CHAPTER 11. RECREATIONAL RESOURCES

11.1 INTRODUCTION

This chapter discusses potential environmental consequences associated with implementation of the alternatives within the region of influence (ROI) for each resource. A description of the affected environment for each resource is provided in Volume 2 (Marine Corps Relocation – Guam). The locations described in Volume 2 include the ROI for the utilities and roadway projects with the chapters presented in the same order as in this volume.

11.2 ENVIRONMENTAL CONSEQUENCES

11.2.1 Approach to Analysis

11.2.1.1 Methodology

Utilities

Information on recreational resources on Guam and public access was collected through stakeholder meetings in April 2007, Geographic Information System data compiled and reviewed for this Environmental Impact Statement/Overseas Environmental Impact Statement/Overseas Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) literature review, personal communications, and limited visitor data that are available for a few specific locations on the island. A comprehensive recreational carrying capacity analysis—assessing the number of individuals who can be supported in a given area within natural resource limits without degrading the natural social, cultural, and economic environment (Global Development Research Center 2008)—was not conducted as part of this EIS/OEIS. Existing baseline data for conducting recreational resource impact analyses are somewhat limited because the Government of Guam, Department of Parks and Recreation does not collect visitor data (e.g. user counts, visitor satisfaction, user conflicts, visitor demands, etc.) for its recreational facilities (Personal obtained through site reconnaissance and communications with natural resource planners at AFB and park rangers at National Park Service. The analysis of potential impacts to recreational resources is based on the long-term (operational) effects – i.e., after construction has occurred and all buildings, facilities, and structures are in place. Construction-related activities would be relatively minimal in their impacts (i.e., earth-moving equipment clearing vegetation and constructing facilities and other structures).

Roadway Projects

Methodology used in assessing recreational resource impacts as a result of the proposed roadway improvements is generally the same as that described under Utilities subheading above. However, the analysis focuses on direct (e.g., land acquisitions, elimination of access, degradation of facilities) and indirect (e.g., degradation of use due to traffic delays), temporary (i.e., construction), and permanent (i.e., operation) effects that could result with implementation of the proposed Guam Road Network (GRN) under each alternative.

11.2.1.2 Determination of Significance

For the purpose of this EIS/OEIS, the proposed action and alternatives would cause a significant impact on recreational resources if they:

- Would impede access to recreational resources
- Would substantially reduce recreational opportunities
- Would cause substantial conflicts between recreational users
- Would cause substantial physical deterioration of recreational resources

Recreational impacts as a result of the proposed roadway improvement projects are assessed following Federal Highway Administration Guidance for Preparing and Processing Environmental and Section 4(f) Documents (T 6640 8A), which are similar to those listed above.

11.2.1.3 Issues Identified During Public Scoping Process

As part of the analysis, concerns related to recreational resources that were mentioned by the public, including regulatory stakeholders, during the public scoping meetings were addressed. These included the potential impact of the proposed action on civilian access to Department of Defense (DoD) facilities, recreation areas, Apra Harbor, and other locations, both in terms of construction and operations impacts.

11.2.2 Power

11.2.2.1 Interim Alternative 1 (Preferred Alternative)

Interim Alternative 1 would recondition existing combustion turbines and upgrade T&D systems and would not require new construction or enlargement of the existing footprint of the facility. This work would be undertaken by the GPA on its existing permitted facilities. Reconditioning would be made to existing permitted facilities at the Marbo, Yigo, Dededo No. 1, and Macheche combustion turbines. These combustion turbines are not currently being used up to permit limits. T&D system upgrades would be on existing above ground and underground transmission lines. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Construction

The proposed reconditioning of the existing GPA facilities at Marbo, Yigo, Mecheche, and Dededo No.1 would be confined to the existing locations, wherein general overhaul, capabilities testing, and controlled startups would be performed. Also transmission and distribution systems would be upgraded. This would include installation of larger wires on existing overhead distribution lines, moving some of the overhead lines to underground, and upgrades to existing substations within their current footprints. The proposed construction activities may inadvertently impede roadway access to recreational areas by way of coning off construction area and/or diverting traffic to other routes. Increased time traveling on affected roads may occur; however, direct impacts to recreational resources is not expected.

Operation

The proposed reconditioning of the existing GPA combustion turbines and transmission and distribution improvements would be confined to the existing locations and routes. At present, there are no recreational resources sited near the proposed (preexisting) location of the reconditioning and transmission and distribution upgrades. Therefore, Interim Alternative 1 would result in no impacts to recreational resources.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.2.2 Interim Alternative 2

Interim Alternative 2 is a combination of reconditioning of existing permitted GPA facilities, an increase in operational hours for existing combustion turbines, and upgrades to existing T&D systems. Interim Alternative 2 would not require new construction or enlargement of the existing footprint of the facility. Reconditioning would be performed on the existing permitted GPA facilities at the Marbo, Yigo, and Dededo combustion turbines. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Construction

The construction work associated with the proposed reconditioning of the existing permitted GPA generating facilities and upgrades to the existing T&D systems may inadvertently impede roadway access to recreational areas by way of coning off construction area and/or diverting traffic to other routes. Increased time traveling on affected roads may occur; however, direct impacts to recreational resources is not expected.

Operation

The proposed alterations to the existing GPA facilities would be confined to the existing locations and routings. Therefore, Interim Alternative 2 would result in no impacts to recreational resources.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.2.3 Interim Alternative 3

Interim Alternative 3 is a combination of reconditioning existing GPA permitted facilities at Marbo, Yigo, and Dededo and upgrades to the Department of Defense power plant at Orote. Upgrades would be made to existing T&D. The proposed reconditioning to the existing power generation facilities at Marbo, Yigo, and Dededo would not require new construction or enlargement of the existing footprint of the facility. For the Orote power plant, upgrades would include a new fuel storage facility to facilitate longer run times between refueling. This would disturb approximately 1 acre (4,047 square m) and is within the current footprint of this facility. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Construction

The proposed reconditioning of the existing GPA permitted facilities at Marbo, Yigo, and Dededo, upgrades to the DoD power plant at Orote, and T&D upgrades may inadvertently impede roadway access to recreational areas by way of coning off construction area and/or diverting traffic to other routes. The upgrade of the existing Orote power plant is proposed to last six months. The work associated with the proposed upgrade (i.e., work on cooling towers and generator tune ups) would be confined to the existing site, which is on the Navy base. Increased time traveling on affected roads may occur; however, direct impacts to recreational resources is not expected.

Operation

There are no recreational resources in proximity of the GPA facilities in Yigo, Marbo, and Dededo, or to the Navy facility at Orote. Moreover, no interruptions to the existing recreational resources at the Apra Harbor Naval Reservation are anticipated. Therefore, Interim Alternative 3 would result in no impacts to recreational resources.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.2.4 Summary of Impacts

Table 11.2-1 summarizes the potential impacts of each interim alternative.

Table 11.2-1. Summary of Potential Impacts to Recreational Resources-Power

*Interim Alternative 1**	*Interim Alternative 2*	*Interim Alternative 3*
NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)	NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)	NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)

Legend: NI = No Impact. *Preferred Alternative.

he interim power alternatives would recondition the existing GPA facilities, upgrade transmission and distribution systems, and upgrade the DoD generation facility at Orote. The upgraded distribution lines would be routed within the existing utility corridors and distribution system upgrades would occur within the footprint of existing substations. In as much as there are no identified recreational resources in proximity of the locations considered, the components of the proposed activities would be keeping with the existing environment and adverse impacts to recreational resources are not anticipated.

11.2.3 Potable Water

11.2.3.1 Basic Alternative 1 (Preferred Alternative)

Basic Alternative 1 would consist of installation of up to 22 new potable water supply wells at Andersen AFB, rehabilitation of existing wells, interconnection with the GWA water system, and associated T&D systems. A new 5 MG (19 ML) water storage tank would be constructed at ground level at Finegayan.

Construction

The implementation of Alternative 1 is limited to DoD lands where access is restricted to installation personnel and guests. Development of the proposed wells at Andersen AFB and the 5 MG ground-level water storage tank at Finegayan may inadvertently impede roadway access to recreational areas by way of coning off construction area and/or diverting traffic to other routes. Increased time traveling on affected roads may occur; however, direct impacts to recreational resources is not expected.

Operation

Operation of the existing water supply wells and water storage tank are not expected to affect the function of the existing recreational resources that are near the proposed site. Therefore, Alternative 1 would result in no impacts to recreational resources.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.3.2 Basic Alternative 2

Basic Alternative 2 would consist of installation of up to 20 new potable water supply wells at Andersen AFB, up to 11 new potable water supply wells at Barrigada, rehabilitation of existing wells, interconnection with the GWA water system, associated transmission and distribution systems upgrades.

Additionally, new 3.6 MG (13.6 ML) and 1 MG (3.8 ML) water storage tanks would be constructed at ground level at Finegayan and Barrigada, respectively.

Construction

The development of the water supply wells at Andersen AFB and Barrigada, as well as the construction of the ground-level water storage tanks at Finegayan and Barrigada may inadvertently impede roadway access to recreational areas by way of coning off construction area and/or diverting traffic to other routes. Increased time traveling on affected roads may occur; however, direct impacts to recreational resources is not expected.

Operation

The implementation of Basic Alternative 2 is limited to DoD lands where access is restricted to installation personnel and guests. Operation of the existing water supply wells and water storage tanks at Finegayan and Air Force Barrigada would not affect the function of the existing recreational resources that are near the project. Therefore, Alternative 2 would result in no impacts to recreational resources.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.3.3 Summary of Impacts

Table 11.2-2 summarizes the potential impacts of each interim alternative.

Table 11.2-2. Summary of Potential Impacts to Recreational Resources-Potable Water

*Basic Alternative 1**	*Basic Alternative 2*
NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)	NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)

Legend: NI = No Impact. *Preferred Alternative.

The proposed alternatives for potable water, wherein new water supply wells would be developed at Andersen AFB and at Barrigada, and the construction of ground-level water storage tanks at Finegayan and Barrigada, would be confined to areas not within proximity to recreational resources. During the construction period, there may be slight delays on public right-of-ways due to the presence of construction-related vehicles; however, no direct impacts to the existing recreational resources in the proximity of the project locations are anticipated. The operation of the proposed features under either alternative would have no effect on the existing recreational resources.

11.2.4 Wastewater

11.2.4.1 Basic Alternative 1a (Preferred Alternative) and 1b

Basic Alternative 1 (Alternative 1a supports Main Cantonment Alternatives 1 and 2; and Alternative 1b supports Main Cantonment Alternatives 3 and 8) combines upgrade to the existing primary treatment facilities and expansion to secondary treatment at the Northern District Wastewater Treatment Plant (NDWWTP). The difference between Alternatives 1a and 1b is a requirement for a new sewer line from Barrigada housing to NDWWTP for Alternative 1b.

Construction

The proposed upgrade of the existing primary treatment facilities and expansion of the secondary

treatment at the NDWWTP would be confined to the existing location. Although the Tanguisson Beach and Hilaan coastline are within close proximity to the NDWWTP site, there is no expectation of loss of access and use to these recreational resources, specifically at Tanguisson beach and the Hilaan coastline.

Operation

The operation of the proposed features would not adversely affect recreational users at nearby Tanguisson beach and the Hilaan coastlines due to the considerable distance from the point of wastewater outfall discharge to the near-shoreline area where recreational uses occur (e.g. snorkeling, swimming, beachcombing). Therefore, Alternative 1a would not result in adverse impacts to recreational resources.

11.2.4.2 Basic Alternative 1b

Construction

In addition to a sewer line proposed under Alternative 1a, a new sewer line would be installed to convey wastewater generated from Barrigada housing to the NDWWTP. During construction period, there may be slight delays on public right-of-ways in or near the Barrigada site due to the presence of construction-related vehicles. Increased time traveling on affected roads may occur; however, direct impacts to recreational resources is not expected.

Operation

The effects during the operational phase would be similar to those described under Basic Alternative 1a.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.4.3 Summary of Impacts

Table 11.2-3 summarizes the potential impacts of each interim alternative. An analysis of long-term alternatives was not developed because the alternatives are not ready for project-specific analysis.

Table 11.2-3. Summary of Potential Impacts to Recreational Resources-Wastewater

*Basic Alternative 1a**	*Basic Alternative 1b*
NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)	NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)

Legend: NI = No Impact. *Preferred Alternative.

The upgrade of the existing primary treatment facilities and the expansion of the secondary treatment facilities at the NDWWTP site involve site-specific work that would not impede the existing access to and the use of the recreational resources, which can be found at the nearby Tanguisson beach and the Hilaan coastline. The presence of construction-related vehicles on right-of-ways may impede the access to these recreational uses, but there is no expectation of these uses being adversely affected as the result of the implementation of the proposed actions. The proposed installation of the new sewer line from Barrigada housing to NDWWTP would have similar effect on the right-of-ways and persons traveling by car to the recreational resource in the Barrigada area—during the construction phase only; no impacts to the recreational resources near the Barrigada area is anticipated during the operational phase.

11.2.5 Solid Waste

11.2.5.1 Basic Alternative 1 (Preferred Alternative)

The Preferred Alternative for solid waste would be the continued use of Navy Landfill at Apra Harbor until Layon Landfill is opened, which is scheduled for July 2011.

Construction

The proposed construction efforts for the planned Layon Landfill would likely be completed before the relocation of the Marines and their dependents to Guam. No impacts to the recreational resources are anticipated.

Operation

This Alternative proposes the use of the existing Navy landfill until the completion of the new Layon Landfill in July 2011. Continued use of the existing Navy landfill is not expected to cause adverse impacts to the recreational resources as they are not situated within proximity. There are no recreational resources at the proposed Layon Landfill.

Potential Mitigation Measures

No mitigation measures are needed.

11.2.5.2 Summary of Impacts

Table 11.2-4 summarizes the potential impact of the Preferred Alternative. A text summary is provided below.

Table 11.2-4. Summary of Potential Impacts of the Preferred Alternative

Basic Alternative 1
NI Recreational Resources (trails, historic and cultural attractions, dive sites, game hunting, fishing/crabbing, scenic points, golf course, day use resorts, spelunking, parks, beaches)

Legend: NI = No Impact

The existing Navy Landfill near Apra Harbor is not situated in close proximity to the recreational resources in the area; adverse impacts to the access to and the use of these resources as the result of continued operation of the landfill is not anticipated. Similar to the Navy Landfill, there are no recreational resources at or near the proposed Layon Landfill site. There are no impacts to the recreational resources anticipated with the implementation of the proposed actions.

11.2.6 Off Base Roadways

This section addresses effects to non-public and public recreational facilities during the peak construction and post-construction periods (2014 to 2030). The analysis focuses on direct (e.g., land acquisitions, elimination of access, degradation of facilities) and indirect (e.g., degradation of use due to increased noise, traffic delays) temporary (i.e., construction) and permanent (i.e., operation) effects that could result with implementation of the proposed Guam Road Network (GRN) under each alternative. Because the GRN projects are public works-type improvements, such as pavement strengthening, intersection improvement, road widening, road rehabilitation, bridge replacement, road relocation, and Military Access Point (MAP) construction, they generally include small to medium work crews and machinery. Most of the proposed improvements would be constructed within the public right-of-way (ROW) or within existing DoD lands. Only a small number of projects that involve intersection improvement, road

widening, and road relocation would require some ROW acquisition. Construction activities would include the identification and location of staging areas (e.g., machinery and material storage, equipment, trailers, employee parking); construction material and equipment transportation; site clearing and demolition, utility relocation, roadway/bridge construction, and finish work (e.g., landscaping, signage). Most of the environmental consequences associated with implementation of the proposed action would occur during construction. Once the proposed action is implemented, its operation would be tested, including traffic signal system, communications systems, and associated equipment (if any).

11.2.6.1 Alternative 1

The roadway projects that would be implemented for Alternative 1 are listed in Table 2.5-3, with the exception of GRN #38 (MAP), 39 (MAP), 41 (MAP), 47 (MAP), 48 (MAP), 49 (MAP), 49A (MAP), 63 (pavement strengthening), and 74 (pavement strengthening). The following subsections described impacts to recreation resources during the peak construction period and the future year 2030 due to the proposed roadway construction.

Year 2014 (Peak Construction and Population)

North

The proposed roadway improvement projects within the North Region are located along Routes 1, 3, 9, 15, and 28. There are no GRN projects that would result in either direct or indirect effects to recreational facilities located at Andersen AFB, including the Northwest Field area. These recreational facilities are located within the base north of the proposed GRN projects. In addition, access to these facilities is limited to installation personnel and their guests.

Route 3 provides the principal access to recreational opportunities in the western segment of the North Region (i.e., Dededo and Finegayan areas). Proposed improvements along Route 3 would include pavement strengthening, intersection improvements, road widening, and MAP. As previously noted, recreational opportunities within this area are almost exclusively focused along the coast approximately 1.5 miles (mi) (2.4 kilometers [km]) from Route 3. One of the most popular tourist attractions within the North Region is Two Lovers Point. This tourist attraction can be accessed from Routes 1 or 3.

Routes 1 and 15 provide the principal access to recreational opportunities in the eastern segment of the North Region (i.e., Spring Hill Subdivision, Perez Acres, Gayinero, and Lupog). Proposed improvements along Routes 1 and 15 are limited to pavement strengthening and MAP. Along Route 1, recreational activities are limited to a conservation reserve, golf course, and memorial park. Route 15 includes scenic vistas, historic/cultural attractions, and trails.

Temporary easements would be required along Routes 1, 3, 9, and 15 during the construction period. Temporary indirect impacts would result due to construction activities and may include traffic delays, lane closures, and rerouting of traffic. A Traffic Management Plan (TMP) would be developed for implementation during construction activities. The Department of Public Works (DPW) would closely coordinate with business and recreational facility owners to continuously provide them with information regarding construction schedules, anticipated traffic lane closures, and detour routes. The impacts are not considered adverse with incorporation of the TMP and coordination plan. Once the construction is completed the availability of improved roadway conditions would help enhance the recreation opportunities within the island.

In addition to traffic delays and access obstruction, it is anticipated that approximately 35,000

construction workers would be required for military facility construction during the peak construction period. Most of these workers would come from off-island. This growth has been addressed as part of the Guam and Commonwealth of the Northern Mariana Islands (CNMI) military relocation plan. Construction of the GRN projects would also require hundreds of workers on top of those required for military facility construction. These temporary workers and their family members would increase the use of recreational facilities during the peak construction period. Because the increase in the number of construction workers has been projected and addressed in relevant planning documents, the relevant planning agencies within the Island of Guam would be in a position to plan for this growth.

Central

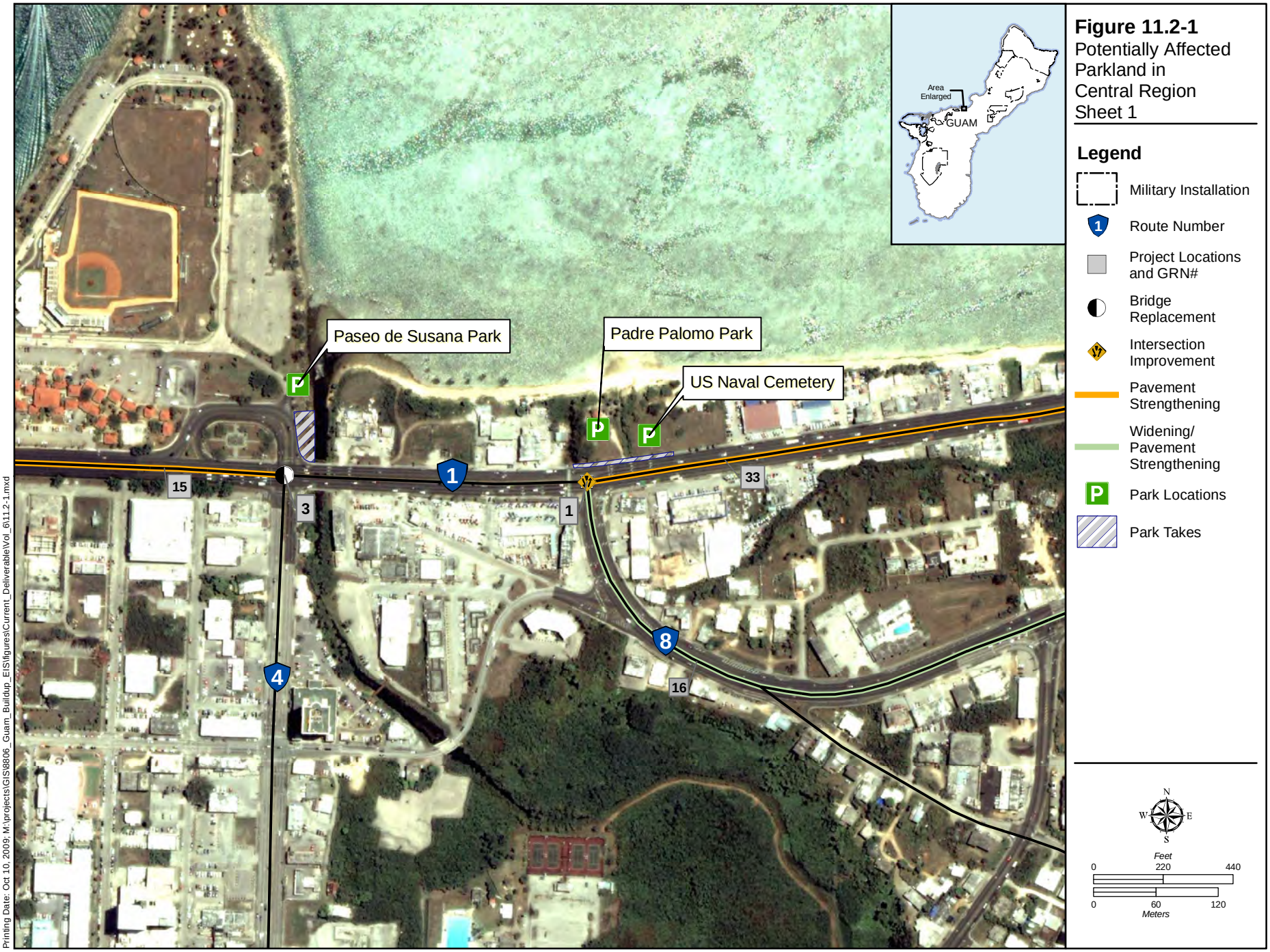
Road improvements within the Central Region would occur along Routes 1, 7, 8, 8A, 10, 15, 16, 25, 26, and 27, and Chalan Lujuna Road. Most of the proposed improvements are pavement strengthening, with a few intersection improvements, road widening and road realignment.

There are no GRN projects that would result in either direct or indirect effects to recreational facilities contained on Navy Barrigada or Air Force Barrigada. These recreational facilities are located outside of the proposed GRN projects. In addition, access to these facilities is limited to installation personnel and their guests.

Route 1 provides the principal access to recreational opportunities in the western segment of the Central Region (i.e., Piti, Asan, Hagatna, Mongmong, and Tamuning). Proposed improvements along Route 1 include pavement strengthening, intersection improvements, bridge replacement, and MAP. Recreational opportunities along the western segment of the Central Region are largely comprised of beaches, trails, public parks, and scenic vistas. Portions of Route 1 are located immediately adjacent to or within close proximity to these areas. Traffic congestion and travel delays could be expected during the peak construction year. A Traffic Management Plan (TMP) would be developed for implementation during construction activities. The Department of Public Works (DPW) would closely coordinate with business and recreational facility owners to continuously provide them with information regarding construction schedules, anticipated traffic lane closures, and detour routes. The impacts are not considered adverse with incorporation of the TMP and coordination plan. Once the construction is completed the availability of improved roadway conditions would help enhance the recreation opportunities within the island.

Based on preliminary engineering design information, some minor parkland acquisition would be required to be taken from three parks located along Route 1 to accommodate roadway construction, as summarized below.

- **Paseo de Susana Park** would be affected by GRN #3 (Agana Bridge Replacement) (see Figure 11.2-1). The bridge replacement limits are very conceptual at this stage, and the affected land cannot be accurately estimated; however, based on the preliminary drawing, approximately 4,800 ft^2 or 0.10-ac (0.004 ha) of land may be required.
- **Buffer Strip Park** would be affected by GRN #7 and GRN #6 intersection widening at Routes 1 and 27, and Routes 1 and 26 (see Figure 11.2-2). While the widening currently depicted can likely be adjusted to avoid most of the linear impact, the existing roadway at the intersection with Route 27 appears to encroach on the park ROW by approximately 500 ft^2 or 0.010 ac (0.004 ha).



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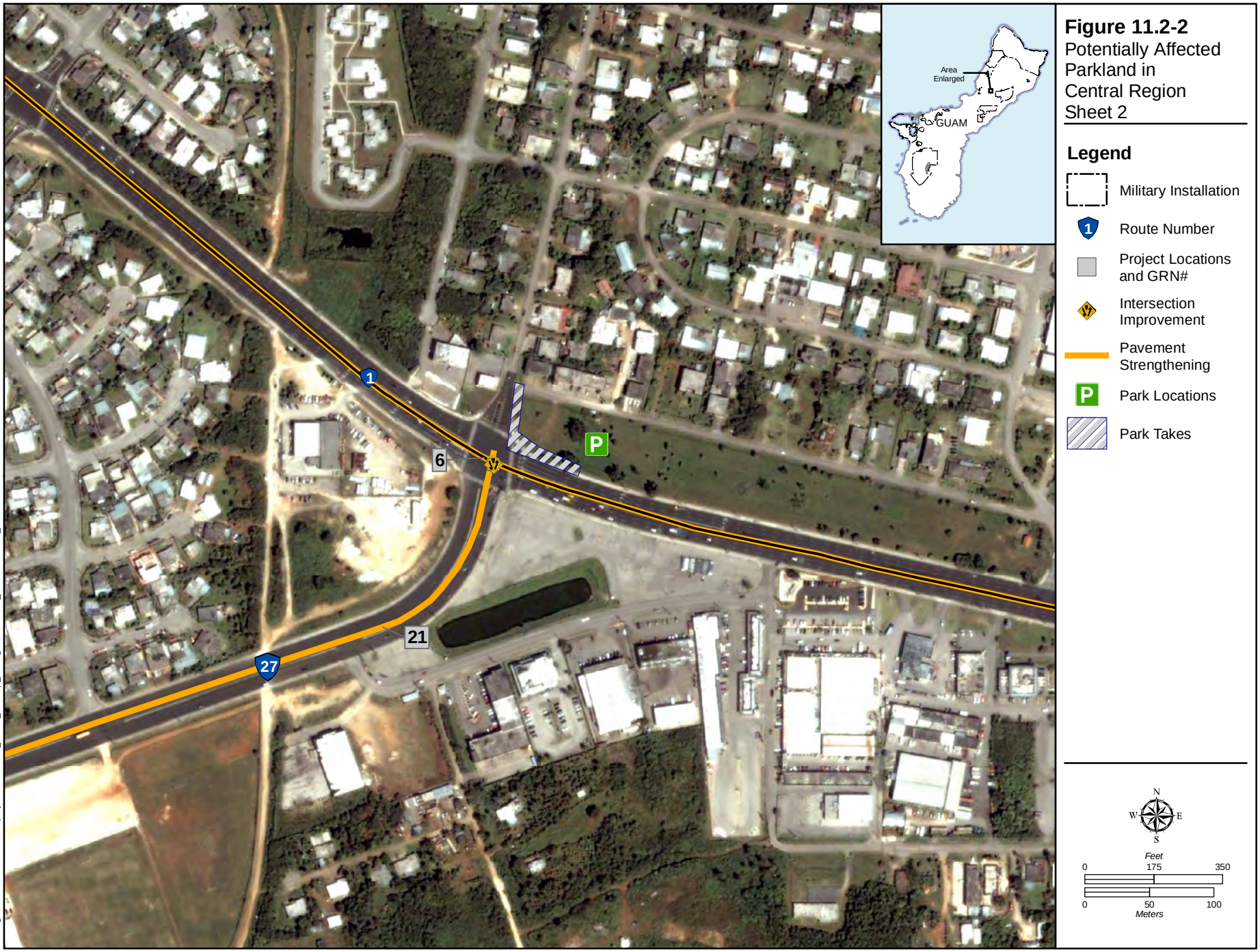

Figure 11.2-2
Potentially Affected Parkland in Central Region
Sheet 2

Legend

- Military Installation
- Route Number
- Project Locations and GRN#
- Intersection Improvement
- Pavement Strengthening
- Park Locations
- Park Takes

N
W E
S

Feet
0 175 350

0 50 100
Meters

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GUAM
Area Enlarged
P
31
8A
Figure 11.2-3
Potentially Affected Parkland in Central Region Sheet 3
Legend
Military Installation
Route Number
Project Locations and GRN#
Widening/ Pavement Strengthening
Park Locations
Park Takes
N
W
E
S
Feet
0
210
420
0
60
120
Meters
Printing Date: Oct 10, 2009; M:\projects\GIS\8806_Guam_Buildup_EIS\figures\Current_Deliverable\Vol_6\11-2-3.mxd

- **Chinese Park** would be affected by GRN #33 intersection widening at Routes 1 and 14 (see Figure 11.2-3). The existing ROW parcel line appears to indicate that the existing roadway is built partially inside the park ROW. Approximately 15,900 ft^2 or 0.36-ac (0.15-ha) of land would need to be acquired to correct this situation and to allow the intersection improvements.

Note that the above information is subject to change during the detailed engineering design phase. Some design adjustment could also avoid impacts to the existing parkland. Any acquisition of parkland would be coordinated between DPW and Department of Parks and Recreation. Because construction of the proposed improvement projects would be centered on the roadway intersection and corridor, no park closure is anticipated during the peak construction year. The impacts are not considered adverse with incorporation of the TMP and coordination plan described above. It should also be noted that the use of public parks for transportation projects would be considered a use of Section 4(f) resources. Impacts on Section 4(f) resources are addressed in Volume 6 Chapter 21.

Routes 10 and 15 provide principal access to recreational opportunities in the eastern segment of the Central Region (i.e., Barrigada, Asbeco, and Adacao). Proposed improvements along Routes 10 and 15 include pavement strengthening, intersection improvements, road realignment, and MAP. As previously noted, recreational opportunities within this area are almost exclusively focused along the coast approximately 0.5-mi (0.8-km) to 1.5 mi (2.4 km) from Route 15.

Effects during the construction period within the Central Region would be similar to those described for the North Region. Once the construction is completed the availability of improved roadway conditions would help enhance the recreation opportunities within the island.

Apra Harbor

Road improvements within the Apra Harbor Region would occur along Routes 1, 2A, and 11. These improvements are limited to pavement strengthening, intersection improvements, and MAP.

There are no GRN projects that would result in either direct or indirect effects to recreational facilities within Naval Base Guam. These recreational facilities are located outside of the proposed GRN projects. In addition, access to these facilities is limited to installation personnel and their guests.

Routes 1 and 11 provide the principal access to recreational opportunities in the Apra Harbor Region (i.e., Piti). Proposed improvements along Route 1 include pavement strengthening, intersection improvements, rehabilitation, and MAP. Recreational opportunities in the Apra Harbor Region are largely limited to the Sasa Bay area and immediately northwest of Piti, that contains marine reserves and fishing areas. Portions of Routes 1 and 11 are located immediately adjacent to or within close proximity to these areas.

Effects during the construction period within the Apra Harbor Region would be similar to those described for the North Region. The impacts are not considered adverse with incorporation of the TMP and coordination plan described above. Once the construction is completed the availability of improved roadway conditions would help enhance the recreation opportunities within the island.

South

Road improvements within the South Region include two pavement strengthening projects on Route 5, a intersection improvement on Route 2, and a MAP project on Route 12 in the village of Santa Rita.

There are no GRN projects that would result in either direct or indirect effects to recreational facilities contained on the NMS. These recreational facilities are located outside of the proposed GRN projects. In addition, access to these facilities is limited to installation personnel and their guests.

Routes 2 and 17 provide the principal access to recreational opportunities in the South Region (i.e., Santa Rita, Agat, and Merizo). Proposed improvements along Route 2 are limited to intersection improvements. There are no improvements proposed for Route 17. Recreational opportunities in the South Region are largely limited to hiking trails, scenic vistas, and beaches/parks. Portions of Route 2 are located immediately adjacent to or within close proximity to these areas.

Effects during the construction period within the South Region would be similar to those described for the North Region. The impacts are not considered adverse with incorporation of the TMP and coordination plan described above. Once the construction is completed the availability of improved roadway conditions would help enhance the recreation opportunities within the island.

Best Management Practices (BMPs)

- The GovGuam DPW would develop a TMP for implementation during construction activities. The TMP would identify and provide alternate traffic detour routes, construction materials hauling routes, bus stops, transit routes and operation hours, pedestrian routes, and residential and commercial access routes to be used during the construction period.
- The GovGuam DPW would develop an outreach program to keep residents, businesses, and any service providers within the area informed, and to inform surrounding communities about the project construction schedule, relocation plans and assistance programs, traffic-impacted areas and the TMP, and other relevant project information.
- To the extent applicable, engineering design would take into consideration avoidance of acquisition of public recreational facilities, such as parkland.

Potential Mitigation Measures

No mitigation measures would be required.

Year 2030

North

As described previously, the proposed GRN improvements are largely public works-type projects that are designed to enhance and improve the roadway system of Guam. No land acquisitions or permanent access closures for either public or non-public facilities are proposed that would result in permanent adverse effects to recreational opportunities contained within the North Region. In certain instances, some roadway improvements may result in long-term beneficial effects where access may previously be limited or in poor condition.

Central

As mentioned in the impact section under Year 2014, three public parks located along Route 1 would be affected by minor ROW acquisitions to accommodate the proposed intersection improvements and road widening; however, no permanent closure of these parks is anticipated. Land acquisition would be required that would affect the existing three parks, however, the land to be acquired is small and would not affect the use of the facilities in the long-term.

Apra Harbor

Effects during the operation period within the Apra Harbor Region would be similar to those described for the North Region.

South

Effects during the operation period within the South Region would be similar to those described for the North Region.

Potential Mitigation Measures

No mitigation measures would be required.

11.2.6.2 Alternative 2 (Preferred Alternative)

The roadway projects that would be implemented for Alternative 2 are listed in Table 2.5-3, with the exception of GRN #38A (MAP), 39A (MAP), 41A (MAP), 47 through 49A (MAP), 63 (pavement strengthening), and 74 (pavement strengthening). Peak construction and long-term impacts on recreation resources under Alternative 2 would be similar to those described under Alternative 1 because the same projects are proposed under this alternative with the only difference is the gate location for the MAP projects which have no impact on existing recreational resources. BMPs as listed in Alternative 1 would be implemented

Potential Mitigation Measures

No mitigation measures would be required.

11.2.6.3 Alternative 3

The roadway projects that would be constructed under Alternative 3 are listed in Table 2.5-1, with the exception of GRN #38 (MAP), 39A (MAP), 41 (MAP), 49A (MAP), 19 (pavement strengthening) 20 (pavement strengthening), 31 (pavement strengthening), and 124 (new roadway). Impacts on recreation from construction activities under Alternative 3 in 2014 during peak construction would be slightly less than Alternatives 1 and 2 because no new roadway (GRN#124) would be constructed under this alternative. However, beneficial impacts on recreational enhancement would be slightly less than Alternatives 1 and 2 due to unavailability of roadway to support the planned land-use development within the Dos Amantes Planning Area. BMPs as listed in Alternative 1 would be implemented.

Potential Mitigation Measures

No mitigation measures would be required.

11.2.6.4 Alternative 8

The roadway projects that would be constructed under Alternative 8 are listed in Table 2.5-1, with the exception of GRN #38 (MAP), 39 (MAP), 41 (MAP), 47 through 49 (MAP), 63 (pavement strengthening), and 74 (pavement strengthening). In general, the MAP and pavement strengthening projects would not cause significant impact to recreational facilities; therefore, impacts on recreation under Alternative 8 in 2014 during peak construction would be similar to those described under Alternative 1 because the same projects are proposed under this alternative with the exception of GRN# 49A, which is a MAP project. In the long-term beneficial impacts to recreation facilities under Alternative 8 would be similar to Alternatives 1 and 2. BMPs as listed in Alternative 1 would be implemented.

Potential Mitigation Measures

No mitigation measures would be required.

11.2.6.5 Summary of Impacts

Table 11.2-5 summarizes the potential impacts of each alternative. Implementation of the proposed

roadway improvement projects would cause disruption to recreational opportunities situated along the roadway corridors during the construction period. This impact would be temporary and would cease after the construction activity is complete. To accommodate the proposed improvements, some parkland along certain roadway corridors would be subject to acquisition, but none of them would result in severe disruption to recreation opportunities or permanent closure of any parkland. Roadway improvements around the island would essentially enhance the recreation opportunities around the island of Guam in the long-term.

11.2.6.6 Summary of Potential Impacts to Recreational Resources-Roadway Project

Table 11.2-5. Summary of Potential Impacts to Recreational Resources-Roadway Project

Potentially Impacted Resource	*Alternative 1*	*Alternative 2**	*Alternative 3*	*Alternative 8*
Disruption of Recreation Opportunities during Peak Construction	SI-M	SI-M	SI-M	SI-M
Disruption of Long-term Recreation Opportunities	LSI	LSI	LSI	LSI
Enhancement of Long-Term Recreation Opportunities	BI	BI	BI	BI

Legend: SI-M = Significant Impact Mitigable to Less Than Significant, LSI = Less Than Significant Impact, BI = Beneficial Impactt. *Preferred Alternative.