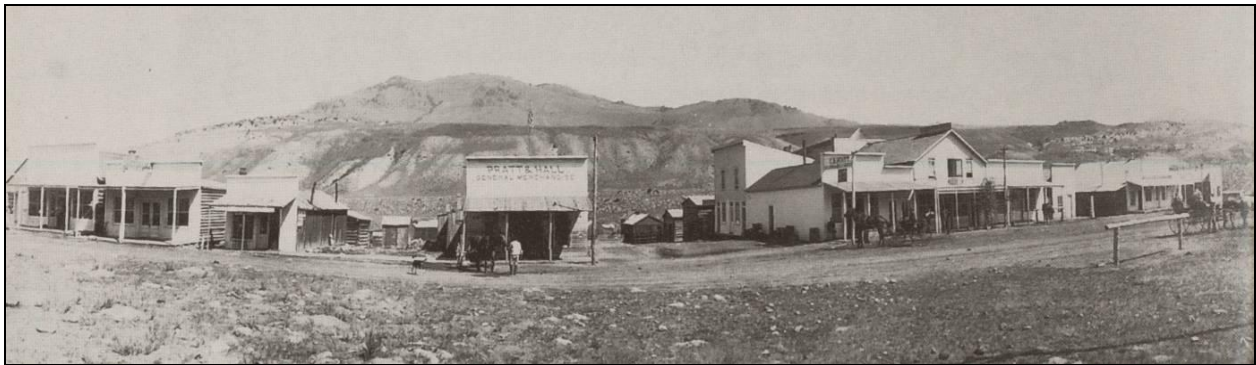




National Park Service
U.S. Department of the Interior
Yellowstone National Park
Wyoming, Montana, Idaho

North Entrance/Park Street Improvement Plan Environmental Assessment

July 2011



North Entrance/Park Street Improvement Plan

Environmental Assessment

EXECUTIVE SUMMARY

Yellowstone National Park (YNP) proposes to develop a plan to implement several modifications to the park's North Entrance Station and road corridor as well as parking areas encompassing Park Street, Gardiner Transportation Center, and Roosevelt Arch, all within or adjacent to Gardiner, Montana. Modifications are needed to improve the flow of inbound traffic during 'Peak Use' times of visitation, provide a safe and functional work environment for employees at the North Entrance Station, address parking and vehicle and pedestrian flow in front of Park Street, Gardiner Transportation Center, and Roosevelt Arch, and improve storm water management deficiencies. The purpose of the plan is to improve pedestrian and vehicular circulation, enhance visitor experience and local business access, and improve safety for visitors and employees at one of the most utilized entrances to YNP.

This environmental assessment (EA) evaluates a No-Action Alternative and two Action Alternatives:

Alternative A- No-Action Alternative

Alternative B- Operation/Traffic Configuration B

Alternative C- Operation/Traffic Configuration C (Preferred Alternative)

A No-Action and two Action Alternatives were selected for evaluation in this environmental assessment. The No-Action Alternative would not implement modifications; operations would continue as they currently exist in the project area. Existing vehicular traffic patterns and circulation would remain as currently organized and managed. Work and safety conditions for employees at the North Entrance Station would not be improved. Visitor experience and pedestrian crossings would not be addressed. Changes to manage storm water deficiencies would not occur and no additional disturbance to the surrounding natural and cultural resources would be incurred. The first Action Alternative, Alternative B would provide the minimum level of improvements necessary to improve pedestrian and vehicular circulation, parking, visitor experience, visitor and employee safety, and working environment for park employees. The second Action Alternative, Alternative C would provide expanded improvements for traffic circulation, visitor experience, visitor and employee safety, and working environment for park employees. Of the three Alternatives, Alternative C would most fully meet plan objectives to improve traffic flow and vehicular congestion, provide adequate facilities for park employees at the North Entrance Station, provide safer parking and pedestrian conditions, and enhance visitor experience. Three additional Action Alternatives were evaluated during the planning stages of this project but dismissed from further consideration.

Development of this plan included review of past efforts, projected changes in visitation, and public comments received during the public scoping process. Resources evaluated in detail in the EA include: topography, geology and soils, vegetation, wildlife, special status species, Yellowstone species of management concern, cultural resources, visitor use and experience, socioeconomics, and park operations. All other resources were dismissed because the projects "effects" to those resources would be negligible or minor. No major adverse impacts are anticipated as a result of this project. Public scoping was conducted in May 2010 to assist with

the development of this proposal and no major issues were raised related to the proposal. Comments received were mostly in support of the proposed plan.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) and other associated laws and regulations to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Yellowstone National Park resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts.

Public Comment

Comments on this EA may be submitted through the NPS Planning, Environment and Public Comment (PEPC) internet website at: <http://parkplanning.nps.gov/yell> or by mailing comments to: Superintendent; Yellowstone National Park, P.O. Box 168, Yellowstone National Park, WY 82190.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so due to the Freedom of Information Act. This EA will be on public review for 30 days. Comments are due by midnight, August 13, 2011.

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CHAPTER 1 - PURPOSE AND NEED

Introduction

Yellowstone National Park (YNP) encompasses 2.2 million acres and is located in the northwest portion of Wyoming; its boundaries cross the borders of Montana and Idaho. By an Act of Congress on March 1, 1872, Yellowstone was "... set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people...and to...provide for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition". The North Entrance to Yellowstone National Park is bordered by park lands and the town of Gardiner, Montana. The area covered in this plan includes the North Entrance Station, Park Street (which is partially within the park boundary), the access road in front of the Gardiner Transportation Center, and the Roosevelt Arch. Figure 1 shows the general vicinity of the proposed improvement area.

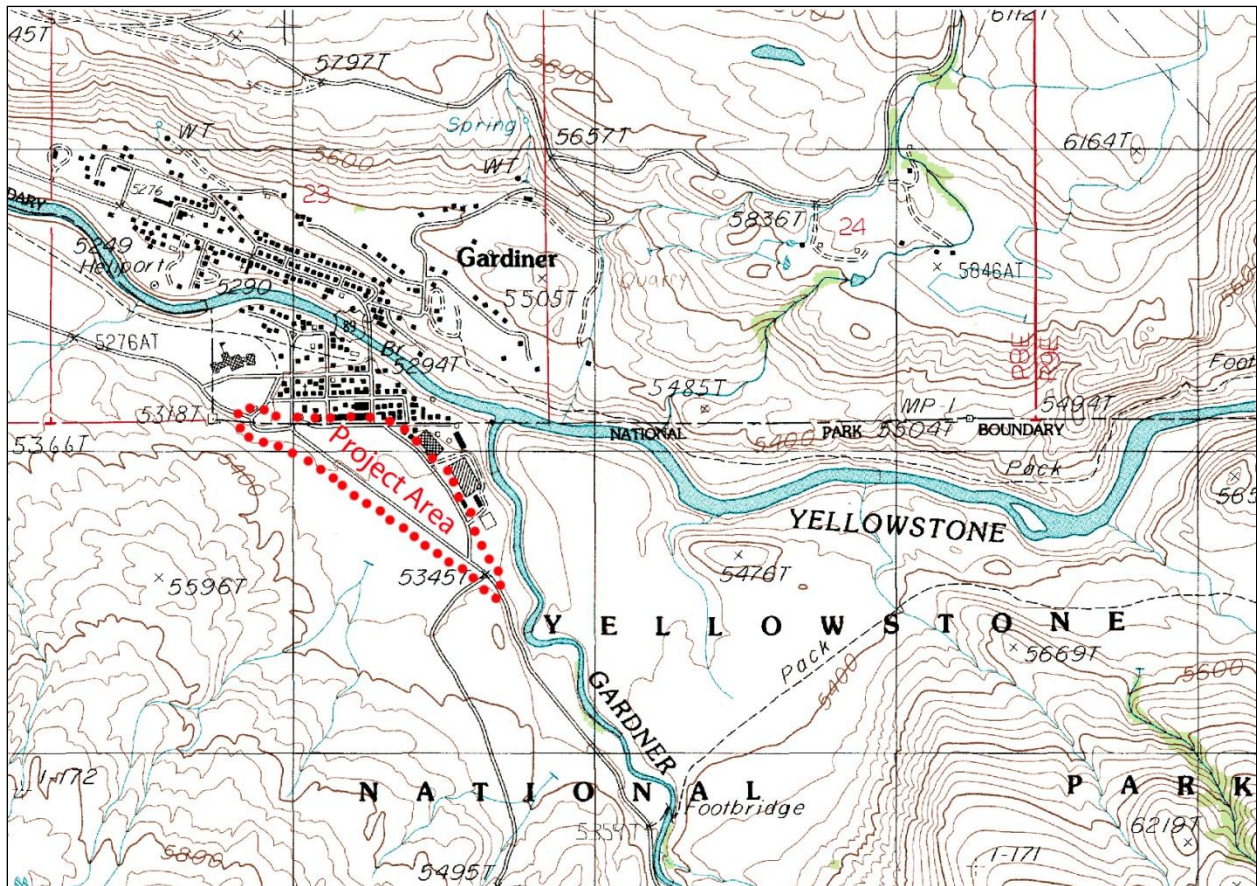


Figure 1 - Vicinity Map

This EA examines the environmental impacts associated with the plan to improve conditions around the North Entrance of Yellowstone National Park. Increased visitation over the last ten years has greatly accentuated problems associated with the town of Gardiner and North

Entrance. Actions proposed in this EA would improve park operations and visitor experience while addressing associated safety concerns.

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and the National Park Service Director's Order (DO)-12 (Conservation Planning, Environmental Impact Analysis, and Decision-Making).

National Park Service's (NPS) Management Policies, 2006 require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the National Park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of these resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment, but an impact would be more likely to constitute an impairment when there is a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated. An impairment analysis for the preferred alternative can be found in Appendix A.

Background

In 1872, when the park was established, only a trail suitable for saddle and pack trains following the route of the current secondary supply and employee entrance road into the park provided some visitors and supplies access to the Mammoth Hot Springs area. During the early days, the freighters wagon road, called the Turkey Pen Road, left Gardiner, Montana following the north side of the Yellowstone River, crossing the river east of the confluence of the Gardner River (thus avoiding the narrow canyon of the Gardiner River) and proceeding on a higher route on the west side of Mount Everts, eventually ending up near the northeast area of the park supplying the Clarks Fork miners above Cooke City. A wagon road from Gardiner to Mammoth

Hot Springs constructed by Philetus Norris in 1877 followed an old tourist wagon road, presently known as the “Gardiner High Road”, but the steep gradient of the road and the steep descent into the Mammoth area made the road impassible in bad weather and it was abandoned as the major transportation route although it still exists and is maintained today as a recreational route. In 1884, Army Corp of Engineers Lt. Dan Kingman constructed a new (and the current) alignment between the town of Gardiner and the park headquarters at Mammoth Hot Springs. But it was not until the construction of the Roosevelt Arch in 1903 that the road was constructed from the vicinity of the current North Entrance Station to the Roosevelt Arch (Whittlesey 1997).

Park Street—the east-west running street in Gardiner, Montana that fronts on Yellowstone National Park—has been Gardiner’s most prominent street since James McCartney settled near its east end in late 1879. It has buildings only on its north side, and it runs parallel to the north boundary of Yellowstone National Park.

Prior to 1926, travelers from the north did not enter the town on the north and east sides of Yellowstone River as U.S. Highway 89 does today. Instead, all travel from Paradise Valley was on the west and south sides of the river via the “Old Yellowstone Trail,” which today remains a mostly-dirt road that approaches the Roosevelt Arch from the northwest. Getting across the Yellowstone River was long a problem for travelers in both directions (north to Livingston or south to Gardiner).

The first bridge across the Yellowstone River at Gardiner was built, sometime before 1893. The second bridge, which replaced the (first), was constructed in 1893 in the same location, and like its predecessor, offered residents of Gardiner access to the north bank of Yellowstone River, allowing the town to continue expansion. In 1902, the railroad tracks reached Gardiner and a grander entrance befitting the emerging National Park idea was envisioned that reinforced for visitors that they were entering a wonderland like no other. A swinging footbridge—built in 1914 on the location of today’s U.S. 89 bridge—allowed early walking-access to the south (main) part of Gardiner. The footbridge was replaced in 1930 by today’s U.S. 89 bridge. Road access to the park through the Roosevelt Arch and along today’s Arch-kiosk road (North Entrance road) was not possible until 1903, when Captain Hiram Chittenden of the U.S. Army Corps of Engineers built both the Roosevelt Arch and that short stretch of road, as explained in his road report of that year. In accordance with his plans to “dress up” Gardiner, Chittenden actually planted trees along this new stretch of road, but they all died within a year. Chittenden also began the construction of a ditch to be used for hydroelectric power generation; which was never completed. Features in the area were improved to present “a very pleasing picture to the tourists as they entered the Park” as stated by Acting Superintendent John Pitcher in his 1904 Superintendent’s report.

Two fences built by park (U.S. Army) officials have lined Park Street during its history—a wire one erected by Chittenden in 1903 and the present wrought-iron fence built in 1913 by Acting Superintendent (Lt. Col.) Lloyd Brett. Acting Superintendent (Major) John Pitcher stated in 1903 that in connection with Chittenden’s new Roosevelt Arch:

A wire fence has been constructed, which extends for about 4 miles along the northern boundary of the park. This fence has long been needed, and it now affords a means of keeping stock of all kinds off that section of the park in the vicinity of Gardiner and Cinnabar, thereby saving for the antelope, deer, and elk the grass which they badly needed in the winter.

Although Chittenden’s wire fence protected, to some degree, the arch-meadow from wandering cows and sheep and kept some park animals within the park, trash and garbage from Park

Street businesses became an even bigger problem by 1908. Campers who brought their own stock and conveyances to Yellowstone were constantly trying to camp on Park Street, which was technically inside the park. In 1915, the first automobile entered the park forever changing the transportation system. In 1929, NPS landscape architects produced a map showing Second Street extended through the fence to the Arch-kiosk road. A plan for this continued in 1938, and the proposal again appeared in the 1939 “Master Plan for Yellowstone National Park” but the extension of Second Street never happened (Whittlesey 2011).

NPS planning for actually moving park headquarters from Mammoth Hot Springs to Gardiner (which again included extension of Second Street) began in early 1945 when Assistant Superintendent Fred Johnston issued a “Confidential Report to Superintendent [Edmund] Rogers” that recommended a complete transfer of all NPS headquarters’ functions to the North Entrance. He included a map that showed Second Street (U.S. 89) extended to the arch-kiosk road, a new NPS administration building at the center of the Arch-kiosk road and many new housing units in the meadow south of the Arch-kiosk road. This plan was on the NPS drawing board two years when Acting Director Hillory Tolson in Washington proposed that Roosevelt Arch itself be completely dismantled and removed because of the recent establishment of the Roosevelt memorial park in North Dakota. The proposal was met with immediate hostility by the NPS Regional Director, Superintendent of Yellowstone, and Gardiner residents. The Acting Director finally agreed and thus ended the threat to the Arch, but proposed changes to Park Street in the form of traffic rerouting remained. That opposition and opposition for the next few years from various NPS officials would eventually cancel the proposal to move headquarters to Gardiner. But the proposal to route Second Street through the iron fence and across Gardiner Triangle remained in NPS plans (at least in small form) until 1959.

The ending of World War II in 1945 injected immediate chaos into the proposal when it became apparent that the park’s post-war funds would have to be focused on the massive public visitation that was expected for the summer of 1946 rather than on “improving” Park Street and Gardiner. The NPS continued to grapple with increasing visitation for years following the war, and it too made more difficult the proposals of rerouting traffic and moving headquarters.

By the time NPS’s Mission 66 program was well under way; many improvements had been made at Mammoth Hot Springs, so there was an impetus for park headquarters to remain at Mammoth. Park Street remained a dirt street until 1965, at which time the NPS blacktopped the main thoroughfare and the checking station was located just inside the Arch until 1966. The NPS road proposal—to extend Second Street through the iron fence and across “Gardiner Flats”—re-emerged in the 1970s. In 1972, NPS historians David Battle and Irwin Thompson in writing about the Roosevelt Arch noted that “there are currently plans for a new road alignment into Gardiner which would virtually eliminate all auto traffic through this [Roosevelt Arch] structure.” Although Battle and Thompson recommended that Roosevelt Arch be bypassed by the main road and instead “preserved and developed as a wayside historical exhibit,” that action did not occur and the road proposal disappeared again.

Because pressure to improve traffic flow, parking, and the general “look” of Park Street was continuing, the NPS completed some tentative improvements between 1983-1985. In late 1984, Superintendent Robert Barbee spoke of a Gardiner “improvement plan” that would address “parking and traffic patterns in the area,” which would include all of Park Street; it got scaled back in the reality of budget considerations and traffic circulation. The latter became a large subject for discussion. One proposal was to route traffic “one-way only” (inbound) through the Roosevelt Arch. This proposal was abandoned because it required all traffic to leave the park via the “employee route”—with those people thus missing the businesses on Park Street—and

added the cumbersome requirement of forcing anyone including employees who wanted to visit Park Street or points north to re-enter the park through the Arch. In connection with this Gardiner “improvement plan,” the NPS Maintenance Division performed a substantial amount of work on Park Street during the 1980s.

In 1985, the NPS contracted a major repair of the roof of Roosevelt Arch as well as general stabilization efforts on it. Park Street was graded and resurfaced in the 1980s. NPS signs on and along the wrought-iron fence that indicates “No Overnight Parking” has been in place for at least twenty years if not longer.

A new North Entrance Station (the present log building on the Arch-kiosk road) was constructed in the fall of 1991. It replaced a tiny, primitive structure resembling a toll-road booth containing sliding windows that was locally referred to as “The Box.” In 2007, the NPS performed a resurfacing, milling, and striping of Park Street.

During the period 2000-2010, the NPS has been faced with constantly increasing vehicular traffic at its North Entrance through the Roosevelt Arch. This section was historically built to allow entry by narrow stagecoaches passing through it from a train station immediately to its west. Built in 1903, it today requires a hairpin curve to access it from Park Street, and its narrow opening essentially restricts traffic to one lane of entry. The curve plus the Arch’s narrow opening and the tendency of visitors to slow down or stop to view it creates a bottle-neck for modern auto traffic. Past requests—both formal and informal—for “improvements” at the Arch and on Park Street have often been accompanied by concerns for the public to be able to enjoy the Arch in some improved fashion, because today the historic structure provides little safe opportunity for visitor interface.

In 1903, total park visitation numbered less than 14,000 people annually (as compared to 3.6 million visitors in 2010). Although only a small percentage of visitors originally came through the North Entrance, today’s North Entrance arguably receives more auto traffic than the Arch road can reasonably accommodate during summer months. Between 2006 and 2010 in the months of June through September, the NPS recorded numbers of vehicles at the North Entrance that ranged from 28,000 to 49,000 cars each month. These increasing numbers have served as part of the current impetus for a North Entrance/Park Street improvement project.

Existing Conditions

This section describes the existing conditions of the North Entrance/Park Street area and the need for this project. Figure 2 provides an overview reference of locations for the existing conditions described.

North Entrance Station

The North Entrance Station has seen an increase in the number of total vehicles entering in both summer and winter months. In the past ten years, an approximate increase of ten percent during the peak summer months of June, July, and August and an approximate increase of eleven percent during winter months of December through March has occurred at the North Entrance Station (NPS Stats Info website).

The existing single story log frame North Entrance Station was constructed by the NPS in 1991 and is approximately 500 square feet and edged with native stone. The kiosk currently functions as an Entrance Station, break room, restroom, office, storage space, fee processing area, visitor contact station, and duty location for up to eight employees during peak season (June 1 – September 30). The area is inadequate to support all of these functions. Modifications are needed to accommodate current administrative and operational functions of the North Entrance Station and to meet regulatory standards for security, telecommunication, Occupational Safety & Health Administration (OSHA), and Americans with Disabilities Act (ADA).

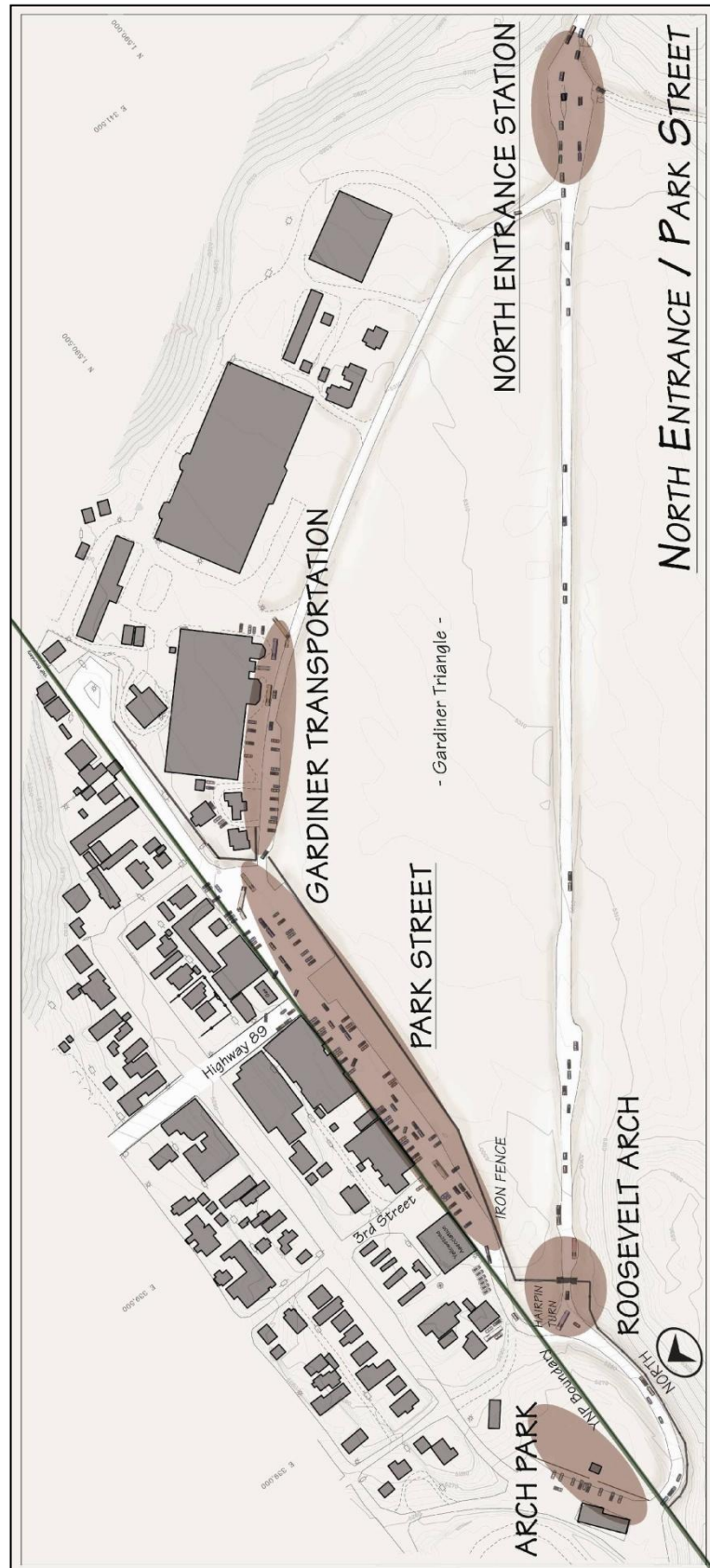


Figure 2-Overview of Existing Condition

The North Entrance Station currently provides one lane of incoming visitor traffic, one lane for incoming administrative access and one lane of outbound traffic for both visitors and administrative use. This existing configuration is often insufficient to handle increased traffic volumes during the 'Peak Use' of operation. During 'Peak Use', inbound vehicles waiting to be processed at the North Entrance Station can back up into the town of Gardiner, Montana; a distance of ½ mile or more. This situation requires entrance staff to switch to a mode where they work in the traffic to direct travel one-way (with two in-bound lanes) from the Roosevelt Arch to the North Entrance Station with a minimum of two NPS employees to work among traffic to organize traffic lanes. Outbound traffic exits towards the highly congested Gardiner Transportation Center, bypassing the store fronts of many Gardiner, Montana businesses. Operating the North Entrance Station in this manner is a safety hazard, where several near misses have occurred, which compromises both NPS employees and concession operations near the Gardiner Transportation Center.

Park Street

Encompassing the area between the Gardiner Transportation Center and Roosevelt Arch is Park Street. Park Street, which is within the park boundary serves as the main entrance road to the North Entrance to YNP and main access and parking for downtown Gardiner, Montana businesses. Currently Park Street leads traffic through the main street of Gardiner which includes storefront parking to the north and informal parking to the south. The area lacks pedestrian crossings, vehicle controls and delineated oversize vehicle parking. During 'Peak Use', these conditions lead to recognizable safety concerns such as congestion of a mix of vehicles and pedestrians, poor visibility for entry and exit into the travel way, constriction of entry into the travel way, an inefficient use of space, loss of parking opportunities, and a general sense of confusion.

Gardiner Transportation Center

Situated between Park Street and the North Entrance Station is the Gardiner Transportation Center where the entrance is signed as a service road operated for employee and delivery traffic only. The Gardiner Transportation Center operates as the central headquarters and commercial center for two of the main concessioners within YNP and includes: Xanterra Parks & Resorts (XPR) human resource offices, check-in/check-out station for all Xanterra concession employees, merchandise distribution center, central fleet distribution, maintenance and storage, park-wide laundry center, and dispatch office. Yellowstone Park Service Station (YPSS) headquarters, warehouse and distribution center are also in this area.

Safety concerns related to this area include the informal use of the service road as a primary exit for the North Entrance Station during 'Peak Use', resulting in a highly congested area mixed with commercial operations, pedestrians, and visitor traffic. Past efforts to control speed and organize parking at this site have resulted in limited success.

Roosevelt Arch

The Roosevelt Arch a contributing feature of the Fort Yellowstone National Historic Landmark is a popular and iconic beginning or ending for many park visitors. This structure measures 16 feet wide at the roadway requiring inbound and outbound traffic to yield many times as visitors stop in the roadway and exit their vehicles to take a photo and experience the grandeur of the Roosevelt Arch. Additional informal parking has evolved on the shoulder of the 'hairpin' turn

north of the Arch resulting in a vehicular bottleneck during peak season. Designated pedestrian walkways are not available to visitors resulting in a mix of pedestrians among inbound and outbound traffic. Although recognized as a significant safety concern, this is a daily occurrence during 'Peak Use'.

Storm Water Management

Numerous deficiencies exist with respect to the current storm water management within Park Street, the North Entrance Station and the Gardiner "Triangle" area. The historic irrigation ditches intercept surface runoff disrupting natural flow. Sheet runoff from existing paved and dirt areas drains haphazardly into makeshift ditches and towards the Yellowstone River, or collects between the paved and unpaved areas. In relatively level areas pooling and icing persists during storm events prolonging the safety concerns for employees and visitors.

Purpose and Need

The purpose of the North Entrance Station and Park Street improvement plan is to provide the values and purposes for which YNP was set aside; especially protecting the natural and cultural resources in the area of the North Entrance and Park Street in addition to improving visitor experience with improved way finding and aesthetic enjoyment. This should also improve traffic circulation and parking, manage congestion, improve storm water deficiencies and safety in the project area which encompasses the North Entrance Station, Park Street, Gardiner Transportation Center, and the Roosevelt Arch.

The improvement plan is needed to meet the following objectives:

1. Develop the infrastructure necessary at the North Entrance Station to improve traffic flow and alleviate congestion issues during 'Peak Use' as well as provide adequate facilities for park employees. Measures of success would include:

- Improved employee work environment and safety
- Improved space for security and telecommunications
- Increased capacity to process visitors
- Reduced time for entering traffic with no backups into Gardiner
- Efficient employee and delivery entry and exit
- Improved organization and flow of inbound and outbound traffic

2. Improve vehicular circulation and provide safer parking conditions along Park Street and the Gardiner Transportation Center, by reducing exposure of visitors and employees to active traffic movement. Measures of success would include:

- Delineated parking that accommodates oversized vehicles
- Separation of pedestrians and parked vehicles from inbound and outbound traffic
- Safe walkways, crossings, and points of interest for visitors
- Access to local businesses
- Separation of employees and parked vehicles from traffic
- Safe walkways, crossings, and bus staging areas for employees

3. Improve visitor experience and aesthetics throughout the project area. Improve safety and access to the Roosevelt Arch through expansion of visitor parking, walkways, facilities and improvement of traffic and pedestrian flow. Measures of success would include:

- Organized and simplified traffic flow through Roosevelt Arch
- Safe and unobtrusive parking in close proximity to the Arch
- Safe and easy access to view and photograph the Arch
- Improved area aesthetics and way finding for visitors around the Arch and along Park Street

4. Meet the needs of the plan while protecting the values and purposes for which YNP was set aside; especially those natural and cultural resources in the area of the North Entrance and Park Street. Measures of success would include:

- Maintain the historic integrity of the Roosevelt Arch as part of the Fort Yellowstone National Historic Landmark designation, North Entrance Road Historic District, National Register eligible properties and identified cultural landscape components
- Improved storm water management and reduce erosion potential
- Wildlife migration patterns protected
- Remaining native vegetation protected

Relationship to Other Plans and Policies

The North Entrance and Park Street Improvement Plan/EA is consistent with the following plans and policies:

- **Yellowstone National Park Master Plan (NPS 1974)**
The Record of Decision strives to balance human impacts and preservation of park resources by developing objectives for General Management, Resource Management, Visitor Use, and Interpretation.
- **Statement for Management (NPS 1999)**
The Statement for Management described the existing conditions and management objectives for natural resources, adjacent lands coordination, visitor use, cultural resources, and park operations and planning.
- The proposal is consistent with the goals and objectives of the **2006 National Park Service Management Policies** (NPS 2006) that state that major park facilities within park boundaries should be located so as to minimize impacts to park resources. The proposed sites for improvement were identified to minimize harm to all park resources, particularly significant cultural resources.
- Future Mammoth Hot Springs and North Entrance Comprehensive Planning.
- Future Mammoth to Gardiner Road Reconstruction Plan.

Scoping

Scoping is an early and open process to identify the resources that may be affected by a project proposal and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Internal scoping was conducted in 2010 by an interdisciplinary team from YNP to define the purpose and need for the project, potential environmental impacts and possible mitigation measures.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to improve pedestrian and vehicular circulation, visitor experience, improve storm water management, local business access, and orient visitors at the North Entrance, Roosevelt Arch and Park Street area. The scoping letter dated May 19, 2010 was mailed to more than 320

individuals, organizations, federal and state agencies, affiliated Native American tribes, local governments, and local news organizations. Scoping information was also posted on the park's website (<http://www.nps.gov/yell/>). During the 30-day scoping period, 52 public responses were received which included approximately 130 comments. A majority of respondents were in support of improvements for the North Entrance Station and Park Street area. Most comments focused on improving circulation and parking as well as facility improvement (e.g. adding a second entrance kiosk, public restrooms, picnic areas, better signage). Resource concerns expressed included protecting wildlife corridors, viewsheds, cultural resources and night sky. The public did not express positive support for a bypass road placed as an extension of U.S. Highway 89 through the "Triangle" area. Also, a large expansion of infrastructure at the North Entrance Station was not supported by public comments.

Impact Topics Retained For Further Analysis

In this section and the following section on Impact Topics Dismissed from Further Analysis, the NPS evaluates all potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates "major" effects as "significant" effects. The identification of "major" effects would trigger the need for an EIS. Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional evaluation and judgment in making the assessment.

The NPS defines "measurable" impacts as moderate or greater effects. It equates "no measurable effects" as minor or less effects. "No measurable effect" is used by the NPS in determining if a categorical exclusion applies or if impact topics may be dismissed from further evaluation in an EA or EIS. The use of "no measurable effects" in this EA pertains to whether the NPS dismisses an impact topic from further detailed evaluation in the EA. The reason the NPS uses "no measurable effects" to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with CEQ regulations at 1500.1(b). Impact topics for this project were identified on the basis of federal laws, regulations, and orders; 2006 Management Policies; and NPS knowledge of resources in YNP.

Impact topics retained for further analysis in this EA are listed below along with the reasons why the impact topic is being carried forward. For each of these topics, baseline conditions (i.e. affected environment) are described in Chapter 3 in order to facilitate an analysis of impacts.

Natural Resources

Topography, Geology, and Soils

According to NPS Management Policies 2006, the NPS will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue. These policies also state that the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

Topography, geology, and soils may be impacted at a measureable amount in the area adjacent to the existing road due to ground disturbance activities such as excavating, trenching, grading and placement of fill during construction. Although mitigation measures would be implemented for minimizing soil loss and reconfiguring topography during and post construction, the two Action Alternatives would result in new ground disturbance and a potential to impact topography, geology, and soils exists. Therefore, the topic was retained for further analysis.

Vegetation and Special Status Plant Species

According to the NPS Management Policies 2006, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006). The project area has a predominance of non-native vegetation within the “Triangle” and on adjacent lands between Roosevelt Arch and the North Entrance station due to past agricultural practices. Impacts to vegetation would come from construction activities along the road edge, at culverts, and at widened or new pullout or road construction areas, but would be confined mostly to the existing road prism. Disturbance associated with construction would provide an opportunity for non-native plant species to continue to spread to a measureable extent. A special status plant species also exists in the vicinity of the project thus this impact topic was retained.

Wildlife

According to the NPS 2006 Management Policies, the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals (NPS 2006). The project area is located in a natural wildlife movement corridor of the park; particularly from ungulate species (elk, bison, and pronghorn antelope) use this area as a corridor when moving to winter range. Additionally wildlife in the area could be impacted by loss of habitat or disturbance during construction; therefore this topic was retained for further analysis.

Special Status Wildlife Species and Yellowstone Species of Management Concern

The Endangered Species Act of 1973 requires examination of impacts on all federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 Management Policies and Director’s Order-77 Natural Resources Management Guidelines require the NPS to examine the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2006). The improvements in the North Entrance/Park Street area could have indirect impacts (such as disturbance to ungulate movement which may indirectly affect predator actions) on the following listed species within Yellowstone: grizzly bears, Canada lynx or gray wolves and on Yellowstone Species of Management Concern species (pronghorn, bald eagle, peregrine falcon) that may occur in the vicinity. A special status plant species exists in the vicinity of the project. Given there may be measureable impacts to special status species, this impact topic has been retained.

Cultural Resources

The NPS, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. According to the NPS 2006 Management Policies and Director's Order-28 Cultural Resource Management, management decisions and activities throughout the NPS must reflect awareness of the irreplaceable nature of these resources (NPS 2006). The NPS will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with these policies and guidelines.

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment in the consultation process. The term "historic properties" is defined as any site, district, building, structure, or object eligible or listed in the National Register of Historic Places (NR), which is the nation's inventory of historic places and the national repository of documentation on property types and their significance. More information about this consultation can be found in Chapter 5: Consultation and Coordination.

The term "historic structures" refers to both historic and prehistoric structures determined eligible for the NR, which are defined as constructions that shelter any form of human habitation or activity. The North Entrance/Park Street Improvement Plan contains several historic structures encompassed within historic districts (North Entrance Road Historic District, Yellowstone Park Transportation Historic District). The Roosevelt Arch is a non-contiguous structure contributing to the Fort Yellowstone National Historic Landmark. Since potential measureable impacts to the viewshed (adverse or beneficial) of these historic properties are possible, this topic has been retained for further analysis.

Within the viewshed of these historic properties, previous impacts have occurred including the removal of train tracks, train station and activities associated with train visitation; removal of farm operations at the "Triangle"; removal of an entrance structure at the Roosevelt Arch and placement of the Heritage Resource Center.

Archeological Resources

In addition to the NHPA and the NPS 2006 Management Policies, the NPS Director's Order-28B Archeology affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the NPS. As one of the principal stewards of America's heritage, the NPS is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the NPS reflect a commitment to the conservation of archeological resources as elements of our national heritage.

In 2008, the University of Montana (UM) archeological field school provided block survey of the area around the North Entrance. Sites 24YE0198, 24YE199 and the previously recorded site 24YE0118 were documented. The features of these sites will be within the area of this planning effort and has potential for measureable impacts to these sites. Therefore, this impact topic will be retained.

Cultural Landscapes

According to the NPS Director's Order-28 Cultural Resource Management Guideline, a cultural landscape is a reflection of human adaptation and use of natural resources, and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. A cultural landscape inventory (CLI) has been drafted for the planning efforts related the Mammoth Hot Springs Comprehensive Plan. Until determination of eligibility using National Register standards takes place, the cultural landscape will be considered eligible and NPS will proceed as if eligible. Site specific Section 106 consultation would take place after determination of eligibility and prior to any actions being undertaken. Therefore, this impact topic has been retained.

Social and Economic Resources

Visitor Use and Experience

According to the NPS 2006 Management Policies, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS 2006). The NPS is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, the NPS will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. The NPS 2006 Management Policies also state that scenic views and visual resources are considered highly valued associated characteristics that the NPS should strive to protect (NPS 2006).

The average visitor length of stay in Yellowstone National Park is 9.8 hours for about half the visitors, the other half spends an average of 3.9 days visiting the park. The most commonly visited areas of the park are Old Faithful (90%) and Mammoth Hot Springs (69%). Given that the North Entrance is open year round and is the closest entry to Mammoth Hot Springs, the northern range, wolf watching and Cooke City and given its proximity to the town of Gardiner, this improvement project would have measurable beneficial effects to visitor experience. Therefore, this impact topic has been retained.

Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economies of nearby Gardiner, Montana, as well as Park County due to minimal increases in employment opportunities for the construction workforce and revenues for local businesses and governments generated from these additional construction activities and workers. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as construction. Changes in visitor circulation would make local businesses more accessible and could lead to an increase in visitors and an increase in revenue for local businesses. Therefore, this impact topic has been retained.

Park Operations

The administrative functions for the North Entrance Station are currently in one kiosk (500 sq ft). This kiosk must house not only administrative infrastructure for employees but (visitor contact, office, payment processing, fee collection, restroom, storage and break area), it must also house security and telecommunications equipment vital to park communications. Recent issues have emerged related to peak visitation and the fact that employees must try to safely direct traffic flow outside of the entrance kiosk area. Employee complaints have increased as the safety of the North Entrance Station area has been compromised due to increased visitation.

Construction of new infrastructure at the North Entrance Station would provide a measurable improvement on the park's North Entrance staff and their daily operations.

Concessioner's operation on the Gardiner Transportation Center service road include central headquarters and commercial center for two of the main concessioners within YNP and includes: human resource offices, check-in/check-out station for all Xanterra concession employees, merchandise distribution center, central fleet distribution, maintenance and storage, park-wide laundry center, and dispatch office. YPSS headquarters, warehouse and distribution center are also in this area. Changes in circulation will affect concessioners, delivery traffic and contractors for YNP, especially entering the North Entrance via the Gardiner Transportation Center service road. For these reasons, park operations have been carried forward for further analysis in this document.

Impact Topics Dismissed From Further Analysis

The following resource topics would only be impacted at an intensity level of minor or less by the proposed project and, consequently, were dismissed from further analysis.

Water Resources

NPS policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

The proposed project area is not near any streams, lakes, rivers, or floodplains and is mostly dry, except for periodic runoff during storm events. Water quality, water quantity, and drinking water are not expected to be affected by the project. In the preferred alternative, the size of the improvement area's footprint (approximately 4 acres) would increase the amount of impervious surface in the area, which could possibly increase the erosion potential of the area; however, improvements to storm water drainage proposed in this plan would offset or mitigate this effect. To further assist with erosion and water quality, disturbed areas would be revegetated and re-contoured following construction. Therefore, these effects are minor or less in degree; this topic is dismissed from further analysis in this document.

Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to

support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 Protection of Wetlands requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, §404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. NPS policies for wetlands as stated in 2006 Management Policies and Director's Order 77-1 Wetlands Protection strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 Wetlands Protection, proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings for wetlands.

No wetlands are located in the project area. Therefore, a statement of finding for wetlands will not be prepared. Because no wetlands exist in the project area, this topic is dismissed from further analysis in this document.

Floodplains

Executive Order 11988 Floodplain Management requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. Under the NPS 2006 Management Policies and Director's Order 77-2 Floodplain Management will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 Floodplain Management, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains. The project area is not within a 100-year floodplain. Therefore, a statement of findings for floodplains will not be prepared. For these reasons, this topic is dismissed from further analysis in this document.

Ethnographic Resources

During the past decade, YNP has made a concerted effort to involve Native American Tribes, associated with the park. These efforts include the compilation of ethnographic resources found within the park that are valued by various tribes. To date, no Traditional Cultural Properties have been evaluated within Yellowstone National Park and certain ethnographic properties such as the Bannock Trail, used by the Crow, Nez Perce, Northern Cheyenne, the Wind River Shoshone, and the Fort Hall Shoshone-Bannock Tribes, are unable to be located on the landscape (although the concept of the Bannock Trail is important to those early park visitors still today). After the work of park naturalist, Wayne Replogle, prior to 1956, park historian, Aubrey Haines published a pamphlet on the Bannock Indian Trail in 1964 (both studies not corroborated with the Bannock or any Native American Tribe) that indicated the possibility of a "connector trail" to the Bannock Trail passing through the North Entrance area following the Yellowstone River. University of Montana graduate student and former YNP employee, Katie White, has continued the study of the Bannock Trail as part of her master's thesis work, and although this work is not yet completed, White indicates that the Bannock Trail is more of a concept of the corridor of passage rather than a resource on the ground.

The park's ethnographic resource inventory (ERI) identifies a variety of animals that can be found commonly or occasionally within the North Entrance project area. Included are antelope (Pronghorn), bighorn sheep, and elk, identified as significant by the Blackfeet, Confederated Tribes of the Salish and Kootenai, Crow, Nez Perce, and Fort Hall Shoshone-Bannock. Bison

were identified as ethnographically significant by the above listed tribes along with the Confederated Tribes of Colville, Confederated Tribes of Umatilla, Kiowa, and Northern Arapaho. Coyotes, deer, wolves, and bears as well as hawks and eagles are also identified by many tribes as culturally significant. Vegetation commonly identified by various tribes as culturally significant and located within the project area include juniper, prickly pear cactus, and sagebrush. All of the above named natural resources can be found in ample quantity in many areas throughout the park. The proposed project will not affect the availability of any of these resources and should not displace any of the above mentioned resources to a measureable level.

In 1999, acknowledging the significance of buffalo in their culture, the Lakota Sioux initiated a “buffalo walk” from Rapid City, South Dakota to YNP –a peaceful walk to raise awareness of traditional and spiritual teaching of indigenous people and of the plight of the Yellowstone buffalo. The walk culminated in several ceremonies with one ceremony in the North Entrance “Triangle” area just east of the Roosevelt Arch involving the Sioux, the Crow and the Nez Perce to honor the buffalo. Two years previous to this ceremony many of the same Native persons gathered for an offering of prayers for the buffalo at the Stephens Creek bison capture facility. Since that time other related buffalo ceremonies have taken place in locations outside Yellowstone National Park. Subsequently, research on the implications of the Yellowstone “Buffalo Walk” have been conducted by Sarah Tarka and Dr. Richard Sattler of the University of Montana culminating in the 2008 report *My Brother the Buffalo: Documentation of the 1999 Buffalo Walk and the Cultural Significance of Yellowstone Buffalo to the Lakota Sioux and the Nez Perce Peoples*. The report finds that the sites associated with the Buffalo Walk do not fall under the criterion considerations for listing on the National Register either as historic sites or as traditional cultural properties. Further, the report relates that the major participants in the Buffalo Ceremony do not consider the “Triangle” site of the ceremony any different than the rest of the Yellowstone landscape and therefore does not warrant treatment as a sacred site. The park recognizes that the location is significant yet the proposed actions will not preclude access to the area nor preclude additional ceremonies in the future. Indeed, the proposed actions will likely make the triangle and arch area more accessible. Previous to the 1999 ceremony and subsequent to the ceremony no other similar ceremonies have been documented at that site or in the area. To date, no tribe or tribal member that participated in the Buffalo Walk has requested further National Register consideration for the site.

All Native American Tribes affiliated with the park or with bison within the park have been notified of the proposed improvements to the North Entrance area via the scoping letter dated May 19, 2010. More than six months later, at this time, no response has been received from any of the tribes notified or from any Native Indian person identifying ethnographic or general concerns due to the proposed undertaking. Therefore, the topic has been dismissed from further analysis at this time.

Paleontological Resources

According to 2006 Management Policies, paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research (NPS 2006). Mount Everts towers over the North Entrance area located less than ½ mile from the North Entrance Station to the northeast and welcomes visitors with a massive 3000-ft display of Cretaceous era (65 – 140 million year old) stratigraphy where the thick sequence of marine and non-marine fossil bearing rocks are well exposed. Small outcrops of Jurassic (140 – 200 million years old) rocks are also exposed on its eastern slopes. Preliminary fossil survey work suggests the potential for

significant paleontological discoveries –both plant and vertebrate localities have recently been documented on the upper reaches of Mount Everts, south of the North Entrance of Yellowstone.

Fortunately, these fossil sites are located away from public view in the upper regions of the uplift and are firmly imbedded in limestone, shale, and sandstone rocks. Due to the dry nature of the climate, there is very little possibility of slopewash transporting fossil fragments onto the flat glacial and riverine outwash plane where the North Entrance developed area and the proposed undertaking is located. Extensive paleontological and archeological survey of the North Entrance area has identified no fossil localities or fossils in secondary deposition; therefore this topic is dismissed from further analysis in this document.

Museum Collections

According to Director's Order-24 Museum Collections, the NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, National Park Service museum collections. Many of the Park's museum collections are stored in the Heritage and Research Center in Gardiner, Montana, or within visitor centers of the park. This project would not affect these collections, and thus would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because these effects are minor or less in degree and would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 et seq.) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with NPS units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. YNP is designated as a Class I air quality area under the Clean Air Act. A Class I designation indicates that air quality degradation is unacceptable under the Clean Air Act of 1977.

There is the possibility of short-term temporary impacts on air quality or visibility in the North Entrance/Park Street area. Construction activities such as hauling materials and operating heavy equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized and would likely dissipate rapidly. Overall, the project could result in a negligible degradation of local air quality, and such effects would be temporary, lasting only as long as construction. The Class I air quality designation for YNP would not be affected by the improvement plan. Further, because the Class I air quality would not be affected, there would be no unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Because the effects on air quality would be negligible, and the proposed actions would not result in any unacceptable impacts, this topic is dismissed from further analysis in this document.

Wilderness

None of the alternatives proposed in this document would occur in YNP recommended wilderness areas; therefore, this topic is dismissed from further analysis in this document.

Soundscape Management

In accordance with 2006 Management Policies and Director's Order-47 Sound Preservation and Noise Management, an important component of the NPS mission is the preservation of natural soundscapes associated with National Park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

The proposed improvements would occur in what can be considered the developed corridors of YNP. Existing sounds in this area are most often generated from vehicular traffic (visitors and employees using park roads within the park), people, some wildlife such as birds, and wind. Sound generated by the short-term construction improvements may include equipment such as dozers, dump trucks, paving equipment, and asphalt plants. During construction, human-caused sounds would likely increase due to construction activities, equipment, vehicular traffic, and construction crews. Any sounds generated from construction would be temporary, lasting only as long as the construction activity is generating the sounds, and would have a negligible to minor adverse impact on visitors and employees. Further, such negligible or minor impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Therefore, effects associated with this plan are minor or less in degree and would not result in any unacceptable impacts; this topic is dismissed from further analysis in this document.

Natural Lightscapes

In accordance with 2006 Management Policies, the NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). YNP strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The park also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. Localized lighting for road construction activities during night hours would be the primary sources of light generated from this project within the park.

The proposed action may incorporate minimal exterior lighting for safety purposes near roadside hazards or barricades. The amount and extent of exterior lighting for this road construction project would have negligible effects on the existing outside lighting or natural night sky of the area because downward facing lights would be used instead of brighter street lights. Construction lighting would be temporary in nature, and last only as long as this project. Further, such negligible impacts would not result in any unacceptable impacts; the proposed actions are consistent with §1.4.7.1 of NPS Management Policies 2006. Therefore, these

effects are minor or less in degree and would not result in any unacceptable impacts; this topic is dismissed from further analysis in this document.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. According to the NRCS, the project area does not contain prime or unique farmlands (NRCS 2003). Therefore, there would be no effects on prime and unique farmlands; this topic is dismissed from further analysis in this document.

Indian Trust Resources

Indian trust resources are land, water, minerals, timber, or other natural resources that are held in trust by the United States for the benefit of an Indian tribe or individual tribal member. Indian trust resources would not be affected by the proposed actions.

Environmental Justice

Executive Order 12898 General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The NPS provides contracting guidelines to assure that proper and appropriate efforts are extended to low-income and minority contractors. Because the proposed improvements would be available for use by all regardless of race or income, and the construction workforces would not be hired based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Therefore, there would be no disproportionate effects and this topic is dismissed from further analysis in this document.

Climate Change and Sustainability

Climate change has been described by many as the greatest environmental challenge facing National Parks today. Although climatologists are unsure about the long-term results of global climate change, it is clear that the planet is experiencing a warming trend that affects ocean currents, sea levels, polar sea ice, and global weather patterns. These changes are likely to affect winter precipitation patterns and amounts in the parks, it would be speculative to predict localized changes in temperature, precipitation, or other weather changes, in part because there are many variables that are not fully understood and there may be variables not currently defined. The proposed action would not increase the level of traffic entering YNP; it would only allow for more efficient movement of traffic. Therefore, the effects of the project on climate change would not be measurable. The effects of climate change on the project would not be measurable due to the localized nature of the actions involved. While the spread of non-native species can be a result of climate change at larger scales, since measures will be in place to ensure that the spread of non-native vegetation will not occur due to these actions there should

not be a measurable change due to climate change. Actions will not measurably affect the sustainability of resources either due to the localized nature of the actions because ground disturbance and activities will essentially remain within the current footprint of disturbance in the project area. Therefore, climate change and sustainability are dismissed from further analysis in this document.

CHAPTER 2 - ALTERNATIVES

This chapter presents a description of the alternatives that address the purpose and need for action. During 2010, following public scoping, an interdisciplinary team of NPS employees met for the purpose of developing project alternatives. These meetings resulted in the definition of project objectives as described in Chapter 1 (*Purpose and Need*), and a list of alternatives that could potentially meet these objectives. Three alternatives were identified for this project, a no-action alternative and two action alternatives. A summary table comparing alternative components is presented at the end of this chapter.

Alternatives Carried Forward

Alternative A- No Action

Under Alternative A (Figure 3), proposed improvements would not occur. Operations and circulation would continue as they currently exist. Current traffic circulation and parking at the Gardiner Transportation Center, Park Street and Roosevelt Arch would continue. Interim measures implemented for the 2011 summer season address immediate health and safety issues related to the operation of the North Entrance Station are included under No Action (see next page).

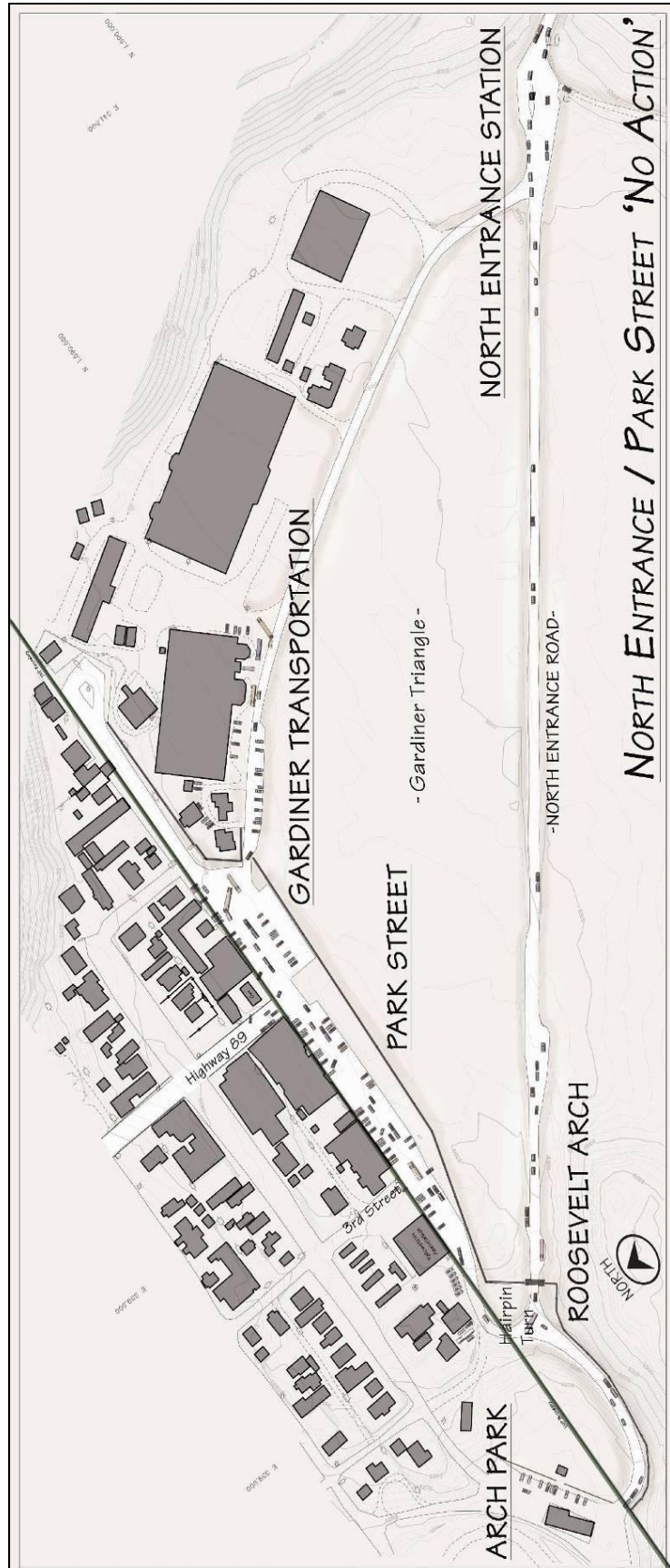


Figure 3 - No Action Overview

Interim Measures-North Entrance Station

Figure 4 represents operation of the North Entrance Station during 'Peak Use'. This includes the installation of a temporary 'shed' Entrance Station and reconfiguration of the traffic pattern.

Measures implemented for the 2011 summer season were designed to decrease the time required to process visitors, and address known safety concerns. The design allows management the operational flexibility necessary to meet changing conditions at the North Entrance Station.

The following example and Figure 4, represent anticipated operation during 'Peak Use'.

Inbound Traffic: Visitors

Visitors would enter YNP through the Roosevelt Arch; the North Entrance Road would be one-way and allow two lanes to hold and process traffic.

Inbound Traffic: Employee and Delivery

Entry would be permitted on the Gardiner Transportation Center road. Traffic would be required to merge with visitor traffic prior to the Entrance Station.

During times of extreme traffic volumes North Entrance Station staff would manage the intersection from the safety of the median. No employees would be permitted within traffic.

Outbound Traffic: All traffic

All traffic would exit YNP along the Gardiner Transportation Center road. No outbound traffic would exit through Roosevelt Arch.

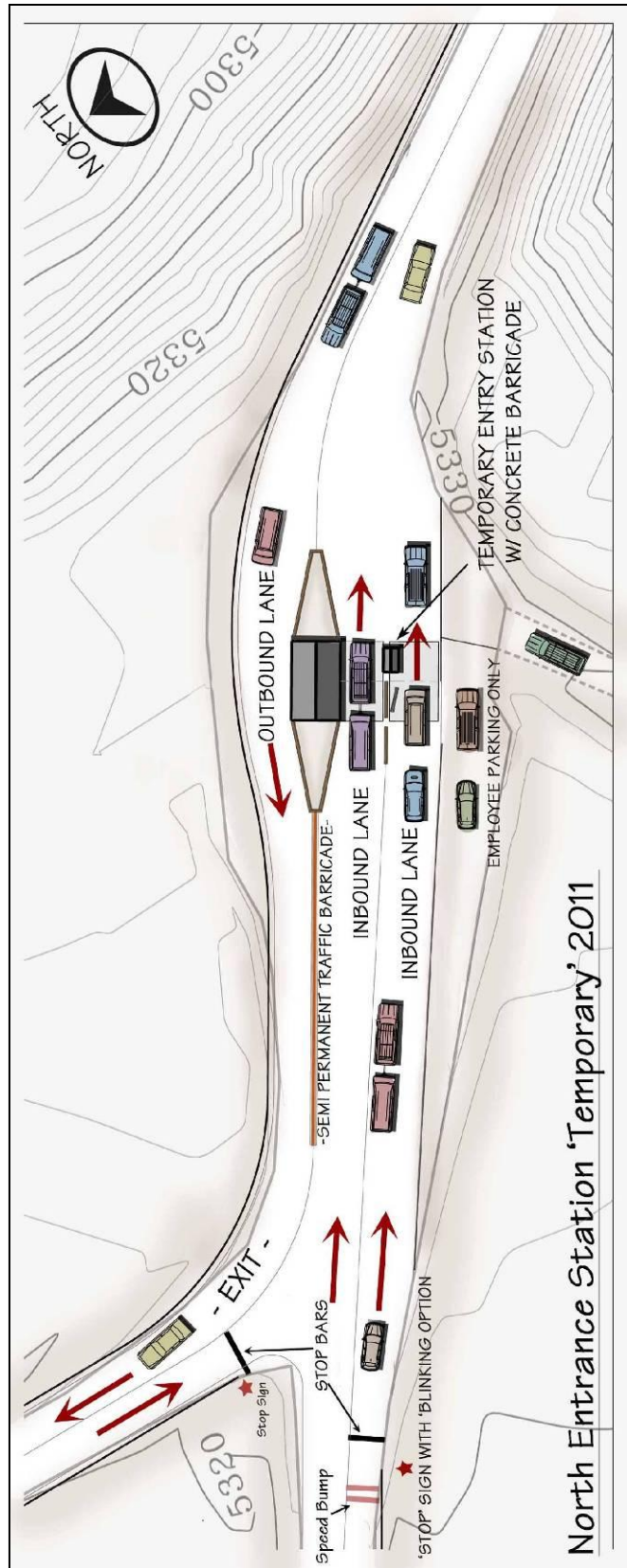


Figure 4 - No Action Interim Overview

Actions Common to Alternatives B and C

Traffic Circulation

Visitors would continue entering Yellowstone National Park's (YNP), North Entrance Station by driving south on US Highway 89 from Livingston, Montana. Visitors cross the official park boundary at the intersection of US Highway 89 and Park Street in Gardiner, Montana. Upon entry into YNP signage would direct visitors west along Park Street towards the Roosevelt Arch. Employee and delivery traffic would be permitted to enter on the Gardiner Transportation road (a designated service road).

Seasonal Fluctuation in Visitation

Visitation records for the North Entrance Station (2000 through 2010) indicate an overall increase in visitation and seasonal fluctuation (summer vs. winter). To address fluctuations in visitation two management strategies have been identified. These dates and times are estimated.

'Peak Use'

June 1-September 30, daytime hours (8am to 5pm)

'Non-Peak Use'

October 1-May 31, including night time hours

Gardiner "Triangle" Pathway

The Gardiner "Triangle" Pathway a proposed mile long pedestrian pathway (universally accessible) extending around the perimeter of the Gardiner "Triangle" connecting Park Street, the Roosevelt Arch, Arch Park and points of interest in the area. Features associated with the pathway would include sidewalks, road shoulders, fencing, curbing, crosswalks, viewing platforms and interpretive panels.

Storm water Management

The existing roadways and parking areas would be re-graded and re-surfaced with asphalt, drainage features such as culverts and additional curbing would be added where necessary and located to avoid sensitive areas such as archeological sites. Where feasible, storm water would be controlled and directed into the Gardiner "Triangle", to infiltrate into the ground.

Utilities

Fiber and copper telecommunication lines would be buried along the North Entrance Road from the kiosks, under the Arch to the park boundary near the west end of Arch Park to provide the kiosks with DOI Network service from the Heritage Resource Center and Qwest leased telephone circuits from their Gardiner Central Office. Two polymer/concrete handhole fiber optic splice vaults would be buried at either ends of the buried fiber. One vault would be located near the kiosks and the other vault at the north end near the boundary; sensitive areas such as archeological sites would be avoided. Other utilities (electric, water, and septic) would connect to existing underground utilities in collaboration with Gardiner representatives and utility companies. Reclamation of sites would be completed in accordance with the parks topsoil, re-vegetation, and non-native plant management guidelines.

Construction staging, materials and timing

The majority of construction activities would be scheduled and completed during the early spring and late fall, purposefully avoiding periods of high visitation. However, some activities would require that construction take place during periods of high visitation, therefore mitigation measures would be implemented to lessen the duration and impacts on local businesses, visitors, park operations and local residents.

In order to minimize hauling and reduce fuel consumption materials and construction activities would be staged primarily within existing government operated pits located in the northern region of YNP.

Telecom Service to North Entrance structures

Final design for North Entrance structures in either action alternative would be completed in collaboration with the NPS Telecommunications office to ensure effective housing of telecommunications equipment. Conduit containing both copper and fiber conductors would be buried between structures to provide service to all facilities to support video security, credit card machines, cash registers, land and mobile radio communications, intrusion/duress alarms, and telephones.

Standards for the Treatment of Historic Properties

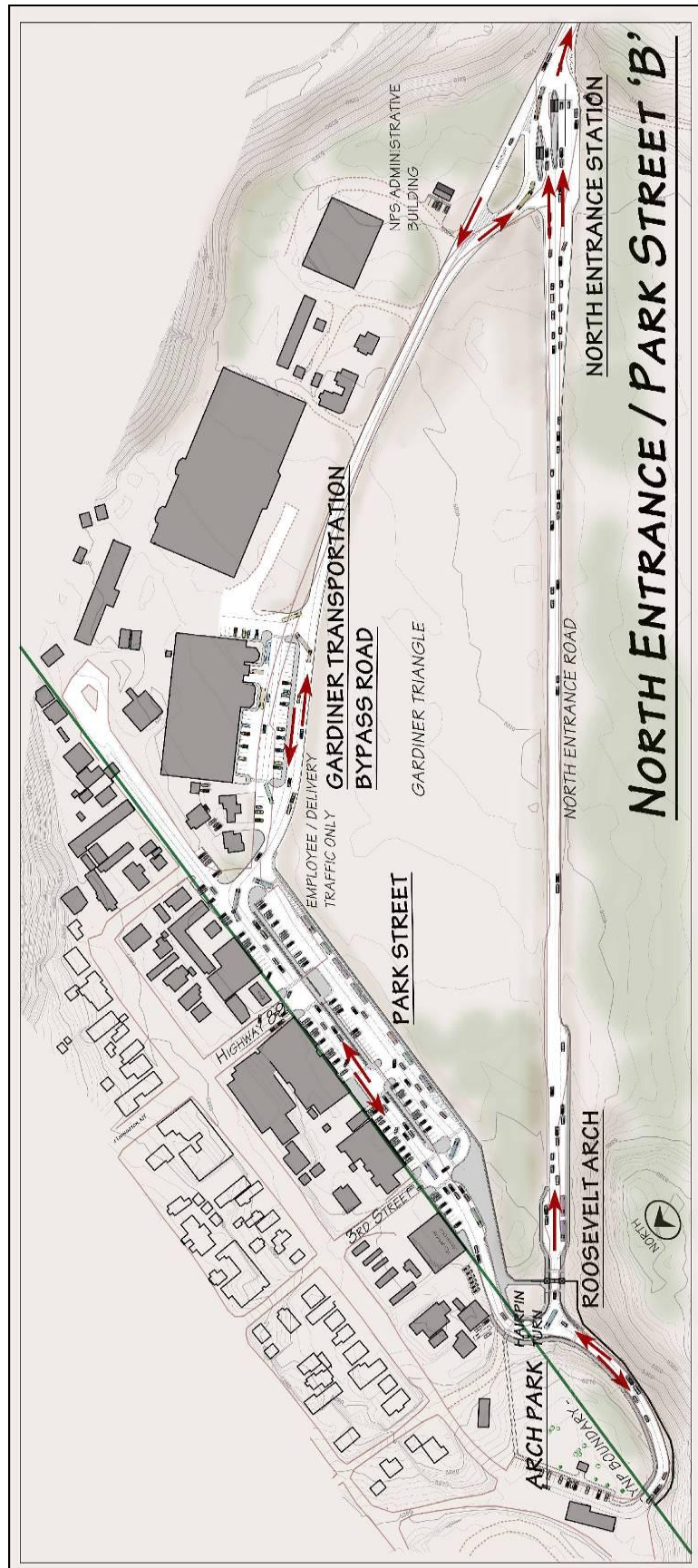
The Secretary of the Interior's Standards for the Treatment of Historic Properties would be utilized to guide the design process in this area to ensure the new structures blend with the current setting.

Secretary of Interior's Standards

Consultation with Montana State Historic Preservation Office (MSHPO) and the Advisory Council on Historic Preservation along with adherence to the Secretary of Interior's Standards will guide the designs associated with the Roosevelt Arch.

Alternative B - Operation/Traffic Configuration B

Alternative B describes the minimum level of action necessary to address problem areas and issues identified during 'Peak Use' including, the North Entrance Station, Gardiner Transportation Center, Park Street, and Roosevelt Arch (Figure 5).



**Figure 5 - Alternative B- Peak Use
Overview**

North Entrance Station

A second kiosk (similar in scale and style to the existing) would be located to the northwest of the existing North Entrance Station. The new kiosk would include upgrades for accessibility, ergonomics, functionality, security, utilities and light pollution.

The configuration of roads allows management the operational flexibility necessary to meet changing conditions at the North Entrance Station. Figure 6, Alternative B represents anticipated operation during 'Peak Use'.

Inbound Traffic: Visitors

Visitors would enter YNP through the Roosevelt Arch, the North Entrance Road would be one-way and allow two lanes to hold and process traffic.

Inbound Traffic: Employee and Delivery

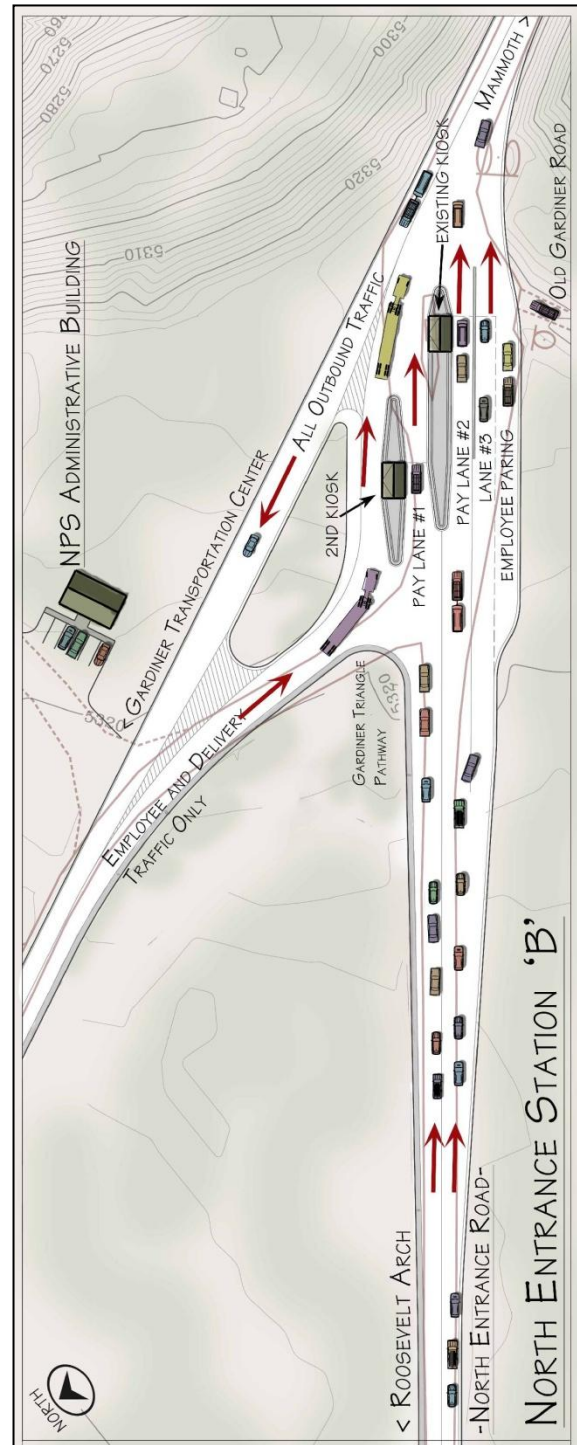
Entry would be permitted on the Gardiner Transportation Center road. Traffic would bypass the entrance kiosk on the left, and merge beyond the kiosk.

Outbound Traffic: All traffic

All traffic would exit YNP on the Gardiner Transportation road. No outbound traffic would exit through Roosevelt Arch.

During times of 'Non-Peak Use,' one kiosk would remain open including an employee lane. During night time hours the employee lane and kiosk may be closed, similar to existing conditions. Traffic may exit either through the Roosevelt Arch or Gardiner Transportation Road.

Figure 6 - Alternative B: Peak Use, North Entrance



Administrative Building

Administrative functions for the North Entrance Station would be located in a separate building (maximum 2,000 square feet), located to the northeast of the North Entrance Station. The new structure may consist of administrative space to accommodate employee needs including office space, restroom, break room, fee processing area, storage, security / telecommunication equipment, mechanical room and parking (4-6 vehicles).

Park Street

Signage (located at the intersection of Highway 89 and Park Street) would direct visitors west along Park Street (main road) toward the Roosevelt Arch.

Park Street (main road) and storefront parking would be adjusted to accommodate traffic maneuvers and improve visibility at intersections. Additional parking including oversize vehicle parking would be located to the south of Park Street requiring the existing iron fence to be relocated approximately 30 feet into the Gardiner “Triangle”. A pedestrian island would be located between the parking lot and Park Street and would include crosswalks, sidewalks, fencing, and point of entry into the parking lot for vehicles. The sidewalk system within the Park Street area would connect pedestrians to the Gardiner “Triangle” Pathway. Parking capacity along Park Street would increase approximately 10 to 15 percent and include oversize parking (Figure 7).

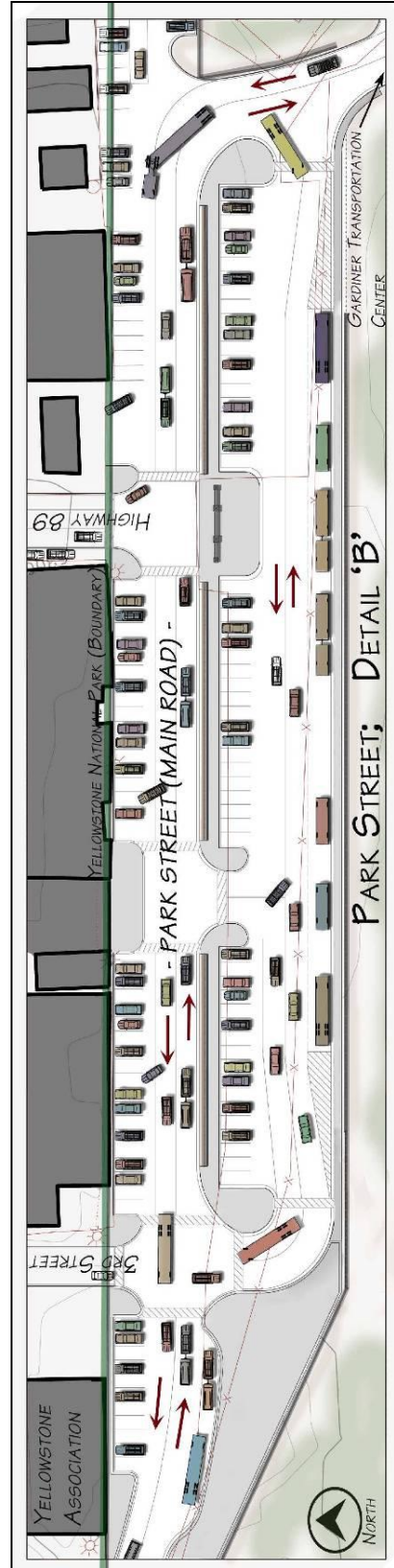


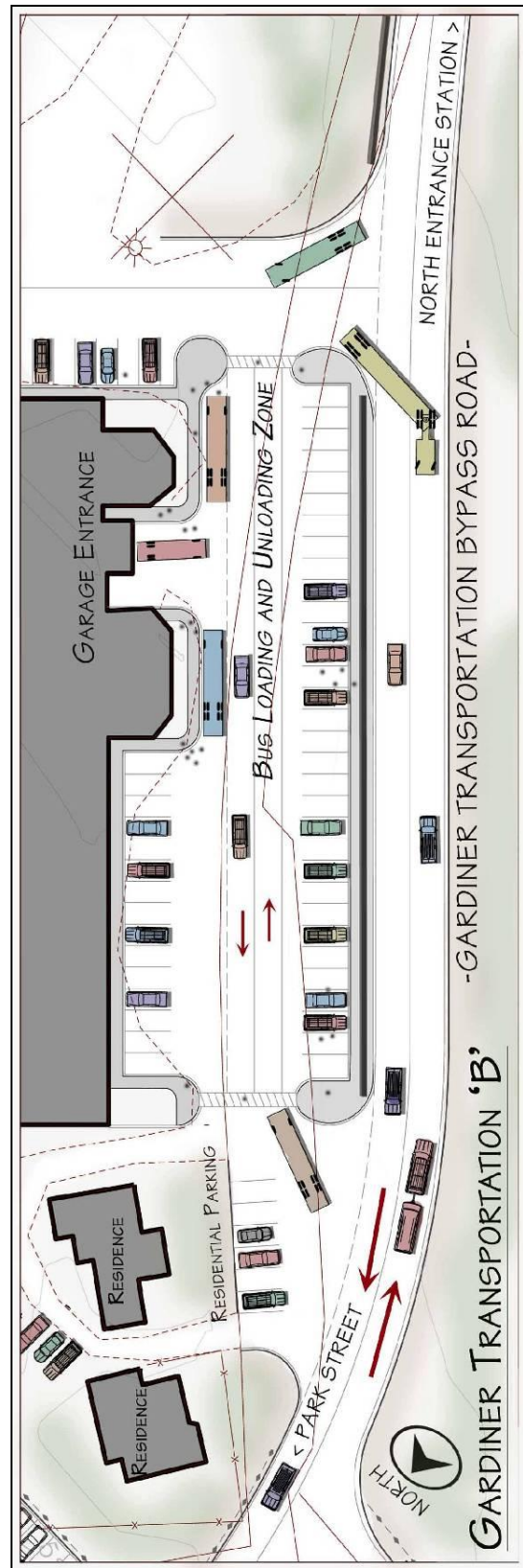
Figure 7 - Alternative B: Park Street

Gardiner Transportation Center

To reduce congestion and address safety concerns the road through the Gardiner Transportation center would be relocated west approximately 40 feet into the Gardiner “Triangle”.

All commercial and employee parking would be located to the east of the Gardiner Transportation Center road; providing space to stage and maneuver oversize vehicles. Employees accessing their place of business would no longer be required to cross the main flow of traffic (Figure 8).

Concessioner and delivery as well as employee traffic would not be mixed with visitor traffic on the Gardiner Transportation Road.



Figure

8 - Alternative B: Gardiner Transportation

Roosevelt Arch

The configuration of traffic around the Roosevelt Arch allows management the operational flexibility necessary to adjust to changing conditions at the North Entrance Station and congestion at the 'hairpin turn.' The following example and Figure 9, represent anticipated operation during 'Peak Use'.

Inbound Traffic:

Visitors entering through the Roosevelt Arch would travel one-way along the North Entrance Road to the North Entrance Station.

Outbound Traffic:

No outbound traffic would be directed towards the Roosevelt Arch.

During periods of 'Non-Peak Use,' traffic through the Roosevelt Arch could be changed to two-way similar to the existing condition.

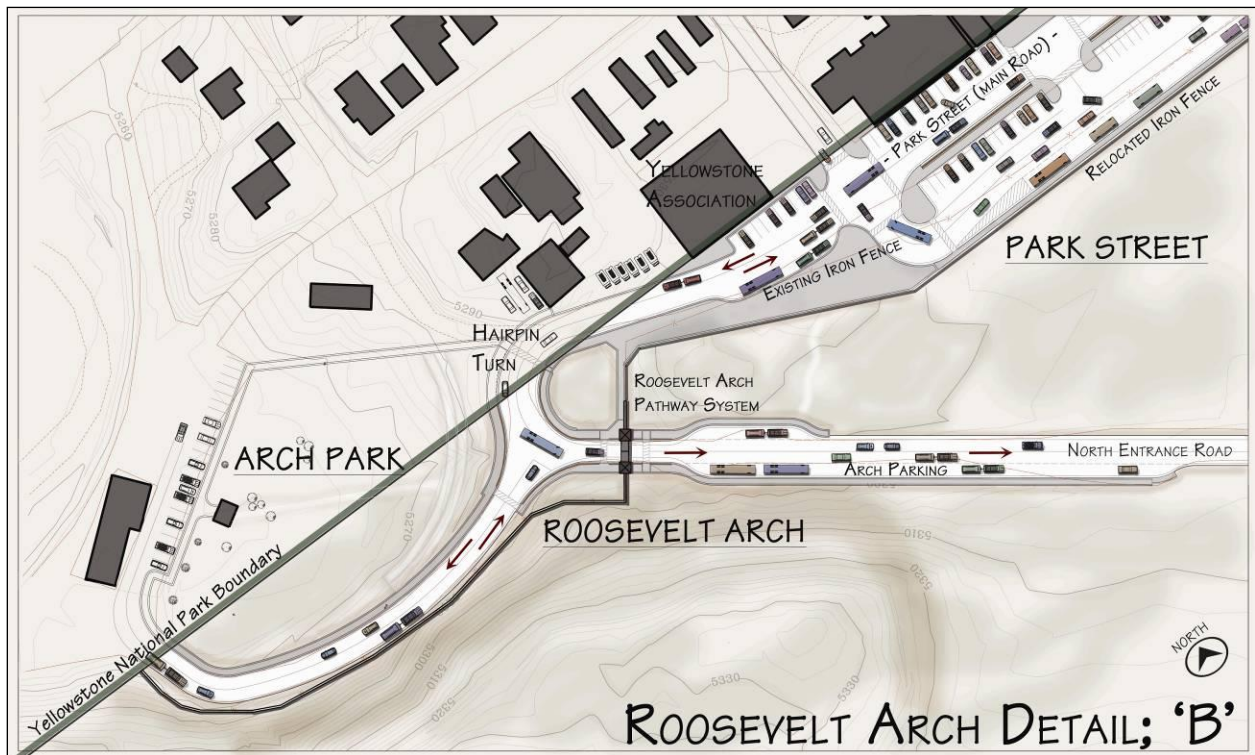


Figure 9 - Alternative B: Peak Use, Roosevelt Arch

Traffic between Park Street and Arch Park (around the 'hairpin turn') would remain two-way. To accommodate safe passage of oversize vehicles around the 'hairpin turn' the roadway would require widening and a small retaining wall along the east side of Arch Park.

Parking near the Roosevelt Arch would allow pedestrian access to the Roosevelt Arch and designated viewing areas (a segment of the Gardiner "Triangle" Pathway). To facilitate pedestrian access and safety the pedestrian portals of the Roosevelt Arch would be re-opened, allowing access through the Arch but out of the travel lane. Elements constructed in proximity

of the Roosevelt Arch including fencing, seating, walls, sidewalks and curbing would reflect the historic character of the area and aid in separating pedestrians from vehicles.

Alternative C – Preferred Operation/Traffic Configuration C

Alternative C addresses expanded improvements for problem areas and issues identified during 'Peak Use' including, the North Entrance Station, Gardiner Transportation Center, Park Street, and Roosevelt Arch. This Alternative would include the construction of an Arch bypass road.

Due to limited funding, actions proposed in this alternative would be implemented in phases and timed in order to minimize impacts to operations and traffic (Figure 10).

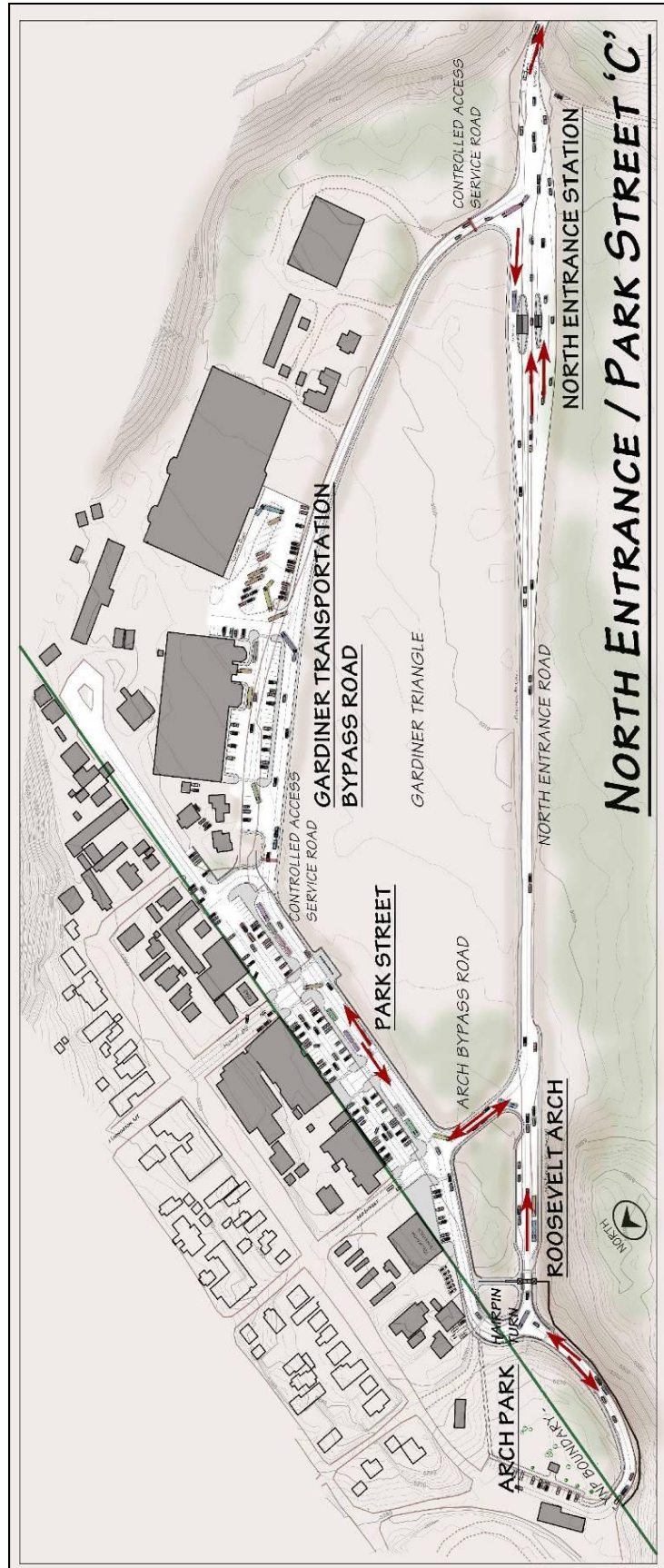


Figure 10 - Alternative C: Peak Use
Overview

North Entrance Station

A new North Entrance Station complex (two structures) reflecting the rustic architectural style of the area would be located approximately 500 feet to the northwest along the North Entrance Road (i.e. closer to the Roosevelt Arch). The main structure (maximum 2,000 square feet) may consist of administrative space to accommodate employee's needs including, office space, restroom, break room, storage, security/telecommunication equipment, and mechanical room. The kiosk structure (approximately 500 square feet) would operate during periods of 'Peak Use'. Both structures would include upgrades for accessibility, ergonomics, security, utilities and light pollution. Employee parking (4-6 vehicles) would be located in proximity to the North Entrance Station complex.

This alternative allows management the operational flexibility necessary to meet changing conditions at the North Entrance Station. A third lane may be added to the North Entrance Road to hold and process visitors. The following example and Figure 11, represent anticipated operation during 'Peak Use'.

Inbound Traffic: Visitors

Visitors would enter YNP through the Roosevelt Arch or Arch bypass; the North Entrance Road would be two-way.

Inbound Traffic: Employee and Delivery

Entry would be permitted onto the Gardiner Transportation Center road (controlled access service road); traffic would bypass the entrance kiosk and merge to the southeast.

Outbound Traffic: All traffic

All traffic would exit YNP on the North Entrance Road in the direction of the Roosevelt Arch, turning right onto the Arch bypass road.

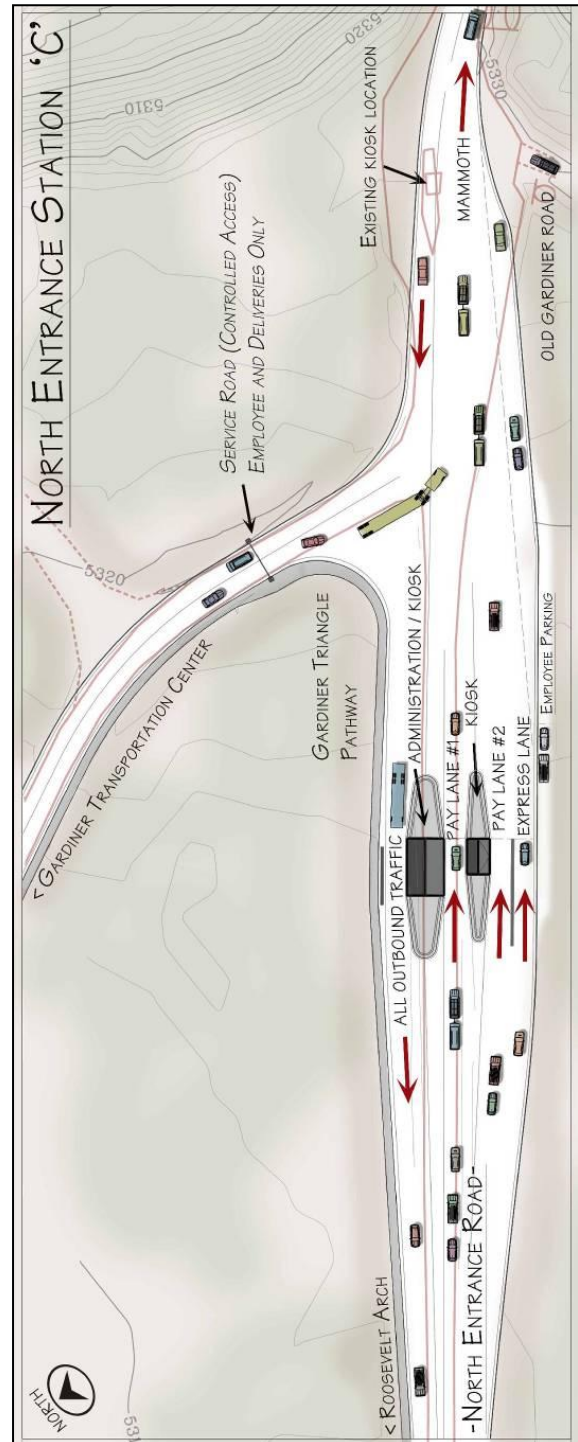


Figure 11 - Alternative C: Peak Use, North Entrance

Outbound Traffic: Employee and Delivery

Traffic would be permitted to exit on the Gardiner Transportation Center road (controlled access service road).

During times of 'Non-Peak Use,' the main entrance structure would remain open including an employee lane. During night time hours the employee lane and kiosk may be closed, similar to the existing condition. Traffic may exit either through the Roosevelt Arch or the Gardiner Transportation Road.

Park Street

Signage located at the intersection of Highway 89 and Park Street (main road) would direct visitors west along Park Street toward the Roosevelt Arch and Arch Bypass. The Arch Bypass Road intersects Park Street at the third street intersection.

Parking for automobiles and oversize vehicles would be located on the north side of Park Street, within close proximity to businesses. Capacity would increase approximately 10 to 15 percent and include oversize vehicle parking.

Park Street would be shifted approximately 30 feet into the Gardiner "Triangle" and adjusted to accommodate traffic maneuvers and improve visibility at intersections, requiring the relocation of the existing iron fence. A pedestrian island including crosswalks, sidewalks, fencing, and points of entry into the parking lot would separate the parking lots and Park Street. The sidewalk system within the Park Street area would connect pedestrians to the Gardiner "Triangle" Pathway (Figure 12).

Gardiner Transportation Center

See description in alternative B (Figure 7).

Traffic entering via the Gardiner Transportation bypass road (service road) would be required to present a coded YNP gate pass to operate an automated traffic control gate at either entrance.

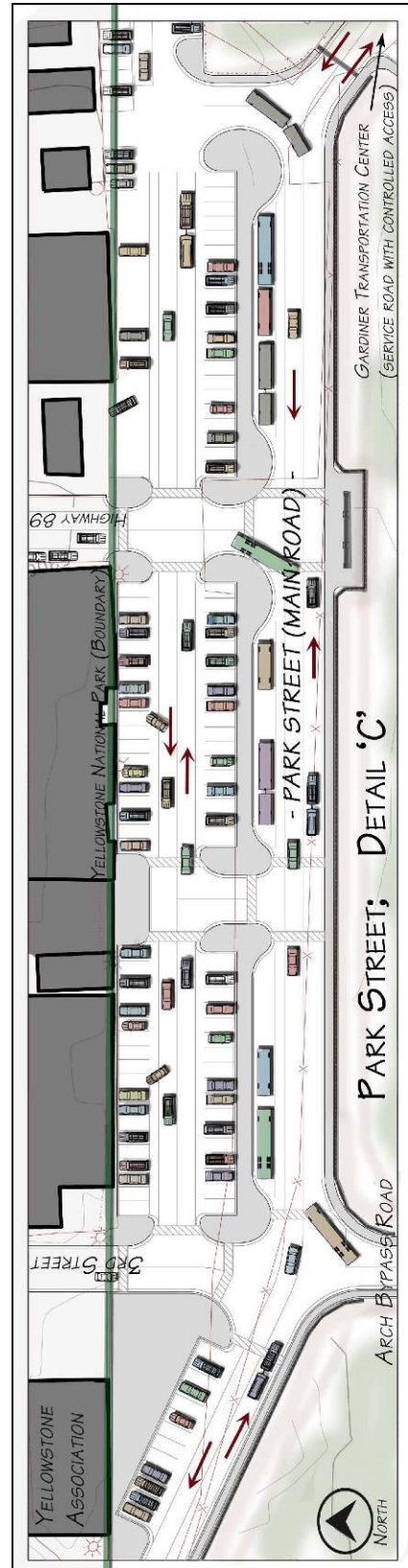


Figure 12 - Alternative C: Peak Use, Park Street

Roosevelt Arch

Under this Alternative, the configuration of roads around the Roosevelt Arch would allow management the operational flexibility necessary to adjust to changing conditions at the North Entrance Station and congestion at the 'hairpin turn.' Traffic through the Roosevelt Arch or Arch Bypass could be operated as a two-way or one-way road. The following description of Figure 13 represents anticipated operation during 'Peak Use'.

Inbound Traffic:

Visitors entering through the Roosevelt Arch along the North Entrance Road would travel one-way and merge with inbound traffic at the intersection with the Arch bypass road. The Arch bypass road would remain two-way (inbound and outbound).

Outbound Traffic:

All traffic would exit YNP on the North Entrance Road in the direction of the Roosevelt Arch, turning right onto the Arch bypass road.

Traffic between Park Street and Arch Park (around the 'hairpin turn') would remain two-way. To accommodate safe passage of oversize vehicles around the 'hairpin turn' the roadway would require widening and a small retaining wall along the east side of Arch Park.

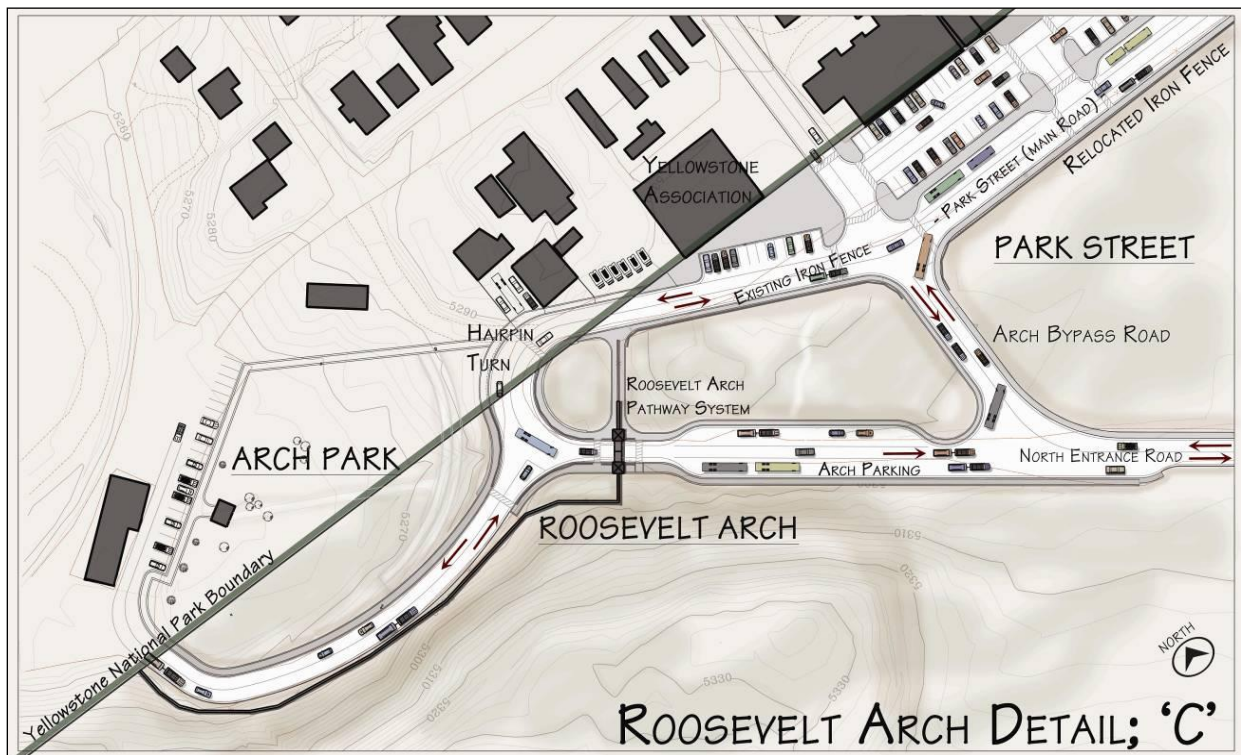


Figure 13 - Alternative C: Peak Use, Roosevelt Arch

To facilitate pedestrian access and safety the pedestrian portals of the Roosevelt Arch would be re-opened allowing access through the Arch but out of the travel lane. Elements constructed in the area of the Roosevelt Arch including fencing, seating, walls, sidewalks and curbing would reflect the historic character of the area and aid in separating pedestrians from vehicles.

Parking near the Roosevelt Arch would allow pedestrian access to the Roosevelt Arch and designated viewing areas (a segment of the Gardiner “Triangle” Pathway).

Mitigation Measures

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and would be implemented during construction of the action alternative, as needed:

- Temporary impacts, such as soil and vegetation disturbance and the possibility of soil erosion, associated with the construction of improvements would occur. In an effort to avoid introduction of non-native plant species, no hay bales would be used. Hay often contains seed of undesirable or harmful alien plant species. Therefore, on a case-by-case basis the following materials could be used for any necessary erosion control: wood bark mulch, clean straw, sand bags, and silt fences. Wood bark mulch may be used to help retain soil moisture and promote seed generation of native plants. Standard erosion control measures such as silt fences and/or sand bags would be used to minimize any potential soil erosion.
- Although soil side-cast during construction would be susceptible to some erosion, such erosion would be minimized by placing silt fencing around the excavated soil. Excavated soil may be used in the construction project; excess soil would be stored in approved areas.
- Construction would take advantage of previously disturbed areas wherever possible. Vegetation impacts and potential compaction and erosion of bare soils would be minimized by the following; the use of conserved topsoil would help preserve micro-organisms and seeds of native plants. The topsoil would be re-spread in as near as original location as possible, and supplemented with scarification before placement, mulching, seeding, and/or planting with species native to the immediate area. This would reduce construction scars and erosion.
- Should construction activity unearth previously unknown historic or prehistoric cultural remains or artifacts, work would be stopped in the area of the discovery and the park archeologist would be notified. The cultural remains would be assessed and Montana SHPO notified. If the cultural remains are assessed as significant and retain integrity for the archeological information they may provide, the site would be avoided and protected. If avoidance is not possible, data recovery excavations would be conducted prior to any construction activity resuming in the area. If YNP, with the concurrence of the Montana SHPO, determines the archeological remains are not sufficient to meet the definition of a site, or the archeological information within the site is not significant, all cultural remains will be collected and construction activity may commence with archeological monitoring.
- The Park Service would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging archeological sites or historic properties. Contractors and subcontractors would also be instructed on inadvertent discovery procedures to follow in case previously unknown archeological resources are uncovered during construction. Equipment and materials staging areas and material extraction areas would also avoid known NR eligible archeological resources.
- Non-contributing areas of the NR eligible sites 24YE198/118 where construction activities would be permitted would be identified through subsurface excavation and other techniques prior to final design or construction disturbance. Montana SHPO concurrence to the non-contributing areas would be required prior to construction staking.
- Contractors would coordinate with park staff to reduce disruption in normal park activities. Construction workers and supervisors would be informed about the special sensitivity of park values, regulations, and appropriate housekeeping.

- To minimize the amount of ground disturbance, staging and stockpiling areas would be in previously disturbed sites, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.
- Sensitive resource areas would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the sensitive resources in the construction zone and confine activity to the minimum area required for construction. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond these areas as defined by the fencing or markers.
- Recontouring of disturbed areas would take place following construction and would be designed to minimize the visual intrusion of the structure. All disturbed areas would be returned as nearly as possible to pre-construction conditions shortly after construction activities are completed. Because non-native vegetation prevails in the project area, revegetation efforts may not be successful. If revegetation were attempted, efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species using native species. Weed control methods would be implemented to minimize the introduction of noxious weeds.
- Fugitive dust generated by construction would be controlled by spraying water on the construction site, if necessary.
- To reduce noise and emissions, construction equipment would not be permitted to idle for long periods of time in areas near residential areas.
- To minimize possible petrochemical leaks from construction equipment, the contractor would regularly monitor and check construction equipment to identify and repair any leaks.
- Construction workers and supervisors would be informed about special status species. Contract provisions would require the cessation of construction activities if a species were discovered in the project area, until park staff re-evaluates the project. This would allow modification of the contract for any protection measures determined necessary to protect the discovery.
- All project-related employees, such as contract and government construction employees would be given orientation on how to avoid disturbing or encountering bears, wolves, coyotes and other animals that could become habituated and how to minimize unavoidable effects or encounters. Orientation would include information about park regulations regarding food storage, disposal of garbage and other bear attractants, and approaching or harassing wildlife.
- To minimize the potential for impacts to park visitors, variations on construction timing may be considered. One option includes conducting the majority of work during off-peak times of the day or during shoulder seasons. Another option includes implementing daily construction activity curfews such as not operating construction equipment near residences and hotels between the hours of 6 PM to 7 AM in summer (May – September). The NPS would determine this in consultation with the contractor. Visitors would be notified of construction activities and possible traffic delays through the park newspaper, news release, and in visitor centers and Entrance Stations.
- According to 2006 *Management Policies*, the NPS would strive to construct facilities with sustainable designs and systems to minimize potential environmental impacts. Development would not compete with or dominate the park's features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity associated with wetlands. To the extent possible, the design and management of facilities would emphasize environmental sensitivity in construction, use of nontoxic

materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. The NPS also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology. Energy efficiency is incorporated into the decision-making process during the design and acquisition of buildings, facilities, and transportation.

Alternatives Considered and Dismissed

The following three alternatives were considered for project implementation, but were ultimately dismissed from further analysis. Reasons for their dismissal are provided in the following alternative descriptions.

- **Move North Entrance Station Further Into the Park**

This alternative proposed moving entrance station approximately .4 mile to the southeast of the existing kiosk in the existing 'wildlife pullout'. Administration functions would be included in a second, larger kiosk structure of the approximate size discussed in the action alternatives. This alternative was considered and dismissed due to topography issues. Widening of the road would have involved extensive road cuts into the natural slopes in the area and was considered to be unnecessary given the other options available. Therefore it did not meet all the objectives outlined in Chapter 1: Purpose and Need.

- **Locate the Arch Bypass through the Center of the "Triangle"**

This alternative proposed locating the Arch bypass from the intersection of Hwy 89 and Park Street straight across the Triangle to join the road between the North Entrance Station and Roosevelt Arch. This alternative was dismissed because it would divide an area known to accommodate migrating wildlife in a way that would not allow enough space for wildlife to graze without crossing through traffic. Also, this alternative would not effectively improve traffic flow and would move visitors away from Gardiner businesses. Therefore it did not meet all the objectives outlined in Chapter 1: Purpose and Need.

- **Close Roosevelt Arch to Motorized Use**

This alternative proposed closing Roosevelt Arch to motorized use and allowing only pedestrian and bicycle access. Traffic (inbound and outbound) would be routed southeast through the triangle starting at the intersection of highway 89 and Park Street (bypassing the Gardiner Transportation center) to the entrance station. This alternative was considered and dismissed due to its impacts on the defining character of the National Historic Landmark Roosevelt Arch. The Roosevelt Arch is classified as an element to the North Entrance Road Historic District. Therefore it did not meet all the objectives outlined in Chapter 1: Purpose and Need.

Alternative Summaries

Table 1 summarizes the major components of the Alternatives and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the No Action Alternative does not address all of the objectives.

Table 1 – Summary of Alternatives and How Each Alternative Meets Project Objectives

Alternative Elements	Alternative A – No Action	Alternative B – Minimum	Alternative C - Maximum
Vehicular Circulation	<p>Measures implemented for the 2011 summer season would decrease the time required to process visitors, and address known safety concerns.</p> <p>Visitors would enter YNP through the Roosevelt Arch; the North Entrance Road would be one-way and allow two lanes to hold and process traffic.</p> <p>During times of extreme traffic volumes Entrance Station staff would manage the intersection from the safety of the median. No employees would be permitted within traffic.</p> <p>Employee/delivery traffic would be permitted on the Gardiner Transportation Center road. Traffic would be required to merge with visitor traffic prior to the Entrance Station.</p> <p>All traffic would exit YNP along the Gardiner Transportation Center road. No outbound traffic would exit through the Roosevelt Arch.</p>	<p>Anticipated circulation would be as follows:</p> <p>Visitors would enter YNP through the Roosevelt Arch, the North Entrance Road would be one-way and allow two lanes to hold and process traffic.</p> <p>Entry would be permitted on the Gardiner Transportation Center road. Traffic would bypass the entrance kiosk on the left, and merge beyond the kiosk.</p> <p>All traffic would exit YNP on the Gardiner Transportation road. No outbound traffic would exit through the Roosevelt Arch.</p> <p>During times of 'Non-Peak Use,' one kiosk would remain open including an employee lane. During night time hours the employee lane and kiosk may be closed, similar to the existing condition. Traffic may exit either through the Roosevelt Arch or Gardiner Transportation Road.</p>	<p>Anticipated circulation would be as follows:</p> <p>Visitors would enter YNP through the Roosevelt Arch or Arch bypass; the North Entrance Road would be two-way.</p> <p>Entry would be permitted onto the Gardiner Transportation Center road (controlled access service road); traffic would bypass the entrance kiosk and merge southeast of the kiosk.</p> <p>All traffic would exit YNP on the North Entrance Road in the direction of the Roosevelt Arch, turning right onto the Arch bypass road.</p> <p>Traffic would be permitted to exit on the Gardiner Transportation Center road (controlled access service road).</p> <p>During times of 'Non-Peak Use,' the main entrance structure would remain open including an employee lane. During night time hours the employee lane and kiosk may be closed, similar to the existing condition. Traffic may exit either through the Roosevelt Arch or on the Gardiner Transportation Road.</p>

Alternative Elements	Alternative A – No Action	Alternative B – Minimum	Alternative C - Maximum
North Entrance	A temporary safety adjustment would be allowed providing a small second kiosk, but no changes to entry/exit lanes.	A second kiosk would be situated to the northwest of the existing kiosk. The size of the second kiosk would be approximately 500 square feet; An additional administration building would be built, approximately 2000 square feet in size.	Two newly constructed North Entrance Station kiosks would be constructed approximately 500 feet to the northeast (i.e. closer along the road towards Roosevelt Arch) of the existing kiosk area. The second larger administrative building/kiosk would have a square footage of approximately 2000.
Park Street	Existing conditions would remain	Park Street (main road) and storefront parking would be adjusted to accommodate traffic maneuvers and improve visibility at intersections. Additional parking including oversize vehicle parking would be located to the south of Park Street, requiring the existing iron fence to be relocated approximately 30 feet into the Gardiner “Triangle”. A pedestrian island would be located between the parking lot and Park Street and include crosswalks, sidewalks, fencing, and point of entry into the parking lot for vehicles. Parking capacity along Park Street would increase approximately 10 to 15 percent and include oversize parking.	Park Street (main road) would be shifted approximately 30 feet into the Gardiner “Triangle”, and adjusted to accommodate traffic maneuvers and improve visibility at intersections, requiring the relocation of the existing iron fence. A pedestrian island including crosswalks, sidewalks, fencing, and points of entry into the parking lot would separate the parking lots and Park Street. The sidewalk system within the Park Street area would connect pedestrians to the Gardiner “Triangle” Pathway.
Gardiner Transportation	Existing conditions would remain	To reduce congestion and address safety concerns the road through the Gardiner Transportation Center would be relocated west approximately 40 feet into the Gardiner “Triangle”. All commercial and employee parking would be located to the east of the Gardiner Transportation	Same as Alternative B but traffic movement would be controlled via a coded YNP gate pass and automated traffic control gate.

Alternative Elements	Alternative A – No Action	Alternative B – Minimum	Alternative C - Maximum
		Center road; providing space to stage and maneuver oversize vehicles. Employees accessing their place of business would no longer be required to cross the main flow of traffic.	
Roosevelt Arch	Existing conditions would remain	<p>Traffic configuration would vary between one-way and two-way to accommodate changing conditions during 'Peak Use'. Traffic between Park Street and Arch Park (around the 'hairpin turn') would remain two-way. To accommodate safe passage of oversize vehicles around the 'hairpin turn' the roadway would require widening and a small retaining wall along the east side of Arch Park.</p> <p>Parking near the Roosevelt Arch would allow pedestrian access to the Roosevelt Arch and designated viewing areas (a segment of the Gardiner "Triangle" Pathway). To facilitate pedestrian access and safety the pedestrian portals of the Roosevelt Arch would be re-opened, allowing access through the Arch but out of the travel lane. Elements constructed in proximity of the Roosevelt Arch including fencing, seating, walls, sidewalks and curbing would reflect the historic character of the area and aid in separating pedestrians from vehicles</p>	<p>Same as Alternative B except:</p> <p>Visitors entering through the Roosevelt Arch along the North Entrance Road would travel one-way and merge with inbound traffic at the intersection with the Arch bypass road. The Arch bypass road would remain two-way (inbound and outbound).</p> <p>All traffic would exit YNP on the North Entrance Road in the direction of the Roosevelt Arch, turning right onto the Arch bypass road.</p>
Project Objectives	Meets Project Objectives?	Meets Project Objectives?	Meets Project Objectives?
Develop the infrastructure necessary at the North	No. The existing situation would not improve the employee work	Yes. This alternative will improve the employee work environment,	Yes. This alternative will improve the employee work environment,

Alternative Elements	Alternative A – No Action	Alternative B – Minimum	Alternative C - Maximum
Entrance to improve traffic flow and alleviate congestion issues during peak season as well as provide adequate facilities for park employees.	environment, provide space for all needed infrastructure, increase capacity to process visitors and subsequently reduce congestion and waiting.	provide space for all needed infrastructure, increase capacity to process visitors and subsequently reduce congestion and waiting, but not as effectively as Alternative C. Backups may still occur due to traffic associated with the Arch.	provide space for all needed infrastructure, increase capacity to process visitors and subsequently reduce congestion and waiting. By moving the Entrance Station away from the Gardiner Transportation Center road, safer, more efficient traffic flow would be accomplished.
Improve vehicular circulation and provide safer parking conditions along Park Street and the Gardiner Transportation Center, by reducing exposure of visitors and employees to active traffic movement.	No. The existing situation would not delineate parking, accommodate oversize vehicles, separate pedestrians from parked vehicles. It would not provide safe walkways, crossings, and point of interest for visitors or better access to local businesses	Yes. This alternative would improve circulation and safety by delineating parking, accommodating oversize vehicles, providing better access to local businesses, separating employees from traffic and providing safer employee staging areas. It would improve safety somewhat, but not as effectively as Alternative C because pedestrians would not be separated from traffic as effectively.	Yes. This alternative would improve circulation and safety by delineating parking, accommodating oversize vehicles, providing better access to local businesses. By moving traffic flow away from parking, providing crossings and a pedestrian pathway, it would better separate pedestrians from traffic. Controlling access on the Gardiner Transportation Center road will most effectively separate employees from traffic and improve employee safety.
Improve visitor experience, safety and access to the Roosevelt Arch through expansion of visitor parking, facilities and improvement of traffic and pedestrian flow.	No. The existing situation would continue to cause congestion and safety situations around the Roosevelt Arch.	Yes. This alternative would organize traffic flow thru Roosevelt Arch, provide safe parking in close proximity to the Arch and somewhat improve access to view and photograph the Arch.	Yes. This alternative would improve visitor experience most effectively by organize and also simplify traffic flow through Roosevelt Arch by diverting traffic not visiting the Arch directly to the Entrance Station, by providing safe parking in close proximity to the Arch, a pedestrian pathway, viewing platform and improved viewing space near the Arch to separate pedestrians from traffic.
Meet the needs of the plan while protecting the values and purposes for which Yellowstone National Park was set aside; especially those	No. The existing situation would not change impacts to resources, but does not meet the needs of the plan.	Yes. This alternative would meet the needs of the plan while protecting the historic significance of the Roosevelt Arch as part of the Fort Yellowstone National Historic Landmark designation, North	Yes. Same as alternative B.

Alternative Elements	Alternative A – No Action	Alternative B – Minimum	Alternative C - Maximum
natural and cultural resources in the area of the North Entrance and Park Street.		Entrance Road Historic District, National Register eligible properties and identified cultural landscape components. It would improve storm water management to reduce erosion potential. It would maintain wildlife migration patterns and remaining native vegetation.	

Table 2 summarizes the anticipated environmental impacts for the Alternatives. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 2 – Environmental Impact Summary by Alternative

Impact Topic	Alternative A – No Action	Alternative B - Minimum	Alternative C – Maximum
Topography, Geology, Soils	Direct, indirect, short- and long-term, local, minor to moderate adverse impacts because erosion would continue to wash away soils causing gully and removal of soil horizon.	Direct, indirect, short and long term local, minor adverse impacts due to changes to soil physiochemical characteristics from excavation and other ground disturbance activities. Direct, indirect, short- and long-term, local, minor to moderate, beneficial impacts because of a reduction in water erosion from improvements to storm water drainage.	Direct, indirect, short and long term local, minor adverse impacts due to changes to soil physiochemical characteristics from excavation and other ground disturbance activities would impact an additional acre under this Alternative. Direct, indirect, short- and long-term, local, minor to moderate, beneficial impacts because of a reduction in water erosion from improvements to storm water drainage.
Vegetation and Special Status Plant Species	No new ground disturbing actions; therefore no additional direct effects to vegetation. However, under this alternative, there would be no changes to the storm water management deficiencies would occur. Therefore impacts would be indirect, short- and long-term local, minor, and adverse impacts.	Direct, indirect, short and long term, local, minor, adverse impacts due to removal of ground cover from construction operations and an increase in suitable stratum for establishment of non-native vegetation. Beneficial impacts would be localized, minor to moderate, and long-term because of a reduction in water erosion from improvements to storm water drainage.	While Alternative C impacts an additional acre due to the Arch bypass road, it is in an area of low quality vegetation, therefore impacts are the same as described in Alternative B.
Wildlife including, Special Status Wildlife Species and Yellowstone Species of Management Concern	Without a change in human activity, development, and vegetation in the project area, wildlife use would generally remain the same and the quality of habitat would remain low due to impacts by earlier land use, an increase in non-native vegetation establishment, construction activities, existing development and human use. Therefore, impacts to wildlife species would be indirect, local, short- and long-term and minor.	Impacts would include potential displacement during construction activities and permanent removal of approximately 3 acres of low quality habitat. Wildlife would be expected to return once construction activities are completed. Disturbance would also occur in relation to increased pedestrian activity in the vicinity of walkways, viewing platforms and the Gardiner “Triangle” pathway. Displacement or stress to wildlife would occur during times of peak use in the busy visitor season. The Arch bypass road would decrease the	Impacts would include potential displacement during construction activities and permanent removal of approximately 4 acres of low quality habitat. Wildlife would be expected to return once construction activities are completed. Disturbance would also occur in relation to increased pedestrian activity in the vicinity of walkways, viewing platforms and the Gardiner “Triangle” pathway. Displacement or stress to wildlife would occur during times of peak use in the busy visitor

Impact Topic	Alternative A – No Action	Alternative B - Minimum	Alternative C – Maximum
		amount of open space in the “Triangle” for wildlife movement. Therefore impacts would be short and long-term direct, adverse and minor to moderate.	season. The Arch bypass road would decrease the amount of open space in the “Triangle” for wildlife movement. Therefore impacts would be short and long-term direct, adverse and minor to moderate
Archeological Resources	Natural deterioration of the North Entrance Road structure would contribute to deterioration of the archeological features adjacent to the roadway. Numerous short duration road and road feature repairs would contribute to added impact to the archeological site. Therefore, the no action alternative would result in indirect, local, short-and long-term minor adverse impacts to the NR eligible historic and prehistoric components of the documented archeological site.	Although the expansion of the entrance gate area is within the historic and prehistoric archeological site boundary, it is in an area disturbed by a previous entrance station and abandoned but not reclaimed roadbeds. Vehicle parking across from the Park street businesses would be expanded, creating new ground disturbance into the archeological site in that area. Impacts of the widened road corridor and the expansion of the Park Street parking area into the archeological site would add to disturbance of the site but, through on-going sub-surface archeological testing and project design to avoid known cultural features, would have little impact to the National Register qualities of the historic and prehistoric archeological site. Therefore, impacts would be indirect, local, short-and long-term minor and adverse impacts.	Same Impacts as describe under Alternative B plus the following: The creation of the Arch bypass road would also increase impact to the archeological site but in an area where no surface manifestations of the past occupation of the area are present and the broken topography suggests that there will be little buried cultural layers, but sub-surface testing will be conducted prior to any disturbance and the design will reflect avoidance of any significant cultural features. Therefore, impacts would be indirect, local, short-and long-term and minor adverse.
Historic Structures	Impacts to the historic structures from the no-action would involve deterioration of the North Entrance Road Historic District from continued parking on the edges of the pavement, poor drainage impacting the road base in some areas, and overcrowding of road surfaces during the busy summer months as well as visual impacts from introduction of minor parking and road improvements. The Roosevelt Arch has sustained and will continue to be	Impacts to the historic structures would involve widening of the road within the North Entrance Road Historic District, improvements to drainage impacting the road base in some areas, and reduction of congestion on road surfaces during the busy summer months. The Roosevelt Arch would continue to be affected by oversized vehicles, but parking in the vicinity of the Arch and more pedestrian viewing opportunity would allow for reduction in trampling of the landscape around the arch	Same impacts as described under Alternative B plus the following: The Arch bypass road would reduce the amount of traffic through the Arch and therefore the Roosevelt Arch would be less affected by oversized vehicles passing through the Arch without adequate space. Parking in the vicinity of the Arch and more pedestrian viewing opportunity would allow for reduction in trampling of the landscape around the

Impact Topic	Alternative A – No Action	Alternative B - Minimum	Alternative C – Maximum
	affected by oversized RV's passing through the arch structure without adequate space. Trampling of the landscape around the arch by visitors wishing for a photograph or a closer view of the arch contributes to erosion damage to the base of the arch. Therefore the impacts A on historic districts and contributing features would be direct, local, short- and long-term, minor and adverse.	by visitors wishing for a photograph or a closer view leading to reduction in erosion around the Arch. Therefore the impacts on historic districts and contributing features would be direct and indirect, local, short- and long-term, minor and adverse, but also indirect, long-term, minor and beneficial.	Arch by visitors wishing for a photograph or a closer view leading to reduction in erosion around the Arch. Therefore, the impacts of Alternative C on historic districts and contributing features would be direct and indirect, local, short- and long-term, minor and adverse, but also indirect, long-term, minor to moderate and beneficial.
Cultural Landscapes	No Improvements at the North Entrance Station, Gardiner Transportation Center, Park Street, and Roosevelt Arch area would occur. Existing vehicular traffic patterns and circulation would remain as currently organized and managed. Continued unstructured parking along the edges of pavement would cause further deterioration of pavement edges along the North Entrance Road and the Old Road at the YPT Co HD. Unstructured parking of large oversized vehicles along Park Street would block views through the iron fence and into the park for visitors heading toward the Arch entrance. Therefore, potential impacts would be negligible long-term and adverse.	The changes proposed to the cultural landscapes of the three historic properties would result in minor, long-term adverse and minor long-term beneficial impacts to potential contributing cultural landscape characteristics. Under §106, this would be considered no adverse effect.	The changes proposed to the cultural landscapes of the three historic properties are greater in Alternative C than in Alternative B. Alternative C would result in minor long-term adverse impacts to cultural landscape characteristics. Under §106, this would be considered no adverse effect.
Visitor Use and Experience	While some improvement may be reached with the interim measures, the North Entrance will continue to provide a congested and busy entry experience during peak season since both visitors and employees will be sharing the same entry lanes. Parking along Park Street and near the Roosevelt Arch will remain	While short-term, minor adverse impacts may occur to visitors because of construction delays related to these improvements, impacts on visitor experience would be improved. Changes to the North Entrance would provide for less congestion and a more pleasant entry experience during all seasons because wait times would be reduced. Parking along	While short-term, minor adverse impacts may occur to visitors because of construction delays related to these improvements, impacts on visitor experience would be improved more under Alternative C than B. Changes to the North Entrance would provide for less congestion and a more pleasant entry experience during all seasons

Impact Topic	Alternative A – No Action	Alternative B - Minimum	Alternative C – Maximum
	unorganized leading to continued visitor frustration, route finding problems and safety concerns. Because visitor experience remains relatively unimproved, impacts would be direct and indirect, short- and long-term, adverse and minor to moderate.	Park Street and near the Roosevelt Arch would be increased in size and better organized, leading to better route finding and reduced safety concerns. Pathways and viewpoints would provide for a more pleasant visitor experience because visitors could move at a more leisurely pace with viewing and photographing the Roosevelt Arch. More opportunity would be provided for education and enjoyment of Gardiner facilities because visitors would have better access to parking and less worry around long entrance lines. Visitor traffic would not be mixed with commercial or employee traffic, especially on the Gardiner Transportation road which would reduce congestion and improve safety into the North Entrance of the Park. Therefore impacts to visitor experience would be direct and indirect, short- and long-term, minor to moderate and beneficial.	because wait times would be reduced because better organization of traffic circulation would be provided by the Arch bypass road. Those visitors not wanting to stop at the Arch would be able to move away from the area, reducing congestion around the Arch. Parking along Park Street and near the Roosevelt Arch would be increased in size and better organized, leading to better route finding and reduced safety concerns. The Arch bypass road would move visitors more efficiently into and through the Park Street area. Pathways and viewpoints would provide for a more pleasant visitor experience because visitors could move at a more leisurely pace with viewing and photographing the Roosevelt Arch. More opportunity would be provided for education and enjoyment of Gardiner facilities because visitors would have better access to parking and less worry around long entrance lines. Visitor traffic would not be mixed with commercial or employee traffic, especially on the Gardiner Transportation road which would reduce congestion and improve safety into the North Entrance of the Park. Therefore impacts to visitor experience would be direct and indirect, short- and long-term, minor to moderate and beneficial.
Socioeconomic	Under Alternative A, no changes would occur to improve the North Entrance, Park Street, Roosevelt Arch visitor services. Parking and access to businesses would remain disorganized without ample space for oversized vehicles. Under the No Action	Improvements would have a minor, long-term, beneficial economic impact on the community of Gardiner, Montana because delineated parking and pedestrian walkways and viewing platforms would provide enhanced access to many of the downtown businesses. Short-term beneficial impacts	Improvements would have a minor to moderate, long-term, beneficial economic impact on the community of Gardiner, Montana because delineated parking and pedestrian walkways and viewing platforms would provide enhanced access to many of the

Impact Topic	Alternative A – No Action	Alternative B - Minimum	Alternative C – Maximum
	alternative, there would be no change in socioeconomic factors and no impacts would be expected.	would also occur during construction activities which would bring a temporary influx of contractors into the community. Improvements from Alternate B would have a minor, long-term, beneficial economic impact on concessioners operating in the Gardner Transportation Center because of reduced congestions for incoming and outgoing deliveries. This smoother operation could save the concessioners in expenses related to this reduced congestion.	downtown businesses. The Arch bypass would provide for more traffic passing by the Park Street area. Short-term beneficial impacts would also occur during construction activities which would bring a temporary influx of contractors into the community. Improvements from Alternate C would have a minor, long-term, beneficial economic impact on concessioners operating in the Gardner Transportation Center because of reduced congestions for incoming and outgoing deliveries. This smoother operation could save the concessioners in expenses related to this reduced congestion.
Park Operations	Park operations would continue unchanged, except for the temporary measures to address the immediate safety concern that will be implemented for the 2011 summer season. This temporary measure would move the line of entering vehicles more quickly to ensure that NPS employees do not have to work in moving traffic during peak season. The overall setup would still serve as the primary administrative infrastructure for employees. Deficiencies associated with the current storm water management system would not be addressed under this alternative. Storm water would continue to pool and create safety issues during rainy and icy conditions. Park operations would have to continue to address these conditions, particularly in the winter when they create unsafe conditions for	Installation of a new kiosk and administrative building would ensure that park operations would have a functional administrative infrastructure that would incorporate OSHA and ADA standards, building security, telecommunication equipment and utility upgrades. This alternative would provide a working environment for park employees that meet OSHA, ADA, and security standards and safe entry/egress for concession employees and deliveries. These effects would have a beneficial, moderate and long-term impact on employee communication, work environment, cohesion, and efficiency.	Movement of the North Entrance Station and improvement of Park Street would enhance the park's ability to provide a safe employee work environment and improve the quality and efficiency of overall park operations at this location. This alternative would provide a working environment for park employees that meet OSHA, ADA and security standards and the safest entry/egress for concession employees and deliveries due to the restricted access along the road in front of the Gardiner Transportation Center. Construction of the bypass road that would allow Entrance Station staff to operate the North Entrance road as a two-way or one-way road. These effects would have a beneficial, moderate and long-term impact on employee communication, work environment, cohesion, and efficiency.

Impact Topic	Alternative A – No Action	Alternative B - Minimum	Alternative C – Maximum
	employees walking to the North Entrance Station.		

Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s §101:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural and natural aspects of our national heritage, and maintain, wherever possible, an environment that supports diversity, and variety of individual choice;
- achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative A, no-action, only minimally meets the above six evaluation factors because it would not meet health and safety standards in terms of the North Entrance station, vehicle circulation, safer parking and visitor experience. Although it keeps potential impacts to park resources at a minimum, it does not achieve a balance between these resources and the health and safety of park visitors and staff. The situation would continue to deteriorate, and would not function well during the numerous traffic jams that occur due to the amount of visitor visitation within the North Entrance/Park Street area. This alternative also does not meet the criteria for attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or otherwise undesirable and unintended consequences.

While Alternative B meets the six criteria, it was not considered the environmentally preferred alternative because it did not as adequately address attaining a wide range of beneficial uses without degradation, risk to health or safety, or other undesirable and unintended consequences. Specifically, Alternative B does not provide as high a level of safety in regards to parking configuration or separation of pedestrians and employees from traffic flow as Alternative C.

Alternative C is the environmentally preferred alternative because it best addresses these six evaluation factors. Alternative C would provide a working environment for park visitors and staff that meet health and safety recommendations, while minimizing environmental impacts to the extent possible. It would attain the widest range of beneficial use to visitors. The improvements would preserve important historic, cultural and natural aspects, while providing a better functioning entrance experience for visitors with much less oversight of visitor circulation, and less impacts to employees, visitors and local businesses; therefore achieving a balance between population needs and resource use to permit high standards of living and a wide sharing of life’s amenities. Mitigation measures in place would ensure best practices for sustainability and re-use of renewable resources.

Preferred Alternative

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Because it meets the purpose and need for the project, the project objectives, and is the environmentally preferred alternative, alternative C is also recommended as the National Park Service preferred alternative. For the remainder of the document, alternative C will be referred to as the preferred alternative.

CHAPTER 3 - AFFECTED ENVIRONMENT

Comments received during public scoping and from internal scoping with specialists in the NPS identified issues and concerns affecting the proposed action. Impact topics are the resources of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. The following impact topics were identified on the basis of federal laws, regulations, orders, and National Park Service *Management Policies* (2006): topography, geology and soils, vegetation including special status plants, wildlife including special status wildlife species and Yellowstone species of management concern, cultural resources, socioeconomic resources, visitor use and experience and park operations.

Natural Resources

Topography, Geology, and Soils

A variety of rocks and sediments spanning geologic time crop out in the vicinity of the North Entrance Station (USGS, 1972 and Pierce, 1973). Normal and reverse faults bring some of the oldest rocks in Yellowstone and various sedimentary rocks to the Earth's surface. These most ancient rocks are schist and gneiss. Shales, siltstone, mudstone, sandstone and limestone associated with epicontinental seas, other former seaways, or basin-filling are the bedrock over much of the North Entrance area. Basalts associated with Absaroka volcanism and Yellowstone volcanism form hard rock ledges and outcrops on the hillsides. Hot spring deposits also crop out on the hillside above Gardiner. Mass wasting of sedimentary and volcanic rocks formed the slopes west of the North Entrance Station. Bedrock occasionally crops out among the hummocky topography and this extensive landslide area. Other mass wasting events associated with flash floods deposited alluvial sediments and formed alluvial fans near and at the North Entrance Station. The North Entrance Station and the Gardiner "Triangle" rest upon flood deposits formed by rapid melting of the Yellowstone Ice cap and failure of an ice dam. Excavations beneath these late glacial flood deposits may encounter compacted glacial lake sediments from prior glacial times.

Soils developed on the glacial flood deposits are rich in clay and carbonate (Rodman and others, 1996). Described soil textures include sandy clay loam, sandy loam, loam and gravelly sand loam. The thickness of these alkaline soils (pH 7.4 to 8.3) is greater than 100 cm. Prior land use has affected the texture of these soils.

Flash floods are a concern. Water from steep tributaries to the Gardner River has been diverted previously at the Gardiner "Triangle" and North Entrance Station. Currently, these tributaries do not connect to the Gardner River. Rapid spring snowmelt and intense summer thunderstorms can cause large amounts of sediment and water to flow into the area at the Gardiner "Triangle" and North Entrance Station. The current North Entrance Road acts as a dam to water flow between the North Entrance Station and the Arch. The underlying compacted glacial mud does not allow for rapid infiltration of flood water into the subsurface.

Vegetation

Surrounded by mountainous slopes on the northern boundary of YNP is the Gardiner Basin and is known as the Boundary Lands Area (BLA). Within the BLA is the Gardiner "Triangle" where a

majority of the proposed project is located. While most of the park vegetation is composed of subalpine forest and meadows, the Gardiner Basin represents the lowest elevation (5,189 feet) and driest portion of the park. The majority of the area has previously been disturbed due to historical homesteading practices that began in 1904 for the purpose of winter wildlife feeding to hold animals with park boundaries. After these practices ceased in the mid-1930's much of the area was seeded with crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), western needlegrass (*Agropyron tenerum* = *A. caninum*), and alsike clover (*Trifolium hybridum*). Over time, the crested wheatgrass was replaced by non-native annuals. In response to establishment of many non-native annuals several non-native vegetation control and experimental revegetation trials were initiated. After many unsuccessful attempts, the park collaborated with Gallatin National Forest and the Montana State University-based-Center for Invasive Plant Management to convene a restoration workshop in April 2005. Specialists in arid land restoration were invited to help develop recommended long-term restoration/ management plans for these former agricultural fields within the Gardiner Basin.

The central portion of the project area is flat and free from rocks, while the east and west ends are rockier, suggesting that these areas probably were not cleared for agriculture. Vegetation in the vicinity is dominated by non-native annual weeds, especially the center flat area. The most abundant species dominating large areas of the flat portion include summer cypress (*Bassia sieversiana* syn. = *Kochia scoparia*), Russian thistle (*Salsola tragus*) and desert alyssum (*Alyssum desertorum*). Summer cypress currently dominates the area forming extensive areas of monoculture, but Russian thistle was the dominant species previous to the attempt to establish native vegetation by seeding and watering starting in 2002.

There are numerous other non-native species within the project area including patches and scattered individuals of crested wheatgrass (*Agropyron cristatum*). Several other non-native grasses are also present including quackgrass (*Elymus repens* syn. = *Agropyron repens*, *Elytrigia repens*) which is primarily near some of the old ditches and the road from Roosevelt Arch to the North Entrance Station, and smooth brome (*Bromus inermis*) also along the roadbed. Additionally, there are some areas where a few Russian wildrye (*Elymus junceus*) are encountered which were planted in the early 1970's following excavation for a local water line. The most common non-native grass is annual wheatgrass (*Agropyron triticeum*) which is quite abundant in some areas, along with a few small patches of cheatgrass (*Bromus tectorum*). Additional non-native species include scattered plants of fanweed (*Thlaspi arvense*), flixweed (*Descurainia sophia*), littlepod falseflax (*Camelina microcarpa*), Loesel's tumbled mustard (*Sisymbrium loeseli*), white pigweed (*Amaranthus albus*), rough pigweed (*Amaranthus retroflexus*), prickly lettuce (*Lactuca serriola*), and yellow sweetclover (*Melilotus officinalis*). Two different species of whitetop, (*Cardaria pubescens* and *Cardaria chalepensis*) at one time were encroaching from the road edge near the Gardiner Transportation Center warehouses into the flat portion of the area. This infestation was sprayed, and currently is represented by a few sparse remnants. Two other noxious weeds, spotted knapweed (*Centaurea maculosa*) and Dalmatian toadflax (*Linaria dalmatica*) are present along the eastern road edge in very small numbers.

Prior to seeding efforts, there were a few greasewood (*Sarcobatus vermiculatus*) and rubber rabbitbrush (*Ericameria nauseosa* syn. = *Chrysothamnus nauseosus*) present, especially near the road. Plains prickly pear (*Opuntia polyacantha*) is quite common on the rockier areas on the northwest and southeast part of the Gardiner "Triangle" along with some scattered plants of saltsage (*Atriplex gardneri*). The rocky area on the northwest near the Roosevelt Arch appears to be a portion of the landslide deposit with several native species that are typical of the hills above the arch. Lambsquarters (*Chenopodium bierlandieri*) and povertyweed (*Monolepis nuttalliana*) are present in relatively large numbers on the flat. Other native species that are also

present in extremely low numbers prior to seeding included western stickseed (*Lappula redowskii*), ellisia (*Ellisia nyctalea*), silverscale (*Atriplex argentea*), cowboy's delight (*Sphaeralcea coccinea*), gumweed (*Grindelia squarrosa*), Sandberg's bluegrass (*Poa secunda* var. *secunda* syn. = *Poa sandbergii*) and western wheatgrass (*Elymus smithii*, syn. = *Agropyron smithii*, *Pascopyrum smithii*), yarrow (*Achillea millefolium*), Indian ricegrass (*Achnatherum hymenoides* syn. = *Oryzopsis hymenoides*), fringed sage (*Artemisia frigida*), basin wild rye (*Elymus cinereus*), bluebunch wheatgrass (*Elymus spicatus* syn. = *Agropyron spicatum*), needle-and-thread (*Hesperostipa comata* syn. = *Stipa comata*), foxtail (*Hordeum jubatum*), and green needlegrass (*Nassella viridula* syn. = *Stipa viridula*).

Special Status Species – Plants

YNP has approximately 100 plant species of concern. Rare plant surveys were conducted within the BLA in summer of 2004 in preparation for the Gardiner Basin Workshop using the Montana Natural Heritage Program's list of plant species of special concern. The results of the survey indicate that there are no rare plants in the proposed project area. However, individual spiny hopsage (*Grayia spinosa*) plants, a species of special concern in Montana, does occur to the south and west of the proposed project area but would not be impacted by actions of this project.

Wildlife Resources

The location of the proposed project is in a previously disturbed area that contains minimal native vegetation. The presence of humans, human-related activities, vehicle traffic, buildings, and establishment of many non-native weed species has altered much of the wildlife habitat in the project area.

With 67 mammals documented, Yellowstone is home to the largest concentration of mammals in the lower 48 states. Yellowstone is also home to six reptiles, four amphibians, twelve native fish, five nonnative fish, and more than 300 species of birds. Of those mammals, seven are native ungulates, two are bears, three are wild cats, three are canids, and six are members of the weasel family. The following species descriptions are limited to those that may occur in the vicinity of the project area.

Ungulates

Several species of ungulates use the project area as part of a migration corridor across the northern boundary of the park between wintering and summer ranges.

Elk (*Cervus elaphus*)

The northern Yellowstone elk herd constitutes one of the world's largest migratory elk populations, with maximum counts of >19,000 elk wintering on the northern range in Montana and Yellowstone National Park during the mid-1990s. This world-renowned population is a major attraction for park visitors, provides economic and sport hunting opportunities for the local community, and is an integral part of the park's intact predator-prey system. There is convincing evidence that elk are a keystone species that has a disproportionately large effect on other species inhabiting the greater Yellowstone ecosystem. Thus, changes in elk abundance and distribution could contribute to substantial changes in the structure and function of this ecosystem during the coming decades.

Trend counts of northern Yellowstone elk decreased from approximately 17,000 in 1994 to 4,635 during 2011 (White and Garrott 2005). Predation by wolves and other large carnivores, as well as moderate human harvests of antler-less elk during the Gardiner Late Elk Hunt were the primary factors contributing to this decreasing trend (White and Garrott 2005, Barber-Meyer et al. 2008). Other contributing factors included a substantial winter-kill owing to severe snow pack during 1997 and, possibly, drought-related effects on pregnancy and survival (Taper and Gogan 2002, Vucetich et al. 2005). In response, the Montana Department of Fish, Wildlife, and Parks decreased the number of antler-less elk permits from 1,102 in 2005 to 100 per season during 2006-2010 and no permits in 2011 owing to decreases in elk abundance and recruitment. This reduction essentially eliminated antler-less harvest as a significant factor decreasing elk numbers and should increase the survival of prime-aged females with their high reproductive value and recruitment of calves into the breeding population. Data collected during winter 2000-2002 suggested that northern Yellowstone elk were in relatively good condition; though there were indications that some nutritional limitations occurred on summer ranges, with digestible energy intake insufficient to support both lactation and fat accretion (Cook et al. 2004). Northern Yellowstone elk winter on approximately 1,500 km² of foothills and valley bottoms along the Gardiner, Lamar, and Yellowstone rivers between the northeast entrance of Yellowstone near Cooke City and Dome Mountain/Dailey Lake in the Paradise Valley of Montana (outside the park). Snow pack strongly influences the number of elk migrating to lower elevations in the Gardiner basin and Paradise Valley. Between 832 and 4,547 elk have wintered north of Dome Mountain each winter since 1989, which represents 39-90% of the elk wintering north of Yellowstone. Also, there appears to be a tendency for adult females with calves and yearlings tending to migrate to lower elevation areas inside and outside the park (Houston 1982, Coughenour and Singer 1996, Cook et al. 2004). Thus, lower elevation habitats in the Gardiner basin, both inside and outside the park, are vital to the persistence of this population. The majority of northern Yellowstone elk migrate to summer ranges along the east-central boundary of the park, north of the park onto the Buffalo Plateau, and as far south as Lewis Lake (White et al. 2010).

Northern Yellowstone elk are habitat generalists that use virtually every vegetation type on the northern range during winter (Houston 1982, Mao et al. 2005). They are primarily grazers, but also browse in autumn and winter. During the 1960s and 1980s, winter diets on the northern range consisted of approximately 75-80% grasses, 8-11% shrubs, 3-5% conifers, 2-8% sedges, 1-3% rushes, and 3% forbs (Singer and Norland 1994). Thus, northern Yellowstone elk consumed a relatively low quality diet during winter, with the consumption of browse increasing during severe winters and the consumption of forbs increasing during spring. During winter, the sagebrush- and conifer-covered slopes of Sepulcher Mountain located in the Gardiner basin are frequently occupied by hundreds of elk. These slopes are also a major calving area for elk during mid-May to mid-June.

Mule Deer (Odocoileus hemionus)

The park's mule deer population is estimated to be stable or increasing and commonly observed throughout Yellowstone during the summer months when 2,300 to 2,500 migrate to higher elevations. Although very few winter inside the park's northern boundaries, mule deer are more common in and around Gardiner, Montana, northwest of Reese Creek, and particularly in habitats on the north side of the Yellowstone River and can be found within the proposed project area.

White-tailed deer (*Odocoileus virginianus*)

White-tailed deer are native to the northern Rocky Mountains but have never been abundant in or near Yellowstone. They are occasionally observed in the northern portions of the park, in the upper drainages of the Yellowstone River (NPS 2010).

Bighorn Sheep (*Ovis Canadensis*)

Bighorn sheep in and adjacent to the BLA are comprised of 10-13 bands that function as a metapopulation. An estimate of 100-400 bighorn sheep inhabited the northern Yellowstone winter range during 1890 through the mid-1960's. By 1981, numbers increased to 487 sheep. However, the following winter an outbreak of infectious "pinkeye" resulted in a 60 percent reduction. The population has grown slowly since that die-off to counts of approximately 350 sheep in 2008-2009. Winter ranges on the northern range have remained consistent for over 30 years.

Bighorn sheep typically forage near escape terrain on the northern slopes of Mount Everts, upstream of Gardiner along the breaks above the Yellowstone River, and in Yankee Jim Canyon. Most sheep prefer to forage in areas with less than eight centimeters of snow. Most sheep migrate seasonally but some remain in the areas mentioned above throughout the year. Though not common within the proposed project area, bighorn sheep are known to occupy habitat in the vicinity of the proposed project.

Moose (*Alces alces*)

In the 1970's, an estimated 1,000 moose inhabited the park. Moose populations decreased after the fires of 1988 that burned important winter habitat (i.e., mature spruce/fir forests) in the northern portion of the park (Tyers and Irby 1995). It is estimated that less than 200 moose currently reside in the park. Moose can most often be seen feeding in riparian areas of streams and on aquatic plants. Today, moose typically occur in forested habitat in the park but have been observed passing through the project area.

Bison (*Bison bison*)

Bison use of the project area and surrounding Gardiner Basin fluctuates year to year and is highly dependent on winter conditions. Some years, winter conditions are harsh in the interior of the park causing the bison to move to lower elevation winter ranges where forage is more readily accessible. However, in spring as snow begins to melt and grasses emerge bison leave the Gardiner Basin area before calving season begins. The annual bison count, conducted by YELL, estimated the bison herd at 3,900 animals in July 2010.

Other Wildlife - Mammals**Black Bear** (*Ursus americanus*)

Black bears are dispersed throughout the park and are most likely found in forested areas. Their primary diet includes grasses and sedges, but they opportunistically feed on fish, insects, roots, and berries, and will scavenge on ungulate carcasses. Historically, black bears have been involved in more bear/human conflicts than grizzlies. From 500 to 600 black bears are thought to reside in the park. The species is commonly observed in the vicinity of the project area.

Bats

Eight species of bats may be present in Yellowstone. The most common are the little brown bat (*Myotis lucifugus*), the big brown bat (*Eptesicus fuscus*), and the silver-haired bat (*Lasionycteris noctivagans*). These species, along with the long-legged myotis (*Myotis volans*), often forage over open water and along riparian corridors. Three other bat species that forage over open water but are found in lower densities are the long-eared myotis (*Myotis evotis*), Townsend's big-eared bat (*Corynorhinus townsendii*), and the fringe-tailed bat (*Myotis thysanodes*). Hoary bats (*Lasiurus cinereus*) are generally found in low densities in forested habitats that often have abundant open areas for foraging (Keinath 2007).

Other mammals that occur in or in the vicinity of the project area include medium to large mammals such as, mountain lions, coyotes, badger, and red fox. Small mammals include deer mice, yellow pine chipmunks, red-backed voles, marmots, short-tailed weasels, tree squirrels, golden-mantled ground squirrels, and jackrabbits and cottontail rabbits.

Amphibians and Reptiles

Amphibians and reptiles could be found within or may move through the project area but are unlikely to occupy the site on a permanent basis because the area has been disturbed by past activities.

Reptiles

Six reptile species have been documented in Yellowstone. Four may be found in the project area.

Northern sagebrush lizard (Sceloporus graciosus gracilis)

This species can be found in open sagebrush habitat, and are found in some higher elevation locations, such as Norris Geyser Basin, but is more common in the lower elevations of the park, such as along the park boundary near Gardiner, Montana, which typically experiences hot dry summers and a fairly mild winter compared to the rest of the park.

Rubber boa (Charina bottae)

Rubber boa can be found throughout the park, is usually associated with forested habitat in mountainous terrain but can also be found in grasslands and sagebrush communities. They spend considerable time underground and are rarely seen. The rubber boa is a constrictor which primarily feeds on small mammals but occasionally eats salamanders, frogs, and invertebrates.

Bull snake (Pituophis catenifer sayi)

This species is associated with low-elevation sagebrush plant communities and is found most frequently near the park's northern boundary in the area between Gardiner and Stephens Creek. The bull snake is a constrictor that primarily feeds on small mammals.

Western, or prairie, rattlesnake (Crotalis viridis)

The rattlesnake belongs to a group generically known as pit vipers because they have a heat-sensitive pit between each eye and nostril. A heavy bodied snake with a lobed rattle at the tip of its tail, it is the only poisonous snake in the park. It prefers sagebrush habitat with rocky outcrops and, like the bull snake, it is associated with the lowest elevation areas of the park near Gardiner and primarily feeds on small mammals.

Amphibians

Four amphibian species are known to reside in Yellowstone. The following species could be found near, but outside the project area.

Blotched tiger salamander (Ambystoma tigrinum melanostictum)

This is the only known salamander species in Yellowstone. It is widespread in the park and very numerous in northern range wetlands. Adults usually breed in small ponds or fishless lakes with emergent vegetation that is used for egg attachment. Salamanders are the top aquatic predators in these systems, feeding on insects and other invertebrates (Koch and Peterson, 1995). Although the larvae, which are aquatic, generally have a uniform dark color, a population found in two small, fishless ponds with unusually high natural turbidity lacks most pigmentation and is mostly white with a pinkish tinge. Blotched tiger salamanders are preyed upon by fish, snakes, and several mammal and bird species.

Birds

Migratory birds are those that generally migrate south from their breeding grounds to wintering grounds each fall. They may winter in habitats throughout the Pacific Region and central North America or farther south into Mexico, Central and South America, and the Caribbean. In the spring, they return north to their breeding grounds, where they have young and the cycle repeats. Migratory birds generally follow one of four geographical flyways during their spring and fall migrations across North America. Most of the park is in the Central Flyway; west of the continental divide is in the Pacific Flyway.

In YNP, 324 bird species have been documented, of which 148 nest in the park. Some species reside in the park year-round, e.g., the common raven (*Corvus corax*), Canada goose (*Branta canadensis*), dusky grouse (*Dendragapus obscurus*), gray jay (*Perisoreus canadensis*), red-breasted nuthatch (*Sitta canadensis*), and mountain chickadee (*Poecile gambeli*), but most migrate to lower elevations and more southern latitudes beginning in September. Fall transients include tundra swans (*Cygnus columbianus*) and ferruginous hawks (*Buteo regalis*). A few species, including rough-legged hawks (*Buteo lagopus*) and bohemian waxwings (*Bombycilla garrulous*), migrate to the park for the winter from further north. Migration brings many birds back to the park from their winter journeys south; other birds are passing through to more northern nesting areas.

Bird surveys have been conducted in the park since the early 1900s. Park staff currently participates in five monitoring programs in order to identify trends for raptors, wetland birds, breeding birds, songbirds associated with willow communities, and birds in recently burned forest areas. The North American bird migration count has been conducted since 1992 to determine general population and arrival trends of migratory birds. A summary of the 1993–

2009 data indicates that the numbers of species and birds observed during these surveys have remained relatively consistent.

Raptors

Of the 19 species of raptors that have been documented breeding in the park, the osprey (*Pandion haliaetus*), northern harrier (*Circus cyaneus*), and bald eagle (*Haliaeetus leucocephalus*) rely heavily on aquatic habitats and wetlands for foraging. Other raptors that have been documented breeding in the park include the sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperii*), northern goshawk (*A. gentilis*), Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*B. jamaicensis*), golden eagle (*Aquila chrysaetos*), American kestrel (*Falco sparverius*), peregrine falcon (*F. peregrines*), prairie falcon (*F. mexicanus*), great horned owl (*Bubo virginianus*), northern pygmy owl (*Glaucidium gnoma*), great gray owl (*Strix nebulosa*), long-eared owl (*Asio otus*), short-eared owl (*A. flammeus*), boreal owl (*Aegolius funereus*), and northern saw-whet owl (*A. acadicus*). The bald eagle and peregrine falcon is discussed further under "Yellowstone Species of Management Concern" later in this chapter.

Special Status Wildlife Species

An endangered species is any species that is in danger of extinction throughout all or a significant portion of its range; a threatened species is one that, without conservation efforts, will likely become endangered in the foreseeable future. The purpose of the Endangered Species Act of 1973 is to provide a means in which the ecosystems upon which endangered and threatened species depend may be conserved and a program for the conservation of such species. Species listed as endangered or threatened have the full protections provided under the Endangered Species Act.

Gray Wolf (*Canis lupus*)

Gray wolves were native to the Yellowstone area when the park was established in 1872. Historically hunted for their hides and as predators, they were eliminated from the ecosystem by the 1930s. The USFWS released an environmental impact statement on wolf reintroduction in May 1994. In 1995 and 1996, 31 gray wolves from Canada were released in the park. As of January 2010, approximately 400–450 wolves lived within the Greater Yellowstone Area, and 120 wolves within the park. Elk make up most of their diet, but they also feed on bison, deer, antelope and smaller prey. The gray wolf was delisted in March 2008, but a federal court reinstated Endangered Species Act protection in July 2008.

Grizzly Bear (*Ursus arctos*)

A recovery plan for grizzly bear populations in the lower 48 contiguous United States was implemented because the species was listed as threatened in 1975 under the Endangered Species Act (USFWS 1982). The plan was developed to provide direction for the conservation of grizzly bears and their habitat to federal agencies responsible for managing land within the recovery zone. Management of grizzly bears in Yellowstone has been successful in enabling grizzly bear recovery and reducing bear-human conflicts, e.g., property damage, incidents of bears obtaining human food, bear-inflicted human injuries, and human-caused bear mortalities in the park (Gunther 1994; Gunther et al. 2004). The USFWS removed grizzly bears in the Greater Yellowstone Area from the federal list of threatened and endangered wildlife on April, 30, 2007. However, a lawsuit led to a court ruling on September 21, 2009 that restored protection under the Endangered Species Act. The relisting takes into consideration the

implications of global warming and other factors that could impact grizzly bears such as the decline of spawning cutthroat trout and white bark pine nuts which grizzly bears rely heavily on during certain times of the year. The grizzly bear population has been estimated at approximately 600 within the 5.5 million acres encompassed by the Greater Yellowstone Area, of which nearly 40% lies within the Yellowstone's boundaries. The park's bear management program is directed toward the recovery, maintenance, and management of the grizzly bear populations while also providing for visitor safety. According to the Bear Management Office database between 2005 and 2010 five bear sightings were reported: one grizzly track, two live grizzlies, two black bears and one unknown bear within 1km of the North Entrance Station (Coleman pers. comm. 2011).

Canada Lynx (*Felis lynx canadensis*)

Historical information suggests that lynx were present but uncommon in Yellowstone from 1880 to 1980. Park files contain records of 73 direct or indirect (tracks) observations of lynx made by park visitors or employees from 1887 to 2003. On March 21, 2000, the USFWS listed the Canada lynx as threatened under the Endangered Species Act. In the U.S. Rocky Mountains, lynx occur in cool, moist coniferous forests that typically support heavy snow pack and snowshoe hares, the lynx's principal prey. A 2004 study that documented the presence and distribution of lynx in the park by snow tracking in the winter and setting hair-snares during the summer detected several lynx in the vicinity of Yellowstone Lake and the Central Plateau (Murphy et al. 2004). A lynx was photographed by a visitor in the vicinity of the Indian Creek Campground in April 2010.

In 2002, Yellowstone National Park mapped lynx habitat, primarily subalpine fir Engelmann spruce, and lodgepole pine stands, as lynx habitat in accordance with the Canada Lynx Conservation and Assessment Strategy (Ruediger 2000). Twenty Lynx Analysis Units (LAU) were identified per CLCAS guidelines. The final rule from FWS designating critical habitat for Canada lynx was posted in the Federal Register on February 25, 2009. Having the LAUs in place assists in determining impacts on critical habitat.

Yellowstone Species of Management Concern

The Strategic Plan for Yellowstone (NPS 2000) was written to fulfill the requirements of the Government Performance and Results Act of 1993. This act ensures that daily actions and expenditures of resources are guided by long- and short-term goals set in pursuit of accomplishing an organization's primary mission, followed by performance measurement and evaluation. Part of the strategic plan includes goals set for preserving native species of special concern. These are animal and plant species that scientific evidence indicates need protection, restoration, and/or conservation within a park because they are declining or have exceptionally limited distribution. The following species descriptions are limited to those that may occur in the vicinity of the project area.

Pronghorn (*Antilocapra americana*)

Yellowstone pronghorn were identified as a Native Species of Special Concern and listed as a high-priority in the park's Strategic Plan because they have considerable biological and historical significance. This population was one of only a few not exterminated or decimated by the early 20th century and, as a result, was the source for re-establishing or supplementing populations throughout much of its range (Lee et al. 1994). These pronghorn express much of

the genetic variation that was formerly widespread in the species, but no longer present elsewhere (Reat et al. 1999). Also, this population sustains one of a few long-distance migrations by pronghorn that persist in the greater Yellowstone region (White et al. 2007b). There are serious concerns about the viability of Yellowstone pronghorn because low abundance (300) and apparent isolation have increased their susceptibility to random, naturally occurring catastrophes (National Research Council 2002). Their migration has been effectively truncated by up to 80 km outside the park due to development and habitat fragmentation (Caslick 1998, Scott 2004) and several summering areas were abandoned after culls and translocations during the 1940s-1960s (Scott and Geisser 1996, Keating 2002). Also, all Yellowstone pronghorn share a 30-km² winter range with 2,000-3,000 elk, bison, mule deer, and bighorn sheep that compete for food with pronghorn (Singer and Norland 1994). Pronghorn were once numerous (1000-1500 animals) in the upper Yellowstone River drainage of Montana and Wyoming and migrated 80-130 km down the Yellowstone River from higher-elevation summer ranges in Yellowstone National Park to lower-elevation winter ranges in the Paradise Valley and near Livingston, Montana, USA (Skinner 1922). However, human settlement reduced pronghorn abundance and effectively eliminated their migration north from the park sometime before 1920 (Skinner 1922). Feeding, irrigation, and fencing efforts until 1934 further reduced their distribution and apparently reinforced the tendency for some pronghorn to remain on the winter range year-round (Skinner 1922, Keating 2002).

Today, Yellowstone pronghorn congregate in a relatively small basin near Gardiner, Montana, during December through March where snow depths are relatively low compared to their higher elevation summer ranges. Yellowstone pronghorn prefer to forage in areas with <8 cm of snow and are rarely observed feeding in snow >15 cm deep except during severe winters. Thus, lower elevation habitats in the Gardiner basin, both inside and outside the park, are vital to the persistence of this population. In late March or early April, approximately two-thirds of the pronghorn migrate over Mt. Everts to widely dispersed summer ranges at higher elevations in the Blacktail Deer Plateau, Oxbow Creek slopes, Hellroaring slopes, Specimen Ridge, and Lamar Valley (White et al. 2007b). Remaining animals summer in the Gardiner basin. The recent low abundance of Yellowstone pronghorn may stem from reductions in the density and productivity of big sagebrush (Houston 1982, Singer and Renkin 1995, Wambolt and Sherwood 1999, Wagner 2006), the staple winter food (~60%) of pronghorn during 1930-1990 (Singer and Norland 1994, Barmore 2003). Pronghorn are selective feeders and prefer forbs in all seasons, likely due to their high digestibility and nutritional value. However, shrubs are important for pronghorn survival, especially during winters with deeper snows (Yoakum 2004a). Evidence indicates the production, germination, and survival of sagebrush on the winter range of pronghorn has been declining since the early 1900s in response to browsing by elk, mule deer, and pronghorn (Singer and Renkin 1995, Wambolt and Sherwood 1999). As a result, the percent composition of sagebrush in the winter diets of pronghorn decreased from 67% during 1985-1988 to <10% during 2000-2001, while rabbitbrush increased from 5% to 60% (Boccadori et al. 2008). Today, none of the cover types in the Gardiner basin winter range are extremely productive, as indicated by the low percent canopy cover of herbaceous plants and shrubs (9.8-38.3%). Thus, no one cover type is most important for feeding and/or bedding and pronghorn must meet their nutritional needs from a combination of types (Boccadori 2002).

The persistence of relatively high demographic rates despite decreased food supplies during the leanest period of the year may be possible because numbers of pronghorn are well below ecological carrying capacity after the crash during 1992-1995 (White et al. 2007a) and numbers of elk have decreased >50% since that time (White and Garrott 2005). Thus, per capita resources were not as limiting. The behavioral flexibility of pronghorn in Yellowstone also enables them to make dynamic and rapid changes in migratory tendencies in response to

changing conditions (White et al. 2007b). However, the winter range for pronghorn in Yellowstone may not support larger populations (>500) of pronghorn for sustained periods, as occurred historically (White et al. 2007a). This apparent reduction in carrying capacity due to decreased sagebrush is worrisome because migration routes to historic wintering habitat outside the park have been fragmented by development, fencing, and other land-use practices (Caslick 1998, Scott 2004, White et al. 2007b). The National Park Service is working with the U.S. Forest Service, State of Montana, private landowners, and conservation organizations (i.e., National Parks and Conservation Association) to improve connectivity between the park and historic winter ranges to the north.

***Bald Eagle* (*Haliaeetus leucocephalus*)**

The USFWS removed the bald eagle from the list of endangered and threatened wildlife on August 8, 2007. Current data indicate populations of bald eagles have recovered in the lower 48 states, with an estimated minimum of 9,789 breeding pairs now compared to 417 active nests in 1963. Nesting and fledgling bald eagles in Yellowstone increased incrementally from 1987 to 2005 (McEneaney 2006). Resident and migrating bald eagles are now found throughout the park, with nesting sites located primarily along the margins of lakes and shorelines of larger rivers. The bald eagle management plan for the Greater Yellowstone Ecosystem achieved the goals set for establishing a stable bald eagle population in the park (McEneaney 2006).

***Peregrine Falcon* (*Falco peregrines*)**

The American peregrine falcon was removed from the list of endangered and threatened wildlife on August 25, 1999 due to its recovery following restrictions on organochlorine pesticides in the United States and Canada, and implementation of various management actions, including the release of approximately 6,000 captive-reared falcons (64 FR 46541). The U.S. Fish and Wildlife Service has implemented a post-delisting monitoring plan pursuant to the Endangered Species Act that requires monitoring peregrine falcons at three-year intervals that began in 2003 and will end in 2015. Monitoring estimates from 2003 indicate territory occupancy, nest success, and productivity were above target values set in the monitoring plan and that the peregrine falcon population is secure and viable (71 FR 60563). Peregrine falcons reside in Yellowstone from April through October, nesting on large cliffs. The number of nesting pairs and fledglings in the park has steadily increased from zero in 1983 to 32 pairs and 47 fledglings in 2007 (Baril et al. 2010).

Cultural Resources

The North Entrance area has a rich history relating back from the earliest developments within the park to the present day structures that facilitate over 1 million visitors entering and leaving the park and concessions operations that support the visitors stay in the park. Several pedestrian inventories and archival studies have been conducted to identify the cultural properties located within the project area and evaluate their significance. The area contains historic and prehistoric archeological sites along with components of several historic districts documented and evaluated in consultation with the Montana State Historic Preservation Office (MTSHPO), the Advisory Council on Historic Preservation (ACHP), and the Keeper of the National Register of Historic Places (NR) several of which are listed on the National Register.

Prehistoric and Historic Archeological Sites

The early American travel corridor along the Yellowstone River has been documented through various studies in and outside of Yellowstone National Park. It is apparent from archeological research that people have passed through the North Entrance Area, following the river, and used resources on the associated landscapes for over 10,000 years. Due to early pioneer development in the Gardiner Basin, the Army and National Park Service development of the North Entrance area, farming practices, and continued animal trampling of the area, very little evidence remains of early Native use of the project area. There are buried remnants of historic wagon roads, old automobile roads, former entrance stations, the railroad station, buggy and stage wash structures, irrigation ditches, Army firing ranges and golf courses, pedestrian walks through the Roosevelt Arch, hay fields, and other evidence of use of the area during the historic period that remain buried under the windswept and now somewhat barren landscape. Over the past 30 years there have been numerous small archeological surveys conducted in the North Entrance area.

A two-year extensive archeological survey of 2,757 acres of YNP land in the Gardiner Basin, including the North Entrance developed area, was conducted by the University of Montana Anthropology Department in 2007 and 2008(citation). This study resulted in the documentation of 47 historic and prehistoric archeological sites, two of which are located within the proposed project area. Site 24YE198/118 is a combined multi-component site comprised of several prehistoric lithic scatters, an exposed hearth, and a historic irrigation ditch associated with parks efforts to raise hay to feed park pack animals and the dwindling elk herd. The eastern portion of the prehistoric component of the site has been bisected by the construction of the current and historic North Entrance Road alignment. The historic irrigation component of the site is eligible for NR listing under Criterion A and the prehistoric component is eligible for NR listing under Criterion D. The historic site 24YE199 is a prominent irrigation system, the North Entrance Ditch, constructed in 1903 by Hiram Chittenden to bring water into what is known as the "Gardiner Flats" and further authorized by President Theodore Roosevelt, during his 1903 visit, a proposed hydroelectric power plant in Gardiner, Montana. 24YE199 has been determined eligible for the National Register. Additional archeological inventory of the area surrounding the project was provided by the Office of the Wyoming State Archeologist in 1999 (National Register testing of prehistoric site 24YE14) and in 2009 with the inventory of portions of the Mammoth-Gardiner developed area, just north of the current proposed project area. Although new sites within the vicinity of the project were documented and tested, none of the sites are within the currently proposed project area (Sanders 2009).

The proposed expansion of parking areas in various locations and the relocation and widening of the North Entrance Kiosk area will impact NR eligible site 24YE198/118 although the surface lithic concentrations and the exposed hearth will be avoided. Further sub-surface testing of areas proposed for new ground disturbance within the boundaries of 24YE198/118 will be conducted prior to final design and construction activities to facilitate moving parking areas or road alignments if they have the possibility of impacting significant buried cultural features or deposits. The work will be conducted in consultation with the MTSHPO to guide final design and reduce the possibility of inadvertent discoveries and impact to significant buried historic properties. The North Ditch site, 24YE199, can be avoided with all of the proposed project components having no impact on the historic property.

Historic Districts and Contributing Structures

The significance of the North Entrance area to the history of Yellowstone National Park and its many visitors is evident in the development of three unique historic districts. These three districts represent three unique periods of significance, all of which document separate but related themes significant in the history of Yellowstone. The following sections describe the significance of each of the districts in detail.

North Entrance Road Historic District

The North Entrance Road Historic district (HD) was documented by YNP staff and listed on the National Register of Historic Places in May, 2002 as nationally significant under Criterion A, being an integral part of one of the first federally planned road systems in the nation and possessing state significance under Criterion C for “blending with nature” and adherence to the park’s design philosophy of “lying lightly on the land”. The road was nominated under the multiple property documentation for Yellowstone’s roads and its associated historic context, *The History of the construction of the Road System in Yellowstone National Park, 1872-1966*, written by Mary Shivers Culpin. The period of significance for the North Entrance Road HD is 1883-1950 and the Historic District’s boundary is 33-feet from the road centerline. The HD has two contributing structures, the road and road features such as the historic culverts with stone masonry or rubble stone headwalls, and the columnar basalt Roosevelt Arch with wing walls and the one remaining retaining wall. The present North Entrance Station, constructed in 1991, and the two modern bridges over the Gardiner River do not contribute to the roads’ historic character.

In 1872, when the park was established, only a trail suitable for saddle and pack trains following the route of the current secondary supply and employee entrance road into the park provided some visitors and supplies access to the Mammoth Hot Springs area. During the early days, the freighters wagon road, called the Turkey Pen Road, left Gardiner following the north side of the Yellowstone River, crossing the river east of the confluence of the Gardner River (thus avoiding the narrow canyon of the Gardner River) and proceeding on a higher route on the west side of Mount Everts, eventually ending up near the northeast area of the park supplying the Clarks Fork miners above Cooke City. A wagon road from Gardiner to Mammoth constructed by Philetus Norris in 1877 followed an old tourist wagon road, presently known as the “Gardiner High Road”, but the steep gradient of the road and the steep descent into the Mammoth area made the road impassible in bad weather and it was abandoned as the major transportation route although it still exists and is maintained today as a recreational route. In 1884, Army Corp of Engineers Lt. Dan Kingman constructed a new (and the current) alignment between the town of Gardiner and the park headquarters at Mammoth Hot Springs. But it was not until the construction of the Roosevelt Arch in 1903 that the road was constructed from the vicinity of the current North Entrance Kiosk to the Roosevelt Arch.

The historic significance of the North Entrance Road Historic District includes providing park visitors access to its scenic wonders, the difficulty of building early roads in a remote mountainous setting, the Army Corp of Engineers setting the philosophy for roads in a wilderness setting, and for the park’s continuing to adhere to the design philosophy of using natural materials and laying lightly on the land.

The Roosevelt Arch as part of the Fort Yellowstone National Historic Landmark

Constructed in 1903 the Fort Yellowstone National Historic Landmark was listed on the National Register of Historic Places in July 2003, with the Roosevelt Arch as a non-contiguous contributing structure in that HD. The arch is significant as the monumental entrance gate that welcomes visitors arriving at the North Entrance to the park. The concrete plaque above the arched roadway proclaims “for the benefit and enjoyment of the people”. The Arch is constructed of native, lightly dressed basalt. The period of significance for the Ft Yellowstone National Historic Landmark is 1888-1918 during the military administration of the park and the NHL boundary is the perimeter of the arch and retaining wall plus 20-feet on each side of the arch and wall.

The Roosevelt Arch remains today much like it looked when originally constructed. The arched pedestrian walkways through the towers on each side of the arch have been boarded closed due to poor night lighting and the 3 original concrete plaques, the roadway plaque as described above, a second plaque over one pedestrian walkthrough inscribed “Yellowstone National Park” and the third plaque over the second pedestrian walkthrough inscribed “Created by Act of Congress March 1, 1872” have all been replaced with similar but smaller plaques in the 1980s. Additionally, the north stone masonry wing wall around the hairpin turn on the north side of the Arch was removed by the NPS in the 1930s presumably to improve visibility for automobiles driving into the park through the arch. Although many changes to infrastructure near the arch have occurred over the years the structure and its imposing setting on the landscape are still intact.

The Yellowstone Park Transportation Historic District

This area, adjacent to the Triangle on the north is assigned to the parks concessionaire for maintenance of their services in Mammoth and throughout the park. The historic district buildings house repair shops, material storage areas, vehicle storage, garages, power plants, tool shops, welding buildings, single family housing and dormitories. The buildings are all Park Service Rustic or Park Service Moderne in architectural style. The 1906 bunk and mess house is an early example of the Rustic Style. The 1920s buildings have strong elements of the Craftsman style and several were designed by noted architect, Robert Reamer. The 30,000-square-foot, two-story, commissary warehouse, designed by Bozeman architect Fred F. Willson and constructed of poured-in-place concrete is an example of the Park Service Moderne structures within the HD.

The Yellowstone Park Transportation HD was documented by park staff in 2001 and the MTSHPD concurred with the district’s eligibility at the state level but a National Register Nomination form has not yet been completed for the HD. The boundary of this historic district is adjacent to the north side of the service road but does not include the road. The proposed project would have minor visual impacts on the HD but would not have any physical impacts.

Cultural Landscapes

Two separate cultural landscape inventories are being completed to document significant landscape features in the north entrance area. The North Entrance Road Historic District and the Yellowstone Park Transportation Company (YPT Co) Historic District were submitted for park review in January 2011. It is anticipated that Section 110 consultations with the Montana State Historic Preservation Office (SHPO) for these landscapes within the Area of Potential Effect (APE) will occur within the calendar year. Section 110 consultations would occur through

consensus determination of eligibility, using the findings of the CLI – however this concurrence has not yet been completed. The CLI is an evaluated inventory of landscapes having historical significance that are listed on or eligible for listing in the National Register of Historic Places. Like the List of Classified Structures, the CLI assists the NPS in its efforts to fulfill the identification and management requirements associated with Section 110(a) of the National Historic Preservation Act, National Park Service Management Policies (2006), and Director's Order #28: Cultural Resource Management. Section 106 consultation and compliance will be completed for individual actions proposed as they are designed and finalized.

Roosevelt Arch (North Entrance Arch) as a component of the North Entrance cultural landscape

The Roosevelt Arch itself constitutes the most visible and dramatic element of the North Entrance cultural landscape and is visible from nearly anywhere in the north entrance area. Although the structure itself is a National Historic Landmark it is placed within a discrete setting in the landscape and is complimented by features which contribute to its sense of setting and place. These characteristics (systems, features, and patterns) that potentially contribute to the character of the setting of the Roosevelt Arch NHL would include:

- the Roosevelt Arch and its associated walls and fences (HS9983) including the ornamental iron fence;
- the open, flat grassland of the Gardiner Flats and associated views throughout;
- the North Entrance road with its linear alignment bisecting the Gardiner Flats;
- the road that curves along the west wing wall of the arch;
- the Old Road along the YPT Co Historic District which defines the eastern edge of the Gardiner Flats;
- and the general spatial organization of these features

North Entrance Road Landscape Characteristics

A parkwide cultural landscape evaluation was previously completed in 2003 by the NPS Washington office entitled "Yellowstone Roads - A Cultural Landscape" which provided parkwide character defining features for park roads. Cultural landscape characteristics contribute to the character of the setting for the North Entrance Road Historic District (NER HD). The end of the period of significance for the North Entrance Road Historic District, however, is 32 years later, which includes changes in the landscape that are mostly the result of the advent of the automobile. Greeted by the monumental Roosevelt Arch, early park visitors originally boarded horse-drawn "Tally-Ho" carriages, in later years, boarded auto coaches to embark on their tour of the park. In 1929, US Highway 89 was re-routed to the eastern side of the Yellowstone River, bringing auto traffic through Second Street in Gardiner, where visitors would now first see the park through the iron fence at the intersection of Park and Second streets. They would then be required to make a right turn and travel along Park Street until they made a hairpin turn to the left to enter through the arch. After proceeding through the iconic Arch, visitors stopped at an entrance station adjacent to the arch (1921-1937) and then followed the straight alignment of the North Entrance Road that bisected the Gardiner Flats fields, which were cultivated with alfalfa.

Also during the period of significance of the North Entrance Road Historic District, which ends in 1950, some of the original design, such as the irrigated alfalfa fields, were abandoned (the last record of hay harvested was in 1937) and the interceptor and irrigation ditches breached. The changes in modes of transportation resulted in the introduction of new buildings such as those

in the Yellowstone Park Transportation Company Historic District (YPT Co HD, 1924) and a new entrance kiosk (1949) in the same location as the modern entrance station (1991). In 1954, after the period of significance, the Gardiner Depot was demolished. In 2004, the Heritage and Resource Center was constructed within the view framed by the arch for those leaving the park. These alterations have diminished the integrity of the setting outside the district and/or park boundary.

The CLI documents that the cultural landscape characteristics which contribute to the character of the immediate setting of the North Entrance Road Historic District, especially within the iron fence, retain historic integrity and are in good condition. The Roosevelt Arch and the majority of its walls retain their original orientation, use, and purpose, as does the North Entrance road alignment through the open grasslands of the former Gardiner Flats fields. The arch continues to stand in stark contrast to open space that is unencumbered by vertical elements such as buildings and structures. It remains the main entry portal through an iron park-boundary fence. The road along the curved west wing wall is extant. The general spatial arrangement of the landscape characteristics that delineate the edges of the Gardiner Flats, namely the Arch, the ornamental iron fence along Park Street, and the Old Road alignment in front of the YPT Co Historic District, remain and continue to convey the character of the landscape. Views into the park from the arch as well as from Park Street also remain unencumbered by structures and buildings, benefiting those entering through one of the nation's most dramatic park entrances.

Cultural landscape characteristics (systems, features, and patterns) that potentially contribute to the character of the setting of the North Entrance Road Historic District (NER HD) would be:

- the Roosevelt Arch and its walls (HS9983) and its associated features as described above;
- the North Entrance road with its linear alignment bisecting the Gardiner Flats,
- the pattern of a national park entry station with a flag pole along the North Entrance Road;
- open views throughout the entrance area.
- 1908 concrete boundary marker near Hall's Store, which is currently the Yellowstone Association Headquarters
- and the general spatial organization of these features

Yellowstone Park Transportation Company Landscape Characteristics

Adjacent to the north entrance landscape is the Yellowstone Park Transportation Company Historic District (YPT Co HD). During the period of significance (1906-1938), the district was constructed to accommodate the movement, maintenance, and storage of what would be YPT Co's large fleet of vehicles, as well as for administration and residential functions. The buildings were clustered together compactly and oriented primarily to the Old Road (the secondary entrance through the iron fence), with their more decorative front facades facing the North Entrance Road entry through the arch. The large utilitarian buildings are all Art Moderne-styled, while the residential buildings are Rustic. While designed primarily to be a functional administrative area, irrigated lawns, trees, and vegetation reveal a commitment to blending the YPT Co Historic District grounds with the surrounding landscape. As a secondary and administrative park entrance, the ornamental park boundary fence was gated at the location of the ranger station within the northern residential cluster. A fieldstone wall defines the edge of the southern residential cluster.

Since the end of the period of significance (1906-1938) the Power Canal to the east side of the district is missing (c. 1969) and some of the irrigated lawn areas have been converted to parking and equipment storage. Cultural landscape characteristics (systems, features, and patterns) that potentially contribute to the character of the setting of the YPT Co Historic District would be:

- building clusters with their front facades oriented to the Old Road;
- vegetation that enhances the viewshed from the Roosevelt Arch and North Entrance Road by softening the edges of the buildings and blending the complex into the surrounding landscape, such as irrigated lawns, trees, and ornamental vegetation.
- shrubs or small, ornamental trees have been planted along the facades. Larger evergreens and cottonwoods are all to the rear of the structures, except the newly-planted cottonwood at the former Ranger Station;
- ornamental iron boundary fence along Park Street with gated entry at the Old Road;
- fieldstone wall at southern edge of southern residential complex.

Social and Economic Resources

Visitor Use and Experience

Over the past decade, annual visitation to Yellowstone National Park averaged approximately 3 million visitors. The highest recorded visitation was 3.6 million in 2010; the overall projected trend is for visitation to continue to increase. The North Entrance Station is one the most heavily used Entrance Stations in the park and is open year round to wheeled vehicles. It provides access to the northern portion of Yellowstone including the Lamar Valley. This access is a popular means to watch wildlife, especially gray wolf populations in the winter months. During 'Peak Use' in June, July, and August 2010, the North Entrance Station averaged 1,461 vehicles a day coming through with traffic frequently backed up to the Roosevelt Arch and Park Street. The North Entrance is a primary entrance for concessioners, delivery vehicles and employees which create congestion with visitor traffic. This bottleneck at the North Entrance Station often leads to delays in admitting visitors and detracts from visitors' initial experience. The North Entrance Station is often visitors' first contact with park staff and a chance to receive park maps and information. The congestion of the Entrance Station often results in safety hazards for entrance station employees because it requires them to switch to a mode where traffic is directed to travel one- way from Roosevelt Arch to the Entrance Station and a minimum of two employees are amongst traffic roving and organizing traffic lanes.

Roosevelt Arch is a popular and iconic beginning or ending for many park visitors. Currently there is minimal space and often inbound and outbound vehicle traffic has to yield many times as visitors stop to take photos of Roosevelt Arch which often leads to congested traffic in the vicinity of the entranceway to the park. The road alignment and existing parking areas are not well delineated. Additional informal parking has evolved on the shoulder of the 'hairpin turn' resulting in a vehicular bottleneck during 'Peak Use'. Pedestrian access is not available to visitors resulting in a mix of pedestrians amongst inbound and outbound vehicle traffic. Although recognized as a significant safety concern, this is a daily occurrence during 'Peak Use'.

Socioeconomics

YNP extends into three different states, including Wyoming, Montana, and Idaho. Most of the property surrounding the park is managed by the U.S. Forest Service and a few private land

owners. The park plays a prominent role in the social and economic life of the greater Yellowstone area.

The greater Yellowstone region's economy (which is considered a 'wildland economy') has grown and diversified dramatically in the past forty years. The trend has been away from a heavy dependence on resource extraction and agriculture toward a largely service-based economy, with significant growth also coming from retirement and investment income. The ideal combination for economic growth is a mix of world-class amenities and ready access via air travel. Therefore, the fastest growth in the regions is associated with the most "connected" places. In comparison to other 'wildland economies' (North Cascades, Glacier, Yosemite, Grand Canyon), the greater Yellowstone region has the fastest rates of population in economic growth, but lags behind in the growth of average wages per job.

Gateway communities of varying sizes have developed outside the park—Cody, Dubois, and Jackson in Wyoming and Cooke City/Silvergate, Gardiner, and West Yellowstone in Montana. The Montana gateway communities are on the immediate border of the park or within a few miles; the Wyoming gateway communities are an hour drive or more from the park boundary. The gateway communities are relatively small, with populations ranging from less than 150 permanent residents for Cooke City and Silvergate combined to almost 9,000 for Cody. The population of West Yellowstone is approximately 1200 and Gardiner has approximately 850 residents; however the population increases during the summer months. Gardiner resides in Park County, Montana. The population of Park County as of 2008 was over 16,000.

The availability of services varies from community to community. Yellowstone's recreational opportunities tend to create a tourist-based economy in communities surrounding the park. These communities receive significant income by providing goods and services to park visitors and employees. Local businesses also benefit from annual NPS and concessioner expenditures for salaries, goods, and services.

Gardiner, Montana is a small community situated at the original entrance to YNP and is the only year round entrance into the park. The town is located in the Upper Yellowstone Valley, surrounded by national park and forest lands. The Yellowstone River flows through the center of town. Gardiner relies on recreation, tourism, and the service industry to support its economy. Primary employers in the area include the National Park Service, Xanterra Parks & Resorts (a park concessioner), and the U. S. Forest Service. Gardiner has a public school that houses kindergarten through 12th grade.

Economic activities supported by visitor use are highly seasonal. June, July, and August are the months of highest use; with 50 percent of the park's visitation arriving in July and August. The shoulder-season months, May and September, receive less use but the volume is still heavy. Use in the winter months is relatively low, (just under 50,000 for the months of December to March), accounting for about two percent of the overall visitation.

Park Operations

Park operations consist of NPS, concessioner, and contractor operations which encompass protection of natural and cultural resources; maintaining all roads, trails, buildings and other structures in a safe and aesthetically pleasing condition; preventing deterioration that would render them unsightly, unsafe, or beyond efficient repair and providing recreational opportunities to park visitors. Park staff provides the full scope of functions and activities to accomplish management objectives and meet requirements in law enforcement, emergency services, health

and safety, science, resource protection and management, visitor services, interpretation and education, utilities, housing, fee collection, and management support.

During 'Peak Use', there can be up to eight employees working at the North Entrance Station. Currently the Entrance Station not only serves as the administration area for employees, it is also the prime area for visitor contact, fee processing, and telecommunications equipment. Several conditions exist in the project area that is not optimal for park employees and operations as described in Chapter 1.

During the 'Peak Use', concession related traffic and delivery traffic make up the majority of traffic along the road adjacent to the Gardiner Transportation Center. Employee commute traffic stays fairly steady year round with increased numbers during summer months. XPR and YPSS have primary operations facilities in the Gardiner Transportation Center. XPR operates park wide laundry, human resources, merchandise distribution, central fleet distribution, maintenance, repair and storage, and dispatch. YPSS headquarters, warehouse and distribution center are also in this area.

CHAPTER 4 - ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the proposed project. Topics analyzed in this chapter include: topography, geology, and soils; vegetation including special status plants, wildlife including special status wildlife species and Yellowstone species of management concern, cultural resources, socioeconomic resources, visitor use and experience, and park operations. Direct, indirect, and cumulative effects, as well as impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes the classification of the impact as either beneficial or adverse, direct or indirect:
 - *Beneficial*: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
 - *Adverse*: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
 - *Direct*: An effect that is caused by an action and occurs in the same time and place.
 - *Indirect*: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.
- **Context** describes the area or location in which the impact will occur. Are the effects site-specific, local, regional, or even broader?
- **Duration** describes the length of time an effect will occur, either short-term or long-term:
 - *Short-term* impacts generally last only during construction, and the resources resume their pre-construction conditions following construction.
 - *Long-term* impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.
- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this environmental assessment. In general, these terms can be described as:
 - **negligible** (the impact is at the lowest levels of detection);
 - **minor** (the impact is slight, but detectable; most likely short term and localized);
 - **moderate** (the impact is readily apparent, measurable; most likely long term,)
 - **major** (the impact is a permanent, adverse impact or of exceptional benefit).

Cumulative Impact Scenario

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what

agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the no-action and preferred alternative.

Cumulative impacts were determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other past, ongoing or reasonably foreseeable future projects at YNP and, if applicable, the surrounding region. The geographic scope for this analysis includes actions within the park's boundaries that may contribute towards cumulative impacts to the resources analyzed in this EA, while the temporal scope includes projects within a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis:

- **Administrative Activities (ongoing):** General maintenance activities that take place that include, but are not limited to: roadside ditch clearing or vegetation management; road repair; removing and replacing culverts; snow removal; and maintaining and reconstruction of trails and boardwalks.
- **Gardiner Basin Restoration Project (ongoing):** YNP is moving towards the restoration of native plant communities to approximately 700 acres of former agricultural fields located west of the Yellowstone River between Gardiner, Montana and the park's northern boundary at Reese Creek. The work will be done in stages over many years, subject to availability of funding. Four pilot areas totaling 50 acres were fenced in 2008 and 2009. The first 23 acre site which was fenced in 2008 was treated with herbicides and no-till drill seeded to a cereal barley crop in the spring of 2009. It and a 7 acre pilot site was no-till drill seeded to winter wheat in September 2009. The other two pilot sites were treated with herbicides and seeded in the spring of 2010. No-till drilling of the native grass seed will be done in the fall of 2011 and fall of 2012.
- **Norris-Madison Road Reconstruction Project, 2001-2010:** Road improvement was made on a 16.3 km (10 miles) segment of the Grand Loop Road between Madison Junction and Norris Junction. This road segment was widened to a 9.2 meter (30 feet) paved top including travel lanes and paved shoulders. The road segment between Gibbon Falls and Tanker Curve was realigned and followed an upland route above the canyon. Construction of a new bridge and removal of one existing bridge took place in 2010. Removal of 2.9 km (1.8 miles) of existing road along the Gibbon River was also completed in 2010.
- **Canyon-Tower (Dunraven Road) Road Improvement Project, (ongoing):** The segment of the Grand Loop Road that comprises the Dunraven Road construction project stretches from Tower Junction to Canyon Junction, a total of 18.4 miles (29.3km). The entire road will be widened from its existing 19–22 feet to 24 feet and design will address needs for better drainage, more pullouts and parking areas, and slopes that can re-vegetate in the short, 2–3 month growing season. Design and construction are being accomplished in two phases. The first phase, from Chittenden Road to Canyon Junction, began in 2003 and was completed in 2005. The second phase from Chittenden Road to Tower Junction is scheduled to begin in 2011, but is dependent upon highway funding. The second phase of the project would include the Tower Fall Campground road, the Tower Fall store parking, and the entrance road to Roosevelt Lodge, again dependent on funding.
- **Lamar River Bridge Reconstruction/Replacement, (ongoing):** The Lamar River Bridge is in the process of being replaced at this time. The current bridge would be replaced with a similar bridge adjacent and just upstream of its current location. Approximately one half mile of the Tower to Northeast Entrance road will be shifted to match the alignment of the new bridge. The old roadbed would then be rehabilitated, and the old bridge removed.

- **Sylvan Pass Reclamation and Road Reconstruction:** This project would reconstruct a portion of the East Entrance Road through Sylvan Pass, and rehabilitate an area that has for many years served as a source of gravel and rock for road reconstruction projects within the park. Design work for the Sylvan Pass project was completed.
- **Norris-Golden Gate Road Reconstruction, Future:** YNP plans to reconstruct a portion of the Grand Loop Road between its intersection with Norris Campground, and north to a point just north of Swan Lake Flats, in an area known as Golden Gate.
- **Tower-Roosevelt Comprehensive Plan:** This plan will alter or improve visitor services, facilities (buildings, roads, and paved parking areas), and utilities while preserving the distinct and significant rustic western camp character and resources in the Tower-Roosevelt area.
- **Mammoth (including Gardiner) Comprehensive Plan, Future:** This plan will determine if further alteration or improvement of visitor services, facilities buildings, roads, and paved parking areas, and utilities are needed in the Mammoth to Gardiner developed areas while focusing on protecting these developed areas by managing growth and development.
- **Old Faithful and Lake Comprehensive Plans, Future:** These plans will alter or improve visitor services, facilities buildings, roads, and paved parking areas), and utilities while focusing on protecting these developed areas by managing growth and development.
- **Mammoth to Gardiner Road Improvement Project:** This project may fall outside of the temporal sideboards established for cumulative effect, but is noteworthy as proposed actions may be developed that could alter or improve circulation patterns beyond those proposed in this EA.
- **Climate Change:** While climate change was dismissed as an impact topic because the contribution of greenhouse gases from proposed actions would be minimal, climate change could still contribute as a cumulative impact on resources. The following is a summary of impacts that could occur due to climate change in Yellowstone. This summary was developed using the document, *Observed and Projected Ecological Response to Climate Change in the Rocky Mountains and Upper Columbia Basin; A Synthesis of Current Scientific Literature*, published by the NPS in 2010.

Temperatures in the Rocky Mountain region are generally expected to increase by approximately 1–2°C (2 – 4 °F) during the next 50 years with natural variation over years to decades. Precipitation is less well understood, but the projection for total annual precipitation suggests that the dominant pattern in North America will be a wetter climate in the northern tier and a drier climate in the southwestern United States.

While there are likely to be regional variations, projected effects across the West include loss of glaciers, less snow, earlier peak flows, less stream flow, warmer water temperatures, more frequent droughts, and more intense storms. Lower summer base stream flows reduce the amount of in stream habitat for invertebrates and fish and cause a reduction in stream-side groundwater tables which are important for sustaining riparian vegetation communities. Reduced water depths may also increase the vulnerability of sensitive species (e.g., amphibians) to harmful ultraviolet radiation. In addition to the shift in the quantity of water, climate change may reduce water quality due to increased erosion and decreased dilution of pollutants. Decreases in snow cover and more winter rain on bare soil are likely to lengthen the erosion season.

How these effects when combined with other foreseeable futures actions may contribute to resource impacts from the proposed actions is difficult to quantify. What can be stated is

during the timeframe of the proposed actions, climate change may contribute slightly (indirectly at the negligible adverse level) but most likely not to the intensity that would, based on climate change alone, increase resource impacts. Climate change may in the long term lead to expansion of non-native plants, but vigilant monitoring of new invasive species introductions and hopefully expansion of native plant revegetation in the Gardiner Basin will assist in offsetting such impacts.

Natural Resources

Topography, Geology, and Soils

Guiding Principles and Policies

The geologic setting is the fundamental underlying factor for the behavior and characteristics of a landscape. NPS geologic resources are important for their role in the ecosystem, their scenic grandeur, and their contribution to visitor enjoyment. Yellowstone was established specifically to protect geologic resources. The park contains geologic resources of international renown, including both geologic features and processes. For the purpose of this discussion, this topic includes soils, bedrock, streambeds and hydrothermal features. The NPS has developed policies and guidance on geologic resource management. Section 4.8 of the NPS Management Policies (2006) addresses geologic resource management. This policy states that the NPS will maintain, preserve, and protect geologic resources as integral components of the park's natural systems.

Methodology and Impact Thresholds

Analyses of the potential intensity of impacts to topography, geology, and soils were derived from available information and park staff's past observations of the impacts on topography, geology, and soils from both visitor use and construction activities.

Impacts to topography, geology, and soils that are unique to Yellowstone or to topography, geology, and soils that support important vegetation species are more significant than impacts to common topography, geology, and soils. The intensity of impacts to topography, geology, and soils is defined as follows:

- Negligible:** Topography, geology, and soils would not be affected or the effects on topography, geology, and soils would not be detectable.
- Minor:** Effects on topography, geology, and soils would be detectable, although these effects would be localized and short-term. There could be some slight physical disturbance, some removal of soil material, and/or some compaction. Mitigation measures proposed to offset adverse effects would include ensuring that topsoil is preserved, ground is reshaped into the natural contours, the ground is de-compacted, and that there is no unnatural erosion of soils.
- Moderate:** Effects on topography, geology, and soils would be readily detectable, localized, and possibly long-term. Measurable effects could include physical disturbance, removal of large amounts of soil, compaction, and/or unnatural erosion of soils. Mitigation measures proposed to offset adverse effects would be extensive and would include measures to ensure that topsoil is preserved, ground is reshaped

into the natural contours, ground is de-compacted, and that there is no unnatural erosion of soils.

Major: Effects on topography, geology, and soils would be widespread, readily detectable, and long-term. Significant measurable effects would include the physical disturbance and removal of large amounts of soil, severe compaction, and the unnatural erosion of soils. Mitigation measures proposed to offset adverse effects would be extensive and not guaranteed.

Impacts of Alternative A (No Action)

Topography, geology, and soil resources within the North Entrance Station, Park Street, Gardiner Transportation and Roosevelt Arch area have been previously impacted by earlier land uses, construction activities, and an increase in non-native vegetation establishment. These resources continue to be disturbed through visitor and operations use of the area. Alternative A proposes no new ground disturbing actions; therefore no additional direct effects to topography, geology, and soil resources are anticipated. However, under this alternative; there would be no changes to the storm water management deficiencies. Because of this deficiency, erosion would continue to wash away soils causing gulying and removal of soil horizon. This erosion would be localized along roadsides, culverts and other drainage features. Therefore, impacts would be direct and indirect, local, minor to moderate, long-term and adverse to topography, geology, and soils in the project area under this alternative.

Cumulative Impacts: Continued use of the North Entrance Station, Park Street, Gardiner Transportation and Roosevelt Arch area under Alternative A combined with other activities in the area, including soil tilling from boundary lands area vegetation restoration and construction on private property near YNP, would result in overall adverse minor to moderate, local, long-term cumulative impacts to topography, geology, and soils. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative topography, geology, and soils would be minor.

Impacts of Alternative B (Configuration B)

Under Alternative B scenario, construction activities associated with the plan would result in both adverse and beneficial land disturbances that would alter topography, geology, and soils within the project area. Total topography, geology, and soil disturbance for Alternative B is expected to be approximately 3 acres with a majority of the disturbance within the existing disturbance footprint of the area.

Activities affecting topography, soils, and geology under Alternative B include:

- Construction of new kiosk
- Construction of new administration building
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"

Short and long-term direct effects from Alternative B would include changes to soil physiochemical characteristics due to excavation and other ground disturbance activities, loss of soil to wind and water erosion from alteration to soil structure and removal of vegetation, a decrease in soil biological activity in newly disturbed areas, an increase in soil compaction, and a suitable stratum for establishment of non-native vegetation. A beneficial effect from this project to topography, geology, and soils would be a reduction in water erosion due to improvements to storm water drainage.

To minimize effects to this resource, mitigation measures would be implemented such as topsoil replacement, native vegetation replacement, and noxious weed treatments to reduce impacts of disturbance. Overall, direct and indirect impacts of Alternative B on topography, geology, and soils would be adverse, short and long term, localized, and minor. Beneficial impacts would be localized, minor to moderate, and long-term.

Cumulative Impacts: Current and future ground disturbance activities within the analysis area include operations and visitor use of the area, ground disturbing activities associated with Alternative B, activities associated with soil tilling from the boundary lands area vegetation restoration as well as construction on private property near YNP. These activities would result in adverse, localized, long-term, minor to moderate impacts through alterations in soil characteristics and properties. Revegetation and improving storm water management at Park Street and Roosevelt Arch would result in a localized, beneficial, minor to moderate, and long-term effect on topography, geology, and soils within the project area. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative topography, geology, and soil impacts would be minor.

Impacts of Alternative C (Preferred Alternative)

Implementing Alternative C would have both beneficial and adverse effects on topography, geology, and soils in the project area. Total topography, geology, and soil disturbance for Alternative C is expected to be approximately 4 acres with a majority of the disturbance within the existing disturbance footprint of the area.

Activities affecting topography, soils, and geology under Alternative C include:

- Construction of second kiosk designed to accommodate operations and administration
- Relocation of two kiosks closer to Roosevelt Arch
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"
- Construction of a bypass road

Short and long-term direct effects from Alternative C would be the same as those described for Alternative B with an additional acre due from the construction of the Arch bypass road. To minimize effects to this resource, mitigation measures would be implemented such as topsoil replacement, native vegetation replacement, and noxious weed treatments to reduce impacts of disturbance. Overall, direct and indirect impacts of Alternative C on topography, geology, and

soils would be adverse, localized, and minor; beneficial impacts would be short and long-term, localized, and minor to moderate.

Cumulative Impacts: These impacts would be the same as those described for Alternative B.

Vegetation and Special Status Plant Species

Guiding Principles and Policies

Section 4.4 of the NPS Management Policies (2006) addresses biological resource management including general vegetation management. This policy states that the NPS is to maintain all plants native to park ecosystems. This is to be done by preserving native plant populations, restoring native plant populations when they have been extirpated in parks by past human-caused actions, and minimizing human impacts to native plant populations, communities, and ecosystems and the processes that sustain them.

Guidance for management of rare plants is found in NPS Management Policies Section 4.4.2.3 (Management of Threatened or Endangered Plants and Animals): "The National Park Service will inventory, monitor, and manage state and locally listed plant species of concern in a manner similar to its treatment of federally listed species to the greatest extent possible. In addition, the Service will inventory other native species that are of special management concern to parks (such as rare, declining, sensitive, or unique species and their habitats) and will manage them to maintain their natural distribution and abundance." Adverse impacts to rare plants would be avoided to the extent possible. Impacts that cannot be avoided would be minimized and if possible mitigated by seed collection and plant salvage from on-site or nearby suitable habitats prior to disturbance and re-established following project completion.

Methodology and Impact Thresholds

Park staff performed vegetation inventories of the proposed project area in summer of 2004 for preparation of the Gardiner Basin Workshop. No rare plant species were located within the projected area. Exotic weed species were observed and documented. Additionally, available information on park native vegetation and unique plant communities was used to analyze the effects of the alternatives. The thresholds of change for the intensity of impacts to vegetation are defined as follows:

- Negligible:** No rare plant species or uncommon plant communities would be affected. Individual native plants might be affected, but impacts would be localized, short-term, and of no consequence to the species.
- Minor:** Native vegetation would be affected, but impacts would occur in a relatively minor portion of the species' occurrence(s) within the park. Mitigation measures to offset adverse effects would be followed. Rare plants or uncommon plant communities could be present and individual plants could be affected, but proposed mitigation measures to avoid adverse impacts to the species or community would be effective.
- Moderate:** A sizable segment of native vegetation within the park would be affected, and proposed mitigation measures would be extensive. Rare plant species or

uncommon plant communities could be affected, and proposed mitigation measures to offset adverse effects could be extensive.

Major: Effects on native vegetation within the park, potentially including rare plants or uncommon plant communities would be extensive and long-term. Proposed mitigation measures to offset the adverse effects would be extensive, and success of the mitigation measures would not be guaranteed.

Impacts of Alternative A (No Action)

Vegetation resources within the project area have been previously impacted by earlier land uses, construction activities, and an increase in non-native vegetation establishment. Vegetation resources would continue to be disturbed through visitor and park operations, including user created paths by foot and vehicular traffic resulting in vegetation trampling and human induced spread of non-native vegetation which enables establishment of non-native vegetation. Alternative A proposes no new ground disturbing actions therefore; no additional direct effects to vegetation are anticipated. However, under this alternative, there would be no changes to the storm water management deficiencies. Because of this deficiency, indirect, local, minor, short and long-term adverse impacts to vegetation would continue in this area.

Cumulative Impacts: Continued use of the North Entrance Station, Park Street, Gardiner Transportation Center and Roosevelt Arch area under Alternative A combined with other activities in the area including soil tilling from boundary lands area vegetation restoration and construction on private property near YNP would result in adverse negligible to minor, local, long-term cumulative impacts to vegetation. The ongoing Gardiner Basin restoration project may lead to knowledge that would be used to implement plans to deal with the non-native vegetation in the project area, though, which could lead to beneficial, negligible to minor, local, long-term impacts. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative impacts on vegetation would be negligible.

Impacts of Alternative B (Configuration B)

Under Alternative B scenario, construction activities would result in land disturbance that would alter vegetation in the project area. Improvements under this alternative would have both adverse and beneficial impacts on vegetation within the project area. Total, vegetation disturbance for Alternative B is expected to be approximately 3 acres with a majority of the disturbance within the existing disturbance footprint of the area where the vegetation is low quality. Therefore, most impacts will be to the non-native vegetation that grows in this area.

Activities affecting vegetation under Alternative B include:

- Construction of new kiosk
- Construction of new administration building
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"

Short and long-term direct effects from Alternative B would include disturbance of existing vegetation by removal of ground cover from construction operations and an increase in suitable stratum for establishment of non-native vegetation leading to adverse, localized impacts. Under Alternative B, a new administration building and additional parking would be constructed. Vegetation would be removed in these locations and could provide a niche for non-native vegetation growth or inhibit growth of native vegetation. Development of pedestrian walkways and viewing platforms and relocation of the existing iron fence could potentially disturb existing vegetation within the area. Road widening would create some new disturbance depending on the final alignment but restoration of existing user-created trails and defined walkways could help to mitigate any new disturbance that may occur. A beneficial effect from this project to vegetation would be a reduction in water erosion from improvements to storm water drainage along Park Street and Roosevelt Arch which may result in better surface water infiltration. To minimize effects to this resource, mitigation measures would be implemented such as topsoil replacement, native vegetation replacement and re-contouring, and noxious weed treatments to reduce further impacts of disturbance. Overall, direct and indirect impacts of Alternative B on vegetation would be adverse, short and long term, localized, and minor. Beneficial impacts would be localized, minor to moderate, and long-term.

Cumulative Impacts: Current and future ground disturbance activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and those activities associated with soil tilling from the boundary lands area vegetation restoration and construction on private property near YNP. These activities would result in adverse, localized, long-term, minor to moderate impacts through alterations in soil characteristics and properties. The ongoing Gardiner Basin restoration project may lead to knowledge that would be used to tackle the non-native vegetation in the project area, though, which could lead to beneficial, negligible to minor, local, long-term impacts. Revegetation and improving storm water management at Park Street and Roosevelt Arch would result in a localized, beneficial, minor, and long-term effect on vegetation within the project area. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative vegetation impacts would be minor.

Impacts of Alternative C (Preferred Alternative)

Implementing Alternative C would have both beneficial and adverse effects on vegetation in the project area. Total, vegetation disturbance for Alternative C is expected to be approximately 4 acres with a majority of the disturbance within the existing disturbance footprint of the area. Activities affecting vegetation under Alternative C include:

- Construction of second kiosk designed to accommodate operations and administration
- Relocation of two kiosks closer to Roosevelt Arch
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"
- Construction of a bypass road

While short and long-term direct effects to vegetation resources from Alternative C would impact

an additional acre due to construction of the Arch bypass road where vegetation would be removed in the roadbed and adjacent vegetation may be disturbed, the site is in an area of low quality vegetation. This disturbance may also provide an additional niche for non-native vegetation which could add to a further reduction in native community productivity and diversity for this site.

To minimize effects to this resource, mitigation measures would be implemented such as topsoil replacement, native vegetation replacement and re-contouring, and noxious weed treatments to reduce further impacts of disturbance. Overall, direct and indirect impacts of Alternative C on vegetation would be adverse, localized, and minor; beneficial impacts would be short- and long term, localized, and minor to moderate.

Cumulative Impacts: These would be the same as Alternative B.

Wildlife Resources

Guiding Principles and Policies

Federal laws exist governing wildlife not protected by the Endangered Species Act (1973), including the Migratory Bird Protection Act, the Bald Eagle Protection Act, and the Lacey Act. (Threatened and endangered species and Yellowstone Species of Management Concern are considered separately under “Special Status Wildlife Species” below.)

Section 4.4.1.1 of the 2006 National Park Service Management Policy states that the National Park Service is to maintain all native plant and animal species and their habitat inside parks. “The Service will ... use management strategies that are intended to maintain natural population fluctuations and processes that influence the dynamics of individual plant and animal populations, groups of plant and animal populations, and migratory animal populations in parks.”

Section 4.4.2 of 2006 Management Policies addresses management of native plants and animals in NPS units. It states that natural processes would be relied upon to maintain native plant and animal species and influence natural fluctuations in populations of these species.

Methodology and Impact Thresholds

Impacts to native wildlife (mammals, birds, amphibians, and reptiles) are analyzed in this impact topic based on the knowledge of park resource specialists and current literature. Impacts to USFWS Threatened and Endangered and Yellowstone Species of Management Concern are analyzed under the Species of Concern impact topic.

Yellowstone National Park wildlife biologists used scientific literature, site-specific information, and professional knowledge to define the following intensity thresholds (i.e., degree of change) of impacts to wildlife. For these thresholds, the term *habitat* is defined as the suite of resources (e.g., food, shelter) and environmental conditions (e.g., precipitation, predators) that enable the presence, survival, and reproduction of a population, even if potentially suitable areas are currently unoccupied. *Short-term* effects are defined as those occurring during the implementation of the project, including conservation measures and monitoring of effects and effectiveness, while *longer-term* effects are considered permanent.

The thresholds of change for the intensity of an impact on wildlife resources are defined as follows:

- Negligible:** Adverse or beneficial impacts to individuals, their habitat, or the natural processes sustaining them would be extremely unlikely to occur or not be measurable.
- Minor:** Adverse or beneficial impacts to individuals, their habitat, or the natural processes sustaining them would affect a small, localized portion of the species' range in or near the park. Short- or longer-term disturbances to individuals may occur and/or a small amount of habitat could be permanently modified or removed. However, these impacts would not measurably affect the movements, reproduction, or survival of many individuals, or the demography (i.e., age/sex structure, recruitment rates, survival rates, movement rates, population sizes, population rates of change) of populations. Sufficient habitat would remain available and functional to maintain the viability of all resident and migratory animals in the vicinity of any existing or reasonably foreseeable future developments.
- Moderate:** Adverse or beneficial impacts to individuals, their habitat, or the natural processes sustaining them would affect a moderate portion of the species' range in or near the park. Short- or longer-term disturbances could measurably affect the movements, reproduction, or survival of many individuals, or the demography of populations. However, impacts would not significantly increase the susceptibility of populations in or near the park to environmental or demographic uncertainty (e.g., severe winters, droughts, disease epidemics, skewed age or sex ratios). Sufficient habitat would remain available and functional to maintain the viability of all resident and migratory animals in the vicinity of any existing or reasonably foreseeable future developments.
- Major:** Adverse or beneficial impacts to populations, their habitat, or the natural processes sustaining would be long-term and affect a large proportion of a species' range in or near the park. The susceptibility of populations in or near the park to environmental or demographic uncertainty would significantly increase.

Impacts of Alternative A (No Action)

Alternative A would maintain North Entrance Station, Park Street, Gardiner Transportation Center and the Roosevelt Arch in its current condition, but allow for temporary measures to address immediate safety concerns that were implemented in the 2011 summer season. The additional temporary structure at the North Entrance would remain within the current lane configuration and 'Peak Use' traffic circulation would be similar to circulation patterns that have occurred in the past. Wildlife species using this area have developed a tolerance of low-moderate intensity of daily activities in the area, as they are routinely observed feeding and bedding at certain times of the year while activities within and around the project area occur. Without a change in human activity, development, and vegetation in the project area, wildlife use would generally remain the same and the quality of habitat would remain low due to impacts by earlier land use, an increase in non-native vegetation establishment, construction activities, existing development, and human use. Ungulates and other wildlife species would likely continue to use the habitat within and around the project area during winter and early spring when human activity is low. Within the developed area's existing footprint, some habitat remains for amphibians and reptiles and birds. These species may use habitat within the developed area for nesting, foraging or shelter but densities are likely low. Human presence and

associated activities has also decreased the quality of habitat in areas immediately adjacent to the project area, the size of which depends on the particular species and individual levels of tolerance for human activities. Therefore, impacts to wildlife species would be indirect, local, short- and long-term and minor.

Cumulative Effects: Development and continued use of the North Entrance Station, the Park Street area, and private property near YNP has resulted in the loss or altering of wildlife habitat. The ongoing Gardiner Basin restoration project may over time enhance habitat conditions in and adjacent the project area, but short term impacts during revegetation activities may cause very short term disturbances. Under Alternative A, wildlife would continue to use habitat within and adjacent to the project area and impacts would be negligible to minor, local, and long-term. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative impacts on wildlife would be indirect, local, short-and long-term and minor.

Impacts of Alternative B (Configuration B)

Alternative B proposes a number of activities within the North Entrance Station, Park Street, Gardiner Transportation Center and Roosevelt Arch area that would result in approximately a 3 acre loss of wildlife habitat. A majority of the disturbance would occur within the existing footprint of the area where a substantial amount of human activity and disturbance has occurred over the years.

Activities affecting wildlife under Alternative B include:

- Construction of new kiosk
- Construction of new administration building
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner “Triangle”

Short and long-term direct effects from Alternative B would include potential displacement during construction activities and ‘Peak Use’ visitor activities as well as permanent removal of approximately 3 acres of low quality wildlife habitat. Wildlife species using this area have developed a tolerance of low-moderate intensity of daily activities in the area, as they are routinely observed feeding and bedding at certain times of the year while activities within and around the project area occur. The most prevalent impacts to wildlife would occur during the construction phase of the project. While the disturbance associated with construction could displace wildlife species that utilize or move through the project area, these species would be expected to return once construction activities are completed. Ground disturbance during some construction activities may destroy the nests of some ground-nesting birds. Amphibian or reptile species may be temporarily or permanently displaced to similar habitat in the adjacent area. Disturbance to wildlife would also occur in relation to increased pedestrian activity in the vicinity of walkways, viewing platforms and the Gardiner “Triangle” pathway. Displacement or stress to wildlife from an increase in noise or human related activities would likely occur during times of the busy visitor season. This increase in displacement of stress could cause interference with behavioral activities such as foraging, reproduction, and movement. During ‘Non-Peak Use’ it is

expected that noise levels, human related activities would decrease and wildlife would resume utilization of the area. To minimize effects to wildlife species mitigation measures would be implemented such as native vegetation replacement and noxious weed treatment to reclaim wildlife habitat. All contractors would be trained and required to comply with the park's bear management plan and would be briefed about proper food storage and wildlife encounters to minimize potential conflicts. Given the above discussion, impacts to wildlife from Alternative B would be short- and long-term, adverse and minor to moderate.

Cumulative Impacts: Current and future wildlife habitat disturbance activities would continue in and on adjacent lands in the project area. Cumulative impacts associated with Alternative B are expected to adverse, short and long-term, minor to moderate. This alternative contributes to cumulative impacts associated with other recent or near future park development, or to other sources of habitat loss, including private land development near YNP, climate change, and increased visitor use. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative wildlife would be minor.

Impacts of Alternative C (Preferred Alternative)

Alternative C proposes a number of activities within the project area that would result in approximately a 4 acre loss of low quality wildlife habitat. A majority of the disturbance would occur within the existing footprint of the area where a substantial amount of human activity and disturbance has occurred over the years.

Activities affecting wildlife under Alternative C include:

- Construction of second kiosk designed to accommodate operations and administration
- Relocation of two kiosks closer to Roosevelt Arch
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"
- Construction of a bypass road

Short and long-term direct effects from Alternative C would have similar impacts as discussed under alternative B with additional impacts from construction of the Arch bypass road. Construction of the Arch bypass road would result in permanent habitat loss. A bypass road could impact wildlife by not only removing habitat, but by increasing the level of disturbance and habitat fragmentation; however a substantial amount of disturbance has already impacted this area and most wildlife would not utilize the area during the 'Peak Use' time when the Bypass road would be open due to low quality forage, increased activity of the area, and daytime temperatures. Given the above discussion, impacts to wildlife from Alternative C would be short- and long-term, adverse and minor to moderate.

Cumulative Impacts: These impacts under Alternative C are similar as those detailed within the Alternative B.

Special Status Wildlife Species and Yellowstone Species of Management Concern

Methodology and Impact Thresholds

Impacts to USFWS Threatened and Endangered Species and Yellowstone Species of Management Concern are analyzed in this impact topic based on the knowledge of park resource specialists, current literature, and consultation with USFWS. The thresholds of change for the intensity of an impact on Threatened and Endangered Species and Yellowstone Species of Management Concern are defined as follows:

- Negligible:** Adverse or beneficial impacts to individuals or population of threatened and endangered species or species of concern or to the species habitat that is not measurable or perceptible would be extremely unlikely to occur.
- Minor:** Adverse or beneficial impacts to individuals or population of threatened and endangered species or species of concern or to the species habitat that is measurable, small, and localized may occur. Short- or long-term disturbances to individuals or population and/or a small amount of habitat could be permanently modified or removed. Impacts would not measurably affect the migration patterns, or other demographic characteristic of the population (i.e., age/sex structure, recruitment rates, survival rates, movement rates, population sizes, population rates of change).
- Moderate:** Adverse or beneficial impacts to individuals or population of threatened and endangered species or species of concern or to the species habitat that is measurable, localized, and of consequence would affect a moderate portion of the species/range in the park. Short- or long-term disturbances could measurably affect the migration patterns or other demographic characteristics of a population (i.e., age/sex structure, recruitment rates, survival rates, movement rates, population sizes, population rates of change). Impacts would not significantly increase the susceptibility of populations(s) in or near the park to environmental or demographic uncertainties (e.g., severe winters, droughts, disease epidemics, skewed age or sex ratios).
- Major:** Adverse or beneficial impacts to individuals or population of threatened and endangered species or species of concern or to the species habitats that is measurable, large, long-term, and causes a widespread change across the region. The susceptibility of populations(s) throughout the region to environmental or demographic uncertainty would significantly increase.

Impacts of Alternative A No Action

Alternative A would maintain the project area in its current condition, but allow for temporary measures to address immediate safety concerns that were implemented in the 2011 summer season. The additional temporary structure at the North Entrance would remain within the current lane configuration and 'Peak Use' traffic circulation would be similar to circulation that has occurred in the past. The project area is not within a lynx analysis unit (LAU) and Canada lynx do not reside in this area of the park. Therefore this alternative would have "no effect" on Canada lynx. The potential always exists for human/grizzly bear interactions that would directly affect bears, such as vehicle accidents or habituation to human food sources from illegal

feeding or available garbage. The proximity of this project to the town of Gardiner and the slow speeds of the “Triangle” area would make it unlikely that there would be any increase in vehicle strikes on bears or gray wolves. Any bears or gray wolves found in this area would typically be hazed out of the area to reduce the risk of bear/human interactions. The no-action alternative “may affect but would not likely adversely affect” gray wolves and grizzly bears.

Species of management concern, namely the pronghorn using this area have developed a tolerance of low-moderate intensity of daily activities in the area, as they are routinely observed at certain times of the year feeding and bedding while activities within and around the project area occur. Without a change in human activity, development, and vegetation in the project area, wildlife use would generally remain the same and the quality of habitat would remain low due to impacts by earlier land use, increased non-native vegetation establishment, construction activities, existing development and human use. Nest locations for bald eagles and peregrine falcons are several miles from the project area (Baril pers. comm.). These species may occasionally fly over or use the area to hunt but is unlikely given the habitat. Impacts to Yellowstone species of management concern would be indirect, local, short- and long-term and negligible to minor.

Cumulative Effects: Development and continued use of the North Entrance Station, the Park Street area, and private property near YNP has resulted in the loss or altering of wildlife habitat. The ongoing Gardiner Basin restoration project may over time enhance habitat conditions in and adjacent the project area, but short term impacts during revegetation activities may cause very short term disturbances. Under Alternative A, species of concern would continue to use habitat within and adjacent to the project area and impacts would be negligible to minor, local, and long-term. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative impacts on wildlife would be indirect, local, short-and long-term and minor.

Impacts of Alternative B (Configuration B)

Alternative B proposes a number of activities within the North Entrance Station and Park Street area that would result in approximately a 3 acre loss of wildlife habitat. A majority of the disturbance would occur within the existing footprint of the area where a substantial amount of human activity and disturbance has occurred over the years.

Activities affecting wildlife under Alternative B include:

- Construction of new kiosk
- Construction of new administration building
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner “Triangle”

Short and long-term direct effects from Alternative B would include potential displacement during construction activities and peak visitor activities as well as permanent removal of approximately 3 acres of low quality wildlife habitat.

The project area is not within a lynx analysis unit (LAU) and Canada lynx do not reside in this area of the park. Therefore, this alternative would have “no effect” on Canada lynx. The potential always exists for human/grizzly bear interactions that would directly affect bears, such as vehicle accidents or habituation to human food sources from illegal feeding or available garbage. The proximity of this project to the town of Gardiner and the slow speeds of the “Triangle” area would make it unlikely that there would be any increase in vehicle strikes on bears or gray wolves. Any bears or gray wolves found in this area would typically be hazed out of the area to reduce the risk of bear/human interactions. Impacts from Alternative B “may affect, but would not likely adversely affect” grizzly bears and gray wolves.

Pronghorn have a developed a tolerance of low-moderate intensity of daily activities in the area, as they are routinely observed feeding and bedding certain times of the year while activities at North Entrance Station and Park Street area occur. Displacement or stress primarily to pronghorn would occur during times of peak use in the visitor season. The greatest potential for impacts primarily to the threatened or endangered wildlife species using this area (namely the grizzly bear and wolf) would occur during the construction phase of the project. Nest locations for bald eagles and peregrine falcons are several miles from the project area. These species may occasionally fly over or use the area to hunt but is unlikely given the habitat. Therefore, impacts from this alternative would likely have negligible on bald eagles and peregrine falcons. While the disturbance associated with construction could displace these species that utilize or move through the project area, the numbers using this area would be very low and these species would be expected to return once construction activities are completed. Disturbance to these species would also occur in relation to increased pedestrian activity in the vicinity of walkways, viewing platforms and the Gardiner “Triangle” pathway.

To minimize impacts to wildlife species, mitigation measures would be implemented such as native vegetation replacement and noxious weed treatment to reclaim wildlife habitat. All contractors would be trained and required to comply with the park’s bear management plan and would be briefed about proper food storage and wildlife encounters to minimize potential conflicts

Cumulative Impacts: Current and future wildlife habitat disturbance activities would continue in and on adjacent lands in the project area. Cumulative impacts associated with Alternative B are expected to adverse, short and long-term, minor to moderate. This alternative contributes to cumulative impacts associated with other recent or near future park development, or to other sources of habitat loss, including private land development near YNP, climate change, and increased visitor use. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative impacts on threatened, endangered or species of concern would be minor.

Impacts of Alternative C (Preferred Alternative)

Alternative C proposes a number of activities within the North Entrance Station and Park Street area that would result in approximately a 4 acre loss of low quality wildlife habitat. A majority of the disturbance would occur within the existing footprint of the area where a substantial amount of human activity and disturbance has occurred over the years.

Activities affecting wildlife under Alternative C include:

- Construction of second kiosk designed to accommodate operations and administration
- Relocation of two kiosks closer to Roosevelt Arch

- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner “Triangle”
- Construction of a bypass road

Short and long-term direct effects from Alternative C would include potential displacement during construction activities and permanent removal of approximately 4 acres of wildlife habitat. While this Alternative impacts an additional acre due to the Arch bypass road, it is in an area of low quality habitat, therefore impacts are similar to those described in Alternative B. There would be “no effect” on Canada lynx as the project is not within a LAU. The project “may affect but not likely adversely affect” grizzly bears or wolves.

Cumulative Impacts: These impacts are the same as those described in Alternative C.

Cultural Resources

Impacts to historic properties are described in terms of type, context, duration, and intensity, which is consistent with the regulations of the Council on Environmental Quality (CEQ) that implement the National Environmental Policy Act (NEPA).

Guiding Regulations and Policies

In accordance with the Advisory Council on Historic Preservation’s regulations implementing section 106 of the NHPA (36 CFR Part 800, Protection of Historic Properties), impacts to historic properties for this project were identified and evaluated by (1) determining the area of potential effect (APE); (2) identifying cultural resources present in the area of potential effect that were either listed in or eligible to be listed in the National Register of Historic Places (NR); (3) applying the criteria of adverse effect to affected cultural resources either listed or eligible for NR listing; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Additionally, Yellowstone National Park has entered into a Programmatic Agreement with the Advisory Council on Historic Preservation, the Wyoming State Historic Preservation Office, and the Montana State Historic Preservation Office to streamline the Section 106 consultation for the principal park road system improvements, under which a portion of the North Entrance project will fall. The Programmatic Agreement provides agreed upon standards for documentation, evaluation, and treatment of both historic structures and archeological resources within the APE of each segment of road to be improved. It also provides a streamlined approach for consultation of effect on road structures and features from the proposed project. Changes to the North Entrance Road Historic District and its documented features will be assessed using the roads Multiple Property Document, the National Register nomination and the roads Programmatic Agreement.

Improvements to the parking areas and pedestrian circulation patterns near the Yellowstone Park Transportation Historic District and the Roosevelt Arch National Historic Landmark and the cultural landscape fall within the standard procedures outlined in Section 106 of the National Historic Preservation Act. Preliminary consultation and concurrence of no adverse effect on the

planning concept of the whole project has been completed and received from the Montana State Historic Preservation Office (concurrence received March 21, 2011) and inquiries concerning the project from the Wyoming State Historic Preservation Office have been addressed. Final consultation of effect of the North Entrance project will be conducted through review of this Environmental Assessment. Subsequent site-specific consultations will take place as actions are designed more fully.

Design for most aspects of this project remains at the conceptual stage. While this level of specification is sufficient to identify resources and quantify impacts, it does not allow for determination of effect per Section 106 of the NHPA. Compliance with Section 106 of the NHPA will be conducted at such time as specific elements of the plan are implemented and designs are available for review by the MTSHPPO.

For all cultural resources analyzed here evaluation for eligibility to the National Register has been completed with the exception of the cultural landscape for which evaluation is in process. A cultural landscape inventory (CLI) has been drafted for the planning efforts related the Mammoth Hot Springs Comprehensive Plan. Given the amount of documentation completed for the cultural landscape it is possible to identify which features and characteristics will potentially contribute to the eligibility and therefore analyze impacts to those features. Until determination of eligibility using National Register standards takes place, the cultural landscape will be considered eligible and NPS will proceed as if eligible. Site specific Section 106 consultation would take place after determination of eligibility and prior to any actions being undertaken.

Prehistoric and Historic Archeological Resources

Methodology and Impact Thresholds

Certain important research questions about human history can only be answered by the actual physical material of cultural resources. Archeological resources have the potential to answer, in whole or in part, such research questions as identified in YNP's Treatment Plans for Historic and Prehistoric Archeology associated with the roads, developed by the Midwest Archeological Center, NPS (1993). Archeological sites can be eligible to be listed in the National Register of Historic Places if the site(s) has yielded, or may be likely to yield, information important to prehistory or history; are associated with the lives of significant persons in our past; embody distinctive characteristics of a type, period or method of construction; or are associated with events that have made a significant contribution to the broad patterns of our history.

Archeological sites can be nominated to the National Register at three levels of significance: local, state, or national (see National Register Bulletin "How to Apply the National Register Criteria for Evaluation"). For purposes of analyzing impacts to archeological resources, thresholds of change for the intensity of an impact are based upon the significance of the site and the degree of effect the undertaking has upon the sites character defining features defined using the seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association –in essence, the essential physical features that express the sites significance as a historic property. The thresholds of change for the intensity of impacts to archeological resources are defined as follows:

Negligible: The impact is at the lowest levels of detection – barely measurable with any perceptible consequences to archeological resources. "Negligible" corresponds with a "no effect" determination by the park for Section 106 purposes.

- Minor:** Effects to historic or prehistoric archeological resources would be detectable (e.g., minor impact to non-contributing portion of the site previously impacted by road construction or impacts that do not affect the character-defining features and whose effect would result in little, if any, loss of significance or integrity. The National Register eligibility of the historic or prehistoric archeological site would not be affected by the project. A “minor effect” corresponds to a “no adverse effect” determination by the park for Section 106 purposes as determined through consultation with the SHPO.
- Moderate:** The impact to a National Register eligible archeological site that would have the potential to diminish the significance or integrity of the site that is locally or regionally significant, and may jeopardize its National Register eligibility. A “moderate effect” corresponds to either an “adverse effect” or a “no adverse effect” depending on mitigation measures proposed. Mitigation measures for historic and prehistoric archeological resources are identified in the parks’ road programmatic agreement and are identified through consultation with the SHPO to develop an archeological data recovery plan that would preserve as much of the site as possible and still provide significant archeological data about the site.
- Major:** The impact affects an archeological site that is nationally significant and the effects of the impact cannot be mitigated. A “major effect” would correspond to an “adverse effect” for Section 106 purposes.

There are two archeological site located within the proposed projects area of potential effect. The first site consists of surface prehistoric and historic remnants of past use by both prehistoric people and early pioneers and developers of the new national park. Intensive inventory of the large site has identified the features that best exemplify past use of the area and the Montana State Archeologist has responded in agreement with the park’s identification of those areas and their significance. The second site is the irrigation ditch constructed by Hiram Chittenden. The majority of this site is outside the APE; with only one end of the irrigation system adjacent to the project this site can be avoided.

Much of the area within the site boundary has been previously disturbed by prior road building and entrance station placement. Agricultural practices in the area of potential effect and within the boundary of the archeological site from 1904 to the 1930s have also impacted the surface and subsurface cultural remains. Presently a program to return the area to natural vegetation, providing a better solution for the animals that roam the Northern Range of YNP, has been initiated with the removal of non-native species of plants. Proximity to the town of Gardiner and the amount of visitor use over the years has also impacted the surface archeological remains by unauthorized collection and trampling.

Impacts of Alternative A (No Action)

This alternative will not permanently resolve the issues of traffic congestion at the Roosevelt Arch, the North Entrance Station, along Park Street or through the Gardiner Transportation Center. Natural deterioration of the North Entrance Road structure would contribute to deterioration of the archeological features adjacent to the roadway. Numerous short duration road and road feature repairs would contribute to added impact to the archeological site. Therefore, the no action alternative would result in indirect, local, short-and long-term minor adverse impacts to the NR eligible historic and prehistoric components of the documented archeological site.

Cumulative Impacts: Current and future ground disturbance activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and those activities associated with soil tilling from the boundary lands area vegetation restoration and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid archeological resources. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative impacts on prehistoric and archeological resources would remain indirect, local, short-and long-term, minor and adverse.

Impacts of Alternative B (Configuration B)

This alternative would concentrate the improvements to traffic flow around the North Entrance kiosk by adding an additional entrance kiosk and widening the road corridor in the area by adding a bypass lane for traffic exiting the park and adding two new lanes for traffic entering the park. Although the expansion of the entrance gate area is within the historic and prehistoric archeological site boundary, it is in an area disturbed by a previous entrance station and abandoned but not reclaimed roadbeds. Vehicle parking across from the Park street businesses would be expanded, creating new ground disturbance into the archeological site in that area. Impacts of the widened road corridor and the expansion of the Park Street parking area into the archeological site would add to disturbance of the site but, through on-going sub-surface archeological testing and project design to avoid known cultural features, would have little impact to the National Register qualities of the historic and prehistoric archeological site. Therefore, the minimum action alternative, Alternative B, would result in indirect, local, short-and long-term minor adverse impacts to the NR eligible historic and prehistoric components of the documented archeological site.

Cumulative Impacts: Current and future ground disturbance activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and those activities associated with soil tilling from the boundary lands area vegetation restoration and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid archeological resources. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative impacts on prehistoric and archeological resources would remain indirect, local, short-and long-term, minor and adverse.

Impacts of Alternative C (Preferred Alternative)

The current design of the proposed improvements identified in this alternative was developed to avoid the surface concentrations of cultural remains but prior to disturbance in new areas lacking surface cultural deposits, subsurface testing will be conducted to gain a better understanding of the stratigraphy and identify any buried cultural layers that may exist. New ground disturbance for expanded roadways and parking areas will avoid impact to buried cultural remains to the extent possible. The continued subsurface testing and development of project designs will be conducted in full consultation with the Montana State Historic Preservation Officer and the Montana State Archeologist to avoid adverse impact to the archeological site and its features.

Impacts would be greater than the no action alternative and slightly greater than Alternative B, but they would not constitute much more new ground disturbance in the expanded parking area and roadway adjacent to Park Street. Moving the widened North Entrance kiosk area to the west would increase new ground disturbance although the roadway through that area is currently constructed of fill placed on top of the archeological site. The new widened road corridor would also be constructed of fill atop the landforms resulting in minimum disturbance of the archeological artifacts and features in the area. The parking area/road corridor past the Yellowstone Transportation Historic district will also be expanded but, pending the results of the sub-surface archeological testing in the area, will be designed to avoid impact to significant archeological features. The expanded road and parking area will create a safer situation for all using the bypass road. The creation of a new arch bypass road will also increase impact to the archeological site but in an area where no surface manifestations of the past occupation of the area are present and the broken topography suggests that there will be little buried cultural layers, but sub-surface testing will be conducted prior to any disturbance and the design will reflect avoidance of any significant cultural features. Therefore, alternative C will result in indirect, local, short-and long-term minor adverse impact to the NR eligible historic and prehistoric components of the documented archeological site.

Cumulative Impacts: Current and future ground disturbance activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and those activities associated with soil tilling from the boundary lands area vegetation restoration and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid archeological resources. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative C to cumulative impacts on prehistoric and archeological resources would remain indirect, local, short-and long-term, minor and adverse.

Historic Districts and Contributing Structures

Methodology and Impact Thresholds

The methodology used for assessing impacts to historic structures is based on how the project will affect the features for which the structure is significant. The thresholds for this impact assessment are as follows:

- Negligible:** The impact is at the lowest levels of detection, barely perceptible and not measurable.
- Minor:**
 - Adverse:* The impact is measurable or perceptible, but it is slight and affects a limited area of a structure or group of structures. The impact does not affect the character defining features of a National Register of Historic Places eligible or listed structure and would not have a permanent effect on the integrity of the structure.
 - Beneficial:* Stabilization/preservation of features is in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.
- Moderate:** *Adverse:* The impact is measurable and perceptible. The impact changes one or more character defining feature of a historic structure, but does not diminish the

integrity of the resource to the extent that its National Register eligibility is jeopardized.

Beneficial: Rehabilitation of a structure is in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Major:

Adverse: The impact is substantial, noticeable, and permanent. For National Register eligible or listed historic structures, the impact changes one or more character defining feature(s) of the historic property, diminishing the integrity of the structure to the extent that it is no longer eligible for listing on the National Register.

Beneficial: The impact is of exceptional benefit and the restoration of a structure is in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*.

Impacts of Alternative A No Action

Impacts to the historic structures from the no-action alternative mainly involve deterioration of the North Entrance Road Historic District from continued parking on the edges of the pavement, poor drainage impacting the road base in some areas, and overcrowding of road surfaces during the busy summer months as well as visual impacts from introduction of minor parking and road improvements. The Roosevelt Arch has sustained and will continue to be affected by oversized RV's passing through the arch structure without adequate space. Trampling of the landscape around the arch by visitors wishing for a photograph or a closer view of the arch contributes to erosion damage to the base of the arch. Therefore the impacts of Alternative A on historic districts and contributing features would be direct, local, short- and long-term, minor and adverse.

Cumulative Impacts: Current and future activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid impact to historic districts and contributing features. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative impacts on historic districts and contributing features would remain direct, local short-and long-term, minor and adverse.

Impacts of Alternative B (Configuration B)

Impacts to the historic structures from Alternative B mainly involve widening of the road within the North Entrance Road Historic District, improvements to drainage impacting the road base in some areas, and reduction of congestion on road surfaces during the busy summer months. The Roosevelt Arch has sustained and will continue to be affected by oversized RV's passing through the arch structure without adequate space, but parking in the vicinity of the Arch and more pedestrian viewing opportunity would allow for reduction in trampling of the landscape around the arch by visitors wishing for a photograph or a closer view leading to reduction in erosion around the Arch. Therefore the impacts of Alternative B on historic districts and contributing features would be direct and indirect, local, short- and long-term, minor and adverse, but also indirect, long-term, minor and beneficial.

Cumulative Impacts: Current and future activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid impact to historic districts and contributing features. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative impacts on historic districts and contributing features would remain direct, local short-and long-term, minor and adverse.

Impacts of Alternative C (Preferred Alternative)

Impacts to the historic structures from Alternative C mainly involve widening of the road within the North Entrance Road Historic District from, improvements to drainage impacting the road base in some areas, and reduction of congestion on road surfaces during the busy summer months. The Arch Bypass would reduce the amount of traffic through the Arch and therefore the Roosevelt Arch would be less affected by oversized RV's passing through the arch structure without adequate space. Parking in the vicinity of the Arch and more pedestrian viewing opportunity would allow for reduction in trampling of the landscape around the Arch by visitors wishing for a photograph or a closer view leading to reduction in erosion around the Arch. Therefore the impacts of Alternative C on historic districts and contributing features would be direct and indirect, local, short- and long-term, minor and adverse, but also indirect, long-term, minor to moderate and beneficial.

Cumulative Impacts: Current and future activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid impact to historic districts and contributing features. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative C to cumulative impacts on historic districts and contributing features would remain direct, local short-and long-term, minor and adverse.

Cultural Landscapes

Methodology and Intensity Thresholds

According to the revised Section 106 Regulations, the Criteria of Adverse Effect is as follows:

800.5(a)(1) Adverse effects occur when an undertaking may directly or indirectly alter characteristics of a historic property that qualify it for inclusion in the Register. Reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative also need to be considered.

800.5(a)(2) Examples of adverse effects include physical destruction or damage; alteration not consistent with the Secretary of the Interior's Standards; relocation of a property; change of use or physical features of a property's setting; visual, atmospheric, or audible intrusions; neglect resulting in deterioration; or transfer, lease, or sale of a property out of Federal ownership or control without adequate protections.

If a property is restored, rehabilitated, repaired, maintained, stabilized, remediated, or otherwise changed in accordance with the Secretary's Standards, then it will not be considered an adverse effect (assuming that the SHPO/THPO agrees). Where properties of religious and cultural significance to Indian tribes or Native Hawaiian organizations are involved, neglect and deterioration may be recognized as qualities of those properties and thus may not necessarily constitute an adverse effect.

The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (http://www.nps.gov/history/hps/hli/landscape_guidelines/index.htm) apply.

The thresholds of change for the intensity of impacts to cultural landscapes are defined as follows:

- Negligible:** The impact is at the lowest levels of detection, barely perceptible and not measurable.
- Minor:** *Adverse:* Alteration of a pattern or feature of the landscape would not diminish the overall integrity of the landscape. The determination of effect for §106 would be no adverse effect.
- Beneficial:* Preservation of landscape patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The determination of effect for §106 would be no adverse effect.
- Moderate:** *Adverse:* Alteration of a pattern or feature of the landscape would diminish the overall integrity of the landscape. The determination of effect for §106 would be adverse effect. A Memorandum of Agreement (MOA) is executed among the NPS and applicable state or tribal historic preservation officer and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts will reduce the intensity of impact under NEPA from major to moderate.
- Beneficial:* Rehabilitation of a landscape or its patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The determination of effect for §106 would be no adverse effect.
- Major:** *Adverse:* Alteration of a pattern(s) or feature(s) of the landscape would diminish the overall integrity of the landscape. The determination of effect for §106 would be adverse effect. Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation officer and/or Advisory Council are unable to negotiate and execute a memorandum of agreement in accordance with 36 CFR 800.6(b).
- Beneficial:* Restoration of a landscape or its patterns and features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The determination of effect for §106 would be no adverse effect.

Impacts of Alternative A No Action

Under Alternative A –No Action alternative, improvements at the North Entrance Station, Gardiner Transportation Center, Park Street, and Roosevelt Arch area would not occur. Existing

vehicular traffic patterns and circulation would remain as currently organized and managed. Continued unstructured parking along the edges of pavement will cause further deterioration of pavement edges along the North Entrance Road and the Old Road at the YPT Co HD. Unstructured parking of large oversized vehicles along Park Street will block views through the iron fence and into the park for visitors heading toward the Arch entrance.

The no action alternative would result in negligible long-term adverse and no beneficial impacts to cultural landscapes and the determination of effect under §106 would be no adverse effect.

Cumulative Impacts: Coupled with past, present, and foreseeable future actions, the incremental contribution of Alternative A on cultural landscapes would be long-term and negligible.

Impacts of Alternative B (Configuration B)

Under Alternative B, actions affecting cultural landscapes would result in minor long-term adverse and beneficial impacts on cultural landscapes in the APE. The activities include:

- Construction of new kiosk
- Construction of new administration building
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- New entrance sign at the intersection of Hwy 89 and Park Street in Gardiner, Montana
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner “Triangle”

Changes to the Roosevelt Arch setting would include the pedestrian walkways and viewing platform at the Arch itself and along the curved road down to Arch Park, which did not exist during the period of significance. However, pedestrians are currently walking along these areas in order to photograph the Arch, and these walkways would delineate where they can walk safely. The fence would be compatible with the style used during the period of significance. It would be the only vertical feature placed within the Arch setting. A mile-long universally accessible pathway around the Gardiner Triangle would be constructed to provide additional safer visitor experience. The historic iron fence will be moved to accommodate increased parking along Park Street. However, it will continue to be used in the same way and same orientation as it was historically – along the south edge of Park Street. A new entry kiosk and administrative building will be placed at the opposite end of the Gardiner Flats. These buildings will be relatively small within the landscape and placed near an existing group of buildings (YPT Co) rather than out in the middle of the open space. These changes will not diminish the integrity of setting enough to constitute an adverse effect under §106, since they follow the Secretary of Interior Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.

Changes to the North Entrance Road setting would include those described above for the Roosevelt Arch NHL; however, the end of the period of significance is 32 years later and therefore the changes constitute less alteration of the setting. Widening the North Entrance road is not perceivable in this large landscape. The additional parallel parking created along the road

is a continuation of parking that existed in that general location during the period of significance. The redesign of parking at Park Street and the new entrance sign at the 2nd Street intersection are also continuation of existing uses and patterns in a more organized manner, following the Secretary of Interior Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. The changes proposed are less in Alternative B than in Alternative C. These changes will not diminish the integrity of setting enough to constitute an adverse effect under §106.

Changes to the YPT Co setting would include the Gardiner Transportation Center bypass. The bypass is a continuation of existing uses and patterns and follows the Secretary of Interior Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. A new fence will be constructed and appropriately maintained to screen existing parking areas, which remain relatively consistent in capacity. A bypass road will be built into the Gardiner Flats on the other side of the fence. Existing lawns, vegetation, and other landscape characteristics will remain. The addition of an administration building at the edge of this district will utilize existing circulation routes. These changes will not diminish the integrity of setting enough to constitute an adverse effect under §106.

The changes proposed to the cultural landscapes of the three historic properties in the APE are less in Alternative B than in Alternative C. Alternative B would result in minor, long-term adverse and minor long-term beneficial impacts to cultural landscape characteristics. Under §106, this would be considered no adverse effect. These alterations are considered a *rehabilitation* under, and are consistent with, the Secretary of Interior Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes.

Cumulative Impacts: Current and future activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid impact to cultural landscapes. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative impacts on cultural landscapes would remain direct, local short-and long-term, negligible and adverse.

Impacts of Alternative C (Preferred Alternative)

- Construction of second kiosk designed to accommodate operations and administration
- Relocation of two kiosks closer to Roosevelt Arch
- Construction of additional parking
- Road widening
- Relocation of existing iron fence
- New entrance sign at the intersection of Hwy 89 and Park Street in Gardiner, Montana
-
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"
- Construction of a bypass road

Changes to the Roosevelt Arch setting would be the Arch bypass road that will add a new

opening in the historic iron fence. This alternative also includes the pedestrian walkways and viewing platform along the curved road down to Arch Park. Pedestrians are currently walking along these areas in order to photograph the Arch, and these walkways would delineate where they can walk safely. This fence and some traffic signs (Arch bypass) would be the only vertical features placed within the arch setting. The historic iron fence will be moved south to accommodate increased parking along Park Street. However, it will continue to be used in the same way and orientation as it was historically – along the south edge of Park Street. A new entry kiosk and administrative building will be placed at the opposite end of the Gardiner Flats. These buildings will be relatively small within the landscape and placed near an existing group of buildings (YPT Co Historic District) rather than out in the middle of the open space. These changes will not diminish the integrity of setting enough to constitute an adverse effect under §106, since they do not introduce vertical structures in the open space around the arch.

Changes to the North Entrance Road setting would include those described above for the Roosevelt Arch NHL, however, the end of the period of significance is 32 years later and therefore the changes constitute less alteration of the setting; widening the North Entrance road not perceivable in this large landscape. The additional parallel parking created along the road is a continuation of parking that existed in that general location during the period of significance. A mile-long universally accessible pathway around the Gardiner “Triangle” will be constructed to provide additional safer visitor experience. The redesign of parking at Park Street and the new entrance sign at the 2nd Street intersection are also continuation of existing uses and patterns in a more organized manner. Re-routing Park Street so that the parking lot is closer to the businesses and the road runs along the iron fence is an improvement to the current layout, as visitors can have unobstructed views into the park as they travel towards the park entrance. The changes proposed around the North Entrance Road Historic District setting are greater in Alternative C than in Alternative B. These changes will not diminish the integrity of setting enough to constitute an adverse effect under §106.

Changes to the YPT Co Historic District would include the Gardiner Transportation Center parking lot, which would extend into the Gardiner Flat. Existing lawns, vegetation, and other landscape characteristics will remain. These changes will not diminish the integrity of setting enough to constitute an adverse effect under §106.

The changes proposed to the cultural landscapes of the three historic properties in the APE are greater in Alternative C than in Alternative B. Alternative C would result in minor long-term adverse impacts to cultural landscape characteristics. Under §106, this would be considered no adverse effect.

Cumulative Impacts: Current and future activities within the analysis area include operations and visitor use of the North Entrance Station and Park Street area and construction on private property near YNP. Within NPS boundaries, these activities would be designed to avoid impact to cultural landscapes. Outside NPS boundaries, these activities would result in adverse, localized, long-term, minor to moderate impacts if proper historic property identification and mitigation would not take place. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative C to cumulative impacts on cultural landscapes would remain direct, local short-and long-term, negligible and adverse.

Social and Economic Resources

Visitor Use and Experience

Guiding Principles and Policies

The NPS Management Policies 2006 state that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of national parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy them (Section 1.4.3).

Yellowstone National Park's 2009 visitation was over 3.2 million people (NPS, 2010). Recreation activities include hiking, backpacking, camping, viewing (nature, wildlife, cultural sites, and scenic canyon and valley vistas), experiencing thermal features (geysers, mudpots), photography, painting, lodging at several historic hotels, fishing, boating, horseback riding, and enjoying backcountry wilderness areas or front country social settings.

Methodology and Impact Thresholds

The impact intensities for visitor use and experience are as follows:

- Negligible:** Impacts would be slight, and if detectable, would be very short-term and highly localized. Visitors would not likely be aware of them or affected by them. There would be no noticeable change in visitor use and experience in any defined indicators of visitor satisfaction or behavior.
- Minor:** Impacts would be detectable but short-term and localized. Visitors would likely be aware of impacts associated with implementation of the alternative, but recreational use and/or experience would not be diminished or improved. Changes in visitor use and/or experience would be slight and detectable, but would not appreciably limit or enhance critical characteristics of the visitor experience. Visitor satisfaction would remain stable.
- Moderate:** Impacts would be detectable and could be short- or long-term, but would not be localized. Visitors would be aware of impacts associated with implementation of the alternative and visitor use and/or experience would be diminished or improved somewhat. A few critical characteristics of the existing visitor experience would change, and the number of visitors engaging in a specified activity would be altered. Some visitors participating in that activity or visitor experience might be required to pursue their choices in other available local or regional areas. Visitor satisfaction at the park would begin to either decline or increase.
- Major:** Impacts would be detectable, frequent, long-term, and cover a large area. Visitors would be readily aware of impacts associated with implementation of the alternative and visitor use and/or experience would be substantially diminished or increased. A number of critical characteristics of the existing visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. Large numbers of visitors overall who desire to continue using and enjoying that activity or visitor experience would be required to pursue their choices in other available local or regional areas. Overall visitor satisfaction would markedly decline or increase.

Impacts of Alternative A No Action

Impacts on visitor experience would remain as current conditions under Alternative A. While some improvement may be reached with the interim measures implemented for the 2011 summer season, the North Entrance would continue to provide a congested and busy entry experience. During 'Peak Use' long lines of vehicles may occur since both visitors and employees will be sharing the same entry lanes. Parking along Park Street and near the Roosevelt Arch will remain unorganized leading to continued visitor frustration, route finding problems and safety concerns. Currently there are no designated crosswalks or walkways for visitors who park on the south side of Park Street and want to access Gardiner businesses or who want to take a photograph of Roosevelt Arch. The lack of designated crosswalks and walkways contributes to an unsafe overlap of pedestrians and vehicle traffic. The road through the Gardiner Transportation Center would remain as the primary exit for the North Entrance Station during 'Peak Use', resulting in a highly congested area mixed with commercial operations, pedestrians and visitor traffic. Because visitor experience remains relatively unimproved, impacts would be direct and indirect, short- and long-term, adverse and minor to moderate.

Cumulative Impacts: Other actions that could cumulatively impact visitor experience would be other road construction activities in and outside the park, crowded conditions in developed areas in the park and gateway communities as well as congestion around other heavily visited viewpoints in and outside the park. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative impacts on visitor experience would be direct and indirect, short-and long-term, minor and adverse.

Impacts of Alternative B (Configuration B)

While short-term, minor adverse impacts may occur to visitors because of construction delays related to these improvements, impacts on visitor experience would be improved under Alternative B. Changes to the North Entrance Station would provide for less congestion and a more pleasant entry experience as traffic would be expedited and visitors spend less time in line waiting. Vehicle, bicycle and foot traffic from the Old Gardiner Road may experience a more difficult exit access because of the additional kiosk and merging of employee and delivery traffic. Parking along Park Street and near the Roosevelt Arch would be increased in size and better organized, leading to better route finding and reduced safety concerns. Addition of new signage, walkways and viewpoints would provide for a more pleasant visitor experience because visitors could move at a more leisurely pace with viewing and photographing the Roosevelt Arch. More opportunity would be provided for education and enjoyment of Gardiner facilities because visitors would have better access to parking and less worry around long entrance lines. A mile long pedestrian pathway around the perimeter of the Gardiner "Triangle" would provide viewing and recreational opportunities for visitors. Visitor traffic would not be mixed with commercial or employee traffic, especially on the Gardiner Transportation Center road which would reduce congestion and improve safety into the North Entrance of the Park. During construction, noise and dust from construction activities could adversely affect visitor use and experience; however all construction-related impacts would be temporary and cease following construction activities. Therefore impacts to visitor experience under Alternative B would be direct and indirect, short- and long-term, minor to moderate and beneficial.

Cumulative Impacts: Other actions that could cumulatively impact visitor experience would be other road construction activities in and outside the park, crowded conditions in developed areas in the park and gateway communities as well as congestion around other heavily visited

viewpoints in and outside the park. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative impacts on visitor experience would be direct and indirect, short-and long-term, minor and beneficial.

Impacts of Alternative C (Preferred Alternative)

Impacts under Alternative C would be the same as those described in Alternative B with the addition of the Arch bypass road and relocation of the North Entrance Station. While short-term, minor adverse impacts may occur to visitors because of construction delays related to these improvements, impacts on visitor experience would be improved more under Alternative C than B. The Arch bypass road would move visitors more efficiently into and through the Park Street area and provide better organization of traffic circulation. Visitors not wanting to stop at the Roosevelt Arch would be able to move away from the area, reducing congestion around the Arch. Vehicle, bicycle and foot traffic from the Old Gardiner Road would have easier exit access to merge with inbound and outbound traffic because the Entrance Station would be moved approximately 500 feet to the northwest.

Cumulative Impacts: Same as those described in Alternative B.

Socioeconomics

Guiding Principles and Policies

NPS Management Policies do not specifically address socioeconomics; however, nearly every action or proposal that is evaluated in this NEPA process has either a direct or indirect effect on socioeconomics. This section analyzes how the alternatives would impact use of the area and how this use would impact economic activity within the area.

Methodology and Impact Thresholds

Analyses of the potential intensity of impacts to socioeconomics were derived from the Yellowstone Atlas project (in development by NPS). The impact intensities for socioeconomics are as follows:

- Negligible:** Visitors/businesses would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not likely be aware of the effects associated with the alternative.
- Minor:** Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor/business would be aware of the effects associated with the alternative, but the effects would be slight.
- Moderate:** Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor/business would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.
- Major:** The impact on socioeconomics would be measurable and perceptible and would involve a large number of businesses across the Intermountain West, including several states outside the GYA.

Impacts of Alternative A No Action

The economic and social influences associated with the park's presence, its operations and staff, and visitors attracted to the area would continue. While the Park would remain an important factor in the socioeconomic landscape, its operations and functioning under Alternative A would result in no change in socioeconomic factors and no impacts would be expected. Under Alternative A, no changes would occur to improve the North Entrance, Park Street, Roosevelt Arch visitor services. Parking and access to businesses would remain disorganized without ample space for oversized vehicles.

Cumulative Impacts: There would be no adverse or beneficial impacts on socioeconomic resources under Alternative A because conditions would remain as current. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative A to cumulative socioeconomics would be negligible.

Impacts of Alternative B (Configuration B)

Improvements from Alternative B could have a minor, long-term, beneficial economic impact on the community of Gardiner, Montana because delineated parking and pedestrian walkways and viewing platforms would provide enhanced access to many of the downtown businesses. Short-term beneficial impacts would also occur during construction activities which would bring a temporary influx of contractors into the community. Improvements from Alternate B could have a minor, long-term, beneficial economic impact on concessioners operating in the Gardner Transportation Center because of reduced congestions for incoming and outgoing deliveries. This smoother operation could save the concessioners in expenses related to this reduced congestion. Temporary employment due to construction activities involving non-local contractors would be negligible to the local economy because of the length of time this project would take to complete.

Cumulative Impacts: There would be no adverse impacts on socioeconomic resources under Alternative B but long-term, minor beneficial impact would occur because better parking and access to Gardiner businesses would be provided. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative B to cumulative socioeconomics would be negligible.

Impacts of Alternative C (Preferred Alternative)

Impacts under Alternative C to socioeconomics would be the same as those described in Alternative B with the addition of the Arch bypass road which would provide for more traffic passing by the Park Street area and downtown businesses.

Cumulative Impacts: There would be no adverse impacts on socioeconomic resources under Alternative C but long-term, minor beneficial impact would occur because better parking and access to Gardiner businesses would be provided. Coupled with past, present and foreseeable future actions, the incremental contribution of Alternative C to cumulative socioeconomics would be negligible.

Park Operations

Guiding Principles and Policies

NPS Management Policies do not contain a specific chapter on park operations; however, virtually every action or proposal that is evaluated in this NEPA process has either a direct or indirect effect on park operations. There are also a number of director's orders that pertain to park operations as well.

Methodology and Impact Thresholds

Impacts to park operations focus on (1) employee and visitor health and safety, (2) ability to protect and preserve resources, (3) staff size (whether staffing needs to be increased or decreased), (4) existing and needed facilities, (5) communication (i.e., telephones, radio, computers, etc.), and (6) appropriate utilities (sewer, electric, water). Park staff knowledge was used to evaluate the impacts of each alternative and is based on the description of park operations presented in the Affected Environment.

Impacts to park concessioner operations focus on safe pedestrian and vehicle operations in front the Gardiner Transportation Center and road and more room to handle deliveries.

The impact intensities for park operations are as follows:

- Negligible:** Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.
- Minor:** The effect would be detectable, but would be of a magnitude that would not have an appreciable adverse or beneficial effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.
- Moderate:** The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- Major:** The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

Impacts of Alternative A No Action

Under Alternative A, park operations would continue unchanged, except for the temporary measures to address the immediate safety concern that was implemented for the 2011 summer season. A new 'shed' style kiosk was constructed containing a second register, doubling the pay transaction capacity of the operation. All 'inbound' visitor traffic would enter YNP through the Roosevelt Arch; the road between the Arch and North Entrance Station would become one-way, allowing two lanes of traffic staging for the entrance station operation. Outbound traffic

from YNP would exit towards the Gardiner Transportation Center. This temporary measure would move the line of entering vehicles more quickly to ensure that NPS employees do not have to work in moving traffic during 'Peak Use'. Even with implementation of this temporary measure, the overall setup would still serve as the primary administrative infrastructure for employees as well as house security and telecommunications equipment vital to park communications.

Deficiencies associated with the current storm water management system would not be addressed under this alternative. Storm water would continue to pool and create safety issues during rainy and icy conditions. Park operations would have to continue to address these conditions, particularly in the winter when they create unsafe conditions for employees walking to the North Entrance Station.

Cumulative Impacts: Any project that occurs in the park has a potential to affect park operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and park operations. Projects such as the Gardiner Basin Restoration Project and the Mammoth Comprehensive Plan along with the impacts of this proposed project involve many park and concessions staff. Under Alternative A, impacts to park operations would be local, adverse, moderate, and long-term. Coupled with past, present and foreseeable future actions the incremental contribution of Alternative A to cumulative park operations would be adverse, major, and long-term.

Impacts of Alternative B (Configuration B)

Under Alternative B, installation of a new kiosk and administrative building would ensure that park operations would have a functional administrative infrastructure that would incorporate OSHA standards, building security, telecommunication equipment and utility upgrades. This alternative would provide a working environment for park employees that meet OSHA and security standards and safe entry/egress for concession employees and deliveries.

Activities affecting park and concessioner operations under Alternative B include:

- Construction of new kiosk
- Construction of new administration building
- Construction of additional parking
- Road widening
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner "Triangle"
- Improvement of the Gardiner Transportation parking and relocation of the road approximately 40 feet

Improvements to storm water deficiencies would improve site drainage by reducing the amount of pooling water during rainy and icy conditions and reducing the chances for slipping hazards. Entry for employees and deliveries would be expedited since this traffic would bypass the entrance kiosk and merge with visitor traffic beyond the kiosk. Location of the NPS administration building may have both beneficial and adverse and short and long-term impacts on park operations. Under certain situations it may be beneficial to have the building separate from the North Entrance Station and in other situations it may be present an inconvenience to

entrance staff. Development of pathways around the Gardiner “Triangle”, Roosevelt Arch, and Park Street may increase the maintenance workload beyond existing conditions but the overall change in operations would be minor. Additional parking at the Gardiner Transportation Center would provide an area to stage and maneuver oversize vehicles and segregate traffic from employees accessing their work site without interfering with traffic from the roadway and causing possible delays. These effects would have a beneficial, moderate and long-term impact on employee communication, work environment, cohesion, and efficiency.

Cumulative Impacts: Projects listed in the cumulative scenario, along with Alternative B are expected to have beneficial, moderate and long-term effects on park operations due to the improvements to storm water deficiencies, construction of a functional administrative building, expedited entry for employees and deliveries, and additional parking at the Gardiner Transportation Center.

Impacts of Alternative C (Preferred Alternative)

Movement and the North Entrance Station and improvements to Park Street, Gardiner Transportation Center and Roosevelt Arch would enhance the park’s ability to provide a safe employee work environment and improve the quality and efficiency of overall park operations at this location. These effects would have a beneficial, moderate and long-term impact on employee communication, work environment, cohesion, and efficiency because park employees would be able to perform Entrance Station operations and administrative duties in one location. Employees would not have to leave the building to cross traffic flow to a separate administration building. Other impacts to Alternative C would be similar to those described in Alternative B.

Activities affecting park and concessioner operations under Alternative C include:

- Construction of second kiosk designed to accommodate operations and administration
- Relocation of two kiosks closer to Roosevelt Arch
- Construction of additional parking
- Road widening
- Improvement of storm water management
- Development of pedestrian walkways and viewing platforms
- Development of a mile long universally accessible pathway around the Gardiner “Triangle”
- Construction of a bypass road
- Improvement of the Gardiner Transportation parking and relocation of the road approximately 40 feet

Cumulative Impacts: Projects listed in the cumulative scenario, along with Alternative C are expected to have beneficial, moderate and long-term effects on park operations due to improvements to storm water deficiencies, movement of the North Entrance Station, expedited entry for employees and deliveries, additional parking at the Gardiner Transportation Center, and construction of the bypass road that would allow Entrance Station staff to operate the North Entrance road as a two-way or one-way road.

CHAPTER 5 - CONSULTATION AND COORDINATION

Internal Scoping

Internal scoping was conducted by an interdisciplinary team of professionals from YNP. Interdisciplinary team members met to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed project site.

External Scoping

External scoping was conducted to inform various agencies and the public about the proposal to make changes to the North Entrance and Park Street area within YNP and to generate input on the preparation of this environmental assessment. The scoping effort began on May 19, 2010 with a press release, mailing to interested parties, and posting of a scoping newsletter on the NPS Planning, Environment and Public Comment (PEPC) website. The 30-day scoping period ended on August 19, 2010.

A total of 52 pieces of correspondence containing 130 distinct comments were received through PEPC. Scoping comments are discussed further in Chapter 1, *Purpose and Need*.

Agency Consultation

In accordance with the Endangered Species Act, the NPS contacted the U.S. Fish and Wildlife Service with regards to federally listed special status species for the *Parkwide Road Improvement Plan* in 2008 which includes the North Entrance Road. A biological assessment was prepared by the park, and a subsequent biological opinion was issued by the U.S. Fish and Wildlife Service. The parkwide biological assessment and biological opinion for the entire parkwide road plan allowed for a “take” of two wolves in any given year and a “take” of six bears in a consecutive three year period. While this project is a component of the overall *Parkwide Road Improvement Plan*, it would not have the same degree of impact and the impact would be less. For project specific impacts refer to Chapter 4: Special Status Wildlife Species. Section 7 determinations of effect for this project on Threatened and Endangered Species are “no effect” to Canada lynx and “may affect but not likely to adversely affect” grizzly bears and gray wolves.

For all cultural resources analyzed here evaluation for eligibility to the National Register has been completed with the exception of the cultural landscape for which evaluation is in process. A cultural landscape inventory (CLI) has been drafted for the planning efforts related the Mammoth Hot Springs Comprehensive Plan. Given the amount of documentation completed for the cultural landscape it is possible to identify which features and characteristics will potentially contribute to the eligibility and therefore analyze impacts to those features. Until determination of eligibility using National Register standards takes place, the cultural landscape will be considered eligible and NPS will proceed as if eligible. Site specific Section 106 consultation would take place after determination of eligibility and prior to any actions being undertaken.

YNP has entered into a Programmatic Agreement with the Advisory Council on Historic Preservation, the Wyoming State Historic Preservation Office, and the Montana State Historic Preservation Office to streamline the Section 106 consultation for the principal park road system improvements, under which a portion of the North Entrance project will fall.

Improvements to the parking areas and pedestrian circulation patterns near the Yellowstone Park Transportation Historic District and the Roosevelt Arch National Historic Landmark and the cultural landscape fall within the standard procedures outlined in Section 106 of the National Historic Preservation Act. Preliminary consultation and concurrence of no adverse effect on the planning concepts of the whole project has been completed and received from the Montana State Historic Preservation Office (concurrence received March 21, 2011) and inquiries concerning the project from the Wyoming State Historic Preservation Office have been addressed. Final consultation of effect of the North Entrance project will be conducted through review of this Environmental Assessment. Subsequent site-specific consultations will take place as actions are designed more fully. The results of this consultation are described in the *Cultural Resources* section in the *Environmental Consequences* chapter.

Native American Consultation

A scoping letter describing the proposed action was mailed to 102 Native American tribal government officials and tribal members belonging to the 26 tribes traditionally associated with YNP. No comments or correspondence related to the proposed action have been received at the time of this writing. The following tribes were consulted:

Assiniboine & Sioux Tribes, Fort Peck
Blackfeet Tribe
Cheyenne River Sioux Tribe
Chippewa Cree Tribe
Coeur d'Alene Tribe
Comanche Tribe of Oklahoma
Confederated Salish and Kootenai Tribes
Confederated Tribes of the Colville Indian Reservation
Confederated Tribes of the Umatilla Indian Reservation
Crow Creek Sioux Tribe
Crow Tribe
Eastern Shoshone Tribe
Flandreau Santee Sioux Tribe
Gros Ventre and Assiniboine Tribes
Kiowa Tribe of Oklahoma
Lower Brule Sioux Tribe
Nez Perce Tribe
Northern Arapaho Tribe
Northern Cheyenne Tribe
Oglala Sioux Tribe
Rosebud Sioux Tribe
Shoshone-Bannock Tribes
Sisseton-Wahpeton Sioux Tribe
Spirit Lake Sioux Tribe
Standing Rock Sioux Tribe

Turtle Mountain Band of Chippewa Indians
--

Yankton Sioux Tribe

Release of this EA will be accompanied by additional correspondence to the tribal mailing list to request input and comments.

Environmental Assessment Review and List of Recipients

The EA will be released for public review on July 14, 2011. To inform the public of the availability of the environmental assessment, the National Park Service will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the park's mailing list, as well as posted on the Planning, Environment and Public Comment website (link below). Copies of the environmental assessment will be available on the internet at <http://parkplanning.nps.gov/yell>. Copies of the document will also be provided to interested individuals, upon request by writing to the address at the beginning of this document.

The EA is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the NPS address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the environmental assessment, as needed.

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APPENDIX A - IMPAIRMENT

National Park Service's *Management Policies, 2006* require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values.

However, the laws do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within park, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible M{S manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of these resources or values. An impact to any park resource or value may, but does not necessarily, constitute an impairment, but an impact would be more likely to constitute an impairment when there is a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to pursue or restore the integrity of park resources or values and it cannot be further mitigated.

The park resources and values that are subject to the no-impairment standard include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and

- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. The NPS's threshold for considering whether there could be an impairment is based on whether an action would have major (or significant) effects.

Impairment findings are not necessary for visitor use and experience, socioeconomics, public health and safety, environmental justice, land use, and park operations, because impairment findings relates back to park resources and values, and these impact areas are not generally considered park resources or values according to the Organic Act, and cannot be impaired in the same way that an action can impair park resources and values. After dismissing the above topics, topics remaining to be evaluated for impairment include: topography, geology, and soils; vegetation; wildlife; threatened/endangered and species of concern; historic and prehistoric archeological resources; historic structures; and cultural landscapes. Fundamental resources and values for Yellowstone National Park are identified in the *Master Plan* and *Foundation Statement*.

- **Topography, Geology, and Soils** – Yellowstone National Park is about 2.2 million acres in size, 98 percent of which is undeveloped. This project would impact about 4 acres of land adjacent to the roadway through widening. To minimize effects to this resource, mitigation measures would be implemented such as topsoil replacement, native vegetation replacement in areas with existing native vegetation, and noxious weed treatments to reduce impacts of disturbance. Overall, direct and indirect impacts on topography, geology, and soils would be adverse, localized, and minor; beneficial impacts would be short and long-term, localized, and minor to moderate because erosion potential would be decreased. Given adverse impacts are minor and short-term there would be no impairment to topography, geology, or soils.
- **Vegetation** – As described above, the project would impact about 4 acres of vegetation adjacent to the roadway. To minimize effects to this resource, mitigation measures would be implemented such as topsoil replacement, native vegetation replacement in areas with existing native vegetation, and noxious weed treatments to reduce impacts of disturbance. Overall, direct and indirect impacts of Alternative C on vegetation would be adverse, localized, and minor; beneficial impacts would be short- and long term, localized, and minor to moderate due to reduction in erosion. Given adverse impacts are minor and short-term there would be no impairment to vegetation.
- **Wildlife** – Yellowstone National Park has an abundance of wildlife within its 2.2 million acres. Short and long-term direct effects would include potential temporary displacement during construction activities and permanent removal of approximately 4 acres of wildlife habitat including reduction in space for wildlife movement. Displacement or stress to wildlife would occur during construction and times of peak use in the busy visitor season. Given the localized and temporary nature, impacts would be short- and long-term, adverse and minor to moderate and therefore would not lead to impairment to wildlife.
- **Special Status Species** – Yellowstone National Park is home to the threatened Canada lynx, and grizzly bear. The gray wolf is considered an experimental population and also considered threatened within the park. An additional entrance station kiosk, as well as other improvements to increase efficiency would have very little affect on special status species. Road alignments would remain the same and no change in speed limits would occur. No loss of habitat currently used by threatened or endangered species within the park would be lost. While impacts to wolves and grizzly bears could occur, they would be considered

negligible. The project is outside any lynx analysis unit and Canada lynx would not be affected. With the implementation of conservation measures from the USFWS biological opinion, and mitigation measures listed in this EA, no impairment of special status species would occur.

- **Historic and Prehistoric Archeological Resources** – Yellowstone National Park has had continuum of human habitation for 11,000 years. As such, thousands of historic and prehistoric sites exist, many un-surveyed as yet. Given the two known archeological sites in the project area would be avoided and/or sub-surface testing would be conducted prior to any disturbance leading to project design that reflects avoidance of any significant cultural features in consultation with MT SHPO, impacts would result in indirect, local, short-and long-term minor adverse impact to the NR eligible historic and prehistoric components of the documented archeological sites. For these reasons, historic and prehistoric archeological resources would not be impaired.
- **Historic Districts and Contributing Structures**– Impacts to the historic structures mainly involve widening of the road within the North Entrance Road Historic District from, improvements to drainage impacting the road base in some areas, and reduction of congestion on road surfaces during the busy summer months. The Arch bypass would reduce the amount of traffic through the Arch and therefore the Roosevelt Arch would be less affected by oversized RV's passing through the arch structure without adequate space. Parking in the vicinity of the Arch and more pedestrian viewing opportunity would allow for reduction in trampling of the landscape around the Arch by visitors wishing for a photograph or a closer view leading to reduction in erosion around the Arch. Therefore the impacts on historic districts and contributing features would be direct and indirect, local, short- and long-term, minor and adverse, but also indirect, long-term, minor to moderate and beneficial. For these reasons, historic districts and contributing structures would not be impaired.
- **Cultural Landscapes** – Within the project area, the changes proposed to the cultural landscapes of the three historic properties will not diminish the integrity of setting enough to constitute an adverse effect under Section 106. Therefore the project would result in minor long-term adverse impacts to cultural landscape characteristics and no impairment to cultural landscapes would occur.

In addition, mitigation measures for these resources would further lessen the degree of impact to and help promote the protection of these resources. Park Service staff would monitor all reconstruction and rehabilitation activities to minimize potential damage to any of the park resources discussed above.

In conclusion, as guided by this analysis, good science and scholarship, advice from subject matter experts and others who have relevant knowledge and experience, and the results of public involvement activities, it is the Superintendent's professional judgment that there would be no impairment of park resources and values from implementation of the preferred alternative.