CHAPTER 14. MARINE TRANSPORTATION

14.1 AFFECTED ENVIRONMENT

14.1.1 Definition of Resource

Marine transportation refers to marine vessels and facilities used to support commercial, military, and recreational uses. The primary military, commercial, and recreational port facilities on Guam are located in Apra Harbor, the main berthing facility on the island. Apra Harbor provides deep water and protected loading and off-loading facilities. Apra Harbor consists of a commercial harbor, a naval complex, and a repair facility. The port handles both containerized and conventional cargo from the United States (U.S.) and other countries.

This chapter describes existing facilities in Apra Harbor and the activities that occur there. The possible effects on the capacity of the harbor to accommodate the increase in the number of ships and ship movements from the proposed relocation of Marines from Okinawa to Guam are also assessed and presented in the Environmental Consequences section (Section 14.2) of this chapter. This chapter covers marine transportation. See Volume 6 Chapter 4 for a discussion of on base and off base roadways and related ground transportation impacts.

14.1.2 North

No marine transportation occurs in the North area.

14.1.3 Central

14.1.3.1 Andersen South

No marine transportation occurs at this location.

14.1.3.2 Barrigada

No marine transportation occurs at this location.

14.1.3.3 Non-DoD Land

No marine transportation occurs at this location.

14.1.4 Apra Harbor

Apra Harbor is located on the western side of Guam. It is a natural harbor protected by Orote Peninsula on the south and Cabras Island and the Glass Breakwater on the north. The Glass Breakwater provides wind and wave protection from the Philippine Sea. The average height of the breakwater is approximately 15 feet (ft) (4.6 meters [m]) above mean sea level (MSL).

Apra Harbor comprises both an outer harbor area (Outer Apra Harbor) and an inner harbor area (Inner Apra Harbor). Navy waterfront facilities are located in both the outer harbor and the inner harbor. Waterfront facilities for the U.S. Coast Guard (USCG) are located in the inner harbor, while commercial and recreational facilities are located in the outer harbor. Most of Outer Apra Harbor and the entire Inner Apra Harbor are under the jurisdiction of the Navy. Use of these waters is restricted because they are adjacent to Naval Base Guam facilities.

Inner Apra Harbor is located to the southeast of Outer Apra Harbor; it is separated from Outer Apra Harbor by the Guam Shipyard and Polaris Point. Outer Apra Harbor is the west-facing entrance way into Apra Harbor. It is 1,500-ft (457-m) wide and more than 100-ft (30.5-m) deep. Although Outer Apra Harbor has many areas where depths exceed 100 ft (30.5 m), it also contains several shoal and reef areas, primarily in the eastern portion of the harbor close to the entrance to Inner Apra Harbor. While these shallow areas pose only a limited threat to normal operations, they represent a major hazard to navigation during periods of high winds. Outer Apra Harbor extends westerly from the harbor entrance toward Drydock Point. To avoid the shoal areas, the channel into the Harbor extends southeasterly to the entrance at Inner Apra Harbor and then due south. Outer Apra Harbor contains several mooring buoys and anchorages used by both military and commercial vessels.

Inner Apra Harbor is separated from Outer Apra Harbor (located to the southeast) by the Guam Shipyard and Polaris Point. Vessels entering Inner Apra Harbor are limited to a maximum draft of 32 ft (9.8 m). The primary Inner Harbor Channel (also termed the Fairway) from Outer Apra Harbor to Inner Apra Harbor is marked at the entrance with two lighted buoys. The centerline of this channel is defined for navigation by two entrance range lights.

More details on Apra Harbor facilities, including Kilo Wharf, are presented below in Section 14.1.4.2, Naval Base Guam.

14.1.4.1 Harbor

USCG

Accoridng to *Sector Guam Relocation Feasibility Study* (Navy 2007), Sector Guam is the center of USCG activities within the Territory of Guam and the Commonwealth of Northern Mariana Islands. It is the USCG base of operations for one 225-ft (69-m) buoy tender, two 110-ft (34-m) patrol boats, and several small response boats that are berthed at Victor Wharf. All Sector Guam facilities are located within a 13-acre (ac) (5.3-hectare [ha]) compound owned by the USCG adjacent to Victor Wharf.

Sector Guam serves a variety of missions including:

- Providing maritime security
- Enforcement of the Maritime Transportation Security Act of 2002
- Maritime safety
- Protection of natural resources and fisheries
- foreign vessel inspections
- Vessel escorts
- Aids to navigation
- General defense duties in support of homeland security

Commercial Port Facilities

Guam's commercial port, Jose D. Leon Guerrero Commercial Port, is managed by the Port Authority of Guam (Port Authority of Guam 2008a). The Port Authority of Guam is a public corporation and autonomous agency of the Government of Guam (GovGuam). The main commercial port facilities are located on 74 ac (30 ha) of Cabras Island. The operation of commercial vessels in Outer Apra Harbor are regulated by the Harbor Rules and Regulations of the Port Authority of Guam (Public Law 26-172 [December 27, 2001]).

Jose D. Leon Guerrero Commercial Port consists of the following:

- Foxtrot 3 wharf is used for general cargo, passenger vessels, and fishing vessels. The wharf is 750 ft (229 m) long and has a water depth of 34 ft (10 m).
- Foxtrot 4, 5, and 6 wharfs are used for container and general cargo. The wharf complex is 1,975 ft (602 m) long with a water depth of 34 ft (10 m).
- Golf (Mobil) Pier is used by liquid bulk tankers; it is operated by Mobil Oil, Guam. The pier is 370 ft (113 m) long. The water depth is 50 ft (15 m).
- Hotel Wharf is used for passenger vessels, fishing vessels, and some general cargo. The wharf is 500 ft (152 m) long and has a water depth of 34 ft (10 m).
- Container Yard provides 26.5 ac (107 ha) for container storage.
- Gregorio D. Perez Marina, which has a capacity of 59 vessels.
- Agat Small Boat Marina, which has a capacity of 163 vessels.
- Four gantry cranes, one mobile harbor crane, four side loaders, and one reach stacker.

Guam Shipyard is a privately operated commercial ship repair yard located at the site of the former Navy Ship Repair Facility, on the west side of the entrance to Inner Apra Harbor. Guam Shipyard leases three floating dry docks from the Naval Sea Systems Command for the repair of Military Sealift Command ships and commercial vessels. The Guam Shipyard provides shore industrial support, repair, maintenance, overhaul, and dry docking services. These services are provided to ships from the Seventh Fleet, Commander Submarine Squadron 15, Military Sealift Command, USCG, local federal agencies, and commercial businesses.

Aquaworld and Harbor of Refuge are private marinas located in the inner Cabras Island area, operated under a management agreement with the Port Authority of Guam. They provide piers for recreational and commercial vessels. In recent years, the sport fishing charter boat industry has increased significantly (GDAWR 2008).

The Port Authority of Guam tracks information on vessels and their cargo. Total vessel visits are known for the years 1995 through 2008 (Table 14.1-1). Vessel tallies are presented for the following categories: Container Ship, Breakbulk/Roll on-Roll off (RoRo)/Bulk, Barges, Fishing, and Total. Breakbulk is cargo which is packed in cases, bales, cartons, drums, or carboys. RoRo is roll-on roll-off (e.g. automobiles), and bulk is general cargo. The overall number of vessels calling on the Port of Guam steadily and substantially decreased between 1995 (2,924 vessels) and 2008 (1,022 vessels); a decrease between those years of about 65 percent (1,902 vessels). However, the number of container ships and the number of containers handled by the Port of Guam has remained relatively constant during the period of 1995 through 2006. The average number of container ships was 119; the average number of containers handled was 84,356. For the years 2007 and 2008, there was a substantial increase in the number of container ships to 153 (2007) and 165 (2008). The number of containers handled also increased substantially in 2007 (99,630) and 2008 (99,908).

Table 14.1-1. Port of Guam Vessel Visits 1995 through 2008

Year	*Container Ship*	*Breakbulk/ RoRo/Bulk*	*Barges*	*Fishing*	*Total*
1995	117	477	169	2,161	2,924
1996	124	296	138	2,351	2,909
1997	130	212	167	2,205	2,752
1998	151	365	106	2,107	2,765
1999	146	296	155	1,942	2,569
2000	114	418	112	1,906	2,529
2001	111	422	111	1,960	2,697

Year	*Container Ship*	*Breakbulk/ RoRo/Bulk*	*Barges*	*Fishing*	*Total*
2002	105	412	102	1,481	2,139
2003	103	433	94	1,332	1,983
2004	109	377	97	1,044	1,648
2005	103	305	60	800	1,327
2006	109	316	17	771	1,289
2007	153	165	21	651	1,113
2008	165	171	17	586	1,022

Source: Port Authority of Guam 2008a and 2008b

Shipping

Vessel traffic in U.S. ports and harbors is governed by a system of traffic separation schemes. Traffic separation schemes are internationally recognized routing designations created by the USCG that separate opposing flows of vessel traffic into lanes (fairways), including a zone between lanes where traffic is to be avoided (33 Code of Federal Regulations [CFR] 166). Safety fairways are lanes or corridors in which no artificial island or fixed structure, whether temporary or permanent, is permitted (33 CFR 167). These fairways, which are also delineated by a series of geographic coordinates, provide unobstructed approaches for vessels using U.S. ports. Vessels are not required to use the fairways, but failure to use one, if available, would be a major factor for determining liability in the event of a collision with another ship or an underwater structure.

Shipping lanes (fairways) in the vicinity of Guam are shown on Figure 14.1-1. In the western Pacific Ocean, commercially navigable waterways link Guam and the Commonwealth of the Northern Mariana Islands (CNMI) with major ports in both the east and west. The waterways running east and northeast serve ship traffic going to and from Hawaii and the mainland U.S., while the waterway running west connects Guam and the CNMI with ports in Asia. Commercial ships travel weekly from the mainland U.S. or Hawaii to Micronesia making their first stop in Guam with later stops at the neighboring islands of Saipan, Tinian, Rota, Yap, Chuuk, Pohnpei, Kosrae, Kwajalein, Majuro, and Ebeye (Matson 2008).

Inter-island shipping is conducted from Guam by three companies:

- Seabridge, Inc. operates weekly shipping services between Guam and the CNMI (www.seabridgeinc.com).
- Maersk Inc. provides weekly shipping between Hawaii, Guam, and China (www.maerskline.com).
- SWIRE Shipping provides service between Guam and Australia and New Zealand once every 35 days (www.swireshipping.com).

14.1.4.2 Naval Base Guam

Apra Harbor can accommodate the largest of Navy ships, including aircraft carriers. Guam Shipyard provides repair and maintenance facilities for these ships. The primary facility located in Outer Apra Harbor is Kilo Wharf, a munitions wharf. It is located on the south side of Outer Apra Harbor approximately 3,600 ft (1,100 m) east of the outer harbor entrance. This wharf is 400 ft (122 m) long. As a result of dredging, depths alongside Kilo Wharf are 45 to 50 ft (13.7 to 15.2 m). Kilo Wharf is the only deep water port in the western Pacific where a loaded munitions ship can berth at a pier to obtain repair and maintenance services. Apra Harbor currently supports an average of two Carrier Strike Group port visits per year for an average of up to 7 days per year, though actual port visits and duration are subject to change based upon Fleet operational requirements. Nuclear powered aircraft carriers berth at Kilo Wharf

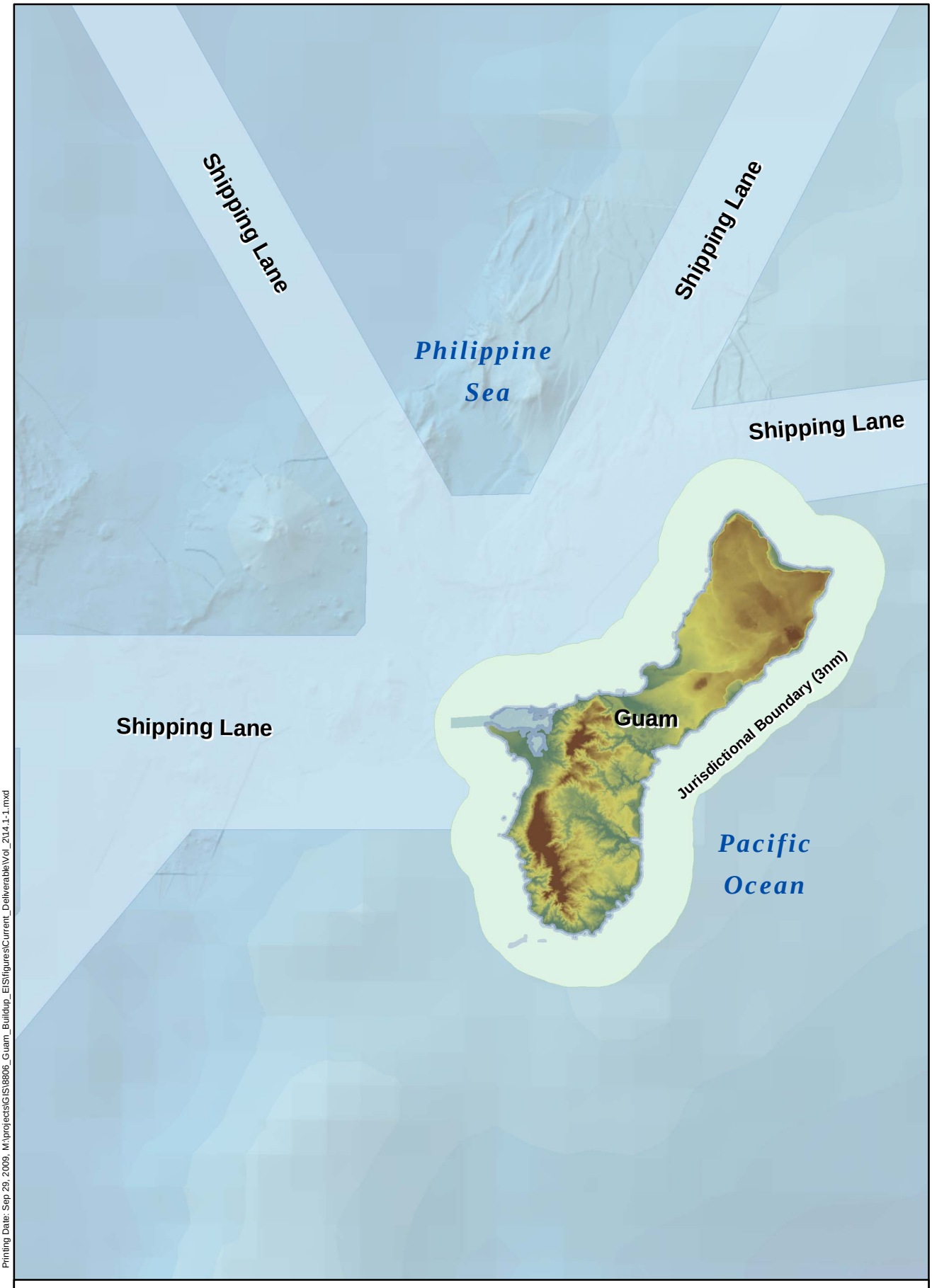

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Figure 14.1-1
Guam Shipping Lanes

because it is the only wharf that meets their draft requirements. Kilo Wharf currently lacks full "hotel" utilities necessary to support the ship (Global Security 2008 and GEDCA 2008).

The existing facilities located in Inner Apra Harbor include the following:

- Alpha and Bravo Wharves are located at the site of the former Navy Ship Repair Facility on the west side of the entrance to Inner Apra Harbor. These wharves are used for submarine berthing.
- Romeo and Sierra Wharves provide berthing services to Navy ships. Sierra Wharf was extensively damaged in an earthquake so only the southwest half of the wharf is now usable. The water depth at these wharves is 35 ft (11 m).
- Tango Wharf is 35 ft (11 m) deep; however, the wharf has been damaged and is currently not used.
- Uniform Wharf, which was damaged in an earthquake and is still unusable.
- Victor Wharf, which is used as the primary wharf for visiting combatant ships, Military Sealift Command, foreign navy vessels, and the USCG. The wharf provides about 700 linear ft (213 m) of berthing space.

A summary of the number of Navy ships recently visiting Apra Harbor was prepared by the Navy in May 2008 (Navy 2008). Information was provided on ship movements: a ship transit into and back out of the harbor is counted as two movements and as one visit. In 2007, 100 ships visited Outer Apra Harbor. From January through May 2008, 50 ships visited Outer Apra Harbor. For Inner Apra Harbor, 220 ships visited in 2007, and 115 ships visited during the first 5 months of 2008.

14.1.5 South

14.1.5.1 Naval Munitions Site

No marine transportation occurs at this location.

14.1.5.2 Non-DoD Land

No marine transportation occurs at this location.

14.2 ENVIRONMENTAL CONSEQUENCES

14.2.1 Approach to Analysis

The primary concern regarding marine transportation is the impact of the proposed action and alternatives on the military, commercial, and recreational navigational usage in Apra Harbor. It is critical that navigational access to the channels be maintained for these users. The consequences of the alternatives for the proposed action and the no-action alternative have been evaluated based upon the magnitude and duration of impacts to navigation. For activities that would have an adverse impact on navigation, appropriate mitigation measures would be required. Although organized by the Main Cantonment alternatives, a full analysis of Waterfront actions is presented beneath the respective headings. A summary of impacts specific to each alternative, Airfield, and Waterfront is presented at the end of this chapter. See Volume 6 Chapter 4 for a discussion of on base and off base roadways.

14.2.1.1 Methodology

Apra Harbor is the only DoD harbor that could accommodate the ships required for the relocation of the Marines to Guam; no other alternatives were feasible.

To determine the impacts of the proposed action on marine transportation, the anticipated annual number of vessels that would visit Apra Harbor is compared to the annual number of vessels that have visited Apra Harbor since 1995. Based upon the maximum number of vessels that visited the harbor during the period of 1995 through 2008, a comparison is made with the anticipated maximum number of vessels that would visit the harbor during the period of 2008 through 2018 (the embarkation period).

14.2.1.2 Determination of Significance

If the maximum annual number of vessels that would visit the harbor during the embarkation period exceeds the annual maximum since 1995, then a significant impact to marine transportation may occur. If the maximum annual number of vessels that would visit the harbor during the embarkation period is equal to or less than the annual maximum number of vessels since 1995, then there would be a less than significant impact to marine transportation.

14.2.1.3 Issues Identified during Public Scoping Process

As part of the analysis, the concerns relating to navigation that were identified by the public, including regulatory stakeholders, during scoping meetings were reviewed. These concerns related to potential access restrictions to areas in Outer Apra Harbor as a result of increased military vessel traffic.

14.2.2 Alternative 1

14.2.2.1 North

Andersen AFB

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Finegayan

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Non-DoD Land

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

14.2.2.2 Central

Andersen South

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Barrigada

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Non-DoD Land

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

14.2.2.3 Apra Harbor

14.2.2.4 Harbor

Construction

To facilitate the berthing of the escort combatant ships, it would be necessary to dredge Sierra Wharf to remove about 508,900 cubic yards (CY) (386,000 m^3) of sediment. It has not been determined whether the dredged material would be disposed in the proposed ocean dredged material disposal site offshore of Guam, or one or more upland placement sites with or without possible beneficial re-use on Navy land on Guam or a combination of all disposal options. If the dredged material is disposed at the ocean disposal site, there would be an increase in the use of the Apra Harbor navigation channels by the vessels transporting the dredged material. It is anticipated that, due to the hard substrate to be dredged, that about 2,000 CY of dredged material would be dredged each day over a period of about 6 to 9 months. One tug would tow a 4,000 CY (3,053 cubic meters [m^3]) scow filled with dredged material to the ocean disposal site and then return to the dredging site. The vessel carrying the dredged material from Apra Harbor would travel along existing shipping lanes and be subject to USCG rules and regulations. A total of about 127 trips would be needed to the ocean disposal site to transport the dredged material from Sierra Wharf. In consideration of the number of vessels that visit the Port of Guam each year (1,022 vessels in the year 2008), the addition of 127 vessel trips by the tug and scow would total 1,149 vessel visits to the Port of Guam during that year (a 12% increase). This number of vessels is much less than the number that visited the Port of Guam in 1995 (2,924 vessels). It is expected that the addition of about 127 vessel trips to transport the dredged material over the period of 6 to 9 months would result in less than a significant impact on marine transportation in Apra Harbor.

Operation

The relocation of Marine Corps forces to Guam would result in frequent embarkation operations. The Navy's amphibious task forces and the Marine Expeditionary Units (MEU) are transient forces that have traditionally come to Guam for port visits and training. These transient port calls do not represent a new mission but an increase in frequency with the proposed relocation.

Typically, there would be three ships carrying amphibious vessels, and sometimes an additional four combatant ships as escort. The amphibious ships would deploy amphibious craft (Landing Craft Air Cushion, Landing Craft Utility, Amphibious Assault Vehicle, or small reconnaissance boats) in either the Outer or Inner Apra Harbor; the craft would then travel to an amphibious laydown area. The duration of each amphibious task force visit would range between 6 and 21 days. No amphibious beach training is planned within Inner Apra Harbor. The MEU training would occur at a minimum of two times per year for three weeks duration each visit on Guam. In consideration of the substantial reduction in the number of annual visits by vessels to the Port of Guam since 1995 (as described above), it is expected that the number of visits of amphibious vessels and combatant ships would result in less than a significant impact on marine transportation in Apra Harbor.

The projected number of containers to be handled in the Port of Guam during the years 2008 through 2018 is presented in Table 14.2-1. The average number of containers to be handled per year during this period is 153,636 with the highest projected total in 2015 (190,000). After 2018, the annual number of military containers is projected to remain at 38,000 until at least 2027 (Port Authority of Guam 2008c).

Table 14.2-1. Port of Guam Total Containers to be Handled 2008 through 2018

Year	*Commercial**	*Military*	*Total*
2008	85,000	19,000	104,000
2009	87,000	21,000	108,000
2010	90,000	39,000	129,000
2011	91,000	58,000	149,000
2012	94,000	78,000	172,000
2013	97,000	81,000	178,000
2014	97,000	85,000	182,000
2015	101,000	89,000	190,000
2016	104,000	76,000	180,000
2017	106,000	46,000	152,000
2018	108,000	38,000	146,000

Notes: * Includes trans-shipment and local/tourist volumes.
Source: Port Authority of Guam 2008c.

The projected average number of containers to be handled each year during the period of 2008 through 2018 is about twice the average number of containers handled during the period of 1995 through 2008 (86,558). The average number of container ships that visited the Port of Guam each year over the period of 1995 through 2008 is 124. However, it is not expected that there would be twice as many visits by container ships to the Port of Guam during the embarkation period because the capacity of container ships has been increasing (Global Security 2009). The maximum number of containers to be handled during the period of 2008 through 2018 is 190,000 (in the year 2015). If the number of containers per ship remains the same as during the period of 1995 through 2008 (average of 706 containers per ship), there would be approximately 269 container ships visiting the Port of Guam during 2015.

As indicated in Table 14.1-1, the total number of commercial (non-fishing) vessels visiting the port of Guam has decreased substantially from 1995 (763 vessels) to 2008 (436 vessels). Assuming a channel

occupancy time of one hour for passage of a vessel into and out of the harbor, channel occupancy has declined from 17% to 9.7%. Even after allowing for military vessels (including priority vessels such as aircraft carriers) and weather interruptions, the harbor's navigation channels appear to have a substantial capacity for additional vessels. Because the annual number of vessels visiting the Port of Guam has decreased by 1,902 vessels over the period of 1995 to 2008, it is expected that the addition of 149 container vessels above the average visiting the Port of Guam over a one year period would result in less than a significant impact on marine transportation in Apra Harbor.

Naval Base Guam

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

14.2.2.5 South

Naval Munitions Site

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Non-DoD Land

Construction

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

Operation

No impacts on marine transportation resulting from the proposed action and alternatives are expected.

14.2.2.6 Summary of Impacts

There would be additional vessels visiting Apra Harbor as a result of the proposed relocation of Marines from Okinawa to Guam. Additional container ships would be required to transport the equipment and supplies necessary to support the relocation. There would be about 145 container ships required in 2015 (the peak year of container shipments) above the annual average of 124 container ships. In addition, there would be about 127 trips over a period of 6 to 9 months by a tug and scow to dispose of dredged material from Sierra Wharf. Because there has been a steady and substantial decline in the number of commercial vessels visiting the Port of Guam from 1995 through 2008 (2,924 to 1,022 vessels), the addition of up to 272 vessels is still be well below the total number of vessels visiting the Port of Guam in 1995. These additional vessel trips would result in less than a significant impact on marine navigation in Apra Harbor.

14.2.2.7 Potential Mitigation Measures

No mitigation measures are needed.

14.2.3 Alternative 2 (Preferred Alternative)

14.2.3.1 North

Andersen AFB

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

Finegayan

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

14.2.3.2 Central

Andersen South

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

Barrigada

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

14.2.3.3 Apra Harbor

Harbor

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

Naval Base Guam

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

14.2.3.4 South

Naval Munitions Site

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 2 are the same as Alternative 1.

Operation

The impacts for Alternative 2 are the same as Alternative 1.

14.2.3.5 Summary of Impacts

The impacts for Alternative 2 are the same as Alternative 1. The additional vessel trips due to construction, dredging, and operations would result in less than a significant impact on marine navigation in Apra Harbor.

14.2.3.6 Potential Mitigation Measures

No mitigation measures are required.

14.2.4 Alternative 3

14.2.4.1 North

Andersen AFB

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

Finegayan

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

14.2.4.2 Central

Andersen South

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

Barrigada

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

14.2.4.3 Apra Harbor

Harbor

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

Naval Base Guam

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

14.2.4.4 South

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 3 are the same as Alternative 1.

Operation

The impacts for Alternative 3 are the same as Alternative 1.

14.2.4.5 Summary of Impacts

The impacts for Alternative 3 are the same as Alternative 1. The additional vessel trips due to construction, dredging, and operations would result in less than a significant impact on marine navigation in Apra Harbor.

14.2.4.6 Potential Mitigation Measures

No mitigation measures are required.

14.2.5 Alternative 8

14.2.5.1 North

Andersen AFB

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

Finegayan

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

14.2.5.2 Central

Andersen South

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

Barrigada

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

14.2.5.3 Apra Harbor

Harbor

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

Naval Base Guam

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

14.2.5.4 South

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

Non-DoD Land

Construction

The impacts for Alternative 8 are the same as Alternative 1.

Operation

The impacts for Alternative 8 are the same as Alternative 1.

14.2.5.5 Summary of Impacts

The impacts for Alternative 8 are the same as Alternative 1. The additional vessel trips due to construction, dredging, and operations would result in less than a significant impact on marine navigation in Apra Harbor.

14.2.5.6 Potential Mitigation Measures

No mitigation measures are required.

14.2.6 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 Marine Corps would not meet readiness, mission and international treaty obligations. Existing operations on Guam would continue. Therefore, implementation of the no-action alternative

would maintain existing conditions, and result in no impacts. The number of military vessels visiting Guam would not change from current conditions. The number of non-military vessels visiting the Port of Guam would continue to decline or remain at about the current level. There would be no dredging of Sierra Wharf to accommodate the escort ships. Therefore, the no-action alternative would result in no impact on marine transportation. Implementation of the no-action alternative would not meet the mission, readiness, national security and international treaty obligations of the Marine Corps.

14.2.7 Summary of Impacts

Table 14.2-2, 14.2-3, and 14.2-4, and 14.2-5 summarize the potential impacts of each action alternative (Alternatives 1, 2, 3, and 8) associated with the Main Cantonment, firing range training, ammunition storage, and NMS access roads. Table 14.2-6 summarizes the potential impacts of other training, airfield, and waterfront components of the proposed action. A text summary is provided below.

Table 14.2-2. Summary of Main Cantonment Impacts – Alternatives 1, 2, 3 and 8

Main Cantonment Alternatives 1, 2, 3, and 8
Construction
NI • No impacts on marine transportation are expected.
Operation
NI • No impacts on marine transportation are expected.

Legend: NI = No impact.

Table 14.2-3. Summary of Training Impacts – Firing Range Alternatives

Firing Range Alternatives A and B
Construction
NI • No impacts on marine transportation are expected.
Operation
NI • No impacts on marine transportation are expected.

Legend: NI = No impact.

Table 14.2-4 Summary of Training Impacts – Ammunition Storage Alternatives

Ammunition Storage Alternatives A and B
Construction
NI • No impacts on marine transportation are expected.
Operation
NI • No impacts on marine transportation are expected.

Legend: NI = No impact.

Table 14.2-5 Summary of Training Impacts – NMS Access Roads Alternatives

Access Road Alternatives A and B
Construction
NI • No impacts on marine transportation are expected.
Operation
NI • No impacts on marine transportation are expected.

Legend: NI = No impact.

Table 14.2-6. Airfield and Waterfront Component Impacts

Other Training (North/Central/South)	*Airfield (North)*	*Waterfront (Apra Harbor)*
Construction		
NI • No impacts on marine transportation are expected.	NI • No impacts on marine transportation are expected.	LSI • Adequate capacity to accommodate increased vessel traffic would result in less than significant impacts on marine transportation at Apra Harbor
Operation		
NI • No impacts on marine transportation are expected.	NI • No impacts on marine transportation are expected.	LSI • Adequate capacity to accommodate increased vessel traffic would result in less than significant impacts on marine transportation at Apra Harbor

Legend: LSI = Less than significant impact, NI = No impact.

The primary military, commercial, and recreational port facilities on Guam are located in Apra Harbor. It is critical that navigational access to the channels be maintained for these users. The number of vessels visiting the harbor has decreased steadily and substantially between the period of 1995 to 2008. The proposed relocation of the Marines would result in an increase in the number of vessels using Apra Harbor primarily during the period of 2010 through 2017. It is expected that the increased vessel traffic could be accommodated by the navigation channels in the harbor since the annual number of vessels visiting the harbor during even the peak year of container shipments would be less than the number of vessels visiting the harbor in 1995. Therefore, the proposed relocation of the Marines would result in less than significant impacts on marine transportation in Apra Harbor.

14.2.8 Summary of Potential Mitigation Measures

No significant impacts on marine transportation would result from the proposed action and alternatives. No mitigation measures are required.