

ROAD STANDARDS: No changes in road standards are proposed.

ESTIMATE OF COST:

	Route 505
Roadway Width (ft)	20
Clearing	$
Landscaping	32,000
Grading	19,000
Drainage	45,000
Structures	
Surfacing/Paving	234,000*
Safety & Traffic Cont	28,000
Mobilization 10%	36,000
Incidental Items 25%	99,000
Construction Subtotal	493,000
Constr Engr (FHWA) 15%	74,000
Total Estimated Cost	$ 567,000
Cost Per Mile	$ 170,000
Prelim Engr (FHWA) 10%	$ 49,000
For Materials Source Inside Park, Deduct	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay from MP 0.00 to MP 1.28 and upon a 3 Inch Depth Bituminous Plant Mix Overlay from MP 1.28 to MP 3.32

BENEFITS/RESULTS:

Replacement of deteriorated wood culvert decks will improve the structural integrity of these installations. A bituminous plant mix overlay will improve riding qualities and extend the pavement service life.

Blending of roadway sideslopes into the terrain will lessen the visual intrusion of the roadway upon the resource.

FIREHOLE LAKE AREA ROADS

ROUTE 505

MP 0.00 Road Entrance at Route 10

MP 0.13 Typical Road Condition

MP 1.24 Typical Road Condition

MP 1.29 Low Profile Culvert

ROUTE 446

MP 2.37 Firehole Lake Vicinity

MP 0.02 Firehole Lake Service Road

#3359J:14
Map: Pg. IV-85
Photos: Pg. IV-469

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. 507 et al; Name: West Thumb Area Roads

Route No. (RIP): 507; West Thumb Road
422; West Thumb Water Intake Service Road
429; West Thumb Service Road

Route 507 Length: 0.28 mile; Milepost 0.00 to Milepost 0.28
Route 422 Length: 0.20 mile; Milepost 0.00 to Milepost 0.20
Route 429 Length: 0.62 mile; Milepost 0.00 to Milepost 0.62

Route Location:
Adjacent to Route 10, Grand Loop Road, in the West Thumb developed area.

Purpose/Function:
Public access and service roads in the West Thumb developed area.

Functional classification:
Route 507 1984 NPS Standard Class II (Connector Park) Road
Route 422 1984 NPS Standard Class VI (Restricted) Road
Route 429 1984 NPS Standard Class VI (Restricted) Road

Topography: Flat

Vegetation:
Lodgepole Pine forest with light to moderate understory.

ROUTE 507:

EVALUATION OF EXISTING ROADWAY:
Existing Average Daily Traffic (1985): 500 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Moderate
Projected Average Daily Traffic (2005): 600 vehicles
Roadway Width (shoulder to shoulder): 20 ft.
Pavement/Surfacing Width: 20 ft.; Type: Bituminous Surface Treatment; Condition: Poor

Base/Subgrade Cond:	Unstabilized;	Drainage Cond:	Fair
Shoulder Width:	0 ft.;	Shoulder Cond:	N/A
Posted Speed Limit:	15 mph;	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Good ;	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment Nos.: 1
1980 RIP Structural CSR: 68.8; Adjusted OSR: 85.3
Roadside Condition: Satisfactory For Use

ROUTE 422:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 10 vehicles
Passenger Cars and Pickups: 50%; Buses and Trucks: 50%
Recreational Vehicles: 0%; Bicycle Use: None
Projected Average Daily Traffic (2005): 10 vehicles
Roadway Width (shoulder to shoulder): 12 ft.
Pavement/Surfacing Width: 12 ft.; Type: Primitive;
Condition: Poor

Base/Subgrade Cond:	Fair ;	Drainage Cond:	Fair
Shoulder Width:	0 ft.;	Shoulder Cond:	N/A
Posted Speed Limit:	mph;	Ave. Oper. Speed:	10 mph
Horizontal Alignment:	Poor ;	Vertical Alignment:	Poor

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 56.3; Adjusted OSR: 93.1
Roadside Condition: Satisfactory For Use

ROUTE 429:

EVALUATION OF EXISTING ROADWAY:

Existing Average Daily Traffic (1985): 40 vehicles
Passenger Cars and Pickups: 50%; Buses and Trucks: 50%
Recreational Vehicles: 0%; Bicycle Use: None
Projected Average Daily Traffic (2005): 50 vehicles
Roadway Width (shoulder to shoulder): 12-16 ft.
Pavement/Surfacing Width: 12-16 ft.; Type: Gravel;
Condition: Fair

Base/Subgrade Cond:	Fair ;	Drainage Cond:	Fair
Shoulder Width:	0 ft.;	Shoulder Cond:	N/A
Posted Speed Limit:	mph;	Ave. Oper. Speed:	15-25 mph
Horizontal Alignment:	Good ;	Vertical Alignment:	Good

Road Improvement Study (RIP) Segment Nos.: 1
1983 RIP Structural CSR: 75.0; Adjusted OSR: 95.9
Roadside Condition: Satisfactory For Use

SPECIAL PROBLEMS OR FEATURES:

Commercial public use facilities in the West Thumb area are in the process of being phased out. The area will then accommodate day use visitors only.

PRINCIPAL ROAD NEEDS:

Route 507: Overlay access road and parking area.
Routes 422 and 429: Maintain in present condition.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

Limiting use of the area is necessary to preserve the unique thermal area resource of the West Thumb area.

TYPES OF IMPROVEMENTS:

Resurfacing	X	Rehabilitation		Reconstruction	
New Construction		No Improvement		Maintenance Seal Coat	

SCOPE OF WORK:

Route 507: Overlay pavement with bituminous plant mix on access road and parking area.
Routes 422 and 429: No work proposed.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
_____ Environmental Assessment
__X__ Categorical Exclusion

ROAD STANDARDS:

No changes in standards are proposed.

ESTIMATE OF COST:

	Route 507
Clearing	$
Landscaping	1,000
Grading	7,000
Drainage	
Structures	
Surfacing/Paving	86,000*
Safety & Traffic Cont	5,000
Mobilization 10%	10,000
Incidental Items 25%	27,000
Construction Subtotal	136,000
Constr Engr (FHWA) 15%	20,000
Total Estimated Cost	$ 156,000
Cost Per Mile	$ N/A
Prelim Engr (FHWA) 10%	$ 13,000
For Materials Source Inside Park, Deduct	$ N/A

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay

BENEFITS/RESULTS:

A bituminous plant mix overly of Route 507 will will improve riding qualities and extend the pavement service life. Visual quality of the facility will be enhanced. Quality of the visitor experience will be improved.

WEST THUMB AREA ROADS

ROUTE 507

MP 0.13 Parking Area

MP 0.25 Parking Area (Facing East)

ROUTE 429

Typical Roadway Condition, West Thumb Service Road

#3359J:17
Map: Pg. IV-199
Photos: Pgs. IV-475 to IV-476

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 509; Name: Virginia Cascade Drive

Route Length: 1.94 miles; Milepost 0.00 to Milepost 1.94

Route Location:
Adjacent to Route 16, Norris Canyon Road, and the Gibbon River in the central park area.

Purpose/Function:
Visitor access to the Virginia Cascades and Virginia Cascades Gorge.

Functional classification:
1984 NPS Standard Class II (Connector Park) Road

Topography: Mountainous

Vegetation:
Dense Lodgepole Pine forest with moderate understory.

EVALUATION OF EXISTING ROADWAY (Route 509):

Existing Average Daily Traffic (1985): 200 vehicles
Passenger Cars and Pickups: 88%; Buses and Trucks: 1%
Recreational Vehicles: 11%; Bicycle Use: Light
Projected Average Daily Traffic (2005): 250 vehicles
Roadway Width (shoulder to shoulder): 17-20 ft.
Pavement/Surfacing Width: 17-20 ft.; Type: Bituminous Plant Mix;
Condition: Fair With Isolated Base and Subbase Failures

Base/Subgrade Cond:	Fair*	Drainage Cond:	Fair
Shoulder Width:	0-4 ft.	Shoulder Cond:	Poor
Posted Speed Limit:	25 mph	Ave. Oper. Speed:	15 mph
Horizontal Alignment:	Fair	Vertical Alignment:	Good

*Some Slide Areas

Road Improvement Study (RIP) Segment Nos.:
1983 RIP Structural CSR: 68.8; Adjusted OSR: 94.8
Roadside Condition: Satisfactory For One Directional Use

SPECIAL PROBLEMS OR FEATURES:

The portion of the roadway which traverses the north wall of the Gibbon River Gorge (MP 0.52 to MP 1.08) is on the alignment of the original Norris to canyon road. In critical areas the roadbed is supported by timber crib retaining walls or rubble masonry walls. There are approximately 12 wall sections, ranging in height from 2 to 60 feet. Some of the smaller walls have been repaired or replaced. However, roadway cracking and settlement above the older walls is symptomatic of progressive structural failure.

Between the upper end of the gorge (MP 1.08 vicinity) and MP 1.52, the alignment is in close proximity to the Gibbon River. Moderate to severe roadway shoulder erosion has occurred throughout this area.

PRINCIPAL ROAD NEEDS:

Abate progressive pavement structure deterioration and restore riding quality of the existing roadway. Repair or replace deteriorating retaining walls in the gorge area, MP 0.52 to MP 1.08. Provide embankment protection as a means of stabilizing the roadway shoulders along the Gibbon River between MP 1.08 and MP 1.52. Provide safety barriers along precipitous roadway and parking area edges through the gorge.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

The Gibbon River Gorge and Virginia Cascade are prime scenic attractions. Any safety installations and modifications to the roadway or retaining wall structures should preserve the scenic and historical character of the roadway without significant compromise of visual quality.

TYPES OF IMPROVEMENTS:

Resurfacing X Roadway Rehabilitation ____ Reconstruction X Retaining Wall
New Construction _____ No Improvement _____ Maintenance Seal Coat ___

SCOPE OF WORK:

Recondition roadway and repair base failure areas; restore and improve drainage; resurface and pave with bituminous plant mix to obtain a 14 to 20 foot wide paved surface (no widening). Install safety barriers through the gorge area.

A separate estimate is included for replacement of retaining walls, shoulder embankment protection, and stabilization in the gorge area and along the Gibbon River. However, since the condition, stability, and life expectancy of the wall elements vary, a detailed structural analysis and geotechnical investigation is considered necessary.

PROBABLE ENVIRONMENTAL CLEARANCE:

_____ Environmental Impact Statement
__X__ Environmental Assessment
_____ Categorical Exclusion

ROAD STANDARDS:

		1984 NPS Stds.
Roadway Width (ft):	14-20	14
Lane Width (ft):	14	14
No. of Traffic Lanes:	1	1
Shldr Width (ft/side):	0-3	0
Shldr Bicycle Lanes:	No	No
Design Speed (mph):	15-25	25

ESTIMATES OF COST:

	BPM Overlay	Wall Replacement and Embankment Stabilization
Roadway Width (ft)	14-20	14-20
Clearing	$	$
Landscaping	10,000	10,000
Grading	12,000	95,000
Drainage		50,000
Structures		980,000
Surfacing/Paving	212,000*	117,000
Safety & Traffic Cont	19,000	2,000
Mobilization 10-5%	25,000	63,000
Incidental Items 25%	70,000	329,000
Construction Subtotal	348,000	1,646,000
Constr Engr (FHWA) 15%	52,000	247,000
Total Estimated Cost	$ 400,000	$1,893,000**
Cost Per Mile	$ 206,000	$ N/A
Prelim Engr (FHWA) 10%	$ 35,000	$
For Materials Source Inside Park, Deduct	$	$

Note: Cost estimates are rounded to nearest $1,000.
*Estimate Based Upon 2 Inch Depth Bituminous Plant Mix Overlay
**Estimate assumes reconstruction of all timber crib and masonry retaining walls. Subject to change based upon findings of structural evaluation and geotechnical studies of proposed structural and geotechnical retaining wall investigations.

BENEFITS/RESULTS:

Repair or replacement of the aging retaining walls and embankment stabilization along the Gibbon River are necessary to ensure the safety and structural integrity of the roadway through the gorge area. The proposed structural evaluation and geotechnical study of the retaining walls will determine the necessity and timing for repair or replacement of the individual walls as well as alternatives for accomplishing the work. Installation of safety barriers will improve the roadway safety characteristics and provide security for vehicles and pedestrians. A bituminous plant mix overlay at an appropriate point in time will improve riding qualities and extend the pavement service life.

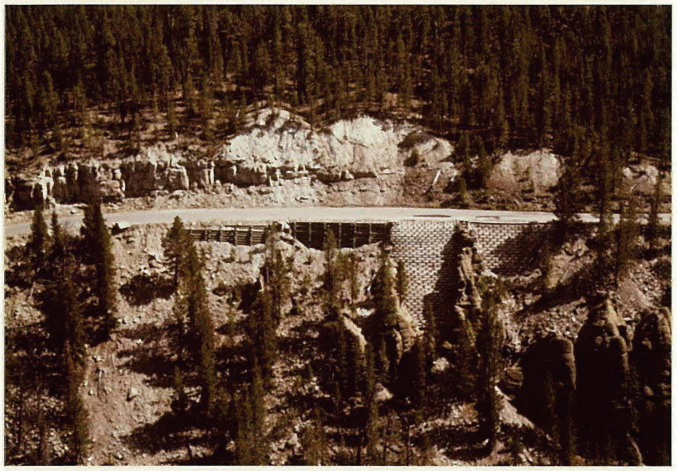
VIRGINIA CASCADE DRIVE

ROUTE 509

MP 0.60 Vicinity, Timber Cribwall

MP 0.63 Typical Roadway, Cascade Gorge Area

MP 0.70 to MP 0.85 Vicinity, View of Roadway and Cribwalls



Aerial View, MP 0.80 to MP 0.90 Vicinity, Timber Cribwalls

MP 0.84 Timber Cribwalls

MP 0.86 Exposed Face of Cribwall From Edge of Roadway

VIRGINIA CASCADE DRIVE

ROUTE 509

MP 0.86 Road Failure Above Timber Cribwall

Aerial View, MP 0.93 to MP 1.00 Vicinity of Rubble Walls and Cribwalls

MP 1.01 Gorge Area Facing West

MP 1.51 Typical Roadway East of Virginia Cascade Gorge

#3369J:1
Map: Pg. IV-219
Photos: Pg. IV-481

PARKWIDE ROAD ENGINEERING STUDY
YELLOWSTONE NATIONAL PARK
ROUTE RECONNAISSANCE REPORT

DATE: September 1986

ROUTE INFORMATION:

Route No. (RIP): 951 et al; Name: Routes Appurtenant to Route 18, Gallatin Highway

Route Location:
Adjacent to Route 18, Gallatin Highway (US 191) in the northwest area of the park.

Purpose/Function:
Public access to trailheads.

TABLE 951-1
FUNCTIONAL CLASSIFICATION AND SUFFICIENCY RATINGS

PARK ROUTE NO (RIP)	ROUTE NAME	ROUTE LENGTH MILES	PURPOSE OR FUNCTION	FUNCTIONAL CLASS	SUFFICIENCY RTNG 1983 (RIP) CSR	ADJ OSR
951	Bacon Rind Creek Trailhead Road	0.30	Public Access to Trailhead	IV	N/R	N/R
952	Bighorn Pass Trailhead Road	0.24	Public Access to Trailhead	IV	N/R	N/R
953	Specimen Creek Trailhead Road	0.04	Public Access to Trailhead	III	N/R	N/R
954	Black Butte Trailhead Road	0.05	Public Access to Trailhead	III	N/R	N/R

N/R = Not Rated

Topography: Rolling to mountainous

Vegetation:
Meadowland, open sagebrush covered land, Aspen groves, and transition zone vegetation dominated by Lodgepole Pine in the uplands.

SPECIAL PROBLEMS OR FEATURES:

Route 18, the Gallatin Highway, is administered and maintained by the Montana State Highway Department under a special use permit issued by the National Park Service. The minor public use facilities along the route within the park are administered and maintained by NPS.

PRINCIPAL ROAD NEEDS:

No needs identified. The park management strategy provides for maintaining the facilities in a primitive or semi-primitive condition as a means of controlling public use. All facilities have a very limited capacity. Route 954, the Black Butte Trailhead, has no defined parking area. This circumstance is causing damage to native grassland vegetation by uncontrolled vehicular parking.

PRINCIPAL ENVIRONMENTAL ISSUES AND CONCERNS:

None identified except as noted above..

TYPES OF IMPROVEMENTS:

Resurfacing		Rehabilitation		Reconstruction	
New Construction		No Improvement	X	Maintenance Seal Coat	

SCOPE OF WORK:

No work proposed under the present park management strategy.

#3369J:4

TABLE 951-2

EVALUATION OF EXISTING ROADWAYS

PARK ROUTE NO (RIP)	ROUTE NAME	WIDTHS (FT) ROADWAY	WIDTHS (FT) PAV/SURF	NO OF LANES	TYPE OF SURFACING	CONDITION ALIGNMENT HORIZONTAL	CONDITION ALIGNMENT VERTICAL	CONDITION PAVEMENT/ SURFACING	CONDITION SHOULDERS	CONDITION BASE/ SUBGRADE	CONDITION DRAINAGE	POSTED OR DRIVING SPEED (MPH)
951	Bacon Rind Creek Trailhead Rd	12	12	1	Light Gravel	Fair	Good	Fair	None	Good	Poor	15
952	Bighorn Pass Trailhead Road	10	None	1	PrimitiveWheelTracks	Good	Good	N/A	N/A	Poor	Poor	10
953	Specimen Creek Trailhead Road	24	16	1-2	Gravel	Fair	Good	Fair	Fair	Fair	Fair	10
954	Black Butte Trailhead Road	10	None	1	PrimitiveWheelTracks	Poor	Fair	N/A	N/A	Poor	Poor	5-10

ROUTES APPURTENANT TO GALLATIN HIGHWAY

ROUTE 951

MP 0.05 Westbound, Typical Primitive Road Condition

MP 0.30 Trailhead Parking Area

ROUTE 952

MP 0.15 Eastbound, Typical Primitive Road Condition