PORT IMPROVEMENT PROJECT

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THE PORT AUTHORITY OF GUAM

Artist rendition of Port in 2015
without improvements

Port assets in 2015 with improvements

TIGER Discretionary Grant Application

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Guam Port Improvement Project Overview

Quick Facts

- *Project Name:* Guam Port Improvement Project
- *What:* Modernization, repair, and capacity investments at the Port
- *Where:* Jose D. Leon Guerrero Commercial Port on the U.S. Territory of Guam
  Rural/Urban: The Port is located in a rural area according to U.S. Census classification
- *Congressional District:* U.S. House of Rep. Delegate At Large Madeleine Z. Bordallo
- *Cost:* $104.2 Million
- *TIGER Request:* $49.7 Million
- *Construction Timeframe:* Spring 2010 – January 2012
- *Jobs:* Approximately 1,600 total jobs (708 direct jobs)

Why Is This Project The Right Choice For TIGER?

1. An Essential Project for A Vital Facility

   As the gateway to maritime commerce for the entire Micronesian Region, over 90% of the region's goods and supplies pass through this Port. Despite its importance as the only commercial port serving the population and our military bases on Guam, a lack of funding has meant that no major capital improvements have been implemented since the Port's construction 40 years ago. As a result, the Port facilities and equipment are in a well-documented state of disrepair, with equipment that no longer functions and dilapidated facilities beyond their useful life. This Project will modernize and repair the most essential assets and double the Port's capacity to accommodate near- and long-term demand, including an impending surge in cargo that will nearly double Port demand over the next six years.

2. Significant Long-Term Benefits
   - Return critical assets to a state of good repair.
   - Significantly improve the Port's yard, gate, and dwell time efficiencies and reliability.
   - Reduce operating costs for the Port, shippers, carriers, and trucks.
   - Double Port capacity to meet projected long-term demand.
   - Improve the safety and security of the Port.
   - By 2015, save nearly 1 million gallons of fuel/year and reduce pollution (annual savings of 81 tons of NO_2 emissions, 8 tons of diesel particular matter emissions, 93 tons of SO_X emissions, and 8,400 tons of CO_2 emissions) in an air quality non-attainment area.

3. A Great Economic Investment
   - B/C Ratio ranging from 2.4 (7% discount rate) to 4.6 (3% discount rate).
   - Economic benefits outweigh the TIGER Grant request by a 4:1 ratio.

4. Tremendous Partnership
   - The Port is contributing more than half of the Project funding by incurring debt that will be repaid through efficiency gains and tariff increases. The Project cannot be implemented without the financial assistance of the TIGER Grant.
   - The Project is strongly supported by a broad range of stakeholders, including local businesses and residents, shippers, carriers, lenders, labor, and the Governor of Guam.

Why Now?

- *National Urgency:* Driven by a treaty signed by the U.S. Government and Japan, a construction program valued at more than $10 billion must begin in 2010 to prepare for the relocation of U.S. military personnel and their dependents to strategic military facilities on Guam. In order for these activities to occur, virtually 100% of the construction-related supplies, materials, and equipment must be shipped through the currently ill-equipped Port.
- *Jobs in an Economically Distressed Area (EDA):* Guam is an EDA with unemployment 2.1 percentage points higher than the national average and a per capita income that is only 37% of the U.S. average.

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1 Project Description

Context and Need for the Project

This Port Improvement Project is an essential package of modernization, repair, and capacity investments for the Jose D. Leon Guerrero Commercial Port located in the Territory of Guam, the largest island in the Micronesian Region of the Western Pacific. As the only commercial port in Guam, it serves as the gateway to maritime commerce for the entire Micronesian Region. With over 90% of the region's goods and supplies passing through its portals, the Port's impact on the quality and sustenance of life for residents of the region cannot be overstated. As Guam can only produce limited amounts of food and products on the island, the Port is truly the life link between the region and the rest of the world.

The Port facilities were designed in the 1960s and put into service in 1969. Over the last forty years, no major capital improvements have been implemented. This is in contrast to the situation at most modern mainland ports which have undergone two or more cycles of technology and maintenance improvements during this same period of time. This situation exists primarily due to a long history of limited funding to support maintenance, repair, and capital projects at the Port.[1] As a result, most of the Port's assets are in a critical state of disrepair and are out of compliance with current codes and standards.

Due to limited working equipment, obsolete facilities, and limited capacity under the existing port configuration, the Port is already struggling to serve current demand effectively—particularly for bulk and breakbulk cargo. For example, it can currently take up to three weeks to offload ships transporting aggregate or rebar construction materials due to insufficient working equipment as well as inadequate space under the current port configuration.

In addition to its importance in regional economic activities, the Port plays a critical role in national defense, benefitting the national interests of the United States. The U.S. military relies heavily upon this port for the shipment of goods and supplies to the military bases located on Guam.[2] These bases are strategic installations for maintaining the Nation's security interests throughout the Asia-Pacific Region, as Guam is the western-most U.S. Territory and more than 3,000 miles closer to Asia than Hawaii.

The U.S.-Japan Defense Posture Realignment Initiative (DPRI) program will relocate a significant number of military personnel to bases on Guam, making Guam the U.S. military's Western Pacific headquarters. In February 2009, Secretary of State Hillary Clinton signed a bilateral treaty with Japan that reaffirmed the goal of relocating Marine Corps personnel and their dependents from Okinawa to Guam.[3] By 2016, Guam's military population will increase more than 250% and the total population of Guam will increase more than 20%.

> Guam's military buildup will be "one of the largest movements of military assets in decades" and will allow the U.S. to "maintain a robust military presence in a critical part of the world." – *U.S. Defense Secretary Robert Gates, speaking in May 2008*

Although the Port Improvement Project will generate significant long-term benefits for businesses and residents of the region, the urgency for implementing this Project is primarily driven by the need to improve the functions of the Port to support the sharp increase in demand brought on by the military construction and subsequent jump in the population base. The U.S. Department of Defense (DOD) estimates that it will be spending over $10 billion (including contributions from the Government of Japan) just to build a new Marine base; it is also undertaking other large construction projects for the Navy, Air Force, and Army on the Island of Guam under the DPRI program over the next several years.[4] This program will not only require a tremendous amount of supplies, materials, and equipment for the construction activities, but it will also require significant additional amounts of supplies and cargo needed to support construction workforce housing and logistics

[1] The situation has been compounded by long-standing limitations on the Port's ability to impose tariff increases; however, a recent territorial law (PL 30-52) expands the Port's ability to raise tariffs. This new authority plays a key role in the Project financial plan.

[2] Apra Naval Base and Anderson Air Force Base are two important U.S. military bases located on Guam. A new Marine Corps base is scheduled to begin construction in 2010.

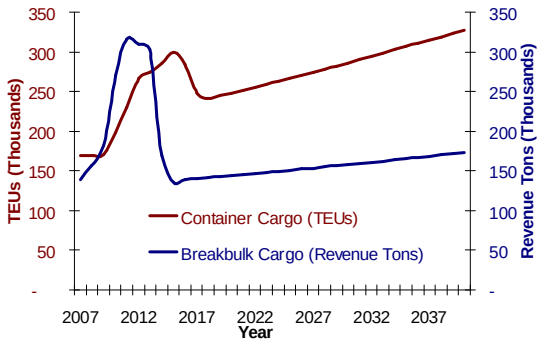
[3] Agreement between the Government of Japan and the Government of the United States of America Concerning the Implementation of the Relocation of the III Marine Expeditionary Force Personnel and their Dependents from Okinawa to Guam, signed February 17, 2009.

[4] Although the urgency to double the port's capacity now is driven by the DOD program, the $10 billion figure does not include the cost of upgrading Port facilities. This Port Improvement Project will help the Port achieve the cargo handling efficiencies necessary to operate as a modern port and support the timeline and magnitude of the military buildup.

requirements. Over 90% of the supplies and materials needed for this construction are estimated to be shipped through the Jose D. Leon Guerrero Commercial Port—at a pace that nearly doubles current cargo throughput—and most of it must be shipped before troops and their dependents can arrive. During the next six years, container shipments are forecasted to increase 71% (from 103,000 containers to 176,000 containers) and breakbulk shipments are forecasted to increase 104% (from 155,000 tons to approximately 316,000 tons).[5] Due to the population increase and the overall expansion of economic activity on Guam, the cargo throughput demands will remain above current Port capacities for container cargo even after the military buildup is completed and temporary construction workers return to Hawaii or the U.S. mainland. The current Port facilities are not capable of serving the long-term demand, let alone the surge activities during military construction.

Due to the deteriorated condition and inadequate quantity of current cargo handling equipment, carriers have voiced concerns about the Port's future ability to service ships within reasonable berth service times without this Project. The container transshipment trade is a competitive business yet provides critical contributions to funding terminal overhead costs.[6] If these carriers decide to bypass Guam, the Port would be forced to raise tariffs considerably higher (which would increase the cost of goods for businesses and residents of the region and push the Island's high inflation rate even higher) or it would reduce the Port's future cash flows available for maintenance and repairs (limiting the Port's ability to provide effective service); either impact would have negative long-term impacts on the residents of Guam and the entire Micronesian Region.

Figure 1: Port Forecast Breakbulk and Container Cargo Volumes



Without this Project, the obsolete Port infrastructure and its operations will be severely impacted as early as 2011 in the face of unmanageable cargo demand. As an example, longer delays (beyond the already onerous truck gate processing time of 15 minutes for inbound trucks and 5 minutes for outbound trucks) would occur at the terminal gates, with as many as 120 trucks queuing along the port access road (Route 11) as they wait to enter the Port (modernized U.S ports typically process inbound trucks in less than 3 minutes). There would also be cargo handling backups in the cargo and breakbulk terminals due to equipment and yard configuration limitations. The severity of the capacity constraints could lead to longer vessel service times and backups in vessel call schedules at the Port. During peak demand periods, some ships are expected to wait more than three weeks in the harbor before being processed. If sustained over an extended period, this in turn would cause some carriers to consider cancelling their port calls in order to maintain their shipping rotations in the primary market between the U.S. West Coast and Asia.

> The Port of Guam is "a choke point in the flow of material and equipment for the military buildup" – *General David Bice, speaking at the 2007 Guam Industry Forum*

Foreseeing the significant changes in Port demand and the looming need to replace aged infrastructure, the Port Authority of Guam (PAG) updated its Master Plan[7] in 2007-2008 to identify capital improvements needed over the long term. A subsequent analysis and report[8] prepared for the Guam Legislature identified the highest-priority investments that are needed to meet forecasted near-term cargo-handling demand increases. This TIGER Discretionary Grant application is for a $ 104.2 million project that represents the highest-priority investments. The project is referred to as the ARRA-USDA Improvements in other documents and referred to herein as the "Port Improvement Project" or simply the "Project".

[5] This demand forecast, based on figures prepared by DOD, conservatively assumes major construction activities on the Island of Guam will occur from 2010 through 2016. If the construction schedule were compressed to finish major activities by the end of 2014, the peak demand would be higher and the need for additional Port capacity would be even greater.

[6] While transshipments currently only represent 10% of the total cargo arriving at the Port terminal, it is highly profitable due to the lower costs (because the boxes are simply off-loaded, stored in the yard, and loaded back onto other ships). Carriers choose service locations based on availability of space and often have no ties to a specific port.

[7] Port Authority of Guam, Master Plan Update 2007, April 2008.

[8] Port Authority of Guam Report (Implementation Plan, Financial Plan, and Economic Impact Statement) to the Legislature pursuant to 5 GCA Chapter 9 § 9301, August 3, 2009.

Using the Project as a stepping stone, the Port also plans to execute future long-term improvements (berth rehabilitation and other smaller project improvements, estimated to cost $104.8 million in base year dollars) that were recommended in the Master Plan. However, the means of financing these longer-term improvements are not yet in place.

It is important to note that the Project has independent utility. It will enable the Port to improve efficiency, handle greater cargo-handling demands, and generate the revenues needed to retire Project debt. The benefits created by the Project do not depend on any additional projects or improvements.

The Port Improvement Project

From the spring of 2010 through January 2012, PAG plans to construct the $104.2 million Port Improvement Project. The investments included in this Project collectively do three general things:

- Return critical assets to a state of good repair;
- Increase capacity sufficient to meet immediate demand; and
- Incorporate new investments that are essential parts of modern port operations (e.g., terminal operating system).

The Project includes an eastward extension of useable terminal area and modernization of the upland port facilities, equipment, utilities, and systems; the yard configuration will also be enhanced by replacing obsolete facilities with improved ones in more appropriate locations. It will also implement automated gate technology and modern truck scanning equipment. Collectively, these improvements will significantly increase the operating efficiency and capacity of the terminal. Further, the Project also includes investments that will make immediate security enhancements and create a security backbone that will lay the groundwork for the Port to meet provisions in the Maritime Transportation Security Act (MTSA), the Customs-Trade Partnership Against Terrorism (C-TPAT) program, and other military and port operations standards. The Project investments include:

Table 1: Port Improvement Project Investments and Benefits[9]

Project Investment	Need & Benefit
Construction Mobilization	Bring an experienced contractor with modern construction equipment and experience for timely completion of the Project without unduly impacting existing terminal operations
Building & Site Demolition	Remove obsolete buildings that interfere with modern operating processes
Extend Port Admin Building	Relocate workforce not directly needed for cargo handling operations outside the terminal for security
Other Buildings & Structures	Replace critical buildings with modern strategically located structures to improve worker efficiency
Yard Heavy Duty Paving	Increase container yard cargo handling capacity by using cargo handling equipment with heavy wheel loads and stacking containers up to five high
Power Supply & Distribution	Power supply for safe and expanded operations in the terminals
Yard Lighting	Permit safe night operations compliant with Occupational Safety and Health Administration (OSHA) requirements
Water & Sanitary Sewers	Provide distributed restroom and other facilities to make the work force more efficient with less down time during shift hours
Storm Drainage System	Provide safer operating conditions during inclement weather and provide environmental safeguards against contamination of Apra Harbor due to contaminated rain water runoff
Fire Protection System	Create code-compliant fire protection to improve Port safety
Security Infrastructure	Provide the communications and data interchange backbone for future security equipment to create a secure environment that meets C-TPAT and other security protocols
5 Top-Picks or Top Loaders	Make substantial improvements in container handling operational

[9] Guam 2007 Master Plan, Executive Summary and Section 6.

4 Side-Picks - Empty Handlers	efficiencies for ship service and yard service. Increase terminal container cargo capacity from 200,000 to 400,000 TEUs
17 Yard Tractors & 50 Chassis	
11 Forklifts, 8 Mafi Trailers, & Break Bulk Equipment	Increase capacity for breakbulk cargo from 150,000 to 400,000 tons per year at terminal
Terminal Operating System	Control terminal functions over entire terminal and implement efficient modern container terminal operations technology
Gates Systems	Provide an efficient semi-automated, secure truck gate system and reduce average truck entry time from current 15 minutes to 3 minutes. Prevent truck queuing on Port access road

An aerial depiction of the Project (overlaid upon a map) is presented in Appendix 1. Capacity improvements will be made within the footprint of the existing terminal, which will not only increase the cost effectiveness of the investments, but it will also avoid impacts on the surrounding environment.

2 Project Parties

The Project has broad and deep support across a wide range of stakeholders, as illustrated by the letters of support. The parties who have a role in the Project approvals and delivery are as follows:

Port Authority of Guam (PAG): PAG is the owner and operator of the Port and it is also the official sponsor of the Project as well as the TIGER Grant applicant. PAG also has the authority to act on behalf of the Government of Guam. PAG and its owner's agent/engineer (PB International) have project development responsibilities until 35% of design is complete on the Port's Master Plan improvements, at which time the project delivery responsibilities are transferred to the U.S. Maritime Administration.

U.S. Department of Transportation (USDOT) / Maritime Administration (MARAD): By the provisions contained in Section 3512 of Public Law 110-447, MARAD is designated as the lead federal agency for the "Port of Guam Improvement Enterprise Program." As such, the law requires that federal funding for the project be managed by MARAD in accordance with federal requirements using this fund. A Program Management Team (PMT) contractor under MARAD's overview will be responsible for delivery of the facilities for the Project in accordance with specifications and technical documents established by the Port. The U.S. Department of Transportation (USDOT) or one of its modal agencies will be responsible for administering the TIGER Grant and ensuring that federal-aid requirements are met.

U.S. Department of Agriculture (USDA): PAG has submitted applications for a $25 million direct loan and a $25 million loan guarantee to USDA for the Project. The credit assistance is being sought through USDA's Community Facility Direct and Guaranteed Loan Program, which is designed to develop essential community facilities for public use in rural areas. USDA has deemed this Port as an essential community facility in a rural area and is thus considering the applications concurrently with USDOT's consideration of this TIGER Grant application. Before making a decision on whether to provide credit assistance to potential projects, USDA evaluates the public benefits, business case, and financial plan for proposed projects. PAG has already received approval for an additional $4.5 million loan guarantee from USDA.[10]

Government of Guam: "GovGuam" is responsible for providing local approvals. This includes the Guam Legislature, the Governor of Guam, and agencies that report to the Governor.

Guam Public Utilities Commission (PUC): Although no approvals are needed from this independent entity for the Project to undergo construction, the PUC is responsible for reviewing and approving the Port's future tariff increases.

3 Sources and Uses of Project Funds

The total Project cost is estimated to be $104.2 million (in end of year 2010 dollars, based on the mid-point of the construction expenditures). The two sources of capital funding for the Project are $54.5 million in new PAG debt (facilitated by the USDA) and a TIGER Discretionary Grant of $49.7 million.

[10] As of September 1, 2009, written approval had been given for $3.5 million and oral approval had been given for $1 million.

PAG Debt Supported by the USDA Community Facility Direct and Guaranteed Loan Program

Contingent upon the TIGER Grant being awarded, PAG will borrow $54.5 million to fund 52% of the Project costs, facilitated by the USDA. The loans contemplated for the Project consist of three separate loans through the Community Facility Direct and Guaranteed Loan Program. They include the following:

- A $25 million loan from the Citizen's Security Bank of Guam (backed by a USDA loan guarantee) for site work, water supply, and drainage improvements.
- A $4.5 million loan from the Citizen's Security Bank of Guam (backed by a USDA loan guarantee) for maintenance replacement of obsolete cargo handling equipment at the terminal.
- A $25 million USDA direct loan for site work, building remodels, electrical and lighting improvements, and security infrastructure.

The Guaranteed Loan is split so that 90% is backed by the full faith and credit of the U.S. Government while the remaining 10% is backed solely by the credit strength of the borrower. The U.S. Government guarantee enables USDA-approved commercial lenders to pass lower interest rates on to borrowers.

PAG will repay all three loans through its revenues derived from user fees, and PAG has already received approval for the $4.5 million loan guarantee. A complete application has also been submitted to USDA for $50 million in direct and guaranteed loans. USDA performs a business-like review of the applications (including the financial plan) and is expected to approve these remaining loans by the fall of 2009. In accordance with USDA and local requirements, the Government of Guam completed the procurement process and selected Citizens Security Bank as the commercial loan lender in July 2009. USDA's indications to date have suggested that the application is likely to receive approval for all three loans, subject to PAG receiving a USDOT TIGER Discretionary Grant.

TIGER Discretionary Grant

A TIGER Discretionary Grant in the amount of $49.7 million (48% of the Project cost) is requested. The following table shows the breakdown of project costs by funding sources and investment type.

Table 2: Project Sources and Uses (2010 $Millions)[11]

Port Improvement Project Categories	Funding Sources				Total Capital Expenditures
	USDOT TIGER Grant	USDA Direct Loan	USDA Loan Guarantee	USDA Loan Guarantee (Equipment)	
Mobilization	5.00	-	-	-	5.00
Demolition	6.68	1.56	-	-	8.23
Buildings	4.01	9.92	-	-	13.93
Sitework and Paving	18.34	-	2.41	-	20.74
Power, Lighting and Electrical	-	13.06	-	-	13.06
Site Utilities	1.75	-	22.59	-	24.33
Security Infrastructure	-	0.45	-	-	0.45
Container Cargo Handling Equip.	4.51	-	-	3.63	8.14
Breakbulk Cargo Handling Equip.	0.83	-	-	0.83	1.65
Terminal Operating System	4.44	-	-	-	4.44
Gate System	4.16	-	-	-	4.16
Total	$49.7M	$25.0M	$25.0M	$4.5M	$104.2M
Share of Total Funds	48%	24%	24%	4%	100%

Note: Totals may not add due to rounding. Engineering/construction management costs are included in the figures above, and are 15% of all categories except Cargo Handling Equipment, the Terminal Operating System and the Gate System, which have allocations of 1%, 4%, and 9%, respectively. A 15% contingency is also included in the project cost estimates above.

[11] USDA Financial Feasibility Report, *Port Authority of Guam,* August 2009.

4 Primary Selection Criteria

4.1 Long Term Outcomes

4.1.1. State of Good Repair

Capital Asset Conditions

The Port of Guam marine terminal is in dire need of upgrades in order to improve the condition and operating performance of existing transportation facilities and systems. The table below shows the age of the existing assets as compared to their useful life. As is evident in table 3, most of the existing equipment is both obsolete and beyond the intended useful life. All of these assets will be replaced by the Project. Following this immediate replacement, the Port of Guam will allocate annual maintenance and replacement capital for these assets.

Table 3: Age and Useful Life of Existing Assets to be Replaced[12]

Assets	Year Implemented	Normal Life Cycle (Years)	Remaining Useful Life (Years)
Container Operating Equipment			
Top-Picks	1994	8	-7
Side-Picks	2002	8	1
Yard Tractors	2002	8	1
Breakbulk Operating Equipment	2002	8	1
Buildings and Misc. Structures	1973	30	-6
Container Yard and Utilities	1973[13]	30	-6

NOTE: Eight of the Port's fleet of 24 tractors are excluded in the above table because they were purchased new in 2008.

The following sections outline the Project's impacts on capital asset conditions.

Container Operating Equipment

The container operating equipment includes equipment for use under both wheeled and grounded operations. The Port currently has 24 yard tractors, most of which are not in operable condition since they are well beyond their useful life.[14] The top-picks and side-picks are also in need of replacement since they are well beyond their useful lives. Investments in new yard equipment will greatly improve the cargo handling capability of the Port (allowing it to achieve the industry's typical rate of 25-27 crane lifts per hour) and its ability to service ships.

Breakbulk Operating Equipment

The existing breakbulk equipment fleet only has one year left in its useful life. The proposed investments include a full replacement of the fleet of breakbulk cargo equipment (in addition to the purchase of new equipment to expand the fleet). The port currently owns several forklifts that were purchased between 1994 and 2002. These forklifts are at or very close to the end of their useful life. The proposed investments will include replacing and expanding the fleet of forklifts in addition to purchase of eight Mafi trailers. This will enable the port to efficiently handle breakbulk cargo.

Buildings and Miscellaneous Structures

The Port's buildings consist of administrative buildings, maintenance sheds, and other miscellaneous structures. These were all constructed when the Port was built in 1967 and are incompatible with modern port cargo handling practice. Selected buildings will be demolished and replaced in new locations if needed or renovated and expanded in place. This, combined with infrastructure improvements to restore facilities service capability and code compliance, will serve to modernize and improve operations efficiency, flexibility, capacity, and security while improving compatible use of land and facilities. Furthermore, the new construction is designed to meet current seismic standards.

[12] Guam Master Plan 2007, Section 2.
[13] Since 1973, the yard and site utilities have had some minor upgrades but are in need of an overhaul.
[14] The Port only has 8 relatively new yard tractors, which were purchased in 2008.

Container Yard

The last container yard paving maintenance was performed in 1990-1991, except a portion behind berth F-5 that was retrofitted in 1997 after earthquake damage. Since then, no major maintenance has been made to the yard area leaving it in poor condition with visible cracks and extreme wear and tear. The yard pavement rehabilitation included in the Project is necessary to facilitate storm water management improvements and the reconfiguration of below-grade utilities (also included as a part of the Project). It is also necessary to transition to a high-density stacked container storage system to support higher cargo volumes and improve the paving for top-pick (top loader) and side-pick (side loader) container handling equipment with extremely high operating wheel loads.

Utilities

The sewer, lighting, and other yard and site utilities are not sufficient to support higher volumes of traffic on the Port and do not meet OSHA and code standards. For example, the lighting poles do not provide recommended illumination for night operations and are not high enough to support higher density stacking operations, the water system faces multiple stoppages a year, there is constant leakage from the underground water pipes, the storm water drainage system is environmentally insufficient, some of the underground water pipes contain asbestos, a (non-Port) fuel line runs through the storage yard, and the Port does not have sufficient fire hydrants and protection systems. The Project investments include upgrades to the utilities and fire protection systems on the Port in order to support the goal of safe and efficient operations, including sustainable operations during inclement weather conditions.

Terminal Operating and Gate Systems

There is currently no modern terminal operating or gate systems on the Port. The existing system utilizes a paper-based system, requiring manual checks on container movements. The Project will install a fully integrated system for managing operations including truck appointment, electronic data interchange, customs interface, differential global positioning systems, refrigeration monitoring, security, gate system interface, finance, human resources, and other satellite information technology components. This will help transform the Port to a modern terminal that can interface with its shippers, vendors, and other stakeholder and operate efficiently.

Capitalization of Assets

Life-cycle costing analysis was used to determine which investments would have the lowest life-cycle cost.[15] In addition, the new buildings and security infrastructure will also be of higher quality and be able to withstand natural (e.g. typhoon and seismic event) and unnatural wear far better than the structures constructed 40 years ago. The higher quality and longer life of the assets will minimize operating costs and be more cost-effective investments when considered over the entire life of the assets.

Ongoing Operating and Maintenance[16]

In addition to the Project producing an operating & maintenance (O&M) cost savings, a sustainable source of revenue is available for debt service and long-term O&M expenses. Throughout the 20-year analysis period from 2010 to 2030, revenues are projected to exceed O&M expenses excluding depreciation (Operating Income Before Depreciation) by 17% or more. The minimum debt service coverage ratio is set to be 1.6 times coverage, providing more than sufficient capacity to fund O&M costs in the event that revenues are less than the forecast due to unforeseen business conditions.

4.1.2. Economic Competitiveness

Unless otherwise noted, all figures presented in this section are from the *Evaluation of Expected Project Costs and Benefits* document.[17] More detail of the analysis and results can be found in that report.

Effectiveness of the Port of Guam

The redevelopment of the Port of Guam will improve both near- and long-term efficiency, reliability and cost-competitiveness in the movement of goods to and from Guam and throughout the surrounding area, including to the Commonwealth of the Northern Mariana Islands (CNMI), a commonwealth of the U.S., the Federated States of Micronesia (FSM), the Republic of Palau, and the Republic of the Marshall Islands

[15] USDA Financial Feasibility Report, *Port Authority of Guam,* August 2009.
[16] USDA Financial Feasibility Report, *Port Authority of Guam,* August 2009.
[17] Evaluation of Expected Project Costs and Benefits, *BST Associates,* August 2009.

(RMI). The Project investments are essential in delivering and sustaining the DOD buildup on Guam. Without this Project, the DOD buildup and supply of cargo to the local population and the regions will be severely constrained because the current Port simply cannot handle the volume of cargo needed.

Even without the military buildup, the Port is reaching capacity to serve its existing markets, and in the near future, if left unimproved, will be incapable of meeting the local demand on Guam. More than 90% of the goods that are consumed in Guam and the neighboring island areas pass through the Port.

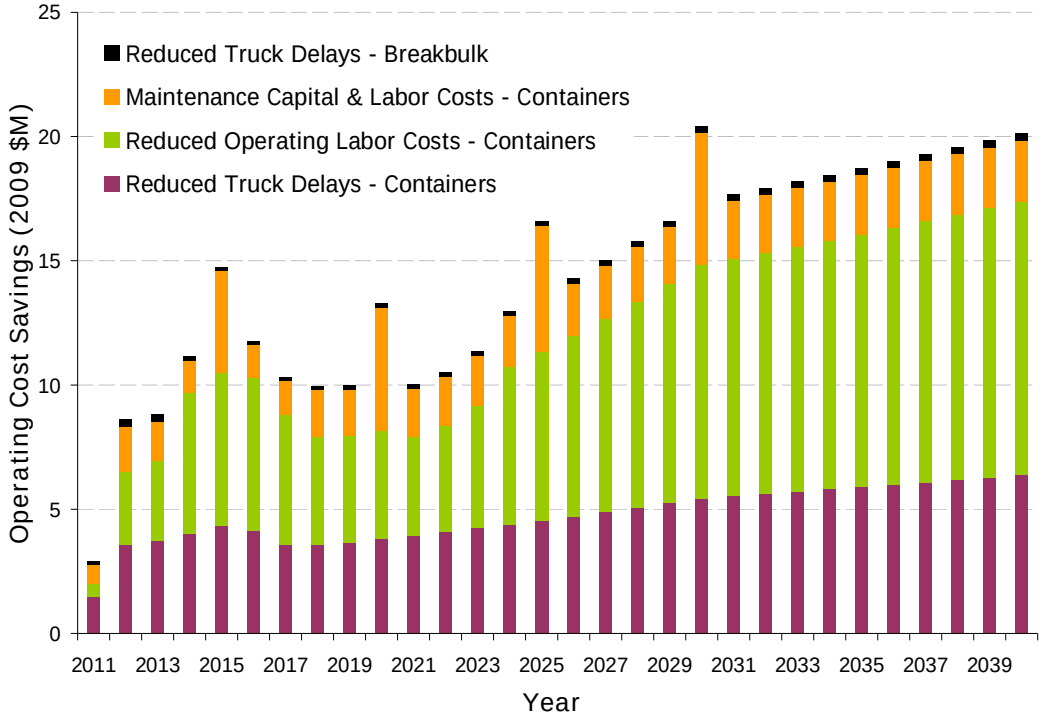
Operational Cost Savings

The redevelopment of the Port of Guam marine terminal will significantly improve the efficiency of the terminal. In fact, the Project will create operating costs savings that range from $8 to 20 million per year, returning the cost of the capital investments in just 10 years after project completion. A detailed model of port operations was developed to assess how cargo operations (containerized and breakbulk) utilize key components of the marine terminal under current conditions as compared with improved conditions. The improvements will generate cost savings as follows:

- *Reduced Truck Delays within the Yard and at the Gates:* Trucks will be processed faster and will require substantially less service time inside the yard. Important sub-components include gate queuing time, gate processing time, and yard service time.
- *Reduced Operating Labor Costs:* Improved gate and terminal operating systems will likewise improve (decrease) the Port's cost of operating the terminal. Important sub-components include truck gate operating hours, container yard grounding service, and vessel stevedoring service (loading and unloading cargo on and off ships).
- *Maintenance Labor and Capital Costs:* Reductions in equipment operating hours will also lower maintenance costs.

Figure 2 illustrates the annual flow of operational cost savings by major category. The reduced truck delays for both breakbulk and container cargo will accrue to both the Port of Guam and to truckers accessing the port on behalf of shippers. The maintenance capital and labor costs, as well as the reduced operating labor costs are savings that are specific to PAG.

Figure 2: Port of Guam Operational Cost Savings by Year



Reduced Inventory Carrying Costs

The Port Improvement Project will reduce the inventory carrying costs of shippers in Guam by reducing the time that cargo remains in the marine terminal prior to arriving at the shipper's warehouse or retail store. As multiple carriers serve the Port (ensuring there is sufficient competition), it is expected that some of this cost savings will be passed on to consumers, benefiting the residents of Guam. This is particularly important in Guam because of the Island's high inflation rate.

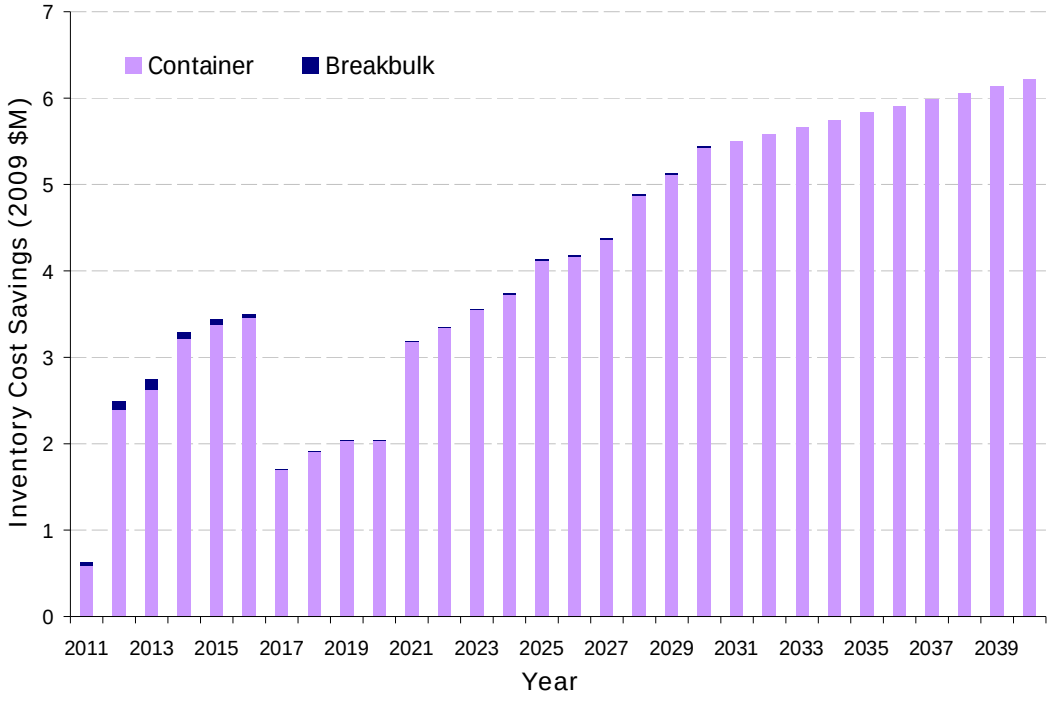
Using a 7% real discount rate, the Present Value (PV) of reduced inventory carrying costs is estimated to be $39.3 million. Using a 3% real discount rate, the PV of reduced inventory carrying costs is estimated to be $73.1 million. Detailed figures are presented in Table 4 and Figure 3 below.

Table 4: Present Value of Reduced Inventory Carrying Costs, in 2009 $Millions

Description	Present Value	
Real Discount Rate	7.0%	3.0%
Container Operations	$38.92	$72.70
Breakbulk Operations	$0.38	$0.49
SUBTOTAL	$39.30	$73.18

Note: Totals may not add due to rounding

Figure 3: Port of Guam Reduced Inventory Carrying Costs by Year



Long-term Jobs and Economic Impacts after Construction

The Port Improvement Project will enable increased employment, particularly in the private sector. It will also have a positive effect on Gross Domestic Product and personal incomes in Guam and the U.S. mainland. Table 5 summarizes the economic impacts from operations at the Port of Guam by comparing existing (2008) levels of income, jobs and economic output with the average level of activity experienced during the post-construction evaluation period of 2011-2041. Direct revenues associated with the activities by the Port of Guam (charges for cargo handling) and other private firms engaged in the Port-related supply chain (tugs, warehousemen, truckers, etc.) were estimated at $51.6 million in 2009. The average revenues after construction are estimated at $74.8 million (adjusted for inflation), or $23.1

million more than in 2009.[18] This is a 44.8% increase over existing operations. The table below includes the long-term impacts of the Project only. While the new operating equipment will improve efficiency and minimize the need for additional labor, the increase in direct employment shown in the table below is due to higher cargo volume levels in the future.

Table 5: Economic Impacts of Port Operations[19]

Economic Impacts	Existing	Average Year After Project Construction	Percent Increase
Output ($Millions)			
Direct	$51.6	$74.8	44.8%
Employment (Jobs)			
Direct	655	857	30.8%
Total	1,053	1,377	30.8%
Income ($Millions)			
Direct	$21.6	$28.6	32.8%
Total	$39.0	$51.7	32.8%

The jobs created at the Port of Guam are also quality jobs. With an average income of $32,930, these jobs are 49.9% higher than the average private-sector wage in Guam.

4.1.3. Livability

For the more than half-million people that live in this rural region (covering over 1.5 million square miles), the Port of Guam is the life link to the rest of the world. The improvements achieved through the Project will ensure better access to consumer goods (including medical supplies and prescription drugs), and they could also have a marginal impact on reducing the cost of services in the region (because almost all goods must be shipped to Guam, changes in shipping costs and Port efficiency can impact consumer prices). In an Economically Distressed Area, such as Guam, this vital service link takes on added significance.

As a part of ensuring community involvement, the Project is derived from the 2007 Port Master Plan, which has been adopted as part of the overall planning documents for the Island of Guam. A planning process that encouraged full community participation was used.

4.1.4. Sustainability

Air Quality, CO_2 Emissions, and Fuel Savings

The Port is located in an air quality non-attainment area that exceeds National Ambient Air Quality Standards (NAAQS).[20] As a result, the potential for Port-related emissions savings are particularly important.

One positive impact of the Project is that it will allow trucks to move through the facility with fewer delays and less idling. Vessels will also shorten dwell time since they will no longer have to wait for the availability of yard equipment. Both of these impacts will reduce emissions and fuel consumption. As compared to a no build scenario, the Project will reduce Nitrogen Dioxide (NO_2) emissions by approximately 81 tons in 2015; Carbon Dioxide (CO_2) emissions will be reduced by approximately 8,400 tons over the same period, Diesel Particulate Matter (DPM) by 8 tons, and Sulfur Oxide (SO_X) by 93 tons. As a result of reduced vessel and truck dwell times and reductions in equipment operating hours, the

[18] The economic impacts are based on a spreadsheet model developed specifically for Guam and this TIGER Grant by BST Associates. The model takes into account typical expenditure patterns for each transaction at the Port (i.e., trucking charges, customs fees, operating costs at PAG etc) and translates these into wages and jobs based upon current conditions in Guam (percent of wages to revenue and average salaries in Guam). The multiplier effects were determined based upon recent economic impact studies prepared in Guam and at other port authorities.

[19] The Port Authority of Guam Report (Implementation Plan, Financial Plan, and Economic Impact Statement) to the Legislature pursuant to 5 GCA Chapter 9 § 9301, August 3, 2009.

[20] The area exceeds NAAQS standards for the SO_2 pollutant.

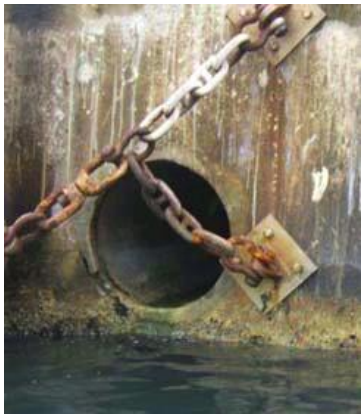
Project will also lead to an annual saving of 945,000 gallons of fuel by 2015 (as compared to the no build scenario).[21]

As noted earlier, some vessels could be forced to wait more than three weeks in the harbor (waiting to be serviced) during peak demand years if this Project is not implemented. These vessels would emit even more pollution than the figures cited above.

LEED Standards

The new buildings and building extensions constructed as part of the Project will be designed to operate more efficiently through the use of energy efficient heating, ventilation, lighting systems, and equipment for other utilities. Building systems and components will utilize recycled materials and be designed with appropriate Leadership in Energy and Environmental Design (LEED) targets in mind.

Figure 4: Untreated Storm Water Flowing Directly into Apra Harbor



Storm Water Management

The current 1960s design permits storm water runoff to enter the harbor without treatment (as shown in figure 4). This has been a stated concern of visiting representatives from U.S. EPA, Guam EPA, U.S. Fish and Wildlife, and National Marine Fisheries. The new storm water system will ensure that storm water runoff is collected and processed, addressing stakeholder concerns.

4.1.5. Safety

The equipment purchases made under the project investments will greatly improve the overall operational safety of the Port since the newer equipment is designed to reduce safety hazards as compared to obsolete counterparts. The new terminal layout and traffic flow scheme is designed to minimize traffic congestion and conflict, thus reducing the likelihood of accidents. Features such as OSHA-compliant lighting and code-compliant storm water collection systems will also permit safer operating conditions at night and during inclement weather.

As noted previously, the buildings on the Port are approximately 40 years old and reflect the lower design standards of the time. They have been subject to harsh natural conditions and are at risk of failure under a natural disaster such as the earthquake that damaged Port facilities in 1993. The extensions and newer buildings constructed as part of the Project will be built to withstand such events.

The Project will also upgrade the Port's fire protection system to support the new terminal operations and facilities. These upgrades will be conducted in coordination with the relevant fire fighting agencies.

4.1.6. Homeland Security

The existing security facilities at the Port are rudimentary, consisting of perimeter fencing, limited video surveillance, security personnel, inspection processes, and padlocks. Given that the commercial area around the Port is open to the public, (used for hotels, resorts, and public beaches), unauthorized personnel have the ability to access the berth and yard areas. Even though the Port recently implemented the Transportation Worker Identification Credential (TWIC) program to ensure that all personnel are approved before gaining access to the Port, the yard still lacks basic security measures, such as security cameras, card readers, and sensors.[22] The Port needs additional basic security investments as well as what will be required to secure the movement of military cargo.

The Project includes additional security infrastructure and equipment in accordance with the MTSA code as established by the Department of Homeland Security. As a part of this plan, perimeter fencing, gates, surveillance monitoring and communications capabilities will all be improved to meet updated Facility Security Plans and special security requirements that come with possible designation as a Strategic Military Port (as discussed below). Other key elements of the project include optical fiber cabling

[21] Detailed emission statistics were prepared as part of the *Evaluation of Expected Project Costs and Benefits,* report. The fuel gallons saved were calculated using the diesel fuel factors provided by the Environmental Protection Agency (EPA) (http://www.epa.gov/OMS/climate/420f05001.htm).

[22] Over the last six years, the Port has received an average of less than $1 million per year in federal Port Security Grants.

technology and an electrical cabling backbone to support emergency response capabilities and comprehensive and integrated security systems components such as radiation portal monitors and X-ray equipment.

The Port has applied to the Maritime Administration for assessment and designation as a "Strategic Port." This process is underway and with the improvements it is anticipated that the Port will be awarded this designation, which will allow it to be able to support diverted military cargo in an emergency or contingency situation. The improvements will be designed to accommodate annual military deployment exercises with military personnel, equipment, and deployment vessels.

4.2 Evaluation of Expected Project Costs and Benefits

This section summarizes a benefit/cost (B/C) evaluation of the Port Improvement Project. It is based on the USDOT's benefit-cost analysis guidelines for TIGER projects, focusing on operational cost savings, reduced inventory carrying costs, and the benefits of reduced air emissions. To be conservative, this analysis only evaluated the Project's impacts on mitigating daily delays that would be associated with successfully handling the future increase in cargo volumes.[23] It did not consider larger impacts such as the possibility of not being able to implement the military buildup or potential impacts on U.S.-Japan relations. Within this context, benefits were estimated to begin in mid-2011 (based on the implementation schedule) and extend through the expected 30-year life of the facility (to mid-2041). A more detailed explanation of the results, methodology, assumptions and figures presented in this section can be found in the document titled *Evaluation of Expected Project Costs and Benefits*, listed in section 10 of this report.

Summary of Benefit/Cost Evaluation

As summarized below, the present value of the Project benefits exceeds the present value of the costs, regardless of whether a 7% or a 3% discount rate is used. The Project's B/C ratio is 2.4 for the 7% scenario and 4.6 for the 3% scenario.

Table 6: Summary of Benefit/Cost Analysis Results, 2009 $Millions[24]

Component	Net Present Value	
Real Discount Rate	7.0%	3.0%
Benefits		
Operational Cost Savings	$143.2	$260.0
Reduced Inventory Carrying Costs	$39.3	$73.2
Benefits from Emission Reduction	$41.4	$73.2
Total Benefits	$223.9	$406.4
Cost	$94.5	$88.5
B/C Ratio	2.4	4.6

Note: Totals may not add due to rounding

Breakdown of Results of Benefit/Cost Analysis[25]

Operational Cost Savings

As described in section 4.1.2, the Project will improve the efficiency of the terminal, thereby reducing operating costs. Annual real net cost savings were estimated based on the costs associated with existing operations less the cost associated with improved operations. Using a 7% real discount rate, the NPV (2009 dollars) of operational cost savings are estimated to be $140.8 million and $2.4 million, for container and breakbulk operations, respectively. The combined operational cost savings are estimated at $143.2 million. Using a 3% discount rate, the NPV is $260.0 million.

Reduced Inventory Carrying Costs

As described in section 4.1.2, the Project is expected to lead to lower inventory carrying costs of shippers by reducing the time lag between when cargo arrives at the Port and when it arrives at the shippers'

[23] Because the Port is already at or nearing capacity, the Port would be overwhelmed even if the DOD buildup were extended.
[24] More details can be found on pages 1-3 of the "Evaluation of Project Costs and Benefits" document listed in Section 10).
[25] More details can be found on pages 1-3 of the "Evaluation of Project Costs and Benefits" document listed in Section 10).

warehouse or retail store. The NPV of the reduction in inventory carrying costs is $39.3 million and $73.2 million for the 7% and 3% real discount rates, respectively.

Benefits from Emission Reductions

The Project will also reduce emissions by reducing the hours of operations by vessels at berth (on all trade routes) and reducing the hours of use of terminal operating equipment (i.e., crane and top-pick operating hours). With the 7% discount rate, the NPV of CO_2 emissions reduction was $6.8 million, NO_X was $3.6 million, SO_X was $15.8 million, and DPM was $15.3 million. Using a 3% discount rate, the NPV of the emissions reductions for CO_2 was $12.8 million, $6.3 million for NO_X, $27.4 million for SO_X, and $26.7 million for DPM. This analysis yielded total reductions in emissions of $41.4 million using the 7% discount rate and $73.2 million using the 3% discount rate.

4.3 Evaluation of Project Performance

PAG will monitor and report the actual project performance (e.g., jobs created, contract status, spending, etc.) consistent with the guidelines of the American Recovery and Reinvestment Act of 2009 and USDOT's requests for TIGER Discretionary Grant recipients. Further, PAG will work through MARAD and its Project Management Team to analyze and prepare a before-and-after study within 18 months of the Project completion, and share the results of that study with USDOT. The study will compare estimated versus actuals for the Project's capital costs, implementation schedule, scope, benchmarks such as those presented in Sections 6.1 and 6.2, and immediate performance outcomes. PAG regularly monitors the Port's key performance metrics but this study will be in addition to that monitoring.

4.4 Job Creation & Economic Stimulus

4.4.1. Job Creation and Economic Stimulus Overview[26]

An economic impact model tailored to Guam was prepared in order to identify the direct impacts from construction and operations.[27,28] Table 7 summarizes the economic impacts attributable to the construction of the Project. As can be seen in the table below, the Project is expected to create approximately 1,600 jobs (708 of which are direct jobs), $209 million in economic output, and $68 million in employee wages. Due to a limited amount of supplies produced on Guam, a significant portion of the construction supplies are expected to come from the Continental United States, sharing a significant portion of the positive effects with the mainland. In particular, much of the lumber, steel, and other materials will be manufactured in the U.S. mainland as well as some of the construction equipment used to undertake the construction. These supplies will also be carried by Jones Act ships constructed in the U.S. and sailed with U.S. flags and U.S. crews.

Table 7: Total Construction Impacts of the Port Improvement Project, 2009 $Millions

Category	Direct Impact on Guam	Total Impact on Guam	Direct Impact on Entire U.S.	Total Impact on Entire U.S.
Economic Output ($millions)	$99.4	$119.3	$99.4	$208.5
Wages/income ($millions)	$19.3	$22.0	$33.2	$68.4
Employment (Jobs)	656	804	708	1,599

Note: Totals may not add due to rounding

4.4.2. Job Creation in an Economically Distressed Area

The Project will generate jobs and economic stimulus in a severely distressed area. As shown in Table 8, Guam's per capita income was a mere $12,768 in 2005,[29] approximately 37% of the U.S. average. The

[26] Economic Impact and Jobs Analysis of the Port Improvement Project, *BST Associates,* August 2009.

[27] Direct economic impacts are the changes in sales, income, and jobs in those business or agencies that directly receive spending from the Project. Firms that directly receive Project funding make purchases of supplies, materials, and outside labor, creating indirect jobs. Induced jobs are also created by the additional spending generated by additional employment earnings.

[28] The following data sources were used: U.S. Census Bureau Economic Census of Guam (2007); and the Guam Department of Labor (2008). The key variables included: revenue/sales by type of business, payroll/income as a percentage of sales, and employment and average wage rates. Total economic impacts (including indirect and induced effects) were estimated based on evaluations of other economic impact studies conducted in Guam and at several port authorities.

[29] 2005 is the most recent data available from Government of Guam.

most recent unemployment rate available for Guam is for September 2007, when Guam experienced 8.3% unemployment.[30] At the time, Guam's unemployment rate was 2.1 percentage points higher than the U.S. average (at 6.2%). In general, unemployment has a history of being higher in Guam than in the mainland United States. Guam meets the criteria for determination as an Economically Distressed Area as defined by Section 301 of the Public Works and Economic Development Act of 1965.

Table 8: Comparison of Guam and U.S. Unemployment Rates and Per Capita Income

	Per Capita Income			Unemployment Rate		
Year	U.S.	Guam	Difference	U.S.	Guam	Difference
2008	$39,751	N/A	N/A	7.1%	N/A	N/A
2007	$38,615	N/A	N/A	6.2%	8.3%	+2.1%
2005	$34,690	$12,768	-$21,922	4.8%	7.0%	+2.2%

Source: Government of Guam and U.S. Dept. of Commerce, Bureau of Economic Analysis

The jobs created during construction will be high-quality jobs, as the average wage paid will be significantly higher than the average wage in the private sector:

- According to the Government of Guam Department of Labor, the average annual wage in Guam is currently $21,970 across all private sector jobs.
- Construction jobs in Guam (general contracting) average $27,900 per year, which is 26.8% higher than the average private sector wage in Guam.

Equal and Safe Employment Opportunities

Opportunities for Small and Disadvantages Business Enterprises

The Port Authority of Guam is an Equal Opportunity Employer, and in addition to observing the following Equal Employment Opportunity (EEO) statutes in its hiring practices, requires compliance by contracted parties with: Title VII of the Civil Rights Act of 1964 (Title VII); Equal Pay Act of 1963 (EPA); the Age Discrimination in Employment Act of 1967 (ADEA), Title I and Title V of the Americans with Disabilities Act of 1990 (ADA); Sections 501 and 505 of the Rehabilitation Act of 1973; and the Civil Rights Act of 1991. The Project will comply with OMB circulars requiring opportunities for small businesses.

Economic Opportunities for Disadvantaged Workers

PAG is a member of the Civilian Military Task Force (CMTF), which was formed by the Office of the Governor. The mission of this group is to develop an integrated comprehensive master plan that would accommodate the expansion of military personnel, operations, assets and missions and to maximize opportunities resulting from this expansion for the benefit of all the People of Guam. PAG works closely with other CMTF members to develop a workforce planning document that seeks to address issues facing the underemployed, non-employed, and employment entitlement programs.

Safety and Fair Treatment of Workers

The Port complies with Occupational Safety and Health Administration (OSHA) regulations, U.S. Coast Guard regulations, and other federal and local regulatory agencies that require the Port to meet a minimum level of operational standards. All entities involved in Port activities will, likewise, be required to be in compliance with these operational standards as well as the EEO requirements listed above.

4.4.3. Project Schedule

Construction spending and the construction-related impacts (by quarter) are shown in Table 9. Most of the construction spending occurs between the third quarter of 2010 and the second quarter of 2011, generating a significant amount of jobs quickly.

[30] The Guam Department of Labor, Bureau of Labor Statistics announced that the September 2007 unemployment rate was 8.3 percent, an increase of 0.9 percentage points from the 7.4 percent collected in September 2006.

Table 9: Quarterly Construction Impacts of the Project[31]

	Construction	Impacts on Guam		Impacts on Entire U.S.	
Quarterly Period	Spending (2009 $M)	Income (2009 $M)	FTE Employment	Income (2009 $M)	FTE Employment
2010 - Q1	$0.52	$0.12	16	$0.39	24
2010 - Q2	$1.94	$0.43	64	$1.46	120
2010 - Q3	$12.08	$2.67	392	$8.38	776
2010 - Q4	$21.81	$4.82	704	$15.01	1,404
2011 - Q1	$26.73	$5.91	864	$18.27	1,724
2011 - Q2	$18.13	$4.01	588	$12.42	1,168
2011 - Q3	$7.17	$1.58	232	$4.92	460
2011 - Q4	$5.95	$1.32	192	$4.07	384
2012 - Q1	$5.05	$1.12	164	$3.47	324
Total	$99.38	$21.97	N/A	$68.39	N/A

Note: Totals may not add due to rounding; all construction in Q1 2012 is expected to be completed by January 31st 2012.

4.4.4. Environmental Approvals

NEPA requirements may be satisfied with either a documented Categorical Exclusion or an Environmental Assessment. An evaluation of existing conditions is currently underway through several concurrent field studies. Study areas will address threatened and endangered species, clean water, clean air, coastal zone management and land use, hazardous waste, site contamination, and cultural and historical issues. Should there be any study area findings requiring discussion with applicable agencies, it is planned that MARAD (as Lead Agency under its Memorandum of Agreement with PAG)[32] will hold those discussions before issuing a final NEPA Determination. However, with this project meeting NEPA's definition of a maintenance and repair and reconfiguration project with temporary construction impacts and no land-use changes, environmental impacts of significance are not anticipated.

All territorial construction permit requirements will be satisfied with the following construction permits and approvals anticipated:

- Environmental Protection Plan
- Building Permit
- Clearing and Grading Permit
- Stockpiling Permit
- Test Boring Permit
- Over-the-Counter specialty permits

4.4.5. Legislative Approvals

On July 14, 2009, Acting Governor Michael W. Cruz, M.D. signed Bill 121 into Public Law 30-52, which placed the Jose D. Leon Guerrero Commercial Port under the oversight of the Guam Public Utilities Commission. This was done as a mechanism for the Port to justify and adjust its tariffs to recover operational costs and generate revenues sufficient to meet operating costs and debt service through an independent rate setting review process of an independent body. Recognizing the critical need for Port improvements, the Port Users Group, a group representing local companies that are the customers of the Port Authority (e.g., the shipping agencies and the carriers), supported this legislation. *No additional legislative approvals are needed before this Project can begin construction.*

4.4.6. State and Local Planning

The Project has fulfilled all "state and local" (in this case, U.S. Territory) planning requirements. A public hearing on the PAG Master Plan was conducted on September 4, 2008. The Port improvements received widespread support, and as an example, the Port Users Group endorsed the Port's Master Plan. Shortly after, the Director of the Bureau of Statistics and Plans recommended the final approval and adoption of the PAG Master Plan to Governor Camacho, as an official element in Guam's Comprehensive Development Plan. On October 10, 2008, Governor Camacho transmitted a letter to the Speaker of the 30th Guam

[31] Project costs based on the USDA Financial Feasibility Report, *Port Authority of Guam*, August 2009.
[32] Memorandum of Understanding between the Government of Guam, PAG, and USDOT-MARAD, signed December 2008.

Legislature, endorsing the PAG Master Plan as an element to Guam's Comprehensive Development Plan. Following conditional approval by the Legislature and additional public hearings held on July 22, 2009, the final Master Plan Approval Documents were presented to the Guam Legislature for final review and approval on September 9-11, 2009. Approval by the Legislature was received on September 11, 2009 and signed by the Governor on September 11, 2009.

4.4.7. Technical Feasibility

The Port of Guam master planning effort performed an extensive evaluation of the technical feasibility of the terminal layout alternatives and addressed all potential flaws identified in earlier stages of the planning and design process. The Project that is now proposed for implementation has undergone several reviews of technical feasibility, in order to develop the confidence that the planned development can be implemented and is sustainable. Even under the peak operations period in 2015, the planned equipment operations did not show any operational flaws. Construction phasing plans have been developed for this Port Improvement Project,[33] and the Port will be able to maintain adequate terminal operations during the planned construction period. However, it is critical to the Port operations that this Project be implemented in accordance with the proposed timeframe. If the Port is not able to begin implementing this project in 2010 (in the event that it does not receive a TIGER Discretionary Grant), then a delayed implementation may impact the Port's ability to function adequately during the construction period, as it will be more challenging to construct the project in later years when DOD-related demand would exacerbate the demands on the Port's already stressed infrastructure.

4.4.8. Financial Feasibility

As shown in section 3, the Port financing facilitated by the USDA along with the TIGER Grant are sufficient to fund the Project. The financial plan includes $54.5 million in borrowing facilitated by the USDA direct loan and loan guarantee program at a blended interest rate of 4.725% over 20 years. To generate sufficient cash flows for debt service and coverage, across-the-board tariff increases averaging 2.6% per year are required for the 20-year financing term (3.4% in 2010, 2.8% per year from 2011 to 2020, and 2.4% per year from 2021 to 2030). The Port now has authority to implement limited tariff increases (subject to review and approval by an independent panel) and these future increases have been optimized to maximize the amount of capital generated through debt while maintaining adequate long-term financial health for PAG.

The USDOT TIGER Grant is a critical and indispensable component of the financial framework to make the Project feasible, and the USDA financing is linked to award of the TIGER Grant. Financial feasibility studies performed in 2008 and 2009 have shown that PAG has a maximum borrowing capacity of approximately $58 million should it implement a 20-year program to attain financial self sufficiency while concurrently modernizing and rehabilitating its aging facilities to achieve optimum operational efficiencies.[34] The $54.5 million in loans will nearly maximize PAG's borrowing capacity; however, combined with the $49.7 million from the TIGER Grant funding, PAG will have the critical minimum level of funding needed to perform the carefully prioritized facility and equipment improvements that it will quickly leverage to obtain peak operating efficiency. *Thus, this Project is the foundation for placing the Port in a sound financial position and financial self-sufficiency for the next 20 years.* As noted earlier, it will have stand alone independent utility.

The Port Authority of Guam cannot finance the full $104.2 million Port Improvement Project because:

- The tariff pricing escalation needed to provide debt service and coverage for $104.2 million in borrowing over the next 20 years would be unreasonably high and inflationary (the Port's impact on inflation is particularly apparent because over 90% of goods consumed on Guam must be shipped through the Port);

[33] The first phase of the Project construction will take place in the mid-east terminal yard while the second phase will be in the west terminal yard once the mid-east yard is completed and operations can be consolidated and maintained there. The spatial split in construction areas will require some adjustment to day-to-day operations; however, this adjustment will not impact the overall capacity and operations of the port during the construction years. The sequencing approach was selected to provide the best opportunity to bring the facilities online in time so that the operational efficiencies to support the peak cargo flows are in place.

[34] USDA Financial Feasibility Report, *Port Authority of Guam,* August 2009, page 22.

- The Port is already taking cost mitigation measures with respect to salaries to minimize future tariff escalations;[35] and
- The Port faces unfunded pension liabilities for which it must maintain the financial flexibility to retire.[36]

Borrowing the full $104.2 million to finance the project would require that PAG borrow an additional $49.7 million. With USDA sources fully utilized, the only source of financing would be the bond market. Recent experience with other Guam bond issues indicates that PAG could expect to sell below investment-grade (junk) bonds at an interest rate of approximately 8.0%. Generating sufficient cash flows for debt service and coverage on the additional borrowing would require tariff escalations averaging 4.1% per year for the next 20 years, generating significant inflation that would have an economic impact on residents and businesses on Guam, which is already a long-standing Economically Distressed Area.

Furthermore, should volumes or other factors be less favorable than forecast, PAG would not have the flexibility to respond through tariff adjustments without further impacting inflation. Additional tariff increases above the existing 2.6% per year projection associated with the $54.5 million borrowing are PAG's primary mechanism for responding to such market uncertainties. If this tariff flexibility is tied up in additional borrowing, PAG would not have the flexibility to respond to unfavorable market or operating conditions that may arise in the future.

Current charges make shippers pay rates that are in the high range in comparison to mainland West Coast and other ports. The planned annual average rate increases at the Port are consistent with similar increases other ports typically adopt either each year or on a 2 to 4 year cycle. Thus increasing tariffs further than planned is not reasonable as it would place an additional burden on the local population and have significant economic implications on consumer prices in the region, which is already an Economically Distressed Area. As evidence of this, the Port recently deferred implementation of a new salary structure in order to minimize the rate of tariff increases. The Guam Legislature and Governor recently enacted Public Law 30-52 thereby shifting tariff oversight authority from the Guam Legislature to the PUC, thus allowing for future tariff adjustments to be evaluated and implemented based on economic merits and needs.

Despite the financial constraints described above, sufficient contingencies have been incorporated into the capital cost estimates (15%) as well as the financial plan to ensure that the Port will have adequate cash flow available for debt service on the USDA-facilitated loans. The projected tariff escalations assumed in the cash flow analysis ensure that there is sufficient cash flow remaining for debt service after maintenance and replacement capital costs while maintaining a 1.6 coverage factor on the USDA loans. The USDA grant application has been delivered and is currently being reviewed.

Because the Project is anticipated to occur from 2010 through January 2012, it is planned that all USDOT TIGER Grant funds will be expended prior to 2012.

5 Secondary Selection Criteria

5.1 Innovation

Decades of Technological Advancement

As noted previously, the Port was designed in the 1960s and very few investment or upgrades have been made since its opening in 1969. Accordingly, the technological advancement of the Port associated with

[35] In order to hold tariff escalations to a reasonable level, the PAG board has already made the decision to defer implementation of its new Certified Technical Professional salary structure by five years. The new salary structure is intended to bring PAG salaries up to market levels in order to improve the professionalism of the staff. PAG had originally intended to raise salaries to the 50th percentile of the new salary structure over five years. As a result of the required tariff impacts of this measure plus the $54.5 million USDA borrowing, the board has decided to implement the salary structure over 10 years instead.

[36] PAG currently carries a $7.8 million liability on its balance sheet for unfunded pension costs. Compared with its current annual operating revenues of approximately $30 million per year and current cash flow of approximately $3 million per year, this is a substantial liability. PAG is not in a position to assume additional debt with this major liability on its books. With the Port's tariff flexibility tied up in additional borrowing, PAG would not be able to pay off these unfunded pension costs, if needed, through tariff increases.

this Project will be an extraordinary innovation at the facility, leading to the efficiency gains that are so critical to accommodating future demand. Specific technological innovation examples are as follows:

Intelligent Systems for Truck Gate Service & Security

Currently, the Port uses a manual, paper-based system for truck gate services and security, which involves hand written records of truck information and destinations. The Project will include the following innovative gate service/security technologies as needed to interact with shipper operating practices:

- Trucker Identification: With a registered computer-readable document, biometric, or other verification.
- Truck License Plates: Truck license plates and container identification and damage assessment with Optical Character Recognition (OCR) technology.
- Radio Frequency Identification (RFID): RFID is used to read electronic seals for containers equipped with an RFID tag.
- Electronic Truck Access: Includes an Electronic Data Interchange system, which registers trucks at the gate, and has a log of truck and containers entering and exiting the terminal via a truck appointment system.

Terminal Automation

The Port currently has no Terminal Operating System (TOS). The Project includes a TOS to support and improve the operations of all critical functions such as cargo flows, administration and checking, equipment steering, security, yard storage management, etc.

Stacking & Retrieval Technologies to Address Land Constraints

In order to improve yard efficiencies, the container yard design will integrate a denser stacked storage system with intelligent container storage, retrieval, and identification systems. Local GPS or similar technologies will be used. Paired with an overall terminal operating system, this arrangement will permit efficient pairing of full containers unloaded from vessels with truck demand patterns for moving containers out of the terminal to their final destination.

5.2 Partnership

The implementation of the Port of Guam's Master Plan, which includes this Project, has strong support from a broad group of stakeholders. The development of the Port Master Plan included coordination with many entities, as described below.

5.2.1. Jurisdictional and Stakeholder Collaboration

Financial Partnership

The Territory of Guam is making a significant financial contribution to the Port Improvement Project. The Project financial plan includes $54.5 million in PAG debt, which will be repaid indirectly over time by consumers and businesses that use or benefit from goods and supplies that are shipped through the Port. If one were to compare this debt with Guam's current total population (177,619 civilians & military in 2009), this amounts to *a financial contribution of more than $300 of debt per Guam resident.* To put this figure in comparison, $1 billion in U.S. debt represents a $3 commitment per U.S. citizen.

As described in Section 4.4.8 (Financial Feasibility), there are no reasonable alternatives to implementing this essential Project on a timely basis without a USDOT TIGER Discretionary Grant.

Stakeholder Collaboration

The Port Master Plan was developed with significant coordination and support of various stakeholders in Guam. The Guam Chamber of Commerce, which promotes Guam's economy and encourages business and industrial investment for broadening the tax base and providing employment, has submitted testimony to the Guam Legislature in full support of the port's modernization plan. PAG also received assistance in pursuing federal financing through the Guam Economic Development Authority, which is a public corporation with broad responsibilities for the centralized direction, control, and supervision of an integrated plan for the economic development of Guam.

The Guam Department of Public Works (DPW) is currently designing improvements to Route 11, which provides access to the port area as it branches off the island's main arterial, and to Route 1 (Marine Corps Drive). These improvements are part of the island's Haul Road Network project. PAG has

coordinated with DPW to ensure that adequate highway infrastructure will be available to/from the Port. The DPW is also expected to implement a weigh-in motion station on the Port to monitor the weight of the trucks leaving through the gate, in order to manage the impact on the roads. Previously PAG also worked with the U.S. Army Corps of Engineers, who performed feasibility studies on certain sections of Route 11, to address storm runoff and overtopping from the adjacent bay during storm conditions.

As noted in section 4.4.2, PAG is also an active member of the Civilian Military Task Force (CMTF). This group is seeking to maximize opportunities resulting from the military expansion for the benefit of all the People of Guam. PAG has worked closely with other CMTF members to develop a workforce planning document that seeks to address issues facing the underemployed, non-employed, and employment entitlement programs.[37]

5.2.2. Disciplinary Integration

The planned development of the Port modernization program has received strong support from a wide range of stakeholders who are not typically involved in transportation related projects. This includes direct funding support for preliminary engineering, environmental studies, preliminary design work for wharf and yard modernization components, and overall program management. Working through the Governor's office, the Port has received limited grant funding from the following federal sources:

- The Economic Development Administration, U.S. Department of Commerce, totaling $2 million.
- The Office of Economic Adjustment, within the Department of Defense, totaling $2.7 million.
- The Office of Insular Affairs, within the U.S. Department of Interior, totaling $4 million.

This Project is also receiving a concurrent review by the USDA for PAG's applications under the USDA Community Facilities Direct Loan and Guaranteed Loan program, totaling $54.5 million.

In addition to the above, the Department of Defense has recognized the importance of the Port in support of its planned construction activities as well as contingency planning for operational requirements. The Secretary of the Navy is aware of the need for federal investment and has agreed to contact federal agencies to emphasize the importance of this Project to the military buildup on Guam.

The Port and its design team have been working in close collaboration with the Joint Guam Program Office (JGPO), which is the U.S. DOD organization responsible for execution of the military buildup on Guam, to understand their respective requirements and to identify Port improvements that can address the needs of Guam and DOD.

6 Program-Specific Criteria

6.1 Port Throughput, Capacity and Demand on Services

Table 10 identifies the demand and capacity of the Port, comparing the current conditions with the near-term peak year of 2015 (although demand is forecast to moderate after 2015, demand is forecast to be even higher before the horizon year of 2040). The table below shows that the existing terminal is not capable of handling future demand, and that this Project will alleviate the operational constraints with investments in the yard, apron, and gate areas.

Table 10: Demand and Capacity throughout with the Port Improvement Project[38]

	Existing Terminal		Future Terminal		
	Demand	Capacity	2015 Demand	2040 Demand	Capacity
Apron (Revenue Tons/Year)	1,935,000	2,200,000	3,400,000	3,900,000	4,000,000
Gate (TEUs/Year)	103,000	102,000	220,000	235,000	300,000
Yard Storage (TEUs)	5,200	7,000	13,000	13,900	13,900

Note: apron demand and capacity numbers shown in the table above include all types of cargo (containers and breakbulk); yard and gate figures only include containers since there are separate facilities for breakbulk.

[37] Executive Order 2006-10, "Creation of the Civilian Military Task Force," Signed April 26, 2006.

[38] Demand was based on the update to the Port Authority of Guam Report (Implementation Plan, Financial Plan, and Economic Impact Statement) to the Legislature pursuant to 5 GCA Chapter 9 § 9301, August 3, 2009. Forecast capacity was calculated using the estimated efficiencies of the new equipment and other investments included in the Project.

Yard Operations

The cargo terminal currently operates in a hybrid, "wheeled" and "grounded" (or stacked) mode. While wheeled operations provides more flexibility for truckers and allows containers to leave the yard more quickly, it is an inefficient use of the land available since the containers cannot be stacked. The existing yard configuration and equipment are currently key constraints on Port operations; two old rubber-tired gantry cranes (RTGs) are obsolete – thereby limiting the ability to stack containers – and there are not enough chassis available to facilitate an expansion of wheeled operations.

The equipment included in the Project will upgrade the equipment and alleviate the capacity constraints of the terminal. The new equipment will allow for the flexibility to switch from wheeled operations to stacked operations seamlessly during periods of high volume. The ability to switch the stacking density of the yard will satisfy the surge in demand that the Port anticipates to occur up through 2015.

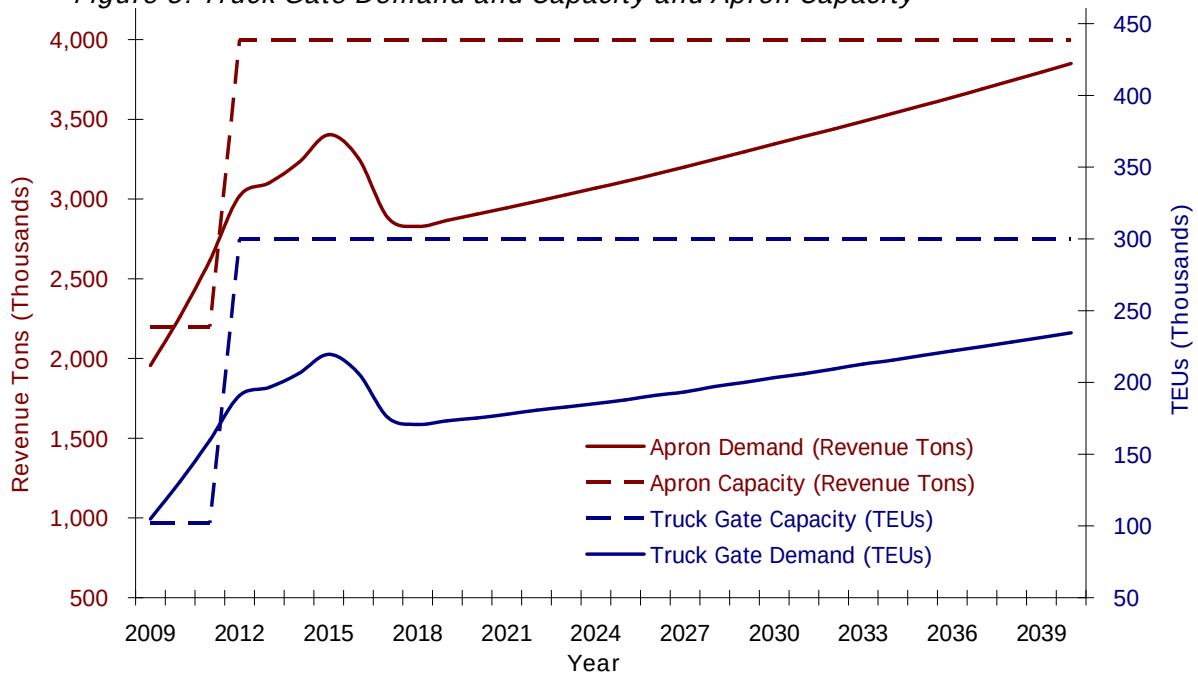
Truck Gate Capacity

Figure 5 (below) highlights the capacity constraint at the gate. As shown in the graph, the gate service is already at the current capacity. The Project investments include a new semi-automated gate system which will improve inspections and flow through the terminal (lower processing time), thereby minimizing congestion at the gate and on Route 11. These investments are expected to increase gate capacity to approximately 300,000 TEUs, which will satisfy demand through 2040.

Apron Capacity

Figure 5 depicts how ship service capacity will be substantially improved upon execution of the Project. With the Project, the Port will be able to meet the surge in demand through the near-term peak of 2015. This will be made possible by the ability of the yard service gangs to support the cranes using the new yard tractors, yard chassis and top-picks, side-picks, forklifts, and Mafi trailers. These capacity investments are expected to increase the capacity of the Port to 4 million revenue tons per year and 25-27 crane lifts per hour from the current 14-17 per hour, which satisfy demand through 2040.

Figure 5: Truck Gate Demand and Capacity and Apron Capacity[39]



[39] Demand was based on an update to the Port Authority of Guam Report (Implementation Plan, Financial Plan, and Economic Impact Statement) to the Legislature pursuant to 5 GCA Chapter 9 § 9301, August 3, 2009. Forecast capacity was calculated using the estimated efficiencies of the new equipment and other investments included in the Project.

6.2 Efficiency

The Port Improvement Project will greatly increase the efficiency of the terminal in terms of time savings, operating cost savings, vessel turnarounds and gate and dwell times, enabling it to reach the standard of "state of the art" for ports in the U.S. Efficiency benefits include:

- Reduced truck delays within the yard and at the gates: improved gate infrastructure and cargo screening systems will speed the flow of trucks with a resulting reduction in truck delays and gate queuing compared with the existing system.
    - Previous truck processing time: 5 minutes outbound, 15 minutes inbound
    - New truck processing time:[40] 1 minute outbound, 3 minutes inbound
- Reduced dwell time: Ships will not have to wait to be unloaded due to the unavailability of yard equipment since the Project investments include the purchase of new top-picks, side-picks and chassis. The Port of Guam currently can only achieve 14-17 lifts per hour due to the lack of yard equipment available to support crane operations. This is much lower than the typical range of 25-27 lifts per hour at modernized ports on the U.S. West Coast.
- Reduced operating labor costs from the following activities (see Figure 2 for annual amounts):
    - Electronic truck processing systems at the gate will reduce the need for additional staffing at the gate since trucks will not need to be manually processed.
    - Container yard grounding service
    - Vessel/stevedoring service
- Reduced maintenance costs: investments in new equipment will reduce the near-term maintenance costs necessary to keep the aged equipment fleet in operable condition.

6.3 Reliability and/or Resiliency of the Facilities

The newer equipment, buildings, and other Port infrastructure described in other parts of this application will not only improve the safety of the overall Port but will ensure consistent and reliable service for customers. Being isolated in the Western Pacific— approximately 6,000 miles from the U.S. mainland, in a typhoon-prone region with the population dependent on the Port for 90% of day-to-day goods—the Ports operations are mission critical.

PAG is currently performing its periodic update the Port Authority of Guam All Hazards Emergency Response Plan to ensure that there is continuity of management and operations as well as command and control for the entire Port community under virtually any emergency.

6.4 Items of National Security Significance

Guam's strategic location enhances military force flexibility, freedom of action, and prompt global action in the event of humanitarian, disaster relief, or national crisis. As the single logistical hub for the Western Pacific, the commercial Port of Guam plays a key role in developing and maintaining military readiness on Guam, and it is also an enabler for the U.S. military's contingency plans. The Port helps protect our national security interests by supporting U.S. military forces with the following five functions.

First, the Port fulfills an indispensible role in meeting the day-to-day military requirements that have a direct impact on military readiness. All sustainment cargo (e.g., unit supply items, commissary merchandise, household goods, etc.) for U.S. military forces on Guam moves through this Port.

Second, the commercial Port is *the* entry point for materials, goods, and equipment needed to facilitate the construction of civilian and military projects for the strategic realignment (increase) of forces to Guam. Without this Port, it is difficult to conceive how the military-related construction could occur on the Island, as there is no other port that can effectively or efficiently handle cargo. Due to the complex nature of the DPRI Program, on-time delivery of cargo associated with the DOD buildup remains critical.

Third, the commercial Port is also used for the deployment of military assets from Guam. For example, military cargo for the Guam Army National Guard and the Navy Seabees recently was shipped through the Port as recently as April 2009 for an overseas military exercise.

[40] These figures are estimates and are currently still under review and design.

Fourth, the commercial Port will also be available for the reception, staging, and deployment of military cargo for those instances when Guam plays a role in multi-national military exercises, humanitarian relief, or crisis operations. Military mobilizations require safe, secure, and efficient port operations to support the flow of military cargo, vehicles, and equipment. This Project will make the Port more capable of fulfilling these important logistical needs.

Finally, the commercial Port also plays a crucial role as a contingency facility for the reception, staging, and deployment of U.S. and Allied military forces on Guam. While the Navy port is the expected site for regular military deployments, the commercial Port would be used if/when the Navy port is either restricted or unavailable. Military forces that could be deployed from the commercial Port in such a scenario include Army, Navy, Marine, Air Force, Guam National Guard and Army Reserves, Coast Guard, and Allied forces.

For these reasons and others, the commercial Port of Guam is now under consideration for designation as a "Strategic Port." This Project will enhance the Port's ability to meet these requirements and support the U.S. strategy for maintaining peace and stability in the Western Pacific.

6.5 External Influential or Limiting Factors

Potential external factors that could limit or influence the benefits of the Project are as follows:

- The Port could face labor shortages if there is not enough skilled labor available on the island for Port operations. However, this is not expected to be a problem since the island currently is developing plans for an extensive recruitment and training program to expand its on-island labor pool; also, given the island's unemployment rate of over 8%, there is an availability of labor. Furthermore, it is also possible to import skilled workers from other ports in Hawaii and on the U.S. mainland to provide interim labor capacity for increased level of cargo handling operations.
- The existing berth depth of the Port is not currently a limitation to the size of ships that call at the Port. In the future, should deeper vessels wish to transit through the Port, the berth dept would be a limitation to maximizing the load in ships. To address this, the Master Plan includes an outline of the work needed to support additional long-term port improvement projects. The Port plans to implement berth improvement projects in future years to address these conditions when funding becomes available.

7 Federal Wage Rate Requirement

The Port Authority of Guam has signed a certification stating that it will comply with Subchapter IV of Chapter 31 of Title 40 of the United Stated Code. See the Index of Links to Related Documents.

8 NEPA Requirement

As discussed in section 4.4.4, the environmental process should be fulfilled with either a Categorical Exclusion or an Environmental Assessment. The studies underway would support either type of document. With work being performed on an existing developed site, there are no environmental impacts of significance anticipated. Environmental documentation and the NEPA Determination by MARAD is expected to be complete by the time of ARRA Grant award.

9 Environmentally Related Federal, State, and Local Actions

The Guam Coastal Management Program, Bureau of Statistics and Plans, and Government of Guam, serve as the authority for local review of federal regulations. Other agencies that also provide regulatory approvals are:

- The Guam Environmental Protection Agency
- Division of Aquatic and Wildlife Resources, Guam Department of Agriculture
- Guam Historic Preservation Resources Division of the Department of Parks and Recreation

The Project Master Plan has been reviewed by these agencies and they have concluded that there are no environmentally related actions needed as long as the Project takes reasonable efforts to preserve the surrounding natural resources. All other federal, state, and local environmental requirements will be satisfied with the permits and approvals noted in section 4.4.4 Environmental Approvals.

10 Index of Links to Related Documents

The following supporting documents can be found on PAG's website http://www.portguam.com:

Background Documents

1. Guam Master Plan Update 2007-2008 Report, *PB International,* April 2008.
2. Port Authority of Guam Report (Implementation Plan, Financial Plan, and Economic Impact Statement) to the Legislature pursuant to 5 GCA Chapter 9 § 9301, August 3, 2009.
3. USDA Financial Feasibility Report, *Port Authority of Guam*, August 2009.
4. Evaluation of Expected Project Costs and Benefits, *BST Associates*, August 2009.
5. Economic Impact and Jobs Analysis of the Port Improvement Project, *BST Associates,* August 2009.

Support/Approval Letters, Including:

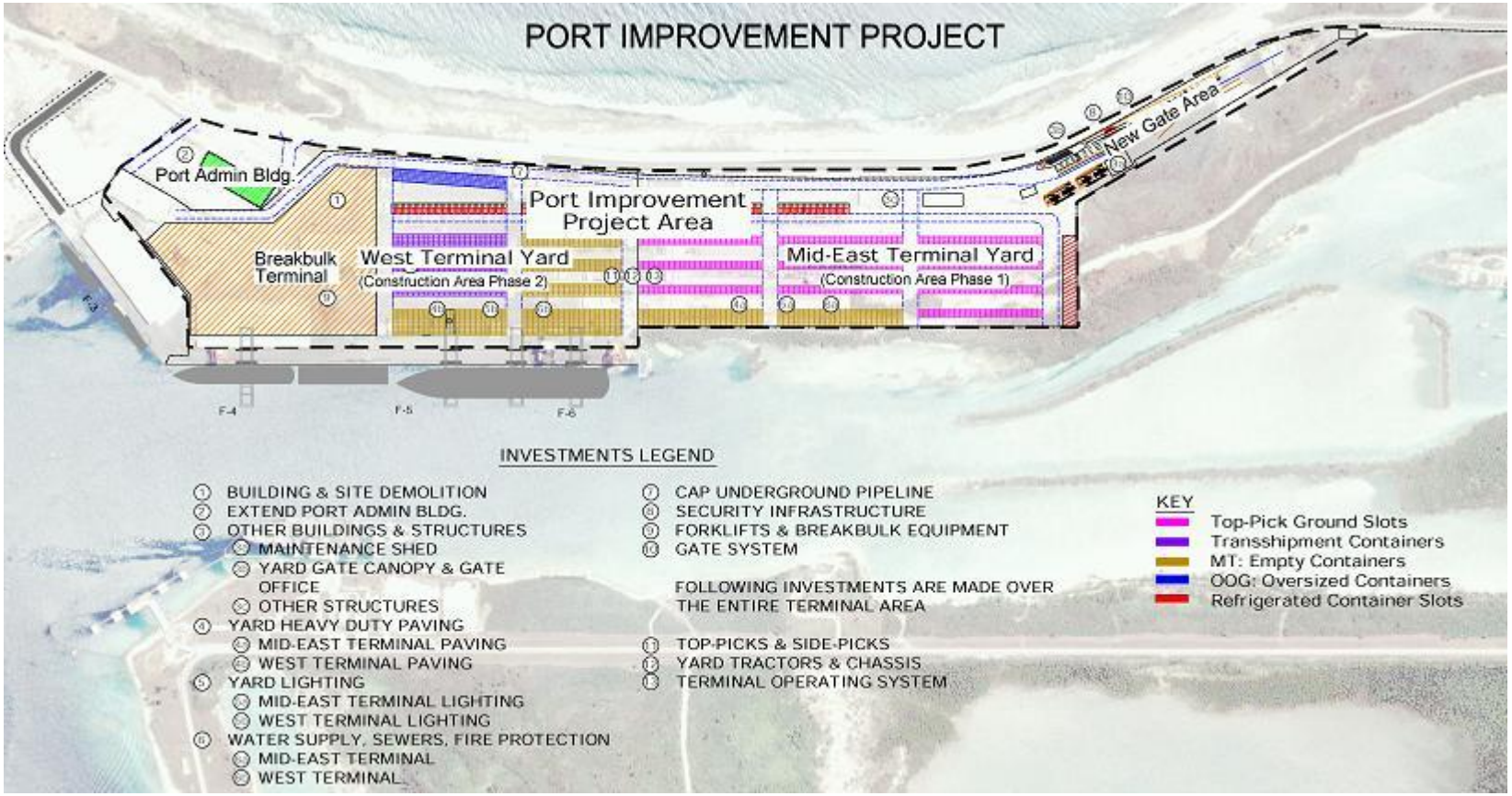
6. Letter from Governor Camacho supporting the TIGER Grant Application, dated September 2009.
7. Letter from the Guam Chamber of Commerce supporting the TIGER Grant Application, dated September 2009.
8. Letter from Congresswoman Bordallo supporting the TIGER Grant Application, dated September 2009.
9. Letter from the Guam Association of Realtors supporting the TIGER Grant Application, dated September 2009.
10. Letter from the Guam Hotel and Restaurant Association supporting the Master Plan, dated August 2009.
11. Letter from the Port Authority of Guam Goodwill and Morale Employee Association supporting the Master Plan, dated July 2009.
12. Letter from the Port Users Group and Guam Chamber of Commerce supporting the Master Plan, dated November 2008.
13. Letter from the Guam Bureau of Statistics and Plans supporting the Master Plan, dated September 2008.

Other Official Documents

14. Federal Wage Rate Requirement Letter signed by the General Manager of PAG, August 2009.
15. Agreement between the Government of Japan and the Government of the United States of America Concerning the Implementation of the Relocation of the III Marine Expeditionary Force Personnel and their Dependents from Okinawa to Guam, signed February 17, 2009.
16. Memorandum of Understanding between the Government of Guam, PAG, and USDOT-MARAD, signed December 2008.
17. Executive Order 2006-10, "Creation of the Civilian Military Task Force," signed April 26, 2006.

11 Appendix A

Figure A1: Port Improvements and Project Area[41]



[41] For a detailed map of the Port (including the areas not included in the Port Improvement Project), refer to Section 5.4 of the Guam Master Plan Update 2007-2008 Report, April 2008.