

## CHAPTER 16.

# SOCIOECONOMICS AND GENERAL SERVICES

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Because of the relatively small size of the island of Guam, most of the anticipated socioeconomic impacts of the proposed action are expected to affect the island as a whole. Therefore, many of the sections in this chapter are not divided by geographical area, as in other chapters of this Environmental Impact Statement (EIS). Instead, this chapter begins with an Affected Environment section that provides a current and historical perspective on Guam's socioeconomic status, including Population Characteristics, Economic Characteristics, Public Services, Sociocultural Issues, Land Acquisition, and specific information on the regions affected by off-base roadways. This affected environment section provides the baseline context for the analysis of the relocation of Marines to Guam and other proposed and connected actions, including off-base roadways. A socioeconomic impact analysis is then provided with respect to five components of Environmental Consequences: Population Impacts, Economic Impacts, Public Services, Sociocultural Impacts, and Land Acquisition Impacts (off-base roadways impact analysis is provided in Volume 6). This chapter then concludes with a Summary of Impacts and a Summary of Mitigation Measures.

As part of the analysis, this chapter summarizes a detailed socioeconomic analysis performed in 2008-2009 and documented in a Socioeconomic Impact Analysis Study (SIAS) that is provided in its entirety in Volume 9 Appendix F. This impact analysis was prepared with the best available information at time of writing on relevant topics such as construction conditions, military personnel numbers, and relocation schedules. Additional changes to the analysis in various sections of the EIS analysis were made following the receipt of comments on the Draft EIS.

### 16.1 AFFECTED ENVIRONMENT

#### 16.1.1 Definition of Resource

Socioeconomics is defined as the basic attributes and resources associated with the human environment. Socioeconomic "resources" include population size and demographics; employment and income; economic activity (including interaction of economic sectors with the military); government-funded health and human services; social cohesion (including, but not limited to, Chamorro issues and military-civilian relations); and land acquisition as it pertains to economic activity and sociocultural effects.

Because of the diversity of these topics, other resource chapters in Volume 2 of this EIS discuss related concerns for the proposed relocation of Marines to Guam. When appropriate, the reader will be referred to such chapters for further information and discussion.

#### 16.1.2 Historical and Economic Overview

The discussion in this section is limited to the time period following World War Two (WWII). However, Guam's socioeconomic history was heavily influenced by over 300 years of Spanish rule (including the Spanish concept of *reduccion*), historic American occupation, the battles of WWII, and the Japanese occupation. Since WWII, Guam's economic history has been volatile, led by changes in population and global events in the military, social, and natural spheres. This section chronologically presents the most important changes after WWII.

Post-war reconstruction and the formation of new United States (U.S.) military bases were the basis for Guam's first major economic expansion and the initial placement of contemporary infrastructure. During this period of reconstruction, Guam's population experienced substantial increase – from a pre-war 1940

level of 22,900 (with a military and dependent population of 1,427) to 59,498 (with a military and dependent population of 26,617) in 1950 (U.S. Census Bureau 2008a).

The 1950s brought with it a shift in military governance, presence, and focus on Guam. Two important events took place in 1950: Congress enacted the Organic Act of 1950 and the Korean War began. The Organic Act re-designated the island of Guam as an unincorporated territory of the U.S., passing its control from the U.S. Navy to the Department of the Interior (DOI) and granting a greater measure of self-governance to the people of Guam. The destruction caused by Typhoon Alice in 1954 required that the U.S. military shift its focus on Guam from base construction to the island's public works. Although the ongoing Korean War and the Cold War with the Soviet Union required a continued military presence on Guam, the island's military population experienced an overall decline of 15% between 1950 and 1960 (Table 16.1-1).

**Table 16.1-1. Combined Military and their Dependents Population on Guam, Selected Years**

1950	1960	1970	1980	1987	1990
26,617	23,300	19,777	20,000	23,790	19,610
1993	1994	1997	2000	2003	2007
22,077	15,865	13,002	11,624	11,832	14,110

Source: U.S. Census Bureau 2008a

In the 1960s, Super Typhoon Karen brought considerable damage to Guam, destroying temporary and permanent structures, and leaving many residents homeless in its wake. The lifting of visitor security clearance requirements, combined with the initiation of Pan American Airway services from Japan to Guam in 1967, sparked opportunities for direct growth of Guam's tourist industry. This growth also led to indirect growth in related industries such as construction, recreational fishing and diving, commercial fishing and retail trade.

Guam's economy stagnated in the 1970s and early 1980s, partially in response to the 1973 Organization of the Petroleum Exporting Countries (OPEC) oil embargo. Construction activity and visitor arrivals declined over the decade. Poor economic conditions continued into the 1980s. However, the economic trend stabilized from 1982 to 1984 and improved between 1985 and the end of the decade. In the latter part of the 1980s, Cold War military spending and the closing of U.S. bases in the Philippines increased Guam's military population (including dependents) to a level not seen since the 1960s (23,800 in 1987), thereby adding to its economic base.

The late 1980s brought fluctuation and an eventual decrease to military population levels on Guam that lasted through the 1990s. Troops temporarily transplanted from closed Philippine bases were relocated at the end of the 1980s resulting in a new post-war military population low of 19,600 in 1990. The Base Realignment and Closure (BRAC) process led to the closure of Naval Air Station Hagatna (also referred to as Naval Air Station Agana) causing the military population on Guam to fall from 22,077 in 1993 to 15,865 in 1994. By 2000 Guam's military and dependent population was 11,624.

Guam's Asia-oriented visitor base expanded and peaked between 1995 and 1997, generating substantial increases in the construction of hotels and condominiums. However, the 1997 collapse of Asian financial markets, compounded by the crash of a Korean Air Lines plane full of visitors, led to a 12.4% decline on Guam's primary Japanese market and an 83% decline in its secondary Korean market from 1997 to 1998 (Guam Bureau of Statistics and Plans 2006). While visitor numbers have increased since that low mark, the peak levels experienced in the mid-1990s have yet to be recaptured.

From 2000 through 2008, Guam's economy has continued to mirror its volatile recent past. In 2000, the visitor industry appeared poised to regain health. This was stymied however by the attacks of September 11 in 2001, the costly Super Typhoon Pongsona in 2002, and the pandemic of severe acute respiratory syndrome in 2003. From 2001 to 2003, Guam's economy contracted: unadjusted for inflation, total payroll declined by 2%, employment declined by 4%, and individual salaries increased by 1%. From 2004 to 2006, partially in response to the announcement of the proposed action, Guam's economy has once again showed signs of expansion. Using 2005 data, a study for the Guam Visitors Bureau (GVB) (GVB 2007) found that tourism was the island's second largest private industry (following Finance, Insurance, and Real Estate) and both the primary Japanese and second Korean market were growing at that time.

As of the end of 2008, Guam's real estate market has shown signs of slowing. Commercial real estate on Guam has declined in value due to worldwide issues of tight credit and declines in consumer discretionary spending. Reports show that Guam real estate sales and construction activity have dropped from 2007 levels due to the global economic decline coupled with a moratorium on development in the Tumon Bay area, that at the time of writing continues to be under debate (Captain 2008b). By the end of 2008, international economic conditions plus other market and demographic factors produced declining year-over-year trends for a variety of key tourism indicators, including total arrivals, hotel occupancy rates and taxes, and hotel room-nights sold (GVB 2008, Guam Hotel and Restaurant Association 2008).

### 16.1.3 Population Characteristics

#### 16.1.3.1 Overall Trends

As of the most recent full U.S. Census of 2000, Guam's population was 154,805. In 2008, the U.S. Census Bureau provided a more recent estimate of Guam's population of 175,877 (U.S. Census Bureau 2008a). The island's population has grown substantially since becoming a U.S. Territory. From 1950 to 2000 Guam's population grew at an average rate of 21% per decade (about 2.1% annually). However, as is shown in Table 16.1-2, the Census Bureau projects (without the proposed action) that this growth will taper off, possibly due to out-migration rates observed around 2002, when the estimates in this table were made.

**Table 16.1-2. Annual Rate of Increase on Guam's Population**

	1950-1960	1960-1970	1970-1980	1980-1990	1990-2000	2000-2008	2010-2020*	2020-2030*
Annual Population Increase	1.2%	2.4%	2.2%	2.3%	1.5%	1.6%	1.2%	0.9%

\* Estimated.

Source: U.S. Census Bureau 2008a

#### 16.1.3.2 Demographics

Table 16.1-3 shows Guam's population growth and changing ethnic mix from 1920 to 2000. Between 1990 and 2000, the percentage representation of Chamorro and Caucasian ethnicities on Guam's population declined, while Filipino and "Other" ethnicities (most often composed of other Asian or Pacific Islander ethnicities) increased. Some changes in ethnic percentages reflect differences in Census definitions over time. However, the dramatic changes in the Chamorro and Caucasian percentages from 1940 to 1950 are a product of WWII, when the U.S. military basing resulted in population increases of other ethnicities on Guam.

**Table 16.1-3. Guam-Wide Total Population and Ethnicity, 1920-2000**

	1920	1930	1940	1950	1960	1970	1980	1990	2000
Total Population	13,275	18,509	22,290	59,498	67,044	84,996	105,979	133,152	154,805
<b>Ethnicity</b>									
Chamorro/Part- Chamorro	92%	89%	91%	46%	52%	NA	45%	43%	42%
Caucasian	2%	7%	4%	39%	31%	NA	8%	14%	7%
Filipino	3%	2%	3%	12%	13%	NA	21%	23%	26%
Other	3%	3%	3%	4%	4%	NA	26%	20%	25%

Source: U.S. Census Bureau 2000a

Table 16.1-4 provides demographic information for Guam and the island's individual villages for the year 2000. The three largest village populations are in the northern villages of Dededo and Yigo and the centrally-located village of Tamuning.

**Table 16.1-4. Demographic Characteristics 2000, Guam Total and Individual Villages**

	Population/Gender			Ethnicity					Median Age	Place of Birth				Education (25 yr. and over pop)		
	Total	Male	Female	Chamorro/Pt	Filipino	Caucasian	Other Pacific Islander	Other		Guam	Other U.S.	Philippines	Other Pacific Islands	High School	College Degree	
Guam Totals	154,805	79,181	75,624	42%	26%	7%	8%	17%	27.1	52%	12%	21%	7%	52%	25%	
North	Dededo	42,980	21,645	21,335	30%	45%	3%	8%	13%	27	46%	7%	35%	7%	50%	23%
	Yigo	19,474	9,999	9,475	27%	31%	15%	8%	19%	25	40%	23%	25%	7%	53%	26%
Central	Tamuning	18,012	9,420	8,592	18%	26%	8%	10%	37%	32	31%	11%	22%	9%	49%	31%
	Barrigada	8,652	4,320	4,332	56%	19%	5%	7%	13%	28.3	62%	9%	15%	7%	53%	25%
	Mangilao	13,313	6,958	6,355	47%	22%	4%	11%	16%	27.4	55%	8%	18%	10%	50%	23%
	Mongmong-Toto-Maite	5,845	2,895	2,950	53%	16%	4%	13%	15%	27.1	60%	8%	13%	11%	54%	22%
	Hagåtña	1,100	672	428	49%	16%	4%	17%	14%	31.8	52%	8%	14%	15%	51%	21%
	Sinajana	2,853	1,433	1,420	73%	7%	4%	6%	9%	28.7	73%	10%	6%	6%	55%	23%
	Agana Heights	3,940	1,946	1,994	68%	10%	6%	7%	8%	28.1	68%	13%	9%	6%	53%	28%
	Chalan Pago-Ordot	5,923	3,011	2,912	53%	11%	5%	6%	26%	27.3	66%	10%	11%	7%	55%	22%
	Asan	2,090	1,078	1,012	71%	8%	8%	5%	8%	28.9	70%	15%	6%	5%	56%	24%
	Piti	1,666	882	784	60%	7%	16%	3%	14%	30.3	60%	22%	7%	4%	50%	31%
South	Yona	6,484	3,242	3,242	70%	5%	6%	4%	15%	24.3	76%	12%	4%	4%	53%	25%
	Agat	5,656	2,910	2,746	67%	23%	3%	3%	4%	25.3	70%	7%	18%	3%	52%	19%
	Santa Rita	7,500	4,028	3,472	31%	20%	24%	1%	24%	26.3	38%	38%	17%	1%	58%	30%
	Talofofo	3,215	1,641	1,574	79%	3%	7%	5%	6%	24.8	78%	12%	2%	5%	55%	22%
	Umatac	887	465	422	95%	1%	1%	1%	2%	21.9	91%	6%	1%	1%	66%	6%
	Inarajan	3,052	1,546	1,506	86%	2%	2%	2%	8%	23.5	86%	7%	2%	3%	57%	11%
Merizo	2,163	1,090	1,073	89%	1%	3%	2%	5%	23.3	86%	9%	2%	2%	62%	11%	

Source: U.S. Census Bureau 2000a

### North

As of 2000, 40% of Guam's population resided in the Northern region. That percentage has likely increased since that time as Dededo and Yigo have been growing quickly over the past 10 years.

The region was 50.06% male, 49.94% female compared to the overall Guam population (51.15% male, 48.84% female). Ethnically, the Northern region was less Chamorro than the rest of Guam; Dededo was far more Filipino than the rest of Guam (45% vs. 26%) and Yigo was more heavily populated with Caucasians than the Guam average (15% vs. 7%).

The median age of the population in the Northern region was similar to that of Guam's overall population; Dededo's median age was 27 years old and Yigo's was 25 years old compared to Guam's overall median age of 27.1 years old.

A lower percentage of people in the Northern region were born on Guam compared to the rest of the Island; similar to the ethnicity of the areas, a proportionally large percentage of Dededo's population was

born in the Philippines (35%) and a proportionally large percentage of Yigo's population was born in other areas of the United States.

In terms of education level, the 2000 Northern region was very similar to the rest of Guam. Dededo has slightly lower percentages of people who have completed high school or college while Yigo had slightly higher percentages than Guam overall.

### Central

As of 2000, 41% of Guam's population resided in the Central region. The most populous villages in the region were Tamuning (18,012) and Mangilao (13,313). Piti and Hagatna were the least populous (1,666 and 1,100, respectively). The Central region was 51.44% male, 48.56% female compared to Guam's overall population (51.15% male, 48.84% female).

Ethnically, the Central region was slightly more Chamorro than the rest of Guam (45% vs. 42%) with the largest Chamorro populations residing in Mangilao and Barrigada. On a percentage basis, Sinajana and Asan were the most heavily Chamorro. Tamuning had the largest Filipino population in 2000; however, the central region is less Filipino than Guam overall (19% vs. 26%).

The Central region tended to be older than Guam overall; the median age in the region was 29.4 years old compared to the overall median age of 27.1 years old. Tamuning had the oldest population on Guam with a median age of 32 years old.

A total of 57% of Central region residents were born on Guam, which is greater than Guam's overall rate of 52%. Mangilao had the highest number of residents who were born on Guam.

In terms of education, the Central region was similar to the rest of Guam. For residents over the age of 25, both had rates of 52% who had completed high school and 25% who had completed college.

### South

As of 2000, about 19% of Guam's population resided in the Southern region. The most populous villages in the region were Santa Rita (7,500) and Yona (6,484). Umatac was the least populous (887).

The Southern region was 51.53% male, 48.46% female compared to Guam's overall population (51.15% male, 48.84% female). The Southern region was 64% Chamorro in 2000, by far the most heavily Chamorro of the three regions. Umatac, Merizo and Inarajan were each over 85% Chamorro. Agat and Santa Rita were each over 20% Filipino and Santa Rita had the highest percentage of Caucasians in all of Guam.

The Southern region tended to be younger than Guam overall; the median age in the region was 25.3 years old compared to the Guam overall median age of 27.1 years old. Umatac had the youngest population on Guam with a median age of 21.9 years old.

A total of 76% of Southern region residents were born on Guam that was greater than Guam overall (52%). In Umatac, Merizo, and Inarajan, over 85% of residents were born on Guam.

In terms of education, the Southern region had a higher percentage of high school graduates when compared to the rest of Guam (57% vs. 52%), but a lower percentage of college graduates (22.8% vs. 25%).

#### 16.1.3.3 Household Characteristics

Table 16.1-5 provides demographic information for Guam and the island's individual villages for the year 2000.

**Table 16.1-5. Household Characteristics 2000, Guam Total and Individual Villages**

	Population in HHs	Number of HHs	Avg HH Size	% of HHs that are Family HHs	% of HHs that are Married	% of HHs that are Families	Median HH Income	Income per HH member	% HHs below poverty line
Guam Totals	150,928	38,769	3.89	83%	59%	36%	\$39,317	\$10,107	22%
North	Dededo	42,635	10,016	4.26	89%	63%	\$37,654	\$8,839	23%
	Yigo	18,947	4,634	4.09	91%	70%	\$37,415	\$9,148	19%
Central	Tamuning	17,619	5,953	2.96	68%	48%	\$35,347	\$11,942	24%
	Barrigada	8,481	2,097	4.04	87%	61%	\$49,974	\$12,370	16%
	Mangilao	12,474	3,190	3.91	83%	55%	\$39,754	\$10,167	26%
	Mongmong-Toto-Maite	5,833	1,633	3.57	76%	47%	\$31,134	\$8,721	31%
	Hagåtña	822	268	3.07	69%	43%	\$31,136	\$10,142	27%
	Sinajana	2,850	742	3.84	82%	50%	\$48,750	\$12,695	20%
	Agana	3,862	1,058	3.65	81%	51%	\$47,396	\$12,985	14%
	Chalan Pago-Ordot	5,846	1,573	3.72	79%	50%	\$36,506	\$9,813	30%
	Asan	2,089	552	3.78	84%	52%	\$48,611	\$12,860	19%
	Piti	1,613	474	3.4	77%	53%	\$54,167	\$15,931	13%
South	Yona	6,434	1,486	4.33	89%	61%	\$52,955	\$12,230	20%
	Agat	5,633	1,298	4.34	86%	54%	\$37,398	\$8,617	24%
	Santa Rita	6,512	1,780	3.66	87%	73%	\$41,928	\$11,456	9%
	Talofofo	3,192	738	4.33	88%	59%	\$47,885	\$11,059	22%
	Umatac	887	162	5.48	93%	54%	\$34,286	\$6,257	33%
	Inarajan	3,036	644	4.71	91%	60%	\$42,361	\$8,994	24%
Merizo	2,163	471	4.59	89%	57%	\$39,940	\$8,702	23%	

Source: U.S. Census Bureau 2000a; HH refers to Households.

### North

As of 2000, almost 41% of Guam's population living in households resided in the Northern region; Dededo was the single largest village on Guam in terms of population in households and number of households.

Both villages in the Northern region had larger average household sizes (Dededo, 4.26 people and Yigo, 4.09 people) than Guam's overall household counts (3.89 people).

Compared to Guam overall, Dededo and Yigo had a higher percentage of family households, married family households, and family households with children.

Household incomes in Dededo (\$37,654) and Yigo (\$37,415) were lower than Guam overall (\$39,317); also, each had lower incomes per household member. Dededo had a higher percentage of households below the poverty line than Guam overall but Yigo had a far lower percentage; the region, on average, had a similar percentage of households below the poverty line (21.5% vs. 22%).

### Central

The Central region, similar to the Northern region, was occupied by about 41% of Guam's population living in households. Tamuning and Mangilao were the largest villages in the region in terms of population living in households and number of households.

The Central region had a much lower number of persons per household than Guam overall (3.51 vs. 3.89). The low number for the region was greatly influenced by Tamuning that had 2.96 persons per household – the lowest number on Guam.

The Central region had lower percentages of households that were family households, married family households, and family households with children than did Guam overall.

Households in the Central region had higher incomes than Guam overall (\$39,764 vs. \$39,317); the region also had a higher income per household member (\$11,383 vs. \$10,107). The village of Piti had the highest household income and income per household member on Guam. While the Central region had higher incomes in general, the region had a higher percentage of households below the poverty line; two of the regions villages, Mongmong-Toto-Maite and Chalan Pago-Ordot, had 30% or more households below the poverty line.

### South

As of 2000, the Southern region was occupied by about 18% of Guam's population living in households. Santa Rita and Yona were the largest villages in the region in terms of population living in households and number of households.

The Southern region had more persons per household than Guam overall (4.23 vs. 3.89). Umatac had the most persons per household on Guam (5.48).

Compared to Guam overall, the Southern region had higher percentages of households that were family households, married family households, and family households with children.

Households in the Southern region had higher incomes than Guam overall (\$43,905 vs. \$39,317); the region also had slightly higher income per household member (\$10,460 vs. \$10,107). While incomes, on average, in the Southern region were higher than Guam overall, some of Guam's poorest villages were located there; Agat, Inarajan, Merizo and Umatac each had incomes that were well below the Guam overall average. Umatac had a higher percentage of households below the poverty line than any other village on Guam.

#### 16.1.3.4 Military Demographics

Military populations can affect the composition and growth of villages on Guam (Table 16.1-6). Dededo and Yigo cover military-owned land and have high proportions of military and military dependent residents relative to other villages. Between 1990 and 2000, these two villages experienced rapid population growth: Yigo's by 37% and Dededo's by 35%. The more service- and tourism-based village, Tamuning, experienced population growth of 8% during the same period. Guam's active duty military population has remained constant at about 6,200 over the past ten years, with a slight dip from 2000 through 2003.

**Table 16.1-6. Active Duty Military Population on Guam, 1998-2007**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total Active Duty	6,379	6,155	5,806	5,974	5,820	5,944	6,220	6,514	6,253	6,286
Navy	3,946	3,902	3,741	3,626	3,810	3,760	3,922	4,085	3,867	3,879
Air Force	2,119	1,964	1,752	1,981	1,670	1,828	1,950	1,844	1,596	1,596
Army	178	158	172	183	200	217	211	422	606	632
Coast Guard	134	130	136	180	136	136	134	160	180	175
Marine Corps	2	1	5	4	4	3	3	3	4	4

Sources: Guam Bureau of Statistics and Plans 2006, COMNAV Marianas 2008.

The demographic characteristics of military personnel and their dependents living on Guam in 2000 are shown in Table 16.1-7. Military and military dependents on Guam were younger than Guam overall. Additionally, there were more Caucasians and fewer Pacific Islanders among the group. Military households had a lower median income than Guam overall. However, military households also had fewer persons per household to the extent that income per household member was greater than Guam overall (\$10,963 vs. \$10,107). It should also be noted that Military households also receive a basic allowance for housing which provides them with more disposable income. Military and military dependents had slightly higher educational attainment; 58% completed high school and an additional 36.6% obtained a college degree.

**Table 16.1-7. Active Duty Military and Military Dependent Demographic Characteristics, 2000**

Median Age	Gender		Ethnicity					Median Household (HH) Income	Median HH Size	Income Per HH Member	Education (25 yr. and over pop)	
	Male	Female	White	Asian	Native Hawaiian/ Other Pacific Islander	Black or African American	Other				High School	College Degree
23	52.2%	47.8%	44.6%	16.0%	11.8%	8.2%	19.4%	\$33,000	3.01	\$10,963	58%	36.6%

Source: U.S. Census Bureau 2000c.

#### 16.1.4 Economic Characteristics

##### 16.1.4.1 Employment and Income

###### Employment by Industry

As of 2000, Guam's industrial employment composition was quite different than that of the U.S. as a whole. Guam's economy was more government- and service-oriented and less production-oriented.

Table 16.1-8 shows that Government of Guam (GovGuam) is the major employer on Guam. Furthermore, it shows that the percentage of Guam's payroll employment in the Government sector is high compared to the U.S. overall.

**Table 16.1-8. Government's Share of Employment (June 2009)**

Country/Territory	Payroll Employment	Government Workers	Government Workers (% of Labor Force)
U.S.	132,609,000	22,511,000	17%
Guam	59,340	14,430	24.3%

Sources: U.S. Bureau of Labor Statistics 2009, Guam Department of Labor 2009b.

Table 16.1-9 shows the industrial employment composition of Guam's economy. Between 2000 and 2009 the number of construction jobs has increased. Over the same period, the number of jobs in the retail trade industry declined, possibly due to lower spending by Guam residents coping with decreasing price-adjusted incomes (see subsequent discussion).



**Table 16.1-9. Guam Civilian Employment by Industry, 2000 and 2009**

<i>Industry</i>	<i>2000 Number</i>	<i>% of 2000 Total</i>	<i>2009 Number</i>	<i>% of 2009 Total</i>	<i>Change 2000-2009 Number</i>	<i>% Change 2000- 2009</i>
Agriculture	288	0%	410	1%	122	42%
Construction	4,430	7%	6,790	11%	2,360	53%
Manufacturing	1,619	3%	1,690	3%	71	4%
Transportation & Public Utilities	4,981	8%	4,690	8%	-291	-6%
Wholesale Trade	1,942	3%	2,050	3%	108	6%
Retail Trade	12,324	20%	11,190	19%	-1,134	-9%
Finance, Insurance & Real Estate	2,657	4%	2,580	4%	-77	-3%
Services	15,129	25%	15,510	26%	381	3%
Federal Government (excl. active-duty military)	4,436	7%	3,790	6%	-646	-15%
GovGuam	12,741	21%	10,640	18%	-2,101	-16%
<b>Totals</b>	<b>60,547</b>	<b>100%</b>	<b>59,340</b>	<b>100%</b>	<b>-1,207</b>	<b>-2%</b>

Source: Guam Department of Labor 2008a

### Occupational Profile

Whereas Table 16.1-9 showed employment on Guam by industry classifications 2000 and 2009, in contrast Table 16.1-10 shows Guam employment by occupational classifications in 2000 and 2008. Industry and occupational employment are different classifications of employment. For instance, construction industry employment includes all employees working for firms in the construction industry (including sales, office support etc.) while construction occupational employment includes only employment related to actual construction work.

As shown in Table 16.1-10 from 2000 to 2008, as measured by the U.S. Bureau of Labor Statistics, Guam added 1,800 jobs (from 57,000 to 58,810), an increase of 3.2%.

More jobs were held in Office and Administrative Support occupations than any other occupation; common jobs under this category include Executive Secretaries and Administrative Support, Customer Service Representatives, and various clerking positions. Jobs in Community and Social Services, Computer and Mathematical, and Legal occupations increased at high rates while jobs in Transportation and Materials Moving, Production, and Healthcare Support each declined by over 10%.

**Table 16.1-10. Guam Employment by Occupation, 2000 and 2008**

<i>Occupation</i>	<i>Employment</i>		
	<i>2000</i>	<i>2008</i>	<i>% Change</i>
Office and administrative support	10,090	10,660	6%
Food preparation and serving related	6,360	5,790	-9%
Sales and related	5,530	5,500	-1%
Management analysts	4,960	4,590	-8%
Construction and extraction	3,380	4,510	33%
Education, training, and library	3,600	4,170	16%
Transportation and material moving	4,120	3,420	-17%
Building and grounds cleaning and maintenance	3,660	3,360	-8%
Installation, maintenance, and repair	3,000	3,140	5%
Personal care and service	1,720	2,430	41%
Protective service	2,370	2,420	2%
Business and financial operations	2,090	2,060	-1%
Production	1,810	1,510	-17%
Healthcare practitioners and technical	1,230	1,500	22%
Architecture and engineering	750	810	8%

Occupation	Employment		
	2000	2008	% Change
Community and social services	360	710	97%
Healthcare support	690	620	-10%
Arts, design, entertainment, sports, and media	590	540	-9%
Computer and mathematical	260	460	77%
Life, physical, and social science	290	370	28%
Legal	140	240	71%
<b>Total</b>	<b>57,000</b>	<b>58,810</b>	<b>3%</b>

Source: U.S. Bureau of Labor Statistics 2009.

### Income Profile

Table 16.1-11 shows median annual salary by occupation for Guam during 2000 and 2008, and includes the percentage change in salary in each occupation over that period. From 2000 to 2008, as measured by the U.S. Bureau of Labor Statistics, median salary for Guam jobs increased by \$3,041 per year (from \$22,890 to \$25,931) an increase of 13%.

The highest salaries were found in Legal, Management Analyst, and Architecture and Engineering occupations. Salaries in Education, Training and Library, and Arts, Design, Entertainment, Sports and Media occupations increased at high rates while salaries in Legal, Community and Social Services, and Life, Physical, and Social Science occupations declined.

**Table 16.1-11. Guam Median Annual Salary by Occupation, 2000 and 2008**

Occupation	Median Annual Salary		
	2000	2008	% Change
Legal	\$61,460	\$55,850	-9%
Management analysts	\$43,320	\$47,270	9%
Architecture and engineering	\$37,700	\$43,000	14%
Computer and mathematical	\$37,770	\$40,860	8%
Healthcare practitioners and technical	\$34,870	\$39,940	15%
Business and financial operations	\$36,660	\$39,540	8%
Life, physical, and social science	\$38,870	\$38,000	-2%
Education, training, and library	\$27,960	\$37,740	35%
Community and social services	\$30,320	\$29,810	-2%
Installation, maintenance, and repair	\$24,420	\$25,860	6%
Construction and extraction	\$24,710	\$25,750	4%
Arts, design, entertainment, sports, and media	\$19,920	\$24,560	23%
Protective service	\$23,820	\$24,510	3%
Office and administrative support	\$20,320	\$23,480	16%
Healthcare support	\$20,180	\$21,380	6%
Production	\$19,350	\$21,030	9%
Personal care and service	\$18,100	\$20,150	11%
Transportation and material moving	\$16,900	\$19,390	15%
Sales and related	\$15,330	\$15,830	3%
Building and grounds cleaning and maintenance	\$13,490	\$15,350	14%
Food preparation and serving related	\$13,670	\$15,180	11%
<b>Employment Weighted Average</b>	<b>\$22,890</b>	<b>\$25,931</b>	<b>13%</b>

Source: U.S. Bureau of Labor Statistics 2009.

### Price Adjusted Income

Changes in salary, over-time, should be understood in terms of purchasing power. Purchasing power is how much people can buy with their income. How much an individual can buy with their income depends

on the prices of the goods and services they purchase. Purchasing power will increase if salaries increase faster than prices but purchasing power will decrease if prices increase faster than salaries.

As shown in the table above, salaries on Guam increased by an average of 13% from 2000 to 2008. However, during that same period consumer prices on Guam increased by 47.3%, as shown in Table 16.1-12. This means purchasing power on Guam decreased substantially.

**Table 16.1-12. Guam and U.S. Consumer Price Index (CPI) Comparison,  
(All Items, Index, Year 2000 = 100)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Guam CPI	100	98.6	99.3	102.0	108.2	116.5	129.9	138.7	147.3
U.S. CPI	100	102.8	104.5	106.9	109.7	113.4	117.1	120.4	125

Sources: Guam Bureau of Statistics and Plans 2009a, U.S. Bureau of Labor Statistics, Division of Consumer Prices 2008.

To illustrate the impacts that price changes have on income, Table 16.1-13 uses information from the previous two tables. Salaries in Table 16.1-11 are divided by the Guam price index in Table 16.1-12. Since the price index begins in 2000 and the value is set at 100, year 2000 salaries are divided by 1 and are thus unchanged. The price index in 2008 reaches a value of 147.3 so 2008 salaries are divided by 1.473 and are thus reduced by 47.3%.

When adjusted for price change, the median salary on Guam decreased by 30% from 2000 to 2008, though it shows a 13% increase in the table above. A 30% decline in price adjusted income means that the same person working the same job could purchase 30% fewer goods and services in 2008 than they could have in 2000.

**Table 16.1-13. Guam, Price Adjusted Median Annual Salary by Occupation, 2000 and 2008**

Occupation	Median Annual Salary (Adjusted for Prices)		
	2000	2008	% Change
Legal	\$61,460	\$37,912	-62%
Management analysts	\$43,320	\$32,087	-35%
Architecture and engineering	\$37,700	\$29,189	-29%
Computer and mathematical	\$37,770	\$27,736	-36%
Healthcare practitioners and technical	\$34,870	\$27,112	-29%
Business and financial operations	\$36,660	\$26,840	-37%
Life, physical, and social science	\$38,870	\$25,795	-51%
Education, training, and library	\$27,960	\$25,618	-9%
Community and social services	\$30,320	\$20,235	-50%
Installation, maintenance, and repair	\$24,420	\$17,554	-39%
Construction and extraction	\$24,710	\$17,479	-41%
Arts, design, entertainment, sports, and media	\$19,920	\$16,672	-19%
Protective service	\$23,820	\$16,638	-43%
Office and administrative support	\$20,320	\$15,938	-27%
Healthcare support	\$20,180	\$14,513	-39%
Production	\$19,350	\$14,275	-36%
Personal care and service	\$18,100	\$13,678	-32%
Transportation and material moving	\$16,900	\$13,162	-28%
Sales and related	\$15,330	\$10,746	-43%
Building and grounds cleaning and maintenance	\$13,490	\$10,420	-29%
Food preparation and serving related	\$13,670	\$10,304	-33%
<b>Employment Weighted Average</b>	<b>\$22,890</b>	<b>\$17,602</b>	<b>-30%</b>

Source: U.S. Bureau of Labor Statistics 2009.

## Unemployment

Table 16.1-14 summarizes Guam's civilian labor force between 2000 and 2007, the last year that data are available.

Between 2000 and 2004, Guam's civilian labor force experienced drastic decline. It began expanding again following 2004, possibly due to news announcements of the proposed action and/or to increases in the number of H-2B workers (see below).

As of 2007, the expansion on Guam's labor force still had not brought the island back to its 2000 level. This is an indicator that Guam's recent economy remains unsettled, despite decreases in unemployment and small increases in total employed persons that have been tracked over the same period. A reduced labor force reflects probable out-migration of Guam's skilled workers and/or is an indicator that "discouraged workers" are dropping out of Guam's economy.

From 2007 to 2009 Guam's labor force increased substantially to the point where, even with an increase in number of persons employed, the unemployment rate increased. Guam's unemployment rate of 9.3% in September 2009 was similar to the national figure 9.8%. Guam has no unemployment insurance program.

As of July 2008 there were 1,619 H-2B workers on Guam (Guam Department of Labor 2008b). The H2-B temporary worker program is for "temporary service or labor if unemployed persons capable of performing such service or work cannot be found in this country" (8 U.S. Code (USC) 1101(a) (15) (H))

**Table 16.1-14. Guam Employment Trends 2000-2007**

<i>Year</i>	<i>Civilian Labor Force</i>	<i>Labor Force Participation Rate<sup>1</sup></i>	<i>Employed</i>	<i>Unemployment Rate</i>
2000	70,800	67.8%	59,950	15.3%
2001	64,800	64.5%	56,040	13.5%
2002	62,050	62.4%	54,980	11.4%
2004	61,520	61.7%	56,810	7.7%
2005	64,130	61.1%	59,630	7.0%
2006	65,940	62.9%	61,390	6.9%
2007	63,600	57.8%	58,290	8.3%
2009	70,310	61.7%	63,800	9.3%

<sup>1</sup>The labor force participation rate is the percentage of the adult population 16+ either employed or unemployed but actively seeking employment.

Source: Guam Department of Labor 2009c. (2008 data not available.)

### 16.1.4.2 Housing Supply and Characteristics

As of the 2000 Census there were approximately 48,000 housing units on Guam. Overall, Guam at that time had a very high vacancy rate (19%) as compared to the U.S. nationwide figure for 2000 (9%).

During the early 2000s, while Guam's economy was in recession, both real estate prices and the construction of new housing units fell. Decreased new home construction led to historically low values of new residential building permits from 2000-2002. Housing price declines continued into 2003, when home prices bottomed at a median price of around \$110,000 for a single-family home (First Hawaiian Bank 2007).

In 2004, real estate prices began to rise again, in response to improving worldwide economic conditions and initial discussions of the proposed action. This in turn spurred new construction. From the time the market bottomed in 2003 through 2006, home prices rose 41% and condo prices rose 74% (First

Hawaiian Bank 2007). Data showed prices increasing through 2007 (Captain 2008a), and anecdotal evidence suggested that this trend was expected to continue through 2008 (First Hawaiian Bank 2008). However, while home prices have continued to increase, the rate of price increase has begun to decline in the currently slowing economy (Captain 2008b).

Table 16.1-15 illustrates declining home prices during the early part of the 2000s and rising home prices more recently. The home purchase component of Guam's Consumer Price Index (CPI) increased 98% from 2003 to 2006 while median salaries increased 2.7% during the same period (U.S. Bureau of Labor Statistics Division of Occupational Employment Statistics 2008).

**Table 16.1-15. Home Purchase Component of Guam CPI, 2000-2006**

	2000	2001	2002	2003	2004	2005	2006
Home Purchase	100.0	98.6	86.5	94.5	124.7	155.9	187.3

Notes: The Guam CPI shows prices bottoming in 2nd quarter 2002 while some market research shows prices continuing to fall into 2003; the true bottom to housing prices probably falls somewhere in between.

Source: Guam Department of Labor 2006

Table 16.1-16 provides year 2000 housing characteristics information for Guam and each of Guam's villages.

**Table 16.1-16. Housing Characteristics for Guam, 2000**

	Total Housing Units	Vacant Units		Occupied Units		Median Rooms	Avg. Bedrooms	Median Value (Owner-Occupied)	Median Rent		Median Year Structure Built	
		Total	For Rent	Total	Renter Occupied				Gross	Contract		
Guam Totals	47,677	19%	10%	38,769	52%	4.1	2.5	\$171,900	\$775	\$645	1983	
North	Dededo	12,119	17%	7%	10,016	45%	4.1	2.6	\$163,100	\$695	\$590	1985
	Yigo	5,489	16%	5%	4,634	57%	4.4	2.5	\$161,800	\$719	\$609	1985
Central	Tamuning	8,108	27%	21%	5,953	75%	3.4	2.2	\$273,600	\$855	\$720	1983
	Barrigada	2,307	9%	5%	2,097	38%	4.2	2.6	\$190,900	\$837	\$705	1983
	Mangilao	3,926	19%	14%	3,190	50%	3.9	2.4	\$182,700	\$741	\$626	1988
	Mongmong-Toto-Maite	2,102	22%	15%	1,633	62%	4	2.3	\$179,900	\$732	\$620	1981
	Hagåtña	395	32%	27%	268	69%	3.5	2	\$266,100	\$665	\$544	1976
	Sinajana	857	13%	10%	742	45%	4.5	2.7	\$189,800	\$852	\$675	1976
	Agana Heights	1,193	11%	8%	1,058	50%	4.4	2.5	\$194,200	\$718	\$623	1976
	Chalan Pago-Ordot	1,920	18%	6%	1,573	44%	4.1	2.5	\$175,900	\$884	\$755	1990
	Asan	660	16%	3%	552	39%	4.7	2.6	\$209,800	\$814	\$661	1979
	Piti	576	18%	15%	474	43%	4.8	2.9	\$271,400	\$1,025	\$911	1977
South	Yona	1,745	15%	10%	1,486	32%	4.6	2.7	\$173,100	\$724	\$547	1981
	Agat	1,499	13%	8%	1,298	51%	3.8	2.4	\$162,700	\$585	\$458	1982
	Santa Rita	2,517	29%	2%	1,780	63%	5	2.8	\$174,000	\$1,006	\$835	1976
	Talofofu	849	13%	3%	738	34%	4.3	2.5	\$170,400	\$797	\$663	1987
	Umatac	179	9%	3%	162	35%	4.7	2.6	\$152,100	\$413	\$213	1984
	Inarajan	701	8%	2%	644	28%	4.2	2.5	\$172,700	\$768	\$613	1986
Merizo	535	12%	8%	471	41%	4.2	2.4	\$171,800	\$679	\$525	1984	

Notes: "Median Rent" is the value where half the rents are higher and half lower. "Contract rent" is the monthly rent regardless of any costs for furnishings, utilities, fees, meals, etc. "Gross rent" includes those additional things.

Source: U.S. Census Bureau 2000a

### North

As of 2000, the Northern region had a total of 17,608 housing units (12,119 in Dededo and 5,489 in Yigo); this comprised 37% of the total number of housing units on Guam.

Overall, Guam had a very high vacancy rate (19% compared to the U.S. nationwide figure of 9%); the Northern region had a lower vacancy rate than Guam overall, but with a 17% rate in Dededo and a 16% rate in Yigo, the region still had a high vacancy rate.

About 7% of total units in Dededo and 5% in Yigo were available to be rented compared to the Guam overall rate of 10%.

The Northern region, on average, had fewer renter occupied units as a percentage than Guam overall; the relatively low rate in Dededo (45%) more than offset the relatively high rate in Yigo (57%).

Housing units were slightly larger in the Northern region compared to Guam overall; Yigo had more rooms per unit and Dededo had more bedrooms per unit than the Guam overall average.

Despite the slightly larger and newer (median year built in 1985 vs. 1983) housing units in the Northern region, prices were lower than Guam overall both in terms of median value and rents.

### Central

As of 2000, the Central region had a total of 22,044 housing units; this comprised 46% of the total number of housing units on Guam.

Overall, Guam had a very high vacancy rate (19% compared to the U.S. Nationwide figure of 9%); the Central region had an even higher vacancy rate than Guam overall. Tamuning had a high percentage of units that were vacant (27%), most of that were available for rent (21%). In general, the Central region had a higher rate of renter occupied units than Guam overall.

Housing units were smaller in the Central region compared to Guam overall; Tamuning had the smallest sized units on Guam.

Despite the smaller units in the Central region, prices were higher than Guam overall both in terms of median value and rents.

Housing units in the Central region were about the same age as Guam overall, the median year units were built was 1983.

### South

As of 2000, the Southern region had a total of 8,025 housing units; this comprised 17% of the total number of housing units on Guam.

Overall, Guam had a very high vacancy rate (19% compared to the U.S. Nationwide figure of 9%); the Southern region had a slightly lower vacancy rate than Guam overall and only a small percentage of these (5%) were available to be rented. On average, the Southern region had a lower rate of renter occupied units than Guam overall.

Housing units were larger in the Southern region compared to Guam overall; Santa Rita had the largest units on Guam in terms of number of rooms.

Despite the larger units in the Southern region, prices were generally lower than Guam overall.

Housing units in the Southern region were older than Guam overall, the median year units were built was 1981.

### Temporary Workforce Housing

Based on information from Guam construction contractors and the Guam Department of Land Management (GDLM) there is presently capacity to house 3,700 temporary workers. Over half of this capacity (1,900) is owned and operated by one contractor at a single location in Harmon Industrial Park. The remainder of the capacity (1,800) is spread among 17 different locations, mostly in the north and central regions (JGPO & NAVFAC Pacific 2009).

#### 16.1.4.3 GovGuam Finances

Table 16.1-17 explains the tax rates, sources, and budgetary destinations for the major internal revenue sources [plus Compact Impact funding – reimbursements to the local government agencies of Guam, Commonwealth of the Northern Mariana Islands (CNMI) and Hawaii for costs incurred due to the in-migration of Micronesians, as per Section 104(e) of the Compact of Free Association (COFA)].

GovGuam bases most of its Gross Receipts and Income taxes on the Internal Revenue Service code. Guam residents pay federal income taxes but those taxes are returned to GovGuam. While real property taxes on Guam are relatively low, taxes on real estate transactions are 35%. Most sources of tax revenue go to the Guam General Fund while some other tax revenues go into a variety of Other Governmental Funds.

**Table 16.1-17. Revenue Sources for the GovGuam**

<i>Tax</i>	<i>Tax Rate</i>	<i>Taxed Item</i>	<i>Budgetary</i>
Gross Receipts Tax	4%	Gross income	General Fund
Hotel Occupancy Tax	11%	Daily room rate	Tourist Attractions Fund
Personal Income Tax	10% - 35%	Income	General Fund
Corporate Income Tax (Guam Based)	15% - 35%	Net income	General Fund
Corporate Income Tax (Other Business on Guam)	15% - 35%	Guam source income	General Fund
Real Property Sales Tax	35% of the full cash value	Sale of land or buildings	Territorial Education Facility Fund
Annual Real Property Tax	0.005% for land	Assessed value	Territorial Education Facility Fund
Annual Real Property Tax	.01% for buildings	Assessed value	Territorial Education Facility Fund
Liquid Fuel Tax	\$0.10 per gallon	Diesel	Highway Fund
Liquid Fuel Tax	\$0.04 per gallon	Aviation fuel	Highway Fund
Liquid Fuel Tax	\$0.11 per gallon	All other fuel	Highway Fund
Federal Grant	Total Federal Grant	Grant Base	Budgetary
Compact Impact Payment	\$30,000,000	% of Insular FAS Population	Discretionary (Governor)
GG.501	Interior Department - Payments to the Territories	Various formulae for broad category of grants and programs <sup>1</sup>	Multiple

*Legend:* FAS= Freely Associated States of Micronesia.

*Sources:* Guam Department of Revenue and Taxation 2008, USDOJ 2009.

GovGuam Revenues

Table 16.1-18 provides breakdown of FY 2008 government revenues. In FY 2008, GovGuam had revenues totaling \$816 million. Tax revenues (\$506 million) accounted for most of the revenue and most of the remainder came from federal contributions (\$234 million). Of that total \$816 million in revenue, \$513 million went to the General Fund, \$118 million went to Other Governmental Funds, \$140 million came from Federal Assistance Grants and \$45 million came in the form of federal grants to the Guam Public School System (GPSS).

**Table 16.1-18. GovGuam FY 2008 Revenues**

	<i>General Fund Revenue</i>	<i>Other Governmental Funds</i>	<i>Federal Assistance Grants</i>	<i>GPSS Federal Grants</i>	<i>Totals</i>
Taxes	\$443,042,946	\$63,232,570			<b>\$506,275,516</b>
<i>Income Tax</i>	<i>\$254,137,767</i>				<i>\$254,137,767</i>
<i>Gross Receipts Tax</i>	<i>\$185,795,875</i>				<i>\$185,795,875</i>
<i>Other Taxes</i>	<i>\$3,109,304</i>				<i>\$3,109,304</i>
Licenses, fees and permits	\$5,593,716	\$46,329,298			<b>\$51,923,014</b>
Use of money and property	\$2,472,737	\$3,300,462			<b>\$5,773,199</b>
Federal contributions	\$45,329,450	\$4,002,636	\$140,240,979	\$44,708,831	<b>\$234,281,896</b>
Guam Public Schools System	\$2,831,209				<b>\$2,831,209</b>
Contributions from component units	\$10,372,580				<b>\$10,372,580</b>
Other	\$3,547,691	\$1,333,251			<b>\$4,880,942</b>
<b>Totals</b>	<b>\$513,190,329</b>	<b>\$118,198,217</b>	<b>\$140,240,979</b>	<b>\$44,708,831</b>	<b>\$816,338,356</b>

Source: GovGuam 2008a. GovGuam FY 2008 Basic Financial Statement.

GovGuam Expenditures

Table 16.1-19 shows GovGuam expenditures for Fiscal Year 2008. GovGuam spent more on public education than any other expenditure category; \$242 million was spent on public education not including payments made to University of Guam (UoG) (\$33.4 million) and Guam Community College (GCC) (\$15.8 million) – in total, one-third of all GovGuam expenditures went to education. General government (\$95 million), protection of life and property (\$93 million) and public health were the three next highest expenditure categories. Over \$41 million was spent paying interest on GovGuam debt during FY 2008.



**Table 16.1-19. GovGuam FY 2008 Expenditures**

	<i>General Fund Revenue</i>	<i>Other Governmental Funds</i>	<i>Federal Assistance Grants</i>	<i>GPSS Federal Grants</i>	<i>Total</i>
<b>Current expenditures:</b>					
General government	\$44,997,050	\$30,540,198	\$19,397,357		<b>\$94,934,605</b>
Protection of life and property	\$72,957,261	\$12,872,333	\$7,427,419		<b>\$93,257,013</b>
Public health	\$10,008,749	\$10,293,921	\$56,089,200		<b>\$76,391,870</b>
Community services	\$6,417,038	\$9,618,752	\$19,472,449		<b>\$35,508,239</b>
Recreation	\$3,320,910	\$877,465	\$682,700		<b>\$4,881,075</b>
Individual and collective rights	\$12,483,687	\$29,901,502	\$8,993,874		<b>\$51,379,063</b>
Transportation		\$10,079,190	\$5,653,650		<b>\$15,732,840</b>
Public education				\$49,379,556	<b>\$242,464,992</b>
Environmental protection		\$7,769,560	\$4,250,941		<b>\$12,020,501</b>
Economic development	\$3,611,857	\$152,086	\$6,130,460		<b>\$9,894,403</b>
<b>Payments to agencies:</b>					
GovGuam Retirement Fund	\$1,329,712				<b>\$1,329,712</b>
A.B. Won Pat Airport Authority			\$3,089,215		<b>\$3,089,215</b>
Chamorro Land Trust Commission (CLTC)		\$481,541			<b>\$481,541</b>
Guam Community College	\$13,615,957	\$840,000	\$1,302,400		<b>\$15,758,357</b>
Guam Educational Telecommunications Corporation	\$593,124				<b>\$593,124</b>
Guam Memorial Hospital Authority		\$11,815,830	\$9,247,308		<b>\$21,063,138</b>
Guam Power Authority			\$4,538,565		<b>\$4,538,565</b>
Guam Visitors Bureau		\$13,428,692			<b>\$13,428,692</b>
Guam Waterworks Authority			\$420,161		<b>\$420,161</b>
Port Authority of Guam			\$145,074		<b>\$145,074</b>
University of Guam	\$31,799,749	\$1,000,000	\$612,639		<b>\$33,412,388</b>
Miscellaneous appropriations	\$19,941,432	\$17,679			<b>\$19,959,111</b>
Interest and other charges	\$17,309,639				<b>\$17,309,639</b>
<b>Capital projects</b>		\$5,481,441	\$10,545,791	\$55,160,750	<b>\$71,187,982</b>
<b>Debt service</b>	\$22,702,010	\$13,581,066		\$5,100,000	<b>\$41,383,076</b>
<b>Total Expenditures</b>	<b>\$454,173,611</b>	<b>\$158,751,256</b>	<b>\$157,999,203</b>	<b>\$109,640,306</b>	<b>\$880,564,376</b>

Source: GovGuam 2008a. GovGuam FY 2008 Basic Financial Statement.

### Overview of Current GovGuam Capacity Issues

Because of its geographic and historical circumstances GovGuam faces two broad types of capacity challenges, both of which will affect its ability to cope with the impacts of the proposed action: (1) human resources, and (2) financial resources.

### *Human Resources*

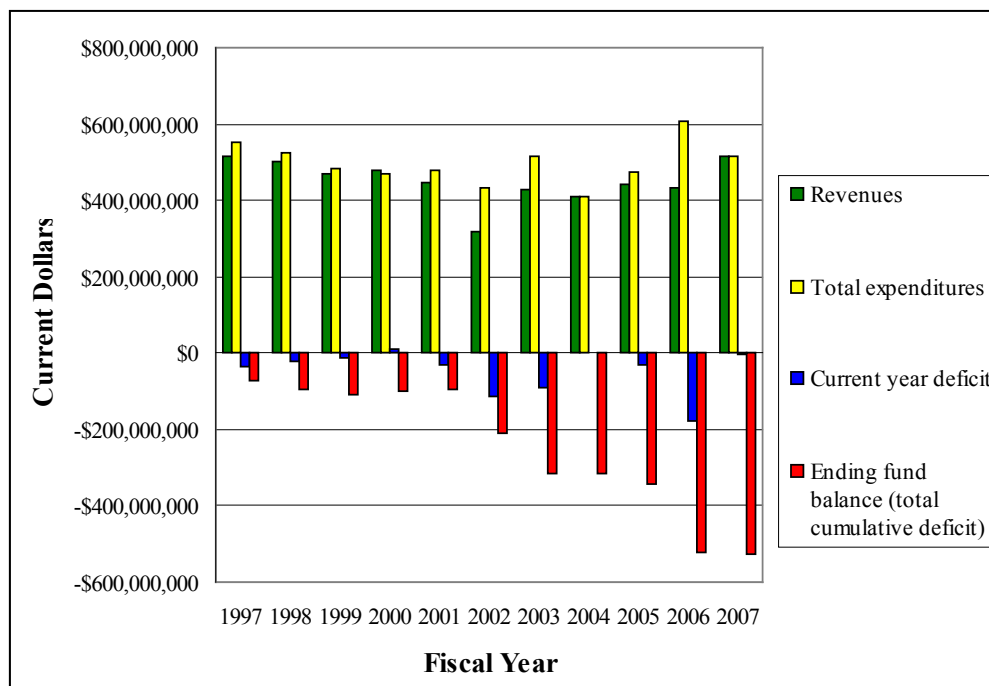
Guam is geographically remote from any major population center and its population base is small. Guam's population is much smaller than any U.S. state and would rank 126 among U.S. mainland cities (U.S. Census Bureau 2007). This small and remote population limits the pool of available skilled, technical and managerial workers.

Additionally, Guam's history as a remote colony of Spain for 400 years, its 20<sup>th</sup>-century occupation by Japan, and its governance by U.S. Naval Officers until the passage of the Organic Act in 1950, has temporally limited Guam's experience at self governance, compared to most U.S. mainland local and state governments. This lack of governance experience has affected GovGuam's performance, especially in regard to handling of federal funds. Several GovGuam agencies have been put into federal receivership because of delinquent services or been cited for high-level administrative fraud.

### *Financial Resources*

Guam's financial challenges involve sufficient revenue for its normal operations and the government's ability to borrow money to support necessary infrastructure for its population (this includes existing population or potential population growth from the proposed action). Some detail is provided below to explain the status of Guam's government finances and additional detail is provided in the SIAS (Volume 9 Appendix F).

The General Fund is the primary operating fund of most U.S. government units. It is used to account for all assets and liabilities of a government except those particularly assigned for other purposes in another more specialized fund. An example of a specialized fund is the capital projects fund that accounts for financial resources used for acquisition, construction, or operation of major capital facilities. Guam has had a persistent problem with deficits in its General Fund receipts and expenditures over the past 10 years. Figure 16.1-1 shows annual General Fund revenues, expenditures, and deficits from FY 1997 to FY 2007. General Fund expenditures grew by an annual average of about 1.8% over FY 1996 to FY 2006, primarily due to a jump in FY2006. However, revenues fell substantially over that period, resulting in a total cumulative deficit of \$528 million by the end of FY 2007.



Sources: Banc of America LLC 2007, Guam Office of the Public Auditor 2008.

**Figure 16.1-1. Historical Guam General Fund Revenues, Expenditures, and Deficits**

In part because deficits were affecting the ability to sell bonds for existing costs and new infrastructure, the government started a deficit reduction plan in FY 2007. This plan included tighter spending controls, more diligent revenue collection, more careful accounting systems, and more timely audits. Upon completion of audits, the FY 2008 balance is expected to show a small surplus (Banc of America LLC 2007). The current (2009) cumulative Guam General Fund deficit is also somewhat improved, at approximately \$510 million (Standard & Poor’s 2008). To achieve balanced budgets Guam has cut staffing and services.

Guam’s efforts to reduce its outstanding \$510 million debt are complicated by even larger “unfunded obligations,” that are not included in its official cumulative debt estimates. Unfunded obligations refer to future commitments that were not backed up by reliable provisions to pay for those commitments. These unfunded obligations, in sum, are much higher than the official Guam total deficit. This means that Guam’s capacity to borrow in order to correct its problems is very limited, creating extreme difficulty in maintaining current levels of service. In addition, both expansion of services and also building new infrastructure (such as could be necessary to accommodate the proposed action) may be difficult in the absence of adequate amounts and sources of borrowing. See the Appendix F SIAS for additional information.

The proposed action would generate more demands on Guam for roads, ports, sewer, water, power, and other necessary infrastructure. Some of these needs can be paid for by establishing private sector responsibilities for their provision, and/or user fees. However, in sum, these demands would increase the pressure for substantial borrowing.

#### 16.1.4.4 Gross Island Product (GIP)

GIP measures the total value of all final goods and services produced in a particular island economy; it is the most commonly used benchmark to gauge the overall size of an island economy. A recent measure of GIP was published in 2010 while previous measures extended to 2002. It was estimated that Guam's GIP was about \$4.3 billion as of 2007. Table 16.1-20 details Guam's GIP from 1991 to 2002 as published by the Guam Bureau of Statistics and Plans and GIP from 2002 to 2007 as published by the U.S. Bureau of Economic Analysis.

**Table 16.1-20. Guam GIP 1991-2007 (Millions of Current \$s)**

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
GIP	\$2,667	\$2,902	\$2,917	\$3,014	\$2,999	\$2,993	\$3,109	\$3,551	\$3,025	\$3,420	NA	\$3,428

Source: Guam Bureau of Statistics and Plans 2006 (years 1991-2002).

	2002	2003	2004	2005	2006	2007
GIP	\$3,568	\$3,542	\$3,846	\$4,100	\$4,176	\$4,280

Source: Bureau of Economic Analysis. 2010. (Years 2002-2007)

Note: "Current dollars" reflect the dollar value for the years data were recorded; for example, in the table above, 1991 GIP is in 1991 dollars, 1992 GIP is in 1992 dollars and et cetera.

### 16.1.5 Public Services

#### 16.1.5.1 Education Services

Primary, secondary, and high-school education for the civilian residents of Guam is provided through the GPSS, and various private schools. Although there are currently no charter schools on Guam, the recently enacted (January 30, 2009) Guam Public Law (PL) 29-140 authorized the establishment of such schools. School-age children of active duty military and eligible populations on Guam are served by schools in the Department of Defense (DoD) Dependent Schools Pacific/U.S. Department of Defense Education Activity Domestic Dependent Elementary and Secondary Schools (DDESS) Guam system.

Higher education services on Guam are provided by the UoG, GCC, and the Pacific Islands University. UoG and GCC also provide vocational training and business development programs.

#### Primary, Secondary and High School Education

##### *GPSS*

GPSS is one unified school district, supporting 40 schools (26 elementary, eight middle, five high and one alternative). GPSS plans to open three new schools. A large number of GPSS schools are located within Guam's central region, followed by the northern area, with the smallest number of schools in the south and Apra Harbor region. As of July 2008, GPSS employed about 4,000 employees and serviced approximately 31,000 students (Kelman 2008).

The student population of GPSS is very diverse. In school year 2007/2008, the largest student ethnic groups were Chamorro (46%), Pacific Islander (30%) and Filipino (21%). A total of 11,739 (37.79%) students were listed as Languages Other Than English students (Guam Department of Education 2008). There are also an estimated 100 military dependents that are part of the total GPSS student population (Appendix F SIAS - GPSS Interview).

##### *Private Schools*

Guam has approximately 27 private schools. Of these schools, 15 are Catholic; 11 are Christian; and one is non-denominational. Civilian and military families wishing for their dependents to receive a faith-based

education often choose private schools. The Catholic Church opened a new high school in November 2008; is studying the possibility of building another in northern Guam whether or not the proposed action occurs; and could build more private schools if the relocation does occur (Kelman 2008). Overall, private schools on Guam have an enrollment of approximately 6,500 (Guam Civilian Military Task Force Education Sub-Committee 2009).

### *DDESS*

All information for this section was obtained from a 2009 interview with DDESS staff (Appendix F SIAS – DDESS Interview).

Education for military dependents in the U.S. is supplied by the umbrella organization, the DoD Education Activity (DoDEA). Prior to 1997, military dependents on Guam enrolled in the GPSS. Guam's military school system was established during school year 1997/1998, citing that GPSS was unable to meet accountability expectations in school improvement. Currently, Guam's military schools are part of the DDESS system that manages military education in territories of the U.S. Although Guam is technically part of DDESS and the school system will be referred to as DDESS in this EIS, the operational control of Guam's military school district was passed in school year 2004/2005 to DoD Dependent Schools-Pacific, headquartered in Okinawa, Japan.

DDESS runs two elementary schools, two middle schools and one high school on Guam. Andersen Elementary and Middle School are located in the north. McCool Elementary and Middle School is located near Apra Harbor. Most recently built (September 2007), Guam High School, is also located in central Guam, as is the District Superintendent's office. As of 2009, DDESS employed approximately 267 employees and had a student population of 2,672. Refer to Appendix F SIAS for details on DDESS enrollment by parental employer type.

### Higher Education

GCC, UoG, and Pacific Islands University are located in Mangilao, in the central region of Guam. GCC and UoG are both fully accredited by the Western Association of Schools and Colleges. Pacific Islands University is accredited by the Transnational Association of Christian Colleges and Schools. See the Appendix F SIAS for additional information on these institutions.

### Educational Attainment

Overall, data from the 2000 Census show a fairly high level of educational attainment on Guam although this attainment is slightly lower than the national average, as shown in Table 16.1-21.

**Table 16.1-21. Guam Educational Attainment as of 2000**

	<i>Guam</i>	<i>%</i>	<i>U.S.</i>	<i>%</i>
<b>Total Population 25 Years &amp; Over</b>	<b>83,281</b>	<b>100%</b>	<b>182,211,639</b>	<b>100%</b>
Less than 9 <sup>th</sup> grade	7,843	9%	13,755,477	8%
9 <sup>th</sup> grade to 12 <sup>th</sup> grade, no diploma	11,862	14%	21,960,148	12%
High school graduate (includes equivalency)	26,544	32%	52,168,981	29%
Some college or associate degree	20,398	24%	49,864,428	27%
Bachelor's degree	12,774	15%	28,317,792	16%
Graduate or professional degree	3,860	5%	16,144,813	9%
<b>% High School Graduate or Higher</b>		<b>76%</b>		<b>81%</b>
<b>% Bachelor Degree or Higher</b>		<b>20%</b>		<b>25%</b>

Source: U.S. Census Bureau 2000a.

#### 16.1.5.2 Health and Human Services

Health services involve the preservation of health and prevention, treatment and management of illness through the professions of medicine, dentistry, nursing, and allied health. Human Services can incorporate a range of agencies and services including support of low-income, specially identified, or at-risk populations.

This section first gives brief detail of the overarching factors that affect health and human services on Guam. It then outlines the key public, nonprofit, private and military agencies that provide primary health and human services to Guam's population.

Guam's population currently experiences a variety of health concerns. Guam's Office of Vital Statistics lists heart disease, cancer, and cerebrovascular disease as the leading causes of death on Guam (Guam Memorial Hospital Authority 2008).

Challenges to the island also include fertility rates, communicable and infectious diseases, and obesity. Diabetes is a huge risk factor in the population, and the rate of dialysis has increased by 540% in the last 10 years, reaching five times the rate of the mainland U.S. (USDHHS 2008). In 2007, Guam recorded the highest number of reported influenza/flu symptoms since 1996. Furthermore, in 2007 Guam reported the most new cases of tuberculosis (TB) since 1997. Guam's TB infection rate is 53 new cases per 100,000 population, or 12 times the 2007 U.S. rate of 4.4 (GDPHSS Office of Epidemiology and Research 2007).

Guam's place as a hub in the Asia Pacific region is an additional factor affecting its overall health status. The island can be susceptible to health concerns that are emergent in neighboring areas, whose populations often have high health needs and often do not have immunization or health records. For example, populations in both Chuuk and the Philippines have experienced high levels of TB, with Chuuk recently experiencing incidents of drug-resistant versions of TB (U.S. Public Health Service Interview – Appendix F SIAS). Because individuals from these locations often come from disadvantaged socioeconomic conditions and backgrounds, upon immigrating to Guam they become eligible for federal public assistance. After arrival on Guam, these populations sometimes live in isolated, overcrowded and substandard conditions that include inadequate infrastructure for living (such as water and power supply) and poor quality public services (such as waste collection, fire and police protection). This leads to high rates of hepatitis B, TB, cholera, and Hansen's disease, among other public health concerns.

Since 1988, Guam has been considered a Medically Underserved Area (GDPHSS Maternal and Child Health Services 2007) that demonstrates the island's difficulty in meeting the above health care needs. The island is currently experiencing shortages of health care providers and lacks specific health care specialists. It is often difficult to recruit specialists from the U.S. mainland because of its remote location and a typically lower pay scale. In 2005, Guam had a total of 244 physicians serving its population, including physicians at the Guam Memorial Hospital and licensed military physicians working on a part-time basis (Western Pacific Region Health Databank 2007). Other statistics show a count of 14.1 active physicians per 10,000 residents, compared to the national average of 25.9 in 2005 (USDHHS 2006). Some off-island physician specialists visit Guam on a quarterly basis in order to provide services not typically available on Guam. Guam's dentist-to-population ratio (including private practice dentists) is 1:2,500 (GDPHSS Maternal and Child Health Services 2007). This indicates significantly lower coverage than the national average dentist to population ratio, where in 2000 it was 1:1,691 (American Dental Survey Center 2002).

Guam's distance also means that referral for specialized services in the U.S. require patients to take a seven-hour trip by commercial plane to Hawaii. Flight times from Guam to various countries for treatment are as follows:

- Manila, Philippines – 3.3 hours
- Tokyo, Japan – 3.4 hours
- Hong Kong, China – 4.4 hours
- Cairns, Australia – 4.9 hours

Also affecting Guam's ability to meet the health care needs of its population is that a large percentage of the island's population does not have adequate health insurance to cover medical costs. Often, immigrants arriving on Guam through the COFA agreement are without insurance. The Guam Department Public Health and Social Services (GDPHSS) has estimated that 60,000 individuals on Guam are uninsured or underinsured, out of a total population of approximately 160,000 (Guam Memorial Hospital Authority 2008). An individual may be considered underinsured if they possess private health insurance but that insurance does not adequately cover necessary treatments. Furthermore, many individuals that have health insurance are unable to afford the co-pays for treatments or medications and will turn to government health agencies for free services. The agencies' mandates are to serve all those that come in through the door. Although they do have processes to verify whether an individual is insured or not, private insurance companies are unwilling to release the names of their clients due to confidentiality issues. Often if an individual states he or she does not have health insurance, agency staff must take their word for it.

Finally, the funding of Medicaid and Medicare programs also provide unique challenges to the Guam healthcare system. For example, by statute Guam's Medicaid funding is capped and annual increases are based on the CPI. Federal matching funds for Medicaid (the Federal Medical Assistance Percentage) is set for 50%, the minimum rate. Once Guam has exhausted this capped Medicaid funding, all Medicaid costs must be assumed by GovGuam. Medicare funding on Guam is still paid under the system of the Tax Equity and Fiscal Responsibility Act of 1982 that limits Guam Memorial Hospital's reimbursement to \$6,000 per discharge. This is a lower rate than allowed to most other U.S. states and territories (USDHHS 2008).

#### Guam Memorial Hospital Authority (GMHA)

Unless otherwise noted, all information for this section was obtained from a 2008 survey and 2009 interview with GMHA staff (Volume 9 Appendix F SIAS - GMHA Interview).

GMHA is Guam's only civilian general hospital, servicing the entire population's primary health care needs. In 1964, a public law was passed for GovGuam to administer and operate GMHA. In 1978, the hospital moved to its current location in Tamuning, a building originally built for the Catholic Diocese to serve as a private acute care facility. In 1996, GMHA opened a Skilled Nursing Unit (SNU) facility in Barrigada Heights. GMHA employs 105 medical staff. Approximately 77% of GMHA staff is board certified.

Currently, the 220,000-square-foot GMHA provides a total of 250 beds including 158 acute care beds. The SNU has 40 beds. GMHA is often at capacity.

GMHA is funded primarily through patient payment. Patients are mostly civilian, although military dependents do at times access GMHA services, after that the hospital can bill TRICARE (military health plan provider).

## GDPHSS

The GDPHSS provides various health services to the public including primary and acute health care.

### *Bureau of Primary Care Services (BPC)*

The GDPHSS BPC was established in 1998 to administer two Community Health Clinics (CHCs): the Northern Region Community Health Center (NRCHC) and the Southern Region Community Health Center (SRCHC). These centers are Federally Qualified Health Centers that provide primary, acute and preventative care on an outpatient basis only. Prior to 1998, primary care services from GDPHSS did not exist, and services were limited to preventive services under the Maternal Child Health Program of the GDPHSS Bureau of Family Health and Nursing Services (BFHNS).

Anyone is able to use the services of the CHCs regardless of income, family size, or ability to pay, however, the Clinics focus on low income, uninsured and medically underserved populations. Their Sliding Fee Program is based on the federal income poverty guidelines that take into account income and family size. Through this program, patients receive discounts of 100%, 75%, 50% or 25%. Furthermore, GMHA will refer patients who have no primary care provider and/or health care to CHCs after they are discharged from the GMHA Emergency Room or after hospitalization (Volume 9 Appendix F SIAS - GDPHSS BPC Interview).

### *BFHNS*

The GDPHSS BFHNS provides health and social services, mostly to individuals with no insurance. It is located at the central GDPHSS location, has one room at the NRCHC, and its staff makes visits to the SRCHC. The BFHNS provides: women's health services, family planning services, child health services, services for children with special health needs, home care services, communicable disease services (e.g. immunization, TB clearance, health certificate, and skin tests), chronic screenings in the community, and information to the public through information booths. BFHNS has experienced a dramatic increase in access of communicable disease services between 2007 and 2008. Decreases in various other services accessed do not necessarily indicate a decreasing need for these services, but rather the inability for BFHNS to meet these needs. Because of staffing and supply shortfalls, the BFHNS currently prioritizes its work in the following order: infectious diseases, child health, prenatal care, women, chronic needs, and family planning. Integral to the work of the BFHNS is its staff of nursing personnel. Community Health Nurses at the BFHNS travel to different villages on Guam, making visits in order of priority (Appendix F SIAS - BFHNS Interview).

### *Bureau of Communicable Disease Control (BCDC)*

All information for this section was obtained from a 2009 interview with BCDC staff (Appendix F SIAS – CDC Interview). The Center for Disease Control (CDC) provides STD, human immune-deficiency virus (HIV), and TB related services, children and adult immunizations, and laboratory services. These services are provided at the central GDPHSS location, as well as at the NRCHC and SRCHC through Memoranda of Understanding (MOU) agreements. Services at the main location are completely free of charge while the CHCs charge a fee for service. The CHCs see approximately 22,000 clients a year, with higher morbidity rates in the northern areas of Guam.

### *Division of Public Welfare*

All information for this section was obtained from a 2009 interview with Division of Public Welfare staff (Volume 9 Appendix F SIAS – DPW Interview). The Division of Public Welfare is responsible for a wide array of social services, administered through a number of different Bureaus. The Division's



administrative headquarters are located in the main building, while eligibility sites for each of the social services it administers are scattered throughout the island. Bureaus and sections encompassed by the Division of Public Welfare are the Bureau of Social Services Administration, Bureau of Management Support, Bureau of Health Care Financing Administration, Bureau of Economic Security, and the Work Programs Section.

#### *Division of Environmental Health (DEH)*

The DEH provides regulatory services including the generation of sanitary permits and health certificates, and the issuance of health citations. The DEH will perform pre-operation inspections of new permanent or temporary facilities, issue permits for their operation, and continue to perform periodic inspections of these facilities during operations. DEH also generates health permits for employees requiring such a permit (such as those working with food, at massage parlors, or cosmetologists), making sure that the employees have completed their TB skin test and any food safety workshops (offered at GCC) that are required.

In 2008, DEH generated 2,841 sanitary permits for permanent establishments, conducted 1,112 facility inspections, and generated 31,000 health certificates (Volume 9 Appendix F SIAS – DEH Interview).

#### Guam Department of Mental Health and Substance Abuse (GDMHSA)

Guam's behavioral health service providers are made up of the GDMHSA, the single state agency offering comprehensive behavioral health services to adults and children on Guam, as well as private and non-profit providers. The GDMHSA is located next to the Guam Memorial Hospital (GMH).

All individuals are eligible for services at GDMHSA, although the agency prioritizes the most indigent clients. Prioritization of GDMHSA's work is as follows: emergency services, inpatient acute care, medication dispensation, residential treatment services, outpatient services and prevention and outreach activities. Those with insurance will typically be seen in a private practice environment. However, insured individuals wishing to access free medication will sometimes go through GDMHSA's diagnosis system (Volume 9 Appendix F SIAS - GDMHSA Interview).

#### Guam Department of Integrated Services for Individuals with Disabilities (GDISID)

All information for this section was obtained from a 2009 interview with GDISID staff (Volume 9 Appendix F SIAS – GDISID Interview).

GDISID was created to be a single point of entry to services for Guam's disabled population. It is made up of three departments: the Division of Vocational Rehabilitation, the Division of Support Services, and the Division of Evaluation Enforcement and Compliance. GDISID manages the Guam Get Care System, a web-based comprehensive directory of services, funded by a grant from the Aging and Disability Resource Center through the year 2010. Divisions encompassed by GDISID include the Division of Vocational Rehabilitation, Division of Support Services, and Division of Evaluation Enforcement and Compliance.

#### Naval Hospital Guam

The Naval Hospital Guam in Agana Heights offers medical care to military personnel, military dependents, veterans, and in case of emergency, civilians. The military also runs small outpatient clinics at Andersen Air Force Base (AFB) and on the Naval Base, as well as a dental clinic. The current Naval Hospital Guam facility was opened in 1954, is 306,000 square feet, and houses 38 active beds including six intensive care unit beds, plus an additional 64 contingency beds (Naval Hospital Guam 2008).

Collaboration between the military and public health systems includes limited consultation and treatment services by specialized military medical officers, assistance when GMHA or the GDPHSS encounter supply or pharmaceutical shortages, as well as a source of back up during times of human or natural disaster.

The military sector provides mental health services to active duty members and their dependents, while the Veterans Affairs (VA) Administration services the mental health needs of veterans and their families.

#### Guam VA Office

All information for this section was obtained from a 2009 interview with the Guam VA that advocates for veterans and active-duty personnel on Guam for access to veterans' benefits (Appendix F SIAS – VA Interview).

The U.S. Department of VA is responsible for the provision of benefits for qualified veterans. The Guam VA office, currently run by a staff of two individuals, assists veterans with information and applications for their benefits and claims. Guam also provides veterans with free driver's licenses and veterans license plates that can be processed on Guam. However, most of the forms and claims filed by Guam veterans are sent to the U.S. Department of Veterans Affairs in Honolulu, where they are reviewed and processed.

#### Private Providers

There has been a recent increase in private mental health providers on Guam. Private providers are mostly psychiatrists, clinical psychologists, and individual, marriage, and family therapists. Private clinics also provide mental health services. Only a limited number of private providers and pharmacies accept government insurance such as the Medically Indigent Program (MIP) and Medicaid due to factors such as slow reimbursement.

#### Non-Profit or Academic Centers/Providers

Currently there are no non-profit groups on Guam providing health care and no academic medical centers. Various non-profit providers on Guam serve both adults and youth, and provide ancillary and support services, as well as emergency, homeless, and youth shelter. Some examples of these include: the Guam Salvation Army, Sanctuary, Inc., and Catholic Social Services. These organizations are important elements in supporting the health and human service system on Guam. Often, local and federal government agencies contract with these organizations for services.

#### 16.1.5.3 Public Safety

Public Safety includes the protection from and prevention of events endangering the general public's safety, including crime and disasters, both natural and man-made. Government agencies on Guam involved in law and traffic enforcement, fire suppression, emergency medical response, safety inspections, civil and criminal litigation, justice, and corrections are all considered public safety agencies.

While overall crimes as processed by the Guam Police Department (GPD) increased by about 9% between 2002 and 2006, the territory had significantly lower reported rates of both violent and property crimes per 100,000 residents when compared to U.S. averages. Table 16.1-22 compares recent crime rates for Guam and the U.S. (using Part I or "serious" crime as defined by the Federal Bureau of Investigation [FBI]). The violent crime rate on Guam has recently been trending down while the property crime rate has been trending up. In 2006, larceny-theft (2,639 cases) was the most common offense known to GPD. Vandalism (1,500 cases), burglary (1,292 cases) and disorderly conduct (1,156 cases) were other common offenses. Other than disorderly conduct, each of the crimes mentioned had increased from 2002 levels.

Guam is a high-risk public safety area during times of natural and man-made disasters. The remaining information in this section is from the Guam Emergency Response Plan (Guam Homeland Security Office of Civil Defense 2009), unless otherwise noted.

**Table 16.1-22. Comparison of Violent and Property Crime Rates, Guam Versus U.S., 2002-2006**

Year	Violent crime rate per 100,000 residents		Property crime rate per 100,000 residents	
	Guam	U.S.	Guam	U.S.
2002	292.4	494.4	2,188.7	3,630.6
2003	302.0	475.8	2,332.6	3,591.2
2004	277.8	463.2	2,189.2	3,514.1
2005	230.2	469.0	2,749.1	3,431.5
2006	239.7	473.5	2,423.1	3,334.5

Sources: Guam Police Department 2007, U.S. Department of Justice, Federal Bureau of Investigation 2006

The territory's location makes it vulnerable on a number of levels. Guam is located in an area of high risk for natural disasters including typhoons, tropical storms, and tsunamis. Its remoteness means that it cannot depend on aid from contiguous regions in the event of disaster (Suburban Emergency Management Project 2007). Guam's geographic location is also one that places it in close proximity to areas such as North Korea and China, and the proposed action itself is meant to utilize this strategic positioning to "...fulfill U.S. government national security and alliance requirements in the Western Pacific Region" (Suburban Emergency Management Project 2007).

The Emergency Operations Center at the Office of Civil Defense (whose administrator is designated by the Governor of Guam) is the primary agency responsible for coordinating Guam's response to all emergencies and disasters through the National Incident Management System (NIMS). The primary federal agency that works with the territory of Guam in times of emergency is the Federal Emergency Management Agency (FEMA), and more specifically, the FEMA Region IX Pacific Area and Regional offices.

The next section gives brief overviews of the key GovGuam agencies responsible for public safety on Guam and concludes with a description of some of the local and military collaborations. More information on Guam's public safety agencies is provided in the Appendix F SIAS.

### GPD

GPD is the law enforcement agency for the entire territory, outside of federal property. GPD's four precincts include: Hagatna, Dededo, Agat, and Tumon/Tamuning. Police stations are located in, respectively, Hagatna, Dededo, Agat, and the Tumon Bay resort area. A new Yigo precinct is also planned for the near future. The 2006 precinct population was as follows:

- Dededo 68,996
- Hagatna 53,148
- Agat 28,976
- Tamuning 19,899

In 2007, GPD employed 309 sworn personnel and 66 civilian employees. The total number of arrests in 2007 were 3,315 (Guam Police Department 2007).

### Guam Fire Department (GFD)

GFD is the primary agency responsible for fire suppression, search and rescue, and emergency medical response for the territory of Guam. GFD operates 12 fire stations (5 in the northern district and 7 in the southern district), two rescue bases, and the E911 Integrated Emergency Communications Center. Guam experiences weather conditions that make it vulnerable to wildland/urban interface brush fires. GFD is usually the first responder in such incidents. GFD currently employs approximately 200 full time sworn personnel, including emergency medical technicians. Approximately 32 of these personnel are equipped to perform open water rescues.

GFD cooperates with military fire response agencies through the NIMS. For land-based search and rescue incidents that occur on federal or military property, military responders take the lead on emergency coordination, supported by GovGuam agencies. For sea-based incidents beyond the GFD's capacity, the USCG takes operational lead (Guam Homeland Security Office of Civil Defense 2009).

GFD also employs two inspectors that work in cooperation with the Guam Department of Public Works (GDPW) to ensure that any construction plans are reviewed for compliance with fire codes prior to being approved. The GFD's Code Enforcement Section performs inspections of facilities for code compliance (Appendix F SIAS - GFD Interview).

Staffing, equipment and facilities constraints currently exist for GFD. These are detailed in the Public Service Impacts discussion in the Environmental Consequences section below.

### Guam Department of Corrections (GDoC)

The GDoC is responsible for the handling of persons after their conviction of a criminal offense. The Department is organized into four divisions: Administration, Prison Security, Diagnostic Treatment Services, and Parole Services.

Space constraints currently exist for GDoC facilities. Overcrowding at the Hagatna Detention Facility necessitates that the Adult Correctional Facility be used to house some pre-trial individuals. GDoC has considered building a new facility to meet housing needs, but there have been no firm plans to do so (GDoC 2008).

### Guam Department of Youth Affairs (GDYA)

The GDYA runs a variety of programs geared toward youth development, rehabilitation, and involvement with the community. Its youth programs and facilities include Youth Correctional Facility and Cottage Homes, Counseling/Case Management, Community Social Development Resource Centers, Prevention, and Vocational Rehabilitation and Support Services.

### Military Security

While Navy and Air Force security personnel work independently, they share facilities and training. In addition, if military personnel are given base suspension or debarment on one military property, they lose privileges on all military bases. In the 1980s, a military corrections facility existed on the Naval Base, but that facility has since been closed due to underuse. Andersen AFB maintains a small correctional facility of four cells (Volume 9 Appendix F SIAS - Naval Security Interview). In 2009, Joint Region Marianas was established, with the Navy taking the lead management role for the joint (Navy and Air Force) region.

In addition to on-base patrol, military security plays a role outside the fence. There is a close working relationship between GPD and military security. GPD headquarters are located in old Navy facilities that

GPD provides safety briefings for the military and have recently begun working together to patrol the Tamuning/Tumon area. Furthermore, when large ships come in to port, shore patrol is a requirement (Volume 9 Appendix F SIAS - GPD Interview).

#### 16.1.5.4 Agencies Affected by Population Growth

The agencies discussed in this section were selected because they will likely be impacted by increases in service population or an increase in H-2B construction workers.

##### Guam Department of Parks and Recreation (GDPR)

The GDPR administers approximately 70 public parks and recreational facilities, including beach parks, community parks, skate parks, historic parks, baseball fields, a baseball stadium, a sports complex, tennis courts and a public pool. All other community centers and parks fall under the 19 village mayors, who work closely with GDPR. GDPR also runs sports leagues and provides swimming and tennis lessons among others. A sports complex is in the process of being built in Dededo, and it will include baseball fields and a swimming pool (Volume 9 Appendix F SIAS – GDPR Interview).

GDPR current staffing runs less than 80 employees. Staffing for park rangers, teaching positions, and park maintenance is primarily outsourced. GDPR's Historic Preservation Office (HPO) conducts cultural resource review under federal law and engages a comprehensive historic preservation program on Guam. It also conducts permit reviews. This office has a staff of approximately 13 people (Volume 9 Appendix F SIAS – GDPR Survey).

##### Guam Public Library System (GPLS)

The GPLS provides one main library in Hagatna, five branch libraries in the villages of Agat, Barrigada, Dededo, Merizo, and Yona, and a bookmobile. Currently, GPLS employs a staff of 28. GPLS supports the needs of the public, as well as schools and government agencies, providing library services, programs for school children and families, and reference and internet searching. All residents on Guam are eligible for a library card.

Library resources are also available at all public and some private schools on Guam, institutions of higher education, and other institutions such as the Territorial Law Library (Volume 9 Appendix F SIAS – GPLS Survey).

##### Judiciary of Guam

The Judiciary of Guam is comprised of the Courts and Ministerial Division, Probation Services Division, Marshal's Services Division, Client Services and Family Counseling Division, and Procurement and Facilities Management Division.

Until recently, the Judiciary was housed on one site in Hagatna. As of August 2009, it opened up a Northern Court Satellite in the Dededo Mall, where there is room for one court room that will process small claims and traffic violations, among others (Volume 9 Appendix F SIAS – Guam Judiciary Interview).

##### Guam Department of Labor (GDoL)

The GDoL consists of numerous divisions, bureaus, and programs related to employment. The agency's organizational chart presents three main clusters: (1) "Statistics," including the Bureau of Labor Statistics and its Economic Research Center; (2) "Employment and Training," including various employment assistance and job training programs; and (3) "Regulatory and Compliance," including divisions for

occupational safety and health, fair employment, etc. The Workforce Investment Board is also attached to the Director's Office.

While all parts of GDoL would be affected by the proposed action, the Agency for Human Resources Development and the Alien Labor Processing and Certification Division (ALPCD) are among those particularly likely to be affected, and in fact are already heavily involved. The Agency for Human Resources Development works to increase the pool of labor on Guam by identifying actual or potential discouraged workers – including those deficient in basic skills – and improving their skills through means ranging from classroom training to on-the-job training with private-sector partners. The ALPCD is responsible for processing applications to bring foreign (“alien”) workers into Guam and assuring compliance with federal Department of Homeland Security (DHS) requirements (Guam Department of Labor 2009a).

ALPCD is the primary Guam entity reviewing and issuing permits under the H-2B work visa program of the U.S. Citizenship and Immigration Service (USCIS), and would be the primary unit of GovGuam affected by the proposed project's use of H-2B workers (indirect effects arising from housing these workers on GDPW and possibly GDLM would occur).

ALPCD manages the H-2B program's Guam components (with oversight by the Governor and in cooperation with the U.S. State Department), and is involved in the H-2B process in six ways:

1. Prospective employers file applications for Temporary Labor Certification with ALPCD
2. ALPCD adjudicates these applications, recommending approval or denial to the Governor of Guam (the Governor's recommendation, further interviewing, and visa issuance are handled by the U.S. State Department)
3. If ultimately approved by the USCIS, once the worker arrives on Guam, he/she must report to the ALPCD to file an Application for Registration and get a worker identification card issued by ALPCD
4. ALPCD conducts labor law enforcement, compliance monitoring, job site and temporary worker housing inspections
5. ALPCD processes Exit Clearance forms two weeks before the worker is ready to depart the U.S.
6. Statistics, data gathering, and recordkeeping on ALPCD programs

H-2B workers are issued one-year permits, renewable up to three years. For the proposed action, it is likely that most workers hired before 2015 would stay for more than one year, meaning extensions would have to be granted by ALPCD.

For the most recently completed FY2007 and FY2008, staffing of the ALPCD totaled 5 full time equivalents (FTEs).

#### 16.1.5.5 Agencies Affected by Development on Guam

The agencies discussed in this section were selected because they will likely be impacted by increases in development and construction on Guam as a result of the proposed action. They are GovGuam agencies responsible for issuing, monitoring, and enforcing development permits on Guam.

Because actions taken on federal land do not require local development permits, most of the impact on GovGuam development permitting functions would come from off-base growth generated by the proposed action (i.e., purchases from construction or operations and from indirect growth). In a few cases – such as the Guam Environmental Protection Agency (GEPA) – federal agencies have delegated

responsibility for oversight of direct project activities to local agencies, and so the direct project impacts also affect local permitting, monitoring, and enforcement to some extent.

For private-sector development permits, two primary agencies are involved: GDLM for rezoning proposals and GDPW for building permits. If rezoning (including conditional use permits) is required, developers apply with GDLM, the agency that acts as the technical arm for the Guam Land Use Commission (GLUC) and also makes referrals to other agencies for rezone reviews. If the rezoning action is allowed, developers then go to the “one-stop permitting” center with GDPW (GDPW in turn, typically refers part of the building permit review to GDLM). If no rezoning is needed, the GDPW one-stop permitting center is the primary point of contact for applicants. GDPW typically refers building permit applications for review by any or all of the agencies addressed in this section (listed above).

### GEPA

GEPA was initially established in 1973 as prescribed in Guam PL 11-191, signed into law on December 7, 1972. The Agency has six divisions: Administrative Services, Water Programs, Environmental Monitoring and Analytical Services, Air and Land Programs, Environmental Planning and Review, and Energy, Sustainable Development, and Outreach. This last division is new and was approved in GEPA’s 2009-2013 work plan. GEPA’s jurisdiction includes wastewater; clearing, grading, and excavation; drinking water and water quality certification; groundwater management and water quality monitoring; hazardous waste and clean-up of toxic waste sites air quality; air quality; land use impacts; and water pollution control; clearing, grading, stockpiling and stormwater management (GEPA 2009).

GEPA is delegated authority by USEPA to carry out USEPA mandates on Guam including but not limited to program implementation, inspections, monitoring, reporting and compliance oversight. GEPA has several divisions, including Air and Land, Water, Environmental Planning and Review, and Monitoring.

### GDPW

GDPW is a multi-purpose agency with responsibility for: highway maintenance, construction, and safety; bus operations; housing management; solid waste management; administration of capital improvement projects; and operation of the “one-stop permitting” center. The focus of this EIS is on this agency’s permitting operations – namely, building (architectural and structural), electrical, plumbing, flood control, and highway encroachment, as well as management of the one-stop permitting center (Guam Department of Public Works 2009).

GDPW is a “one-stop” permitting center where those needing development permits can get referred to the full range of permits needed for their projects. GDPW not only reviews the permits, but also routes applications to other agencies for their review.

### GDLM

GDLM has five operating divisions: Land Planning; Land Administration; Land Survey; Land Records, and Geographic Information System (GIS)/Land Information System. The focus of this EIS for GDLM is on the Planning Division that has clearance responsibilities relating to building, occupancy, and clearing and grading permits; business, liquor and contractor licenses; temporary worker housing facilities; and childcare facilities. Under the auspices of the Land Use Commission and the Shoreline Protection Commission (as of writing, the latter Commission was to soon be transferred to the Coastal Management Program [CMP]), the Planning Division is responsible for processing zoning changes and variances,

subdivision applications, development plans, conditional use and wetland permits, and horizontal property regime requests (Guam Department of Land Management 2009).

Much of GDLM's permitting activity is driven by referrals from GDPW, through GDPW's one-stop permit center. However, other permitting issues arise, especially rezoning proposals previous to issuance of building permits that are heard by the GLUC with staff assistance primarily by GDLM, the GLUC chair.

### GBSP

The GBSP is responsible for collection and dissemination of economic and business statistics, coordinating information management throughout the government, producing mapping tools and products that facilitate the use of data by governmental agencies, and the administration of the CMP.

The focus of the analysis for this agency is on CMP administration. The entire island of Guam is designated a Coastal Zone. CMP conducts a number of programs, including public education, permit review, consistency reviews, and policy planning. The agency is responsible for reviewing a wide variety of applications for developments including requests for zone changes; issuing seashore reserve permits; making federal consistency determinations; conducting site inspections; monitoring activities and developing mitigation strategies. When the new Seashore Reserve Plan is adopted, this agency will administer it (Volume 9, Appendix F SIAS – GBSP Interview).

### Guam Economic Development Authority (GEDA)

GEDA (formerly known as the Guam Economic Development and Commerce Authority [GEDCA]), a public corporation, is an autonomous agency of GovGuam. Its mission is to promote a sustainable economy for Guam. It manages three industrial parks as well as several parcels for the Guam Ancestral Land Commission. It provides investor incentives and commercial loans. The Authority generates its own revenues (Guam Economic Development Authority 2009).

### Guam Department of Agriculture (GDA)

The GDA is organized into five divisions: Aquatic & Wildlife Resources, Forestry and Soil Resources, Agricultural Development Services, the Plant Inspection Facility, and Animal Control. It operates five marine reserves and has played an important role in the restoration of coral reefs and fishery resources. The Department must sign off on any construction permits that would impact the environment (Guam Department of Agriculture 2009).

## **16.1.6 Sociocultural Issues**

With the announcement of the proposed action, National Environmental Policy Act (NEPA) requirements necessitated public scoping meetings be conducted (Earth Tech 2007). Several meetings were conducted in 2007. During that time public comments were collected. Of interest in this section are the categories of comments in which concerns were expressed relating to the socioeconomic impact of the proposed military relocation, above and beyond those discussed in the sections above. The section below lists the categories most often mentioned in the public scoping meetings, and provides background to these issues. Refer to the SIAS (Volume 9 Appendix F) for a more detailed discussion.

### 16.1.6.1 Political Self-Determination

The political administration of Guam has undergone many changes, and its political status as an unincorporated Territory of the U.S. continues to be a topic of public debate. While not a part of the proposed action and not technically "impacted" by the proposed action, some members of the Guam



public expressed concern during public scoping meetings and in response to the Draft EIS (DEIS) that increased military activity on the island would weaken Guam's ability to change or "improve" the Territory's status. Similarly, a political goal of some Chamorros has been independence of the island, and they feel that the increase in military activity increases a sense of "colonization" on Guam and decreases the possibility of achieving independence. Comments related to these issues were numerous and indicate underlying social and political dissatisfaction with longstanding federal-territorial status issues outside the scope of DoD legal authority. The various EIS public engagement forums provided an indirect avenue for informing some and reminding others in local and federal policy-making institutions of issues that are important to a significant segment of the Guam community. Additional discussion on this topic can be found in the SIAS (Volume 9 Appendix F)

#### 16.1.6.2 Minoritization

There is also a concern about the growing "minoritization" of Chamorros. Prior to WWII, Chamorros composed more than 90% of Guam's population. The percentage dropped below 50% by 1980 and was 42% in 2000. Past labor shortages have resulted in increases in Filipinos and non-Chamorro Micronesians, while the military has been a driver of Caucasian or other Mainlanders coming to Guam. This increase of other ethnic groups on Guam as a percentage of population decreased the percentage of population of Chamorro ethnicity.

Some fear that increasing minoritization of the Chamorro people will result in reduced Chamorro political and cultural representation on the island due to the increase of other ethnic groups on as a percentage of population.

Most young people on Guam are assimilating in the sense that they speak "only English" (65% for those five to 17 in 2000, versus 28% "only English" for those 18 and over). Among the 11% of children who were Chamorro speakers, two-thirds spoke it less frequently than English – while among the 26% of adults who were Chamorro speakers, only one-third spoke it less frequently than English.

#### 16.1.6.3 Cultural Artifacts

The Department of Chamorro Affairs (DCA) is charged with administering and expanding Guam's current relatively small museum for archaeological or other cultural artifacts, under Chapter 76, Article 1:76114 of the Guam Code enacted by PL 12-126. An expression of interest has been made by members of the Chamorro community that artifacts and human remains discovered in archaeological excavations during the EIS investigations or subsequent military construction to be stored at this or a future proposed Museum. Refer to Chapter 12 of this Volume, Cultural Resources, for discussion of the curation of artifacts.

#### 16.1.6.4 World War II Reparations

Wartime reparations from the Japanese occupation remain a highly contentious issue, particularly because the elderly victims of that period are now reaching the end of their life spans. Guamanians suffered under the Japanese military administration from 1941 to 1944 (see Volume 9, Appendix F SIAS), and some believe that this occupation was the result of U.S. military presence on Guam. Although the U.S. guaranteed Japan immunity from reparations claims through Article 14 of the Treaty of Peace in 1946, Guamanians continue to request that the U.S. federal government pressure Japan to pay war reparations, or that the federal government pay them in Japan's stead. However, neither the U.S. Department of Interior Office of Insular Affairs nor the U.S. State Department has expressed a strong desire to pursue this request and Congress has refused to waive protections in Article 14 (USDOJ 2004).

#### 16.1.6.5 Military-Civilian Social Issues on Okinawa that Affect Public Perceptions on Guam

This section provides a discussion of particular perceptions of the military presence on Okinawa. The discussion is included in this chapter because such perceptions are widely publicized and thus have impacted public perception on Guam regarding the proposed action.

Okinawa Prefecture in Japan consists of 49 inhabited and 110 uninhabited islands including the actual island of Okinawa (the largest island in the prefecture). U.S. military presence on Okinawa began in the closing weeks of WWII with the Battle of Okinawa. Although the U.S. occupation of the main Japanese islands ended in 1952, the U.S. continued administration of the Ryukyu Islands, including Okinawa, until 1972. Over the years, the presence of the U.S. bases has incurred protests from anti-war organizations, labor and religious groups, women's organizations, and political factions. Historically, the Okinawan public has voiced concerns regarding the following issues:

- Use of land
- Economic development
- Environmental damage
- Military-related accidents
- Crime and social order
- Prostitution and crimes against women

The rest of this EIS contains detailed analysis of the impacts the current proposed action would have on some of these topics. However, the information below refers to public perceptions of impacts the military has on Okinawa.

One existing perception on Okinawa is that U.S. military bases have impeded the planned urban redevelopment of the area, due to their location and size. Military bases occupy approximately 10.4% of prefectural land and 18.8% of the main island of Okinawa where most of the population and industries are concentrated (Okinawa Prefecture 2004).

Additionally, noise pollution on Okinawa has been perceived as having a range of physical and mental consequences to the Okinawan population (Asahikawa Medical College 2000), and environmental damage has been claimed due to training exercises using live ammunition. Military-related accidents and incidents, including helicopter and aircraft crashes, have also elicited public concern on Okinawa. (Okinawa Prefecture 2004).

Finally, crime and social order issues involving Status of Forces Agreement (SOFA) personnel on Okinawa have been a focus of Okinawan residents. A critical event occurred in September 1995 with the abduction and rape of an Okinawan schoolgirl by three U.S. service members. Widespread public protests led to bilateral negotiations between the U.S. and Japan and led to the establishment of the Special Action Committee on Okinawa. In addition, prostitution occurs on Okinawa, and there exists the perception that it is fueled by military presence (Okinawa Women Act Against Military Violence 2009).

SOFA-related data rely on Okinawa prefecture records that group crime statistics into six major categories:

- Heinous crimes – murder, rape, robbery, arson
- Violent crimes – assaults, blackmail, extortion
- Thefts – burglaries, car thefts, muggings
- Intellectual crimes – fraud, counterfeiting

- Moral offenses – gambling, indecent assault, molestation
- Other, that includes vandalism and trespassing

Quantitative data available for “Heinous Crime Arrests” on Okinawa are detailed in the table below (Table 16.1-23). Information on Moral Offenses is combined with Other Arrests and is therefore not listed in the table.

**Table 16.1-23. SOFA-Status Total and Heinous Crime Arrests on Okinawa, 2003-2008**

Year	Total Arrests		Heinous Crime Arrests	
	# of Individuals	Cases	# of Individuals	Cases
2003	133	112	12	7
2004	72	59	1	1
2005	65	66	4	2
2006	63	57	5	3
2007	46	63	6	6
2008	63	70	13	7

Source: Allen 2009.

The number of SOFA-status individuals arrested in Okinawa for heinous crimes is low, although there is a widely accepted belief that sexual crimes are consistently underreported. However, analysts have stated that crimes by Americans on Okinawa are perceived as a major problem largely because of the attention they get in the local and international press and protests by anti-base groups on the island (Allen 2008).

Americans connected to the military commit far fewer crimes per capita than their Okinawan counterparts. In 2008, SOFA-status people made up 3.28% of the island’s population but accounted for 1.62% of all arrests. Previous years’ statistics show similar low rates (Allen 2008, 2009; Allen and Sumida 2008; Republic of Korea Drop 2008; Weaver and Kusumoto 2008).

During 2008, the Marine Corps made several changes to help prevent misconduct among its service members in Okinawa. Some of the changes included an expansion of uniformed courtesy patrols, a new liberty card policy, checks of outgoing vehicles at Marine Corps installations, and additions to the orientation and education seminar that all newcomers must attend (Allen 2009).

#### 16.1.6.6 Crime, Vice, and Social Order

Tourism, the military, and periodic construction spikes have all been perceived to create markets for alcohol, illegal drugs, prostitution, and illegal gambling on Guam. Such issues have emerged as significant during public dialogue about the proposed action and its attendant construction phase.

The first U.S. military-civilian conflicts on the island back in 1899 centered on fights due to the sale of liquor to Sailors and Marines, and subsequent “drunkenness” (Rogers 1995). Guamanians also remain particularly concerned about the abuse of local women, due to reports of rapes by military personnel on Okinawa.

Recent figures from 2006 show Part I Offenses account for 26.02 cases per 1,000 residents, while Part II Offenses tally at 42.65 cases per 1,000 residents (Guam Police Department 2007).

Part I or Part II offenses are defined in the Federal Bureau of Investigation (FBI’s) *Uniform Crime Reporting Handbook*. Part I offenses are major crimes that are more likely to be reported and recorded consistently over time and geographic locations. These include the “violent” crimes of criminal homicide,

forcible rape, robbery, and aggravated assault, as well as the “property” crimes of burglary, larceny-theft, and arson.

Part II crimes are generally less serious and recording or reporting may vary greatly from place to place and from year to year as law enforcement policies change. Part II offenses are more numerous. Examples include other assaults, prostitution and commercialized vice, drug abuse violations, offenses against the family and children, liquor laws, drunkenness, and disorderly conduct. For the purposes of this section, Part II offenses are considered violations of social order.

Data available as of April 2010 from the Naval Base Guam Security Office regarding crime and social disorder occurring off base and involving military personnel have shown the following (Naval Base Security Office 2010):

- Shore Patrol has recorded 3 incidents requiring Shore Patrol action in January 2010
- Assaults
  - 2008: 9 off-base assaults recorded, all involving both military and civilians (or unknown assailants), 7 in Tumon and 2 in Tamuning, with 8 occurring in early morning hours.
  - 2009: 12 off-base assaults recorded, all involving both military and civilians (or unknown assailants), mostly in Tumon and Tamuning, with 11 occurring in early morning or late night hours.
  - 2010: 10 off-base assaults recorded, 1 involving military only and 9 involving both military and civilians (or unknown assailants), mostly in Tumon or Tamuning and a majority occurring in early morning or late night hours.
- Sexual Assaults
  - 2008: 5 off-base sexual assaults recorded, 3 involving military only, 1 involving military with unknown suspect, and 1 involving civilian with military suspect.
  - 2009: 6 sexual assaults recorded, all occurring on base, 3 involving military only, 2 involving military and a civilian spouse or family member, and one involving protected identity minors.
  - 2010: 2 off-base sexual assaults recorded, both involving military only.

For on-base crimes, Guam has concurrent jurisdiction that allows civilian law enforcement personnel access to the base. For example, U.S. Marshals can go on base to serve court orders (Guam Judiciary 2008). Depending on the type of case, the military can take jurisdiction. For example, if Child Protective Services is involved, the military and civilian agencies work together, and the information is public. However, if cases are handled by internal base procedures, no public disclosure is necessary (Guam Civilian Military Task Force Committee on Public Safety 2008).

#### 16.1.6.7 Sociocultural Changes

When overseas bases are placed in areas culturally different from the majority of military personnel, there often exists a feeling of disconnect between incoming military personnel’s culture and customs and that of the local population. On Guam, discussions on this topic often involve the concept of military personnel’s respect for Guam’s people. There is no clear evidence that this feeling is any more or less pronounced on Guam than elsewhere. However, the most common suggestion for the military in conducting the proposed action was better communication (KUAM 2008).

Community surveys capture the diversity of community sentiment toward the proposed action. A March 2007 survey by the Guam Chamber of Commerce found 71% of those polled support an increased

military presence (Partido 2007). A subsequent survey conducted by the UoG Public Affairs and Legal Studies Club in 2008 found that 52% of those surveyed think that the proposed action is a good thing for Guam and 88% expect the relocation to bring jobs and other economic benefits to Guam. The Guam Chamber of Commerce then conducted a follow-up survey in early 2009 and again found about a 70% favorable response, with slightly higher support among less affluent households (Tamondong 2009).

Since the release of the DEIS, public commentary opposed to the military relocation has increased. A compilation of public comments in response to the release of the DEIS, as well as responses to these comments, are available in Volume 10 of the EIS.

#### 16.1.6.8 Quality of Life

The concept “quality of life” overlaps with virtually all topics covered by this EIS, and concerns in general the ability of the island to adequately support the proposed action, including how the island’s general tranquility, quality of family and community relations, infrastructure, social services, schools, and standards of living would be affected.

The 2007 Guam Chamber of Commerce survey noted above found that 60% of polled Guam residents thought the proposed action would improve quality of life. However, there remain concerns that are heightened by the fact that military facilities are segregated from public facilities, and are ultimately seen as better quality than the latter. For instance, DoD’s decision to establish its own school system in the late 1990s was interpreted as a “hostile” action by some elected officials (Underwood 1997), removing funding from a public school system to establish a separate, competing system. This feeling can be extended to health care infrastructure, housing costs and availability, access to recreational facilities, and competitive pricing (on-base versus off-base).

#### 16.1.6.9 Recreational Fishing

The importance of marine resources in Chamorro culture is ancient, as implied by the exclusive use of canoes for deep water fishing by higher status families in traditional society (Coomans 1997). Magellan’s sailors in 1521 were impressed by the speed and agility with which Chamorros used their “flying proas” or outrigger sailing canoes, some capable of carrying numerous occupants (Barratt 2003). The earliest archaeological sites in the Mariana Islands circa 1500 B.C. often contain evidence of pelagic fishing before the sea dropped to present levels (Carson 2008), while later sites after A.D. 1000 contain a higher percentage of reef fish and marine shell as lagoon environments stabilized. Traditional fishing methods noted by the first Spanish settlers to Guam in the late 1600s included baited hooks, netting, spearing, trolling, poisoning, and trapping in weirs (Russell 1998). During the months in which the juvenile rabbitfish schooled close to shore, the entire community might be mobilized to aid in their capture (Freycinet 2003). This season is still eagerly anticipated today (Tudela 2009).

Fishing on Guam thus has a deep historical and cultural component. A 1975 islandwide survey of 180 random Guam households conducted by the University of Guam indicated that 65% of the people reported some involvement in local fishing. Many “recreational” fishermen, including traditional fishermen, today rely on their catch for food, although this trend has been declining and many sell part of their catch to offset fuel and boat costs. A 2005 survey indicated that 38% of the fish consumed by people was caught by the consumer, a relative or a friend (Allen and Bartram 2008).

Recreational fishing on Guam is typically divided into three types: coral reef fishing, bottom fishing and pelagic fishing. All three of these types of fishing are influenced directly or indirectly by the health of the coral reef ecosystem; fishes that actually use the reef during one or more life stages directly rely on this resource, and as ecosystem boundaries are open and components of ecosystems are inherently linked,

neighboring ecosystems (e.g. pelagic) are indirectly reliant on the coral reef ecosystem (WPRFMC 2009b). Recreational sport fishing began to grow on Guam in the 1980s (Davis and Clarke 1998). Guam's fisheries have been in decline for many years. Part of this is due to fishing pressure, and part is due to ecosystem impacts from stormwater and wastewater (Davis and Clarke 1998). According to a 2005 study, Guam's shoreline fishery saw a drop in catch-per-unit-effort in the 1980s and has still not returned to pre-1980s levels (Porter et al. 2005). GovGuam, in an attempt to help the fisheries, established five marine preserves in 1997 that included limits on fish takes and the types of fishing allowed. Dip netting, gill netting, drag netting, surround netting spear fishing, and the use of gaffs is prohibited in all five preserves. These preserves cover 10% of Guam's coastline and have been met with some public resistance (Porter et al. 2005, Allen and Bartram 2008).

Coral reefs support various life stages of many fishes and invertebrates, and as a result, the health of reefs is often an indicator of the overall health of the entire area. They are one of the most diverse and productive ecosystems on earth. The physical reef structures created by corals protect coastlines from erosion, which directly impacts humans living, working or recreating near the shoreline. Other benefits to humans from coral reefs include those resulting from tourist and commercial industries; lush reefs are a major tourist attraction for divers and snorkelers, and they support commercial and recreational fisheries (NMFS 2010). The health and abundance of coral reefs worldwide has been steadily declining in recent years from various anthropogenic (human-based) sources, and in the Indo-Pacific, reefs have seen a decline over the past 40 years; these declines are cause for great concern. The reefs surrounding Guam make it home to one of the most species-rich marine ecosystems among U.S. jurisdictions (Waddell et al. 2008). More detailed information on Guam's coral reefs can be found in Volume 2, Chapter 11, Marine Biological Resources.

Historically, the highest-used fishery on Guam has been the coral reef fishery (WPRFMC 2009b). There are historical as well as practical reasons for this. In 1956 the first pelagic fish species was included in the catch reports. Prior to that all fish species reported on in the catch reports were species associated with the reefs. According to the Western Pacific Regional Fishery Management Council (WPRFMC), shore-based harvesting of fish and invertebrates accounts for most of the resources taken from coral reefs. Some species that have been impacted by heavy fishing are the bumphead parrot fish (*Bolbometopon muricatum*), Napoleon wrasse (*Cheilinus undulatus*), and stingrays (*Batoidea* sp.). One family of fish, the Lethrinidae, accounts for over 36 percent of the reef species total catch, including the emperor fishes (WPRFMC 2009b). The WPRFMC (2009b) has indicated that, at present, the coral reefs at Guam have not been determined to be overfished or subject to overfishing.

Pelagic fishing started to gain a foothold on Guam during the 1950s along with the growth of the tourist industry. During the 1980s, it gained even more popularity with both tourists and the local population; as household incomes grew, Guamanians could now afford the boats and motors required for trolling (Davis and Clarke 1998). The five most common pelagic species caught on Guam waters are mahi-mahi (*Coryphaena hippurus*), wahoo (*Acanthocybium solandri*), skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacores*), and Pacific blue marlin (*Makaira mazara*). There have been large fluctuations in the number of these species caught from year to year. For example, from 2003 to 2004 the mahi-mahi catch increased 134% and the wahoo catch increased 83%. Meanwhile, blue marlin landings were down 24% in the same timeframe, and below the 23 year average for the species (WPRFMC 2009a). Pelagic fish tend to be highly migratory and at the top trophic level of oceanic predators. The pelagic fishing fleet numbered 386 boats in 2006 (Allen and Bartram 2008). This was an increase of roughly 8% from 2005 (Allen and Bartram 2008). Meanwhile, harvest levels have decreased from 922,000 pounds in 1996 to just 500,000 pounds in 2006 (Allen and Bartram 2008). Similarly, the number of fishing trips

taken by these vessels fell from 16,000 in 1996 to 6,414 in 2006 (Allen and Bartram 2008). Approximately 7% of this fleet is comprised of charter boats with the remainder comprised of Guam residents using owner-operated boats, mostly towed to launch sites, as opposed to semi-permanent marina docking (Allen and Bartram 2008). The charter industry is most widely used by tourists and U.S. military personnel (Allen and Bartram 2008). Pelagic charter trips totaled roughly 2,000 in 2006, with an estimated 67,000 pounds of catch with mahi-mahi, skipjack, and wahoo accounting for the top three species (Allen and Bartram 2008).

Bottom fishing on Guam is divided into two types: shallow water (<500 ft) and deepwater (>500 ft). Smaller operator-owned boats (i.e. recreational fisherman) tend to target shallow water, while the commercial fishermen tend to target deeper water (WPRFMC 2009b). Bottom fishing on Guam is highly seasonal, taking place mainly in the warmer months, which coincides with calmer weather months allowing more fishermen to visit the offshore banks (WPRFMC 2009b). The WPRFMC (2009b) states that less than 20% of shallow water harvests are taken outside the three mile limit. This is largely due to deeper depths and stronger currents farther out to sea. Bottom fishing charters have come to account for between 15% and 20% of bottom fishing trips since 1995 (WPRFMC 2009b), and they have increasingly become catch-and-release operations. This is especially true for the larger charters carrying up to and over 30 passengers per trip; generally only the larger fish are kept to serve as sashimi for guests. WPRFMC (2009b) estimates that there were roughly 1,700 charter trips in 1999.

#### **16.1.7 Land Acquisition Issues**

This section provides historical and current information on the administration and socioeconomic value of land on Guam. In addition, an overview of the federal land acquisition process is provided (more detailed information is provided in the Volume 9 Appendix F SIAS).

Information on the general land uses and real estate characteristics of each of the parcels under consideration for acquisition, and used for impact analysis in this chapter, can be found in the separate Land Acquisition Baseline Report (Volume 9 Appendix F).

##### **16.1.7.1 Historical Land Tenure and Administration on Guam**

Guam has a history of occupation by various rulers and administrators that have implemented assorted forms of land administration. This history affects the manner in which changes in land administration (such as those proposed by this project) occurs, and is received.

##### Pre-Contact through Japanese Occupation

All information for this section, unless otherwise noted, was obtained from the book “Land Tenure in the Pacific” (Souder 1987).

Prior to Western contact, Guam was inhabited by a group of people that came to be known as the Chamorros. During the pre-contact era, a person’s membership in one of the three social classes of ancient Chamorro society determined his or her land tenure rights. The social classes consisted of: *Chamorri* (high ranking chiefs), *atchaot* (middle class, younger branches of nobility), and *manachang* (lowest class). *Chamorri* controlled the most desirable land. The *manachang* were unable to own land, and instead worked as serfs, farming on the land of the nobility (Souder 1987). While precise land tenure rights of the nobility are unknown, it is believed that noble families were organized into matrilineal clans, and that land rights passed to nephews rather than to sons.

The Spanish Era (1521-1898) began with Magellan’s arrival in 1521 (permanent Spanish settlement began in 1668). During the Spanish era, under the Laws of the Indies, all lands technically belonged to the

Spanish Crown. In 1700, approximately 5% of Guam lands had been established for the Spanish governor's benefit under the *encomiendas* system, through which the governor had the authority to entrust tracts of land (and eventually land grants) to his followers, and derive income from that land. The *encomiendas* system maintained upper class land ownership on Guam. The Spanish granted Chamorros legal equality with all Spanish subjects in 1681, and in 1771 the governor made land available to all families for agricultural purposes. While this meant that much land remained in Chamorro families, this ownership became concentrated in the hands of more wealthy and influential families, descendants of Chamorro nobility that had married into Spanish families.

The recording of land title on Guam was initiated in the 1860s by Queen Isabella II of Spain. Records from this period (provided they contain sufficient information) are recognized even into the present day. However, the method of locating property lines during this time was by reference to adjacent owners or natural boundaries, not by survey. This makes present-day verification of these lines difficult if these boundaries have changed through time.

The Spanish Crown lands were seized by the United States during the Spanish-American War (1898). As a result, Guam was placed under U.S. Navy administration and control through Executive Order (EO) 108-A on December 23, 1898. American sovereignty over Guam under international law officially began on April 11, 1899 when the Treaty of Paris was proclaimed law after being signed and ratified by both the U.S. and Spanish governments.

Following this transfer of control to the U.S. Navy, all land transactions had to be approved by the Navy governor including the sale or transfer of land ownership, and the acquiring of land interests by aliens (not to exceed 5 years) or U.S. citizens (not to exceed a 50-year renewable lease). A heavy land tax was imposed on all lands, making it expensive for owners to continue land ownership. While the Navy government did attempt to assist owners who could not pay land taxes, it ended up acquiring land during this time through tax delinquency. By 1937, Navy government land on Guam (2,924 hectares) consisted of land that had been mostly acquired through non-payment of taxes and purchase. At the same period of time, U.S. federal government land (16,507 hectares) consisted mostly of acquired Spanish Crown lands (approximately a fourth of the island at time of transfer to the U.S.) and purchased land.

Land surveys were attempted under U.S. Navy administration. However survey control points and triangulation control systems were not implemented until after 1910. Cadastral maps contained many errors and did not capture previous surveys and descriptions. Furthermore, inheritance law under Navy administration emphasized individual holdings, and required that land owned by a deceased person without a will be divided equally among the heirs. Because the writing of wills was not common practice on Guam, deceased estates were commonly registered in the joint names of the heirs, who were then left to decide amongst themselves how the land was to be managed and divided. On the one hand, this allowed for the continuation of family-centered land tenure patterns on Guam, despite inheritance laws. However, on the other hand, this practice led to confusing record-keeping.

Japan occupied Guam between the years 1941-1944. The U.S. recaptured Guam from the Japanese in July 1944. The U.S. repossession of Guam from Japanese occupation in 1944 brought with it substantial change in the administration of land (see following section). At this time, 58% of the island was taken over for military purposes by the U.S. government.

#### U.S. Administration of Guam Land During and After WWII

All information from this section, unless otherwise noted, was obtained from the book "Destiny's Landfall" (Rogers 1995).



Following the repossession of Guam from Japan, the U.S. Navy administration began the process of rebuilding. While efforts in education and public health had more positive results for Guam's population, the processes involving land were fraught with discontent that remains to the present day. While current policies of federal land acquisition (detailed in later sections) address some of the issues and attempt to codify preventative policies, such discontent can affect perceptions of the proposed action.

Tokyo acknowledged the fall of Guam on August 11, 1944 and on the 15<sup>th</sup>, the island was turned over to a U.S. Island Command. However, this defeat was only a stepping stone for the U.S. military WWII strategy, as Guam had been reacquired partially to support forward Navy and air bases. In order to achieve U.S. strategic goals, large tracts of land, especially around Apra Harbor and planned airfield areas, needed to be acquired. The land was thus confiscated, with the understanding that formal legal acquisition (through lease, purchase or condemnation) would be required.

The first properties to be acquired included Orote Peninsula, property in and around Apra Harbor, much of the Libugon-Fonte area, the plateau between Agana Heights and Anigua, and the Jalaguac-Tiyan plateau. The U.S. military began rebuilding, constructed a highway (now Marine Corps Drive), and dredged a channel into Apra's inner harbor, among other activities. Construction of areas for troops, fuel and ammunition storage occurred on large cantonment areas. In addition to land for military activities, 1,500 acres (ac) (607 hectares [ha]) of land were acquired as farmland to support the military.

Civilians experienced loss of land due to the U.S. bombardment of the Japanese, as well as Navy land acquisition. Eighty percent of dwellings on Guam had been destroyed, and though the military government constructed 1,400 dwellings and Guam residents built about 1,500 dwellings, there remained a housing shortage and 5,000 Chamorros remained in refugee camps by mid-1945. As of June 1946, while the camps were mostly empty, an estimated 10,000 people still lived in temporary government-provided houses.

The Seventy-ninth Congress passed several laws in 1945-1946 involving land issues (below), and a Land and Claims Commission began operation in April 1945 to administer those and other laws.

- PL 224 (15 November 1945), the Guam Meritorious Claims Act, authorized payment for war-connected claims, including property loss. There was a ceiling of \$5,000 placed on each property loss claim. Principal claims that emerged involved the largest landowners (Catholic Church, Atkins, Kroll, Torres, Butler, Martinez and Bordallo families).
- PL 225 (November 1945), the Land Transfer Act, made federal land available to Guam residents who had been relocated due to the bombardment or through land acquisition. These residents had been moved to refugee camps to be later compensated with either payment or replacement lands.
- PL 594 (2 August 1946), the Land Acquisition Act, authorized the Navy Department to acquire private land for military installations. Following the end of the war, it was identified that a total of 75,700 ac (30,634 ha) or 55% of Guam would be needed for defense and security reasons in the present and into the future. The U.S. already owned 28,345 ac (11,470 ha), and 29,460 ac (11,922 ha) needed to be acquired, with a remaining 17,895 ac (7,242 ha) to be leased.

Confusion over land ownership documentation was increased during this period. During the Japanese occupation, there had been widespread destruction of land documents. Later, during the U.S. bombardment, many homes and landmarks delineating property boundaries were demolished and rebuilding efforts often disregarded old property boundaries, especially if the physical characteristics that

identified those boundaries no longer existed. Thus the rebuilding process resulted in new lots that contained portions of tracts owned by different people. Adding to the disorder was the fact that much of the land to be acquired by the Navy had not been surveyed.

As a result of this confusion, the Navy was able to obtain larger parcels at reduced rates rather than negotiating individual lot by lot. The average price paid for an ac of land was \$54.00, while acreage was leased at an average of \$0.60 an acre. Although the land acquisition occurred in 1947, the acquisition prices were based upon 1941 appraisals, so as not to inflate land values.

Some landowners were willing to sell their land while others did not want to and took their cases to court (still others did not address their concerns in court, leading to a continued feeling of unresolved grievances in the present day). A Superior Court of Guam was enacted by executive order (EO) in October 1947 in order to hear civil actions and land condemnation cases. By the end of 1949, the court had cleared almost 3,000 cases. There was discomfort with the court's decisions, as no Guamanians were included in the court. The presiding judge, John C. Fischer, was hired from the U.S. mainland, and was also the presiding judge of the Court of Appeals that listened to any appeals that emerged from the Superior Court's processes. Coercive tactics such as "threats, coercion, appeals to patriotism, and fear of military reprisal" were also reported and later emerged in court claims and investigations (Rogers 1995). In 1948 and 1949, the Ninth Guam Congress passed resolutions and bills asking to have Guamanian representation in land decisions, the end to the condemnation of Tumon Bay and the abolishment of the Superior Court. These bills and resolutions were rejected, although only half of Tumon Bay was restricted from public access, instead of the entire bay as previously planned.

The civil administration of Guam was finally transferred from the U.S. Navy to the U.S. Department of the Interior (DOI) in August 1950 as part of the Guam Organic Act.

Per Section 22 of the Organic Act, U.S. federal lands used by the Navy government for civil affairs were to be transferred to GovGuam within 90 days of August 1, 1950. The Navy retained lands that were required for military purposes or as replacement lands. However, Section 33 gave rights to the president to designate any part of Guam a military reservation, and a total of 42,380 ac ( that were used for civil affairs, including a large part of sewer, water, power and telephone systems, were kept under Navy ownership per Section 33.

In all, after the enactment of the Organic Act, the Navy and Air Force controlled 36% of the island, GovGuam took control of over 22% of the island, leaving 42% of the island under private ownership.

Since the Organic Act, land continues to undergo ownership change and come under claim. The 1977 Omnibus Territories Act contained an amendment to the Organic Act, allowing the U.S. District Court to hear compensation claims for land that the Navy had condemned after WWII. By 1980, 600 claims had reached the courts. Following a positive determination for one case, claim filings increased to a total of 1,377 claims for 3,525 condemned parcels of land. In addition, GovGuam unsuccessfully sued the federal government in 1984 in an attempt to acquire excess land held by the Navy.

The federal government has also released excess lands, albeit with timelines fraught with "red tape" issues (Rogers 1995). For example, the Guam Excess Land Act released DoD property to GovGuam that was declared to be excessive to military requirements under the Guam Land Use Plan (GLUP) 1977. DoD land control has decreased over the past three decades as a result of the Guam Excess Land Act of 1994 and BRAC recommendations. The former Naval Air Station Agana was closed in 1995, and the Navy transferred or released ownership of it to GovGuam and other government agencies as a result of BRAC. In 1997, BRAC realigned Naval Base Guam, which included the release of surplus/excess Navy military

property determined to be excessive in the GLUP. The previous Naval Facility, at Ritidian Point, was transferred to the U.S. Fish and Wildlife Service (USFWS). Other DoD parcels also have been, or are currently in the process of being transferred to GovGuam. In addition, the Navy out-leased the Former Navy Ship Repair Facility (SRF) located within the Apra Harbor Naval Base to GovGuam for utilization as a commercial shipyard facility.

#### 16.1.7.2 Current Land Tenure and Administration on Guam

Figure 16.1-2 shows the number of acres on Guam estimated to be under federal, GovGuam and private ownership. Table 16.1-24 shows the percentage of ownership this acreage represents. The rest of this section goes on to provide more detail on these three types of land ownership on Guam.

**Table 16.1-24. Summary of Guam Acreage by Ownership**

	<i>ac (ha)</i>	<i>% of Acreage</i>
GovGuam	63,988 (25,895)	48%
Federal	37,088 (15,009)	28%
Private	33,238 (13,451)	25%

#### Federal

Figure 16.1-2 shows that the approximate acreage of federal land on Guam is 37,088 acres (15,009 hectares; approximately 28% of total land on Guam) concentrated at the northern tip of the island and the southwestern coast. Federal lands are excluded from Guam land use planning unless there is anticipated release of federal lands. In addition, Guam local zoning regulations and permitting are not applicable to federal lands development.

#### GovGuam

Figure 16.1-2 shows that the approximate acreage of GovGuam land on Guam is 63,988 acres (25,895 hectares; approximately 48% of total land on Guam), although data on this land are not complete (Guam Bureau of Statistics and Plans 2009b). GovGuam lands include land used for government operations, as well as public lands that are subject to either ancestral or indigenous land rights claims.

GovGuam lands are currently managed by the GDLM. Under the GDLM Director's Office are the:

- Land Planning Division – administrators of past, current and future land use projects on Guam.
- Land Administration Division – works to promote effective development of current GovGuam land, as well as manage land acquisitions and sales. This division is divided up into a Land Disposition Section, Land Acquisition Section and Land Registration Section.
- Land Survey Division – registers and surveys GovGuam land, maintaining files for GovGuam and private use
- Land Records Division – administers land registrations, processing all certificate of Title requests, and provides services to public and private companies on ownership, location of boundaries and certification of ownership pertaining to real property
- GIS/LIS Division – aims to capture all data elements (maps and land records) for the island of Guam and to automate various GDLM services.

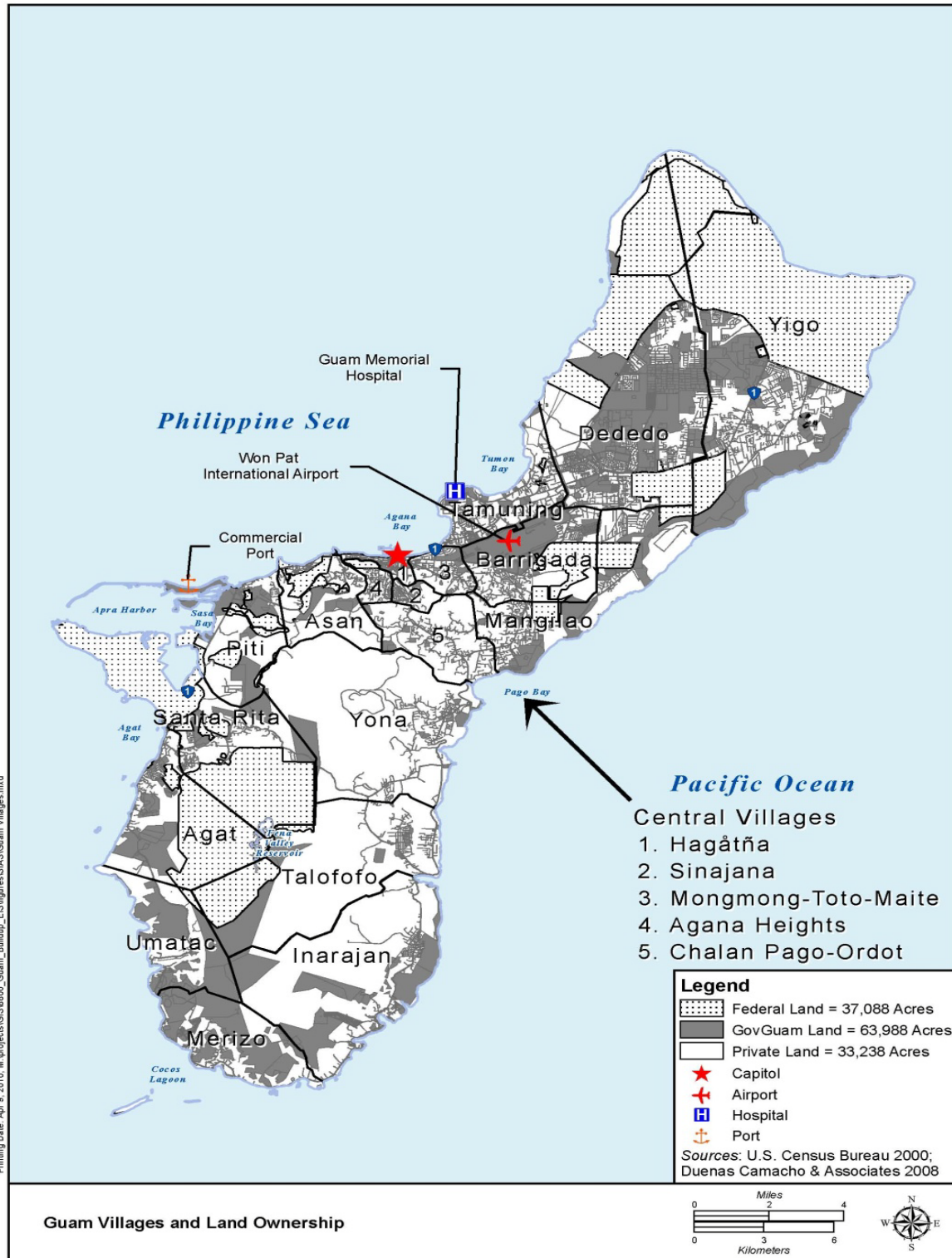


Figure 16.1-2. Guam Villages and Land Ownership

GDLM houses both the Guam Ancestral Lands Commission (GALC) and the Chamorro Land Trust Commission (CLTC), the commissions with primary responsibility for managing lands under ancestral or indigenous claim. Other agencies (such as GEDA) work with GALC and CLTC, as described further below. Comprehensive land use planning is the responsibility of the Bureau of Statistic and Plans (BSP). Other entities, including the Guam Department of Agriculture and Guam Department of Parks and Recreation (GDPR), have land management functions specific to a land classification. The Guam Department of Public Works administers roads and highways.

#### *Guam Ancestral Lands Commission*

GALC was established by Guam PL 25-45 in order to administer Guam's ancestral lands and to assist original landowners or their heirs and descendants in exercising their ancestral property rights. It is responsible for investigating, recording, filing and reporting claims for ancestral lands, and responding to requests for remedy from claimants (including GovGuam) for lands taken by the U.S. or by the government of Guam on or after January 1, 1930 (Guam Office of Public Accountability 2006).

Originally, GALC began with 3,200 ac (1,295 ha) of land identified in P.L. 22-145 and an additional 6,500 ac (2,630 ha) identified in P.L. 23-141. Of these a, releasable properties (some land could not be released due to easements and other necessary government functions) included 448 lots, or 5,929 ac (2,399 ha). As of July 2006, GALC had released 234 of these lots to applicants (Guam Office of Public Accountability 2006).

Ancestral lands are lands where qualified ancestral property rights can be accrued. This is property that was previously privately-owned by a Guam resident on or after January 1, 1930, and was subsequently condemned for public purposes by either the Navy GovGuam or the U.S. These lands were released as excess public lands in accordance with local and federal authorities.

The seven-member GALC is appointed by the Governor and must be residents of Guam and descendants or heirs of ancestral land owners.

The commission has several duties including:

- Maintenance of five registries for the settlement of ancestral claims (see below);
- Managing the extinguishment of ancestral claims through granting what is deemed “just compensation.” Such compensation is arranged through satisfactory negotiations between the claimant and GALC. In exchange for just compensation, the claimant surrenders all interest in the ancestral land claim;
- Administration of Landowner's Recovery Fund, created to grant loans, loan guarantees or grants-in-aid to landowners, or to defer costs or fees for professional services required by those who have ancestral land claims;
- Administration of Land Bank lands. Land Bank lands include Spanish Crown Lands and other non-ancestral lands. The GALC is tasked with developing these lands to the highest and best use. It administers these lands through a Memorandum of Understanding (MOU) with the Guam Economic Development Authority (GEDA). Revenues generated from this land development are used to provide just compensation in ancestral claim extinguishment, however as of 2005, no funds had been disbursed because a compensation schedule had not been determined (Guam Office of Public Accountability 2006);

- Administration of a private account, into which revenues from an inherited license agreement are deposited. This license agreement was inherited from GEDA, and allows a private company to occupy approximately 10 ac (4 ha); and
- Participation in zoning of ancestral lands, through participation in a Provisional Commission, and subject to approval by the Legislature.

The five registries maintained by the GALC include:

1. Original Landowners Registry – listing of recorded owner names of properties confiscated or condemned by the U.S. or GovGuam after 1930. This list confirms applicants property claims for future extinguishment upon receipt of just compensation;
2. Excess Lands Registry – listing all lands already declared excess by the U.S. or GovGuam, and lands that may be declared excess in the future. This list identifies specific lots that GALC may use as just compensation to extinguishment claims;
3. Claims Registry – lists all claims to ancestral title;
4. Conditional Awards Registry – lists all conditional compensational awards made to claimants; and
5. Ancestral Title Registry – lists applicants granted land titles in return for the surrender of property claims.

#### *Chamorro Land Trust Commission*

The CLTC was formed to advance the well-being of the Chamorro population through the distribution of land. The Twelfth Guam Legislature passed P.L. 12-266 in 1974, the Chamorro Land Trust Act, which was modeled after the Hawaiian Homes Commission Act. However, the law was not implemented for 18 years due to difficulties in defining the legal definition of a native Chamorro (Rogers 1995). The CLTC was codified by 21 Guam Code Annotated (GCA), Title 21, Chapter 75.

The CLTC controls GovGuam land designated as Chamorro homelands. Chamorro homelands are defined as all GovGuam lands, with the exception of lands reserved for public purposes or ancestral lands (managed by the GALC).

The CLTC makes Chamorro homelands available to qualified applicants (native Chamorros or descendents thereof) through residential, agricultural and commercial leases for \$1 per year for 99 years, with some limitations (detailed below). For purposes of this Land Trust, a “native Chamorro” is defined as any person who became a U.S. citizen by virtue of the authority and enactment of the Organic Act of Guam or descendants of such person (21 GCA Title 21, Chapter 75). “Public utility companies or corporations also may be granted licenses for telephone and electric power lines, gas mains etc., and to churches, hospitals, public schools, post offices and for other public improvements” (Guam Office of Public Accountability. 2009).

The five-member CLTC is appointed by the Governor and confirmed by the legislature. The CLTC Chairman is one of the five members and also appointed by the Governor. Full time staff includes an Administrative Director and administrative staff.

Leases to qualified Chamorro applicants are limited in the following manner:

- Acreage for subsistence agriculture or aquiculture limited to ¼ acre
- Acreage for commercial agriculture, aquiculture, or grazing limited to 20 ac (8 ha)
- Acreage for residential lots limited to 1 ac (.4 ha)
- Leases are for 99 years

- Lessees are required to occupy the land and make minimum improvements
- Cottage industry activity (industry such as manufacturing items occurring from the home) is authorized
- Licensing authority for community support facilities such as churches and markets can be obtained for up to 21 years

When Chamorro homelands are not required for Chamorro leases, general leases can be made available for these lands. In such a case, CLTC returns the lands to the GDLM for general leasing, with the following stipulations:

- Lease terms are 25 years or less
- Leases are subject to termination
- Generated revenues are put into the Chamorro Home Loan Fund. These funds can be loaned to CLTC lessees for land improvements. Ten percent of the fund is used for educational purposes through the Chamorro Education Assistance Fund.

As of September 2008, CLTC employed an Administrative Director and 11 classified employees to operate four divisions:

- Administrative Services
- Logistical Support
- Residential and Agricultural Leasing
- Commercial Licensing

In June 2009 the Legislature passed a bill imposing a moratorium on commercial leases until the CLTC develops regulations and a land use plan designating specific lands available for commercial leases (Hart 2009). This bill was the culmination of a critical report by the Office of the Public Auditor on, and subsequent legislative attention to, a variety of questions about CLTC management and staffing capacity to deliver all its services to native Chamorros. Part of the intent of the bill was to ensure residential leases are prioritized over commercial leases (Gesick 2009).

### Private

Non-federal and non-GovGuam lands are assumed to be privately held. Figure 16.1-2 shows that the approximate acreage of private land on Guam is 33,238 ac (13,450 ha); approximately 25% of total land on Guam. Private land ownership on Guam is not restricted on the basis of nationality or residency and title can be held in fee simple, which means the owner has the right to control, use, and transfer the property at will.

#### 16.1.7.3 Economic Value of Land on Guam

During the pre-contact era, although land was highly valued on Guam, it was typically never sold. Thus there was no exchange or monetary value attached to land (Souder 1987). The value of land rested in its support of subsistence living. Fertile land had more relative value than infertile land, and land with access to water had more relative value than land that did not have water access.

This subsistence valuation of land changed with European contact. Firstly, monetary values for land parcels were established as a basis upon which taxes could be levied (Souder 1987). Secondly, as crops suitable for export increased dramatically in price, the value of a piece of land depended on the type of crop that it would support.

### Monetary Value of Land

The monetary value of land on Guam has generally increased over time. Table 16.1-25 shows the typical 1973 price per square meter of land on Guam by village. Table 16.1-26 shows prices for unimproved land on Guam by village, as of November 2009. Although some village boundaries have undergone shifts, a comparison of the two data sets shows that prices have increased between 1973 and the present.

Evidence shows that land value has been increasing: a 1987 report showed the average value of a tract of land on Guam increasing from \$115 in 1941 to \$51,132 (Souder 1987). Increases in Guam land prices may be due to any number of factors including population increase, inflation, and improvements in infrastructure.

**Table 16.1-25. Price Range for Guam Land by Village, 1973**

<i>Village</i>	<i>Price/m<sup>2</sup></i>	<i>Notes</i>
Agat	\$2-\$12	Includes present day Santa Rita
Asan	\$1-\$4	
Barrigada	\$3-\$52	
Dededo	\$4-\$75	
Inarajan	\$1-\$21	
Piti	\$1-\$47	
Sinajana	\$1-\$191	
Talofofu	\$1-\$4	
Umatac	\$10	
Yona	\$1-\$4	
Machanao	\$4-\$6	Included northwest corner of Guam, part of Dededo and part of Yigo
Agana	\$61-\$405	Includes present day Agana Heights, Chala-Pago-Ordot, Hagatna, Mangilao, Merizo, Mongmong-Toto-Maite and Tamuning

**Table 16.1-26. Estimated Price Range and Median Price for Guam Land, by Village, 2009**

<i>Village</i>	<i>Price/m<sup>2</sup></i>		
	<i>Low</i>	<i>Median</i>	<i>High</i>
Agana Heights	\$42	\$42	\$42
Agat	\$8	\$38	\$251
Asan	\$37	\$89	\$350
Barrigada	\$16	\$42	\$372
Dededo	\$23	\$50	\$295
Hagatna	\$203	\$405	\$726
Inarajan	\$2	\$34	\$122
Mangilao	\$30	\$61	\$106
Merizo	\$14	\$59	\$278
MongMong-Toto-Maite	\$38	\$99	\$131
Ordot-Chalan Pago	\$15	\$80	\$233
Piti	\$6	\$91	\$182
Santa Rita	\$16	\$40	\$129
Sinajana	\$12	\$31	\$273
Talofofu	\$14	\$48	\$100
Tamuning	\$125	\$281	\$1,023
Umatac	\$40	\$45	\$49
Yigo	\$20	\$35	\$284
Yona	\$14	\$78	\$507

*Note:* Estimate based on data from Public Multiple Listing Service (MLS) Search. Includes a sample of 364 unimproved properties. (Multiple Listing Service 2009).



Guam's current zoning code allows the following types of land usage:

- A: Rural Zone – This zone allows agricultural uses, single-family dwellings, duplexes, and uses considered accessory to these.
- R-1: One-Family Dwelling Zone – Primarily for single-family dwellings, this zone allows schools, churches, parks, and health services as conditional uses.
- R-2: Multiple Dwelling Zone – This zone allows duplexes and multi-family residential uses, as well as single-family dwellings and hotels.
- C: Commercial Zone – In addition to typical commercial uses, this zone also allows single and multiple-family dwelling units.
- P: Automobile Parking Zone – This zone is intended for commercial and public parking and garages, as well as service vehicle storage.
- M-1: Limited Industrial Zone – This zone allows light manufacturing (drugs, cosmetics, food products), as well as auto repair facilities, warehouses and other similar uses. Packaging of fish or meat products, including fat rendering, is not allowed.
- M-2: Industrial Zone – The Heavy Industrial Zone allows all uses not specifically prohibited by law.
- LC: Limited Commercial Zone – While the LC zone is listed in §61201 as an established zone, the code does not contain regulations enumerating specifically allowed uses in this zone.
- H: Hotel-Resort Zone – The Hotel-Resort Zone is geared toward tourism-related activities, and all associated uses are conditional in nature.
- S-1: School Zone – Established for public schools and related facilities.
- PF: Public Facility Zone – The Public Facility zone is intended for schools, police and fire stations, community centers, and other public or government facilities.

Table 16.1-27 shows estimated current market prices for unimproved land, for sale at a point in time (November 2009) by type of zoning. The table does not include all types of zoning because at the point in time, land in every zoning category was not available for sale. Land zoned hotel/resort, light industrial and multiple dwelling are the most expensive. Although these uses require large initial investments to get started, they have long-term potential for high profitability.

**Table 16.1-27. Estimated Median Prices for Land on Guam by Selected Zoning Types**

<i>Type of Zoning</i>	<i>Price/m<sup>2</sup></i>
Hotel Resort Zone	\$500
Limited Industrial Zone	\$236
Multiple Dwelling Zone	\$184
One-Family Dwelling Zone	\$57
Commercial Zone	\$42
Rural Zone	\$36
Industrial Zone	\$25

*Note:* Estimate based on data from Public Multiple Listing Service (MLS) Search.

Includes a sample of 364 unimproved properties; accessed on 11/28/2009 (MLS 2009).

### Equity Value of Land

The equity value of Guam land can be an important contributor to economic growth. In the U.S. for example “up to 70% of the credit that new businesses receive comes from using formal titles as collateral for mortgages” (Dam 2006). Table 16.1-28 shows the estimated total equity value for Guam land not including improvements. While government owners of land are not likely to mortgage their property, if the private owners of Guam land leverage the value of their land, then the land may provide a pillar for economic expansion.

**Table 16.1-28. Estimated Total Value of Guam Land, 2009**

<i>Village</i>	<i>Total ac (ha)</i>	<i>Land Value</i>	<i>Value Per Acre</i>
Agana Heights	637 (258)	\$109,043,694	\$171,077
Agat	6,641 (2,688)	\$1,010,408,514	\$152,138
Asan	3,534 (1,430)	\$1,272,391,283	\$360,076
Barrigada	5,274 (2,134)	\$890,865,865	\$168,902
Chalan Pago-Ordot	3,633 (1,470)	\$1,176,305,331	\$323,743
Dededo	19,003 (7,690)	\$3,845,090,768	\$202,343
Hagatna	541 (219)	\$886,579,583	\$1,640,136
Inarajan	11,919 (4,823)	\$1,659,621,914	\$139,244
Mangilao	6,765 (2,738)	\$1,667,442,797	\$246,499
Merizo	4,906 (1,985)	\$1,175,398,064	\$239,588
Mongmong-Toto-Maite	1,150 (465)	\$461,859,769	\$401,474
Piti	4,660 (1,885)	\$1,709,231,981	\$366,824
Santa Rita	10,295 (4,166)	\$1,675,852,233	\$162,784
Sinajana	548 (222)	\$67,808,008	\$123,841
Talofof	11,129 (4,504)	\$2,146,467,835	\$192,879
Tamuning	3,487 (1,411)	\$3,961,824,985	\$1,136,269
Umatac	4,327 (1,751)	\$788,002,146	\$182,109
Yigo	23,422 (8,479)	\$3,292,014,428	\$140,553
Yona	12,673 (5,129)	\$3,993,410,624	\$315,112
<b>Guam Total</b>	<b>134,543 (54,448)</b>	<b>\$31,789,619,822</b>	<b>\$236,279</b>

Note: Estimate of total land value by Village made by multiplying median prices from Table 16.1-26 by total number of square meters of land for each Village. Estimate does not include land improvement values, for example houses.

#### Economic Value of Land for GovGuam

GovGuam receives various economic benefits from Guam land. In particular, GovGuam:

- levies a direct annual tax based on real property value
- uses the value of taxable land as a base on which to put a ceiling on its debt issuance; and
- receives fees from the use of public recreation areas

#### *Real Property Tax*

GovGuam collects taxes from owners of real property (land and improvements on land). Property tax revenues are based primarily upon assessed value, which is determined as a percentage of appraised value. For every \$100 of appraised land value, GovGuam assesses \$70 and charges a tax of 0.125% on the \$70. Therefore, for every \$100 of appraised land value, GovGuam is owed approximately \$0.09 in property tax. Real property tax revenue is held in GovGuam's General Fund and is used to pay for public services.

In an evaluation report of Guam's tax collection activities, the U.S. DOI Inspector General estimated property tax collections of \$18.9 million in FY 2006. This represented about 5% of total GovGuam tax collections. The report recommended that Guam become compliant with local tax code, which requires updates to tax assessments to reflect current values. This is important as the most recent available appraisal of real property for tax purposes on Guam was done in 1993.

#### *Debt Issuance Ceiling*

Debt (or bond) issuance is the act of a government, such as GovGuam, borrowing money with the agreement to repay the money including interest, in the future. One of the major uses of debt issuance is to fund expensive infrastructure improvements such as roads or utilities. The major benefit of debt issuance is that a government may proceed with a project that it cannot pay for with cash on-hand. On the

other hand, the major disadvantage of debt issuance is that the cost of the project becomes much higher in the long-term, because interest is owed on the debt.

A government's debt issuance ceiling is the maximum amount of debt that it is legally allowed to incur. In March 2007, the U.S. Supreme Court upheld the spirit of the rule in the Organic Act, that public indebtedness (GovGuam's debt issuance ceiling) be calculated as 10% of the assessed valuation of property on Guam.

Although Title 11 of the Guam Code Annotated (G.C.A.) § 24102 defined the assessed value of property on Guam as 35% of the appraised value of property, Guam PL 29-19 amended this definition. Under this amendment, assessed value of property is to be calculated as 70% of the appraised value of property.

The 2006 certified tax roll appraisal value of taxable land on Guam was \$11.6 billion (taxable land is generally limited to privately owned land). At an assessment rate of 70%, the assessed value of all taxable land on Guam was \$8.12 billion. As GovGuam's debt issuance ceiling is 10% of assessment value, Guam's debt ceiling, based on the 2006 certified tax roll, is \$812 million (Guam Office of Public Accountability 2007).

More recent data from a March, 2010 report highlighting the finances of the Guam Economic Development Authority (GEDA) (Guam Office of Public Accountability 2010) explain that GovGuam has nearly reached its debt capacity of \$879.1 million; \$37.4 million is available for future debt. Also, as of October 2009, government of Guam's annual debt service payment was \$76.2 million.

#### *License and Lease Revenue*

Both GALC and CLTC receive appropriations from the GovGuam legislature. GALC provides commercial licenses and leases allowing other entities (public & private) to conduct business on GALC land; the fees GALC receives for licenses and leases are deposited into the Land Bank Account which had a balance of \$114,776 as of June 30, 2006 (Guam Office of Public Accountability 2006).

CLTC provides agricultural and residential leases as well as commercial leases; revenues from residential and agricultural leases are deposited into the Chamorro Commercial Loan Fund and revenues from commercial leases are deposited into a separate checking account opened by the Commission (Guam Office of Public Accountability 2009). As of September 30, 2008, the carrying amount of CLTC's total cash and cash equivalents was \$647,730 (Government of Guam 2008).

In addition, GovGuam land is sometimes leased to public and private entities, usually through the Guam Economic Development Authority (GEDA), these leases generate revenue for GEDA operations which are meant to encourage increased economic activity on Guam.

The Guam Office of Public Accountability (OPA) in audit reports provides detailed information on license and lease revenues for CLTC, GALC and GovGuam land (typically through GEDA):

- A 2005 OPA audit of CLTC states that the majority of the land licensed by CLTC is for use as a raceway park. CLTC licenses about 250 ac (101 ha) for the raceway park at a rate of \$3,300 per month (about \$40,000 per year) – annually, CLTC licenses the use of its land for use as a raceway park for \$158 per acre. The majority of CLTC leased land is leased for use as a golf course; CLTC leases about 205 ac (83 ha) to the golf course at a rate of \$18,065 per month (about \$217,000 per year) – annually, the CLTC leases the land for \$1,058 per year. Table 5.1-6 shows the total acreage, annual revenue and annual revenue per acre for CLTC licensed and leased land.

- A production center, pits and quarrying; GALC licenses the use of about 100 ac (40 ha) for production, pits and quarrying at a rate of \$5,000 per month (about \$60,000 per year) – annually, GALC licenses the use of its land for production, pits and quarrying use for \$600 per acre. GALC leases a total of less than four acres to GovGuam agencies including the Guam Environmental Protection Agency, Guam Police Department and Guam Fire Department; most of this land is leased at no cost and provides no revenue to GALC. Table 5.1-6 shows the total acreage, annual revenue and annual revenue per acre for GALC licensed and leased land.
- A 2010 OPA audit of GEDA states that GovGuam land is leased to private entities for three industrial parks. In total, 160 ac (65 ha) of GovGuam land are leased and GEDA receives revenue of \$1.7 million per year. Table 5.1-6 shows the total acreage, annual revenue and annual revenue per acre for GovGuam leased land.

**Table 5.1-5 Estimated Total Value of Guam Land, 2009**

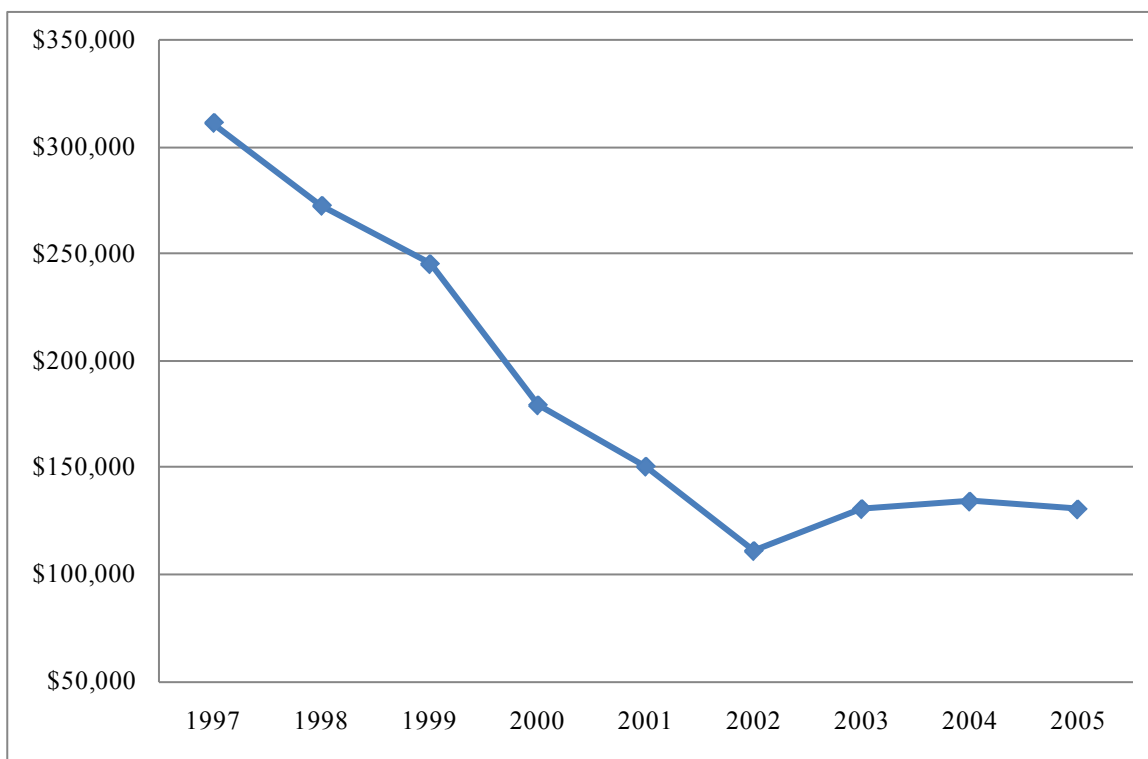
<i>Entity</i>	<i>ac (ha) Licensed/Leased</i>	<i>Annual Revenue</i>	<i>Revenue per Acre</i>
CLTC	570 (231)	\$449,436	\$788.72
GALC	120 (49)	\$373,115	\$3,099.47
GovGuam	160 (65)	\$1,730,098	\$10,813.11

*Sources:* Guam OPA 2005. Guam OPA 2006. Guam OPA 2010.

#### *Fees for Recreational Use of Land*

GovGuam collects fees for the use of the facilities maintained by the GDPR, including recreational facilities such as pools and tennis courts, as well as parklands, through the collection of use permit fees. While these fees generally do not meet the entire costs to operate facilities and maintain park land, they support the continuation of the public service provided by GDPR.

Figure 16.1-3 shows revenues from fees collected for the use of DPR maintained recreational facilities (FY 1997 to FY 2005). The figure shows a decline in fees between FY 1997 to FY 2002, after which they have leveled off to between \$100,000 and \$150,000 thousand per year (Guam Office of Public Accountability 2006a).



Source: Guam Office of the Public Accountability 2006a

**Figure 16.1-3. GovGuam Revenues from Recreation Fees**

### Recreational Value of Land

The overall economic value of recreation in a region is generally based on the number and variety of available recreational resources. Since community members have various preferences for recreation, the more recreational choices available to the community, the higher the overall recreation value a region offers. Generally, as the number of recreational sites in a region increases, the recreation value of the region increases. As the number of recreation sites in a region decreases, the recreation value of the region decreases.

The recreational resources on Guam that may be impacted by land acquisition are noted in the Recreational and Cultural Sites and Activity section below. As indicated there, all recreational site location or use information is available in other Volume 2 chapters, including Chapter 9 (Recreational Resources) and Chapter 12 (Cultural Resources).

#### 16.1.7.4 Sociocultural Value of Land on Guam

Contemporary land issues on Guam with most relevance to the proposed action on Guam are issues of federal land ownership and land access, with the cultural value of land underpinning both these issues.

As identified (refer to Current Land Tenure section above), federally-owned land on Guam is currently estimated in the EIS at 37,088 ac (15,009 ha), or approximately 28% of total land on the island. This percentage was noted by many commenters on the DEIS as being excessive, although this is lower than the national average.

The history of forced or uncompensated land taking on Guam by various outside administrating forces (refer to Historical Land Tenure section) impacts public perception of any present-day land acquisition on

Guam. Forced or uncompensated land acquisition approaches were not past policy and are not the current policy of the DoD and regulated by federal law. However the public has expressed concern that past land acquisition injustices may be repeated. Between the late 1970s and early 1990s, various parcels of federally-owned lands were determined to be excess through various BRAC actions, and were identified to be returned to GovGuam and original landowners. Although large parcels of land were released, there remain identified land parcels that have not yet been released, resulting in public dissatisfaction. Similar to the issues identified in the Social Values and Issues section, some Guam residents argue these past actions should be “made right” by the military and/or the federal government in the course of the planned relocation.

Public comment has included dissatisfaction not only with the quantity of federally-owned land, but with the restriction of public access to these lands, although DoD on Guam follows the same standard procedures for all U.S. military installations worldwide.

Access to recreational land and ocean areas (including historical and cultural sites) for hiking, fishing, beach-going, diving, and sight-seeing among other activities, is also an issue. The public perception as identified in comments on the DEIS is that existing military land regulations already block access to some of the prime recreational activity locations on Guam. It is believed that further land acquisition will expand such restrictions on land and ocean-based recreational activities. Some recreational areas which are located on the proposed lands to be acquired are also known to provide social services to the Guam community. In particular, the Guam International Raceway makes its location available to public safety agencies for emergency vehicle training. More information regarding recreational activities on public and federal land, including access to federal lands for recreational purposes, is available in Volume 2, Chapter 9 (Recreational Resources) of this EIS. In addition, information regarding DoD policies regarding access to navigable waters in Surface Danger Zones (SDZ) that are associated with firing ranges is available in Volume 2, Chapter 8 (Land and Submerged Land Use) of this EIS.

Many members of the native Chamorro population of Guam and their elected or self-appointed representatives feel that their culture would bear an unfair burden of impact from the proposed action, especially in the continued loss of public and private land ownership and access to these lands. Importantly, these lands are sources of various attributes and resources with cultural significance, as highlighted in the following paragraphs.

Both land and submerged lands, and the resources that are available on or in those areas have been identified as a source of health and sustenance for the Chamorro people. The Cultural Resources chapter of Volume 2 of the EIS contains an overview of archaeological evidence of early settlement reliance on ocean resources “with emphasis on exploitation of the shallow water, fringing reef and lagoon areas” accompanied by foraging activities, which gradually developed during the Latte period to include cultivation of plots of land and increased consumption of rice, and tubers such as taro or yams. Various products of the land are also identified as being used by the Chamorro people in order to access these sources of sustenance, such as the yoga (*Elaeocarpus joga*) ifit (*Intsia bijug*) and dukduk tree (*Artocarpus mariannensis*,) used for timber (such as canoe building, food and cordage). Following European contact, the products of fishing and land cultivation allowed for sustenance through trading with passing vessels. Additional information on recreational fishing is available under the Sociocultural Issues above.

The Cultural Resources chapter also identifies various plants traditionally used for medicinal purposes by the *suruhanu*, which are “spirit counselors” or “medicine men” of the native Chamorro culture, whose knowledge was passed down from previous generations (usually orally) (McMakin, 1975). Possessing the ability to communicate with *taotaomo'na* (ancestral spirits), as well as traditional knowledge of *tinanom*

(plants) and *amot* (medicine), the *suruhanu* was a central cultural, curing figure (Bevacqua, 2009 and McMakin, 1975). *Suruhanu* exist in the present day, and continue to practice the gathering of medicinal plants and administration of *amot* to the Chamorro community, with their practices being documented in written and video formats (McMakin 1975 and 1976). Thus, not only does land provide the resources for the preservation of health, but of a traditional Chamorro knowledge based upon the ecosystem.

Land on Guam also provides the value of cultural heritage and existence to the native Chamorro community. The inheritance of family properties is a continuing aspect of Chamorro culture that remains evident in the current land tenure system on the island. As stated in the Historical Land Tenure section above, ancient Chamorro society was a matrilineal society and control of land was passed down through the women. Although alternate practices of dividing land were administered under Spanish and American control, these were not always followed by Chamorro residents. These practices were “not fully utilized (by all Chamorro families) as family members continued to keep the family land intact in accordance with the ancient Chamorro system of land inheritance” (De Oro, 2009). Evidence of this heritage can be seen in current land ownership records showing collections of inherited lands remaining grouped by family. These groupings of land ownership can provide Chamorro families a sense of existence of family lineage and heritage through the possibility of intergenerational bequest.

Regardless of actual legal ownership designations, land on Guam also represents to native Chamorros a sense of place. The island of Guam is often referred to by them as *Tano y Chamorru* or the land of the Chamorros, a reference not to land ownership in the Western sense, but to spiritual ties that a people feel for their cultural birthplace – in other words, where they belong. Ancient Chamorro beliefs do not place the dead in a higher or lower plane of existence. Instead, they believe that their ancestor’s spirits remained in the world, that “a person’s soul was *taifinakpo*’ (without end) and that the *ante* (spirit) would return to the world its family still lived in with new powers and obligations” (Bevacqua 2009). Significantly, the ancient Chamorro practice of animism, or the belief that everything in nature contains a spirit or soul, means that these spirits (ancestors) and thus people in general are interconnected and inextricable from nature (Mendiola 2009). In addition, specific ancestral spirits are place-based, causing the need for the living, unfamiliar to certain spirits, to ask permission before entering certain areas (Bevacqua 2009).

#### 16.1.7.5 Recreational and Cultural Sites and Activities

All cultural and historical site information was taken from the Cultural Resources chapter of Volume 2. All recreational site location or use information was taken from the Recreational Resources chapter of Volume 2.

##### Former FAA Parcel

The Recreational Resources and Cultural Resources chapters of the EIS provide detailed information on recreational and cultural sites/activities on the parcel including:

- A popular walking/jogging trail
- Ague Cove
- Hilan’an Rock Shelter

There is a walking/jogging trail on the Former FAA parcel that is frequently utilized by the public. Ague Cove is situated on the coast below the northwest corner of the parcel and is visited by members of the Chamorro culture and resident community, accessed by a steep and undeveloped trail. The 0.4-mile trail begins from the former Oceanview Housing Area. Here, numerous small caves and rock shelters contain evidence of prehistoric habitation and burial, including rare examples of traditional rock art. Swimming and snorkeling in the cove is also possible in calm weather.

The Hilaan'an Rock Shelter has also been recorded in survey on this parcel. A 2.6-mile (4.2-km) hike starts from the Tanguisson Power Plant at the Guma Fahou beach to Danu Charu Point. At the trail terminus, visitors can enjoy snorkeling, SCUBA diving, swimming, fishing, picnicking, and camping. A trail in the middle of the Hilaan trail leads to Lost Pond, a natural freshwater pool. Hilaan hike is considered Guam's best hike (Lotz and Lotz 2001).

### Harmon Annex

The Recreational Resources chapter of the EIS did not identify any recreational sites or activities on the Harmon Annex parcel. There is evidence however of a cleared area (noted in the Land Acquisition Baseline Report in Appendix F of the EIS) that is still informally used for the flying of model aircrafts, as well as some subsistence farming activities. In addition, the area Guma Fahou, an ocean recreational area (snorkeling and swimming) is located on the coastline off of the Harmon property.

The Cultural Resources chapter of the EIS note that the Harmon Annex area was surveyed in 2009 (Dixon and Walker 2009). One NRHP-eligible archaeological site was encountered during the survey, which contained prehistoric pottery and WWII and post-WWII *lancho* elements.

### Route 15

Notable recreational and cultural sites and activities on the Route 15 parcels were identified in the Recreational Resources and Cultural Resources Chapter of the EIS include:

- Pagat Village (including Pagat Cave)
- Pagat Point
- Marbo Cave
- Pagat Trail and related hiking trails
- Off-shore fishing
- Cultural gathering activities (*suruhanu*)
- Subsistence farming activities
- Guam International Raceway Park

The prehistoric site of Pagat Village is located on a coastal terrace below Route 15. This archaeological site is listed on the National Register of Historic Places (Lotz 1973) and is of special note because of the intensity of academic research which has been conducted there over the past half century (Reinman no date, 1967, 1977; Craib 1986); few sites have received that level of attention on Guam (Guam Historic Preservation Plan 1976, 2007). In May 2010, the site was listed by the National Trust for Historic Preservation as one of America's eleven most endangered historic places.

The Pagat Village site appears to center around a freshwater source inside a sinkhole cave formation known as Pagat Cave. Cultural resource surveys indicate that apparent depositional and preservation characteristics of Pagat Cave may be the best opportunity to find older archaeological deposits if indeed they exist here (Volume 9, Appendix G).

Another site located immediately to the north is referred to as Pagat Point, a likely agricultural farming area for the prehistoric Pagat Village settlement and the historic to modern ranch or *lancho* of Juan Cepeda who collects traditional plants of the limestone forest and coastal areas there in his role as *suruhano* or traditional pain doctor (McMakin 1975, 1976).

Marbo Cave is situated immediately south of Pagat Village and is regularly visited by members of the Chamorro culture and resident community. This limestone cave is filled with freshwater, with a depth up



to 30 ft (9 m), from the underground lens. Smaller caves are connected to the main cave. Visitors swim in the freshwater pool inside the cave and visit the archaeological remains recorded on the slopes below (Henry and Haun 1993).

At present, there is a series of trails connected to the Pagat Trail. The trails are open to the public and feature sinkholes, caves, and rugged limestone formations. On a popular weekend, visitors comprising tourists, local boonie stomp groups, and morale, welfare, and recreation activities generating from Navy Barrigada may attract as much as 60 hikers (Andersen AFB 2009). Visitors have been known to swim at the bottom of a sinkhole where there is a fresh water source (Lotz and Lotz 2001).

The coastal areas off the Pagat site area are used for fishing by local residents and native Chamorros. A list of traditionally harvested fish and where they are harvested can be found in Volume 9 Appendix K. While most subsistence fishing on Guam is done on the western coast in places such as Cetti Bay, Umatac Bay, and Mamaoan Channel, when waters are calm enough, fisherman will also fish off the coast near the Pagat site on the eastern side of Guam.

Finally, as noted in the Land Acquisition Baseline Report (Volume 9, Appendix F), the Guam International Raceway is also a popular racetrack for motor cross competition, vehicles that attracts participants and spectators, and provides a venue for the training of public safety personnel. This report has a more detailed description of the Raceway.

In addition, anecdotal information regarding the *Lujan* lower coastal area in the northeasternmost part of the parcel identifies activities such as cultural gathering (ginger and fruit), fishing and ecotourism (Sablan 2010). Accessible ocean shoreline access more toward the southern area of the parcel allows the capture of fish (including reef fish, some off-shore bottom fish and seasonally Pacific spiny lobster), mostly for family distribution (Sablan 2010).

#### 16.1.7.6 Federal Land Acquisition Process

Federal guidelines would be followed in executing project-related land acquisitions.

Federally funded projects such as the proposed action can require the acquisition of private and public lands for project implementation, and the government has developed various regulations to guide such processes. In general, these federal guidelines ensure the fair, equitable, and consistent treatment of affected property owners.

There are various types of real estate acquisition that could be used for the proposed action:

- Fee Simple – allows full ownership of title
- Leasehold – allows right of exclusive possession for a specified period and use
- Easement – allows non-possessory right of use for a specific purpose (restrictive easements allow for the right to restrict use of others for specific purposes)
- Purchase Option – allows the right to acquire a specific interest for a specific price, within a specified period of time

The Navy is required to comply with federal land acquisition law and regulations, which includes the requirement to offer just compensation to the owner, to provide relocation assistance services and benefits to eligible displaced persons, to treat all owners in a fair and consistent manner, and to attempt first, in all instances, acquisition through negotiated purchase.

### The Uniform Relocation Assistance and Real Property Acquisition Policies Act

All information contained in this section can be found in the National Highway Institute's online training FHWA-NHI-141045 (National Highway Institute 2010).

The foremost federal policy that applies to those affected by any proposed federal land acquisition is the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), and as enacted through PL 91-646. This Act provides minimum standards of performance for all federally-funded projects that require the acquisition of real property, including the relocation of persons displaced by such acquisition. See Volume 9 Appendix F SIAS for expanded information on the history of the Uniform Act and brief mention of additional policies that may apply to land acquisition related to the proposed action.

The Uniform Act includes provisions for the following:

- Property Appraisal and Fair Market Value
- Written Offer and Negotiations
- Partial Acquisitions
- Payment
- Relocation
- Condemnation

The following is a brief discussion of each of these topics. The SIAS in Volume 9 Appendix F has more detailed description and information.

#### *Property Appraisal and Fair Market Value*

By law, the federal government is required to offer property owners "just compensation" for their property, which is based upon "fair market value" of the property. Fair market value is determined through a federal real property valuation appraisal. The estimated fair market value is used as the basis for the acquiring agency's estimate of just compensation. An estimate of just compensation must be established before any property negotiations begin.

Once the property appraisal has been completed and reviewed, the approved appraisal amount is used to determine the amount of just compensation to be offered for the property. Just compensation will never be less than the fair market value established by the approved appraisal (Federal Highway Administration 2010).

#### *Written Offer and Negotiations*

All property appraisal processes must be complete before negotiations begin. Once an estimate of just compensation has been established, the Uniform Act requires acquiring agencies to provide a written offer to the property owner for the full amount.

It is at the point of this written offer that relocation eligibility for property owners and tenants is established (more information provided below).

Negotiations sometimes result in additions to the estimate of just compensation for a property. A property owner can provide additional information and make reasonable counter offers and proposals for consideration. This information can be used as a basis for additions to offer amounts, which is called an administrative settlement. Administrative settlements may be approved if they are reasonable, prudent, and in the public interest.

### *Partial Acquisitions*

Sometimes acquiring agencies do not require the acquisition of entire properties. This is referred to as a partial acquisition. If a partial acquisition creates an “uneconomic remnant,” the agency is required to offer to purchase those remnants. In addition, if partial acquisitions cause damages to remaining properties, offer amounts should include, as a separate line item, amounts offered as compensation to the damages to the remaining property.

### *Payment*

Once negotiations have been completed, a property owner is not required to surrender the property until the agreed purchase price is paid by the acquiring agency. Only exceptional cases warrant right-of-entry for the agency prior to making payment, and only upon approval of the owner.

### *Relocation*

In addition to paying fair market value, the Uniform Act prescribes certain benefits for eligible occupants impacted by federal property acquisitions, including: assistance in finding acceptable replacement housing or business location; the payment of moving and other incidental and miscellaneous expenses and; as needed, certain supplemental payments for increased housing or rental costs at a replacement location.

### *Condemnation*

While the government is authorized to acquire property through its powers of eminent domain (condemnation), it has been the consistent peacetime policy of the Department of the Navy to acquire real estate through negotiation with owners. Use of the condemnation process may be necessary even with willing sellers in order to clear problems with title.

## **16.1.8 Off-Base Roadways**

### **16.1.8.1 Regional Overview of Community Facilities and General Services within Off-Base Roadways Study Area**

The following section describes the affected environment for off base roadway construction projects that would be implemented by the Federal Highway Administration (FHWA). This section provides a description of the socioeconomic environment that would be impacted by the proposed roadway improvement project. The regional locations of community facilities and general services, including police, fire, medical, educational, and cultural, are described in this section. Community facilities and general services are summarized in Table 16.1-29, Table 16.1-30, and Table 16.1-31, and shown in Figure 16.1-4, Figure 16.1-5, and Figure 16.1-6. Information on parks and recreational facilities can be found in Chapter 9, Recreational Resources. Following the tables and figures, brief descriptions are provided of the facilities and services available in the north, central, Apra Harbor and southern regions.

**Table 16.1-29. Community Facilities by Region, Off-Base Roadways**

<i>No.</i>	<i>Service or Facility</i>	<i>No.</i>	<i>Service or Facility</i>
<b>North</b>			
<i>Government Offices</i>		<i>Community Facilities</i>	
G14	Dededo Mayor's Office	C10	Dededo Community Center
G15	Yigo Mayor's Office	C11	Yigo Senior Citizen's Center
G19	Northern Public Health Satellite Facility	C12	Yigo Gym
G20	UOG Experimental Station	C13	Astumbo Gym and Community Center
G21	GWA Laboratory	<i>Fire and Rescue Stations</i>	
G22	GPA Main Office	F1	Andersen Air Force Base Station

No.	Service or Facility	No.	Service or Facility
G23	GWA Main Office	F4	Yigo Fire Station, Station #10
G24	DPW	F6	Dededo Fire Station, Station #4
G25	DPW Transfer Station	<i>Post Offices</i>	
G26	Guam Energy Office	PO5	Yigo Postal Unit
G27	Guam Visitor's Bureau	<i>Police Protection/ Law Enforcement</i>	
G28	Guam International Airport	P3	Dededo New Precinct
G29	Department of Land Management		
G30	GEDCA		
<b>Central</b>			
<i>Government Offices</i>		<i>Community Facilities</i>	
G1	Piti Mayor's Office	C2	Chalan Pago Community Center
G2	Asan Mayor's Office	C3	Asan Community Center
G3	Agana Heights Mayor's Office	C4	Sinajana Community Center
G4	Hagatna Mayor's Office	C5	Agana Heights Community Center
G5	Sinajana Mayor's Office	C6	Mongmong-Toto-Maite Community Ctr.
G7	Barrigada Mayor's Office	C7	Barrigada Community Center
G8	Governors Complex	C8	Mangilao Community Center
G9	Mayors Council of Guam	C9	Tamuning Community Center
G10	Chalan Pago Ordot Mayor's Office	<i>Post Offices</i>	
G11	Mongmong Toto Maite Mayor's Office	PO1	University of Guam Postal Unit
G12	Mangilao Mayor's Office	PO2	Hagatna Post Office
G13	Tamuning Mayor's Office	PO3	Barrigada Main Facility
G16	Dept. of Health and Social Services	PO4	Tamuning Post Office
G17	Public Defender Office	<i>Fire and Rescue Stations</i>	
G18	Superior Court	F3	Piti Fire Station, Station #7
G31	Office of Civil Defense	F5	Astumbo Fire Station, Station #12
G32	Dept. of Parks and Recreation	F7	Fire Rescue Base 1 and 2
G33	Department of Corrections	F9	Nimitz Hill Station
G34	Department of Agriculture	F10	Sinajana Rescue and Station #2
G35	Department of Youth Affairs	F11	Tamuning Station #1
G36	Police Department	<i>Police Protection/ Law Enforcement</i>	
G37	Guam EPA	P1	Hagatna Police Precinct
G38	Customs and Quarantine	P2	Tamuning Police Koban
G39	Bureau of Statistics and Plans Coastal Zone Management Program	P4	Guam Police Headquarters
G40	GHURA	P5	Tumon Police Koban
G41	Department of Labor	P6	Tumon/Tamuning Precinct
G42	Department of Administration	<i>Hospitals</i>	
G43	Guam Public Schools System	H1	Naval Hospital Station
G44	Governor's Office	H2	Guam Memorial Hospital
G45	BBMR		
G46	Bureau of Planning		
G47	Guam Housing Corporation		
<b>South</b>			
<i>Government Offices</i>		<i>Community Facilities</i>	
G6	Santa Rita Mayor's Office	C1	Santa Rita Community Center
<i>Fire and Rescue Stations</i>			
F8	Naval Station		

Source: Bureau of Statistics and Plans 2008.

**Table 16.1-30. Educational Facilities and Libraries by Region, Off-Base Roadways**

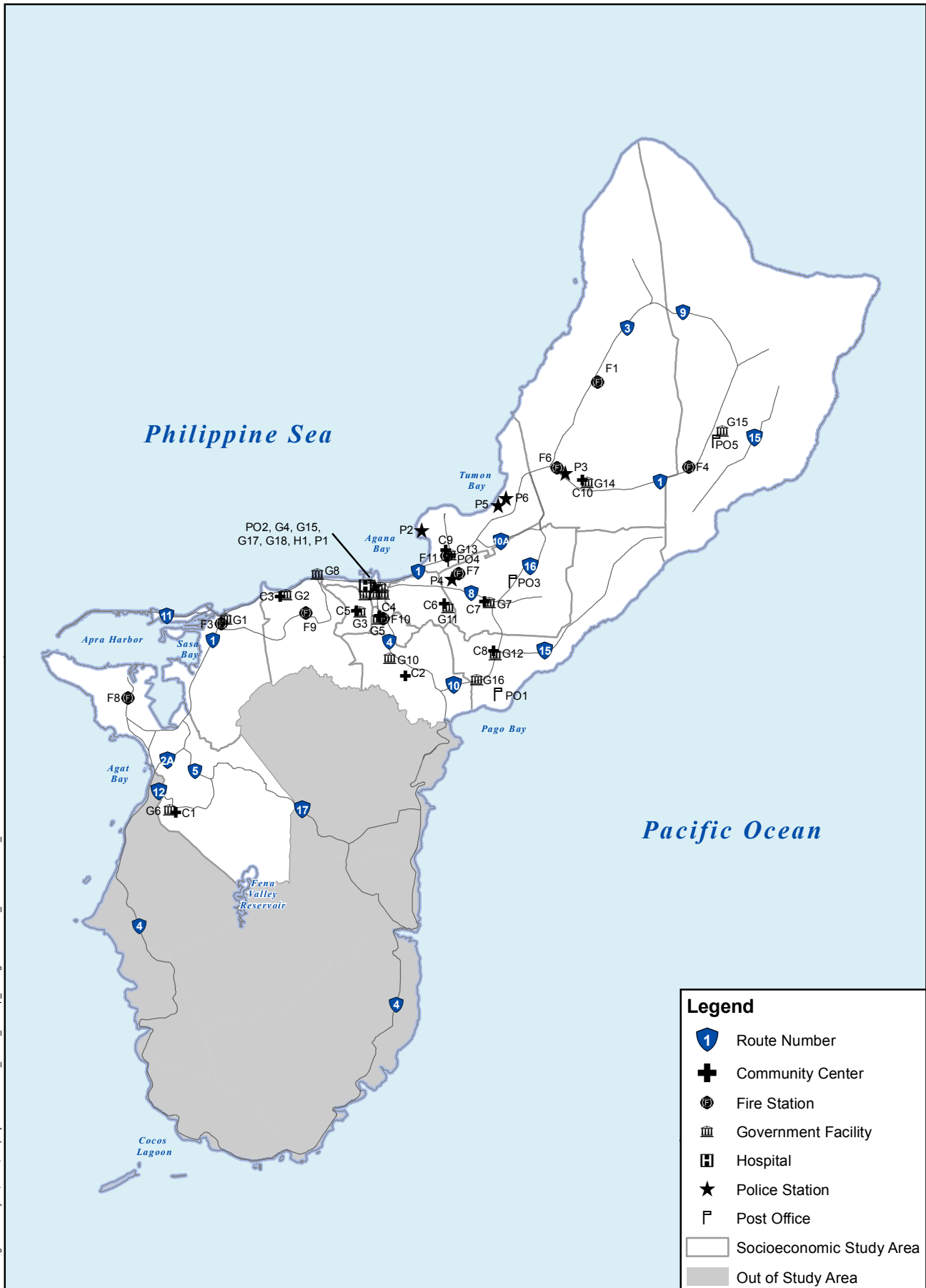
No.	Service or Facility	No.	Service or Facility
<b>North</b>			
<i>Schools</i>			
S25	Ukudu High School	S37	UPI Elementary School
S26	Wettengel Elementary School	S42	Liguan Elementary School
S27	Vicente S.A. Benavente Middle School	S43	J.M. Guerrero Elementary School
S28	Astumbo Elementary School	S45	Santa Barbara School
S29	Astumbo Middle School	S46	Adacao Elementary School
S30	Maria Ulloa Elementary School	S47	St. Paul's
S31	Dominican School (Private)	S48	Pacific Christian Academy
S32	Daniel L. Perez Elementary School		
S33	Simon Sanchez High School	<i>Libraries</i>	
S34	F. B. Leon Guerrero Middle School	L4	Dededo Public Library
<b>Central</b>			
<i>Schools</i>			
S5	Agueda Johnston Middle School	S22	Japanese School (Private)
S6	Chalan Pago Ordot Elementary School	S23	J.Q. San Miguel Elementary School
S7	Father Duenas Memorial High School	S24	Tamuning Elementary School
S8	Evangelical Christian Middle High	S35	Finegayan Elementary School
S9	Guam Community College	S36	Machananao Elementary School
S10	George Washington High School	S38	Chinese School of Guam
S11	University of Guam	S39	Saint John School (Private)
S12	Jose L.G. Rios Middle School	S40	John F. Kennedy High School
S13	DoDEA Guam High School	S41	Chief James A. Brodie Memorial School
S14	Agana Heights Elementary School	S44	Saint Anthony School (Private)
S15	Bishop Baumgartner Junior High	S53	Untalan Middle School
S16	Taitano Elementary School		
S17	Harvest Christian Academy (Private)	<i>Libraries</i>	
S18	Lyndon B. Johnson Elementary School	L1	Robert F. Kennedy Library
S19	P.C. Lujan Elementary School	L2	Nieves M. Flores Memorial Main Public Library
S20	Carbullido Elementary School	L3	Barrigada Public Library
S21	Price Elementary School		
<b>South</b>			
<i>Schools</i>			
S1	J.P. Torres Alternative School	S49	Marcial Sablan Elementary School
S2	McCool Elementary Middle School	S50	Oceanview Middle School
S3	Southern High School	S51	Southern Christian Academy
S4	Harry S. Truman Elementary School	S52	Mount Carmel Catholic School

Source: Bureau of Statistics and Plans, January 2008.

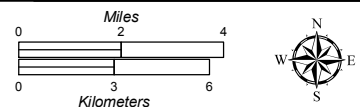
**Table 16.1-31. Houses of Worship by Region, Off-Base Roadways**

No.	House of Worship	No.	House of Worship
<b>North</b>			
26	Santa Barbara Church	54	Bible Baptist Church
28	UCCPG	55	Iglesia Ni Cristo
29	Yigo Baptist Church	57	Korean Seventh Day Adventist Church
30	Base Chapel Number 2	58	Church of God
31	Base Chapel Number 1	59	Church of Jesus Christ of Latter Day Saints
41	Church of Jesus Christ of Latter Day Saints	60	Our Lady of Lourdes Church
48	Blessed Diego Luis De San Vitores	61	Church of the Nazarene
63	St. Paul's Church	62	Seventh Day Adventist Church
<b>Central</b>			
1	San Juan Bautista Church	27	Seventh Day Adventist Church
2	Evangelical Church	32	Faith Presbyterian Reformed Church
3	Faith Presbyterian Reformed Church	33	Harvest Baptist Church
4	Guam Bible Church	34	Immaculate Heart of Mary
5	Our Lady of Peace Church	35	Nuestra Senora De Las Aguas Church
6	Campus Ministry	36	First Church of God
7	Guam Baptist Church	37	Full Gospel Korean Church
8	The Salvation Army Corps Center	38	Guam United Methodist
9	Our Lady of Assumption Church	39	San Vicente Ferrer-San Roke Church
10	Church of Christ	40	Santa Teresita Church
11	Nimitz Hill Chapel	42	Faith Baptist Church
12	Nino Perdido Church	43	New Covenant Life Church
14	Dulce Nombre De Maria Cathedral Basilica	44	Palauan Evangelical Church of Guam
15	Agana Heights Baptist Church	45	Saint Anthony Catholic Church
16	Our Lady of Purification Church	46	Sisters of Mercy
17	Our Lady of the Blessed Sacrament Church	47	Tamuning Baptist Church
18	Saint Fidelis Friary	49	Calvary Baptist Church
19	Saint Jude Thaddeus Catholic Church	50	Church of the Blessed Diego
20	Seventh Day Adventist Church	51	Pacific Missionary Aviation
21	U.S. Naval Hospital Guam Chapel	52	PMC Church
22	Bayview Baptist Church	53	Saint John's Church
23	Church of Jesus Christ of Latter Day Saints	56	Kingdom Hall of Jehovah's Witnesses
25	Pacific Presbyterian Church		
<b>South</b>			
13	Church of Jesus Christ of Latter Day Saints	24	Our Lady of Guadalupe Church

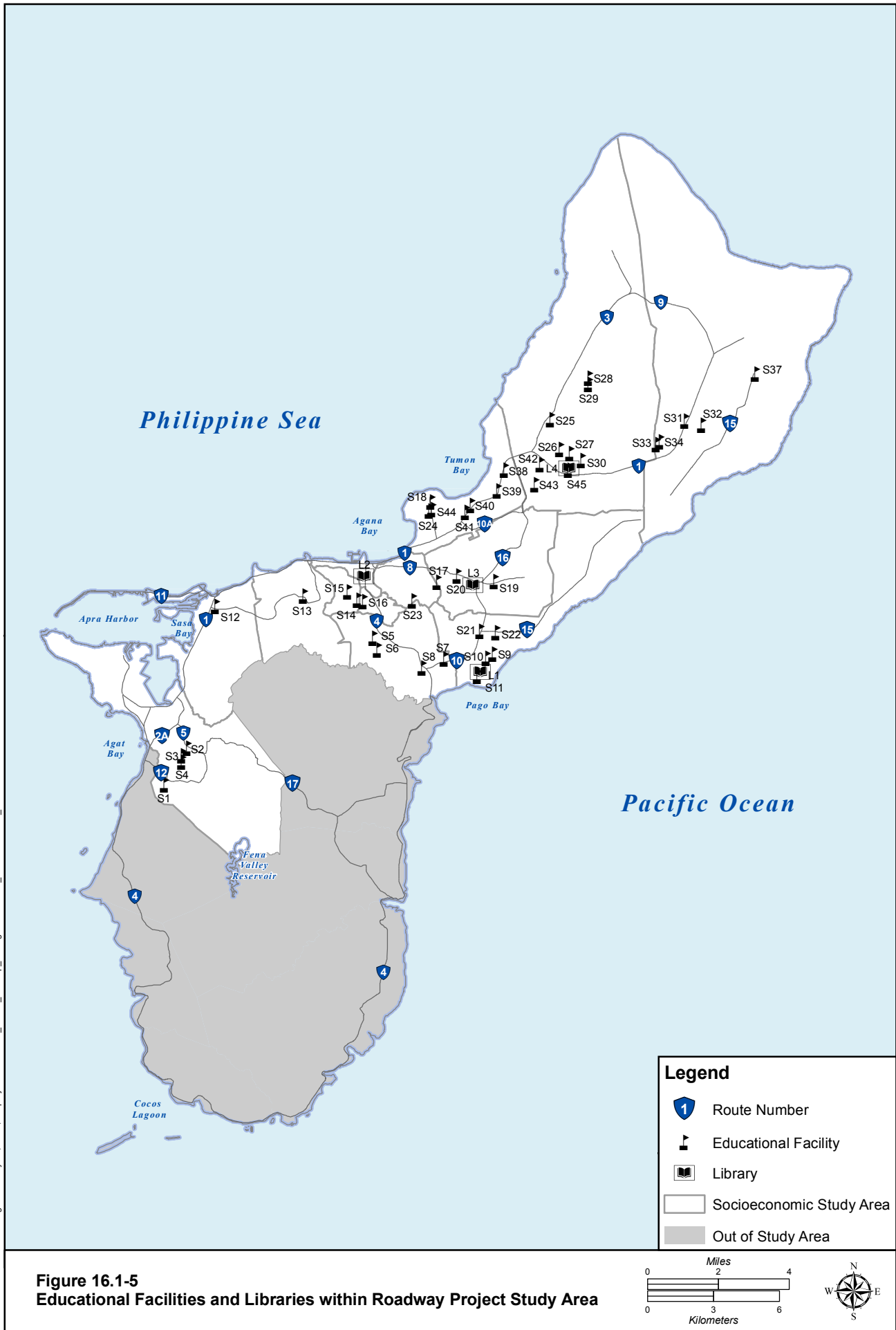
Source: Bureau of Statistics and Plans, January 2008.



**Figure 16.1-4**  
**Community Facilities within Roadway Project Study Area**

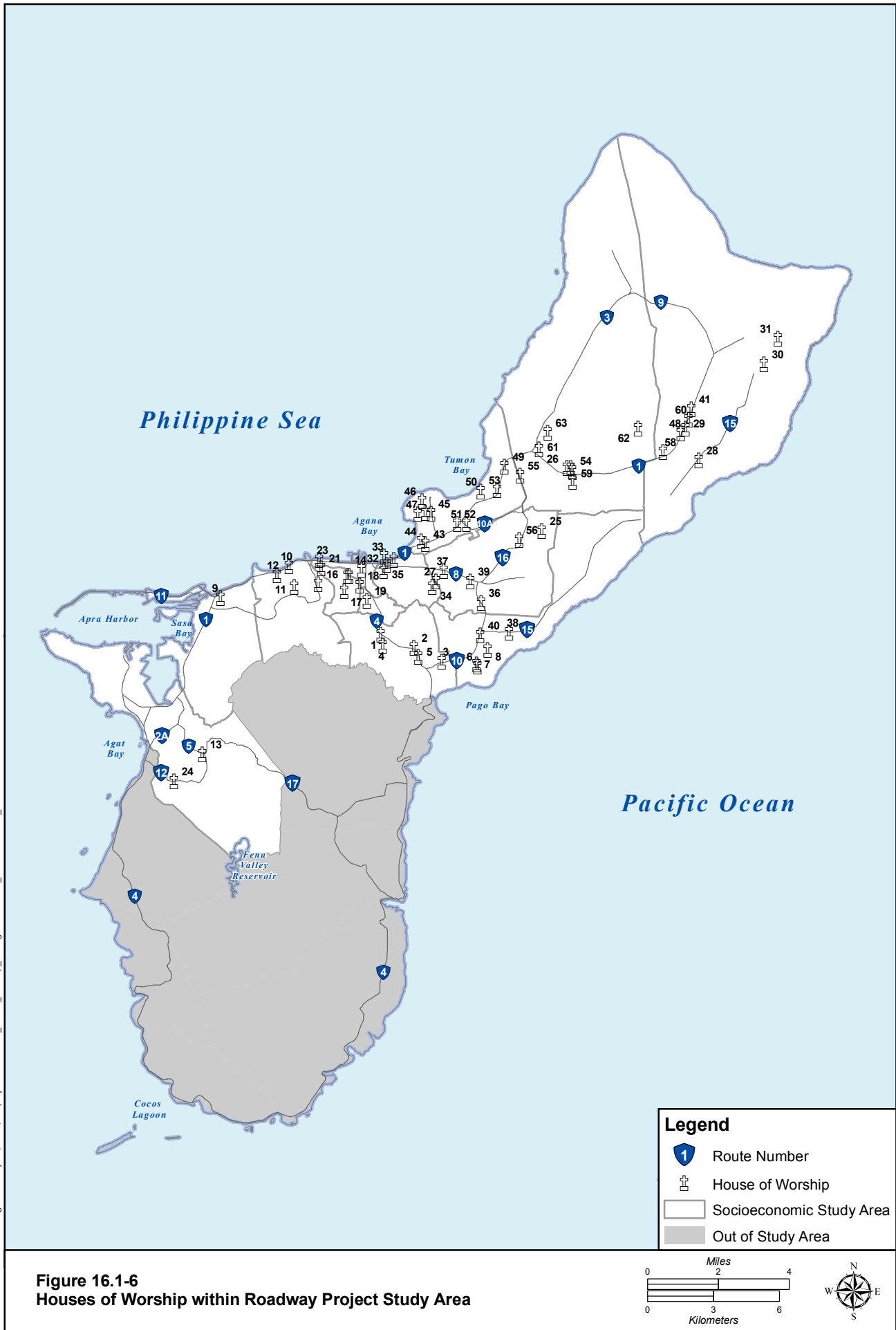


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**Figure 16.1-6**  
Houses of Worship within Roadway Project Study Area

#### 16.1.8.2 North

Most of the population on Guam presently resides in the villages of Dededo and Yigo within the north region. Many retail shopping centers and restaurants are located in this region. Agricultural areas within this region produce a variety of crops, including coffee, cocoa, pineapple, orange, and tangerine crops.

The Dededo Community Center is located in the village of Dededo within the north region. The Yigo Senior Citizen's Center and Yigo Gym are located in the village of Yigo. In addition, government offices in this region include the Dededo and Yigo Mayor's offices, the Northern Public Health and Satellite Facility, UOG Experimental Station, Guam Waterworks Authority (GWA) Laboratory and Main Office, Guam Power Authority (GPA), DPW, the Department of Land Management (DLM), and the Guam Energy Office. The Yigo Postal Unit is located in the north region as is the GVB and the Guam International Airport Authority (GIAA).

Police protection and traffic enforcement in the study area are provided by the GPD. Fire protection services are provided by the GFD. Within the north region, there are three fire stations and one police precinct that serve the Dededo and Yigo villages.

Within the north region, there are 17 schools in the Yigo and Dededo villages, including eight elementary schools, three middle schools, three high schools, and three private schools. The Dededo Public Library is within the north region.

Fourteen houses of worship of various denominations are located in the north region. These facilities serve as community focal points.

#### 16.1.8.3 Central

Located in the central region, Tumon is the primary tourist district on the island of Guam. Tumon offers hotels, restaurants, and other tourist attractions, including attractive beaches along Tumon Bay. The villages of Mangilao, Agana Heights, Sinajana, and Chalan Pago-Ordot are located in the northeastern part of the Central Region and are part of the Kattan (Eastern) District. Mangilao is the center of higher education on Guam, with University of Guam and Guam Community College. The village of Sinajana overlooks the central parks of Guam. Agana Heights is located north of the capital city of Hagatna and was a resettlement community for many residents of old Hagatna after World War II. Today, Agana Heights is the location of Government House and center of two of the island's oldest organizations, the Elks Club and the Shriners Club. Chalan Pago-Ordot village is located in the eastern part of the Central Region. Hagatna, the capital of Guam, has remained an important coastal city and is the center of government on the island.

Asan and Piti are located in the southern portion of the central region. These villages are part of the Luchan (Western) District. In the village of Asan, Asan Beach Park and the War in the Pacific National Historic Park are popular tourist destinations. The village of Piti is located on the western shore of Guam and is also known as the Port City. Situated within the village is the commercial port of Guam at Apra Harbor, several of the island's largest power plants, and many historical sites.

There are eight community centers located within the villages of Mongmong-Toto-Maite, Chalan Pago-Ordot, Tamuning, Mangilao, Agana Heights, Sinajana, Barrigada, and Asan that constitute the Central Region. Thirteen Mayor's offices and several Guam Government Department offices are located in the central region. The Department of Health and Social Services, Guam Superior Court and Public Defenders office, and the Governors Complex are all located in this region of the study area. Two

hospitals are located within the central region: Guam Memorial Hospital, located in Tamuning, and a Naval Hospital Station, located in Agana Heights. Four post offices are located in the central region.

Within the central region, five police precincts and six fire stations serve regional villages, including Mangilao, Tamuning, Barrigada, Hagatna, Mongmong Toto-Maite, Chalan Pago-Ordot, Asan, Sinajana, and Piti. The Guam Police Headquarters is located in Mongmong Toto-Maite.

Twenty-eight schools are located in the central region, including 11 elementary schools, four middle schools, five high schools, and four private schools. The central region also has two post-secondary educational facilities located in the Mangilao Village: UoG and GCC. DoD Education Activity Guam High School is located in the Asan Village area. The village of Tamuning has three elementary schools, one high school, and three private schools. Three libraries are located in the central region.

Forty-five houses of worship of various denominations are located in the central region. These facilities serve as community focal points.

#### 16.1.8.4 Apra Harbor

Apra Harbor is the largest harbor in the Pacific between the Philippines and Hawaii. The Port Authority of Guam (PAG) services more than 1,000 vessels in Apra Harbor. The International Maritime Commission recognizes Guam as having one of the most efficient port operations in the world.

One fire and rescue station is located in the Apra Harbor Region. There are no other community facilities within the Apra Harbor Region.

The Apra Harbor Region is a popular destination for divers and snorkelers.

#### 16.1.8.5 South

In the south region of Guam, the village of Santa Rita is part of the Haya (Southern) District. A large portion of the village of Santa Rita is operated by the U.S. Military.

The Santa Rita Mayor's office and the Santa Rita Community Center are located in the study area within the south region.

Eight schools, including two elementary school, two middle school, one high school, and three private schools are located in the study area within the south region.

Two houses of worship are located within the study area in the south region. These facilities serve as community focal points.

## 16.2 ENVIRONMENTAL CONSEQUENCES

### 16.2.1 Approach to Analysis

This Environmental Consequences section presents impact analysis under the proposed action and the no-action alternative. As the socioeconomic impacts would be islandwide in nature with little difference in effects among the various alternatives (with the exception of land acquisition impacts), the summary of impacts presented below covers all of the alternatives. Exceptions to this coverage are land acquisition impacts, which are treated in a separate part of this Environmental Consequences section, and the no-action alternative, which is treated separately following the land acquisition discussion.

For the island of Guam, this analysis addresses potential population impacts, economic impacts, public service impacts, and sociocultural impacts from both construction and operational phases of the proposed action. Land acquisition impacts address the operational phase of the proposed action only, when land

acquisition would possibly occur. An analysis of the impacts associated with the off-base roadways is discussed in Volume 6 and a summary of impacts from all of the proposed actions is addressed in Volume 7.

Direct, indirect, and combined or “total” impacts of the proposed action are addressed in this section. Direct impacts are impacts that come from *direct expenditures*, or the first round of spending. These include expenditures related to the construction phase first, and then ongoing military expenditures during the operational phase. Indirect impacts are impacts that are stimulated by *indirect expenditures*, or subsequent rounds of spending. These expenditures circulate through the economy, generating “spin-off” sales and businesses. The term “indirect impacts” is used to cover both *indirect effects* and *induced effects*.

The environmental consequences analytical results reported in this chapter are calculated for a maximum potential scenario that assumes there would be no constraints (blockages) to the rapid development of spin-off private-sector economic activity driven by the military construction and permanent military operational stages.

#### 16.2.1.1 Methodology

Methodology for assessed impacts varies. Following is a brief summary. Refer to the Methodology Chapter (Chapter 2) of the Socioeconomic Impact Assessment Study (SIAS) for details of methodologies used (see Volume 9, Appendix F).

##### Methods for Population and Economic Sections

Labor force, population, and housing demand estimates all flow from specific economic assumptions about workers per million dollars of expenditures, non-working dependents per worker, and workers per housing unit.

For economic impacts, standardized economic impact models and techniques were used in conjunction with customized input data for measurement of impacts related to both construction and operational phases. To calculate direct impacts - using factors gathered in interviews with Guam sources – project-related input data were adjusted to represent the amount of money from the proposed action that would enter Guam’s economy and generate economic activity. To calculate the indirect impacts of spending, the 2005 State of Hawaii Input-Output (I-O) model was used to estimate how many jobs and other economic variables are created as initial new spending and later rounds of spending flow through the Guam economy. Since there is no specific updated economic model for Guam, Hawaii models are used to represent Guam’s similar island-based economy.

##### Methods for Public Service Sections

Impacts on GovGuam public service agencies were estimated based on information from literature reviews, searches of online and historical data sources, written surveys, key informant interviews, and agency data sources when available.

The basic method of analysis involved first determining the number of key professional staff currently working at each agency and providing the existing population with necessary services. Care was taken to determine an appropriate baseline measure by seeking historical data from the agencies, to reduce the odds that the most recent available figures came from years with unusually high or low standards of service. Then the number of each agency’s “service population” (i.e. the people using the services) was determined, and care was taken to determine whether this meant the population in general or just some

portion, such as civilians only or children only. Finally, these two numbers were used to develop an agency-specific ratio of key professional staff positions to service population.

Once the above calculations were completed, population increases associated with the proposed action could be applied to the ratios to determine the additional professional staff that would be associated exclusively with the proposed action.

#### Methods for Sociocultural Sections

Sociocultural topics are addressed in a more qualitative fashion. Analysis used available evidence from published sources, interviews, and historical evidence. Some social issues could have many outcomes and are more important to manage than to predict. There are also pre-existing social issues that, due to the nature of the proposed action, may be more often discussed or remembered by residents; issues such as these were acknowledged in the “Affected Environment” sections above.

#### Methods for Land Acquisition Sections

The analysis of land acquisition impacts addresses the potential economic and sociocultural effects of an islandwide increase in federally-controlled land on Guam. The EIS process includes the potential acquisition of the following parcels of land:

- Former FAA Parcel
- Harmon Annex Parcel
- Route 15 Parcel Alternatives A and B

Impacts are examined with reference to three classes of affected Guam stakeholders: individuals, community and GovGuam.

Socioeconomic impacts of land acquisition can be discussed under construction and/or operations. In this chapter they are discussed as operational impacts.

Impact analysis assumed that the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), the federal law guiding all federally-funded land acquisition projects, are applicable (see Affected Environment section for a description of the Uniform Act).

Existing land and real estate data on the parcels of land were obtained from the separate Land Acquisition Baseline Report (available in Volume 9 Appendix F). All cultural and historical site information and recreational site location or use information was taken from the Cultural Resources and Recreational Resources Chapters (Chapters 12 and 9, respectively) in this Volume. Secondary sources (news articles, EIS scoping and public meetings, professional literature) were used to identify a limited number of potential impacts for each of the stakeholder classes.

Refer to the Land Acquisition Approach to Analysis section of Chapter 5 of the SIAS for details of methodologies used (located in Volume 9, Appendix F).

#### 16.2.1.2 Determination of Significance

Impact significance determinations vary among different types of socioeconomic impacts, because what might be “beneficial” (or good) to one entity could be “mixed” to another and “adverse” (or bad) to yet another, and related socioeconomic topics often are like two sides of the same coin, one “beneficial” (such as increased job opportunities) and the other mixed or “adverse” (such as social stress from immigrant workers attracted by new jobs).

Mitigation measures are noted at the end of this chapter, providing avenues to address major adverse impacts identified in the analysis, as well as Guam's unique position as an isolated island economy.

The U.S. Council on Environmental Quality (CEQ) regulations for implementation of NEPA provides 10 broad guidelines about determining whether the intensity of an impact is "significant." None are specific to socioeconomic topics, but three of the guidelines refer to the "public" or the "human environment" rather than physical resources or places:

- "The degree to which the proposed action affects public health or safety." (Code of Federal Regulations [CFR] Title 40 Sec. 1508.27(b)(2))
- "The degree to which the effects on the quality of the human environment are likely to be highly controversial." (40 CFR 1508.27(b)(4))
- "The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." (40 CFR 1508.27(b)(5))

While these are insufficient by themselves to generate criteria for significance of socioeconomic impacts, they help in the following formulations.

#### Significance Criteria for Population/Economic Sections

Although there is no national legislation that establishes criteria for assessing socioeconomic impacts, there is DoD-specific legislation (PL 110-17 10 U.S.C. 2391: Military base reuse studies and community planning assistance) and implementing DoD Directives (DoD 3030.01 and 5410.12) that address the issue of what is a significant impact on communities due to changes in DoD programs, such as a military base realignment or expansion. Collectively, these documents establish "thresholds" that allow the DoD's Office of Economic Adjustment to provide communities with technical and financial assistance for organizing and planning for DoD program impacts. To qualify for financial assistance, the magnitude of DoD personnel increases must meet the following statutory thresholds:

- More than 2,000 direct military civilian and contractor DoD personnel (i.e., net additional), or
- More military, civilian and contractor personnel than equal to 10% of the number of persons employed in the counties or independent municipalities within 15 miles (24 kilometers) of the installation, whichever is less, and
- Federal, state or local community impact planning assistance is not otherwise available.

Additionally, the Office of Economic Adjustment must make a finding that the affected community will experience a "direct and significantly adverse consequence" based on the DoD impacts in light of community-specific needs and resources (Economic Adjustment Technical Bulletin 5: Managing Community Growth).

The above thresholds are population/economic and capacity-driven and they have been applied by the Office of Economic Adjustment to make financial grants to GovGuam.

The Population/Economic analysis in this EIS focuses primarily on the impact the proposed action alternatives would have on the economy of Guam and the prosperity of its people.

Given that the Office of Economic Adjustment threshold criteria have already been met, for purposes of this analysis any population or economic impact was considered "significant" if it would add 2% or more at any point in time to expected population or economic levels without the proposed action. The literature on growth rates that communities can absorb without experiencing serious consequences to their physical and social infrastructure and fiscal health does not provide an absolute threshold. Rather the literature points to the relative abilities of communities to absorb growth based on their existing capacities and

contextual settings. The value of 2% was selected for purposes of this EIS because of the small size and remoteness of Guam's economy and its relatively limited financial resources. Another value often used for statistical comparisons is 5%, but this threshold of significance was deemed too stringent for Guam given existing constraints on Guam's infrastructure capacity and financial capabilities. Even the construction phase of the proposed action would potentially result in an impact that exceeds the 5% threshold, so the 2% value was used to more accurately determine impact significance given Guam's relative ability to absorb growth generated by both the construction and operations phases of the proposed action.

Quantifiable impacts related to jobs and dollars – the usual measures of prosperity – were considered “beneficial” impacts if they increased the expected level of jobs or dollars by 2% or more. While the potential for economic downturns after the construction boom peak will be noted, they are not considered sufficient to change the overall impact assessment from “beneficial” to “adverse.”

Impacts that are either qualitative (such as effects on tourism) or where precise numbers cannot be predicted (such as cost of living) were given significance ratings on a judgmental basis considering the overall information available from surveys or interviews conducted as part of this study. In some cases the results of these efforts were too mixed in nature to be clearly called either a beneficial or an adverse impact.

Population increases in particular were considered as inherently mixed (both beneficial and adverse), because population growth fuels economic expansion, but sudden growth also strains government services and the social fabric.

#### Significance Criteria for Public Service Sections

The Public Service sections focus primarily on the impact the proposed action alternatives would have on GovGuam public service agencies, especially key professional staff. The proposed action is expected to increase population in the area, resulting in more demands for services. Significance of additional demand was assessed through qualitative and quantitative calculation of whether this increase would necessitate substantial increases in 1) staffing (including consideration of whether staffing needs could easily be met), 2) new or physically altered facilities, and/or 3) equipment/vehicles. The 2% criterion used as a threshold of significance for population impacts was applied in relation to the reported actual staffing levels in the “baseline year” (generally 2005) for agencies that supplied information. Given the financial challenges facing GovGuam (discussed in Volume 9, Appendix F), demands for additional staffing were considered adverse in nature.

#### Significance Criteria for Sociocultural Sections

Sociocultural impacts are largely qualitative in nature, and the analysis focused less on predicting quantifiable impacts than on identifying potential problems and opportunities. However, sociocultural impacts remain an important element of the proposed action and have attracted much public attention and comment. Many sociocultural impacts tend to be mixed in nature. To the extent their “significance” can be assessed, it was based on the relative magnitude of the proposed action under consideration. They were regarded as “adverse” if they threatened public safety or order, and “beneficial” if they preserved or enhanced the social fabric.

## Significance Criteria for Land Acquisition Sections

### *Economic Significance*

There would be no economic impact to individual landowners when the federal government acquires land under the Uniform Act. The Uniform Act provides for just compensation under either negotiated purchase (as there is an agreed upon price) or eminent domain (as the payment for land is determined by a federal court). Furthermore, the Uniform Act prescribes full compensation for improvements to land and relocation costs for occupants of land. The 5th amendment of the U.S. Constitution guarantees the provision of "just compensation" to landowners and occupants of land when the government takes land from private hands for public use.

Economic impacts to the community would occur if land acquisition were to affect the viability of Guam to achieve a self-sustaining economy (discussed in terms of equity value of private land and capacity for agricultural production), and the ability of the community to choose recreational areas to frequent. Economic impacts to GovGuam would occur if land acquisition were to affect the government's ability to collect taxes and garner revenue from real property on the island.

The significance of these impacts is determined through a consideration of the magnitude of the economic value of these impacts relative to these same economic factors Guam-wide. More detailed information regarding the approach to land acquisition impact assessment and significance determinations can be found in Volume 9, Appendix F (SIAS).

### *Sociocultural Significance*

There are a variety of possible sociocultural impacts that may occur due to land acquisition.

Much public response following the release of the DEIS indicated that was bot supportive of an increase in federally-owned or controlled land on Guam, and considered the increase an adverse impact. Per public comments, impacts would be intensified if the lands to be acquired were lands that have been or are in the process of being released by the federal government, such as the Former FAA parcel and the Harmon Annex parcel.

Furthermore, comments received during the scoping and public comment period did not support access restrictions to recreational and cultural resources on island. Increases in public access restrictions to recreational and cultural sites would be a potential adverse impact.

There may be some landowners (private or government) who are interested in selling or leasing land to the federal government and would perceive federal acquisition or lease of their property as a beneficial impact. Other owners who do not want to sell their property (or relocate) are likely to consider the sale or relocation as an adverse impact even though they are compensated.

Regardless of type of land acquisition adopted (lease, purchase, other), acquisition would require any tenants or current occupants on the land to relocate. There may be some tenants or licensees who are interested in relocating or do not mind relocating, and would perceive the federal acquisition or lease of the property they currently occupy as non-adverse. Others who do not want to relocate are likely to consider forced relocation as an adverse impact even though they are compensated.

Because specific parcels of land may represent patterns of social organization and interpersonal ties to a landowner, user or occupant, land acquisition may cause scattering of social networks, kinship groups and other social resources available to the individual (i.e., a phenomenon known as "social disarticulation" may occur). Cultural marginalization may be experienced within the Guam community due to land



acquisition, and would center around cultural site access and the maintenance of the integrity or intrinsic characteristics of a cultural property. If public access to cultural sites is restricted, and project actions disturb the characteristics of a cultural property, then it can be considered that the action has an adverse impact on the community's cultural cohesion.

Finally, the taking of land by the federal government from an unwilling seller would be considered an adverse sociocultural impact on the entities that are losing ownership or control of their property. "Taking property" in this discussion refers to a situation where the property owner is legally required to sell property to the federal government.

The significance of these impacts is determined through a consideration of the magnitude of these potential impacts to individuals as well as the Guam-wide community.

#### 16.2.1.3 Issues Identified During Public Scoping Process

The citizens and governments of Guam and CNMI commented on a variety of socioeconomic issues during public scoping meetings held on Guam, Saipan, and Tinian on April 17-20, 2007. The importance of these issues was reinforced as additional public comments were received via mail and email. Additionally, these issues have been stressed in studies and publications released by GovGuam and covered in the public media on Guam. This Environmental Consequences section addresses these issues.

Citizens expressed concerns about the following:

- *Social Infrastructure*: e.g., education, healthcare, childcare, and mental health services etc.
- *Community Infrastructure*: e.g., power, water, wastewater, solid waste etc.
- *Labor Impacts*: availability of labor and material for non-defense projects etc.
- *Housing*: e.g., housing supply and demand, affordability, etc.
- *Public Safety*: e.g., police, courts, fire protection, etc.
- *Tourism/recreation*: e.g., effects on tourism and recreational assets and access, etc.
- *Private Property*: concern for use and access to private property, etc.
- *Cultural Impacts*: effects on Chamorro culture of off-island construction workers, etc.
- *Access*: effects on continued access to recreational and cultural sites and activities
- *Land*: effects on ensuring Chamorro people's right to their land

Issues raised during scoping meetings with GovGuam included:

- GovGuam capacity and impacts on agencies
- Federal agencies capacity
- Increasing immigration
- Lack of existing socioeconomic data
- Availability of local trained labor
- Sources of off-island labor
- Housing impacts, especially during the construction stage for off-island workers.

### 16.2.2 Proposed Action

#### 16.2.2.1 Population Impacts

Population impacts include analysis of:

- Project Related Population
- Demographic Characteristics

- Household Characteristics

### Summary of Population Impacts

The population impacts analysis indicates direct and indirect significant impacts – of mixed beneficial/adverse nature. Total Marine Corps-related population impacts are expected to peak for a short period of time in 2014, and then decline to a stable, steady-state level by 2019. Table 16.2-1 shows the peak population impact and the steady-state level.

**Table 16.2-1. Summary of Marine Corps-Related Population Increase – Peak and Steady-State Levels**

	<i>Peak</i>	<i>Steady-State</i>
Total Population	65,527	31,071

### Project-Related Population

#### *Approach to Analysis*

The project-related population impact assessment predicts all new populations on Guam related to the proposed action.

*Direct new populations* include construction workers from off-island and their dependents, active duty military, military dependents, new residents filling on-base civilian jobs and their dependents, and new residents filling jobs created by the first round of spending and their dependents.

*Indirect new populations* include new Guam residents who may move to Guam to fill jobs created by subsequent rounds of spending and their dependents. If there are a large number of “stay-behind” workers (in-migrants that migrate for construction-phase jobs and stay on Guam), the decline in population from the beginning of 2014 to the end of 2016 will not be as dramatic as shown in the population impact calculations below. If the stay-behind worker phenomenon leads to increased in-migration over time, then the population in the years 2017 forward would increase at a faster rate than indicated. Since it is expected that a large percentage of immigrant workers would originate from the Philippines, population growth related to stay-behind workers would likely, disproportionately, originate from there.

Table 16.2-2 provides assumptions made in conducting analysis for the construction phase, as well as the source of or rationale for those assumptions.

**Table 16.2-2. Construction Component Assumptions for Marine Corps-Related Population Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Average number of dependents for in-migrating direct, on-site, construction jobs	0.20 - 0.35	Contractor interviews
Average number of dependents for in-migrating direct from purchases jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews
Average number of dependents for in-migrating indirect/induced jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews

Table 16.2-3 provides assumptions made in conducting analysis for the operations phase, as well as the source of or rationale for those assumptions.

**Table 16.2-3. Operational Component Assumptions for Marine Corps-Related Population Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Marines by 2014	8,552	Description of Proposed Action and Alternatives (EIS)
Number of Marine dependents by 2014	9,000	Description of Proposed Action and Alternatives (EIS)
Number of rotational transient Marines by 2014	2,000	Description of Proposed Action and Alternatives (EIS)
Average number of dependents for in-migrating civilian military personnel	0.95	U.S Census data on persons per jobs (U.S. Census Bureau 2000d)
Average number of dependents for in-migrating direct from purchases jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews
Average number of dependents for in-migrating indirect/induced jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews

*Impacts*

The projected project-related impact on population is shown in Table 16.2-4. As the table indicates, a 2014 peak-year total impact would result in a population increase of 65,527, falling to a steady 31,071 as increases in base operational expenditures cease by 2019.

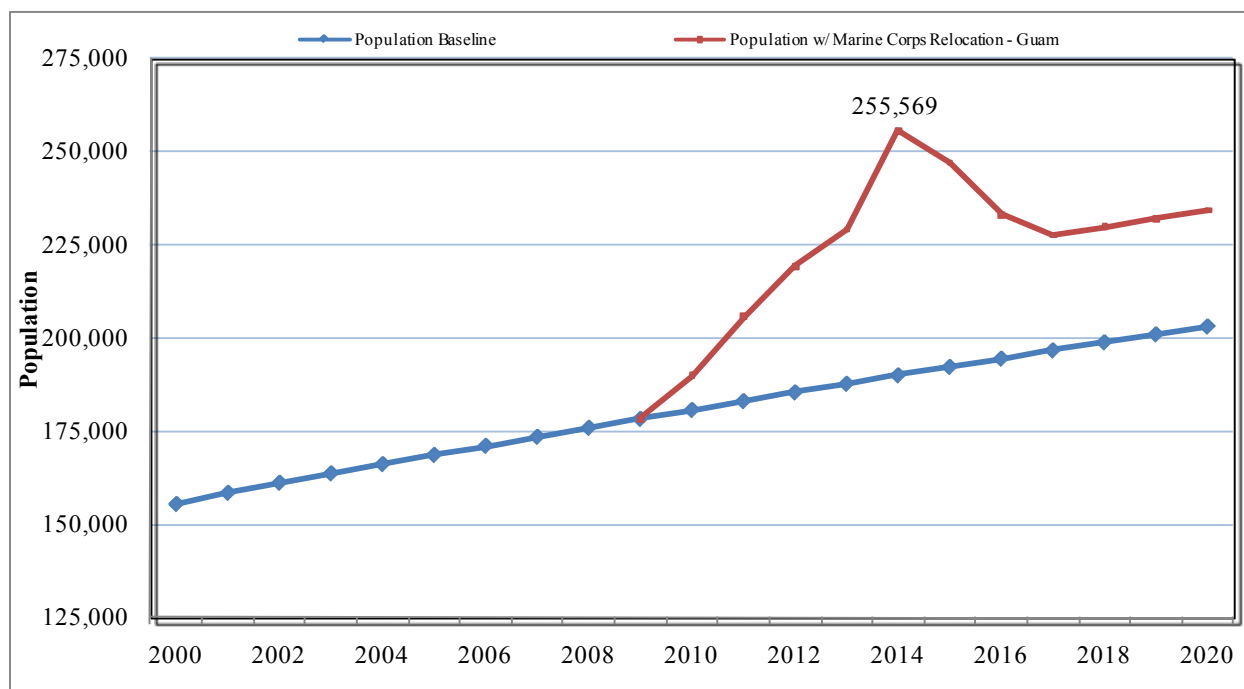
**Table 16.2-4. Estimated Population Increase Associated with Proposed Marine Corps Action**

	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>2020</i>
Total Population <sup>1</sup>	9,239	22,667	33,916	41,464	65,527	54,799	38,612	30,894	30,894	31,071	31,071

<sup>1</sup> Marine Corps population numbers include: uniformed Marines, associated civilian workers and their dependents from off-island.

Figure 16.2-1 compares total population on Guam with and without the proposed action. At the 2014 peak, population with the proposed action is 34% higher than it otherwise would have been, without the project. At 2020, the difference declines to 15%. This far exceeds the 2% growth threshold of significance.

Figure 16.2-1 also indicates significant project-related impact. Population increases are considered to be inherently mixed (both beneficial and adverse), because population growth fuels economic expansion but sudden growth also strains government services and the social fabric.



**Figure 16.2-1. Population with and without Proposed Action**

Demographic Characteristics

*Approach to Analysis*

New population on Guam related to the proposed action would have a different demographic composition than what currently exists on Guam, and will thus affect the island’s demographic composition.

Demographic impact data discussed here are broken out into two components. One is for those individuals coming to Guam as part of the proposed action (i.e. marine relocation). The other is for people who are likely to come to Guam seeking employment. The analysis is based on the historic characteristics of in-migrating groups and the military population. Results from this analysis are compared to the demographic characteristics of Guam presented in the Affected Environment section.

Table 16.2-5 provides assumptions made about the demographic characteristics of population related to the employment component as well as the source of or rationale for those assumptions.

**Table 16.2-5 Employment Component Assumptions for Demographic Characteristic Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Not born on Guam, moved to Guam for employment)	1,525	U.S. Census. Guam 10% PUMS data, 2000
Average Year of Entry	1987	U.S. Census. Guam 10% PUMS data, 2000
Median Age when moved to Guam	32	U.S. Census. Guam 10% PUMS data, 2000. Reported median age adjusted for year of entry
<b>Gender</b>		
Male	74.2%	U.S. Census. Guam 10% PUMS data, 2000
Female	25.8%	U.S. Census. Guam 10% PUMS data, 2000
<b>Ethnicity</b>		
Asian Alone	56.1%	U.S. Census. Guam 10% PUMS data, 2000
Native Hawaiian/Other pacific Islander	24.8%	U.S. Census. Guam 10% PUMS data, 2000

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
White Alone	13.1%	U.S. Census. Guam 10% PUMS data, 2000
Other	6.0%	U.S. Census. Guam 10% PUMS data, 2000
<b>Predominant Places of Birth</b>		
Philippines	44.8%	U.S. Census. Guam 10% PUMS data, 2000
U.S.	18.1%	U.S. Census. Guam 10% PUMS data, 2000
Micronesia	13.4%	U.S. Census. Guam 10% PUMS data, 2000
Korea	5.6%	U.S. Census. Guam 10% PUMS data, 2000
China	5.0%	U.S. Census. Guam 10% PUMS data, 2000
Japan	3.9%	U.S. Census. Guam 10% PUMS data, 2000
Palau	2.4%	U.S. Census. Guam 10% PUMS data, 2000
CNMI	1.4%	U.S. Census. Guam 10% PUMS data, 2000
<b>Educational Attainment (25 yrs. and older)</b>		
High School Grad.	42.5%	U.S. Census. Guam 10% PUMS data, 2000
College Degree	33.4%	U.S. Census. Guam 10% PUMS data, 2000

Table 16.2-6 provides assumptions made about the demographic characteristics of population related to the military operational component as well as the source of or rationale for those assumptions.

**Table 16.2-6 Military Component Assumptions for Demographic Characteristic Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Military & military dependents)	1,995	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Median Age	24	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Gender</b>		
Male	56.7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Female	43.3%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Ethnicity</b>		
White alone	61%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Asian alone	12%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Black or African American alone	7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Some other race alone	5%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Two or more major race groups	12%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Predominant Places of Birth</b>		
U.S.	86.6%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Philippines	2.5%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Japan	1.8%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Germany	1.5%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Puerto Rico	1.1%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Korea	0.8%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Guam	0.7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Educational Attainment (25 yrs. and older)</b>		
High School Graduate	47.2%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
College Degree	50.7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates

### *Impacts - Employment Component*

Populations who move to Guam for employment purposes are composed of more males than females. Therefore, the proposed action would increase the percentage male population on Guam.

Populations who move to Guam for work have historically moved at an average age of 32. This is an older population than Guam's current population. Therefore the employment component of the proposed action would increase the average age of the Guam population slightly.

Populations who have moved to Guam for employment purposes in the past have relocated largely from Asian or other Pacific island areas, with places of birth located mainly in the Philippines, the U.S., or Micronesia. This component of the proposed action would thus result in the population of Guam being made up of a relatively smaller population of Chamorros and Guam-born individuals, and a relatively higher population of Filipinos, Caucasians from the U.S. mainland, and Micronesians.

The educational attainment levels of people who move to Guam for jobs are variable, with some groups displaying low levels of high school graduation but others high levels of college graduation. This likely represents the historical type of employment available on Guam (typically trades-related or requiring a specialty skill). Overall, the analysis shows that the in-migrant population would have a similar educational attainment as those currently living on Guam (most would have at least a high school diploma).

### *Impacts - Military Component*

The military component incoming population would have a higher ratio of males to females than currently reside on Guam. Therefore, the proposed action would increase the percentage male population on Guam.

The military component incoming population would generally be younger than Guam's population. Therefore this component of the proposed action would decrease the average age of the Guam population slightly.

The military component incoming population would be composed of more Caucasian backgrounds than Guam's current population. This component of the proposed action would thus result in the population of Guam being made up of a relatively smaller population of Chamorros and Guam-born individuals, and a relatively higher population of Caucasians from the U.S. Mainland.

There is a higher overall level of educational attainment among the expected military population than is currently present on Guam. Therefore the proposed action would increase the number of people on Guam who possess a college degree.

## Household Characteristics

### Approach to Analysis

If a new population on Guam related to the proposed action had a different household composition than what currently exists on Guam, it would affect the island's household composition.

Impacts are presented in *employment component* and *military operational component* phases. Results from this analysis are compared to the household characteristics of Guam presented in the Affected Environment section.

Table 16.2-7 provides assumptions made about the household characteristics of population related to the employment component as well as the source of or rationale for those assumptions.

**Table 16.2-7. Employment Component Assumptions for Household Characteristics Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Not born on Guam, moved to Guam for employment)	1,525	U.S. Census. Guam 10% PUMS data, 2000
Average Household Size	3.58	U.S. Census. Guam 10% PUMS data, 2000
Median Household Income	\$39,580	U.S. Census. Guam 10% PUMS data, 2000
Income per Household Member	\$11,055	U.S. Census. Guam 10% PUMS data, 2000
Family Households	80%	U.S. Census. Guam 10% PUMS data, 2000
Households with Children	42.4%	U.S. Census. Guam 10% PUMS data, 2000
% of Households Below the Poverty Line Below	23.3%	U.S. Census. Guam 10% PUMS data, 2000

Table 16.2-8 provides assumptions made about the household characteristics of population related to the construction component as well as the source of or rationale for those assumptions.

**Table 16.2-8. Military Component Assumptions for Household Characteristic Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Military & military dependents)	1,995	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Average Household Size	3.4	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Family Households	87.1%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Households with Children	31.9%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
% of Households Below the Poverty Line Below	1.1%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates

### Impacts - Employment Component

The household characteristics of populations who come to Guam for employment purposes are very similar to Guam overall. Households that include persons who moved to Guam for employment purposes have:

- Slightly fewer people per household (i.e., smaller household size)
- Slightly more children per household
- The same rate of poverty
- Slightly higher income per household

Impacts to Guam's overall household composition would be negligible.

*Impacts - Military Component*

The expected military population would have:

- About one-half fewer persons per household
- Fewer children

Military household income in Hawaii was slightly lower than Hawaii households overall. However, this may or may not be the case for the military population on Guam. In 2000, military household income was lower than Guam overall; however, income per household member was higher than Guam overall. The expected impact is that military households would have similar household income but higher income per household member. Only 1.1% of military households lived below the poverty line. Thus, Guam's overall poverty rate would be lowered if the proposed action were implemented.

## 16.2.2.2 Economic Impacts

Economic impact analysis primarily includes topics for which numerical estimates can be made, including:

- Civilian employment and income
- Housing for civilian population
- Government revenues and sources
- GIP

Some economic topics are less conducive to quantification, but qualitative information about their impacts is presented in the section for:

- Potential effects on standard of living
- Unemployment
- Local business opportunities and constraints
- Effects on tourism

Summary of Economic Impacts

Economic impact analysis indicates direct and indirect significant impacts – of a beneficial nature. In general, economic impacts are expected to peak, for a short period of time in 2014, and then decline to a stable, steady-state level, by 2019. Table 16.2-9 shows peak economic impacts and steady-state levels for topics in which numerical estimates are made.

**Table 16.2-9. Summary of Economic Impacts – Peak and Steady-State**

	<i>Peak</i>	<i>Steady-State</i>
Total Employment (FTE Jobs)	32,980	6,146
Total Income (Millions of \$'s)	\$1,134	\$246
Total Housing Demand (Housing Units)	9,431	2,959
GovGuam Tax Revenue (Millions of \$'s)	\$328	\$97
Total Impact on GIP (Millions of \$'s)	\$822	\$157

Employment and Income

Employment and income impacts include the following topics:

- Civilian Labor Force Demand
- Civilian Labor Force Supply



- Civilian Labor Force Income
- Standard of Living
- Unemployment

#### *Civilian Labor Force Demand - Approach to Analysis*

Labor force “demand” refers to the jobs created by the proposed action and the workers needed to fill them. The analysis focused on civilian jobs only, including federal civilian workers and other jobs from spin-off economic growth. Calculations are in terms of FTEs. For example, two half-time jobs would be counted as one FTE. The number of FTE jobs is assumed to be equal to the number of required workers.

Table 16.2-10 provides assumptions made in conducting the civilian labor force demand analysis for the construction phase as well as the source of or rationale for those assumptions.

**Table 16.2-10. Construction Component Assumptions for Civilian Labor Force Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Worker Requirement Factor	75 Workers Per \$10 Mil Project Cost	Guam Contractors Association interviews
Supervisory Worker Requirement Factor	4 Supervisory Workers Per \$100 Mil Project Cost (not additional to other workers)	Guam Contractors Association interviews
Labor Cost as % of Total Project Cost	21%	Calculated as verification of worker requirement factor. Consistent with contractor projections.
Current H-2B Construction Labor on Guam	1,443	GDoL Employers Workplace Monthly Report Summary July, 2008
Guam Construction Workforce	2,531	Average of two estimates. The first estimate is based on GDoL June 2008 Current Employment Report construction industry production workers (with present H-2B construction workers excluded). The second estimate is based on estimates made by contractors during interviews.
Percentage of On-Site Workforce from H-2B	56%-61%	Contractor interviews

Table 16.2-11 provides assumptions made in conducting the civilian labor force demand analysis for the operations phase, as well as the source of or rationale for those assumptions. Table 16.2-12 shows key intermediate calculations feeding into subsequent estimates of the impact on total labor force demand from operations.

**Table 16.2-11. Operational Component Assumptions for Labor Force Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Civilian Military Workers per Active-Duty Marine	0.4	Description of Proposed Action and Alternatives (EIS)

**Table 16.2-12. Intermediate Operations-Related Calculations for Civilian Labor Force Demand**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Civilian Military Employees	204	468	468	468	3,421	3,421	3,421	3,421	3,421	3,421	3,421

#### *Civilian Labor Force Demand – Impacts*

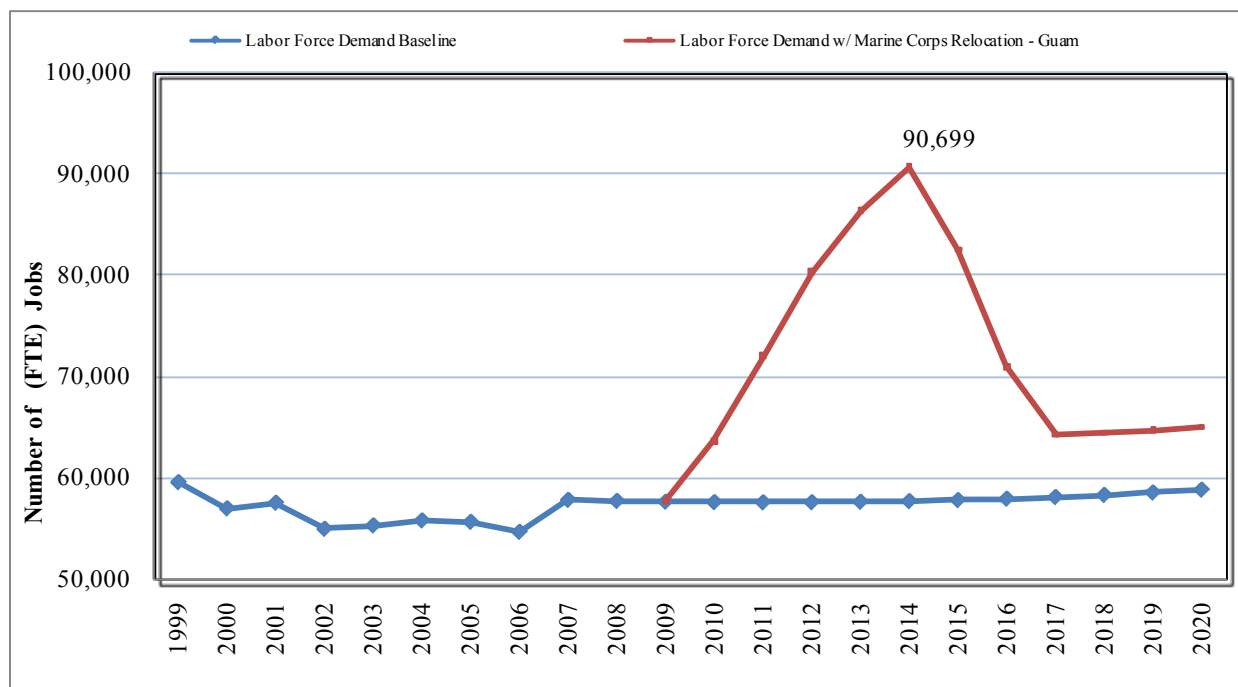
Collectively, employment impacts are beneficial (especially during the construction phase). However, total employment after the construction peak would decline substantially but would be above pre-project levels.

Table 16.2-13 shows the proposed action would support a combined 32,980 workers at the 2014 peak, but 6,146 after construction abates in 2017.

**Table 16.2-13. Impact on Civilian Labor Force Demand (FTE Jobs)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Combined Total Employment	6,041	14,440	22,701	28,741	32,980	24,712	13,040	6,146	6,146	6,146	6,146

Figure 16.2-2 compares total labor force demand on Guam with and without the proposed action. At the 2014 peak, civilian labor force demand with the proposed action is 75% higher than it otherwise would have been, without the project. At 2020, the difference declines to 12%. Both peak and steady-state impacts to civilian labor force demand exceed threshold levels of significance.



**Figure 16.2-2. Labor Force Demand with and without Proposed Action**

*Civilian Labor Force Supply - Approach to Analysis*

Evidence for potential labor supply sources is provided for:

- Direct on-site military construction
- Other employment (direct construction jobs from purchases or civilian operational jobs, as well as indirect workers)

Analysis was conducted to address the following two questions:

- How many of the civilian jobs (on a net basis) are likely to accrue to currently unemployed Guam residents?
- From what countries or regions are the remaining workers likely to in-migrate?

Possible sources for direct on-site military construction workers include:

- Current Guam residents
- Temporary foreign workers

- CNMI and other U.S. Pacific islands
- Other workers from the continental U.S. (CONUS) or Hawaii

Table 16.2-14 presents assumptions about labor sources for direct on-site military construction labor, and the source or rationale for these assumptions. Refer to Volume 9, Appendix F SIAS for additional descriptions of and historical information regarding each of these sources.

**Table 16.2-14. Assumptions for Origins of Direct On-Site Labor Force Construction Supply**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
<b>Quantitative Assumptions</b>		
Construction employment	75 workers per \$10 million total construction cost	Guam Contractors Association interviews
Guam residents holding construction jobs	Up to 2,670 jobs at peak	GCA and Guam DOL employment by industry data
CONUS/Hawaii/Japan % of workforce	4 supervisory workers from U.S. or Japan per \$10 million project cost.	Guam Contractors Association interviews
Supervisor/Labor split of CONUS/Hawaii/Japan	4% / 96%	Guam Contractors Association interviews
Philippines/Other split of H-2B workforce	85% / 15%	Guam Contractors Association interviews
Other U.S. Pacific Island % of workforce	residuals of work force	Guam Contractors Association interviews
<b>Qualitative Assumptions</b>		
Fees for H-2B workers	They do not become an impediment to recruiting affordable labor	Entire project could founder if the economics are impractical
Competition for CONUS workers from federal stimulus spending	This would alone not be sufficient or widespread enough to deter at least some CONUS workers from Guam	This is a matter of great uncertainty, but there is a strong commitment by government to seek out U.S. workers

*Notes:* No assumption is made about the likely split of “Other Pacific Island” workforce among the CNMI, Federated States of Micronesia, Republic of the Marshall Islands, Palau, and American Samoa. This reflects conflicting evidence in the foregoing table and the general difficulty of predictions for specific small areas.

Possible sources for construction-related jobs other than direct on-site jobs (i.e., direct from purchases and indirect); direct federal civilian jobs associated with the military; and spin-off jobs include:

- Guam residents
- Temporary foreign workers (H-2B visa workers)
- Other U.S. Pacific island workers
- Other workers from CONUS, Hawaii, or Okinawa transfers

Given the uncertainties involved for various potential off-island labor sources, this analysis is restricted to assumptions and estimates strictly about “on-island” and “off-island” labor force sources Table 16.2-15. Refer to the Appendix F SIAS for additional descriptions of and historical information regarding these sources.

**Table 16.2-15. Assumptions for Origins (On vs. Off-Island) of Labor Force Supply for Employment Other Than Direct On-Site Construction**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Sources of direct federal civilian employment.	50% Okinawa transfers, 25% military spouses, 25% other off-island.	Planning assumption provided by NAVFAC Pacific
Absorption of Guam’s pool of unemployed workers.	By 2014, Guam’s unemployment rate would decline to 4.0%, then gradually rise somewhat thereafter.	For analysis/modeling purposes, currently unemployed Guam residents were assigned to Indirect employment

*Civilian Labor Force Supply - Impacts*

Table 16.2-16 shows the probable origins of the labor force supply for direct onsite military construction jobs. Interviews with construction firms on both Guam and Hawaii indicate that the majority of H-2B construction workers would likely come from the Philippines.

**Table 16.2-16. Estimated Origin of Workers Constructing Military Facilities**

	2010	2011	2012	2013	2014	2015	2016
<b>TOTAL</b>	<b>3,186</b>	<b>7,672</b>	<b>12,358</b>	<b>15,816</b>	<b>15,257</b>	<b>10,572</b>	<b>3,928</b>
<b>GUAM</b>	<b>562</b>	<b>1,226</b>	<b>1,768</b>	<b>1,999</b>	<b>1,929</b>	<b>1,336</b>	<b>497</b>
<b>OFF-ISLAND</b>	<b>2,622</b>	<b>6,443</b>	<b>10,584</b>	<b>13,810</b>	<b>13,322</b>	<b>9,231</b>	<b>3,430</b>
H-2B Workers	1,775	4,401	7,295	9,600	9,261	6,417	2,384
Philippines	1,508	3,741	6,201	8,160	7,872	5,455	2,027
Other	266	660	1,094	1,440	1,389	963	358
CONUS/Hawaii/ Japan	499	1,202	1,936	2,478	2,391	1,656	615
CNMI	72	173	278	356	343	238	88
Other U.S. Pacific Islands	277	667	1,075	1,376	1,327	919	342

Notes: Numbers may not add exactly due to rounding.

Table 16.2-17 indicates that Guam residents are expected to capture 2,566 jobs at the 2014 construction peak; these jobs include civilian military jobs, direct from purchases jobs and indirect/induced jobs. By 2020, 2,211 jobs related to the proposed action would go to Guam residents. Table 16.2-18 shows that at the 2014 peak, 15,157 jobs would be taken by off-island workers with that number decreasing to 3,935 by 2020.

**Table 16.2-17. Estimated Numbers of On-Island Workers for Various Job Categories Excluding Direct On-Site Construction**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Jobs, for On-Island Workers (Excluding Direct Military Construction)	479	948	1,334	1,812	2,566	2,466	2,433	2,302	2,302	2,211	2,211

Notes: Demand is in terms of FTE jobs, and assumes one worker per FTE job

**Table 16.2-18. Estimated Numbers of Off-Island Numbers of Workers for Various Job Categories Excluding Direct On-Site Construction**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Jobs, Excluding Direct Military Construction, for Off-Island Workers	2,376	5,819	9,009	11,112	15,157	11,674	6,678	3,845	3,845	3,935	3,935

Notes: Demand is in terms of FTE jobs, and assumes one worker per FTE job

*Civilian Labor Force Income - Approach to Analysis*

Civilian labor force income refers to the cumulative gross wages and salaries (before deductions for taxes) earned by the civilian workers. This information is important for later GovGuam revenue calculations.

Table 16.2-19 provides assumptions made in conducting civilian labor force income analysis for the construction phase, and the source or rationale for these assumptions.

**Table 16.2-19. Construction Component Assumptions for Civilian Labor Force Income**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Non-Supervisory Worker Annual Wage	\$27,999	GDoL Current Employment Report June, 2008 - Construction Industry Average Weekly Earnings multiplied by 52.
Supervisory Worker Annual Wage	\$85,830	U.S. Bureau of Labor Statistics Occupational Employment Statistics - Mean annual wage for "Construction Managers."

Table 16.2-20 provides assumptions made in conducting the civilian labor force income analysis for the operations phase, and the source or rationale for these assumptions.

**Table 16.2-20. Operational Component Assumptions for Civilian Labor Force Income**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Civilian Military Worker Average Total Income.	\$51,793	Median value of GS Summary Table

*Notes:* "GS" stands for "General Schedule," that is a pay scale for federal Employees and is developed by the U.S. Office of Personnel Management (OPM). The OPM produces a table with Grade level on the vertical axis and Time-in-Grade on the horizontal axis. The median value pinpoints the mid-point of the Grade axis and the mid-point of the Time-in-Grade.

#### *Civilian Labor Force Income - Impacts*

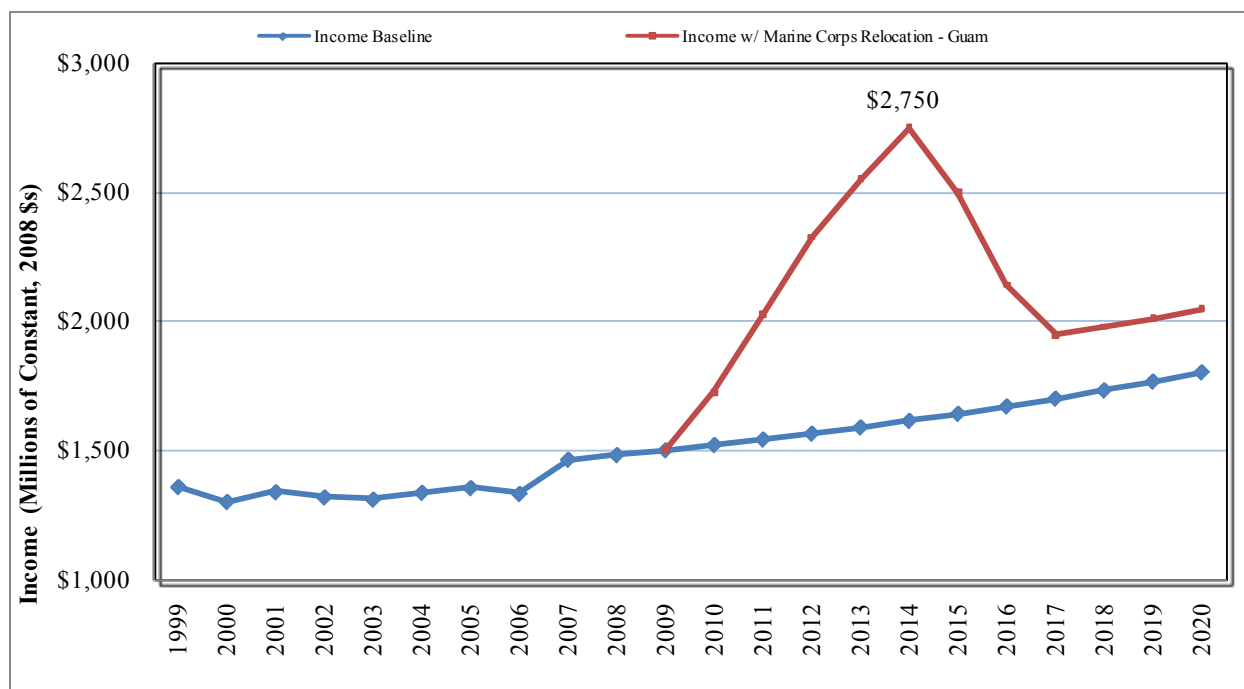
The civilian labor force income amounts presented below apply to the entire labor force rather than to the incomes of individual workers. Collectively, income impacts are beneficial (especially during the construction phase). However total income after the construction peak would decline substantially but would be above pre-project levels.

Table 16.2-21 shows that the peak figure is \$1.1 billion in 2014, falling back to \$246 million as construction ends after 2016.

**Table 16.2-21. Impact on Civilian Labor Force Income (Millions of 2008 \$)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Income	\$203	\$484	\$761	\$959	\$1,134	\$857	\$472	\$246	\$246	\$246	\$246

Figure 16.2-3 compares total income on Guam with and without the proposed action. At the 2014 peak, civilian labor force income with the proposed action is, a significant, 70% higher than it otherwise would have been, without the project. At 2020, the difference declines to 14% still exceeding the significance criterion.



**Figure 16.2-3. Labor Force Income with and without Proposed Action**

#### *Standard of Living - Approach to Analysis*

Standard of living is a measure of purchasing power. If the standard of living increases for a person it means they can purchase more goods and services. If the standard of living declines for that person, he or she can purchase fewer goods and services.

Changes in a person's standard of living are determined by their income and the prices of the goods and services they tend to purchase. A person's standard of living will increase if their income rises faster than the prices of goods and services they tend to purchase. A person's standard of living will decline if the prices of goods and services they purchase rise faster than the person's income.

The average FTE salary for jobs related to the construction phase (including indirect jobs) was derived using current construction worker wages and outputs from the Input-Output Model (I-O). The total income of new jobs (direct and indirect) created was divided by the total number of jobs created.

The average FTE salary for jobs related to the military operational phase (including indirect jobs) was based on estimated civilian military worker current incomes and incomes derived in the modeling process.

#### *Standard of Living - Impacts*

In both the construction and operational components, the average wage of workers would increase as a function of greater demand for labor. However, the price of goods and services purchased by individuals would rise as well.

Guam incomes are expected to rise; it is estimated that the average FTE salary for jobs related to the construction phase would rise to \$33,500 (compared to 2007 Guam average FTE salary of \$28,150). Construction component salaries are expected to be higher due to the creation of higher-paying jobs in the architecture and engineering, wholesale trade, and health services industries. With a rapid increase in economic activity and a limited pool of on-island labor, there would likely be competition for labor and

thus upward pressure on wage rates. The market wage may increase over the estimated \$33,500 due to the fact that the estimation procedure has no basis for estimating the extent of upward pressure on rates.

It is estimated that the average FTE salary for jobs related to the military operational phase would rise to \$40,000 (compare to 2007 Guam average FTE salary of \$28,150). Operational component salaries are expected to be higher, in large part, due to additional higher-paying on-base civilian military jobs. It is expected that 25% of civilian military jobs would be filled by current Guam residents.

General inflation, arising from the increase in economic activity (and money supply), would likely reduce household purchasing power. This impact would be more acute during the construction period because of the sudden spike in demand for all types of goods and services. Rates of inflation would likely fall to less than significant levels thereafter. From 2000 to 2008 Guam workers have seen their standard of living decline by 30% and the military relocation may not reverse that trend, however it would slow the rate of decline in the standard of living that has been prevalent since 2000.

It should be noted that it cannot be definitively predicted whether wages or the price of goods and services would increase at a faster pace. If wages earned by a particular household rise more quickly than the price of goods and services, then the standard of living would increase. If the price of goods and services rises more quickly than wages, the standard of living would decrease. Thus, households on fixed incomes would experience reduced purchasing power. Those with the ability to quickly renegotiate their wages would have a better chance at maintaining or increasing their standard of living. Overall, the military relocation would likely bring more high skilled, high paying jobs that provide employees more flexibility to have their wages adjusted to meet price increases.

#### *Unemployment - Approach to Analysis*

The proposed action would bring many new jobs to Guam but it would also bring a large new population from off-island. Analysis was done to determine how these two factors would affect the unemployment rate on Guam.

The large influx of new jobs would provide employment opportunities for most that seek them. Therefore, the unemployment rate during the construction component would be lower than current levels and full-employment should be reached or exceeded.

Though not as many new jobs would be available during the operational component as during the construction component there would be many more jobs than at present. Therefore, the impact would result in a generally lower rate of unemployment than there otherwise would have been.

#### *Unemployment - Impacts*

It is projected that the impact of the relocation would reduce the rate of unemployment on Guam from the most recently published rate of 8.3% (Guam Department of Labor 2007a). Guam's unemployment rate would ultimately be lowered by the construction and operational phases of the proposed action.

#### Housing

Topics in the housing analysis include:

- Civilian Housing Demand
- Housing Supply

The following factors are *not* included in the housing analysis:

- “Stay-Behind” Worker Housing
- Housing for on-base active-duty military and dependents
- Household formation for additional Guam residents
- Temporary Workforce Housing (a description however, is provided below)

Refer to the Volume 9 Appendix F SIAS for more information on these topics.

#### *Temporary Workforce Housing*

Housing for temporary workers is not included in the analysis of housing demand because it is assumed that all H-2B worker housing would be provided by construction contractors and would not generate demand in the private market. Immigration law requires that employers provide housing for each H-2B worker they bring in. This section reviews current plans for temporary workforce housing. With 9,600 H-2B workers expected at peak, a large number of new workforce housing units would be required.

There are a number of ways that this demand may be met, including:

- New worker housing.
- Retrofit existing vacant construction workers housing (from past construction booms) or vacant residential apartments.
- Construct new apartment structures.
- Convert large shipping containers into temporary housing units.

DoD would rely on construction contractors, who have significant expertise in the areas of workforce housing and logistics, to support temporary foreign worker housing requirements. While GovGuam and federal agencies would retain their authority to conduct inspections and enforce laws, DoD contract provisions would require quality control, oversight and the hiring of contractors with proven track records. Well thought-out plans related to workforce housing, including quality of life requirements, would be given award preference. Contract provisions would also include requirements to provide workforce medical, dining, transportation and safety/security. There would be health screening of all workers to reduce health risk to the Guam population. Contractors would be required to provide health care either by supplementing local Guam staff and resources or building their own clinic. Contractors anticipating Navy contract awards would likely proceed with plans on how to provide housing for their temporary workers prior to the Record of Decision.

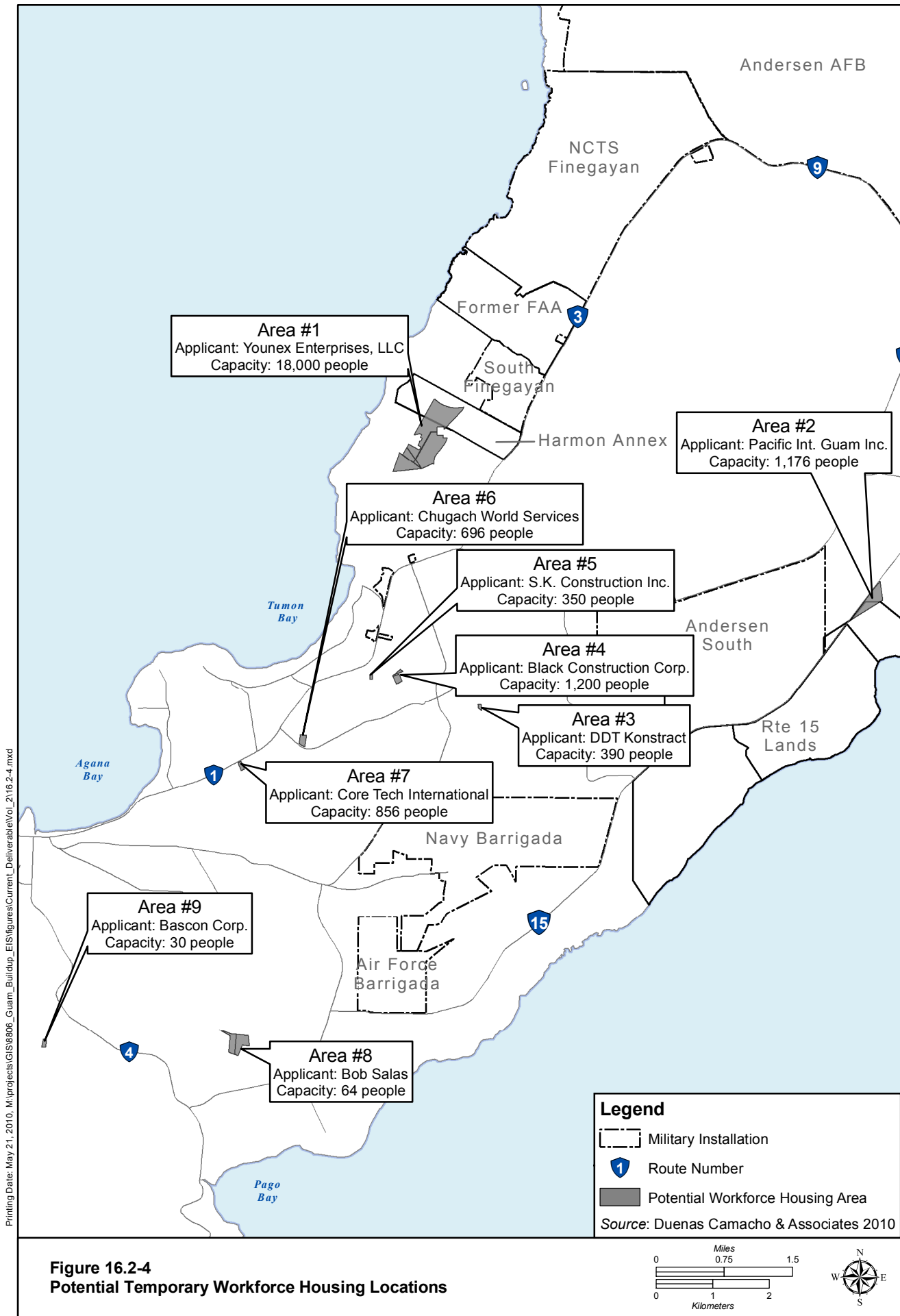
Table 16.2-22 and Figure 16.2-4 provide further information on existing and planned temporary workforce housing units. The largest planned facility would be located in North Tumon, near Two Lovers Point, and would be built on a currently undeveloped 250 ac (101 ha) parcel of land; the planned facility has the potential to house up to 18,000 temporary workers.



**Table 16.2-22. Temporary Workforce Housing Locations and Attributes  
(Map Key for Figure 16.2-4)**

	<i>Guam Land Use Commission Case #</i>	<i>Applicant</i>	<i>Legal Lot Description</i>	<i>Municipal District</i>	<i>Location</i>	<i>Current Zone</i>	<i>Status</i>	<i>Capacity (people)</i>
<b>1*</b>	2009-56	Younex Enterprises, LLC	L10184 & L5039	Dededo / Tamuning	North	"M-1" (Light Industrial)	Approved by GLUC 10/29/2009	18,000
<b>2</b>	2010-22B	Pacific Int. Guam Inc.	L7024-R5	Yigo	North	"A" Rural	Currently being processed	1,176
<b>3</b>	2009-093B	DDT Konstract	L5224-6-2	Barrigada	Central	"A" Rural	Approved by GLUC 4/8/2010	390
<b>4</b>	2009-78	Black Construction Corp.	L5161-1-1 & -1-R15	Tamuning	Central	"M" (Light Industrial)	Approved by GLUC 2/25/2010	1,200
<b>5</b>	2009-94	S.K. Construction Inc.	L5106-5-NEW	Tamuning	Central	"M" (Light Industrial)	Currently being processed	350
<b>6</b>	2010-18	Chugach World Services Inc.	L5148-REM-EAST-1	Tamuning	Central	"M" (Light Industrial)	Currently being processed	696
<b>7</b>	2010-19	Core Tech International	L2103-1A-1	Tamuning	Central	"M" (Light Industrial)	Currently being processed	856
<b>8</b>	2008-53	Bob Salas	L3462 & 3474	Mangilao	Central	"A" Rural	Currently being processed	64
<b>9</b>	2008-72	Bascon Corp.	L3278-2	Ordot	Central	"R-1" (Single-Family Dwelling)	Currently being processed	30
								<b>22,762</b>

\*Note: As of May 13, 2010 Younex reported to the GLUC that they have lowered their planned number of units to a maximum of 14,000.



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**Figure 16.2-4**  
**Potential Temporary Workforce Housing Locations**

*Civilian Housing Demand and Supply - Approach to Analysis*

The civilian housing unit demand in this section is an estimate of the number of *required* units (demand) for the in-migrating Guam civilian population. For discussion of the *supply* of housing in response to these requirements, see the following Housing Supply, Deficits and Prices section.

It should be noted that the Guam Housing and Urban Renewal Authority (GHURA) has recently released a detailed housing needs assessment study. The supply estimates presented herein are therefore provisional and may be revised and further informed based on the more detailed housing study by GHURA (GHURA 2009).

The primary focus of this analysis is demand and supply for the private-sector Guam housing market affected by in-migrating civilian populations.

Construction phase impacts on private market housing would arise primarily from the in-migration of:

- non-H-2B workers who are directly employed at the various military construction sites
- non-H-2B workers who take other direct or indirect construction-related jobs.

Table 16.2-23 shows critical assumptions for the construction phase, as well as the source or rationale of those assumptions.

**Table 16.2-23. Construction Component Assumptions for Civilian Housing Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Average Household Population for in-migrants	3.89	U.S. Census Bureau Guam 2000 average
H-2B worker housing	To be provided by employer and would involve predominantly new construction of quarters, with negligible conversion of existing housing stock to H-2B housing. Military contractual requires all construction contractors to provide housing for their H-2B employees	Employers of H-2B workers are allowed to deduct only a limited amount from H-2B workers' paychecks for housing costs (currently, \$320 per month). This very low allowance means almost all H-2B workers would be likely to be housed dormitory-style
New household formation by Guam residents	Negligible effect	Guam residents directly or indirectly employed due to the proposed action would, on average, make somewhat more money than without the project. However, the number of residents previously living with family or friends to save money, who would move to their own housing units due to the increased pay, is likely to be minimal

During the operational phase, all Marines and their dependents would be housed on base, per specifications of the proposed action. Thus no off-base housing demand would stem directly from that population.

The housing demand during the operations phase is generated by:

- Civilian military workers
- In-migrating direct and indirect workers

Table 16.2-24 provides assumptions made in conducting the housing demand analysis for the operations phase, as well as the source or rationale for those assumptions.

**Table 16.2-24. Operational Component Assumptions for Housing Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Average Household Population for in-migrants	3.89	U.S. Census Bureau Guam 2000 average
Military personnel off-base housing impact	All military personnel would be housed on base	Master Planning Assumption

Table 16.2-25 provides assumptions made in conducting housing supply analysis for both the construction and military operational phases of the proposed action, and the source or rationale for these assumptions.

**Table 16.2-25. Construction and Operational Assumptions for Civilian Housing Supply**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of currently vacant, for-rent housing units	1,915	GBSP (2008)
Current vacant, for sale housing units	467	Multiple Listing Service data provided by Bank of Guam (2009)
Housing units with building permits but that currently have not been completed	500	There are approximately 2,000 such building permits currently, but most are viewed as unlikely to have construction complete at the start of project construction. A factor of 25% was applied
Core total housing vacancy rate	4%	Reflects market delays in matching renters with landlords, and administrative and maintenance factors that would result in some units always being vacant

*Notes:* Of the 467 units vacant for sale, 273 are single-family units (Bank of Guam 2009). Many units currently for sale are “executive units” (priced above \$500,000) that would not be suitable for all but a handful of the expected new population generated by the proposed action.

#### *Civilian Housing Demand and Supply – Impacts*

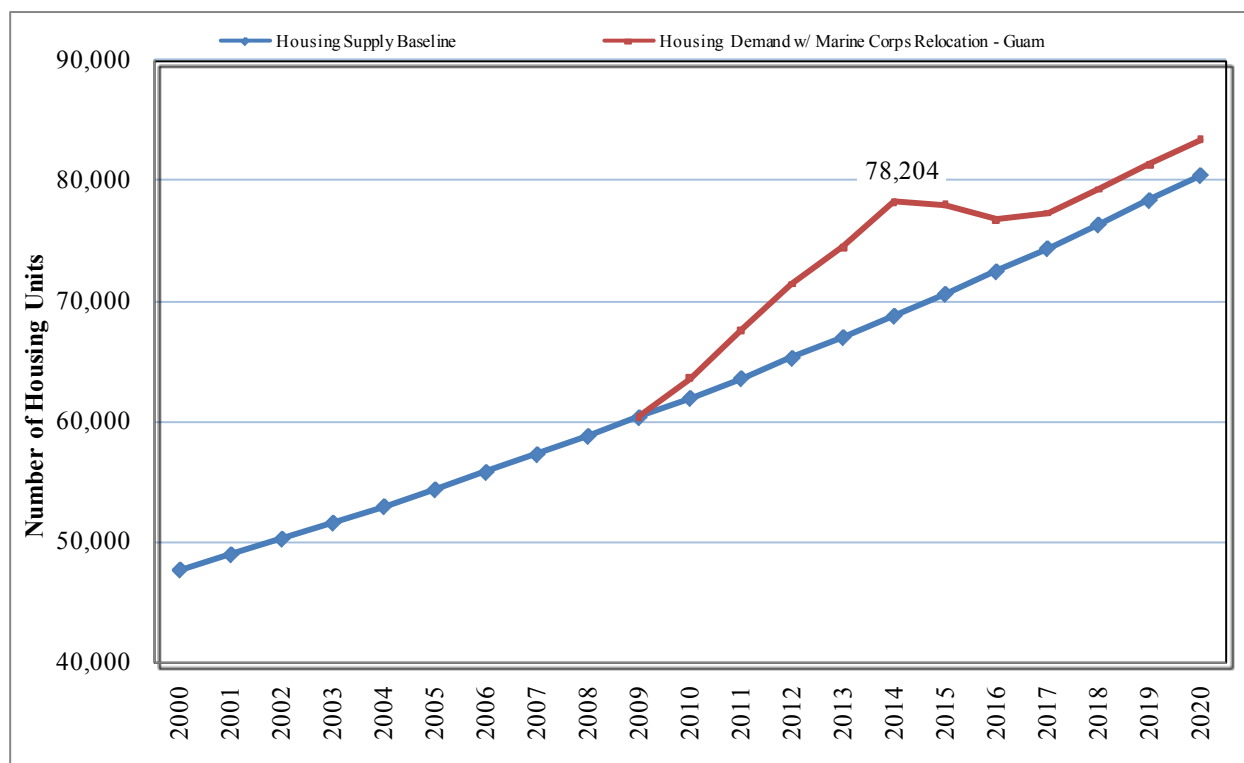
Civilian housing demand and supply impacts were found to be significant.

Table 16.2-26 indicates the combined total impact of the proposed action would be a demand for 9,431 new units in the peak year of 2014, falling to 2,959 by 2020.

**Table 16.2-26. Demand for New Civilian Housing Units**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Housing Demand	1,648	3,972	6,119	7,465	9,431	7,406	4,283	2,913	2,913	2,959	2,959

Figure 16.2-5 compares total housing demand on Guam with and without the proposed action. At the 2014 peak, housing demand with the proposed action is 14% higher than it otherwise would have been, without the project. At 2020, the difference declines to 4%. Both peak and steady-state impacts are considered significant.



**Figure 16.2-5. Housing Demand with and without Proposed Action**

Based on assumptions, the stock of likely available housing was estimated at 2,787 units at the start of project construction in 2010.

Table 16.2-27 shows an estimated housing surplus in the years subsequent to the construction phase if the market were to provide all the needed housing during the construction-period. The recently released housing needs assessment study by the GHURA may provide an updated estimate of the available housing and the market’s ability to respond to the additional housing unit demands.

**Table 16.2-27. Demand and Supply for New Civilian Housing Units**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Combined Action Total Impact	1,648	3,972	6,119	7,465	9,431	7,406	4,283	2,913	2,913	2,959	2,959
Annual Change in Demand	1,648	2,324	2,147	1,346	1,966	(2,025)	(3,123)	(1,370)	0	46	0
Available Housing Supply (vacant, likely available)	2,787	1,139	0	0	0	0	0	0	0	0	0
Annual Construction Needed to Eliminate Housing Deficit	0	1,185	2,147	1,346	1,966	0	0	0	0	0	0
<b>Surplus Units if Supply Increases to Eliminate Deficit</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,025</b>	<b>5,148</b>	<b>6,518</b>	<b>6,518</b>	<b>6,472</b>	<b>6,472</b>

It should be noted that the estimates provided here are theoretical, and meant to be indicative of the amount of housing construction that would be needed to satisfy the increased demand.

In reality it is unlikely that construction of new housing would fully respond to the demand to eliminate a housing deficit. The main challenges to increase housing supply in the face of projected rapid demand increases would occur mostly during the construction phase, and generally fall into three categories:

- Scarcities of labor and materials to build new housing (supply bottlenecks)
- Financial feasibility of constructing housing for short-term demand increases
- Bottlenecks in the Guam housing permitting system to accommodate rapid increases in permit demand

Another factor that should be recognized is the possibility of a typhoon disaster. If a typhoon were to hit Guam, some currently available housing units may be destroyed that would create higher demand for new housing units than shown in tables. Higher demand would stem from a lower number of currently available housing units and a possible spike due to the presence of temporary relief workers.

Housing supply during the post-construction timeframe would be less challenging because local contractors and housing supply materials would have been freed up to meet housing demand more competitively than during the construction period.

Impacts would be adverse if sufficient housing supply cannot be developed and results in crowding, continued price increases, and/or substandard housing development (Refer to the Appendix F SIAS for more detailed discussion).

#### Local Government Revenues

This section provides an estimate of revenues accruing to GovGuam from the primary sources identified in the Affected Environment Section 16.1. The analysis does not specify all governmental costs but does make note of likely differences in timing between costs and revenues.

#### *Approach to Analysis*

Government revenue sources that are analyzed include gross receipts tax, corporate income tax, and personal income tax. These taxes are collected quarterly or annually and there may be a time lag between when government revenues are needed and when they are actually available for use. The analysis assumes GovGuam collects all tax revenues that it would be owed.

Table 16.2-28 provides assumptions made in conducting local government revenue analysis for the construction and operational phases, as well as the source or rationale for these assumptions.

**Table 16.2-28. Assumptions for Local Government Revenue**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
GRT	0.04	GovGuam GRT tax rate
Profit	0.06	Based on market conditions
Corporate income tax rate	0.17	Based on GovGuam Corporate Income tax rate
Personal income tax rate (applies to military as well as to civilians)	0.15	Based on IRS Tax tables

*Notes:* Guam residents do not pay federal income taxes. Instead, GovGuam taxes resident income at the federal rates passes the money to the federal government that then passes the same amount back. Military personnel income taxes are also returned.

#### *Impacts*

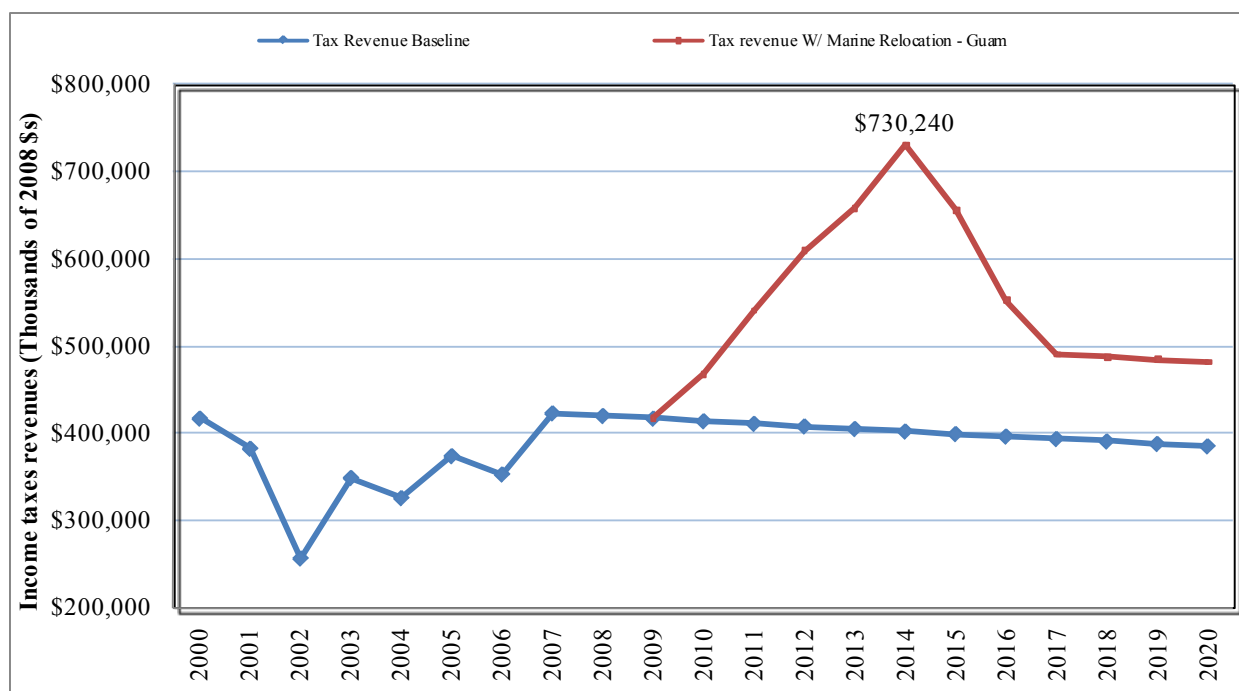
Table 16.2-29 provides GovGuam tax revenue impact summary data. Year-by-year impacts can be found in the Appendix F SIAS.

Revenue impacts are beneficial to GovGuam, subject to the issues of timing and the fluctuation associated with construction ramp-up and decline.

**Table 16.2-29. Impact on GovGuam Tax Revenue Summary (Thousands of 2008 \$s)**

<i>Tax</i>	<i>Peak Impact</i>	<i>Steady Impact</i>
GRT	\$107,638	\$8,433
Corporate Income	\$27,448	\$2,150
Personal Income	\$192,585	\$86,030
<b>Total</b>	<b>\$327,671</b>	<b>\$96,614</b>

Figure 16.2-6 compares total GovGuam tax revenue with and without the proposed action. At the 2014 peak, tax revenues with the proposed action are 81% higher than they otherwise would have been without the project, representing a significant beneficial increase. At 2020, the difference declines to 25%, a lesser but still significantly beneficial increase.



**Figure 16.2-6. GovGuam Tax Revenues with and without Proposed Action**

GIP

*Approach to Analysis*

GIP for Guam represents the total market value of all final goods and services produced in a given year. The concept is generally referred to as Gross Domestic Product (GDP) and it the most commonly used benchmark to assess the overall strength of an economy; when the term economic growth is mentioned it usually refers to an increase in Gross Product from one time period to another.

Table 16.2-30 provides assumptions made in conducting the GIP analysis for the construction phase. Table 16.2-31 provides assumptions made in conducting the GIP analysis for the operations phase.

**Table 16.2-30. Construction Component Assumptions for GIP**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Gross value of military contracts – 2010	\$425 million	NAVFAC Pacific 2009
Gross value of military contracts – 2011	\$1,023 million	NAVFAC Pacific 2009
Gross value of military contracts – 2012	\$1,648 million	NAVFAC Pacific 2009
Gross value of military contracts – 2013	\$2,109 million	NAVFAC Pacific 2009
Gross value of military contracts – 2014	\$2,034 million	NAVFAC Pacific 2009
Gross value of military contracts – 2015	\$1,410 million	NAVFAC Pacific 2009
Gross value of military contracts – 2016	\$524 million	NAVFAC Pacific 2009
Percent of expenditures made on Guam – Equipment	6%	Interviews with GCA
Percent of expenditures made on Guam – Design	2%	Interviews with GCA
Percent of expenditures made on Guam – Materials	5%	Interviews with GCA
Percent of expenditures made on Guam – Supplies	6%	Interviews with GCA
Construction employment.	75 workers per \$10 million total construction cost	Interviews with GCA
Average construction wages – Supervisory	\$85,830/yr.	U.S. BLS Occupational Employment Statistics
Average construction wages – overall	\$27,999/yr.	GDoL
Percent of gross pay spent on Guam economy – Guam workers	47%	State of Hawaii I-O PCE, adjusted by John M. Knox & Associates
Percent of gross pay spent on Guam economy – High-skilled construction and construction in-migrants from CONUS/FAS/Hawaii	45%	State of Hawaii I-O model PCE, adjusted by John M. Knox & Associates
Percent of gross pay spent on Guam economy – Construction H-2B workers	20%	State of Hawaii I-O model PCE, adjusted by John M. Knox & Associates
Ratio of GIP to Output	0.75	Output is always larger than GIP as GIP represents only final purchases. Output adjusted downward to represent GIP. Based on ratio of total sales from 2002 economic census to Guam GIP from 2002 Bureau of Statistics and Plans (BSP)



Table 16.2-31 below shows key intermediate calculations feeding into subsequent estimates of the impact on GIP from operations.

**Table 16.2-31. Operational Component Assumptions for GIP**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Total expenditure, base operations – 2010	\$4.7 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2011	\$8.7 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2012	\$9.4 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2013	\$9.9 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2014	\$47.8 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2015-2020	\$52.4 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Percent of military operations contracts awarded to Guam firms	17%	Historical local contract award expert advice, provided by GCA
Average annual wages of enlisted personnel	\$28,895	Western Pacific Alignment Plan (WAP)
Average annual wages of military support personnel	\$41,435	Estimate based on Government Service (GS) pay scale (Office of Personnel Management 2008)
Percent wages spent on Guam economy, enlisted military	12%	State of Hawaii I-O model, adjusted by John M. Knox & Associates
Percent wages spent on Guam economy, military support	47%	State of Hawaii I-O model, adjusted by John M. Knox & Associates
Federal Military Output Multipliers	1.7	Hawaii 2005 I-O Model
Personal Expenditures Output multiplier	1.89	Based on various multipliers from Hawaii I-O Model weighted by expenditures category
Ratio of Output to GIP	0.75	Output is always larger than GIP as GIP represents only final purchases. Output adjusted downward to represent GIP. Based on ratio of total sales from 2002 economic census to Guam GIP from 2002 BSPs.
Total relocation of all active-duty military personnel to Guam	Complete by 2014	DoD policy – necessary to meet agreement with Government of Japan (GoJ)

*Impacts*

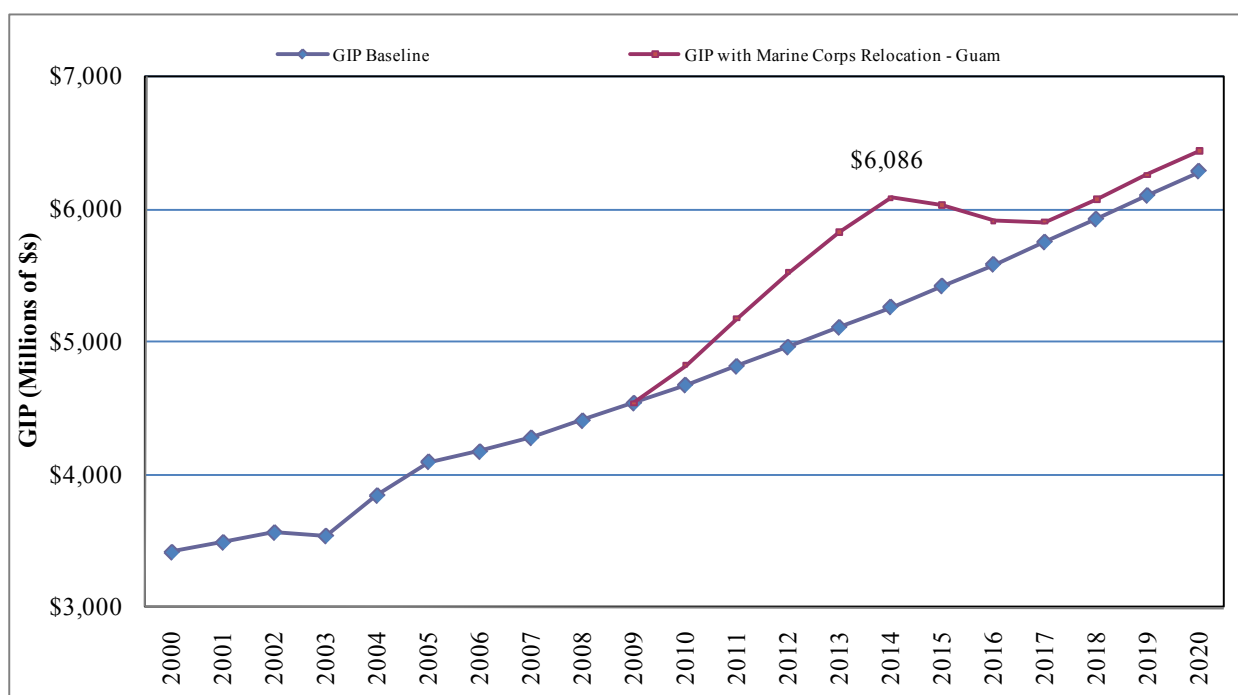
The following impacts are significant. Collectively, GIP impacts are beneficial (especially during the construction phase). Total GIP after the construction peak would decline substantially, but would still be above pre-project levels.

Table 16.2-32 shows the combined total impact on GIP would be \$822 million in 2014, declining to a stable figure of \$157 million beginning in 2017 during the steady-state operational phase.

**Table 16.2-32. Impact on GIP (Millions of 2008 \$s)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Impact on GIP	\$152	\$361	\$566	\$714	\$822	\$616	\$327	\$157	\$157	\$157	\$157

Figure 16.2-7 compares Guam’s GIP with and without the proposed action. At the 2014 peak, GIP with the proposed action is a significant 16% higher than they otherwise would have been, without the project. At 2020, the difference declines to 2% a level still considered significantly beneficial.



**Figure 16.2-7. Guam GIP with and without Proposed Action**

Local Business Contracts

Guam businesses have historically expressed concern about being under-bid by Alaskan contractors using minority-owned small-business status. To address such concerns, this section provides information on relevant legalities, and possible opportunities and constraints.

*Approach to Analysis*

Recent legal changes have resulted in a switch from ethnically-based preferences in contracting to geographically-based preferences (Refer to Volume 9, Appendix F SIAS for more detailed information). With these legal parameters in mind, Naval Facilities Engineering Command Pacific (NAVFAC Pacific) is creating a system of preferences worth \$1 billion for small and local businesses specific to the proposed action (Murphy 2009). The incentives in this system would hold valid for the duration of the action. Also,

the Defense Logistics Agency is providing \$386,000 to establish the new Guam Procurement Technical Assistance Center at the UoG School of Business and Public Administration. The Procurement Technical Assistance Center would help small businesses on Guam navigate the DoD's procurement bureaucracy in hopes of increasing the share of contracts awarded (Hodai 2008).

### *Impacts*

While the exact impacts to local business contract opportunities cannot be predicted, it is assumed that additional business opportunities would increase and constitute a beneficial impact.

The main driver of local business impacts during the construction phase would be the specific preferences written by NAVFAC Pacific, especially their application of the Price Evaluation Adjustments on bidding for smaller contracts based on the HUBZones program. These preferences would determine how much of the total construction budget is awarded to Guam companies.

There may also be service contract opportunities (especially food and supplies), for H-2B worker camps during the construction phase. As of March 2009, NAVFAC Pacific was using the legal framework described above to map out set-asides for small businesses on Guam during the construction phase.

The operational phase is anticipated to bring enhanced business opportunities for Guam companies. Guam businesses tend to compete better for military *service* contracts, as opposed to *construction* contracts (Guam Chamber of Commerce 2008). Although all supplies and products are imported from off-island services, local companies would participate in facilitation of those imports. Furthermore, Guam companies can manage service facilities such as gyms, libraries, and fast food franchises (see Volume 9 Appendix F SIAS - Global Facilities Services Interview).

### Tourism

Tourism is Guam's second largest private industry (GVB 2007) and is likely Guam's primary private-sector source of outside dollars injected into the economy.

### *Approach to Analysis*

Guam's resort hub, Tumon Bay, is located in the central part of Guam and much of the commercial marine tourism activities (e.g., water skiing or scuba diving) also occur in the central area or Apra Harbor. However, both optional tour activities and economic effects of tourism are island wide in nature.

Scoping comments and interviews with industry leaders were used to identify probable tourism impacts of the proposed action. This analysis is qualitative and based largely on interviews with industry leaders in 2008 and early 2009.

Topics identified and addressed include:

- Increased Construction-Related Business Travel
- Infrastructure Improvement
- Loss of Workforce and/or Wage Increases
- Impacts on Ocean-Based Tourism from Environmental Degradation
- Blocked Growth of Chinese and Russian Markets
- Loss of Possible Tourism Attractions from DoD Acquisition of New Land
- Tourism Market Loss Due to Construction Chaos
- Increased Operations-Related Business and Leisure Travel
- Growth in Support Businesses for Ocean-Related Tourism

- Market Loss Due to Conflict Between “Militarization” of Guam and Cultural Tourism
- Impacts on Ocean-Based Tourism from More Population and Competition

### *Impacts*

Overall, tourism impacts would be mixed (both beneficial and adverse). Industry leaders stressed they were not opposed to the proposed action because they felt on balance that the positives outweighed the negatives and they felt that they could work with the military to mitigate many of their concerns.

During the construction phase, the following tourism impacts would be possible (more detailed discussion on each of these topics is available in Volume 9, Appendix F SIAS):

*Increased Construction-Related Business Travel:* Hoteliers and other industry leaders interviewed for this analysis reported an increasing amount of recent new business associated with planning for construction. They anticipate additional business from construction contract managers as military construction begins.

*Infrastructure Improvement:* Infrastructure improvement is an over-arching consideration that would result in positive impacts for all business on Guam.

*Loss of Workforce and/or Wage Increases:* The possibility of wage increases or loss of labor to higher-paying jobs during the construction component is a highly likely outcome, as wages in the construction sector are larger than those in the tourism sector.

*Impacts on Ocean-Based Tourism from Environmental Degradation:* Guam’s warm waters attract tourists to commercial activities such as scuba diving and submarine rides. Potential impacts could occur as a result of dredging and construction activities. Volume 2, Chapter 4 of the EIS states that dredging at Apra Harbor would not produce impacts, and Volume 2, Chapter 3 states that Low Impact Development (LID) and applicable laws concerning stormwater run-off would mitigate impacts. Therefore, based on these conclusions, there would be no impact on marine-based tourism.

*Loss of Possible Tourism Attractions from DoD Acquisition of Property:* There is some concern that DoD acquisition of land could affect tourism assets. Section 16.2.3 Land Acquisition Impacts provides more information on the recreational and tourism sites located on the parcels of potential acquisition. The GVB (Appendix F SIAS – GVB Interview) specified the Guam International Raceway as a prime focus of concern due both to its economic role in attracting racers from Asia and also because of its general social value as a place where military and civilians mingle and a venue for keeping young hot-rodders off the public roads.

*Tourism Market Loss Due to Construction:* Industry leaders interviewed for this analysis consider this a minimal risk. Historical evidence also shows that the hotel construction boom during the 1980s and 1990s was centered in the Tumon Bay resort district itself, and the tourism market was able to grow nevertheless. During the operations phase, the following tourism impacts would be possible.

*Increased Operations-Related Business and Leisure Travel:* It is likely that a significant increase in military personnel would generate more visits from friends and family, as well as more business travel. Additionally, off-duty military personnel and their families are likely to patronize retail and restaurants islandwide, including the central entertainment district of Tumon Bay.

*Growth in Support Businesses for Ocean-Related Tourism:* Population increases are likely to provide expanded markets for support businesses.

*Market Loss Due to Conflict Between “Militarization” of Guam and Cultural Tourism:* In late January 2009, the GVB launched a rebranding of Guam tourism focused away from the traditional “sun-and-sand”

marketing and focused instead on Chamorro cultural and historical assets that are unique to Guam. There is a concern that publicity of the proposed action on Guam and an increase in military activities and imagery on the island would affect visitors' on-island experiences, supplanting the desired tourism branding with a "military base brand" instead. The supplanting of a cultural tourism branding for one that is more militarized remains a concern of GVB (Appendix F SIAS – GVB Interview), as Japan remains the source of 80% of Guam's visitors, and there has been extensive publicity in Japan about the proposed action. However, a maximum potential adverse outcome is not inevitable. Among the factors that could determine what does actually happen would be:

- Military cooperation in exposing personnel to Chamorro culture and history themselves
- Visible presence of military police in tourist areas frequented by many off-duty Marines, to reassure Japanese visitors with negative perceptions from media accounts
- Overall military-civilian relations and communications efforts that would also affect a sense of partnership with the visitor industry

*Impacts on Ocean-Based Tourism from More Population and Competition:* Military personnel and their families, as well as additional population from spin-off economic growth, would generate both more business for ocean-based commercial activities and also more participants in non-commercial activities such as boating and diving.

#### 16.2.2.3 Public Service Impacts

Public service impact analysis includes:

- Public Education
- Public Health and Human Services
- Public Safety Services
- Other Selected General Services
- Growth Permitting and Regulatory Agencies

#### Public Education

##### *Approach to Analysis*

This section assesses the proposed action's impact on:

- GPSS – Elementary Schools, Middle Schools and High Schools
- GCC – Post-Secondary School Programs
- UoG – All Programs

In particular, quantitative impact analysis was conducted on:

- Student population numbers
- GPSS teacher and GCC and UoG non-adjunct faculty requirements

The capacity of private or military schooling on Guam was not analyzed, although the presence of such resources was taken into account when analyzing impact on public facilities.

The impacts discussed are independent of any needs that may result from non-project related general population growth.

Table 16.2-33 presents the key construction component assumptions used in analysis of impacts as well as the source or rationale of these assumptions. These include:

- Analysis used the current teacher to student ratios determined through agency surveys.
- The most recent available statistics were used to determine the percentage breakdown of the new *civilian* population that would attend GPSS and private schools at the various levels as well as UoG and GCC.
- Analysis assumed no H-2B population impact on primary, secondary or higher education.

**Table 16.2-33. Construction Component Assumptions for Public Education Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Elementary Teacher : Student Ratio	1 : 14	GPSS elementary teacher to student ratio (2005-2008). This ratio, derived from the GPSS survey, is supported by the agreement between the Guam Federation of Teachers AFT Local 1581 AFL-CIO and the Guam Education Policy Board (GEPB) contract requirements that mandates specific GPSS teacher to student ratios. (Agreement between the Guam Federation of Teachers AFT Local 1581 AFL-CIO and the Guam Education Policy Board for GPSS Teachers).
Middle School Teacher : Student Ratio	1 : 14	GPSS middle school teacher to student ratio (2005-2008). Remained at 1:14 from 2005 - 2008. This ratio, derived from the GPSS survey, is supported by the GEPB agreement mentioned above.
High School Teacher : Student Ratio	1 : 19	GPSS high school teacher to student ratio (2005 – 2008). Remained at 1:19 from 2005 through 2008. This ratio, derived from the GPSS survey, is supported by the GEPB agreement mentioned above.
GCC Non-adjunct Faculty : Post-Secondary Student Ratio	1 : 18	2007 GCC non-adjunct faculty to post-secondary student ratio (GCC 2007)
UoG Non-adjunct Faculty : Post-Secondary Student Ratio	1 : 18	2000-2007 non-adjunct faculty to student ratios remained relatively steady at 1:18 (University of Guam Survey [Appendix F SIAS]).
% civilian island population composed of primary, middle, and high school age youth	Primary – 14% Middle – 5% High – 6%	Primary school age used: 5-11 years old Middle school age used: 12-14 years old High school age used: 15-18 years old, (U.S. Census Bureau 2000a)
% civilian school-age population attending public and private schools	Public – 86% Private – 14%	1991-2004 Guam public and private school enrollments. (Guam Bureau of Statistics and Plans 2008)
% adult (18 years and above) civilian population attending GCC or UoG	GCC –  UoG –	2007 GCC and UoG enrollment (GCC and UoG Surveys [Appendix F SIAS]) compared with 2007 adult civilian population estimate.
Number of school-age dependents accompanying H-2B workers	0	Interviews with contractors, GCA, and GDoL (Appendix F SIAS)
Number of H-2B workers attending GCC or UoG	0	Although H-2B workers are able to access some continuing education classes, their numbers are not tracked. To the extent that GCC might accommodate cohorts of H-2B workers in continuing education classes such as ESL, these cohorts would most likely be arranged by sponsoring construction companies and GCC and staffing for the classes taken care of on an as-needed basis. (GCC Interview [Appendix F SIAS]).

Table 16.2-34 presents the key operational component assumptions used in analysis of impacts, as well as the source or rationale of these assumptions. Assumptions include:

- The assumption that increases in DoD school population would be absorbed by existing or new Domestic Dependent Elementary and Secondary Schools (DDESS) schools.
- The most recent available statistics were used to determine the percentage breakdown of the new military population that would take classes at UoG and GCC.

**Table 16.2-34. Operational Component Assumptions for Public Education Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
All quantitative assumptions for construction component also apply for the operational component, unless negated by the assumptions listed below.		
% of civilian DoD workers whose dependents would be attending DDESS schools.	75%	Assumption is that 50% of civilian DoD workers would be from off-island. Additionally, 25% of civilian DoD workers would be the spouses of active duty military. The dependents of these individuals would be eligible for education through the DDESS system. See above labor section for rationale of DoD worker percentage assumptions.
% students eligible to attend DDESS schools that would go to GPSS schools instead.	0%	Assumption is that – of those dependents of active duty military and DoD civilian workers eligible to attend DDESS schools – none would attend GPSS schools, although some might choose to attend faith-based or other private schools. (Guam DDESS and GPSS Interviews [Appendix F SIAS]).
% of active duty military population enrolled in UoG classes.	0.2%	Number of 2005 UoG active duty military enrollments and total 2005 active duty military population numbers. (UoG Survey [Appendix F SIAS]).
% of military dependent population enrolled in UoG classes.	0.3%	Analysis of 2005 UoG military dependent enrollment statistics and total military dependent population numbers.

### *Impacts*

Table 16.2-35 provides an overview of the proposed action's impacts on GPSS student populations for the action's peak year and steady-state. c provides an overview of the proposed action's impacts on GPSS staffing for the action's peak year and steady-state. Year by year breakdowns of impacts are provided in the Appendix F SIAS. The analysis indicates significant adverse impacts to public education agencies due to the proposed action.

**Table 16.2-35. GPSS Student Population Impacts Summary**

<i>Agency</i>	<i>Baseline Service Population</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Service Population (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GPSS Elementary	14,436	2014	3,173	22%	847	6%
GPSS Middle	6,887	2014	1,331	19%	355	5%
GPSS High	9,661	2014	1,764	18%	471	5%

**Table 16.2-36. Primary and Secondary Education Teacher Requirements Impacts Summary**

<i>Agency</i>	<i>Baseline Teacher Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Teacher Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Teacher Requirements (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GPSS Elementary	1,035	2014	229	22%	61	6%
GPSS Middle	504	2014	97	19%	26	5%
GPSS High	514	2014	94	18%	25	5%

Table 16.2-37 and Table 16.2-38 provide overviews of the proposed action's impacts on GCC and UoG student populations and non-adjunct faculty requirements for the action's peak year and steady-state.

**Table 16.2-37. Higher Education Student Population Impacts Summary**

<i>Agency</i>	<i>Baseline Service Population</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Service Population (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GCC	1,806	2014	455	25%	155	9%
UoG	3,282	2014	790	24%	244	7%

**Table 16.2-38. Higher Education Faculty Requirement Impacts Summary**

<i>Agency</i>	<i>Baseline Non-adjunct Faculty Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Non-adjunct Faculty Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Non-adjunct Faculty Requirements (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GCC	100	2014	25	25%	9	9%
UoG	185	2014	45	24%	14	8%

Other factors regarding the impact of the proposed action on Guam's public education system include (refer to the Appendix F SIAS for more detailed discussion):

*GPSS Teacher to Student Ratios:* The GPSS ratios do not capture problems with teacher absenteeism. Reports in 2008 indicate the absenteeism of Guam teachers overtook that of students and that on an average school day on Guam 12% of GPSS employees were absent versus less than 7% of GPSS students (Guam Department of Education 2008).

*GPSS Teacher Recruitment:* GPSS's ability to meet the demand for new GPSS teachers depends on Guam's teacher supply. Administrators believe that the expansion of the DDESS system to meet the increasing educational needs of Guam's military population might siphon off GPSS teachers. Also, as additional educational administrative positions open up, current GPSS teachers may choose to apply for those, further exacerbating a teacher shortage. On the other hand, the proposed action brings the benefit that some incoming military spouses might be qualified to teach in the public schools.

*GPSS Administrative Staffing:* Other staff positions in GPSS represent an important aspect not included in the analysis above. Examples of these positions include: principals and assistants, administrators, health counselors, cafeteria, custodial/maintenance, and school aides. Survey results indicate that there is an approximate 2:1 ratio between teachers and administrative staff in the GPSS school system. Thus the number of required additional teachers indicated in the tables above could be cut in half to indicate the number of additional GPSS administrative staffing that would be required.



*GPSS Facilities:* GPSS facilities also should be considered in a discussion of the proposed action's impact. There is an existing need for improvement of GPSS classrooms. Three new schools are currently being planned. New schools are most required in the north and central areas, areas of current school overcrowding (for example JFK and George Washington high schools). Schools in the southern region, on the other hand, often have vacant spaces.

*Additional GCC Service Population:* The analysis does not analyze GCC's secondary school age population. This population represents almost 50% of its student body. In 2007, GCC employed 32 faculty and 4 counselors in its secondary school program. It also does not take into account any changes in GCC classes offered that may be determined by the need for additional career and technical education workers and the demand for such classes from relocation-related industries such as construction, or an increase in enrollment that might occur due to the opening of GCC's new allied health building in September of 2009.

*GCC and UoG Adjunct Faculty:* Adjunct faculty are not included in the GCC or UoG calculations, and may be used to meet some of the noted requirements for additional faculty. In 2007, GCC employed 59 adjunct faculty, making up 37% of the GCC faculty population (Guam Community College 2007). Survey results show that in 2007, UoG employed 62 adjunct faculty, making up about 25% of the UoG faculty population (Appendix F SIAS – UoG Survey). GCC and UoG have some flexibility in hiring adjunct faculty to meet specific needs. GCC only hires such faculty if there is a need in upcoming adult education, apprenticeship, or continuing education courses.

*GCC and UoG Administrative Staffing:* Administrative staffing numbers are also not included in the tables above. In 2007, GCC faculty made up 46% of its full-time employee pool. Staff made up another 39% and Administrators the remaining 16% (Guam Community College 2007). In 2008, UoG employed a total of 550 full-time employees. Of these 182 were faculty, 104 performed clerical and secretarial functions, 34 were administrators, and the remaining performed a variety of professional, technical or maintenance jobs.

*GCC and UoG Facilities:* Survey results show that the GCC main campus is currently able to support the number of students being educated there. An increase in study population however would require expansion and renovation of the existing facilities. UoG survey results (Appendix F SIAS) show that of 21 listed University facilities, all except one (the community lecture hall) are not currently able to meet the needs of the student population, thus a majority would not be able to meet the needs of an expanded student population.

### Public Health and Human Services

#### *Approach to Analysis*

An analysis was performed of potential impact on the following GovGuam public health and human service agencies that were described in Section 16.1:

- GMHA
- GDPHSS
- GDMHSA
- GDISID

In particular, quantitative analysis was conducted on the proposed action's impact on:

- Service population numbers
- Key public health and human services staffing requirements

The capacity of private or military health care facilities on Guam were not analyzed, although the presence of such resources were taken into account when analyzing impact on public facilities, and are discussed as they pertain to possible overflow into health service demands on public service agencies.

The impacts discussed are independent of any needs that may result from non-project related general population growth.

Table 16.2-39 presents the key construction component assumptions used in analysis of impacts, and the source or rationale for these assumptions. These include:

- Analysis used the current Health Professional to Service Population ratios determined through agency surveys.
- The percentages of *civilian* population are considered part of the service population for the various Health and Human Service agencies of GovGuam.
- The service population of GDPHSS and GDMHSA was defined as 37.5% of Guam's total island population, the percentage of Guam's population that is underinsured (as estimated by GDPHSS), and are thus likely to utilize the services of these two agencies. The term underinsured is used to mean individuals that possess health coverage that does not adequately protect them from high medical expenses.

**Table 16.2-39. Construction Component Assumptions for Public Health Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% of Guam's civilian population supported by GMHA services	100%	All incoming population would be part of the service population of GMHA. Although some may choose to access services from private or GDPHSS clinics, they are still considered part of the public and, if in case of medical emergency, would be seen at GMHA. (GMHA Interview [Appendix F SIAS]).
% total island population supported by GDPHSS and GDMHSA Services	37.5%	This is the % total population on Guam that is uninsured or underinsured (GDPHSS estimate). These are the most likely populations to access services from GDPHSS and GDMHSA and the results of this analysis was used as the estimated service population for all impact analyses for GDPHSS and GDMHSA. (GDPHSS and GDMHSA Interviews [Appendix F SIAS])
% of Guam's civilian population supported by GDISID services	100%	All incoming civilian populations would be part of the service population of GDISID, as the agency would provide services to anyone on the island that is or becomes disabled and meets agency criteria. (GDISID Interview [Appendix F SIAS])
GMHA Physician : Service Population Ratio	1 : 2,821	2008 GMHA physician to island civilian population ratio - GMHA Survey (Appendix F SIAS)
GMHA Nurse/Allied Health Staff : Service Population Ratio	1 : 453	2008 GMHA nurse and allied health staff to island civilian population ratio - GMHA Survey (Appendix F SIAS).
GDPHSS Bureau of Primary Care Ratio of Providers and Nursing Staff : Service Population Ratio	1 : 1,499	2008 agency bureau provider and nursing staff numbers to service population estimates - GDPHSS Bureau of Primary Care Survey (Appendix F SIAS)
GDPHSS BCDC Ratio of Communicable Disease Prevention Specialists : Service Population Ratio	1 : 1,999	2008 agency specialist numbers to service population estimates - GDPHSS BCDC Survey (Appendix F SIAS)
GDPHSS BFHNS Ratio of Nursing Personnel : Service Population Ratio	1 : 2,915	Midpoint of agency bureau nursing personnel numbers (2005-2008) of staffing data - GDPHSS BFHNS Survey (Appendix F SIAS)

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
GDMHSA Ratio of Mental Health Professionals : Service Population Ratio	1 : 507	Midpoint of GDMHSA mental health professional numbers (2000-2008) to service population estimate - GDMHSA Survey (Appendix F SIAS)
GDISID Ratio of Social Workers and Counselors : Service Population Ratio	1 : 12,086	2008 agency staffing data to service population ratio - GDISID Survey (Appendix F SIAS).

Table 16.2-40 presents the key operational component assumptions used in the analysis of impacts, and the source or rationale for these assumptions. These include:

- No military or dependents are considered part of the service population of GMHA.

**Table 16.2-40. Operational Component Assumptions for Public Health Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
All quantitative assumptions for construction component also apply for the operational component, unless negated by the assumptions listed below	See above	See above
% active duty military and military dependent population supported by GMHA	0%	Although there is anecdotal information mentioned in the text below that indicates active duty military and their dependents would sometimes access GMHA services, no quantitative data were available to support this analysis as in general GMHA does not record whether a patient is military or civilian. In certain circumstances, when GMHA does knowingly serve a military individual, they can bill TRICARE for the services.
% of civilian DoD workers supported by GMHA	25%	Assumption is that 50% of civilian DoD workers would be from off-island. Additionally, 25% of civilian DoD workers would be the spouses of active duty military. It is assumed that these populations would be eligible for medical services from the Naval Hospital. The other 25% would be serviced by GMHA. Assumption derived from labor force analysis in above sections.

### *Impacts*

Table 16.2-41 provides an overview of the proposed action's impacts on GMHA, GDPHSS, GDMHSA and GDISID service populations for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS. The analysis indicates significant adverse impacts to public health agencies due to the proposed action.

**Table 16.2-41. Impact on Public Health and Human Services, Service Population Summary**

<i>Agency</i>	<i>Baseline Service Population</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady Additional Service Population (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GMHA	160,797	2014	41,062	26%	5,437	3%
GDPHSS	65,954	2014	23,543	36%	10,183	15%
GDMHSA	65,954	2014	23,543	36%	10,183	15%
GDISID	169,209	2014	54,228	32%	18,604	11%

Table 16.2-42 provides an overview of the proposed action's impacts on various public health and human services agency staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-42. Public Health and Human Services Impact Summary**

<i>Agency and Staffing Type</i>	<i>Baseline Staffing Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Staffing Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Staffing Requirements (going forward)</i>	<i>Steady Staffing Requirements Percentage Increase</i>
GMHA Physicians	57	2014	15	26%	2	4%
GMHA Nurses and Allied Health Professionals	355	2014	91	26%	12	3%
GDPHSS - Primary Care Medical Providers and Nursing Staff	44	2014	16	36%	7	16%
GDPHSS – BCDC Communicable Disease Prevention Professionals	33	2014	12	36%	5	15%
GDPHSS - BFHNS Nurses	22	2014	8	36%	4	18%
GDMHSA – Mental Health Professionals	130	2014	46	35%	20	15%
GDISID Social Workers and Counselors	14	2014	4	29%	2	14%

In July of 2008, The U.S. Department of Health and Human Services provided a Guam Issues Inventory response to GovGuam prioritized health and human services issues related to the proposed action (USDHHS 2008). These priorities included acquisition of critical staffing, and capital improvement and funding for infrastructure and services.

Thus, other factors regarding the impact of the proposed action on Guam's public health system include (refer to Appendix F SIAS for more detailed discussion):

*Existing Professional Staffing Deficits:* For many of the GovGuam public health agencies listed above, the existing professional staffing to service population ratios that were used in this analysis are ratios that show existing deficits. Since the above staffing analyses are based upon existing ratios rather than standards, they preserve any professional shortages that currently exist on the Island of Guam.

*Additional Staffing Requirements:* While the analysis above provides an outline of impacts on health professional requirements related to the proposed action, an important caveat to this analysis is that for every one of the public health professional positions required, additional administrative staff are required to support the work of that professional. The GDPHSS BPC for example, noted that for each health professional it employs, four additional support staff such as nurse aids and medical records clerks are required. The implications of such a ratio can be far reaching. In the case of the BPC, the project's direct impact peak in 2014 would require the hiring of 48 support staff in addition to the professionals noted in the analysis above. Additional staffing requirements of recent or future public health facility

developments (for example, the newly expanded NRCHC and the soon-to-be expanded SRCHC]) can also affect staffing requirements.

There is also the possibility that the incoming populations associated with the proposed action might require additional staff time and agency resources. For example, GDMHSA staff members have observed that workers from off-island, such as those that would arrive on Guam during the construction phase, often work in stressful and intense situations that increase the prevalence of substance abuse. Similarly, military individuals transferring to a new, remote island location sometimes experience difficulty adapting to a different culture. It has been observed that both these populations would sometimes be inclined to access the confidential and free services of GDMHSA, despite having health insurance, because of the fear that their condition might affect their terms of employment.

*Underinsured Populations:* GDPHSS and GDMHSA target the most indigent populations for health care (see Affected Environment section). Thus the majority of individuals accessing services are uninsured. However, GDPHSS and GDMHSA staff members note that many individuals accessing services do have health insurance, but unaffordable co-payments for services or medications, or missing coverage of specific services and medications makes it necessary that these individuals access the free services of these two agencies. The population growth associated with the proposed action would contribute to these uninsured and underinsured populations, especially in the form of residents entering Guam through the COFA agreement that does not require individuals have health coverage before arriving on Guam.

*Military and Civilian Health Care System Overlap:* Note that the GMHA service population analysis is not able to capture some nuances to utilization of GMHA and Navy Hospital Services on Guam:

- In emergency situations, an individual, civilian or military, would be taken to the closest hospital emergency room (GMHA or Naval Hospital) until they are stable enough to be transported to the appropriate facility (Guam Memorial Hospital Interview – Appendix F SIAS).
- Because the Naval Hospital's capacity is low, military dependents do occasionally use GMHA services, that GMHA can bill TRICARE, the military health insurance system (Guam Memorial Hospital Interview [Appendix F SIAS]).
- There are also plans to build a replacement Naval Hospital as well as a separate 6,000 square-foot outpatient clinic for veterans. (The current clinic is located within the current hospital.)
- Currently, both the military and civilian health care systems do not meet optimal conditions and it is not uncommon for both military and civilians to leave the island for care.

*Facility and Supply Requirements:* Through the process of interviews, qualitative data was collected regarding capital improvement and medical supply needs of various GovGuam public health agencies. GDMHSA reported substandard air quality in the building, fire suppression risks, and mold problems. GDPHSS's TB treatment program was housed in the windowless main public health building. GDPHSS BFHNS indicated a lack of clinical supplies (such as syringes) and antibiotics. GovGuam public health-related capital improvement and feasibility studies are currently being conducted.

*Funding Issues:* The procurement of funding for additional staff, capital improvements, and medical supplies for GovGuam public health agencies is a complex one. In 2008, GovGuam received a total of \$43,283,170 from various federal health and human service funding programs.

In some instances, low staffing numbers or lack of technological capacity inhibits agencies from harnessing the funding that is available. For example, GDMHSA is not able to bill the military TRICARE system for the services they provide, due to technological and staffing capacity issues.

In other instances, lack of funding precludes an agency's ability to operate efficiently and effectively. For example, although the building of a permanent one-stop GDISID facility would eliminate the costly leasing of office space, GDISID lacks the capital to implement the project, even though the agency already has the plan and the land for a facility. As another example, to meet the costs of hiring additional staffing as required by the permanent injunction, GDMHSA must take out loans.

### Public Safety Services

#### *Approach to Analysis*

Analysis was performed on impact on the following GovGuam public safety agencies:

- GPD
- GFD
- GDoC
- GDYA

In particular, quantitative analysis was conducted on the proposed action's impact on:

- Service population numbers
- Key public safety services staffing requirements

The capacity of military security services were not analyzed, although military security departments are discussed in view of their interaction with government agencies in maintaining public safety on the island.

The impacts discussed are independent of any needs that may result from non-project related general population growth.

Further discussion on public safety implications can be found in Chapter 18 of this Volume, Public Health and Safety.

Table 16.2-43 presents the key construction component assumptions used in analysis of impacts, and the source or rationale for these assumptions. Key assumptions include:

- All incoming population is considered part of the GPD service population. GPD's service population is defined in this analysis as Guam's total population, including active-duty military. This is because even active duty military personnel charged with crimes off base would go through the GPD and judiciary systems.
- During the construction phase, additional firefighting personnel would be needed due to high hazard conditions on island. This is incorporated into the analysis through the use of an adjusted growth in service population, in order to capture the impact of increased construction and worker housing on the Island of Guam. The National Fire Protection Association (NFPA) Standard #1710, titled the "Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments" (2001 Edition), recommends five to six on-duty personnel per engine company in jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions or other pertinent factors as identified by the authorities having jurisdiction. This is compared with the recommendation for four on-duty personnel per engine company in other jurisdictions. Worker housing and working areas fall under such high hazard jurisdictions and would impact GFD staffing requirements more heavily.

- Analysis used the current Safety Professional to Service Population ratios determined through agency surveys.

**Table 16.2-43. Construction Component Assumptions for Public Safety Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% island population under the protection of GPD	100%	GPD and Navy Security Interviews (Appendix F SIAS)
% increase over current firefighter to population ratio due to high hazard situations, per year	2010 – 6% 2011 – 11% 2012 – 12% 2013 – 12% 2014 – 10% 2015 – 9% 2016 – 9 %	H-2B housing meets the NFPA definition of high hazard jurisdictions. This would require an additional % increase in required GFD staffing during the construction phase.
% increase in inmates in jail, prison, and federal holds at GDoC per year	2010 – 3% 2011 – 8% 2012 – 13% 2013 – 16% 2014 – 15% 2015 – 10% 2016 – 3%	Percent of adult civilian population increase over baseline as a result of proposed action (construction phase). To produce increase in service population, these percentages were then multiplied by inmate population numbers - GDoC Survey (Appendix F SIAS)
GDYA service population	Ages 5-21	GDYA service population includes military dependents. GDYA Interview (Appendix F SIAS)
GPD Sworn Police Officer : Service Population Ratio	1 : 561	2007 GPD staffing numbers to service population ratio - GPD Survey (Appendix F SIAS)
GFD Firefighter : Service Population Ratio	1 : 846	2008 GFD staffing numbers to service population ratio - GFD Survey (Appendix F SIAS)
GDoC Corrections Officer : Inmate Ratio	1 : 6	2008 GDoC staffing to inmate numbers - GDoC Survey (Appendix F SIAS)
GDYA Youth Service Worker : Service Population Ratio	1 : 504	2008 GDYA youth service worker numbers to service population estimates - GDYA Survey (Appendix F SIAS)

Table 16.2-44 presents the key operational component assumptions used in analysis of impacts and the source or rationale for these assumptions. These assumptions are much the same as those used for the construction phase analysis.

**Table 16.2-44. Operational Component Assumptions for Public Safety Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
All quantitative assumptions for construction component also apply for the operational component, unless negated by the assumptions listed below.		
% increase in inmates in jail, prison or federal holds at GDoC per year.	2010 – 1% 2011 – 1% 2012 – 1% 2013 – 1% 2014 – 4% 2015 – 4% 2016 – 4% 2017 – 4% 2018 – 4% 2019 – 4% 2020 – 4%	Percent of adult population (not including active duty) increase over baseline as a result of proposed action. To produce increase in service population, these percentages were then multiplied by inmate population numbers provided in the GDoC Survey (Appendix F SIAS).

*Impacts*

Table 16.2-45 provides an overview of the proposed action's impacts on GPD, GFD, GDoC, and GDYA service populations for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS. The analysis indicates significant adverse impacts to public safety agencies due to the proposed action.

**Table 16.2-45. Impact on Public Safety Service Population Summary**

<i>Agency</i>	<i>Baseline Service Population</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Service Population (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GPD	160,797	2014	65,527	41%	31,071	19%
GFD	175,877	2014	49,895	28%	9,604	5%
GDoC	1,035	2014	240	23%	80	8%
GDYA	39,813	2014	19,502	48%	12,667	32%

Table 16.2-46 provides an overview of the proposed action's impacts on various public safety services agency staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-46. Public Safety Services Staffing Impacts Summary**

<i>Agency and Staffing Type</i>	<i>Current Staffing Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Staffing Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Staffing Requirements (going forward)</i>	<i>Steady Staffing Requirements Percentage Increase</i>
GPD – Police Officers	309	2014	117	38%	55	17%
GFD - Firefighters	190	2014	59	31%	11	6%
GDoC – Custody and Security Personnel	188	2014	44	23%	15	8%
GDYA – Youth Service Professionals	79	2014	39	49%	25	31%

Other factors regarding the impact of the proposed action on Guam's public safety system include (refer to Appendix F SIAS for more detailed discussion):



*Other Staffing Factors:* Support staff numbers are not included in the analysis above, but are large components of agency staffing. For example, 2006 data show that for every five police officers, approximately one civilian staff member was employed by GPD. Similarly, for every 6 custody and security staff at GDoC, 1 administrative or fiscal employee was employed in the parole division. These staffing ratios would add at the peak impact year of 2014, the requirement of 19 additional civilian staff at GPD and an additional 6 administrative or fiscal employees at GDoC. As another example, increasing enrollment in GDYA programs would require increased intake staff.

*Existing Professional Staffing Deficits:* The GFD analysis is based upon a baseline staffing ratio that does not allow the meeting of certain NFPA fire protection standards on a consistent basis. While GFD is able to meet the response time requirements, the agency is currently unable to meet the recommended staffing ratio per engine company on a consistent basis, due to sick leave, vacations, and deployment of staff through the National Guard. This would be exacerbated due to the proposed action's fire prevention requirements.

*Regional Issues:* Regional aspects of the island affect both GFD and GPD's public safety responsibilities and would affect the number of additional staff that would be required at various locations. High hazard areas GFD must take into consideration include industrial regions where hazardous materials are stored, areas such as the Port Authority, regions with high rise buildings, and the remote and hilly southern regions of the island. Road and traffic congestion as well as lack of water pressure, due to the impacts of construction and a general increase in population would also impact safety and rescue operations. These regions require more staffing than others.

Precinct-specific police officer to population ratios are dependent on demographic traits and characteristics, and would be impacted by incoming population groups. Areas requiring more law enforcement presence include: those with an urban center (businesses), with legal gambling (game rooms), or highly mobile/seasonal populations (Guam Police Department 2007). In 2006, the ratio of sworn police officers to 1,000 inhabitants was as follows:

- Tamuning/Tumon Precinct: 2.0
- Agat Precinct: 1.0
- Dededo (including Yigo) Precinct: 0.5
- Hagatna Precinct: 0.5

*Jurisdictional Issues:* Because of the large military presence on the Island of Guam, issues of jurisdiction require close collaboration between local and federal public safety agencies, and such collaboration would require strengthening. In the past and currently, cases involving jurisdictional issues require that federal and local officials talk through the case and decide how the case is best prosecuted. This discussion includes issues such as what is best for all parties, what is best use of taxpayer resources, government assets and the best way to adjudicate and work through issues (Guam-JGPO Public Safety Forum 2008). Overall, collaboration between civilian and military safety agencies has been good, and these positive relationships and formal guidelines would require further development.

*Additional Facilities and Equipment Needs:* Public safety agencies indicate that they deal with current issues of overcrowding and inadequate facilities. Increased staffing population numbers at these agencies would necessarily require upgrades of facilities so that new personnel can work productively. Increased service population numbers would also require additional space. Such infrastructure additions are necessary for security purposes.

An increase in agency staff combined with project-related safety incidents would require that GovGuam agencies acquire additional equipment and vehicles. It is difficult to assess the proposed action's impact on type public safety incidents that are likely to occur, and the connected equipment and vehicles that might be required. For instance, while hazardous conditions on road due to construction might cause increased traffic accidents, increased traffic due to a growing population may lead to slower traffic and a lower number of fatalities. It is expected that water emergency incidents such as boating accidents and drowning would increase with population numbers and equipment such as rescue boats and jet skis are used in such incidents.

*Current Facilities and Equipment Deficits:* A number of GFD fire stations were originally built for other purposes and do not house the equipment properly, exposing fire trucks and rescue boats to weather damage. In particular, the fire stations at Sinajana, Agat, and Piti are over capacity, while the stations at Tamuning, Yigo, Astumbo, Inarajan, Umatac, Yona and Talofofu are at maximum capacity.

The GDoC is unable to house all its inmates, overnighters and parolees that are being held on an infraction, and must shift individuals between its Adult Correctional Facility and Hagatna Detention Facility (Volume 9, Appendix F SIAS - DoC Interview). GDYA also has crowding issues. While the agency's Dededo facility and one of its Agat facilities would be able to accommodate additional service population that only required access to the agency's services (i.e., did not require housing), GDYA's remaining four facilities that do house service population are currently either at or above capacity.

#### Other Selected General Services

##### *Approach to Analysis*

Analysis was performed on the following GovGuam agencies that would be impacted by population growth:

- GDPR
- GPLS
- Guam Judiciary

In particular, quantitative analysis was conducted on the proposed action's impact on:

- Service population numbers
- Key staffing requirements for the three agencies

The impacts discussed are independent of any needs that may result from non-project related general population growth. Also, it should be noted that many parks and community centers on Guam are not under the purview of GDPR, but rather are maintained and managed by the 19 mayors on Guam. Information on these facilities was not available at time of writing.

Table 16.2-47 presents the key construction and operation component assumptions used in analysis of impacts. These include:

- Analysis used the current professional to service population ratios determined through agency surveys.
- This analysis considers the service populations of GDPR, GPLS, and the Guam Judiciary as the entire island population. Each of these agencies service both civilian and military population needs.

**Table 16.2-47. Assumptions for Other Selected Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% of island population assumed to be in GDPR service population	100%	The entire island population is allowed access to the parks and recreation areas run by GDPR
% of island population assumed to be in GPLS service population	100%	All island residents and visitors are allowed access to the GPLS libraries, and all individuals with a valid form of identification are allowed to obtain a library card - GPLS Survey (Appendix F SIAS)
% of island population assumed to be on Guam Judiciary's service population	100%	All civil and criminal activity processed and litigated on the Island of Guam would go through the Judiciary system - Guam Judiciary Interview (Appendix F SIAS).
GDPR Staff : Service Population Ratio	1 : 1,954	Midpoint of agency staff (2000-2008) to service population estimates - GDPR Survey (Appendix F SIAS).
GPLS Staff : Service Population Ratio	1 : 6,281	2008 GPLS staff to service population ratio - GDPR Survey (Appendix F SIAS).
Guam Judiciary Judge : Service Pop Ratio	1 : 29,313	2007 Judiciary judges to service population ratio (Guam Judiciary 2008)

*Impacts*

Table 16.2-48 provides an overview of the proposed action's impacts on GDPR, GPLS and Guam Judiciary key staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS. The analysis indicates significant adverse impacts to other GovGuam general service agencies due to the proposed action.

**Table 16.2-48. Impact on Other Selected General Service Agency Service Population**

	<i>Baseline Service Population Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Service Population Numbers (going forward)</i>	<i>Steady Service Population Percentage Increase</i>
GDPR, GPLS, and Judiciary Service Population	160,797	2014	65,527	41%	31,071	19%

Table 16.2-49 provides an overview of the proposed action's impacts on GDPR, GPLS and Guam Judiciary key staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-49. Other Selected General Service Agency Impacts Summary**

<i>Agency and Staffing Type</i>	<i>Baseline Key Staffing Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Key Staffing Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady-State Additional Key Staffing Requirements (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GDPR – General Staff	90	2014	34	38%	16	18%
GPLS – General Staff	28	2014	10	36%	5	18%
Judiciary - Judges	6	2014	2	33%	1	17%

Other factors regarding the impact of the proposed action on these agencies include (refer to Appendix F SIAS for more detailed discussion):

*Current Agency Capacity Deficits:* The analysis ratios used in the calculations above do not take into account current agency capacity issues. For instance, due to government budget cuts, GDPR has experienced a 50% decrease in staffing in the space of 12 years and despite population increases and staffing numbers have not changed significantly since 2003. According to criteria for determining adequacy of Public Library Services set down by the GPLS Board, the Island of Guam presently lacks at least ten professional librarians. Finally, the Guam Judiciary currently requires three additional judges to manage the workload that is not related to the proposed action (Guam-JGPO Public Safety Forum 2008).

*Additional Support Staff Requirements:* Impacts on support staff (in addition to the “key professional” numbers above) are important aspects of the proposed action’s effects on agency capacity. However, they are much more difficult to quantify because agency support staff numbers were not always available at time of writing or support functions were contracted out.

While staffing numbers in this analysis relate to overall GDPR staffing, the GDPR practices extensive outsourcing of various duties including: maintenance, teacher, lifeguard, and park attendant.

GPLS staffing numbers in this analysis included all staffing. However, it should be noted that because of the lack of professional librarians on Guam, GPLS Library Technicians are often put in charge of library operations.

The Guam Judiciary has engaged the support of the National Center State Courts to develop a comprehensive master plan addressing the entire agency’s staffing needs, including parole, counselors, youth workers and marshals. Although current staffing numbers were not provided, a recent Judiciary needs assessment document indicated the need for nine additional support staff per judge, including chamber clerks, bailiffs, law clerks, and deputy clerks (Guam Judiciary Interview – Appendix F SIAS). These numbers are not indicative of total support staff that are needed by the Judiciary, but just those administrative staff directly supporting each judge.

*Facilities and Equipment:* In addition to staffing, the equipment, materials and technology that these agencies currently utilize are often inadequate. The GPLS Five-Year Plan (2008-2012) indicates inadequate library equipment and furniture, and ineffective electronic archiving and catalog systems (GPLS 2007). The Guam Judiciary’s Strategic Plan notes the trends of security technology, use of the Internet, and increased networking of information requiring improved information and telecommunications technology (Guam Judiciary 2006). The GDPR notes that all facilities including beach parks, historical parks and recreational facilities are in poor condition due to budget cuts.

*Budgetary Constraints:* Budgetary constraints are common among these agencies, and affect their ability to meet the requirements of the proposed action’s impact. The Judiciary’s 2009 budget was cut by 10% and the agency has begun to implement a range of cost-cutting measures including a delay in the opening of its satellite center, a hiring freeze, and monitoring and reducing operating expenses. The GDPR has current capacity issues due to government budget cuts – the department has experienced a 50% decrease in staffing in the space of 12 years and despite population increases, staffing has not changed significantly since 2003.

## Growth Permitting and Regulatory Agencies

### *Approach to Analysis*

Analysis was performed on the following GovGuam agencies responsible for issuing, monitoring and enforcing development permits on Guam:

- GDPW Building Permits and Inspection
- GDLM
- GEPA
- CMP (within the GBSP)
- GPA
- Guam Water Authority (GWA)
- GFD
- HPO, within the GDPR
- DEH, within the GDPHSS
- ALPCD within the GDoL

Unlike the previously described services, the permitting work of these agencies would be driven by increases in permit applications before and during the process of growth on Guam (rather than population increases). Note that impacts to GFD, GDPR and GDPHSS were also addressed in prior impact sections. This section analyzes only the impact on their permitting functions (a small percentage of their overall functions).

There are no distinctions between construction and operation component assumptions for the agencies analyzed in this section. This is because impacts are driven by the number of development permits estimated to be required, regardless of the project phase. Therefore, the assumptions listed in Table 16.2-50 apply to both components.

**Table 16.2-50. Assumptions for Growth Permitting Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Permits other than building permits	Proportional to population growth	Environmental permits generally grow with population
Monitoring/enforcement	Proportional to population growth except as noted below	Environmental monitoring and enforcement generally grow with population
<b>Department of Land Management Assumptions</b>		
% permits received by GDPW that would be referred to GDLM	100%	Records show that GDLM processed several times the number of permits as did GDPW (Guam Department of Land Management and GBSP Survey Responses)
% FTEs in permitting	33%	2005 base year (GDLM Survey Response 2009)
% FTEs in monitoring/enforcement	11%	2005 base year (GDLM Survey Response 2009)
% FTEs in administrative/support	11%	2005 base year (GDLM Survey Response 2009)
Number permits processed per permitting FTE	1,569	2005 base year (GDLM Survey Response 2009)
Number of rezones	Increase from base year according to population impact with two-year lead time from population increase	Rezoning assumed to be tied to population growth, with two years often needed from submittal to rezone to completion of construction.
Enforcement/monitoring	Increase according to permit increase	Enforcement assumed to be tied to population growth.

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
<b>GEPA Assumptions</b>		
% permits received by GDPW that would be referred to GEPA	74%	2005 base year (GEPA Survey Response 2009)
% FTEs in permitting	65%	2005 base year (GEPA Survey Response 2009)
% FTEs in monitoring/enforcement	15%	2005 base year (GEPA Survey Response 2009)
Number permits processed per permitting FTE.	52.3	2005 base year (GEPA Survey Response 2009)
On-site activities (direct project)	Equivalent of 200 permits on-site in 2010, increasing along with population impacts	Some set-up would be required early in project
Monitoring/enforcement	Proportional to population growth except 200 permit-equivalents needed in 2010	Environmental monitoring and enforcement generally grow with population but typically require effort closer to beginning of projects.
<b>GFD Assumptions</b>		
% permits received by GDPW that would be referred to GFD.	13.8%	Survey response, 2007 base year
% FTEs in permitting.	31%	Survey response, 2007 base year
% FTEs in monitoring/enforcement.	31%	Survey response, 2007 base year
Number permits processed per permitting FTE	45.7	Survey response, 2007 base year
<b>DEH Assumptions</b>		
% permits received by GDPW that would be referred to DEH.	3.2%	Based on year 2005 GDPW permits referred to DHES (DHES survey response) to average annual GDPW permits of 1,336
% FTEs in permitting.	11.4%	DHES survey response, 2005 base
% FTEs in monitoring/enforcement.	55.3%	DHES survey response, 2005 base
Number permits processed per permitting FTE	1,389.1	DHES survey response, 2005 base
<b>Department of Parks and Recreation (HPO) Assumptions</b>		
% permits received by GDPW that would be referred to GDPR.	28.5%	Based on year 2007 GDPW permits referred to GDPR (GDPR survey response) to average annual GDPW permits of 1,336
% FTEs in permitting.	45%	GDPR survey response, 2009 base
% FTEs in monitoring/enforcement.	25%	GDPR survey response, 2009 base
Number permits processed per permitting FTE	194	GDPR survey response, 2009 base
Permits required for direct project activities	200 in 2010, declining till 2020	As new lands are to be disturbed, program preparation is required.
<b>GDoL ALPCD Assumptions</b>		
No H-2B workers would be associated with operation of the proposed project. H-2B workers would only be employed for direct construction, and not for any indirect or induced activities.	0%	H-2B workers are mostly used for construction on Guam. Local workforce training programs are focusing on a variety of skill area training, and non-H-2B workers, for example from FAS, would provide the skills match for all non-site construction jobs.
Ratio of H-2B workers to ALPDC staff.	288:1	The current number of H-2B workers on Guam is about 1,440, and there were five FTE staff in the ALPCD in FY007 and FY2008 (CMTF 2008).

*Impacts*

Table 16.2-51 shows the estimated number of key growth permitting professional staff required due to the proposed action. The peak requirement in 2014 ranges from about 9% (GPA) up to 103% (Guam DLM) greater than baseline staffing levels, depending on the agency (except for ALPCD that would experience a 200% peak increase in required staffing due to large influx of H-2B workers). After construction ends by the end of 2016, the required staffing levels are 0% (DPR-HPO and ALPCD) to 64% greater (Guam DLM) than reported baseline staffing levels. By the criteria discussed previously, the overall effect would be considered a significant and adverse impact.

**Table 16.2-51. Additional Growth Permitting Staff Required**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Guam DPW Permitting Staff	8	9	7	6	3	2	2	1	1	1	1
Guam DLM Permitting Staff	8	8	9	9	8	7	7	7	7	7	7
GEPA Permitting Staff	16	19	17	16	12	11	10	3	3	3	3
CMP Permitting Staff	2	2	4	5	5	3	3	2	2	2	2
GPA Permitting Staff	3	4	3	2	2	2	1	1	1	1	1
GWA Permitting Staff	3	4	3	3	2	2	2	1	1	1	1
GFD Permitting Staff	12	14	10	9	5	4	4	2	2	2	2
GDPHSS - DEH Permitting Staff	1	2	2	3	4	3	2	2	2	2	2
Guam DPR - HPO Permitting Staff*	2	2	2	2	1	1	1	0	0	0	0
Guam Department of Labor - ALPCD Permitting Staff	6	9	10	8	0	0	0	0	0	0	0

*Notes:* Numbers show combined total impact. See Appendix F SIAS for a breakdown of the above numbers by construction and operations, as well as direct and indirect effects, for each agency.

\* The Programmatic Agreement (further described in the Cultural Resources chapter) helps the HPO with staffing issues by streamlining the Section 106 process. Because staffing requirements to meet federal regulations would be reduced by this agreement, freeing up current staff to work on non-federal projects, the staffing requirements noted in this table may not be as high.

## 16.2.2.4 Sociocultural Impacts

Sociocultural Impact analysis includes the following issues:

- Crime and Serious Social Disorder
- Political and Chamorro Issues
- Community Cohesion

Crime and Serious Social Disorder*Approach to Analysis*

Scoping comments and interviews were used to identify probable crime and social disorder impacts of the proposed action. Analysis is qualitative and based largely on interviews conducted in 2008 and early 2009.

Topics identified and addressed include:

- Increase in overall crime

- Increase in prostitution
- Increase in drug use/substance abuse
- Increase in sexual assaults
- Increase in crimes against women and children
- Increase in military-civilian fights

#### *Impacts – Construction Phase*

During the construction phase, crime and social disorder impacts are possible, and are overall due to the large increase in population during the construction phase.

*Increase in Overall Crime:* It is expected that a spike in the number of offenses and arrests would occur at the onset and for the duration of the construction component, especially considering that the overall social change at this time would be augmented by the relocation of all Marine Corps personnel.

Construction booms in general cause a variety of social disruptions. However, interviews with industry professionals that experienced Guam's hotel construction boom of the late 1980s and early 1990s indicate that Guam did not experience large increases in crime or social disorder (Guam Contractors Association and Guam Visitors Bureau Interviews – Volume 9 Appendix F SIAS).

Historically, H-2B workers have low impacts on crime and social disorder. In-migrants from the Freely Associated States of Micronesia (FAS) (including Palau, Federated States of Micronesia [FSM], and the Republic of the Marshall Islands [RMI]) have been associated with increased crime, and are disproportionately represented in arrests for Part I and Part II offenses in the most recent years that data were published. Micronesian gangs are also emerging as a concern of GPD (Guam Police Department Interview – Volume 9, Appendix F SIAS).

The possibility of ethnic bias in arrest patterns must be acknowledged in reference to the above data citing the association of crime and FAS in-migrant populations. Cultural differences could affect arrest rates as well. Although GPD data combines FAS and FSM populations, immigrants from the FSM account for the majority of the FAS residents on Guam (U.S. Census Bureau 2009). These immigrants not only come from depressed economies, but also often live by different legal systems that may manifest in behavior that is acceptable in their culture but not on Guam. For example, while educational requirements are nominal in FSM, not attending school is defined as truancy on Guam.

*Increase in Prostitution:* The volume of prostitution may be assumed to grow consistent with the large increase in transient population during the construction period.

In general, prostitution prospers in boomtown settings. Thousands of people are added to the local population, and transient workers often have little stake in the community. As a result, drugs, alcohol abuse, and prostitution can become problems, and annual arrests can double or triple in a single year (Ortiz et al. 2007).

Inquiries to the GPD revealed an absence of quantitative data about those who patronize prostitutes. Arrest data refer only to prostitutes, not their clients. Thus, there is no clear evidence whether likely in-migrating groups are any more or less likely to patronize prostitutes and it is not possible to say whether these groups of workers in particular would differ from other construction-related workers in contributing to prostitution.

*Increase in Drug Use/Substance Abuse:* The proposed action would likely increase the number of arrests for drug and alcohol-related offenses simply because of the population growth. Furthermore, rapid social and economic change can impact drug and alcohol abuse.



It is not possible however, to determine whether construction workers in particular would incur more drug and alcohol-related arrests than other types of workers. The GPD reports on drug abuse arrests by age and types of drugs involved and Driving Under the Influence arrests are reported by outcomes (involving crash, injuries or fatalities) and ethnicity, not by type of employment. Data is available on FAS/FSM alcohol offenses. In 2006 FAS/FSM arrests were disproportionately high for alcohol-related offenses though not for drug violations.

Finally, the flow of goods and legal and illegal immigrants into Guam presents opportunities for drug smuggling. The drug methamphetamine was involved in 54% of the drug arrests in 2006 (Guam Police Department 2008). The 2003 Drug Threat Assessment reported that methamphetamine is the most available, most abused illegal drug on Guam (U.S. Department of Justice 2003). It is readily available on Guam due to a steady supply from the Philippines, Hong Kong, China, Taiwan, and South Korea.

#### *Impacts – Operations Phase*

Overall, there exist limited crime data and statistics on individual branches of the armed forces. During the steady state of the operational phase, active-duty Marines and their dependents represent less than 60% of the total population increase resulting from the proposed action. Thus, during the operational phase, crime and social disorder impacts are possible, but similar to the construction phase, are due to an increase in population in general.

*Increase in Overall Crime:* It is expected that an increase in overall crime would occur in proportion to the increase in population on Guam due to the proposed action.

*Increase in Sexual Assaults:* There is potential for an increase in sexual assaults due to an increase in population on Guam.

In 2006, GPD recorded 141 arrests for forcible rape and seven arrests for sex offenses (Guam Police Department 2008). While GPD does not gather specific data on military charged with crimes, Guam Naval Base Security data shows a total of 5 sexual assaults involving military in 2008 and 6 occurring in 2009 (refer to Affected Environment). This data conveys the impression that the impact of sexual assaults by any branch of the military would not be significant.

*Increase in Prostitution:* There is potential that the overall volume of prostitution would grow consistent with the increase population (military and civilian).

Historically, prostitution has long been associated with the presence of military bases. The U.S. military has declared a “zero tolerance” policy regarding prostitution. Realistically, some military personnel, like some civilians, frequent houses of prostitution and engage in other types of commercialized vices. Given that there is already a fairly large military population on Guam, the few 2006 arrests on Guam for prostitution indicate that the problem is not a large one.

*Increase in Drug Use/Substance Abuse:* An increase in drug use and substance abuse is possible due to an increase in population on Guam. “Substance abuse” can include alcohol.

Information on drug use/substance abuse in specific branches of the military was not available for analysis. In 2005, the DoD conducted a survey of 16,037 active-duty military personnel. (Central Broadcasting Service News 2009). Published results did not compare rates among different military services or with civilians of comparable age and socioeconomic status. In addition, there has been nationwide concern that military personnel returning from Iraq and Afghanistan are experiencing a range of difficulties, including the abuse of tobacco, alcohol and illegal drugs as coping mechanisms. The National

Institute on Drug Abuse convened a conference in 2009 to address substance abuse and co-morbidities among military personnel, veterans, and their families.

The drinking age on the Island of Guam is currently 18. There have been discussions about enforcing an on-base drinking age of 21. While there are also discussions of enforcing an off-base drinking age of 21 for military personnel as well, these limits would be difficult to enforce, and would require the attention of the military.

*Increase in Offenses Against Women and Children:* There is potential that the overall volume of offenses in women and children would grow consistent with the increase population (military and civilian).

In 2006, 53 arrests for “Offenses Against the Family” were reported (Guam Police Department 2008). Guam Naval Base Security information shows that: out of the 5 sexual assaults involving military in 2008, all victims were female; out of the 6 sexual assaults involving military and occurring in 2009, 5 victims were female. The data also show that out of the 9 assaults involving military in 2008, 2 involved females; and out of the 12 off-base assaults involving military in 2009, 1 involved a female.

*Increase in Military/Civilian Fights:* Fights have occurred between military and civilian populations since the U.S. armed forces first came to Guam. Occasional personal conflicts occur around all military bases throughout the world and regardless of country or nationality. Despite Guam’s existing military population, such conflicts are not considered a major issue at present, but interviews with various Guam civic leaders found significant concern based in part on a perception of the Marine’s “warrior culture” and in part on widespread memories of encounters when there was a larger military presence on Guam during the Vietnam War period (Guam Civilian Military Task Force Committee on the Environment 2008, Guam Civilian Military Task Force Committee on Health and Social Services 2008, Guam Civilian Military Task Force Committee on Public Safety 2008). Guam Naval Base Security information shows that out of 9 recorded off-base assaults involving military in 2008, and 12 in 2009, all involved civilians as well (refer to Existing Conditions).

Ultimate fighting and mixed martial arts training have been gaining popularity worldwide, and this is also the case among the young civilian population on Guam. Interviews with Guam public safety and youth agencies indicate that there have been reports that youth interested in the sport and undergoing training may test themselves against Marines who have the reputation of possessing fighting skills (Guam Police Department Interview – Volume 9 Appendix F SIAS).

### Political and Chamorro Issues

#### *Approach to Analysis*

Impacts on political and Chamorro issues for both the construction and operational phases may result from the introduction of military and DoD civilian workers into the population. Acquisition or leasing of lands for development would also generate impacts to a lesser extent, and are discussed in the section below this one. In all cases, the more significant impacts on Chamorro issues would be felt during the operations phase as opposed to the construction phase.

Based on scoping input and interviews, Political and Chamorro Issues analysis identifies and addresses the following topics:

- Political minoritization of Chamorros and existing local population by temporary workers, permanent military population, and in-migration related to the proposed action
- Unearthing of Chamorro artifacts
- Perceptions of mutual respect from the U.S. military

*Impacts – Construction Phase*

During the construction phase, the following issues would be possible (more detailed discussion on each of these topics is available in the Volume 9 Appendix F SIAS):

*Minoritization:* At 42% of the population, Chamorros are already a minority on Guam (although they are still a plurality – i.e., the largest single group). The incoming wave of temporary H-2B construction workers and other workers associated with a construction boom could increase Chamorro feelings of marginalization. However, the portion of these workers from the FAS or on H-2B visas would lack political rights, and most of these workers would leave Guam after 2016. Therefore, the construction component should not have significant ongoing political minoritization impacts for indigenous Chamorros or the existing local population.

*Artifacts:* There is a concern that military development could unearth Chamorro artifacts. Chamorro groups such as the DCA, the Guam Council on the Arts & Humanities Agency, and the Guam Museum are requesting the military give the anticipated artifacts and provide funding to the Guam Museum. Refer to Chapter 12, Cultural Resources of this Volume for a discussion of the curation of artifacts.

*Impacts – Operations Phase*

During the operational phase, the following impacts would be possible:

*Minoritization:* Overall, the analysis indicates a sustained increase of approximately 33,500 people on Guam. Most of these people would have political rights as U.S. citizens. Therefore, their sustained presence could affect Chamorro culture in a number of ways.

Firstly, the continued decrease in the proportion of the local voting population relative to the total island population could impact ongoing and future political debates. A reduction in Chamorro and local voting power may also be felt on the policy level, when cultural tradition is involved. For example, it is commonly agreed among Chamorro politicians that public funds should be spent to support funeral and wake activities. However, non-Chamorro elected officials may not appreciate this cultural tradition, risking the elimination of these and related policies or practices (Guam DCA Interview – Volume 9 Appendix F SIAS).

On a cultural level, while the loss of the Chamorro language has been occurring for years on Guam, it may be accelerated with the military relocation, due to an increase in the non-Chamorro speaking population on the island. Guam's integration into the larger English-speaking American society has been correlated with a loss of the use of Chamorro language in everyday life. A survey of Chamorro residents (Santos and Salas 2005) found that 90% said the language was a source of pride, and students are learning to read and write the language with more comprehension than most of their elders. However, younger people are much less able to speak and comprehend the spoken language than their elders. Younger people speak the language primarily just with older relatives, not among their peers. This loss of language skills is a common occurrence where a more dominant culture influences a minority culture.

*Respect:* The Chamorro concept of inafa'maolek holds that society is based on good relationships and mutual respect. Inafa'maolek is based on varying familial relationships, and reciprocal obligations between two people in any of these relationships. The relationships tend to be based on age, with the older person owing the younger person responsibility, and the younger owing the older deference. Chamorros expect people to approach their relationships with the wider society conforming to the philosophy of respetu (respect). This philosophy involves respecting the environment and society that the individual lives. Chamorros are held to inafa'maolek and respetu by a strong sense of mamahlao, or shame. A proper

Chamorro has a sense of mamahlao in social situations, and does not openly contradict a superior or act outside of social mores (Guam DCA 2003).

Nuanced aspects of the way the military deals with the Chamorro population on Guam would determine the perception of whether they respect the local population and culture. A survey by the Public Affairs and Legal Studies club at the UoG found over 80% of respondents wanted to tell the military that communication would be the surest sign of respect and path to smooth interaction on Guam (KUAM 2008).

### Community Cohesion

#### *Approach to Analysis*

The negative interactions related to incoming new population discussed here do not rise to the level of major issues previously discussed under “Crime and Serious Social Disorder,” but are more likely to be irritants that may undermine a sense of mutual respect between groups.

Also, the arrival of new populations can bring positive benefits that infuse communities with opportunities for more meaningful interactions.

Topics identified and addressed include:

- Increase in Cultural Conflicts
- Increase in Military Outreach/Community Programs

#### *Impacts – Construction Phase*

During the construction phase, issues of cultural conflict would be possible (more detailed discussion on each of these topics is available in the Volume 9 Appendix F SIAS). The following discussion outlines examples of cultural discontinuities that could emerge during the construction component, producing conflict. Such discontinuity and conflict could reach significant levels as greater numbers of immigrants arrive.

Large-scale in-migration of culturally different populations can easily lead to tension with the host community’s longtime residents (United Kingdom Department of Communities and Local Government 2007). The main populations relevant to this proposed action are H-2B construction workers or groups from the Asia Pacific region that may in-migrate for available indirect jobs.

As previously discussed, Guam’s temporary foreign workers (H-2Bs) are generally regarded causing few disruptions to the community. However, there has been some historical experience with foreign construction workers who, due to unfamiliarity with local conditions and prohibition, have disturbed local customs or environments. For example, temporary foreign workers have upset residents by harvesting marine animals normally not consumed on Guam (species considered too small), and by taking shells and corals to the point where reefs have been damaged (Guam Bureau of Statistics and Plans Interview – Volume 9, Appendix F SIAS).

Public health and education issues arise in relation to immigrants from the FAS who come to Guam for direct construction work or new indirect jobs. A 2001 General Accounting Office report on Micronesian migration cited data showing that COFA migrants were working low-paying jobs that required few skills, and that most (more than 50%) were living at poverty levels on Guam, Hawaii, and the CNMI in conditions that places a strain on public services.

Conflicts between local and in-migrant customs related to housing and living conditions is also an issue on Guam. For example, up to 15 or 20 individuals from these groups have been reported to reside in a single housing unit, and there are stories of subdivided lots without sewer connections or other infrastructure being sold by unscrupulous developers to Micronesians, who find it natural to live in the “traditional” rural style found on their home islands (Guam Contractors Association 2008, Guam Housing and Renewal Authority 2008). Causes of these conflicts can occur because public health standards are not the same from island of origin to host island. It is also argued that these in-migrants accept such crowding and harmful living conditions because of economic reasons, not because it is a cultural norm – i.e., these same in-migrant groups do not live with the same household densities in their home islands (Center for Micronesian Empowerment Interview – Volume 9 Appendix F SIAS).

Cultural conflicts can also be observed in the education sector. Based on existing information, the education level completed by FAS in-migrants is low when compared to Guam and U.S. national averages. Few have college degrees and just over 50% have graduated from high school (General Accounting Office 2001). As mentioned in the Crime and Serious Social Disorder section, the acceptance of lower educational requirements in Micronesia by in-migrants to Guam may be reflected in lax parental enforcement of school attendance, and higher levels of truancy for Micronesian students.

#### *Impacts – Operations Phase*

During the operations phase, issues of cultural conflict would also be possible (more detailed discussion on each of these topics is available in the Volume 9 Appendix F SIAS).

As noted in the Chamorro Issues section, concerns about increased military-civilian conflict often reflect beliefs that incoming populations would not have sufficient knowledge of and respect for local culture. Also noted previously, the way the military works with the local population and efforts made to understand local issues, would determine whether increased cultural conflicts would occur in the military operational phase. Already in place is a newcomers’ orientation program offered by the Navy and the Air Force that informs newly assigned service members and their families about the culture and uniqueness of Guam (Office of the Governor of Guam 2009).

Military outreach and community programs should increase during the operations phase. For decades, a variety of community service programs have encouraged positive interaction and cultural exchange between the military and civilian populations on Guam. Many of these programs were instituted by the Naval and Air Force commands on the island (Office of the Governor of Guam 2009).

These programs have the potential to bring a beneficial impact to Guam to the point that positive interactions could strengthen military ties to local communities. For example, the larger military contingent would add greater numbers of volunteers to community service programs that would bring together both military and civilian groups working toward shared goals.

Some examples of these programs are:

1. Sister Village Program - Military units are paired with villages to foster mutual sharing and understanding between the people of Guam and the military personnel and their family members stationed on Guam. School partnerships with military units were established in 1987.
2. In 1997, volunteer efforts were formally expanded in five project categories to help strengthen education and the quality of life on Guam through joint military and community effort. Those project categories include:
  - Partnership in Education

- Guest Teacher Program
  - Health, Safety, and Fitness
  - Environmental Stewardship
  - Campaign Drug
  - Project Good Neighbor (Pacific Daily News 2008)
3. Naval Hospital Guam Community Services
    - Staff contribute thousands of community service hours on projects such as school clean-up, work with Guam Animals in Need and countless other organizations
    - Naval Hospital received top honors in the 2008 Navy Environmental Stewardship Flagship Award for large, shore-based commands
    - Most notable is the nursing mentorship that is provided for seniors of the UoG nursing program (Naval Hospital Guam Interview – Appendix F SIAS)
  4. Andersen Air Force Base Programs
    - Big Brother Big Sister
    - Donations to schools through the DoD Computers for Learning Program (Lessard 2008)
    - Air shows open to the community

### Recreational Fishing

Several factors play a key role in both the fish resource and the activity of recreational fishing, including boat ownership, areas with fishing restrictions, and pressures on the fish stocks. During interviews conducted for the SIAS (Appendix F of Volume 9), some concerns were voiced by the Guam Fishermen's Cooperative Association regarding the potential sociocultural impact of the proposed action on the traditional fishing community. There is a concern that a potential increase in boat ownership because of military leisure time that is often spent at the water (not necessarily fishing) may cause a dramatic change in the life of the fishing community, along with worries that more regulation and more conservation areas could be established to mitigate more fishing activity.

The number of military and construction workers that will take up fishing on Guam cannot be directly quantified. However, with the increase in population size that is expected through direct increase in the military population and indirect growth due to the temporary construction workforce, induced civilian population growth, and anticipated regular civilian growth, there would likely be some increase in recreational angling.

Impacts to coral reef ecosystems which support fisheries and other human interests in the region are anticipated. Increased population size on Guam would increase negative impacts to reefs from anthropogenic activities without implementation of avoidance and minimization measures described below.

#### *Impacts – Construction Phase*

Depending on the amount of fishing done by construction workers and other induced population, there could be indirect significant impacts to recreational and traditional fishing during the construction period. Most temporary workers would be at work during daylight hours, and therefore only able to participate in recreational fishing at night, on weekends, or during holidays, which could reduce the anticipated increase in fishing activity. The impacts would be short-term and localized, and therefore minimal. No adverse effect to EFH is expected from the proposed action.

Impacts to the coral reef ecosystem located near the project area may occur from increased use of this resource by construction workers; the magnitude of impacts is directly related to the increase in

recreational use. DoN plans to educate its service members, dependents and construction workers on the importance of coastal ecosystems and the proper way to interact with those resources to avoid and minimize damage to reefs typically caused by anchors, reef-walkers, or reckless diving, snorkeling, and fishing activities. Impacts are expected to be short-term and localized, and therefore minimal. No adverse effect to EFH is expected from the proposed action.

Short-term and minimal impacts are expected from run-off associated with construction activities, with the implementation of LID and BMPs required by Army Corps of Engineers (ACOE) construction permits limiting the magnitude of impacts.

#### *Impacts – Operations Phase*

Direct impacts to fishing due to the growth in the military population and dependents are expected to be less than significant. This is based partly on studies indicating that military personnel do not play a large role in recreational fishing (Allen and Bartram 2008). As noted, military personnel tend to use charter services and these made up only 7% of the fleet. The majority of recreational fishing is done by local residents, with a much smaller group made up of tourists, military personnel, and residents associated with the military (Allen and Bartram 2008). Given these factors, it is not expected that direct impacts to recreational fishing would be significant. Recreational and traditional fishing has been in decline since the mid 1990's, in both trip numbers and catch levels. It is also recognized that while fishing has been historically and culturally important, trends suggest that community dependence on seafood is waning (Allen and Bartram 2008). In addition, the WPRFMC (2009b) indicates that the fish resources surrounding Guam are not being over fished. Current levels of recreational fishing are well below the historic highs of the 1990's, and the military relocation on Guam is not likely to contribute directly to further decline of this resource. Therefore, long-term impacts of the proposed action would be less than significant.

Impacts to the coral reef ecosystem surrounding Guam may be long-term and localized. Coral reef ecosystems are threatened by human activities such as direct damage to reefs from anchors, increased fishing pressures, including destructive fishing methods, reef walking by beach goers at low tide, and floundering snorkelers and divers, and indirect damage from coastal runoff and pollution, including increased wastewater treatment plant (WWTP) discharges. All of these potential impacts are directly related to increased population size. DoN plans to educate its service members, dependants and construction workers on the importance of coastal ecosystems and the proper way to interact with those resources to avoid and minimize damage to reefs typically caused by anchors, reef-walkers, or reckless diving, snorkeling, and fishing activities. The DoN anticipates increased coastal resource management from local and federal agencies with the pending induced population growth.

With respect to wastewater upgrades, the Realignment Roadmap Agreement between the U.S. Government and the Government of Japan (GoJ) states that Japan will provide funding to develop facilities and infrastructure on Guam to enable the U.S. Marine Corps relocation. Currently, the GoJ is considering funding approximately \$580 million of water and wastewater improvement projects. Northern District Wastewater Treatment Plant (NDWWTP) upgrades are a priority since the majority of increased wastewater flows associated with the military relocation would occur at this plant. Please see supplemental information provided in our June 11 email regarding details and potential benefits of NDWWTP upgrades. Additionally, the Council on Environmental Quality is facilitating interagency discussions with DoD and appropriate federal agencies to identify specific utilities projects, the level of funding, and source of funding for necessary water and wastewater infrastructure improvements that must be accomplished in the first five (5) years of the military relocation effort to bridge the gap between GoJ

funding and remaining Guam utilities infrastructure needs. This includes identifying funding for the remaining WWTP's on Guam. Lastly, the Economic Adjustment Committee (EAC) is evaluating overall Guam civilian hard (e.g.: facilities) and soft (e.g.: manpower, operations & management) infrastructure needs, including those associated with the proposed DoD relocation for water and wastewater improvements, that may not be provided by GoJ financing.

Failure to secure necessary funding may require that DoD delay or not issue construction contracts or task orders until such time as the financing is received from the GoJ and the necessary improvements to the NDWWTP primary treatment capability are implemented. Such action would severely impact the construction pace and the ability of Navy to complete required construction to support the Marine Corps relocation.

Impacts are expected to be long-term; however minimal and localized, therefore less than significant. No adverse effect to EFH is expected from the proposed action.

### 16.2.3 Land Acquisition Impacts

This section details the various potential socioeconomic impacts of the proposed land acquisition.

There are multiple siting alternatives identified for various components of the proposed action. Land acquisition is required to support three of the four Marine Corps main cantonment alternatives and both of the training range complex alternatives. The preferred alternatives are Alternative 2 for the main cantonment and Alternative A for the training range complex.

Table 16.2-52 shows the land parcels proposed for potential acquisition in each alternative, while Table 16.2-53 provides more information on real estate characteristics of land acquired, by alternative. Impacts for each action alternative are additive, according to the parcels that are included in that alternative. Therefore, impacts are first discussed by parcel, and then further shown by alternative.

**Table 16.2-52. Summary of Private Land Parcels included in each Alternative**

<i>Main Cantonment Alternative #</i>	<i>Former FAA Parcel Included?</i>	<i>Harmon Annex Parcel Included?</i>	<i>Route 15 Training Alternative A or B Included?</i>
<b>1</b>	YES	YES	YES
<b>2</b>	YES	NO	YES
<b>3</b>	NO	NO	YES
<b>8</b>	YES	NO	YES



**Table 16.2-53. Summary of Impacts of Land Acquisition by Alternative**

	<i>Alternative 1</i>		<i>Alternative 2 &amp; 8</i>		<i>Alternative 3</i>	
	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
Potential Increase in Federal Land (ac/ha)	2,096/848	2,803/1,134	1,768/715	2,475/1,001	1,090/441	1,797/727
Private Land Potentially Acquired (ac/ha)	253/102	1,104/447	11/4	862/349	11/4	862/349
GovGuam Land Potentially Acquired (ac/ha)*	1,841/745	1,697/687	1,757/711	1,613/653	1,079/437	935/378
<i>GALC Land Potentially Acquired (ac/ha)</i>	<i>1,079/437</i>	<i>1,157/468</i>	<i>995/402</i>	<i>1,073/434</i>	<i>307/124</i>	<i>395/160</i>
<i>CLTC Land Potentially Acquired (ac/ha)</i>	<i>259/105</i>	<i>156/63</i>	<i>259/105</i>	<i>156/63</i>	<i>256/104</i>	<i>156/63</i>
Number of Lots Potentially Acquired	54	287	30	263	12	245
<i>GovGuam Lots Potentially Acquired</i>	<i>31</i>	<i>50</i>	<i>29</i>	<i>48</i>	<i>11</i>	<i>30</i>
<i>Private Lots Potentially Acquired</i>	<i>23</i>	<i>237</i>	<i>1</i>	<i>215</i>	<i>1</i>	<i>215</i>
Number of Occupants on Land Parcels	8	23	7	22	6	21
Potential Loss of Property Tax Revenues	\$44,346	\$87,146	\$1,500	\$44,300	\$1,500	\$44,300
Decrease in Debt Ceiling	\$3,520,000	\$6,944,199	\$120,000	\$3,544,199	\$120,000	\$3,544,199

### 16.2.3.1 Former FAA Parcel

The Former FAA parcel is located south of NCTS Finegayan and extends east to west between the Philippine Sea coastline and Route 3. On the southern boundary is the GLUP 77 parcel (non-DoD) and Finegayan South (DoD). The parcel is part of the preferred alternative for the Main Cantonment (Alternative 2) as well as Main Cantonment Alternatives 1 and 8. Proposed use for the parcel would be for the main cantonment, primarily community support, and bachelor housing components. Though the Former FAA parcel would extend from Route 3 to the coastline, development would not extend beyond the cliff-line toward the ocean. The Navy controls the adjacent submerged lands and no acquisition of submerged lands is proposed.

#### Economic Impacts

##### *Individual Owner/Occupants*

Preliminary research of public land records has identified that there may be one or more private owners or claimants on a portion of the Former FAA parcel. Any economic impacts would depend on verification of ownership status and whether a particular claim has been perfected.

##### *Community*

##### Equity Value of Private Land

Because it has not been verified that any privately-owned land would be acquired on the Former FAA parcel, impacts to equity value of private land are not estimated.

### Recreational Value

Affected recreation sites are listed in Section 16.1.7.5. Each of the sites is utilized by Guam residents. The loss of these sites would limit the number of choices for recreational activities available to local residents.

The sites listed in Section 16.1.7.5 are not major tourist attractions and the loss of these sites would not directly impact Guam's tourism industry. There may be small indirect impacts to tourism as Guam residents seeking alternatives to lost recreational sites may increase visitation of tourist attractions, competing with tourists for access.

### Agricultural Production

The Former FAA parcel is zoned for Hotel/Resort use and no known agricultural production currently takes place on the parcel. Land acquisition of the Former FAA parcel would have no impact on agricultural production.

### Indirect Economic Impacts

The Former FAA parcel is currently undeveloped. Replacement of this area with the expected primary uses of military family housing, community support and bachelor housing would have indirect economic impacts.

In general, the more developed an area is, the higher property values will be, and thus the development of the Former FAA parcel may affect the value of nearby areas. Higher property values due to nearby development are a product of, among other things, the convenience of local markets and restaurants or proximity to places of work.

Proposed development of the Former FAA parcel would likely not generate greater convenience to local markets for residents of the surrounding area. However, community support and bachelor housing development would have some associated employment which may make the surrounding residential areas more valuable to those workers who seek to minimize their commutes. The extent to which this would affect property values in the surrounding area is unknown but some related price increase could be expected.

There are potential economic impacts for nearby businesses. The residents of the on-base facilities would have access to on-base shopping and are expected to do most of their shopping on base. However, nearby shops which may carry items not found on base could see some increased business. The nearby Micronesian Mall, for instance, is occupied by numerous specialty shops which provide unique products and services, as well as more of a "shopping experience" than may be found at on-base exchanges. Thus it is also expected that the acquisition of the Former FAA parcel, would bring about higher foot traffic to nearby specialty commercial establishments and especially as it is part of the larger proposed action, land acquisition may lead to higher commercial rents at the Micronesian mall and nearby strip malls.

### GovGuam

#### Property Tax Revenues

Preliminary research shows that all of the land in the Former FAA parcel is owned by GALC. Because GALC is a GovGuam agency and does not pay property taxes, land acquisition would not have any impact on property tax revenues.

### Adjustments to Guam's Debt Ceiling

It cannot be verified whether acquisition of the Former FAA Parcel would cause a change in the amount of private land subject to GovGuam property taxes and, in turn, a change the assessed value of taxable land cannot be verified.

### License and Lease Revenue

All of the land in the Former FAA parcel is owned by GALC. Some of the land is used for buried cable lines; however, it does not appear that there is a commercial license that generates GALC revenue. Since no revenue is attached to the land, no community programs would require budgetary cutbacks, and no economic impacts are expected if land acquisition takes place.

GALC owns approximately 680 ac (275 ha) of the Former FAA property, but it is not currently generating revenue from this property. If land acquisition takes the form of a long-term lease to the federal government, GALC would see an increase in its annual lease revenues. At an estimated lease rate of \$3,099/acre/year, GALC's lease revenue would increase by about \$2.1 million per year.

### Payments and Fees for Use of Recreational Resources

Recreational facilities for the Former FAA parcel are listed in Section 16.1.7.5. There are no recreational facilities operated by GovGuam on the Former FAA parcel, thus there are no lost fees.

### Sociocultural Impacts

#### *Individual Owner/Occupants*

The acquisition of this parcel would mean an acquisition of approximately 680 ac (275 ha) and 18 lots. All lots are currently unoccupied except one lot on the northwest section of the parcel, along the coast line. This lot is under claim by an individual. Thus, the relocation of approximately one claimant may be required. In addition, acquisition of this land may reduce the land-based resources available to other claimants.

#### *Community*

The acquisition or long-term leasing of this parcel would increase the acreage of DoD controlled land on Guam by 680 ac (275 ha). This would represent reacquisition of federal land, as the parcel was formerly used as a housing site for the FAA and has been released by the federal government to GovGuam.

The potential acquisition of the Former FAA parcel may result in cultural marginalization of community members. This parcel is made up of lands where qualified ancestral property rights can be accrued, and thus have a higher possibility of representing patterns of social organization and interpersonal ties to former Chamorro family owners of land, even though ancestral property rights have not yet been determined by the GALC.

As noted in the Affected Environment section, the following recreational and cultural sites are located in the Former FAA parcel:

- A walking/jogging trail
- Ague Cove
- Hilan'an Rock Shelter
- WWII-era Navy Communications Camp

If land acquisition of the Former FAA parcel were to occur, access to and use of the walking/jogging trail located on the parcel would be restricted. Chapter 8 of this Volume, Recreational Resources, notes that comparable resources for civilian use would be available in adjoining properties.

Chapter 12 of this Volume, Cultural Resources, notes that operation of facilities on the Former FAA parcel would bring additional personnel into the area, which could in turn increase vandalism of the cultural and historical sites located on the parcel.

In addition, access to these sites to the public would be restricted. Although it is DoD's intent to maintain public access to DoD lands that contain cultural sites, access permission is to be consistent with safety and operational requirements and areas would not be as accessible under DoD ownership or control as they previously were.

#### *GovGuam*

Land acquisition of this parcel would primarily affect the GALC, as all parcel lots are managed by the GALC with the assistance of GEDA.

#### 16.2.3.2 Harmon Annex

The Harmon Annex parcel is located south of Navy GLUP 77 and Finegayan South. Route 3 and residential development are located to the east of the parcel, and non-DoD land to the south and the west. The area of interest is located inland from the coastline. The parcel is part of the Main Cantonment Alternative 1, but not part of the preferred alternative. The proposed use of the Harmon Annex property would be military family housing. No acquisition of submerged lands is proposed and the parcel does not border the ocean. The submerged lands in the vicinity are Navy-owned.

#### Economic Impacts

##### *Individual Owner/Occupants*

##### Landowners

Twenty-two (22) of the 24 Harmon Annex lots are privately owned.

If land acquisition of these lots were to occur through negotiated purchase with these owners, in the short and medium term, the landowner's financial condition would be considered unchanged because there would be agreement on the purchase, the purchase would take place at fair market value and neither party can be considered to have profited. Thus land acquisition would not cause economic impact.

##### Displaced Occupants

There are no tenants on the Harmon Annex parcel other than one claimant. Economic impacts on the claimant are unknown and depend on whether a displaced occupant would be eligible for relocation assistance benefits under the Uniform Act.

##### *Community*

##### Equity Value of Private Land

There are 243 ac (98 ha) of privately-owned land in the Harmon Annex parcel. Based on a Multiple Listing Service (MLS) search conducted in November of 2009, the median value of undeveloped land in Dededo, where the parcel is located, is \$202,343 per acre – this is an advertised value, not a market value, and thus is considered a generally high base value for analysis. If it is assumed that all 243 ac (98 ha) are valued at the median land value (\$202,343 per acre), it can be estimated that a maximal impact scenario

estimate of the total value of equity in private land in the Harmon Annex parcel is about \$49 million. Because the Harmon Annex parcel is undeveloped, it is assumed that it is not income producing.

According to FDIC rules and regulations, a landowner may expect to obtain a loan in the amount of approximately 75% of the value of their land. To present a maximal impact scenario if it assumed that all of the equity value in the Harmon Annex parcel were mortgaged, then the private owners of Harmon Annex properties may receive loans amounting to \$36.8 million in the aggregate to start new businesses.

#### Recreational Value

Affected recreation sites are listed in Section 16.1.7.5. Each of the sites is utilized by Guam residents. The loss of these sites would limit the number of choices for recreational activities available to local residents.

The sites listed in Section 16.1.7.5 are not major tourist attractions and the loss of these sites would not directly impact Guam's tourism industry. There may be small indirect impacts to tourism as Guam residents seeking alternatives to lost recreational sites may increase visitation of tourist attractions, competing with tourists for access.

#### Agricultural Production

No land in the Harmon Annex parcel is zoned for agriculture although the Land Acquisition Baseline Report shows photographic evidence of some sparse agricultural production on the parcel.

#### Indirect Economic Impacts

The Harmon Annex parcel currently sits undeveloped. Replacement of this area with the expected uses of community support, and family housing, would have indirect economic impacts.

In general, the more developed an area is, the higher property values will be. In general, higher property values due to development are due to, among other things, the convenience of local markets and restaurants or proximity to places of work.

Because of the nature of the development, an increase in residential property values due to increased convenience is not expected. However, community support and family housing that would go on the Harmon Annex parcel would have some associated employment which may make the surrounding residential areas more valuable to those workers who seek to minimize their commutes. The extent to which this would affect property values in the surrounding area is unknown but some related price increase could be expected.

There are potential economic impacts for nearby businesses. The residents of the on-base facilities would have access to on-base shopping and are expected to do most of their shopping on base. However, nearby shops which may carry items not found on base could see some increased business. The nearby Micronesian Mall, for instance, is occupied by numerous specialty shops which provide unique products and services, as well as more of a "shopping experience" than may be found at on-base exchanges. Thus it is also expected that the acquisition of the Harmon Annex parcel, would bring about higher foot traffic to nearby specialty commercial establishments and especially as it is part of the larger proposed action, land acquisition may lead to higher commercial rents at the Micronesian Mall and nearby strip malls.

#### *GovGuam*

##### Property Tax Revenues

There are 243 ac (98 ha) of land in the Harmon Annex parcel that are privately owned and subject to GovGuam property tax. Neither GDLM Records Division nor Guam Department of Revenue and

Taxation Real Property Tax Listings had current data on the assessed values of this land or whether GovGuam has collected property taxes associated with this land. The remaining 84 ac (34 ha) of land in the parcel are owned by GALC, which does not pay property taxes to GovGuam.

To provide a maximal impact scenario estimate of lost tax revenues, data from Table 16.1-26 is used to proxy the appraised value of the 243 ac (98 ha) of privately-owned land in the Harmon Annex parcel. Table 16.1-28 shows that an acre of land in Dededo may be appraised at \$202,343/acre. The total appraised value of private land in the Harmon Annex parcel would then be equal to \$49 million (243 acres x \$202,343/acre). The assessed value of the land would equal \$34 million (\$49 million x 70%), and the total, annual, tax revenue lost to GovGuam would equal \$42,846 (\$34 million x 0.125%).

#### Adjustments to Guam's Debt Ceiling

GovGuam's debt ceiling is equal to 10% of the assessed value of taxable land. Based on the tax maximal estimate of assessment value, above, of \$34,000,000, and using the conservative assumption that all of the private land in the parcel is included in the tax roll, acquisition of the Harmon Annex parcel would adjust GovGuam's debt ceiling downward by \$3,400,000.

#### License and Lease Revenue

Two lots, comprising 84 ac (34 ha) within the Harmon Annex parcel, are owned by GALC. Both lots are largely undeveloped (about 3 ac [1.2 ha] are used as a road corridor). However, it does not appear that the GALC has issued any revenue-generating commercial licenses for this parcel. Since no revenue is attached to the land, no community programs would require budgetary cutbacks, and no economic impacts are expected if land acquisition takes place.

GALC owns approximately 84 ac (34 ha) of land in the Harmon Annex. If land acquisition takes the form of a long-term lease to the federal government, GALC would see an increase in its annual lease revenues. At an estimated lease rate of \$3,099/acre/year, GALC's lease revenue would increase by about \$260,000 per year.

#### Payments and Fees for Use of Recreational Resources

Recreational facilities for the Harmon Annex parcel are listed in Section 16.1.7.5. There are no recreational facilities operated by GovGuam on the Harmon Annex parcel, thus there are no lost fees.

#### Sociocultural Impacts

##### *Individual Owner/Occupants*

The acquisition of this parcel would mean an acquisition of approximately 328 ac (133 ha) of land and 24 lots. Twenty two (22) of the Harmon Annex lots are privately owned. All privately-owned lots are currently unoccupied.

Because 15 of the privately owned lots represent lands that were transferred due to ancestral property rights (transfer was done through a GALC deed), there is the possibility of cultural marginalization impacts due to the military acquisition of the Harmon Annex parcel, as these parcels of land have a higher possibility of representing patterns of social organization and interpersonal ties to Chamorro family owners of the land.

One GALC lot is occupied. Although this is a GALC lot, it is under claim by an individual. Thus, the relocation of approximately one claimant may be required. In addition, acquisition of this land may reduce the land-based resources available to other claimants.

### *Community*

The acquisition or long-term leasing of this parcel would increase the acreage of DoD controlled land on Guam by 328 ac (113 ha). This would represent reacquisition of federal land, as the parcel was former Air Force land that was released from federal land inventory as surplus federal lands under the Guam Excess Land Act 1994.

The potential acquisition of the Harmon Annex parcel may result in cultural marginalization of community members. This parcel is made up of lands where qualified ancestral property rights can be accrued, and thus have a higher possibility of representing patterns of social organization and interpersonal ties to former Chamorro family owners of land, even though ancestral property rights have not yet been determined by the GALC.

One NRHP-eligible archaeological site has been identified on the Harmon Annex parcel, containing prehistoric pottery and WWII and post-WWII *lancho* elements. In addition, a cleared space is still utilized for the flying of model aircraft. Although it is DoD's intent to maintain public access to DoD lands that contain cultural sites, access permission is to be consistent with safety and operational requirements and areas would not be as accessible under DoD ownership or control as they previously were.

### *GovGuam*

Two lots on the Harmon Annex parcel are GovGuam land managed by GALC.

#### 16.2.3.3 Route 15 Lands

Route 15 is a roadway aligned north-south along the east coast (Pacific Ocean) of the island, connecting Route 10 from the south to Route 1 near the Andersen AFB gate. Its current functional classification is as a Minor Highway (connecting smaller communities and traffic generators to larger highways). These roads carry moderate volumes of traffic over comparatively short distances (Guam Bureau of Statistics and Plans, 2009b).

The proposed firing ranges for Training Alternatives A and B require acquisition of non-federal land located east of Route 15 and Andersen South. Alternative A lies north of the Alternative B parcel, and there is an overlap (approximately 845 ac [342 ha]) between the two options. The proposed action requires the acquisition of either Alternative A *or* Alternative B, not both Alternatives A *and* B.

Alternative A is the preferred training range alternative.

In both options, Route 15 would be the boundary between non-firing and firing range complexes. Alternative A would include the realignment of a portion of Route 15 to go through Andersen South, with a fence constructed on either side of the road. The southeast corner of Andersen South would be incorporated into the live-fire training complex but is not included in this analysis because it is currently DoD land and would not have to be acquired. Alternative B would not require the realignment of Route 15.

The land disturbance required for firing ranges is concentrated at the firing points and targets, and perimeter access road and fencing. The majority of the site would remain naturally vegetated open space and encompass the SDZs.

DoD anticipates acquiring the minimum amount of land needed to safely construct and operate the proposed firing range. The intent would be to acquire the minimum acreage required.

## Economic Impacts

### *Individual Owner/Occupants*

#### Landowners

One out of twelve lots in the Route 15 Alternative A parcel is privately owned and 88% of lots in the Route 15 Alternative B parcel are privately owned.

If land acquisition of these lots were to occur through negotiated purchase with these owners, the landowner's financial condition would be considered unchanged because there would be agreement on the purchase, the purchase would take place at fair market value and neither party can be considered to have profited. Thus land acquisition would not cause economic impact.

#### Displaced Occupants

Six Alternative A lots are occupied, including one lot occupied by CLTC licensee Guam International Racing Federation. Twenty-one Alternative B lots are occupied, also including the lot occupied by the Guam International Racing Federation. Relocation of these occupants would be required, if their leases and licenses still remained current by the time of acquisition.

The Affected Environment section discusses the relocation process for occupants (individuals and businesses) of acquired land, which would affect tenants. The relocation process, under both negotiated purchase and eminent domain, compensates occupants for improvements to land and for relocation expenses. Since there is full compensation, the land acquisition process leaves occupants of acquired land in an unchanged economic condition and there is no economic impact.

There is also one CLTC lease to an occupant on the Route 15 Option A parcel. This lease is given at a rate of \$1 per year, which is far below market value.

### *Community*

#### Equity Value of Private Land: Route 15 Alternative A

There are 11 ac (4 ha) of privately-owned land in the Route 15 Alternative A parcel. The median value of an acre of land in Mangilao, where the majority of the parcel is located, is \$246,499. The total equity value of private land in the Route 15 Alternative A parcel is estimated to be a maximum of \$2.7 million (11 acres x \$246,499/acre).

In keeping with the presentation of a maximal impact scenario, if the assumption is made that all private landowners chose to use the value of their land as collateral for a new business loan, the landowner could expect to obtain a loan of about 75% of the value of the land (Federal Deposit Insurance Corporation 2000) and the private owners of Route 15 A properties could receive a loan amounting to \$2 million (75% of \$2.7 million) to start new businesses.

#### Equity Value of Private Land: Route 15 Alternative B

There are 862 ac (349 ha) of privately owned land in the Route 15 Alternative B parcel. The median value of an acre of land in Mangilao, where the majority of the parcel is located, is \$246,499. The total equity value of private land in the Route 15 Alternative B parcel is estimated a maximum of \$212.5 million (862 acres x \$246,999/acre).

If all of the equity value in the Route 15 B parcel were mortgaged (a maximal impact scenario assumption), then the private owners of Route 15 B properties could receive a loan amounting to \$159.4 million (75% of \$212.5 million) to start new businesses.



### Recreational Value

Affected recreation sites for the Route 15 parcel, Alternatives A and B, are listed in Section 16.1.7.5. Each of the sites is utilized by Guam residents. The loss of these sites would limit the number of choices for recreational activities available to local residents – reducing the overall economic benefits from recreation that are available to them on Guam.

Sites such as Pagat Village/Cave, Pagat Point and the Guam International Raceway also have value to Guam's tourism industry. The loss of these sites would likely reduce business and government revenues stemming from tourism.

### Agricultural Production: Route 15 Alternative A

The entire Route 15 A parcel is zoned for agricultural use; however, only 3 ac (1 ha) have a current land use of subsistence agriculture and none of the land in the parcel is being used for productive (beyond subsistence) agriculture. The three acres currently used for subsistence agriculture are either owned or occupied by one family. The food supply of this family could be impacted by land acquisition. The exact scope of subsistence agriculture in this parcel is unknown and thus difficult to value. However, whatever the magnitude of this use, the use would be considered an improvement to the land. Since the presence of subsistence agriculture would be considered an improvement to the land, it would be considered when determining amount of compensation in the land acquisition process.

### Agricultural Production: Route 15 Alternative B

The entire Route 15 B parcel is zoned for agricultural use; however, only 11 ac (4 ha) have a current land use of subsistence agriculture and none of the land in the parcel is being used for productive (beyond subsistence) agriculture. The 11 ac (4 ha) currently used for subsistence agriculture are either owned or occupied by a small number of families (probably less than five). The food supply of these families would be impacted by land acquisition. The exact scope of subsistence agriculture in this parcel is unknown and thus difficult to value. However, whatever the magnitude of this use, the use would be considered an improvement to the land. Since the presence of subsistence agriculture would be considered an improvement to the land, it would be considered when determining amount of compensation in the land acquisition process.

### Indirect Economic Impacts

Noise contouring studies have shown that exposure to noise generated at the firing ranges may be considered incompatible with noise-sensitive residential land uses in surrounding areas. Alternative A appears to have the potential to affect a smaller amount of existing land – approximately 23 of the surrounding lots are currently occupied. Alternative B appears to have the potential to affect a larger amount of existing land use - there are approximately 68 occupied areas surrounding the Alternative B parcel of land. While noise levels reach those considered incompatible with current land use.

### Indirect Economic Impacts: Residential

The intended military use for the Route 15 Alternatives A and B parcels would be for training. Training in the area is expected to produce a significant noise impact to the point where surrounding areas are affected. These sorts of conditions would be generally displeasing to nearby residents and thus may lead to lower residential housing prices for the surrounding area (Guam News Factor 2009).

### Indirect Economic Impacts: Commercial

Since personnel would travel to training facilities and then back to living facilities on a daily basis, and personnel would likely not patronize commercial establishments during these ventures, it is unlikely that land acquisition of this parcel would support any new nearby commercial establishments. Furthermore, it is unlikely that, since residential values may fall – and new residential development may be curbed – that existing commercial establishments would see increasing traffic which may lead to higher commercial rents. The training associated with land acquisition would more likely lead to stable or declining values than to increasing values.

#### *GovGuam*

##### Property Tax Revenues: Route 15 Alternative A

There are 11 ac (4 ha) of land in the Route 15 Alternative A parcel that are privately owned and would be subject to GovGuam property tax. At a 70% assessment rate, the average, per acre tax assessment for Route 15 lands is \$108,839. The total tax assessment for private lands is estimated to be \$1.2 million (\$108,839x 11).

Land is taxed at 0.125% of assessed value so the total lost property tax revenue to GovGuam would equal \$1,500 per year (1.2M x 0.125%). GovGuam, CLTC and GALC, whom do not pay property tax, own the remaining 1,079 acres of land in the Route 15 Alternative A parcel.

##### Property Tax Revenues: Route 15 Alternative B

There are 862 acres of land in the Route 15 B parcel that are privately owned and would be subject to GovGuam property tax. At a 70% assessment rate, the average, per acre tax assessment for Route 15 B lands is \$41,116. The total tax assessment for private lands is estimated to be \$35,441,992 (\$41,116x 862).

Land is taxed at 0.125% of assessed value so the total lost property tax revenue to GovGuam would equal \$44,300 per year (\$35,441,992x 0.125%). GovGuam, CLTC and GALC, whom do not pay property tax, own the remaining 935 acres of land in the Route 15 Alternative B parcel.

#### Adjustments to Guam's Debt Ceiling

GovGuam's debt ceiling is equal to 10% of the assessed value of taxable land.

Based on the tax assessment value of \$1.2 million, GovGuam's debt ceiling would be adjusted downward by \$120,000 if the Route 15 A parcel is acquired.

Based on the tax assessment value of \$35,441,992, GovGuam's debt ceiling would be adjusted downward by \$3,544,199 if the Route 15 B parcel is acquired.

#### License and Lease Revenue

The CLTC has provided the Guam International Raceway Park a commercial license to operate on CLTC land for a term of 20 years, beginning in 1998 and ending 2018. The table below shows the rent schedule for the Raceway Park for that 20-year period (Guam Office of Public Accountability 2005).

**Table 16.2-54. Guam Raceway Park Rental Fee Schedule from 1998 through 2018**

<i>Years</i>	<i>Monthly Rate</i>	<i>Total Payments</i>
1998 – 1999	Waived	\$0
1999 – 2000	Waived	\$0
2000 – 2001	\$1,000	\$12,000
2001 – 2002	\$2,000	\$24,000
2002 – 2003	\$3,000	\$36,000
2003 – 2008	\$3,300	\$198,000
2008 – 2013	\$3,630	\$217,800
2013 – 2018	\$4,000	\$240,000
	<b>Total</b>	<b>\$727,800</b>

*Source:* CLTC Non-Appropriated Funds Performance Audit, December 2005.

*Note:* Years in the Table above begin on June 1 and end on May 31.

The Raceway Park also operates a coral quarry and shares 50% of the profits with the CLTC. Based on information in the CLTC Performance Audit published in 2005, quarry operations provide the CLTC with approximately \$70,000 per year.

If a land acquisition of the Raceway Park occurred in 2010, CLTC would lose \$87,120 in license fees for the years 2011 and 2012 and an additional \$240,000 from 2013 to 2018. The total lost license fees would equal \$327,120. In addition, if coral quarry operations also ceased in 2010 due to land acquisition, the CLTC would lose a projected profit sharing revenue of \$560,000 from 2011 to 2018 based on past revenue stream.

Total lost income to the CLTC (between 2011 and 2018), combining lost Raceway license fees and lost profit share from coral quarry operations is a projected \$887,120.

CLTC owns approximately 256 ac (104 ha), GALC owns about 307 ac (124 ha), and GovGuam owns roughly 516 ac (209 ha) in the properties identified in the Route Alternative A. Currently the only revenues being generated from properties are from the raceway and its associated quarry. If land acquisition takes the form of a long-term lease to the federal government, CLTC, GALC and GovGuam would see an increase in their annual lease revenues using information on license/lease rates presented in Tables 5.1-5, Table 5.3-2 shows the estimated increase in lease revenue that could be expected if the long-term lease option is utilized.

CLTC owns about 166 ac (67 ha), GALC owns roughly 395 ac (160 ha) and GovGuam owns approximately 386 (156 hectares) in the properties identified in the Route 15 B Alternative. If land acquisition takes the form of a long-term lease to the federal government, CLTC, GALC and GovGuam would see an increase in their annual lease revenues using information on license/lease rates presented in Tables 16.1-28, Table 16.2-55 shows the estimated increase in lease revenue that could be expected if the long-term lease option is utilized.

**Table 16.2-55. Potential Increase in Revenue: Route 15 Alternative's A and B**

<i>Parcel</i>	<i>CLTC</i>	<i>GALC</i>	<i>GovGuam</i>	<i>Total</i>
Route 15 Alternative A	\$201,913	\$951,538	\$5,579,566	\$6,733,017
Route 15 Alternative B	\$130,928	\$1,224,292	\$4,173,861	\$5,529,081

Since without land acquisition CLTC would receive between \$43,000 and \$48,000 (based on data in table 5.3-1) per year in license revenue from the raceway and associated quarry, net revenues gained from land acquisition would be lower than the amounts shown above in Table 5.3-2. When license revenue from the raceway is subtracted from the CLTC numbers in Table 5.3-2, the net revenue gain to CLTC would be between \$154,000 and \$159,000 for Alternative A and between \$83,000 and \$88,000 for Alternative B.

### Payments and Fees for Use of Recreational Resources

Recreational facilities for the Route 15 Alternatives A and B parcels are listed in Section 16.1.7.5. There are no recreational facilities operated by GovGuam these parcels, thus there are no lost fees.

### Sociocultural Impacts

#### *Individual Owner/Occupants*

The acquisition of Route 15 Alternative A parcel would mean an acquisition of approximately 1,090 ac (441 ha) of land, involving up to 12 lots, while Alternative B would mean an acquisition of approximately 1,800 ac (728 ha) involving up to 245 lots.

One of the twelve lots in the Route 15 Alternative A parcel is privately owned and 88% of lots in the Route 15 Alternative B parcel are privately owned.

Three Alternative A lots are under use, including one lot occupied by CLTC licensee Guam International Racing Federation. Twenty Alternative B lots are occupied, also including the lot occupied by the Guam International Racing Federation. Relocation of these users would be required.

Because 107 of the privately-owned lots on Alternative B represent either Parental Distributions or Deeds of Gift, denoting the likely transference of land between family members, there is the possibility of social and cultural marginalization of these owners due to the military acquisition of the Route 15 Alternative B parcel, as these parcels of land have a higher possibility of representing patterns of social organization and interpersonal ties to family owners of the land.

In addition, land acquisition may reduce the land-based resources available to displaced occupants, such as subsistence farming.

Although contact with owners and occupants was out of the scope of this study, proponents of the Guam International Raceway have expressed in local media the desire to maintain the Raceway lease of the land in this area, and various landowners owning land on the Route 15 parcel expressed their opposition to land acquisition through public comment to the DEIS.

#### *Community*

The acquisition or long-term leasing of Route 15 Alternative A would increase the acreage of DoD controlled land on Guam by approximately 1,100 ac (445 ha). The acquisition of Route 15 Option B would do so by 1,800 ac (728 ha).

Five of the Route 15 Alternative A lots are managed by the GALC, and 2 are managed by CLTC. Nine of the Route 15 Alternative B lots are managed by the GALC, and 16 are managed by CLTC. This parcel is made up of lands where qualified ancestral property rights can be accrued, and thus have a higher possibility of representing patterns of social organization and interpersonal ties to former Chamorro family owners of land, even though ancestral property rights have not yet been determined by the GALC or CLTC.

As noted in the Affected Environment section, the following recreational and cultural sites are located in both Alternatives A and B of the Route 15 land parcel:

- Pagat Village (including Pagat Cave)
- Pagat Point
- Marbo Cave
- Pagat Trail and related hiking trails

- Off-shore fishing
- Cultural gathering activities (*suruhanu*)
- Guam International Raceway Park
- The *Lujan* lower coastal area

Access to these sites and activities would be limited due to safety reasons. Although it is DoD's intent to maintain public access to DoD lands that contain cultural sites, access is to be consistent with safety and operational requirements and areas would not be as accessible under DoD ownership or control as they previously were.

#### *GovGuam*

Seventy five percent (75%) of the Route 15 Alternative A parcel is owned by GovGuam, including lands managed GDPR, GALC and CLTC. In comparison, 12% of the Route 15 Alternative B parcel is owned by GovGuam.

Five of the Route 15 Alternative A's 11 lots are managed by the GALC, 3 lots are managed by the GDPR, and 2 are managed by CLTC. Nine of the Route 15 Alternative B's 245 lots are managed by the GALC, 3 are managed by the GDPR, 2 are other GovGuam lands, and 16 are managed by CLTC.

Because the taking of land by the Federal Government is considered an adverse impact on the entities that are losing ownership or control of their property, including GovGuam, until land negotiations are complete, the impact analysis assumes a significant adverse impact on GovGuam due to land acquisition.

#### 16.2.3.4 Alternative 1

Impacts under the proposed action Alternative 1 would be a combination of impacts for the following parcels:

- the FAA parcel
- the Harmon Annex parcel
- either Alternative A or B of the Route 15 Parcel

As can be seen in the tables below, Alternative 1, including the preferred Training Alternative A would require the acquisition of 254 ac (103 ha) of private land and 1,819 ac (736 ha) of GovGuam land, including 1,076 ac (435 ha) of GALC managed land and 240 ac (97 ha) of CLTC managed land. Overall, approximately 53 individual lots would have to be acquired and the relocation of 10 occupants would have to occur. In total, the percentage of DoD owned or controlled lands on Guam would be increased by 6%.

The tables also show that Alternative 1, including the preferred Training Alternative B would require the acquisition of 1,104 ac (446 ha) of private land and 1,694 ac (685 ha) of GovGuam land, including 1,154 ac (467 ha) of GALC managed land and 156 ac (63 ha) of CLTC managed land. Overall, approximately 287 individual lots would have to be acquired and the relocation of 23 occupants would have to occur. In total, the percentage of DoD owned or controlled lands on Guam would be increased by 8%.

**Table 16.2-56. Alternative 1 Land Parcel Characteristics**

	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
Potential Increase in Federal Land (ac/ha)	2,096/848	2,803/1,134
Private Land Potentially Acquired (ac/ha)	253/102	1,104/447
GovGuam Land Potentially Acquired (ac/ha)*	1,841/745	1,697/687
<i>GALC Land Potentially Acquired (ac/ha)</i>	<i>1,079/437</i>	<i>1,157/468</i>
<i>CLTC Land Potentially Acquired (ac/ha)</i>	<i>259/105</i>	<i>156/636</i>
Number of Lots Potentially Acquired	54	287
<i>GovGuam Lots Potentially Acquired</i>	<i>31</i>	<i>50</i>
<i>Private Lots Potentially Acquired</i>	<i>23</i>	<i>237</i>
Number of Occupants on Land Parcels (includes non-residential i.e. park and racetrack land)	8	23
Potential Loss of Property Tax Revenues	\$44,346	\$87,146
Decrease in Debt Ceiling	\$3,520,000	\$6,944,199

Note\*: Includes GovGuam land not managed by GALC or CLTC

**Table 16.2-57. Alternative 1 Potential Land Ownership Changes**

	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
% Potential Change in Federal Land on Guam	6%	8%
% Potential Change in Private land on Guam	-1%	-3%
% Potential Change in GovGuam Land on Guam	-3%	-3%

### Economic Impacts

Individuals would not be economically impacted as it is assumed federal land acquisition law would be adhered to and just compensation provided to affected landowners and occupants. Impacts to the community includes the loss of unlimited access to recreational areas on the Former FAA, Harmon Annex, and Route 15 parcels. Local equity value in private land would be lost from the Harmon Annex and Route 15 parcels. Land used for subsistence agriculture would be lost from either the Route 15 A or Route 15 B parcel. There would be impacts to GovGuam as federal land ownership would replace private ownership in the Harmon Annex parcel and either of the Route 15 parcels – reducing the real property tax base of GovGuam.

Based upon currently foreseeable land use of these parcels, the economic impacts of this land acquisition would be less than significant. However should the relocation not occur, this land would be available for potential economic development by others.

### Sociocultural Impacts

Depending on the Training Alternative chosen (Route 15 Alternative A or B), Alternative 1 would impact 11 – 23 individual lot occupants and 23 – 237 private lots would be potentially acquired, some of which represent lands that were transferred through ancestral or family-based property rights (transfer was done through a GALC deed, Deed of Gift, or Parental Distribution). Between 31-50 GovGuam owned lots of land would be potentially impacted.

Alternative 1 would represent re-acquisition of federal land (Former FAA and Harmon Annex parcels) and would restrict access to the following cultural and recreational sites and activities:

- A walking/jogging trail on Former FAA parcel
- Ague Cove

- Hilan'an Rock Shelter
- Cleared space used for model aircraft flying
- One NRHP-eligible archaeological site on Harmon Annex parcel
- Pagat Village (including Pagat Cave) on Route 15 parcel
- Pagat Point on Route 15 parcel
- Marbo Cave on Route 15 parcel
- Pagat Trail and related hiking trails on Route 15 parcel
- Off-shore fishing off Route 15 parcel
- Cultural gathering activities (*suruhanu*) on Route 15 parcel
- Guam International Raceway Park on Route 15 parcel
- The *Lujan* lower coastal area on Route 15 parcel

Because public commentary before and after the release of the DEIS expressed an overall discomfort with increases in federal land ownership on the island of Guam, an expressed opposition to the re-acquisition of lands that have been or are in the process of being released by the Federal Government, and opposition to the loss of access to recreational and cultural sites and activities, land acquisition due to Alternative 1 would constitute an adverse sociocultural impact to the community.

Overall, the sociocultural impacts of land acquisition are considered significant; however some of these impacts could be reduced through mitigation.

#### Alternative 1 Proposed Mitigation Measures

Land acquisition would have both economic and sociocultural impacts on individuals, the community and GovGuam. Federal regulations regarding land acquisition automatically mitigate for the economic impacts experienced by individual landowners and occupants due to land acquisition, leading to a less than significant economic impact. However, an increase in federally owned or controlled land on Guam, and a reduction in access to lands of sociocultural and recreational importance and possible impacts to the social fabric of the community would result in significant sociocultural impacts. Proposed mitigation measures include the implementation of land acquisition and related programs/access agreements in a way that would reduce the sociocultural impacts of land acquisition.

#### 16.2.3.5 Alternative 2 (Preferred Alternative)

Impacts under the proposed action Alternative 2 would be a combination of impacts for the following parcels:

- The Former FAA parcel
- either Alternative A or B of the Route 15 Parcel

As can be seen in the tables below, Alternative 2, including the preferred Training Alternative A would require the acquisition of 11 ac (4 ha) of private land and 1,735 ac (702 ha) of GovGuam land, including 992 ac (401 ha) of GALC managed land and 240 ac (97 ha) of CLTC managed land. Overall, approximately 29 individual lots would have to be acquired and the relocation of 9 occupants would have to occur. In total, the percentage of DoD owned or controlled lands on Guam would be increased by 5%.

The tables also show that Alternative 2, including the preferred Training Alternative B would require the acquisition of 862 ac (348 ha) of private land and 1,610 ac (652 ha) of GovGuam land, including 1,070 ac (430 ha) of GALC managed land and 156 ac (63 ha) of CLTC managed land. Overall, approximately 263 individual lots would have to be acquired and the relocation of 22 occupants would have to occur. In total, the percentage of DoD owned or controlled lands on Guam would be increased by 7%.

**Table 16.2-58. Alternative 2 Land Parcel Characteristics**

	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
Potential Increase in Federal Land (ac/ha)	1,768/715	2,475/1,002
Private Land Potentially Acquired (ac/ha)	11/4	862/349
GovGuam Land Potentially Acquired* (ac/ha)	1,757/711	1,613/653
<i>GALC Land Potentially Acquired (ac/ha)</i>	<i>995/403</i>	<i>1,073/434</i>
<i>CLTC Land Potentially Acquired (ac/ha)</i>	<i>259/214</i>	<i>156/63</i>
Number of Lots Potentially Acquired	30	263
<i>GovGuam Lots Potentially Acquired</i>	<i>29</i>	<i>48</i>
<i>Private Lots Potentially Acquired</i>	<i>1</i>	<i>215</i>
Number of Occupants on Land Parcels	7	22
Potential Loss of Property Tax Revenues	\$1,500	\$44,300
Decrease in Debt Ceiling	\$120,000	\$3,544,199

Note\*: Includes GovGuam land not managed by GALC or CLTC

**Table 16.2-59. Alternative 2 Potential Land Ownership Changes**

	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
% Potential Change in Federal Land on Guam	5%	7%
% Potential Change in Private land on Guam	0%	-3%
% Potential Change in GovGuam Land on Guam	-3%	-3%

### Economic Impacts

Individuals would not be economically impacted as it is assumed federal land acquisition law would be adhered to and just compensation provided to affected landowners and occupants. Impacts to the community includes the loss of unlimited access to recreational areas on the Former FAA and Route 15 parcels; there would be a loss of recreation value, equity value and subsistence agriculture from either the Route 15 A or Route 15 B parcel. There would be impacts to GovGuam as federal land ownership would replace private ownership in either of the Route 15 parcels – reducing the real property tax base of GovGuam.

Based upon currently foreseeable land use of these parcels, the economic impacts of this land acquisition would be less than significant. However should the relocation not occur, this land would be available for potential economic development by others.

### Sociocultural Impacts

Depending on the Training Alternative chosen (Route 15 Alternative A or B), Alternative 2 would impact 10 – 22 individual lot occupants and 4 - 215 private lots would be potentially acquired, some of which represent lands that were transferred through ancestral or family-based property rights (transfer was done through a GALC deed, Deed of Gift, or Parental Distribution).

Alternative 2 would represent a re-acquisition of federal land (Former FAA parcel) and could restrict access to the following cultural and recreational sites and activities:

- A walking/jogging trail on Former FAA parcel
- Ague Cove
- Hilan'an Rock Shelter
- Pagat Village (including Pagat Cave) on Route 15 parcel
- Pagat Point on Route 15 parcel



- Marbo Cave on Route 15 parcel
- Pagat Trail and related hiking trails on Route 15 parcel
- Off-shore fishing off Route 15 parcel
- Cultural gathering activities (*suruhanu*) on Route 15 parcel
- Guam International Raceway Park on Route 15 parcel
- The *Lujan* lower coastal area on Route 15 parcel

Because public commentary before and after the release of the DEIS expressed an overall discomfort with increases in federal land ownership on the island of Guam, an expressed opposition to the re-acquisition of lands that have been or are in the process of being released by the Federal Government, and opposition to the loss of access to recreational and cultural sites and activities, land acquisition due to Alternative 2 would constitute an adverse sociocultural impact to the community.

Overall, the sociocultural impacts of land acquisition are considered significant; however some of these impacts could be reduced through mitigation.

#### Potential Alternative 2 Mitigation Measures

The mitigation measures are as described for Alternative 1.

#### 16.2.3.6 Alternative 3

Impacts under the proposed action Alternative 3 would consist of impacts for either Alternative A or B of the Route 15 Parcel.

Alternative 3 does not require land acquisition by the federal Government for the main cantonment area. Thus the Former FAA parcel and the Harmon Annex parcel would not be acquired under Alternative 3.

As can be seen in the tables below, Alternative 3, including only the preferred Training Alternative A would require the acquisition of 11 ac (4 ha) of private land and 1,090 ac (441 ha) of GovGuam land, including 317 ac (128 ha) of GALC managed land and 240 ac (97 ha) of CLTC managed land. Overall, approximately 11 individual lots would have to be acquired and the relocation of 8 occupants would have to occur. In total, the percentage of DoD owned or controlled lands on Guam would be increased by 3%.

The tables also show that Alternative 3, including only the preferred Training Alternative B would require the acquisition of 862 ac (348 ha) of private land and 935 ac (378 ha) of GovGuam land, including 395 ac (160 ha) of GALC managed land and 156 ac (63 ha) of CLTC managed land. Overall, approximately 245 individual lots would have to be acquired and the relocation of 21 occupants would have to occur. In total, the percentage of DoD owned or controlled lands on Guam would be increased by 5%.

**Table 16.2-60. Alternative 3 Land Parcel Characteristics**

	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
Potential Increase in Federal Land (ac/ha)	1,090/441	1,797/727
Private Land Potentially Acquired (ac/ha)	11/4	862/349
GovGuam Land Potentially Acquired* (ac/ha)	1,079/437	935/378
<i>GALC Land Potentially Acquired (ac/ha)</i>	<i>307/124</i>	<i>395/160</i>
<i>CLTC Land Potentially Acquired (ac/ha)</i>	<i>256/104</i>	<i>156/63</i>
Number of Lots Potentially Acquired	12	245
<i>GovGuam Lots Potentially Acquired</i>	<i>11</i>	<i>30</i>
<i>Private Lots Potentially Acquired</i>	<i>1</i>	<i>215</i>
Number of Occupants on Land Parcels	6	21
Potential Loss of Property Tax Revenues	\$1,500	\$44,300
Decrease in Debt Ceiling	\$120,000	\$3,544,199

Note\*: Includes GovGuam land not managed by GALC or CLTC

**Table 16.2-61. Alternative 3 Potential Land Ownership Changes**

	<i>Including Training Alternative A</i>	<i>Including Training Alternative B</i>
% Potential Change in Federal Land on Guam	3%	5%
% Potential Change in Private land on Guam	0%	-3%
% Potential Change in GovGuam Land on Guam	-2%	-1%

### Economic Impacts

Individuals would not be economically impacted as it is assumed federal land acquisition law would be adhered to and just compensation provided to affected landowners and occupants. Impacts to the community includes the loss of unlimited access to recreational areas on the Route 15 parcel; loss of recreation value, equity value and subsistence agriculture from either the Route 15 A or Route 15 B parcel. There would be impacts to GovGuam as federal land ownership would replace private ownership in either of the Route 15 parcels – reducing the real property tax base of GovGuam. If the long-term lease option is applied to land acquisition then there would be increases to lease revenues for GALC, CLTC and GovGuam; this would represent a beneficial impact from land acquisition.

Based upon currently foreseeable land use of these parcels, the economic impacts of this land acquisition, on balance, would be less than significant.

### Sociocultural Impacts

Depending on the Training Alternative chosen (Route 15 Alternative A or B), Alternative 3 would impact 9-21 individual lot occupants and 4 - 215 private lots would be potentially acquired, some of which represent lands that were transferred through ancestral or family-based property rights (transfer was done through a GALC deed, Deed of Gift, or Parental Distribution). This alternative could also potentially impact 10-30 GovGuam owned lots of land.

Alternative 3 would restrict access to the following cultural and recreational sites and activities:

- Pagat Village (including Pagat Cave)
- Pagat Point
- Marbo Cave
- Pagat Trail and related hiking trails
- Off-shore fishing off Route 15 parcel

- Cultural gathering activities (*suruhanu*) on Route 15 parcel
- Guam International Raceway Park
- The *Lujan* lower coastal area

Because public commentary before and after the release of the DEIS expressed an overall discomfort with increases in federal land ownership on the island of Guam, and opposition to the loss of access to recreational and cultural sites and activities, land acquisition due to Alternative 3 would constitute an adverse sociocultural impact to the community.

Overall, the sociocultural impacts of land acquisition are considered significant; however some of these impacts could be reduced through mitigation.

#### Alternative 3 Proposed Mitigation Measures

The mitigation measures are as described for Alternative 1.

#### 16.2.3.7 Alternative 8

Impacts under the proposed action Alternative 8 are the same as those under Alternative 2.

#### Alternative 8 Proposed Mitigation Measures

The mitigation measures are as described for Alternative 1.

### **16.2.4 Summary of Impacts**

Socioeconomic impacts are anticipated to be largely islandwide in nature with little difference in effects among the various alternatives. The impacts in this chapter are calculated under a scenario that assumes there would be no constraints (blockages) to the rapid development of spin-off private-sector economic activity driven by the military construction and permanent military operational stages. Most impacts are characterized by a burst of activity and impacts in the 2013-2014 timeframe, followed by relatively much lower impacts when construction ends.

#### 16.2.4.1 Population Impacts

Including active-duty Marines, dependents, and rotating transient Marines (about 19,500 people), the proposed action would add about 65,500 residents to Guam's population in 2014 and a subsequent more stable approximate of 31,000 by 2020.

Population increases are considered to be inherently mixed (both beneficial and adverse), because population growth fuels economic expansion but sudden growth also strains government services and the social fabric.

#### 16.2.4.2 Economic Impacts

Most long-term economic impacts would be beneficial, though the construction boom would entail substantial growing pains related to rapid population influx and housing shortages. These impacts, combined with others such as increased noise and traffic, would substantially impact quality of life on Guam for several years, until the steady-state military operational phase is in place.

Including all the spin-off activity, the proposed action would provide jobs for about 33,000 civilian workers at the 2014 peak and approximately 6,150 on a more permanent basis. Guam residents are estimated to capture about 2,000 of the direct on-site construction jobs for Marine Corps facilities at the 2013-2014 peak, as well as approximately 2,570 spin-off jobs that year, with a slight decline thereafter.

Although a more detailed fiscal impact assessment will be done by GovGuam using output from this EIS, preliminary estimates in this chapter suggest revenues from the three most important tax sources – gross receipts, corporate income, and personal income – would exceed \$325 million in 2014 and stabilize at nearly \$97 million thereafter.

Civilian housing unit demand would peak at about 9,500 units in 2014 – an amount that is unlikely to be entirely met by new construction, resulting in consequences such as crowding, possible illegal units, and further increases in housing costs – falling to about 3,000 for the steady-state phase.

While Guam businesses are expected to benefit from various opportunities, including military set-asides, there could be a variety of impacts on tourism, both positive (e.g., increased hotel occupancies from business travelers and military families) and negative (a military “sense of place” competing with the historic/cultural milieu the GVB hopes to promote).

Guam’s GIP, the total market value of all final goods and services produced in a given year, would increase by \$822 million in 2014 and by nearly \$157 million a year from 2017 on.

#### 16.2.4.3 Public Service Impacts

The large increase and subsequent rapid decrease in construction-related population, in tandem with an increase in operational population, means that the proposed action creates a boom-bust economic cycle on Guam that strains public services during the boom and could result in a recession-like environment following the construction phase. Typically, local economies are able to absorb and mitigate the impacts to social services that have been discussed. However, this is not possible in the case of Guam, as it is in a unique position with a small and geographically isolated economy that is unable to absorb the large population increase brought about by the proposed action. In addition, there is an acknowledged existing sub-standard condition of key public social service on Guam and documented historical difficulty in addressing and funding these conditions. Any increase in service population due to the proposed action would further strain these services.

Many public services offered by GovGuam would need to increase professional staff to service the new population. Most of these agencies would need to rapidly expand their services and staff during the 2013-2014 peak (raising serious issues of availability of qualified workers), then cut back them back as construction ends.

For public education services, the GPSS, GCC, and UoG together would need to hire a combined 490 teachers/faculty for the year 2014, falling to a combined 135 after construction ends.

For health and human services, this chapter considered impacts on various aspects of the GMHA, the GPHSS, the GDMHSA, and the GDISID. These agencies would need a combined 192 new key professional workers by 2014, dropping to a combined 52 a few years later.

Public safety agencies – Police, Fire, Corrections, and Youth Affairs – would require a combined 259 key professionals in 2014, falling to a combined 106 a few years later.

Other selected general service agencies – Parks and Recreation, Libraries, and the Judiciary – would require a combined 46 key professionals in 2014, falling to a combined 22 after construction ends.

Agencies that deal with permitting and regulating growth are affected more by the initial requests for permits and then subsequent inspections and monitoring. For the agencies involved in development permitting, impacts on workloads would tend to be slightly earlier than for other agencies, because generally, rezoning and permit applications occur one to two years before construction projects are

completed and occupied. The peak year of demand for permitting agency staffing was found to vary by agency, rather than the 2014 standard. Of the permitting agencies providing information for this EIS, the GEPA appeared to require the largest numeric staffing increase, at 19 FTEs in 2011. Other, smaller agencies such as the DLM would experience numerically smaller staff demand increases, but the proportional increases would be similar across permitting agencies.

#### 16.2.4.4 Sociocultural Impacts

There would likely be impacts on crime and social order, especially during the construction phase, because of the large increase in population.

Political and Chamorro concerns involving political minoritization are impacted by the potential increase in non-Chamorro populations due to the relocation. More non-Chamorro and local voters could potentially affect ongoing and future issues undergoing votes.

There is potential for cultural conflict, especially in the opening years of the proposed action.

No adverse effects on EFH, specifically coral and coral reef ecosystem, at Andersen AFB and Haputo ERA and with the implementation of DoN avoidance and minimization measures for indirect recreational impacts; therefore a less than significant impact. These measures are identified in the EFH sections of this Volume. A less than significant impact from non-native species introductions to Apra Harbor and island-wide, with implementation of mitigation measures (i.e. BMP). All other impacts on marine biological resources are anticipated to be less than significant. Volume2, Section 11.2.8, Table 11.2-1 and Table 11.2-2 describe associated impacts from all alternatives.

#### 16.2.4.5 Land Acquisition Impacts

Land acquisition would have both economic and sociocultural impacts on individuals, the community and GovGuam.

Federal regulations regarding land acquisition automatically mitigate for the economic impacts experienced by individual landowners and occupants due to land acquisition, leading to a less than significant economic impact. However, an increase in federally owned or controlled land on Guam, and a reduction in access to lands of sociocultural and recreational importance and possible impacts to the social fabric of the community would result in significant sociocultural impacts.

Table 16.2-62 provides a summary assessment of the potential impacts of the proposed action.

**Table 16.2-62. Summary of Impacts Associated with the Proposed Action**

<i>Proposed Action-All Alternatives</i>
<b>Construction</b>
Population Impacts <ul style="list-style-type: none"> <li>• Significant impact due to increase of about 65,500 in Guam's population during the construction phase</li> </ul>
Economic Impacts <ul style="list-style-type: none"> <li>• Beneficial impact due to economic expansion fueled by increased population</li> <li>• Beneficial impacts to civilian labor force demand due to provision of construction-related jobs on Guam</li> <li>• Beneficial impacts to civilian labor force incomes due to infusion of income into the Guam economy</li> <li>• Beneficial impacts to the standard of living associated with higher incomes reducing the rate of reductions in standard of living.</li> <li>• Beneficial impacts to local business opportunities due to increased military service contract opportunities for local Guam businesses</li> <li>• Beneficial impacts due to increase in local government revenue</li> <li>• Impacts to tourism would be mixed (adverse and beneficial). On balance beneficial impacts outweigh adverse impacts</li> <li>• Significant impact to civilian housing demand following construction phase if demand is met at the peak. Subsequent over-supply of housing units would follow the construction period, and result in declining housing values</li> <li>• Significant impact to civilian housing demand if construction phase housing demand is not met at the peak, resulting in high costs, crowding and/or homelessness</li> </ul>
Public Service Impacts <ul style="list-style-type: none"> <li>• Significant impacts to public service agencies influenced by population increases, due to difficulty in meeting fluctuating staffing requirements during the construction phase with an existing environment of staffing and budget shortfalls, recruitment complications, and lack of adequate and appropriate facilities and equipment</li> <li>• Significant impacts to growth permitting and regulatory agencies due to difficulty in meeting fluctuating staffing requirements with an existing environment of staffing and budget shortfalls, recruitment complications, and lack of adequate and appropriate facilities and equipment</li> </ul>
Sociocultural Impacts <ul style="list-style-type: none"> <li>• Significant impacts to social fabric resulting in differences in norms and customs between longtime Guam residents and in-migrant workers</li> <li>• Significant impact to crime and social order in proportion to increase in population.</li> <li>• Short-term and localized, therefore minimal indirect impacts to recreational and traditional fishing during the construction period. Therefore less than significant and no adverse effects to EFH.</li> <li>• Short-term and localized, minimal impacts to the coral reef ecosystem located near the project area from increased use by construction workers. Therefore, less than significant and no adverse effects to EFH.</li> <li>• Short-term and localized impacts to the coral reef ecosystem from run-off associated with construction activities. Therefore, less than significant impacts and no adverse effect to EFH</li> </ul>

<i>Proposed Action-All Alternatives</i>
<p><b>Operation</b></p> <p>Population Impacts</p> <ul style="list-style-type: none"> <li>• Significant impact due to steady addition of about 31,000 in Guam's population during the operations phase</li> </ul> <p>Economic Impacts</p> <ul style="list-style-type: none"> <li>• Beneficial impact due to economic expansion fueled by increased population</li> <li>• Beneficial impacts to civilian labor force due to provision of permanent jobs on Guam</li> <li>• Beneficial impacts to civilian labor force incomes due to permanent infusion of income into the Guam economy</li> <li>• Beneficial impacts to GIP due to permanent increased GIP strengthening the Guam economy</li> <li>• Beneficial impacts due to increase in local government revenue</li> <li>• Beneficial impacts to civilian housing demand due to increase in competitive housing market on Guam</li> <li>• Beneficial impacts to the standard of living associated with higher incomes reducing the rate of reductions in standard of living</li> <li>• Beneficial impacts to local business opportunities due to increased military service contract opportunities for local Guam businesses</li> <li>• Impacts to tourism would be mixed (adverse and beneficial). On balance beneficial impacts outweigh adverse impacts</li> </ul> <p>Public Service Impacts</p> <ul style="list-style-type: none"> <li>• Significant impacts to public service agencies influenced by population increases, due to difficulty in meeting fluctuating staffing requirements during the construction phase with an existing environment of staffing and budget shortfalls, recruitment complications, and lack of adequate and appropriate facilities and equipment</li> <li>• Beneficial impact to public service agencies influenced by population increases, due to provision of additional jobs on Guam, if labor supply and funding is available during operational phase</li> </ul> <p>Sociocultural Impacts</p> <ul style="list-style-type: none"> <li>• Significant impacts to social fabric resulting in differences in norms and customs between longtime Guam residents and military personnel, their dependents, and other populations arriving on Guam</li> <li>• If incoming eligible U.S. citizens choose to vote, significant impacts to indigenous Chamorro voter representation due to a decreased proportion of ethnic Chamorro voters, associated with an increase in non-Chamorro voting population on Guam</li> <li>• Significant impacts to crime and social order in proportion to increase in population</li> <li>• Less than significant, minimal long-term impacts to the coral reef ecosystem surrounding Guam directly related to increased population size. No adverse effect to EFH.</li> <li>• Beneficial long-term impacts to coastal waters and people of Guam due to refurbishment and upgrades of GWAs NDWWTP and other WWTPs.</li> <li>• Less than significant direct impacts to fishing due the growth in the military population and dependants</li> </ul> <p>Land Acquisition Impacts</p> <ul style="list-style-type: none"> <li>• Significant sociocultural impacts due to land acquisition</li> <li>• Less than significant economic impacts due to land acquisition</li> </ul>

*Legend:* SI = Significant impact, SI-M = Significant impact mitigable to less than significant, LSI = Less than significant impact, NI = No impact.

### 16.2.5 No-Action Alternative

Under the no-action alternative, Marine Corps units would remain in Japan and would not relocate to Guam. No construction, dredging, training, or operations associated with the military relocation would occur and the U.S. would not meet readiness, mission and international treaty obligations. Existing operations on Guam would continue.

Unlike physical resources, socioeconomic systems do not remain completely at “baseline conditions” if a proposed action is not implemented. Economies and population levels change due to other reasons as well. The various foregoing exhibits showing “baseline trends” for economic and demographic variables indicate long-term trends expected to continue without the proposed action, and Volume 7 lists a number of specific socioeconomic changes expected to occur independent of the proposed action. Furthermore, the announcement of the proposed action has already had socioeconomic consequences, such that a 2010 decision not to follow through on the proposed action would have short-term effects associated with a reversal of those existing consequences.

#### 16.2.5.1 Population Impacts

Project related population in-migration and associated demographic and household characteristic impacts would not occur. Overall Guam population could be expected to increase according to the baseline trend noted above in Figure 16.2-1. The 2010 Census will provide an update on population trends for Guam.

#### 16.2.5.2 Economic Impacts

In the short term, a decision not to implement the proposed action would deflate any current speculative activity attributable the proposed action. Real estate values in particular would likely drop, hurting investors but increasing the affordability of housing. The contrast between the business community’s expectations and a negative Record of Decision would likely produce a period of pessimism about Guam’s economic future, especially if the current national and international economic crisis has not yet abated. These effects, though, would be attributable to an unstable world economic landscape and poor decision making by investors – not to the proposed action.

Long term, the island’s prospects would remain linked to international economic conditions and the health of its tourism industry. Conceivably, a smaller military profile might remove some barriers to growing the potential Chinese tourism market. Growth would resume, though probably with the same volatility experienced in recent decades (see Section 16.1.2).

#### 16.2.5.3 Public Service Impacts

In the case of the no-action alternative, the specific agencies discussed earlier in this chapter would not face the listed pressures to expand professional staffing, and agencies involved in planning and regulating growth would not experience such a sharp increase in workload. Although not specifically covered in the foregoing analysis, it may also be noted that agencies that are required to implement major infrastructure developments – such as the ports and highways – would have substantially more time to implement long-term plans rather than having to achieve much of their objectives over the next few years.

#### 16.2.5.4 Sociocultural Impacts

To the extent that Guam experiences job losses, crime rates may rise in the short term. The political attention given to some contentious issues linked to public perceptions and concerns of the proposed action would likely recede. Military-civilian relations would likely remain at the current generally positive level.

The incentive for increased in-migration from the FAS would decrease, reducing sociocultural issues associated with supporting these populations. However, current incentives for providing support for those populations – both on Guam and the Micronesian states themselves – would be lessened, with detrimental implications for those populations.



#### 16.2.5.5 Land Acquisition Impacts

Under the no-action alternative, no land on Guam would be acquired by the federal government. There would be no economic impacts or sociocultural impacts from land acquisition.

#### 16.2.6 Summary of Proposed Mitigation Measures

A review of the above impacts shows that the proposed action has the potential to have beneficial as well as adverse socioeconomic impacts on Guam.

Mitigation measures noted in this section provide avenues to address the adverse impacts identified in the analysis and focus on possible approaches DoD can take to reduce and mitigate adverse impacts through:

- reducing the impacts of peak population buildup through mitigation measures described in Volume 7, Chapter 2, force flow reduction and adaptive program management of construction
- Implementing new and/or expanding current DoD activities and programs promoting community cohesion
- Implementing programs and conducting land acquisition in a way that would reduce the sociocultural impacts of land acquisition
- assisting the local Government to build its capacity to support and meet the requirements of the relocation, build cultural awareness, and reap beneficial impacts

To this final point, DoD can take a leadership role in a federal inter-agency effort to identify other federal programs and funding sources that could benefit GovGuam and the people of Guam. In addition, in order to assist with GovGuam planning efforts to prepare for the proposed action, the DoD can provide frequent updates to GovGuam on the current planning and construction process.

Although it is difficult to measure if a proposed mitigation measure may lower a sociocultural impact from significant to less than significant, the proposed mitigation measures below are important to implement as they would reduce the severity of adverse impacts to the Guam community.

Table 16.2-63 summarizes the proposed mitigation measures.

**Table 16.2-63. Summary of Proposed Mitigation Measures**

<i>Impact Area</i>	<i>Mitigation Measures</i>
Population	DoD would decrease the rapid population increase associated with the operations phase by implementing force flow and adaptive program management. (See mitigation measures in General category).
Civilian Housing Demand	DoD would assist by leading a federal inter-agency effort to identify other federal programs and funding sources for GovGuam addressing the following: <ol style="list-style-type: none"> <li>a) Collaboration between federal housing agencies and GovGuam to examine currently existing caps on HUD vouchers and other housing allowances, and the appropriateness of these caps for Guam;</li> <li>b) Development of support programs and transitional housing for homeless individuals and families on Guam;</li> <li>c) Expansion of the stock of low- to moderate-income housing on Guam;</li> <li>d) Support for GEDA efforts to obtain funding from HUD to provide community development projects and affordable housing programs.</li> </ol>
Public Service and Growth Permitting and Regulatory Agencies	Continue to support existing DoD programs that contribute and/or donate excess equipment to local agencies.

Impact Area	Mitigation Measures
	<p>DoD would continue to participate in CMTF to address community health needs such as facilitating information sharing between military and civilian health agencies, including health service needs data and health services utilization rates.</p> <p>DoD would coordinate with the Governor’s Office of Community Affairs to facilitate volunteer opportunities at Guam public service agencies for military personnel and their dependents.</p> <p>DoD would assist by leading a federal inter-agency effort to identify other federal programs and funding sources for GovGuam addressing the following:</p> <ul style="list-style-type: none"> <li>e) Enhancement of GovGuam Tax Revenue Collection efficacy. For example, improved revenue could be used to enhance recruitment and retention of GovGuam work force and contractual support;</li> <li>f) Examination of currently existing caps on benefits such as Medicaid and Medicare, and the non-provision of benefits such as Supplemental Security Income benefits, and the appropriateness of these caps and limits for Guam;</li> <li>g) Increase the number of Guam-based offices for the distribution of federal social service support, and to support the work of GovGuam public service agencies;</li> <li>h) Review and implementation of programs to assist GovGuam’s public agencies in adapting to peaks in service population growth;</li> <li>i) Provision of technical assistance for the development and implementation of a system of interpreters and translators available for the interpreting and translating needs of GovGuam public service agencies, to facilitate timely and appropriate provision of services for the English as a Second Language service population;</li> <li>j) The development of AmeriCorps, Teach for America, National Health Service Corps programs, and other similar programs on Guam;</li> <li>k) Improving the grant-writing capabilities within GovGuam agencies to improve possibilities of attracting federal support programs;</li> <li>l) Support for the recruitment of professionals during the construction phases of the proposed action for GovGuam public agency positions;</li> <li>m) Support for the use of the Interagency Personnel Act to support identified GovGuam agency personnel requirements, and/or</li> <li>n) Provision to GovGuam of technical assistance for, and development and implementation of, comprehensive data collection systems focused on the following topics: <ul style="list-style-type: none"> <li>1. GovGuam public services provided to FAS citizens, in order to facilitate GovGuam access to Compact Impact and other related funding.</li> <li>2. GovGuam agency services provided to military individuals, in order to facilitate GovGuam access of TRICARE and other related funding</li> <li>3. GovGuam public health agency patient information, records, and services accessed, in order to facilitate appropriate care administered in a timely manner</li> <li>4. GovGuam public agency billing systems, in order to facilitate GovGuam collection of payment for services</li> </ul> </li> </ul>
<p>Crime and Social Order</p>	<p>DoD would increase collaborative programs with GovGuam public safety agencies to develop a comprehensive and regular shore patrol system, and maintain a regular visible preventative presence.</p> <p>DoD would continue to participate in CMTF to address community crime and social order concerns such as effective crime prevention strategies and information sharing.</p> <p>DoD would continue cross-training exercises with the GovGuam safety agencies.</p> <p>DoD would assist by leading a federal inter-agency effort to identify other federal programs and funding sources for collaborative efforts between the governments of Guam, CNMI and FAS to enhance cultural awareness.</p>

<i>Impact Area</i>	<i>Mitigation Measures</i>
Chamorro Issues/Community Cohesion	<p>Implement a collaborative effort with construction worker contractors to implement an orientation course on Guam local culture, language and history, designed in conjunction with the Guam Department of Chamorro Affairs and Chamorro cultural specialists, to be attended by all arriving H2B workers.</p> <p>Implement a mayoral outreach task force aimed at developing military-civilian relationships, to minimize local community perceptions of separations of military and civilian communities. The task force would work with each mayor and their staff to integrate military participation in existing cultural or recreational community events, expand on existing military outreach activities, and develop new civilian-military collaborative projects as determined by the task force and mayors.</p> <p>Implement an orientation course on Guam local culture, language and history, designed in conjunction with the Guam Department of Chamorro Affairs and Chamorro cultural specialists, to be attended by all arriving active-duty DoD personnel their dependents, and military civilian workers.</p> <p>Develop a military-civilian cultural organization to promote tours, education, and volunteer opportunities.</p> <p>Expand sister village programs to promote military civilian community interaction.</p> <p>Implement the use of UoG and GCC locations for DoD adult education classes, to promote community integration, consistent with DoD policies.</p> <p>Implement an orientation course on Guam local laws and culture, language and history, designed in conjunction with GovGuam public safety agencies, the Guam Department of Chamorro Affairs and Chamorro cultural specialists, to be attended by all arriving service members prior to shore leave on the island of Guam.</p> <p>DoD would assist by leading a federal inter-agency effort to identify other federal programs and funding sources for GovGuam addressing the following:</p> <ul style="list-style-type: none"> <li>a) Supporting the development of Chamorro cultural sites and activities, such as a museum and/or cultural center, Chamorro language immersion school, adult Chamorro language education, and cultural performance and arts organizations;</li> <li>b) Job counseling assistance to be made available to low income families through the Guam Department of Labor (with US funds), which would include training sessions on how to fill out job applications, identify skills, and prepare resumes for job opportunities;</li> <li>c) Before and/or after school programs for children on Guam including formal and informal education, while allowing their parent(s) the time to get a job.</li> <li>d) Transportation to job sites made available for those without the means to travel to work.</li> </ul>
Land Acquisition	<p>Mitigation for the increase in DoD controlled lands on Guam would include conducting new screenings on a periodic basis to identify additional excess DoD lands that could be returned.</p> <p>Expedite the return of lands subject to the Guam Excess Lands Act to the extent possible.</p> <p>Mitigation for the sociocultural impacts of the acquisition of property and the increase in DoD controlled lands on Guam may include:</p> <ul style="list-style-type: none"> <li>a) Land swap for land of similar value and similar cultural and recreational opportunities;</li> <li>b) During the land acquisition process conduct socioeconomic surveys and census of affected landowners, users, ancestral claimants, early in the land acquisition process, in order to identify potential sociocultural impacts;</li> <li>c) DoD collaboration with community, GovGuam and UoG and GCC representatives to implement a system of protected garden areas on public lands for the growth and collection of native plants, including medicinal plants;</li> <li>d) Continued collaboration between DoD, GovGuam, the University of Guam, and cultural resource specialists to develop public education on the cultural and social value of land on Guam including cultural practices, such as the gathering</li> </ul>

<i>Impact Area</i>	<i>Mitigation Measures</i>
	<p>of medicinal plants and the use of wood for carving, cultural tours, and place-based historical information, and/or</p> <p>e) DoD collaboration with community, GovGuam and UoG and GCC representatives to implement guided cultural and historical tours and hikes of relevant locations on acquired land, for visitors and the civilian and military population of Guam.</p> <p>Mitigation for the restriction and/or loss of access to recreational and cultural sites could include:</p> <p>a) Implementation of a public access program including set access hours, improved access to sites, that locations would be made safe for entry and use, and maintenance efforts and regular condition assessments of the impact areas,</p> <p>b) DoD collaboration with GovGuam to improve recreational and cultural activities for the community on GovGuam lands</p> <p>c) DoD assistance with the identification of potential locations for the relocation of the Guam International Raceway</p> <p>DoD would assist by leading a federal inter-agency effort to identify other federal programs and funding sources for GovGuam addressing the following:</p> <p>a) Assistance for opening public garden spaces on GovGuam land.</p> <p>b) Assistance for CLTC to develop a land use plan, written fees collection policies and procedures for commercial licenses</p> <p>c) Assistance for GALC to establish rules and regulations for Land Bank properties, written fees collection system and policies and rules and regulations for issuing licenses.</p> <p>d) Support for the CLTC agricultural program to address the issues identified in the Chamorro Land Trust Commission Multi-Agency Compliance and Needs Assessment Team First Inspection Report (July - September 2009)</p> <p>e) Support for CLTC to provide water lines, roads, sewer lines, power, and land management building on CLTC land.</p> <p>f) Support for CLTC and GALC in establishing property boundaries in the subdivisions where the agencies have active leases.</p> <p>g) Support and implementation of automation systems to manage CLTC and GALC land inventories, finances, and other data.</p> <p>h) Provision of or funding for equipment, training and long-term support for agricultural activities, possibly in a cooperative framework.</p> <p>i) Support for the UoG Tropical Agricultural Department, and other educational and community agricultural programs in the study of traditional plants, including medicinal plant use, and to develop native plant and seedling nurseries accessible to the public for study and use;</p> <p>j) Support for educational and community programs focused on traditional fishing and shellfishing, and related activities;</p> <p>k) Improvement of recreational and cultural activities for the community on GovGuam lands;</p> <p>l) Conservation efforts on Guam; and/or</p> <p>m) Special projects to improve local agricultural production.</p>