CNMI COMPREHENSIVE PUBLIC LAND USE PLAN UPDATE

FOR

DEPARTMENT OF PUBLIC LANDS

Prepared For:
Department of Public Lands
P.O. Box 500380
Saipan, MP 96950

Prepared By:

Pacific Engineering Group & Services
Tun Kiku Building
Saipan, MP 96950

and

Chris Hart & Partners, Inc.
115 North Market Street
Wailuku, Hawaii, 96793-1717

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See GIS Map Book

I. INTRODUCTION

1. ENABLING LEGISLATION

This Comprehensive Public Land Use Plan document has been prepared for the Commonwealth of the Northern Mariana Islands (CNMI), Department of Public Lands (DPL) to satisfy Public Law 15-02, specifically section 105(f), which is to prepare a comprehensive land use plan for public lands that is updated every 5 years.

2. DOCUMENT SUMMARY AND ORGANIZATION

This Comprehensive Public Land Use Plan document has been prepared a consultant team selected by the DPL and is organized into a format that describe the existing conditions of the CNMI, provides a socioeconomic forecast with recommendations for the future and updated Geographic Information Systems (GIS) maps. For a detailed list of each section of this report please refer to the table of contents at the beginning of this document. The hardcopy document will include appendices and be accompanied by a map booklet. An electronic version of this report and associated maps will be available from the DPL.

II. GOALS AND OBJECTIVES FOR THE CNMI PUBLIC LAND USE PLAN

1. GOALS

One mission of the DPL, as trustees for public lands in the CNMI, is to update and adopt a Comprehensive public land use plan that promotes cultural and economic growth for the benefit of our present and future generations. The updated plan shall provide guidance for the efficient and effective services in the management, use, disposition and development of public lands for the economic and social betterment of the CNMI.

2. OBJECTIVES

The Plan shall have the following objectives and components:

(1) Coordinate use and development of public lands with the plans, programs, and requirements of other Commonwealth agencies;

(2) Identify all public lands and priority of uses;

(3) Identify and reserve suitable lands for homesteads;

(4) Identify and reserve lands that contain resources critical to the Commonwealth, such as but not limited to, springs suitable for producing potable water, groundwater aquifers that need protection, potential sites of municipal quarries, current and future sites for government buildings, habitat mitigation areas, wetlands, prime public recreation areas, potential school sites, potential hospital sites, and potential transportation corridors;

(5) Identify and reserve lands that should be made available to private developers for generation of revenue;

(6) Identify lands that should be made available for exchange in order to improve the manageability and value of the public land holdings and other public purposes such as the acquisition of rights of way; and

(7) Identify lands that need special handling due to the presence of hazardous materials, dangerous structures, or other special circumstances.

(8) Encompass all the lands of the Commonwealth of the Northern Mariana Islands.

III. EXISTING CONDITIONS

A. CNMI HISTORICAL/GEOGRAPHICAL INFORMATION

The Marianas were first settled around 2000 B.C. by ancient seafaring people who journeyed in outrigger canoes. They sailed across the vast expanse of the open Pacific and settled The Marianas. Historical records suggest that the indigenous Chamorros were originally from Southeast Asia.

The Marianas were first encountered by Spanish explorer Ferdinand Magellan in 1521 during his world exploration in search of gold and spices. In 1668, 147 years after Magellan's encounter, Fr. Diego Luis de San Vitores, a Jesuit priest, arrived in The Marianas with the mission to convert and implement Christianity among the Chamorros, thus beginning the colonization of The Marianas by Spain. The islands were named after Queen Maria Ana of Spain.

Led by Chief Aghurubw and Chief Nguschul of the Caroline Islands, the settlement of the Carolinians in The Marianas began in 1815.

Germany purchased The Marianas from Spain in 1899, and the islands remained under German rule until the start of WWI in 1914. That year, Japan took possession of the islands under a secret agreement with the British to keep peace in Asia during the war. After WWI, Japan received the islands by the terms of the Treaty of Versailles in 1919, and then later, as a mandate under the League of Nations in 1920. The islands became deadly battlegrounds during the WWII campaign as Japanese and U.S. forces collided to gain control of the Pacific.

U.S. forces gained control of The Marianas in July 1944. In 1947, The Marianas were placed in a United Nations strategic trusteeship known as the Trust Territory of the Pacific Islands with the U.S. as the administering authority. The people of The Marianas decided to enter into a political union with the United States and became a self-governing commonwealth in January 1978. In November 1986, U.S. citizenship was conferred upon the people of The Marianas.

Saipan is located about 120 miles (190 km) north of Guam and 5 nautical miles (9.3 km) northeast of Tinian, from which it's separated by the Saipan Channel. Saipan is about 12 miles long and 5.5 miles wide. Saipan, as the capitol, is the largest and most populated island in The Marianas.

Tinian is about 5 nautical miles southwest of Saipan, separated by the Saipan Channel. It has a land area of 39 square miles, with its highest elevation at Mount Lasso (561 ft). The island has a variety of flora and fauna, and limestone cliffs and caves. There is a variety of marine life and coral reefs surrounding the island.

Rota (Luta) is the southernmost island of the United States Commonwealth of the Northern Mariana Islands (CNMI) and the second southernmost of The Marianas Archipelago. It lies approximately 40 nautical miles north-northeast of Guam. Sinapalo village is the largest and most populated followed by Songsong village.

1. LOCATION AND DENSITY OF LAND USES FOR CNMI

The location of land uses for the CNMI are separated by island and identified on maps located in the attached GIS book.

- Saipan
  See Figure Nos. S-1 and S-2

- Tinian
  See Figure Nos. T-1 and T-2

- Rota
  See Figure No. R-1

- Northern Islands
  See Figure Nos. N-1, N-2, N-3, and N-4

2. CATEGORIES OF PUBLIC LAND USES

The DPL Public Land Inventory Maps have five (5) categories of public land uses (See Figure Nos. S-1, T-1, and R-1);

- Grant of Public Domain Public Land
- Designated/ In Use Public Land
- Undesignated/ Not In Use Public Land
- Leased Public Land
- Covenant/Military Leased Public Land

3. PUBLIC LAND SUPPLY

The following tables provide the public and private land supply for the islands of Saipan, Tinian and Rota.

Table No. 1 Saipan Land Supply

SAIPAN	Hectares	% of total Land	Public Land (Hectares)	% of Public Land
Total Land Area	11,913			
Private Land	5,822	49%		
Public Land	6,090	51%		
Grant of Public Domain Land			1,604	31%
Designated/ In Use Public Land			1,057	20%
Undesignated/ Not in Use Public Land			2,819	38%
Leased Public Land			558	10%
COVENANT Leased Public Land			52	1%

Table No. 2 Tinian Land Supply

TINIAN	Hectares	% of total Land	Public Land (Hectares)	% of Public Land
Total Land Area	10,177			
Private Land	985	10%		
Public Land	9,179	90%		
Grant of Public Domain Land			649	7%
Designated/ In Use Public Land			517	7%
Undesignated/ Not in Use Public Land			1,163	13%
Leased Public Land			590	5%
MILITARY Leased Public Land			6,260	68%

Table No. 3 Rota Land Supply

ROTA	Hectares	% of total Land	Public Land (Hectares)	% of Public Land
Total Land Area	11,913			
Private Land	5,822	49%		
Public Land	6,090	51%		
Grant of Public Domain Land			473	8%
Designated/ In Use Public Land			3,042	48%
Undesignated/ Not in Use Public Land			2,618	42%
Leased Public Land			149	2%

IV. SOCIO-ECONOMIC FORECAST

4. FUTURE CONDITIONS

5. POPULATION TRENDS/PROJECTIONS

As part of the Public Land Use Plan, John M. Knox & Associates, Inc. prepared report titled *Population Forecasts for Master Planning by CNMI, DPL.* (See: Appendix A) the key purposes of the report were:

1. Estimates of "NMD" (Northern Marianas Descent – Chamorro and/or Carolinian) population and Homestead Award Eligibility for 2028, by island.

2. Total Population estimates for 2028, by island, to guide other plan development such as governmental services, infrastructure, conservation and recreation needs.

3. A *secondary* Model purpose involves job estimation which is a critical topic in the CNMI.[1] However, the Model emphasis on NMD population projection requires primary attention to things like natural population increase and net migration age-sex distribution.

The population projections used in the model considered three (3) different scenarios of economic growth for the main inhabited islands of CNMI – Saipan, Tinian, and Rota. The three (3) scenarios are:

Scenario A is a High-Growth scenario. For Saipan, it flows from optimistic visitor arrival scenarios developed for the Marianas Visitors Authority (MVA) in a January 2017 report by consultants Horwath HTL.[2] For Tinian, it assumes two casino hotels and construction of both military training facilities and a divert airfield. For Rota, it assumes three small upscale hotels.

Scenario B is a Medium-Growth scenario, with limited change. For Saipan, it assumes visitor arrivals plateau at the level considered "sustainable" (in terms of infrastructure capacity) in the Horwath report. For Tinian, it assumes just one casino hotel plus military activities. For Rota, it assumes one upscale hotel.

[1] This chapter was completed in January 2018, before any resolution of the CW-1 visa issue.
[2] Horwath HTL. *Tourism Development in the US Commonwealth of the Northern Mariana Islands: A Feasibility & Sustainability Study.* Prepared for the MVA. January 2017.

Scenario C is the only one assuming phase-out of CW-1 visa workers and probable attendant economic devastation – a Poor/Negative scenario. Saipan visitor arrivals would plunge, and then slightly recover. Rota and Tinian would have minimal budget-hotel development, and Tinian would be assumed to have the military training but not the divert airfield. (See: Appendix A)

The Model estimates the number of Eligible NMD adults (including those who may already have awards) as the sub-set of total NMD population who are not disqualified due to being married to an NMD spouse and who meet the eligibility criteria of not being current homeowners and having household incomes under $70,000. Historical research established that NMD net migration patterns have been much less responsive to changes in economic conditions than other CNMI population groups. (See: Appendix A)

Figure 40 to Figure 42 of the population forecast provided in Appendix A show Model estimates for each island, by scenario. For the 2028 target year, Saipan estimates vary from 4,691 to 5,038; Tinian, from 382 minimum to 409 maximum; and Rota, a similar range of from 368 minimum to 421 maximum. On a CNMI-wide base, the 2028 numbers vary from 5,487 to 5,869.

There are important differences between these population-based estimates and data obtained from DPL about awards already made. For Saipan, the estimated number of eligible NMD applicants (including any who may already have received awards) ten years from now is far greater than the number of awards as of 2017. But on Tinian and particularly on Rota, there have already been far more awards made than the estimated future number of eligible applicants. The Rota figure is roughly equal to the island's current population.

Table 4: Homestead Awards as of 2017 Versus Estimated 2028 "Eligible NMD"

	Saipan	Tinian	Rota	Total
TOTAL Homesteads Awarded by 2017:	**1,997**	**912**	**2,597**	**5,506**
Elligible NMD Applicants by 2028 (Scenario A)	5,038	409	421	5,869
Elligible NMD Applicants by 2028 (Scenario B)	4,769	366	368	5,503
Elligible NMD Applicants by 2028 (Scenario C)	4,691	382	413	5,487

It should be understood that some of the awards made by DPL may have lapsed (due to death of awardees with no heirs). Additionally, for Saipan, about 400 homesteaders who have received agricultural lots under the Homestead Waiver Act remain eligible for

village lots on the island, though without further research there is no way to know if a homesteader has already been awarded both.

Total Population

Total population was calculated as the sum of specific estimates on each island of three different components: (1) NMD; (2) Non-NMD Residents of CNMI; and (3) (Foreign) Non-Residents. Historical data indicate that population levels for the latter two components – which represent the majority of the CNMI population – have varied much more greatly as prevailing economic conditions changed.

Therefore, the total population levels for different islands show much greater variation according to the economic scenarios. Of the population forecast show these estimates for Saipan, Tinian, and Rota by scenarios. Saipan estimates for 2028 vary from a low of 40,457 to a high of 67,414; Tinian, from 2,325 to 8,707; and Rota, from 2,284 to 3,577. On a CNMI-wide basis, the numbers add to represent a range from 45,066 to 79,698.

These numbers are significantly different by scenario, and that is because of the wide range of economic futures that now appear possible for the Commonwealth. The most optimistic Scenario A – primarily driven by some of the visitor arrival assumptions in the Horwath Report commissioned by the Marianas Visitor Authority – assumes ongoing strong increases in tourism (and, implicitly, some sort of solutions to potential infrastructure and labor constraints, as well as political support by residents).

By contrast, the essentially catastrophic Scenario C is based on an equally possible future, characterized by loss of CW-1 workers and a reduction in tourism equivalent to what could happen if the Chinese market is blocked by elimination of "paroles" for visitors from China.

In this much greater range of possibilities (compared to the Eligible NMD figures previously summarized), the minimal 2028 Scenario C number is 64% of the maximal Scenario A number for Rota, 60% for Saipan, and just 27% for Tinian. The range is relatively greater for Tinian because economic activities proposed for that island – particularly casino-hotels, but also military activities – is so wide, especially in comparison to existing population. These activities could involve labor demand far in excess of the island's supply and so require substantial in-migration.

The population forecast report has attempted to stress not only the CNMI's great uncertainty over economic futures, but also data limitation challenges facing Model development and validity.

The Model could be modified and re-used in future years once 2020 Census data become available. However, this assumes that:

- The 2020 Census for the CNMI overall includes the detailed race/ethnic and other characteristics normally gathered in the American Community Survey (ACS). The Census Bureau has not conducted the ACS in the CNMI or American Samoa in inter-censal years – the only two U.S. areas for which ACS numbers have not been collected. It is likely but not certain that the ACS will be done in CNMI in 2020.

- These data will actually be available (either as tables or in Public Use Microdata Samples [PUMS]) in ways that permit separating age-sex characteristics for each of the three key population components considered here – i.e., NMD, Non-NMD CNMI Residents, and (Foreign) Non-Residents. That availability needs to be by island.

Whether directly or through the Central Statistics Division, it is suggested that DPL stay in touch with both the Census Bureau and its Congressional delegate to monitor debates in Congress about adequate funding and questionnaire content for the 2020 Census.

V. PUBLIC LAND USE PLAN FOR SAIPAN

1. FUTURE CONDITIONS

2. POPULATION TRENDS/PROJECTIONS

The population of Saipan has experienced growth over the last few decades including a peak population in 2000 of 62,392 people. After the garment industry left the CNMI the island population shrank to 48,220 people by 2010. The 2016 population of Saipan was 49,820 people. Based on historical data and population trends and the CNMI Household Income and Expenditures Survey (HIES) report, total projected Saipan population in **2028** by scenario is:

- Scenario A 67,414 people
- Scenario B 50,559 people
- Scenario C 40,457 people

3. ECONOMIC AND EMPLOYMENT PROJECTIONS

As part of the Public Land Use Plan, John M. Knox & Associates, Inc. prepared report titled *Population Forecasts for Master Planning by CNMI, DPL.* (See: Appendix A) While Saipan legalized casino gambling and issued a license to the Macau-based Imperial Pacific International Holdings Inc. (IPI) for a large casino and hotel soon thereafter (in 2014), only the casino had opened as of 2017. The adjacent hotel (for which construction was expected to finish by August 2018), has now been pushed back to August 13, 2023, due to lack constraints on construction labor supply. IPI proposes a large "Phase 2" of its investment – including an additional casino, hotels, shopping, and other attractions, potentially in the Marpi area. In in consideration of construction labor supply limitations, the initiation and completion date for "Phase 2" is uncertain within the time horizon of this Plan.

There are currently four hotels or condo-tels under construction on Saipan, and five additional with permits under review at the Bureau of Environmental and Coastal Quality (BECQ), totaling a future inventory (if all constructed) of over 2,200 additional rooms on the island. These new rooms would require an estimated 2,000 employees to

operate. Again, however, there is no certainty that all projects "Under Review" will be initiated or completed. Sustained long-term demand for additional units is also uncertain at this time.

The nature of tourism is changing in Saipan. Apartment-based vacation rentals (not counted in MVA lodging inventories) appears to be a significant factor. Some new projects under development are limited-service type "condo-tels" requiring less labor to operate than full-service hotels.

Finally, *Population Forecasts for Master Planning* identified strong industry concern over various DPL hotel leases soon to expire. (In general, off-island investors have long expressed concern over the relative brevity of 40-year leases permitted to non-NMD lessees.) Without certainty lease holders of major properties have been delaying investment in repairs and renovations, contributing to possible perceptions of deteriorating hotel inventory in Saipan.

4. OVERVIEW

As should be expected, the plan for the public use of lands of Saipan differs from Tinian and Rota, a key issue is that Saipan has less significantly less available public land relative to the population. As of the drafting of this Plan, suitable public lands are in limited supply.

5. PUBLIC LAND USE REQUIREMENTS

The island of Saipan is the only island that has zoning in place. The future use of public lands including civic uses, village and agricultural homesteads and proposed facilities are subject to the rules and regulations administered by the DPL. A map showing the existing public lands of Saipan is provided in Figure No. S-1. The Land Use Classifications of Saipan are provided in Figure No. S-2.

6. NUISANCE ACTIVITIES

Nuisance activities on Saipan include landfills for solid waste, solid waste transfer stations, hazardous waste storage, power generation, correctional facilities, wastewater treatment plants and airports. (See: Figure Nos. S-2 and S-3)

The Saipan International Airport is located in the southern portion of the island and currently no expansion is planned. The Marpi Landfill site is currently operational and has capacity for expansion to meet the future needs of Saipan for the purposes of this Public Land Use Plan update.

7. OTHER PUBLIC FACILITIES AND COMMUNITY SERVICES

Other public facilities include government offices, hospitals, ports facilities, schools, roads, police and fire services. On Saipan, government offices are primarily located in an area known as Capitol Hill and other public facilities are located in Garapan and along the western coast of the island. (See: Figure No. S-2.)

8. CONSERVATION AREAS

Many of Saipan's conservation areas are located along the coastline in designated conservation areas. These conservation lands contribute to the quality of life on Saipan, attract visitors and provide habitat for a variety of plant and animal species. Conservation areas shall be maintained and new areas set aside were possible to preserve the islands natural environment. (See: Figure Nos. S-9 – S-11)

Saipan has several inland wetlands located along the western coast of the island. These wetlands shall be preserved in their current locations as part of the natural drainage system for the island. (See: Figure No. S-12)

9. COMMERCIAL USES

Commercial activities such as hotels and resorts are located on public lands that generate revenue through leases. Saipan is the capital of CNMI and therefore has the most commercial uses of any of the islands. Commercial uses are primarily located in the urban core of Garapan and in surrounding suburban villages. Businesses are sparsely located within less developed areas in-between village centers.

Pending: Discussion & Analysis of DPL lands appropriate for lease to private developers on Saipan.

10. LOCATION AND AMOUNT OF PUBLIC DEVELOPABLE LAND ON SAIPAN

Public land supply is determined by current use of public lands and the existence of vacant land. Public lands that are surrounded by existing development shall be developed to complement the existing surrounding uses. Public lands currently used for agricultural maybe subject to development if found to be unproductive. Finally Land in excess of 10% slope is generally not appropriate for public development due to cost.

The island of Saipan has approximately 2,819 hectares of available public lands, however due to topography and natural resources, Saipan has approximately ## hectares of land with a slope less than 10% suitable for development such as village homesteads or commercial uses. (See: Figure Nos. S-13.1, 13.2, 13.3)

11. HOMESTEADS

In Saipan as of December 2017 the total deeded Agricultural homesteads were 400 lots and Village homesteads were 1,875. The total permitted Agricultural homesteads was 0 lots and Village homesteads was 122. Homestead lots that have been "permitted must go through a two (2) year probation period before the lot is deeded". The size of a village homestead lot does not exceed 1,000 square meters and the agricultural homestead lot does not exceed 10,000 square meters (1 hectare).

In Saipan, the 2017 DPL Annual report states that there are currently 2,576 pending village applicants and 0 agricultural applicants. The DLP identified I'denne and As Gonno areas as suitable homestead locations for approximately 400 units. (See: Figure S-14.1, 14.2, and 14.3) The proposed village homestead development at these two (2) sites is not adequate to provide homestead lots to pending applicants for Saipan.

12. FUTURE LAND USES

For the island of Saipan, future public land uses include identification of two (2) village homestead sites, a potential site for a future wastewater facility, a new school, sites for a north and south solar farm, civic uses near Garapon, and a Kagman Wastewater treatment plan. (See: Figure Nos. S-14.1, 14.2, 14.3)

The above listed land uses were located based on criteria such as lands with less than 10% slope, hazards, flood hazard, historical sites, protected habitats and conservation areas, vegetation and soil types. (See: Figure Nos. S-2 – S-12)

VI. PUBLIC LAND USE PLAN FOR TINIAN

1. FUTURE CONDITIONS

2. POPULATION TRENDS/PROJECTIONS

As part of the Public Land Use Plan, John M. Knox & Associates, Inc. prepared report titled *Population Forecasts for Master Planning by CNMI, DPL.* (See: Appendix A) The population of Tinian has experienced growth over the last few decades including a peak population in 2000 of 3,540 people. After the garment industry left the CNMI the island population slightly decreased to 3,136 people by 2010. By 2016 the population of Tinian was 3,160. Based on historical data and population trends and the CNMI Household Income and Expenditures Survey (HIES) report, total Tinian population in **2028** is:

- Scenario A 8,707
- Scenario B 5,779
- Scenario C 2,325

3. ECONOMIC AND EMPLOYMENT PROJECTIONS

The Tinian Dynasty Hotel & Casino opened in 1998. It was the only casino in CNMI for many years, but closed in 2015. The property remains closed as of January 2018. According to data provided by BECQ, most of CNMI's future planned labor demand is for development on the island of Tinian, where two other casino resorts have been proposed, with an estimated labor demand of 6,359 workers for operations – more than twice the island's population in 2016. Due to past volatility in economic growth and decline, likelihood of any or all of these project materializing is uncertain.

- Alter City Group Holdings Ltd. plans a casino complex accompanied by a large resort.

- Bridge Investment Group proposes a Titanic-themed casino on the coast.

- The Dynasty could be renovated if sold (but there is a lien on the property to pay the $75 million fine, which is reportedly a major obstacle to finding investors, though there is also the possibility the amount could be negotiated down).

As detailed further in Appendix A there are also critical questions about the compatibility of tourism with proposed military activities. These considerations could affect the likelihood of proposed developments becoming a reality.

4. OVERVIEW

Tinian is approximately 5 nautical miles southwest of Saipan, from which it is separated by the Saipan Channel. It has a land area of 39 square miles, with its highest elevation at Mount Lasso at 561 feet. The island has a variety of flora and fauna, and limestone cliffs and caves. There is a variety of marine life and coral reefs surrounding the island.

5. PUBLIC LAND USE REQUIREMENTS

Land zoning has not been enacted on the island of Tinian. The future use of public lands including civic uses, village and agricultural homesteads and proposed wastewater facility are subject to the rules and regulations administered by the DPL. A map showing the existing public lands of Tinian is provided in Figure No. T-1.

6. NUISANCE ACTIVITIES

Nuisance activities include landfills for solid waste, solid waste transfer stations, hazardous waste storage, power generation, correctional facilities, wastewater treatment plants and airports. On Tinian, nuisance activities include the airport, wastewater treatment facility, landfill and power plant. (See: Figure No. T-1)

7. OTHER PUBLIC FACILITIES AND COMMUNITY SERVICES

Other public facilities include government offices, hospitals, ports facilities, schools, roads, police and fire services. On Tinian, public facilities are primarily located in the southern portion of the island. (See: Figure No. T-1)

8. HOMESTEADS

In Tinian as of December 2017 the total deeded Agricultural homesteads were 384 lots and Village homesteads were 528. The total permitted Agricultural homesteads was 0 lots and Village homesteads was 0. Homestead lots that have been "permitted" must go through a two (2) year probation period before the lot is "deeded". The size of a village homestead lot does not exceed 1,000 square meters and the agricultural homestead lot does not exceed 10,000 square meters (1 hectare).

According to DPL there are currently 528 village applicants and 474 agricultural applicants for Tinian. Prior to the drafting of this public land use plan the DLP has identified Kastiyu and Marpo Heights as suitable homestead locations.

The area known as Kastiyu is approximately 627 hectares in size. (See: Figure T-8) The proposed village homestead development called Marpo Heights is anticipated to provide 427 village homestead lots. (See: Figure T-8) The available public land at these two sites is adequate to provide homestead lots to pending applicants for Tinian.

9. CONSERVATION AREAS

Many of Tinian's conservation areas are located along the southern portion of the island. These conservation lands contribute to the quality of life on Tinian, attract visitors and provide habitat for a variety of plant and animal species. Conservation areas shall be maintained and new areas set aside were possible to preserve the islands natural environment. (See: Figure T-7)

10. COMMERCIAL USES

Commercial uses on Tinian are relatively small scale and provide basic services and needs for the rural island. Development is primarily located in the southern portion of the island near schools government services and businesses. Several small businesses, such as restaurants, are sparsely located within less developed areas in-between village centers.

Pending: Discussion & Analysis of DPL lands appropriate for lease to private developers on Tinian.

11. LOCATION AND AMOUNT OF PUBLIC DEVELOPABLE LAND ON TINIAN

Public land supply is determined by current use of public lands and the existence of vacant land. Public lands that are surrounded by existing development should be developed to complement the existing surrounding uses. Public lands currently used for agricultural maybe subject to development if found to be unproductive. Finally Land in excess of 10% slope is generally not appropriate for public development due to costs.

There are approximately 1,163 hectares of available public lands on the island of Tinian, however due to topography, natural resources or other disqualifying characteristics, Tinian has approximately ## hectares of land with a slope less than 10% suitable for development such as village or agricultural homesteads, civic uses and infrastructure services. (See: Figure No. T-7)

12. FUTURE LAND USES

For the island of Tinian, future public land uses include identification of agricultural and village homesteads, potential Municipal civic center sites, and a potential site for a future infrastructure and services, including a wastewater facility. (See: Figure No. T-8)

The area known as Kastiyu is approximately 627 hectares in size, which could provide a large quantity of village and agricultural homestead lots. (See: Figure No. R-7) As noted the proposed village homestead development of Marpo Heights is anticipated to provide approximately 427 village homestead lots. (See: Figure No. T-8) The available public land at these two sites is adequate to provide homestead lots to pending applicants for Tinian.

The above listed land uses were located based on criteria such as lands with less than 10% slope, vegetation and soil types that guided the selection of parcels. (See: Figure Nos. T-2-6)

VII. PUBLIC LAND USE PLAN FOR ROTA

1. FUTURE CONDITIONS

2. POPULATION TRENDS/PROJECTIONS

The population of Rota has experienced growth over the last few decades including a peak population in 2000 of 3,283 people. After the garment industry left the CNMI the island population slightly decreased to 2,527 people by 2010. As of 2016 population of Rota was 2,720. Based on historical data and population trends and the CNMI Household Income and Expenditures Survey (HIES) report, total Rota population in **2028** by scenario is:

- Scenario A 3,577
- Scenario B 2,868
- Scenario C 2,284

3. ECONOMIC AND EMPLOYMENT PROJECTIONS

Tourism has had an inconsistent history on Rota, causing some uncertainty for the future. Although a Gaming Commission exists on the island, there are no current likely prospects for casino development. (One proposal resulted in a lawsuit for the Commission, recently settled.) Discussions with the public and government officials for this Public Land Use Plan update suggest that small upscale eco-tourist lodges are now the preferred type of tourism development.

4. OVERVIEW

Rota (*Luta*) is the southernmost island of the (CNMI). It lies approximately 40 nautical miles north-northeast of Guam. Sinapalo village is the largest and most populated followed by Songsong village.

5. PUBLIC LAND USE REQUIREMENTS

Land zoning has not been enacted on the island of Rota. The future use of public lands including civic uses, village and agricultural homesteads are subject to the rules and

regulations administered by the DPL. A map showing the existing public lands of Rota is provided in Figure No. R-1.

6. NUISANCE ACTIVITIES

Nuisance activities include landfills for solid waste, solid waste transfer stations, hazardous waste storage, power generation, correctional facilities, wastewater treatment plants and airports. On Rota, nuisance activities include the airport, landfill and power plant. (See: Figure No. R-2.)

7. OTHER PUBLIC FACILITIES AND COMMUNITY SERVICES

Other public facilities include government offices, hospitals, ports facilities, schools, roads, police and fire services. On Rota, public facilities are primarily located in the two population centers of Songsong and Sinapalo. (See: Figure No. R-2.)

8. HOMESTEADS

In Rota as of December 2017 the total deeded Agricultural homesteads was 338 lots and Village homesteads was 652. The total permitted Agricultural homesteads was 110 lots and Village homesteads was 338. Homestead lots that have been "permitted" must go through a two (2) year probation period before the lot is "deeded".

In Rota, there are currently 696 village applicants and 619 agricultural applicants. The 2017 DPL Annual report states that homestead sites that are "in progress" are As Nieves, Gampap, and Dugi. Of the 244 lots available from these three (3) homestead developments, 69 lots have been delineated.

The size of a village homestead lot does not exceed 1,000 square meters and the agricultural homestead lot does not exceed 10,000 square meters (1 hectare).

On Rota one (1) area has been designated for proposed agricultural homestead development. The area known as Finafa is approximately ### hectares in size. The DLP identified Finafa as a suitable homestead location in the 2017 Annual Report. (See: Figure R-7)

Two (2) areas have been designated for proposed village homestead development northwest and southeast of the Sinapalu village. The area to the northwest is approximately ### hectares in size, the southwest area is ## hectares in size. Combined these proposed locations total ### hectares. (See: Figure No. R-7)

9. CONSERVATION AREAS

The Island of Rota contains recognized wildlife and shoreline conservation areas that are proposed to remain in conservation. (See: Figure No. R-2) Rota is a sparsely populated Island that is significant identified habitat areas. This Land Use Plan Update recommends maintaining and expanding conservation area where feasible. Critical Habitats and important ecological features are present on Rota and identified in Figure No. R-6.

10. COMMERCIAL USES

On Rota commercial uses are limited to several small hotels, restaurants and convenience stores. Some Rota residents are hoping to promote small tourism-related economic development in the form of eco-tourism on the island.

Pending: Discussion & Analysis of DPL lands appropriate for lease to private developers on Tinian.

11. LOCATION AND AMOUNT OF PUBLIC DEVELOPABLE LAND ON ROTA

The island of Rota has approximately 2,618 hectares of available public lands, however due to topography and natural resources and other disqualifying features, Rota has approximately ## hectares of land with a slope less than 10% suitable for development such as village homesteads or commercial uses. (See: Figure No. R-6)

12. FUTURE LAND USES

For the island of Rota, future public land uses include identification of agricultural and village homesteads, civic uses, potential solar farm sites, potential sites for power plant relocation and an area identified as possible exchange land. (See: Figure No. R-7)

The above listed land uses were located based on criteria such as lands with less than 10% slope, vegetation and soil types that guided the selection of parcels. (See: Figure Nos. R-3-5)

VIII. PUBLIC LAND USE PLAN FOR NORTHERN ISLANDS

1. MASTER PLAN FOCUS

This Master Plan focuses on four (4) of the Northern Islands, specifically Agrihan, Pagan, Alamagan, and Anatahan which are intended for habitation, potentially within this masterplan horizon. Analysis was not focused on islands which were not anticipated for the siting of homesteads within the plan horizon.

The Project team was unable to complete a trip to the Northern Islands prior to the issuance of this DRAFT due to in timing project initiation and the higher potential for rough seas.

A trip to the Northern Islands by the project team is currently planned for April 2018 and will be completed prior to the issuance of the Final Report Draft.

Proposed land uses presented in this DRAFT are based on consultation with Northern Island Community Members and the office of the Mayor of The Northern Islands

2. POPULATION TRENDS/PROJECTIONS

Modeling the future population growth the Northern Islands was not included within the population projection analysis for the Land Use Plan, as there is high uncertainty about future with potentially conflicting proposals for the area existing. The DPL has begun surveying agricultural homestead lots on four (4) of the Northern Islands in an effort to allow people to return to the northern islands they previously inhabited.

There are currently approximate _____ individuals identified as displaced residents of the Northern Islands currently residing on Saipan.

3. ECONOMIC AND EMPLOYMENT PROJECTIONS

As part of the Public Land Use Plan, John M. Knox & Associates, Inc. prepared report titled *Population Forecasts for Master Planning by CNMI, DPL.* However the report did not analyze the Northern Islands due to the lack of population and economic activity.

4. OVERVIEW

For the time horizon of this comprehensive public land use plan update the islands of Anatahan, Alamagan, Pagan, and Agrihan were analyzed. The islands and atolls Farallon De Pajaros, Maug, Asuncion, and Guguan are recognized conservation areas containing critical habitats for endangered and or threatened species that will remain in conservation through the time horizon of this plan. The islands and atolls Farallon De Medinilla and Sarigan are not analyzed in this plan. (See: Figure No. 1)

The 2001 Northern Islands Development Plan was prepared to establish more permanent settlements on the islands of Anatahan, Alamagan, Pagan, and Agrihan. The plans goals include establishing homesteads, vital public services, and opportunities for economic development and programs.

5. PUBLIC LAND USE REQUIREMENTS

The Northern islands of Agrihan, Pagan, Alamagan and Anatahan currently do not have zoning, or a land use guidance system in place at this time.

The DPL has surveyed agricultural homestead lots for distribution to those individuals wishing to return to Pagan. The future Homestead lots are subject to the rules and regulations of the homestead program administered by the DPL.

6. NUISANCE ACTIVITIES

The U.S. military is currently preparing an Overseas Environmental Impact Statement (OEIS) to assess the potential effects new live-fire training on Pagan. Some previous residents have opposed this project, hoping to promote homestead use and eco-tourism on the island.

Other forms of economic development are proposed include a proposal to mine for pozzolan.

The socioeconomic study conducted for the military OEIS mentions a 1978 Master Plan for Pagan drafted by the Office of Transition Studies and Planning which noted that exploitation of basalt deposits could be an economic development possibility for the island. However, the socioeconomic study concluded that "Analysis of market conditions and mining operation feasibility indicates that a pozzolan mining operation on Pagan would not be expected to reach profitability or provide an investor with an acceptable rate of return." [3]

7. OTHER PUBLIC FACILITIES AND COMMUNITY SERVICES

Following the project team's visit to the Northern Islands, recommendations for locations of public facilities, primary infrastructure and service offices will be provided.

8. HOMESTEADS

In consultation with the Office of the Mayor of the Northern Islands and at a community meeting there is a desired to introduce the agricultural homestead program on the Northern Islands on Agrihan, Pagan, Alamagan, Anatahan. The size of an agricultural homestead lot consists of a maximum area of 10,000 square meters (1 hectare).

The following initial recommendations are based on consultation with community members and the office of the Mayor of the Northern Islands, and

Three (3) potential areas have been identified for proposed agricultural homestead development on Agrihan.. The area located on the eastern edge of the island is approximately 83 hectares in size, the southeast homestead area is approximately 48 hectares in size and the southern homestead area is approximately 81 hectares in size.

Combined these proposed locations total 212 hectares. While the total number of homestead lots is anticipated to be less than the total land area, it is expected that Northern Island Agricultural Homestead subdivisions will be designed with rural standards. (See: Figure N-1)

Pagan is the second northernmost island and one (1) areas have been designated for proposed agricultural homestead development. The area known as Regusa is

[3] U.S. Department of the Navy. Preliminary Draft (Version 3) *Socioeconomic Impact Assessment Study in Support if the Commonwealth of the Northern Mariana Islands Joint Military Training Environmental Impact Statement/Overseas Environmental Impact Statement.* 2015. P. 5. Available at: http://www.cnmijointmilitarytrainingeis.com/documents

approximately 273 hectares in size. The DLP surveyed a subdivision of thirty-nine (39) lots agricultural lots in 2017. (See: Figure N-2)

On the island of Alamagan two (2) areas have been identified for potential agricultural homestead development. The area to the north is approximately 58 hectares in size, the south area is 81 hectares in size. Combined these proposed locations total 139 hectares. (See: Figure N-3)

Anatahan is the northern island closest to Saipan and two (2) areas have been designated for proposed agricultural homestead development. The area to the Northwest is located at the site of the formerly inhabited Agrihan village and is adjacent to the Anatahan Landing and is approximately 38 hectares in size, the southern homestead area is 70 hectares in size. Combined these proposed locations total 108 hectares. (See: Figure N-4)

9. CONSERVATION AREAS

The Northern Islands and atolls Farallon De Pajaros, Maug, Asuncion, and Guguan are recognized conservation areas that will remain in conservation. Each of the Northern Islands are mostly unaltered natural habitat and this Land Use Plan Update recommends that development of the northern islands is limited to emergency and civic uses and agricultural homesteads.

10. COMMERCIAL USES

At this time a permit to mine pozzolan, a basalt deposit that formed as a result of the 1981 Volcanic Eruption on Pagan is the only current commercial use in the Northern Islands. Some previous residents are hoping to promote small tourism-related economic development in the form of eco-tourism on the island of Pagan. This Public Land Use Plan update is not recommending additional commercial development on the Northern Islands in the next five (5) years.

11. FUTURE LAND USES

Future Land Uses for the Northern Islands within this Draft Land Use Plan update are limited to Agricultural Homestead lots. Following the project team's visit to Anatahan,

Alamagan, Pagan, and Agrihan it is expected that adjustments to potential homestead locations and boundaries may be made, and that recommendations for the location of primary infrastructure, service offices and appropriate economic development.

The location of potential future homesteads lots have been identified on four (4) islands.

The area on Agrihan is approximately 212 hectares in size. (See: Figure N-1)

The area on Pagan is approximately 273 hectares in size. The DLP has surveyed a proposed subdivision of thirty-nine (39) lots agricultural lots in 2017. (See: Figure N-2)

The area identified on Alamagan is approximately 139 hectares in size. (See: Figure N-3)

The area identified on Anatahan is approximately 108 hectares in size. (See: Figure N-4)

IX. PLAN MANAGEMENT

1. INTRODUCTION

The Public Land Use Plan is a guidance document which is intended to be updated every five (5) years, which documents the objectives of outlined Public Law 15-02 which are necessary in the consideration and planning of capital improvements to provide adequate public facilities, infrastructure and homesteads, recreational opportunities and the preservation of critical resources which are essential for the growth of CNMI, the protection of public health and safety and the enhancement of natural and built environments.

2. ADMINSTRATION OF THE PUBLIC LAND USE PLAN

The primary means of implementing the public land use plan will be through the land use regulatory controls and programs. The existing regulatory control requiring the public land use plan is **Public Law No. 15-2,** which outlines the duties of the Department of Public Lands, which is established within the Executive Branch to manage and administer the Commonwealth's public lands under the provisions of Article XI of the Constitution.

Parallel to the Plan Document is the data that can be accessed, manipulated and visually analyzed using Geographic Information System GIS software. Use of GIS allows for ongoing analysis, and consideration between plan updates. This can be done on a daily basis, when changes occur on the ground or when additional data is made available.

3. IMPLEMENTATION OF THE PLAN

Implementation of the Public Land Use Plan update will require coordination between the Commonwealth agencies, the private sector, non-profits, and the community. Implementation mechanisms include planning and regulatory approaches, capital

improvement programming, monitoring and evaluation. Managing and facilitating the plans implementation will require the establishment of an efficient and comprehensive project and operations management approach.

4. MONITORING AND UPDATING THE CNMI PUBLIC LANDS GIS

Public Law No. 15-2, Section 107 Public Lands: Lease Enforcement and Other Requirements. "(d) The Department shall develop and maintain a land records system utilizing current technology. Maps of public lands shall be maintained in a Geographic Information System (GIS) that is compatible with GIS data being collected by other agencies. The land records system and maps will be made available to the public."

Accompanying this Public Land Use Plan update is a digital copy of the complete GIS data set, attribute tables, and maps compatible with ArcGIS software for future public land planning purposes and future updates to the Public Land Use Plan.
An obligation of DPL is to identify lands that should be made available for exchange in order to improve the manageability and value of the public land holdings and other public purposes such as the acquisition of rights of way. In analyzing existing GIS data for the completion of this Plan, it is apparent that including all parcels within the CNMI both private and public in a single comprehensive GIS system is necessary to efficiently analyze options and plan for critical public infrastructure or services which are anticipated to require exchange with private land owners.

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Appendix A

JOHN M. KNOX & ASSOCIATES, INC.

POPULATION FORECASTS FOR MASTER PLANNING BY CNMI DEPT. OF PUBLIC LANDS

Development and Results of Forecast Model

January 31, 2018

Prepared for:
CNMI Dept. of Public Lands
SSFM-CNMI (PEGS)
Chris Hart and Partners

Prepared by:
John M. Knox & Associates, Inc.

John M. Knox, PhD
Sara Bolduc, Masters Urban Planning
Rockey Knox, EdD

1001 Bishop St., Suite 1542 ▪ Honolulu, HI 96813 USA ▪ Phone (808) 523-1352 ▪ Fax (808) 523-1353
E-Mail jmk@johnmknox.com ▪ Web www.johnmknox.com

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1. FORECAST MODEL DEVELOPMENT AND DESIGN

1.1 Primary Purposes of Model

The key Model purposes were considered to be:

1. Estimates of "NMD" (Northern Marianas Descent – Chamorro and/or Carolinian) population and Homestead Award Eligibility for 2028, by island.

2. Total Population estimates for 2028, by island, to guide other plan development.

3. A potential *secondary* Model purpose involves job estimation. This is a critical topic in the CNMI right now.[1] However, the Model emphasis on NMD population projection requires primary attention to things like natural population increase and net migration age-sex distribution. Rough job estimates are used as a way to estimate population rather than as an end in themselves.

1.2 Overview of Model Components

The Model separately considers each of the three main currently inhabited CNMI islands – Saipan, Tinian, and Rota. For each island, there are three very different economic future scenarios:

A. ***Scenario A*** is a High-Growth scenario. For Saipan, it flows from optimistic visitor arrival scenarios developed for the Marianas Visitors Authority (MVA) in a January 2017 report by consultants Horwath HTL.[2] For Tinian, it assumes two casino hotels and construction of both military training facilities and a divert airfield. For Rota, it assumes three small upscale hotels.

B. ***Scenario B*** is a Medium-Growth scenario, with limited change. For Saipan, it assumes visitor arrivals plateau at the level considered "sustainable" (in terms of infrastructure capacity) in the Horwath report. For Tinian, it assumes just one casino hotel plus military activities. For Rota, it assumes one upscale hotel.

C. ***Scenario C*** is the only one assuming phase-out of CW-1 visa workers and probable attendant economic devastation – a Poor/Negative scenario. Saipan visitor arrivals would plunge, and then slightly recover. Rota and Tinian would have minimal budget-hotel development, and Tinian would be assumed to have the military training but not the divert airfield.

This range of possible outcomes is greater than typical for socio-economic forecasts, but reflects uncertainties about CNMI's future to be addressed later in this chapter.

[1] This chapter was completed in January 2018, before any resolution of the CW-1 visa issue.
[2] Horwath HTL. *Tourism Development in the US Commonwealth of the Northern Mariana Islands: A Feasibility & Sustainability Study.* Prepared for the MVA. January 2017.

Based on assumptions about (1) natural increase and (2) net migration in response to economic conditions, separate population results for each scenario are generated for three components of the overall population for each island:

- The NMD demographic which is key to DPL;
- Non-NMD residents (U.S. citizens or green-card holders); and
- Foreign Non-Residents (heavily but not entirely consisting of CW-1 workers and dependents).

1.3 NMD Homestead Awards and Eligibility Criteria

An eligible homestead applicant for a village or agricultural lot must be a (1) a person of Northern Marianas descent (NMD);[3] (2) someone who does not have any interest in land in the CNMI; and (3) someone who must not have the means to acquire a lot. A married couple (or living in common law) cannot be eligible for two lots and is merged into one application. Additionally, there is a maximum income/assets eligibility criterion that disqualifies those applicants who may not own interest in land in the CNMI, but who have sufficient income and/or assets to acquire a village lot in the CNMI. Annual gross income of more than $70,000 and/or assets valued at more than $150,000 disqualifies an applicant (even joint husband wife assets/income).

As of this writing (late 2017), a total of 3,895 homestead lots have been awarded (deeded) in the CNMI. An additional 1,611 lots are currently permitted (they have been awarded but are still under the 2 year probation period) but are likely to become deeded thereafter. This study's projected numbers of future eligible household heads (see Chapter 3, Section 3.4) are for the total NMD population, and do not subtract already awarded numbers below in Table 1.

Table 1: DPL Lots Awarded by Island, 1980-2017

	Saipan	Tinian	Rota	Total
Total Deeded	**1,875**	**912**	**1,108**	**3,895**
Village	1,875	528	652	3,055
Agricultural	400 [1]	384	456	840
Total Permitted	**122**	**0**	**1,489**	**1,611**
Village	122	0	338	460
Agricultural	N/A	0	110	110
TOTAL	**1,997**	**912**	**2,597**	**5,506**

Source: Department of Public Lands. November 2017.

Note: (1) Note: (1) The 400 Agricultural Lots in Saipan were awarded through the Homestead Waiver Act (HWA), as set forth in Public Law 2-13, § 3. It should be noted that if a person (or married couple) has been awarded an agricultural lot through the HWA, he or she is still eligible to apply for a village lot in Saipan.

[3] According to Article XII of the CNMI Constitution a NMD person is defined as someone "who is a citizen or national of the United States and who has at least some degree of Northern Marianas Chamorro or Northern Marianas Carolinian blood or a combination thereof."

1.4 Historical and Projected Population Data

Table 2 provides historical data on population counts or estimates for each island, while the subsequent Figure 1 shows various agencies' projections for future populations. These projections for the most part appear to have been developed on the basis of trends prior to the Saipan economic development boom of the past few years – hence largely assume fairly level or even significantly declining populations. Note the exception in Figure 1 is the Pacific Community's (SPC's) somewhat higher levels, including a 2016 figure that is arguably more consistent with recent economic growth. That is why Table 2 below contains two columns for 2016 – one ("2016A") with the published HIES overall and island figures (which hew closely to 2010 Census counts) and the other with the SPC 2016 total figure for CNMI, with all other "2016B" numbers following the HIES proportions reported by the CNMI's Central Statistics Division (CSD).

Note that NMD population has declined since 2000 (and subsequent analysis will show much of the gain from 1990 to 2000 was due to natural increase). This relative lack of response to economic change will have important consequences in the analysis.

Table 2: Local and Foreign Population by Island – 1990, 2000, 2010, and 2016

CNMI	1990	2000	2010	2016A	2016B
TOTAL Population	**43,345**	**69,221**	**53,883**	**53,890**	**55,700**
Permanent CNMI **Resident**	20,082	29,094	35,115	33,219	34,335
NMD	*17,181*	*21,784*	*19,971*	*18,249*	18,862
Non-NMD	*2,901*	*7,310*	*15,144*	*14,970*	15,473
Foreign **Non-Resident**	23,263	40,121	24,168	20,671	21,365

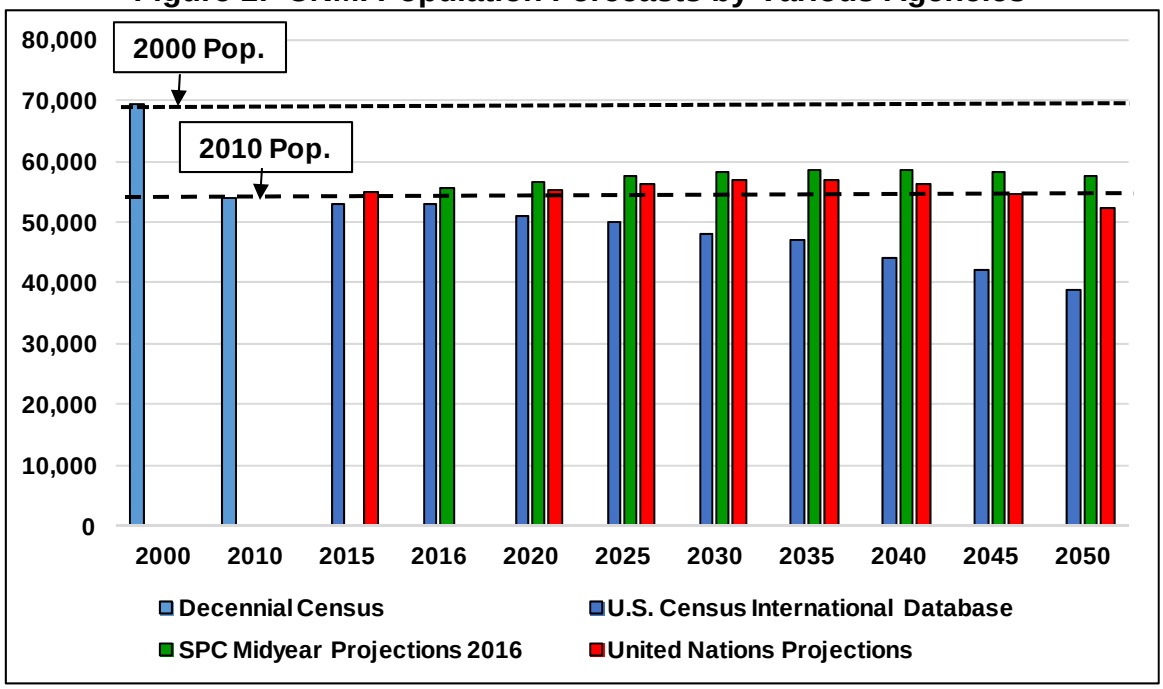
SAIPAN	1990	2000	2010	2016A	2016B
TOTAL Population	**38,896**	**62,392**	**48,220**	**48,200**	**49,820**
Permanent CNMI **Resident**	17,171	24,968	26,227	29,280	30,264
NMD	*14,416*	*18,016*	*16,933*	*15,758*	16,288
Non-NMD	*2,755*	*6,952*	*9,294*	*13,522*	13,976
Foreign **Non-Resident**	21,725	37,424	21,993	18,920	19,556

TINIAN	1990	2000	2010	2016A	2016B
TOTAL Population	**2,118**	**3,540**	**3,136**	**3,056**	**3,160**
Permanent CNMI **Resident**	1,286	1,897	1,782	1,950	2,016
NMD	*1,226*	*1,709*	*1,517*	*1,146*	1,185
Non-NMD	*60*	*188*	*265*	*804*	831
Foreign **Non-Resident**	832	1,643	1,354	1,105	1,143

ROTA	1990	2000	2010	2016A	2016B
TOTAL Population	**2,295**	**3,283**	**2,527**	**2,635**	**2,720**
Permanent CNMI **Resident**	1,595	2,229	1,706	1,989	2,053
NMD	*1,508*	*2,054*	*1,521*	*1,346*	1,389
Non-NMD	*87*	*175*	*185*	*643*	664
Foreign **Non-Resident**	700	1,054	821	646	667

Sources: Overall population figures from Census Data, U.S. Census Bureau Decennial Census 1990, 2000, 2010. For 2016A Data: Department of Commerce. Central Statistics Division (CSD). 2016 Commonwealth of the Northern Mariana Islands Household Income and Expenditures Survey (HIES) Report. April 2017. For 2016B, the overall CNMI population estimate is from the Pacific Community (originally the South Pacific Commission and still referred to as SPC), with assumed island figures based on HIES proportions. The breakdown by population component was provided by demographer and former Census Bureau employee Michael Levin, PhD, who assisted with the HIES project and analysis. We appreciate the CSD provision of the 2016 HIES dataset to Dr. Levin for this and other analyses in this report.

Figure 1: CNMI Population Forecasts by Various Agencies



Sources: (a) U.S. Census Bureau Decennial Census 2000, 2010;
(b) Pacific Community (SPC). Population Projections. Retrieved at https://prism.spc.int/ November 2017;
(c) U.S. Census International Database. International Programs. https://www.census.gov/population/international/data/idb/region.php?N=%20Results%20&T=13&A=separate&RT=0&Y=2017&R=-1&C=CQ Retrieved in November 2017; and
(d) United Nations, Department of Economic and Social Affairs, Population Division (2017). Probabilistic Population Projections based on the World Population Prospects: The 2017 Revision. Population Division, DESA. http://esa.un.org/unpd/wpp/ Retrieved November 2017.

1.5 Initial Historical Research

Model design began with the simultaneous need to (a) address severe data limitations and particular uncertainty about CNMI economic futures (addressed in the following Section.1.6); and (b) conduct primarily Census-based historical research into historical research about the relationship between CNMI economic conditions and population dynamics (addressed in this section).

1. The study's primary focus on NMD population meant there was a need to specify natural increase and net migration patterns for that NMD group in particular, but also other population components as well. Therefore:

    - The overall population was necessarily divided into the three previously-noted components: (a) NMD; (b) Non-NMD Residents of CNMI, and (c) (Foreign) Non-Residents. (The latter group would be primarily CW-1 visa workers and dependents, though would likely include a small number entering the CNMI through other means.)

- A critical question for modeling was: "To what extent will economic change produce normal labor mobility (i.e., in-migration or out-migration) among NMD and Non-NMD Residents before there are effects on supply of foreign workers?" This is a particularly difficult modeling issue, because in reality the availability of U.S. workers (from Guam, the Freely Associated States, other American islands, or even the U.S. Continent) will depend on economic conditions in the source areas and the intensity of recruitment/training efforts by CNMI's government and employers. For modeling purposes, though, the available data are largely limited to historical evidence that can be used to indicate how much in- or out-migration was actually observed among different age-sex groups for NMD and Non-NMD residents during recent historical periods that somewhat parallel the economic scenarios to be used later in forecasting.

- Therefore, this first phase of Model development focused not on economic futures but rather on ***historical research*** into basics of population dynamics for each of these three groups. The ultimate purpose of this historical analysis was to try to understand probable ***net migration patterns*** of various population groups (NMD, Non-NMD, and Foreign Non-Residents) under different economic conditions that parallel those to be used for each scenario for future forecasting.

  In theory, this can be done by using presumed age-specific fertility and mortality rates to "age" the population observed in, say, 1990 for ten years to determine what it would be in 2000 if nobody moved in or out. The difference between these hypothetical 2000 age-sex numbers and the actual observed age-sex numbers from the 2000 Census is conventionally attributed to net migration, allowing understanding both of the *ratio* of migration to natural increase and also of the age-sex *characteristics* of in-migrants or out-migrants.

  Again in theory, the periods 1990-2000, 2000-2010, and 2010-16[4] represent overall economic conditions roughly comparable to a "high-growth" economic scenario (the 1990s, which were a boom period for the CNMI), a "collapse" scenario (the 2000s, when garment factories all closed and the Great Recession hit), and an intermediate scenario (the 2010s to date, during which there was both initial decline and recent strong recovery – net slow growth).

2. To carry out the above theoretical approach to determining net migration patterns under different conditions, comparable data about actual age-sex population distributions would be needed for each of the four defining years – 1990, 2000, 2010, and 2016. The current U.S. Census Bureau made a significant effort to be helpful but lacked access to some past electronic datasets. Former Census Bureau statistician Michael Levin, PhD, a frequent statistical consultant to the CNMI government, assisted us in using the limited available data to generate basic age-sex cohort numbers for each possible population component for the overall CNMI from the Censuses of 1990, 2000, and 2010, as well as the CNMI's 2016 HIES,

[4] These periods are anchored by available population from the 1990, 2000, and 2010 Census, as well as the 2016 Household Income and Expenditure Survey (HIES).

which he helped analyze.[5] He also assisted by providing data needed to develop assumptions about fertility and mortality rates needed to project change over time by natural increase, as well as proportions of NMD households eligible for DPL awards.

Unfortunately, available Census data for 1990, 2000, and 2010 did not permit *island-specific* analysis of age-sex data for each specific population group (e.g., for NMD only). And even at the CNMI-wide level, it was possible only to develop numbers for the NMD group. We could at least subtract these NMD numbers from Total Population numbers to get data for "Combined Non-NMD," but could not further break the data down into Non-NMD U.S. Residents and Foreign Non-Residents.

3. Therefore, JMK Associates used the CNMI-wide 1990 NMD age-sex data and other assumptions to "age" the NMD age-sex numbers and estimate net migration for that group. This same exercise was repeated for the NMD group for the periods from 2000 to 2010 and from 2010 to 2016. The same was done in each of the three periods for "(Combined) Non-NMD" numbers. We also looked at total population age-sex characteristics, which of course *could* be done at the island level.

4. This initial analysis with CNMI-wide NMD and (Combined) Non-NMD numbers established that:

   - As per Figure 2, CNMI's overall NMD population has consistently had an age-sex distribution very different from the (Combined) Non-NMD population pattern. The NMD pattern is closer to a classic expected distribution, with more children than adults, but has usually been characterized by a particularly steep drop-off in the late teens or early 20s, suggesting substantial out-migration in those age groups. The Combined Non-NMD Residents and Foreign Non-Residents have fewer dependents under 18 and a much greater bulge in mid-aged working years.

   - And as per Figure 3 (for reasons of space limited to three Census results), the Total Population age-sex patterns are consistently highly similar for all three islands. This suggests that when and if island-specific data may be lacking, it is reasonable to impute overall CNMI patterns to all islands. This gave credence to the idea that CNMI-wide migration characteristics could legitimately be applied in the same way to all islands.

   - However, resultant net migration characteristics in Figure 4 posed some problems for the analysis. As expected, both population groups showed overall in-migration

[5] There were necessary approximations in this process. To estimate "NMD" numbers from available Census data, Dr. Levin had to include separate data on part-Chamorros and part-Carolinians, such that a small number of people who were *both* part-Chamorro *and* part-Carolinian were likely double-counted. Also, the 2016 HIES collected race/ethnicity data via different question wording than did the Census. The CNMI's subsequent 2017 Labor Force Survey (LFS) would have provided a more "apples-to-apples" dataset in terms of NMD definitions, but it was not completed in time for this analysis. This is also an issue for subsequent Model development, as it was necessary to use the 2016 HIES data for baseline information rather than the more recent LFS. The Model, of course, could someday be re-run with baseline data from the 2017 LFS instead.

during the good times of the 1990s, out-migration during the bad times of the 2000s, and more indeterminate patterns during the 2010s – i.e., ***net migration patterns do respond to economic conditions and must be estimated***.

At the same time, the data for this study's key population group showed that ***NMD net migration has historically been less responsive than other groups to economic conditions for overall population, but rather has exhibited shifts in demographic composition.*** Even in the good economic times of the 1990s, young NMD adults were out-migrating,[6] while there was probable in-migration by older NMD adults and strong (almost improbable) levels of in-migration by NMD children. The average annual migration percentage for the overall NMD population in the 1990s was not much above zero, and the young adult out-migration effectively balanced the in-migration from other working ages.

Furthermore, none of the patterns for any of the time periods in Figure 4 resemble the age-sex characteristics for overall settled populations in Figure 2. Except during the 2000s, some age groups showed in-migration and others showed out-migration (which is why males and females were combined for Figure 4). And as noted, results for children were sometimes strange, possibly reflecting inevitable statistical ranges of error in survey samples.[7] The observed historical patterns in Figure 4 should therefore be regarded as basically true but legitimately subject to some "smoothing" to reduce oddities such as the high levels for children or the occasional staggered patterns of in- and out-migration among consecutive older age groups.

5. Therefore, the actual observed historical patterns in Figure 4 were "smoothed" or altered in generally small ways to produce final figures charted in Figure 5, which can be seen as mostly differing only slightly from those in Figure 4. The text boxes in Figure 5 summarize key changes for each group in each period.

   Specific needed numbers from this historical analysis for the subsequent forecasts were, for each population group and for each time period corresponding to the three scenarios sketched out in Section 1.2, (1) assumed ratios of migrants to natural increase, and (2) assumed age-sex distribution of in-migrants or out-migrants. Figure 5 indicates the ratios for each "smoothed" migration pattern. (The full age-sex distributions from the analysis are given in Table 7 at beginning of Chapter 2.)

[6] Note in the upper part of Figure 4 that young NMD adults dominated out-migration among adults in the other two historical periods as well, although teen-agers and adolescents were also heavily out-migrating in the much more economically mixed 2010s to date.

[7] This analysis was a limited one, and a truly complete exploration would likely have to consider factors such as relative economic conditions in Guam or other nearby islands, as well as educational/ employment opportunities in the rest of the U.S.

Figure 2: CNMI Age-Sex Percentage Pyramids, NMD and Combined Total Non-NMD – 1990, 2000, 2010, and 2016

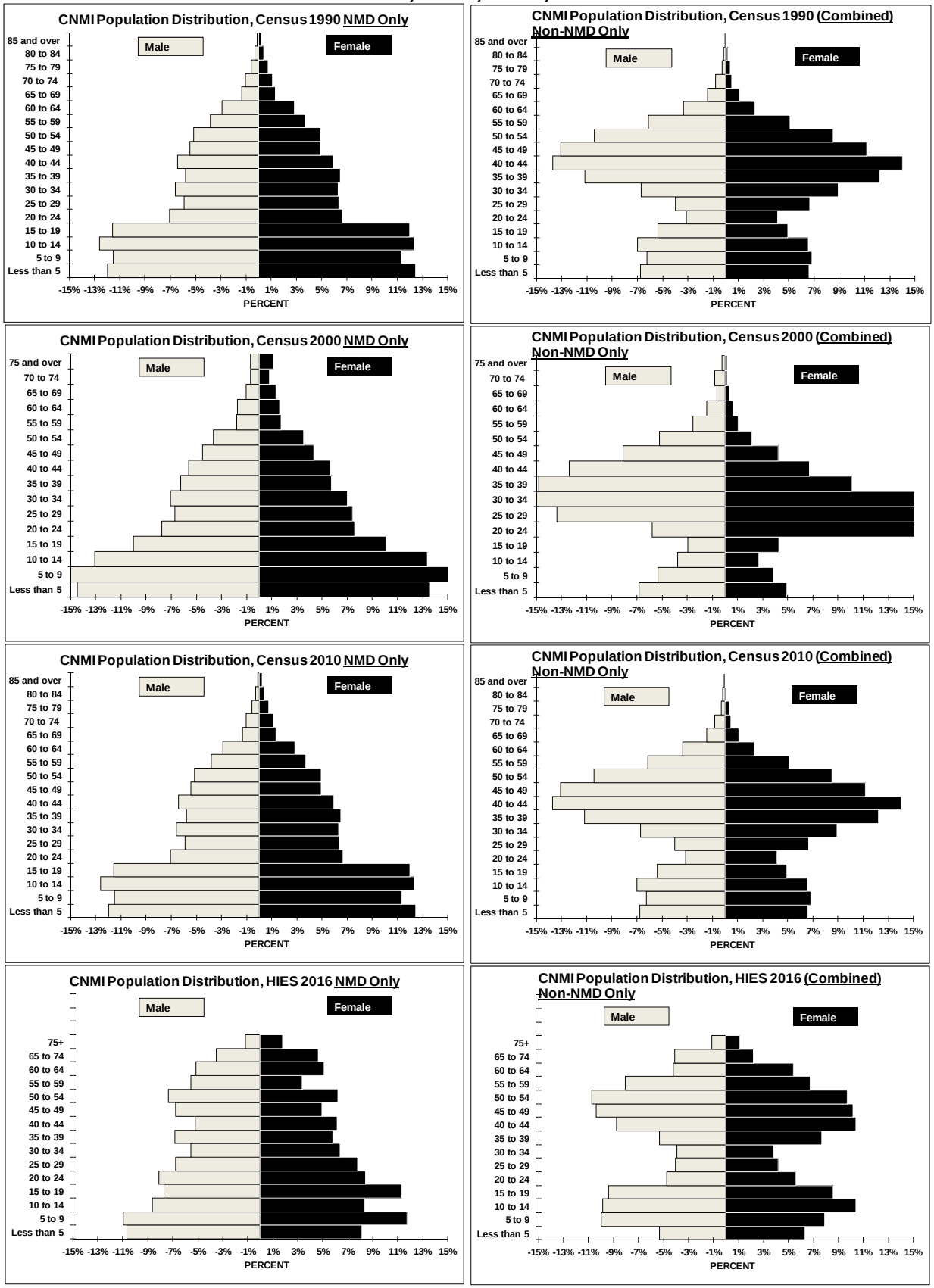


Figure 3: Island Age-Sex Percentage Pyramids, Total Population – 1990, 2000, and 2010

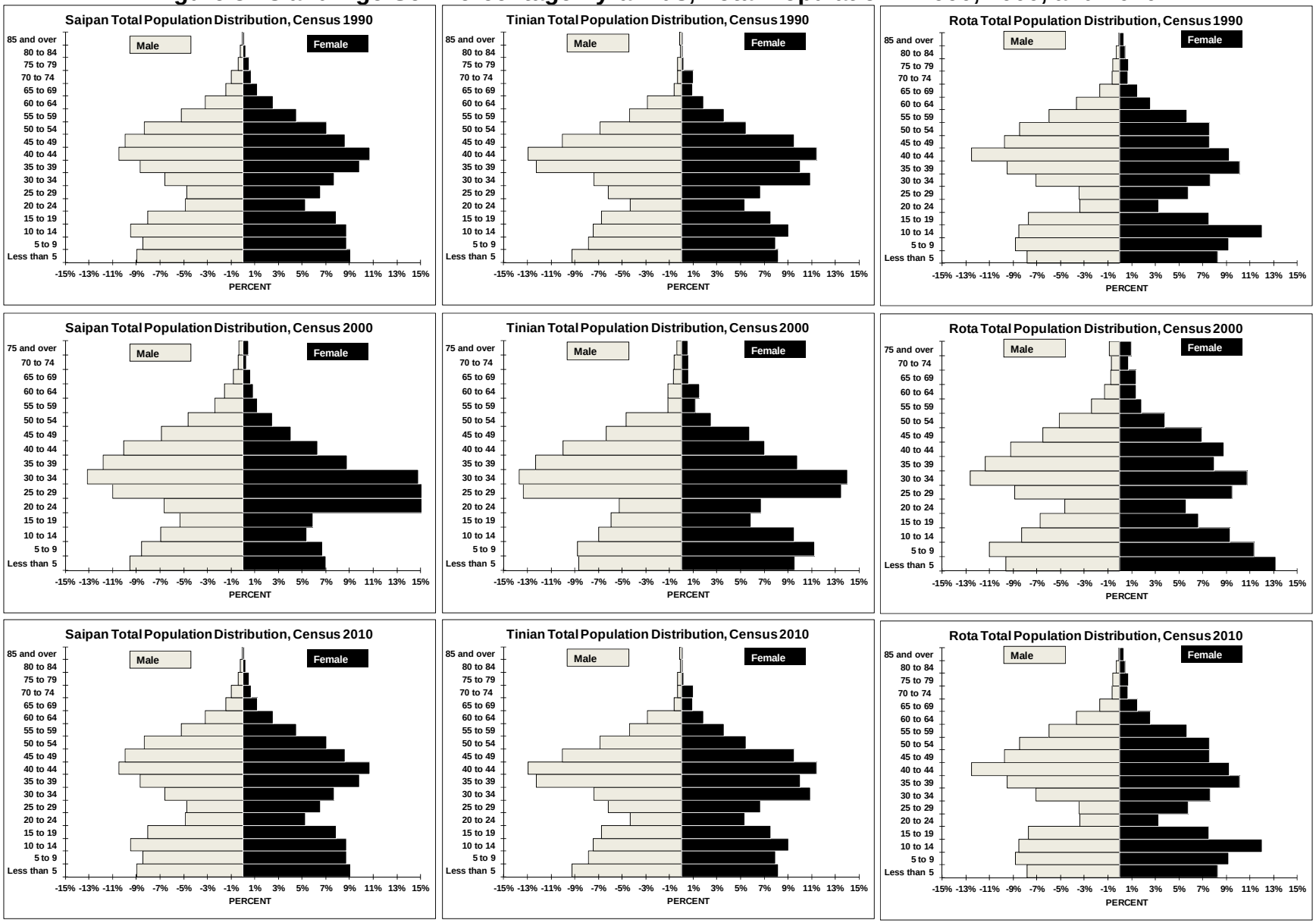
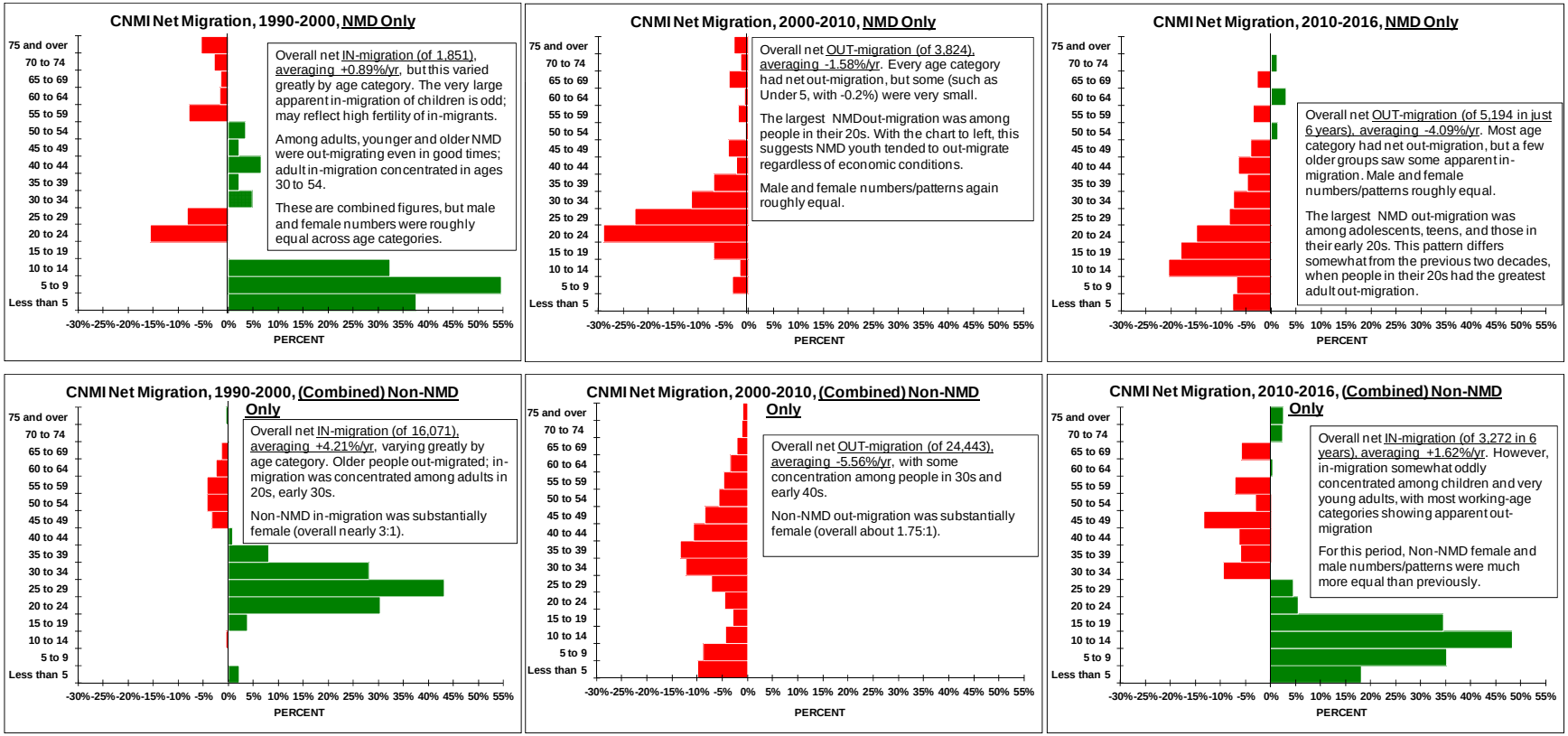
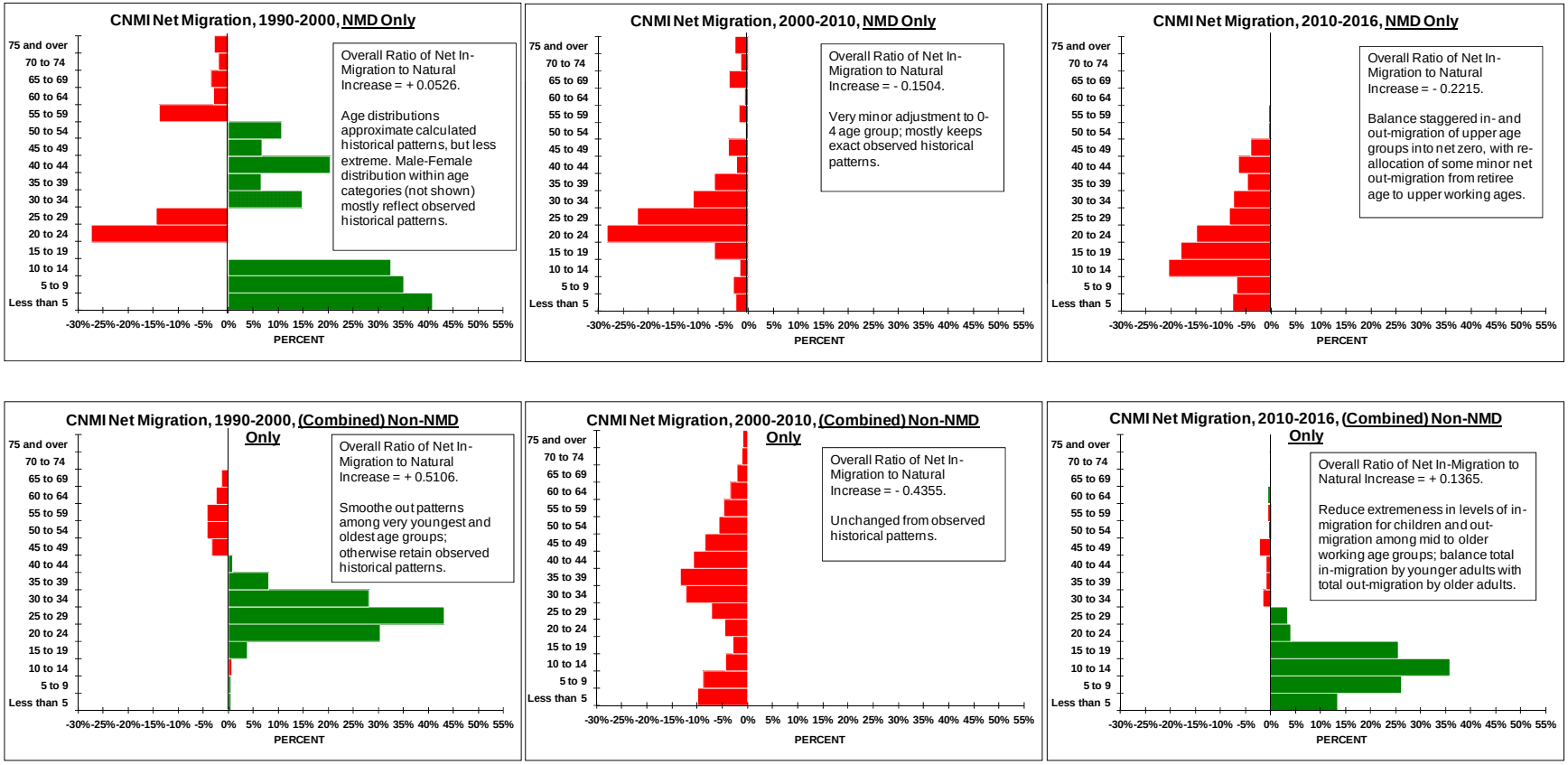


Figure 4: Net Migration Characteristics (NMD vs. Combined Non-NMD) by Age Group for Three Recent Historical Periods



(Note that scales for both NMD and Non-NMD charts are in percentage terms, and thus look similar. However, the total numbers mentioned in the text boxes show that, for both the 1990s and the 2000s, in- and out-migration was much greater for Non-NMD populations. This changed in the 2010s.)

Figure 5: Final "Smoothed" Net Migration Characteristics and Assumed Ratios of Migration to Natural Increase



In regard to estimated ratios of migrants to natural increase: For the 1990s, the model for a future "high-growth scenario," the NMD ratio is just + 0.0526.[8] This means the Model will assume very limited natural in-migration of NMD workers/ population in response to improving economic conditions – for every 100 new NMD workers produced by natural increase, only five NMD in-migrant workers will be assumed.[9] By contrast, for Non-NMD residents, the ratio of + 0.5106 means that for every 100 new workers from natural increase, there will also be 51 in-migrants in response to expanding labor demand. These assumptions are based on historical evidence, but do mean the Model will assume substantial Non-NMD (and probably Foreign) in-migration for positive growth scenarios – thus, ongoing dilution of NMD residents as a percentage of overall population.

1.6 Challenges to Forecast Model Development

Forecast models always face challenges, such as whether cause-effect assumptions built into the models are valid in real life and whether input numbers are correct. However, two other key challenges were present for this effort –

1. **Serious Data Limitations:** CNMI is a small place that went through effective Depression conditions for a decade, only recently emerging from this (at least on Saipan). Government resources are just now permitting new studies and data. Lack of a current CNMI Input-Output (I-O) Model remains a particularly serious constraint to modeling that directly links economic growth to population change.[10] As suggested in Table 2 and Figure 1, there are also uncertainties about actual "current" (2016) population, a key starting point for forecasting future population. There are also limitations in available published Census data regarding the three population components of interest. [11]

[8] The Model in some circumstances sets negative ratios to zero in cases where the focus is on in-migration in positive economic scenarios.

[9] NMD in-migrants of working age would come from limited external pools at any rate. Figure 4 and Figure 5 suggest they would generally be 30 years of age or older – likely often people who out-migrated in their 20s for education or employment opportunities elsewhere – and would be people attracted home as much by personal as employment considerations, given CNMI's lower salaries.

[10] The commercial firm IMPLAN does market an annually-updated I-O Model for the CNMI, and we obtained the most recent version (based on 2015 data) and ultimately used a few job-to-job multipliers from it. However, the IMPLAN model for our purposes is overly specified and more useful for estimating impacts of discrete particular economic changes rather than large-scale forecast modeling.

[11] Detailed population characteristics, such as race/ethnicity by population age-groups that are readily available in every other U.S. State and all Territories are not available for the CNMI. For example, American Community Survey (ACS) data released by the U.S. Census Bureau each year provide one-year and five-year estimates of all States and Territories *except* the CNMI and American Samoa. These demographic profile estimates offer greater depth of data (i.e., selected populations are asked more questions), as well as more recent figures between decennial censuses. Also, as discussed later, available published data have limitations in regard to breaking out age-sex data for the three key population components – NMD, Non-NMD Residents, and Foreign Non-Residents – in "apples-to-apples" comparable ways for the Census and for the 2016 HIES data.

2. **Current Deep Uncertainty about CNMI's Economic Future:** The biggest uncertainty as of this writing is – given limited on-island labor supply – the future availability of foreign workers to construct and operate potential new tourism-related developments (casinos, hotels, etc.), as well as fill societal support positions such as health care. However, there are also other uncertainties – e.g., continuation of tourist visas for the increasingly important Chinese market; potential impact on tourism of new military activities; or availability of capital for casino or other tourism development on Tinian and Rota.

Adding to this sense of economic uncertainty, CNMI has a significant history of "boom-bust" economic patterns over time – i.e., its economy has historically been unstable. The longest available historical data series that illustrates this is MVA data on Visitor Arrivals, which show near-exponential growth till 1997, then a general sharp downward trend to 2011, followed by upturn. (See Figure 6, following page.) Real Gross Domestic Product (GDP) is a better overall economic indicator, though the U.S. Bureau of Economic Analysis has published this only for years from 2002. However, it shows a similar decline to 2011, followed by recovery (Figure 7, following page).

1.6.1 CNMI-Wide Economic Uncertainties

This section will discuss uncertainties with potential to impact the future of labor demand and population growth in the CNMI. The following is likely not a comprehensive inventory of all future possible alternatives, but three issues could particularly sway future CNMI development in the CNMI: (1) an uncertain labor pool; (2) uncertainties about likely growth despite infrastructure limitations; and (3) a sustained tourism market.

Uncertain Labor Pool: The CNMI hospitality industry (including accommodation, construction workers, and food services) is particularly dependent on foreign labor, with more than 80 percent of workers from outside CNMI or the United States.[12] Until 2008, CNMI exercised sole authority over the distribution of tourist visas and foreign labor permits. However, in the midst of the last economic downturn, the U.S. Congress approved the Consolidated Natural Resources Act of 2008 ("CNRA") which initiated a transition to U.S. immigration laws beginning in November 28, 2009.[13] To ease the economic burden of a more restrictive immigration policy, two new categories of visas were created solely for CNMI:

- The CW visa program allowed companies to utilize transitional foreign workers for construction and hotel operation labor. CW-1 permits were issued to foreign workers, while CW-2 permits were issues to the spouses and dependents of those workers.

- Additionally, E2-C permits were created for foreign "investors" in the CNMI (though these permits are used far less often than the CW permits).

[12] U.S. Government Accountability Office (GAO). May 2017). "Implementation of Federal Minimum Wage and Immigration Laws". Retrieved Nov. 2017. *http://www.gao.gov/assets/690/684778.pdf*

[13] Robert J. Misulich. "A Lesser-Known Immigration Crisis : Federal Immigration Law in the Commonwealth of the Northern Mariana Islands" (PDF). Digital.law.washington.edu.

Figure 6: Total Visitor Arrivals CNMI (FY) 1978-2017

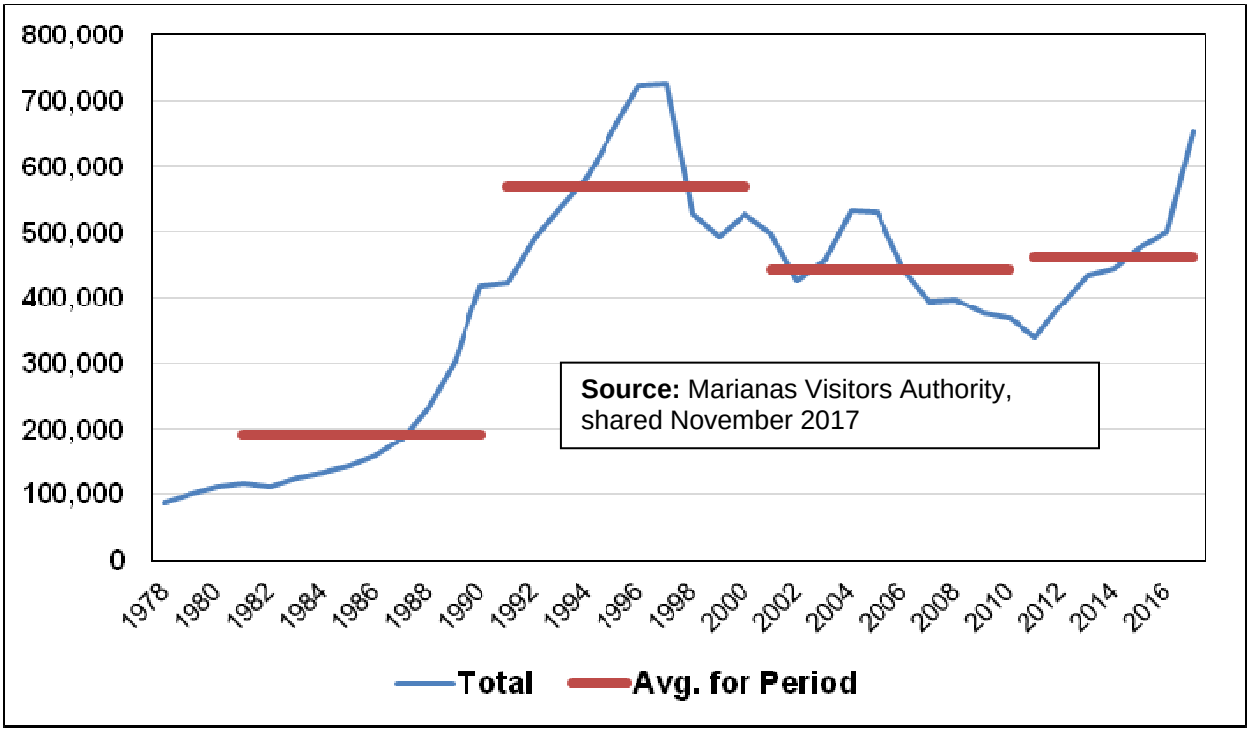
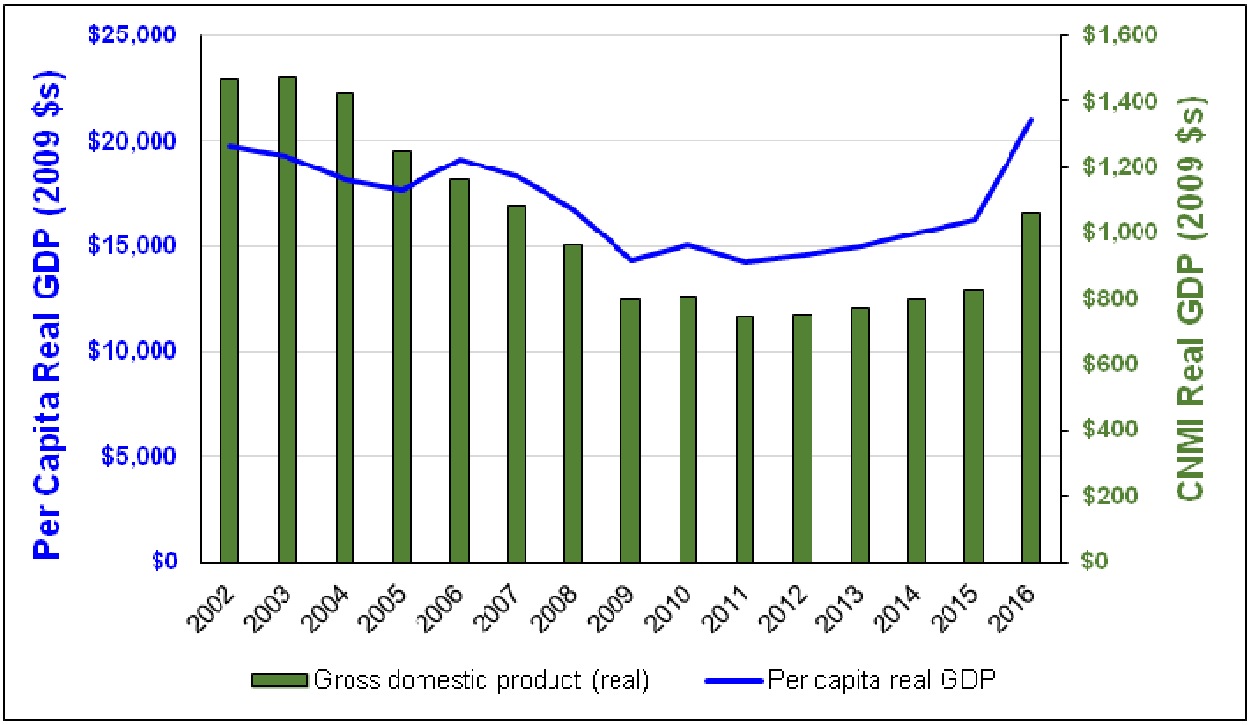


Figure 7: CNMI Real Gross Domestic Product 2002-2016



Source: U.S. Department of Commerce. Bureau of Economic Analysis. Release Date: October 15, 2017. Retrieved November 2017. https://www.bea.gov/national/gdp_territory.htm
Note: Estimates of population for 2013-2016 reflect the incorporation of updated information from the U.S. Census Bureau's International Data Base.

These measures were always intended to be temporary, to allow the CNMI to reduce its dependence on foreign labor while it developed sustainable sources of U.S. labor. Both the CW and E2-C permits were intended to be reduced over a period of five years (2009-2014), and then another five-year extension period (2014-2019) when the program would eventually be phased-out, and foreign workers routed into the nationwide foreign labor permit program (which is capped at 65,000 permits for all of the U.S. including CNMI). A May 2017 report by the U.S. Government Accountability Office estimated that the removal of all CW-1 workers would cause the CNMI GDP to decline by 26 to 62 percent from 2015 levels.[14] Despite this assessment, the deadline for the Program's phasing out remains December 31, 2019, though the battle is ongoing in Congress.

This is perhaps the most obvious and critical uncertainty facing all the CNMI islands. It is generally believed among the public- and private-sector officials interviewed for this effort that CNMI's economy will crash without CW-1 workers to build and then help operate new hotels and casinos, as well as crucial support jobs in fields like health care.

Soaring Growth vs. Infrastructure Limitations: A significant number of construction projects, including resort-hotel and casino developments, have been proposed in recent years throughout the CNMI. If all proposals actually are built, it will add a total of more than 6,600 hotel units to the CNMI inventory and require a labor pool of more than 8,000 for Operations as well as more than 6,000 for construction (see following Table 3). According to the Hotel Association of the Mariana Islands (HANMI), the total visitor unit count in the CNMI as of January 2016 was 3,444.[15] This sort of growth implies a 92% increase in total rooms over just a few years. It is by no means certain that all the new units, if constructed, will find a market to fill them with high occupancy.

Growth occurring at such high rates also raises questions in regard to the sustainability of the CNMI infrastructure. The recently (2017) MVA-commissioned Horwath Report noted that, while the CNMI overall market has seemingly been booming, "the current situation where relatively quick returns are generated without consideration to longer-term impacts is not sustainable."[16] Furthermore, the report highlights that "Overall, relative to the CNMI's resources and population, this target growth level is unrealistic", and that growth beyond a 750,000 visitor arrivals mark (or at levels comparable 1996-1997 peak levels see Figure 6) could only be made possible "with considerable expansion of the existing infrastructure by scales and timelines that correspond to arrival growth (p.7)." Some of the expansions suggested included addressing shortening arrival wait times at Saipan Airport, as well as renovation of existing properties (suggesting that after the initial boom subsided, the low quality of accommodations will negatively impact CNMI's competitiveness as a tourist destination).

[14] U.S. Government Accountability Office (GAO). May 2017). "Implementation of Federal Minimum Wage and Immigration Laws". Retrieved Nov. 2017. http://www.gao.gov/assets/690/684778.pdf
[15] As summarized in MVA reports. Counts for HANMI members only. Excludes vacation rental accommodations, which have not been counted but are estimated by some interviewees for this study to account for up to 35% of total existing inventory. There is also uncertainty about how long some current lodging facilities will remain open due to upcoming lease expirations, as mentioned in subsequent pages.
[16] Horwath HTL. *Ibid.* P. 3

Table 3: Current and Pending CNMI Projects

Island	# Rooms	Employees Needed	Construction Needed	Name of Project	BECQ Status
Saipan	373	540	1,500	Imperial Pacific Resort Hotel	Under Construction
Saipan	51	20	100	Royal View Hotel	Application under review
Saipan	26	8	29	Fantastic Garden	Application under review
Saipan	1,184	560	700	Saipan Garden Resort	Application under review
Saipan	50	20	56	Saipan Vegas	Under Construction
Saipan	312	148	352	Honest Profit Saipan Resort Hotel	Under Construction
Saipan	60	38	49	Surfrider Resort Spa & Beach Club	Under Construction
Saipan	226	96	106	Sugar King Hotel & Dormitories	Under Construction
Saipan	100	70	40	Himawari Commercial Operations	Under Construction
Saipan	536	175	60	Saipan Globe Hotel	Not started
Saipan	100	21	113	Beach Road Ocean View	Not started
Saipan	144	148	250	Ocean Vista Resort	Not started
SUB-TOTAL	***3,162***	***1,844***	***3,355***		
Tinian	300	859	375	Bridge Investment Titanic	Application under review
Tinian	414	1,300	518	Imperial Dynasty	N/A
Tinian	2,500	4,000	2,000	Plumeria Resort	Application under review
SUB-TOTAL	***3,214***	***6,159***	***2,893***		
Rota	225	335	281	Luxury Hotel/ Ecotourism	N/A
SUB-TOTAL	***225***	***335***	***400***		
TOTAL	***6,601***	***8,338***	***6,648***		

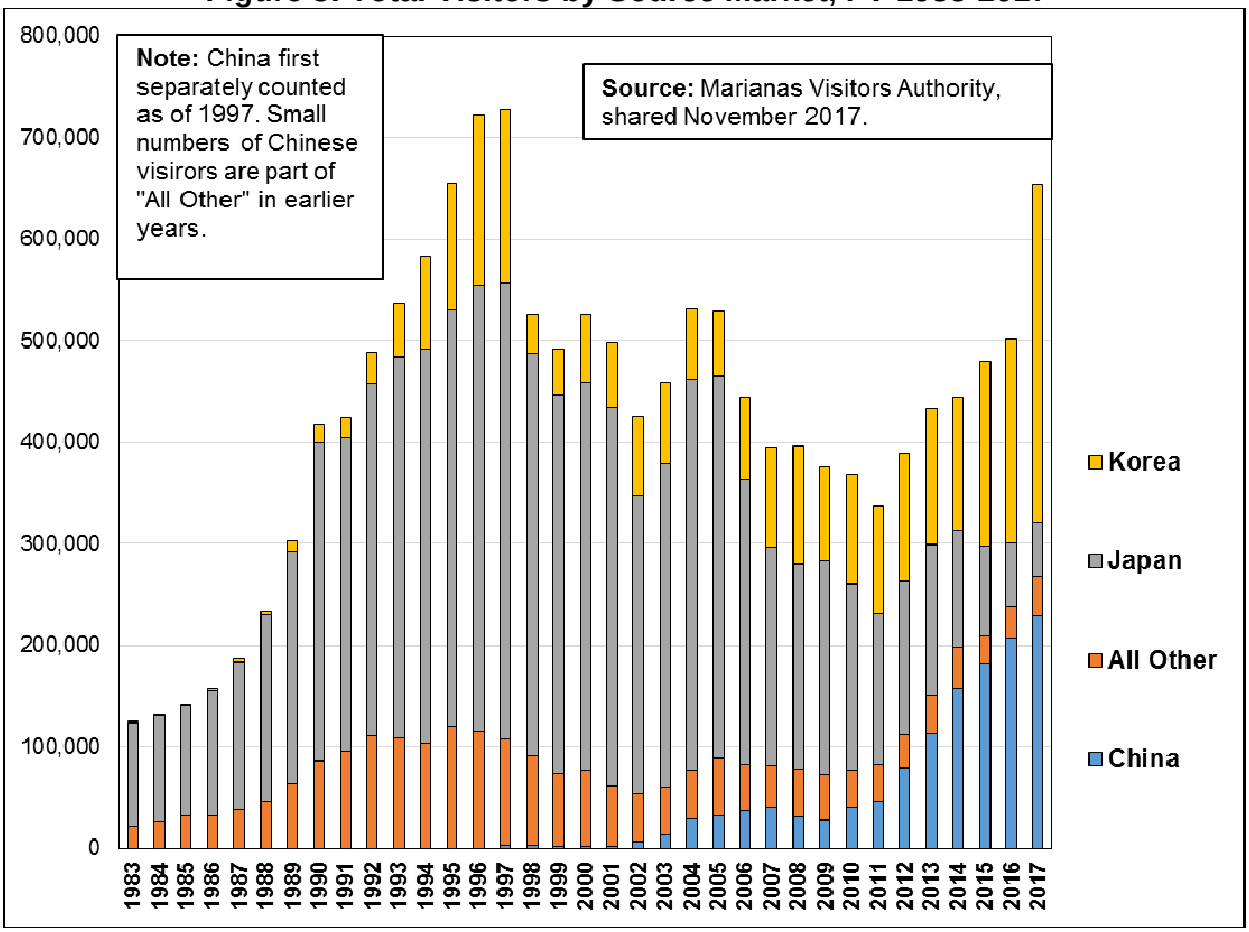
Source: Adapted from data received from the CNMI Bureau of Environmental and Coastal Quality (BECQ). Major Siting Development Chart. 2015-2017. Received in October 2017.

Note: The Tinian Dynasty is currently closed, and no investor has immediate plans to re-open it, but we include it here as a possible future project, should it be purchased. Numbers reflect the number of rooms and employees the Dynasty when it was still in operation. Additionally, while there currently is no official application under review at the BECQ, we have added the possibility of small-scale luxury hotels in Rota, as mentioned to us in interviews with various officials, operators, and investors.

Prospects of a Sustained Tourism Market: Recent increases in visitor arrivals have been marked by a shift from a majority of visitors coming from Japan to a predominant market share of visitors from China and South Korea. From fiscal years 2011 through 2017, the number of visitors from Japan dropped by 65%. Meanwhile, the number of Chinese visitors rose by 123% and the number of South Korean visitors rose by 213% (Figure 8). However, the prospect of a continually growing Chinese tourism market is also dependent on the extension of the U.S. Department of Homeland Security (DHS)'s discretionary parole authority, which allows Chinese (and Russian) visitors to enter the U.S. as temporary visitors for up to 45 days on a case-by-case basis in the CNMI since 2009. The parole program is scheduled to sunset in 2019 (at the same time as the CW and E2-C permits). As of this writing, no Congressional decision has been made in regards to its extension of beyond that.

There are fundamental questions as to how long the recent growth spurts in tourism can continue .Growth was still very strong at the beginning of 2017 (arrivals were up 47% in March 2017 compared to March 2016) but was slowing greatly toward the end of the year (up just 2% by November 2017).

Figure 8: Total Visitors by Source Market, FY 1983-2017



1.6.2 Saipan

While Saipan legalized casino gambling and issued a license to the Macau-based Imperial Pacific International Holdings Inc. (IPI) for a large casino and hotel soon thereafter (in 2014), only the casino had opened as of 2017. The adjacent hotel (for which construction was expected to finish by August 2018), has now been pushed back to August 13, 2023, due to a complicated set of labor issues related in part to current unavailability of CW-1 workers following actions by the U.S. Immigration and Customs Enforcement over safety and illegal hires. IPI proposes a large "Phase 2" to its investment – including an additional casino, hotels, shopping, and other attractions, probably in the Marpi area – but like many other substantial proposals, this is not a certainty at the present time. There are additional questions about whether China will continue to permit external investments in gaming and hotels (as part of a general tightening on foreign investment),[17] likelihood of U.S. federal investigations into future CNMI casinos following the closure of the Tinian Dynasty, etc.

[17] CNBC, Aug. 21, 2017. "No sex, no gambling: China tightens rules on foreign investment." https://www.cnbc.com/2017/08/21/no-sex-no-gambling-china-tightens-rules-on-foreign-investment.html

There are currently four hotels or condo-tels under construction on Saipan, and five additional ones with permits under review at the Bureau of Environmental and Coastal Quality (BECQ), totaling a future inventory (if all constructed) of over 2,200 additional rooms on the island. These new rooms would require an estimated 2,000 employees to operate. Again, however, there is no certainty that all "Under Review" projects will actually materialize – nor, as is always the case, is there any assurance that there is sufficient market demand for new hotels, that an over-supply is not being created.

The nature of tourism is changing in Saipan. Apartment-based vacation rentals (not counted in MVA lodging inventories) have been estimated as 35% of total inventory by some visitor industry sources in confidential interviews for this project. And some new projects under development are more in the nature of limited-service "condo-tels" than traditional full-service hotels.

Finally, both interviews and also recent news reports suggest strong industry concern over various DPL hotel leases soon to expire. (In general, off-island investors have long expressed concern over the relative brevity of 40-year leases permitted to non-NMD lessees.) Without certainty over whether they can renegotiate existing leases or must compete with other bidders, owners of major properties are hesitating to invest in repairs and renovations, contributing to possible perceptions of deteriorating hotel inventory in Saipan.

1.6.3 Tinian

The Tinian Dynasty Hotel & Casino opened in 1998. It was the only casino in CNMI for many years, but closed in 2015 after U.S. federal law enforcement fined its owners $75 million for failing to follow anti-money-laundering procedures. The property remains closed as of January 2018. According to data provided by BECQ, most of CNMI's future planned labor demand is for development on the island of Tinian, where two other casino resorts have been proposed, with an estimated labor demand of 6,359 workers for operations – more than twice the island's population in 2016. The likelihood of any of these project actually materializing is uncertain at this time.

- Alter City Group Holdings Ltd. plans a casino complex accompanied by a large resort.

- Bridge Investment Group proposes a Titanic-themed casino on the coast.

- The Dynasty could be renovated if sold (but there is a lien on the property to pay the $75 million fine, which is reportedly a major obstacle to finding investors, though there is also the possibility the amount could be negotiated down).

As detailed further in the following Section 1.7, there are also critical questions about the compatibility of tourism with proposed military activities, and these also affect the likelihood of proposed developments becoming a reality.

1.6.4 Rota

Despite the island's beauty and environmental appeal, tourism has a spotty history on Rota and it is unclear what can really succeed there. Although a Gaming Commission exists on the island, there are no current likely prospects for casino development. (One proposal resulted in a lawsuit for the Commission, recently settled.) Interviews with public and private officials for this study suggest that small upscale eco-tourist lodges are now more likely to be developed on the island.

1.6.5 Northern Islands

Modeling the future population growth the Northern Islands is essentially not possible, as there is high uncertainty about future (potentially conflicting) proposals currently being proposed for the area. First, the U.S. military is currently preparing an Overseas Environmental Impact Statement (OEIS) to assess the potential effects new live-fire training on Pagan. Some previous residents have opposed this project, hoping to promote small tourism-related economic development in the form of eco-tourism on the island. Other forms of economic development that have been proposed include a proposal to mine for pozzolan. The socioeconomic study conducted for the military OEIS mentions a 1978 Master Plan for Pagan drafted by the Office of Transition Studies and Planning which noted that exploitation of basalt deposits could be an economic development possibility for the island. However, the socioeconomic study concluded that "Analysis of market conditions and mining operation feasibility indicates that a pozzolan mining operation on Pagan would not be expected to reach profitability or provide an investor with an acceptable rate of return." [18]

1.7 Subsequent Approach to Modeling and Scenario Development

While it was initially determined there would be three very different economic scenarios for each island – High Growth, Medium (or Status Quo), and Poor/Negative – the next step of Model development required more detailed specifications. The key drivers for CNMI change that would need to be addressed in each scenario would include:

1. Traditional ***tourism*** growth – typically measured in the CNMI by visitor arrivals;

2. ***Arguably, casino*** activities as a separate factor, because casino revenues do not interact with the rest of the economy as normal visitor expenditures do;

3. Potential ***military*** training activities, which will provide some jobs on Tinian but some fear could suppress tourism on Tinian and Saipan due to air conflicts, image, etc.;

4. ***Construction*** – although it is sometimes difficult to link this coherently with the more permanent ongoing tourism or military activities above.

[18] U.S. Department of the Navy. Preliminary Draft (Version 3) *Socioeconomic Impact Assessment Study in Support if the Commonwealth of the Northern Mariana Islands Joint Military Training Environmental Impact Statement/Overseas Environmental Impact Statement.* 2015. P. 5. Available at: http://www.cnmijointmilitarytrainingeis.com/documents

1.7.1 Conceptual Decisions

This sub-section describes the *general* approaches decided upon to address some of the key topics and uncertainties previously described, and the following sub-section summarizes the overall scenarios decided upon.

General Model Approach to Tourism

Many discussions about potential CNMI (especially Saipan and Tinian) tourism growth center on a current spate of actual or proposed new resort units, varying from hotels to condo-hotels to the uncertain number of private vacation rentals directly marketed over the internet. One such list was presented previously in Table 3.

Our preference was not to rely on units as the main tourism variable if possible, because the mere existence of new hotels or other lodging structures does not guarantee there is enough of a market to fill them. Outside Hollywood, "Build it and they will come" is rarely a viable business plan, and the CNMI has several vacant deteriorating structures that were once struggling hotels.

The ideal variable would be visitor expenditures, because it is money that circulates in the economy and creates demand for other economic activity and for related "ripple effect" new jobs. If the CNMI simply maintained its present visitor counts, but could somehow increase visitor spending by 50% more per day in the local economy, that would produce economic effects roughly equivalent to boosting the visitor count by 50% (if there were no spending increase per visitor).

However, available visitor expenditure data for the CNMI are spotty over time, and a key recent set of possible forecasts (i.e., the Horwath Report for MVA) instead uses visitor arrivals as the critical variable. The Horwath Report's visitor arrival projections are for the CNMI in general, but arrivals now overwhelmingly stay in Saipan, and it is Saipan's infrastructure that is presumably most at stake when Horwath concludes that arrival levels above 750,000 annually may not be "sustainable." Therefore, the first decision in Model scenario design was that Saipan's tourism inputs would be based on different presumed levels of visitor arrivals for each scenario.

However, the Horwath Report is CNMI-wide (with an implicit primary focus on Saipan) and does not provide any range of estimates for Tinian and Rota. For those two small islands, it seems necessary to assume that the level of development being proposed would not greatly outstrip market demand for the relatively short timeframe of this model, and to define scenarios based on how many units exist.

We were thus driven to a hybrid approach in which (a) the Saipan tourism variable is defined by varying assumptions from the Horvath Report about visitor arrivals (which are assumed to apply primarily to Saipan; (b) Tinian and Rota arrivals are separately estimated by assumptions about number of visitor units; and (c) scenarios in which

750,000 arrivals are seen as a "cap" are applied only to Saipan (as that is presumably where infrastructure would be strained), and any new Tinian/Rota tourism growth could still take place. In practice, that would mean that the middling "Scenario B" would be more of a "Status Quo" scenario for Saipan but a slow to "Medium Growth" scenario for Tinian and Rota.

General Model Approach to Casinos

Casinos are currently a major contributor to new lodging development in the CNMI, but their economic behavior is distinctive. Large gambling losses are now handled via payments in China, not in the CNMI. There are no current data on whether casino-specific "high-roller" tourists spend any more lavishly than other visitors in the general Saipan economy outside the casino walls. Casino fees are enhancing CNMI government revenues and helping to pay unfunded liabilities relating to government employee pensions and health care, but it is unclear at this point how many current governmental jobs may be added over time as a result of such revenues.

For these reasons, and because the ultimate focus of this study is on labor demand and associated population dynamics, the relevant range of information is for the variable of casino jobs and how to separate these from estimates of combined casino-hotel jobs.

Saipan: According to recent news reports,[19] casino jobs on Saipan are currently at 1,677, declining from 1,848 in May 2017. Assumptions for the model have considered 1,600 casino jobs at the Imperial Pacific.

Tinian: For the purposes of estimating casino jobs created on Tinian, historical employment counts for the Tinian Dynasty were used. In a recent article,[20] the *Saipan Tribune* reported that 1,300 workers were needed for the operations of the Dynasty Casino/hotel when it was still open. Additionally, the Bridge Investment Group suggests the construction of the "Titanic" will produce 859 jobs.[21] For the purposes of modeling estimated casino-related jobs, we made a general assumption that some portion of operational jobs would be for hotel workers (30%) and another for casino workers (70%).

Rota: While casinos have been proposed for Rota, interviews with current public officials and some private developers suggested a current preference for more of an eco-tourism approach without casinos. Therefore, no casino jobs are assumed for any scenario. (However, the Model has the capacity to add them if needed in any future studies.)

[19] Marianas Variety. "Casino construction workers leaving on Dec. 17". Nov. 30, 2017. Accessed Jan. 11, 2018. http://www.mvariety.com/cnmi/cnmi-news/local/100489-casino-construction-workers-leaving-on-dec-17

[20] Saipan Tribune. "Tinian leaders rally behind CW program extension". Dec. 7, 2017. Accessed Jan. 11, 2018. https://www.saipantribune.com/index.php/tinian-leaders-rally-behind-cw-program-extension/

[21] See GAO. Implementation of Federal Minimum Wage and Immigration Laws. May 2017. Page 82.

General Model Approach to Tinian Military Training and Impact on Tourism

Although there is prospective military live-fire training activity in the Northern Islands, it is the activity at Tinian that would (a) provide a modest amount of direct employment there; and (b) according to some in the CNMI, suppress tourism on both Tinian and Saipan.

Tinian Military Options: Although the federal environmental study process continues for the development of military facilities on Tinian, it now appears likely this will occur and so is assumed for all three Tinian scenarios. According to the 2015 Socioeconomic Impact Assessment Study (SIAS) in support of the Joint Military Training Environmental Impact Statement,[22] a permanent base camp located on Tinian for 20 weeks per year would create 95 jobs there, with an average annual construction jobcount of 571 during the seven years prior to completion. Of the permanent jobs, 19 would be for military personnel and/or government employees with specialized training and experience, and the rest (76) are expected to be filled by existing Tinian residents. However, our analysis – while it accepts the labor demand figures – assumes local population will fill the jobs only if labor supply is available based on unemployment rates and natural increase *in conjunction with whatever else is also assumed about Tinian casino-hotel development*. Thus, "who gets the jobs" in this Model forecasting study depends on overall scenario specifications.

A second proposed military activity is development of a "divert airfield" (i.e., alternative military airfield if facilities at Guam are unavailable due to military or natural emergencies). The divert airfield would have no or minimal associated permanent jobs but would involve a maximum construction jobcount of 150 during the three years prior to completion, with 50% of these jobs for Tinian residents.[23] (Again, though, our Model assigns jobs to residents or in-migrants based on estimated on-island labor supply vs. cumulative demand.) Given completion of military environmental studies and a December 2016 Record of Decision, it appears likely but not completely certain the divert airfield will be built on Tinian. Therefore, these construction jobs are omitted in the pessimistic Scenario C but included for Scenarios A and B.

The Model assumes both military training facilities and (for the first two scenarios) the divert airfield would be operational by 2028. This is likely an optimistic schedule – the joint military training facilities are actually now scheduled for opening in 2030 – but we

[22] U.S. Department of the Navy. Preliminary Draft (Version 3) *Socioeconomic Impact Assessment Study in Support if the Commonwealth of the Northern Mariana Islands Joint Military Training Environmental Impact Statement/Overseas Environmental Impact Statement.* 2015. Available at: http://www.cnmijointmilitarytrainingeis.com/documents

[23] U.S. Air Force. *Final Environmental Impact Statement for Divert Activities and Exercises, Commonwealth of the Northern Mariana Islands.* September 2016. Available at http://pacafdivertmarianaseis.com/docs.html. The study also indicates up to 265 military personnel would come to Tinian for military exercises for up to eight weeks per year, though these would not necessarily be consecutive weeks. This intermittent military population was not included in the Model, nor did we include intermittent training for U.S. Marines and other military personnel associated with the "Joint Military Training" facility.

wanted to be conservative in assessing economic change and associated population impacts for long-term DPL training.

Impact on Tourism: In written comments to the 2015 SIAS, the MVA argued that proposed military activities are deeply incompatible with tourism for both Tinian and nearby Saipan, as well as the Northern Island of Pagan. For this study, we asked MVA about its current position on military-tourism compatibility. Deputy Director Judy Torres provided a lengthy and nuanced response,[24] which we attempt to summarize here:

- MVA now supports a Tinian divert airfield, consistent with recent U.S. Dept. of Defense (DoD) promises "to improve port and airport facilities for civilian and tourism uses" along with military uses. However, MVA still anticipates negative Tinian tourism impacts due to military jet aircraft noise and "intermittent unscheduled loss of primary tourism sites in the DoD leased northern two thirds of the island."

- "While tourism has a chance of co-existing with a divert airfield on Tinian, it has no chance of survival with a full-on live fire training in regime in place" due to the above factors. Current uncertainty about military activities is discouraging casino-hotel development, Ms. Torres wrote. (MVA further maintains its previous position that any military live-fire training use of Pagan would be incompatible with eco-tourism envisioned for that island.)

- Tourism in Saipan and the CNMI generally would also be negatively affected due to (a) interference with tourist-bearing commercial flights encountering sometimes unscheduled conflicts, as normal flight approaches to the Saipan airport go over Tinian; (b) tour agents becoming "reticent" to book CNMI tours if there is indeed a history of flight delays, departing tourists stranded on Saipan, or visitors prevented from reaching the islands; and (c) the possibility that CNMI's Brand image would be associated with negative environmental impacts and "on-going armed military presence and our skies viewed as subject to periodic closure and even the threat of attack …"

Such prospective conflict between two primary economic sectors is a serious consideration, subject to debate and counter-arguments[25] likely to play out as final studies are prepared and decisions made about Tinian military activities. JMK Associates does not feel qualified to determine whether and to what extent these concerns about military impacts on tourism are justified. We decided not to attempt any scenarios in which military activities had various shadings of impact on tourism on Tinian or Saipan. Rather, subsequent specifications for Scenarios A and B implicitly assume high or moderate tourism military co-existence. Scenario C – while more contingent on presumed loss of CW-1 visa workers – is also consistent with a future in

[24] Personal e-mail communication, Dec. 7, 2017.
[25] For example, Hawai'i has maintained a successful visitor industry – and has attracted increased numbers of Asian visitors in recent years – despite a heavy military presence and a history of attack (Pearl Harbor).

which live-fire training on Tinian is at least correlated with virtually no tourism development on that island and steep downturns on Saipan.

General Model Approach to Construction

Major construction projects can add significantly – although temporarily – to total island populations, especially on a small island such as Tinian. However, construction workers and dependents rarely remain long enough to add to the population through births, and the timing of their presence is particularly uncertain. Therefore:

- Scenarios somewhat arbitrarily specify estimated construction-related labor demand and associated population with dependents that might reasonably occur in the final year of a projection period preceding the time period in which a major project is assumed to open. (See shortly following Section 1.8 for specification of the time periods used in the Model.) For example, if a scenario assumes a new casino-hotel opening on Tinian in the 2026-28 time period, point-in-time construction jobcounts might be assigned to 2025, the final year of the preceding 2021-25 time period covered by the Model. (The Model does not attempt to account for any and all construction activity, just major "spikes" above normal due to such large projects.)

- Construction-related population is omitted from the principal population estimates, which are assumed to flow from "permanent" or operational jobs. (For this reason, construction-related population is also not added to the population that is "aged" to estimate natural increase in the Model.) However, the results in Chapter 3 do show the additional total population from presumed construction as a sort of footnote to the principal population figures.

1.7.2 Final Scenario Choices

Chapter 2 begins with more specific details for each scenario, but the key parameters decided upon were as follows:

A. Scenario A ("High Growth") –

- ***Saipan:*** Visitor arrivals unconstrained by either labor or infrastructure capacity; based on averaged projections from Horwath report, they grow to 1.04 million by 2028; new casino opens in 2026-28 period.

- ***Tinian:*** Two casino-hotels open or re-open, one by 2020 and other by 2028; all planned military activities (joint military training and divert airfield) constructed by 2028. (Implicit: Military and tourism can co-exist.)

- ***Rota:*** Three small but very upscale 75-unit hotels are developed – one by 2020, another by 2025, third by 2028.

B. Scenario B ("Medium Growth/Status Quo") –

- ***Saipan:*** Infrastructure or other constraints result in visitor arrivals leveling off at Horwath's "sustainable" level of 750,000; no second casino.

- ***Tinian:*** Just one casino-hotel, and not till 2028; all planned military activities proceed.

- ***Rota:*** One small luxury hotel by 2025.

C. Scenario C ("Poor/Negative Growth" and general economic contraction due to phasing out of all CW-1 workers by 2021) –

- ***Saipan:*** Decimation of visitor industry labor supply causes visitor arrivals to plummet by nearly 300,000 by 2020; then gradual partial recovery but no second casino.

- ***Tinian:*** Military training developed but no divert airfield; no large casino-hotels but perhaps one small budget hotel by 2028 as part of "adaptive response" to new economic conditions.

- ***Rota:*** Similarly, no luxury hotels but one small budget hotel by 2028.

1.8 Final Model Design

The Model created for this study merged the two elements discussed in the immediately preceding sections – (1) age-sex population forecasts for three population components; and (2) economic scenarios. This section describes the final Model design and logic, as well as noting strengths and weaknesses.

The ***general framework*** of the Model involves population groups, island, and time periods:

A. While some CNMI-wide information is used, each Model is at the island level and attempts to separately track population and labor supply levels for three components of each island's population: NMD, Non-NMD Residents (U.S. Citizens and green-card holders), and Foreign Non-Residents (roughly equivalent to CW-1 or other temporary work visa holders and dependents).

B. Five time periods are utilized, extending beyond the 2028 target date to provide additional perspective:

- "Present" (2016) to 2020;
- 2021-2025

- 2026-**2028** (DPL Target Year for Planning)
- 2029-2030
- 2031-2035

The ***fundamental conceptual logic of the Model process*** is as follows. Each step is described in terms of the first time period – and, implicitly, for a particular island and population group – but the steps are identical for other time periods, for other islands, and (mostly) for other population groups.

1. Beginning with the known age-sex population distribution for 2016, fertility and mortality assumptions are used to "age" the existing population one year at a time to the end of the period. This is population "natural increase."

2. Historical data and other assumptions about labor force participation rates and unemployment rates are used to estimate available on-island **labor supply** from natural increase (assuming no net in-migration).

3. The **labor demand** analysis begins with a short chain of assumptions and calculations about "Direct" jobs and ultimately estimates "Total" jobs in the ***Tourism*** sector. ("Direct" jobs are those created by direct visitor expenditures – not only at hotels or other lodging, but also at retail and restaurant establishments, activities and attractions, transportation, etc. "Indirect" jobs are those created by tourism businesses buying from other businesses, and "Induced" jobs are those created by employees spending money or paying taxes in the economy. "Total" Tourism jobs are the sum of Direct, Indirect, and Induced jobs.)

    - On Saipan, presumed new Visitor Arrivals by the end of the time period – along with assumptions about party size, average nights on island, and occupancy levels – generate assumptions about change in the number of lodging units actually demanded. (On Saipan, the Model thus avoids consideration of possible over-building.) Further assumptions are made about the average number of workers per unit, and the ratio of all Direct jobs to lodging jobs alone.

    - On Tinian and Rota, we necessarily begin with assumptions about new units. Visitor Arrivals are estimated from a backward application of assumptions noted above for Saipan, but this is purely for informational value, to generate comparable information for all three islands. The real analysis follows a logic similar to that for Saipan from this point on – i.e., workers per unit and ratio of all Direct jobs to lodging jobs alone, leading to total new Direct jobs.

    - On all three islands, assumptions mentioned above are adjusted to reflect the existence of non-traditional visitor units distributed throughout each island (i.e., vacation rentals, B&Bs, etc.)

    - On Saipan, a single "Type 2" job-to-job multiplier is applied to calculate Total Tourism jobs. It is assumed that all Indirect and Induced jobs created from

money rippling through the economy are captured by Saipan itself, as this island has by far the CNMI's largest economy.

- On Tinian and Rota, the Indirect and Induced jobs are separately calculated – for Indirect, by applying "Type 1" job-to-job multipliers; and for Induced by use of a multiplier equivalent to subtracting the Type 1 from the Type 2 values. It must be assumed that some of the Induced and even more of the Indirect jobs will flow off-island to Saipan. (Thus, though only to a small extent, Saipan jobcounts reflect assumed economic scenarios on Tinian and Rota as well.)

4. The second component of labor demand is assumed to come from change in ***Casino*** jobs. Casinos are an aspect of tourism, but most of the economic effects come from the small specialized group of "high rollers" whose net losses are now helping to subsidize the government but whose economic behavior is likely very different from the average tourist.

   Therefore, we treat Casinos as a separate sector, and begin that part of the analysis with estimates of Direct Casino jobs for a limited number of possible new operations (depending on the economic scenario).

   - As with Tourism, on Saipan we apply a Type 2 multiplier to estimate Total jobs, all assumed captured on Saipan itself.

   - And again as with Tourism, on Tinian and Rota we separately estimate Indirect and Induced jobs, with differing proportions of each of the latter flowing to Saipan.

5. The third component of labor demand is presumed to flow from new Direct ***Military*** jobs (though only on Tinian). Estimates from available military studies are used for these purposes for each time period. The Indirect and Induced jobs are separately estimated, with differing proportions of each assumed to add to Saipan labor demand.

6. The final component of new labor demand would come from ***Construction***. These jobs are very hard to estimate with even remote accuracy due to the differences in labor demand from different types of projects, but they are temporary and generally have only tangential effect on DPL functions and purposes. Therefore we include very, very rough and judgmental estimates in order to acknowledge that island populations can be temporarily expanded at certain times, but these "illustrative" Direct job numbers are separately reported with caveats about their transience.

   Furthermore, the numbers are *only for the final year in the period* – they are "point-in-time" rather than the cumulative addition of new permanent jobs as with Tourism, Casino, and Military. So a new hotel presumed to open in, say, 2020 will no longer need construction workers that year; if construction workers are assumed in 2020, it would be for some project that actually comes on-line a year or two later. This Model

does not concern itself with attempting a full accounting of Construction labor demand, because of the lack of connection with permanent population.

However, for any year in which significant Construction workers are assumed, these are Direct jobs, and again the Indirect and Induced jobs are calculated from multipliers. Again, on Saipan this is from a single Type 2 multiplier (as all Indirect and Induced jobs are presumed captured on Saipan), but on Tinian and Rota there would be separate calculations of Indirect and Induced jobs, with differing proportions of each assumed to flow to Saipan.

7. On each island, total new labor demand by the final year of the time period is calculated as the sum of Direct, Indirect, and Induced jobs from the four sectors of Tourism, Casino, Military, and Construction.

8. If total labor demand meets or exceeds total effective labor supply from natural increase, there is a need for net in-migration of workers.

   - Although it may not be sufficient to meet all the labor needs, historical evidence (see preceding Section 1.6.1) indicates there *will* be some net in-migration of additional NMD and Non-NMD Residents in good economic times such as the 1990s were. Depending on the economic scenario, different periods of history provide different statistical perspectives on the ratio of in-migration to natural increase under different overall economic conditions.

     In-migrating NMD and Non-NMD Residents are presumed to meet new labor demands before additional CW-1 or other (Foreign) Non-Residents are required to in-migrate.

   - However, if there is still unmet labor demand after considering both natural increase and expected intra-U.S. in-migration residents, then Non-Resident workers are assumed to be needed in all but the “Poor/Negative” Scenario C (which assumes an end to the CW-1 visa program and unlikely issuance of many H-1 or H-2 visas).

9. If total labor demand falls below effective labor supply from natural increase, then net NMD and Non-NMD Resident out-migration is assumed to occur by the end of the time period.

10. Net migration of workers (whether positive in-migration or negative out-migration) is accompanied by dependents. The most recent CNMI data about the ratio of each population group’s total numbers (with dependents and all non-workers) to worker numbers alone then yields an estimate about how many people in total will in-migrate or out-migrate. And similar recent historical data shows the age-sex distribution of these net in-migrants or out-migrants, as described in Section **Error! Reference source not found.**.

11. For each population group on each island (e.g., NMDs on Saipan), the age-sex matrix for net migrants is added to (or subtracted from) the age-sex matrix for natural increase. The resulting merged age-sex distribution is considered to represent that group's combined new population at the end of the period. It becomes the starting age-sex distribution (refer to Step 1 in this series) for the next time period.

12. For the NMD population only, the population 18 and above is estimated, and then reduced by application of recent estimates on eligibility criteria (elimination of household heads married to NMD spouses, household income, home ownership).

Minus this last step, Figure 9 provides an overview of Model logic.

The logic in Figure 9 is particularly applicable to Scenario A and Scenario B. Scenario C follows the same basic approach but subtracts CW-1 workers and dependents from the total available labor supply, as per current federal law to a zero level in 2021. Also for Scenario C, there is very little new labor demand that cannot be met by natural increase, but when that does occur the small numbers are assumed to be met by one-third NMD and two-thirds Non-NMD Resident in-migrants.

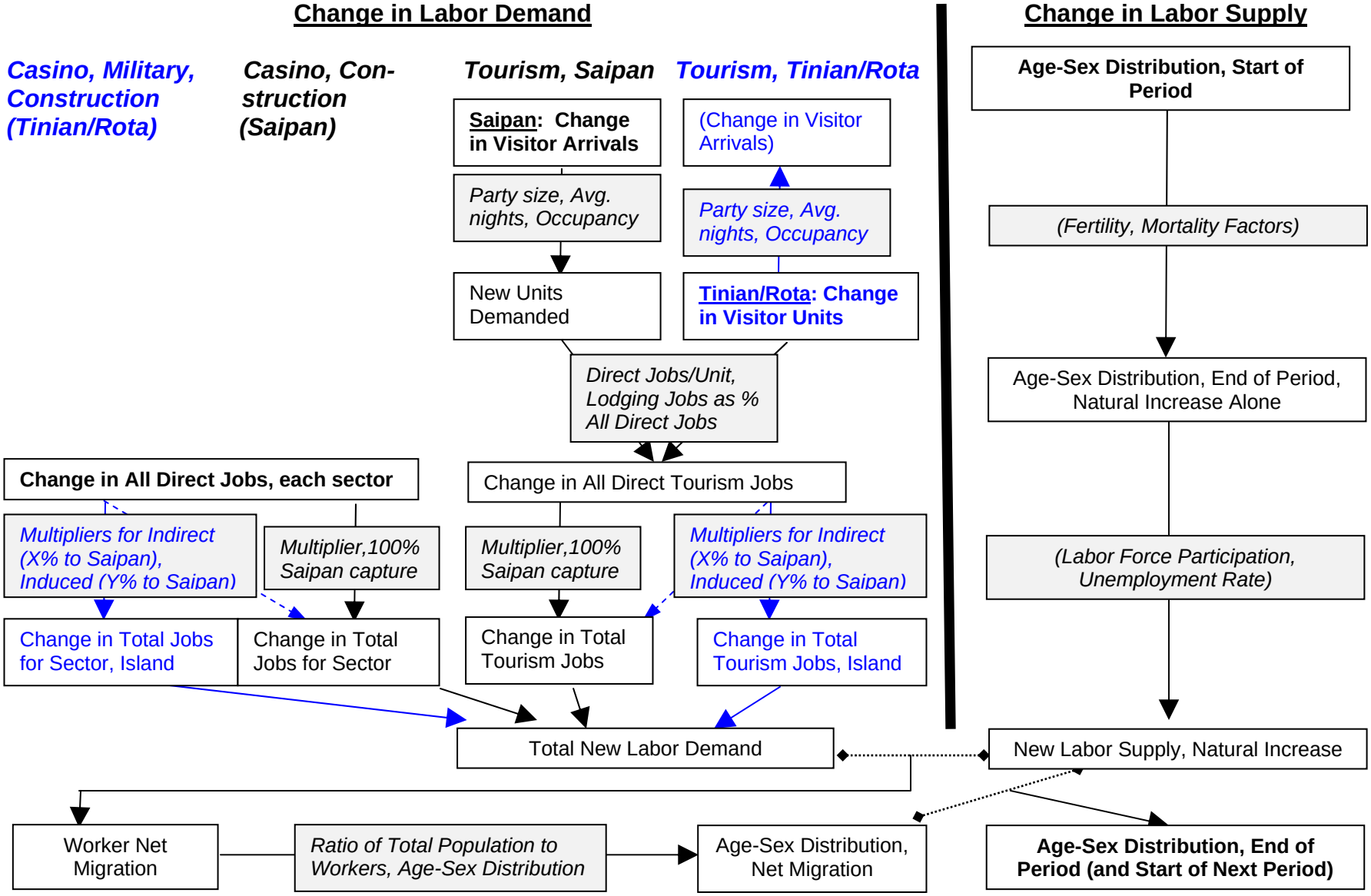
Figure 9 includes some specific assumptions – e.g., multiplier effects, labor force participation rates, etc. – for which detailed values and sources will be provided in Chapter 2.

1.9 Additional Key Model Characteristics

- In order to estimate how much "natural in-migration" of NMD or Non-NMD residents will occur in cases of strong labor demand, we relied on historical data from the preliminary research described in Section **Error! Reference source not found.**. However, this produced negative ratios for some groups under less positive economic scenarios – i.e., it assumed people will out-migrate a little *more* when the poor times are alleviated by small numbers of new jobs coming on-line. Such negative ratios are an artifact of the analytic method that is sometimes at odds with the logic summarized in Figure 9. Therefore, the Model adjusts negative ratios to become zeroes, resulting in slightly higher NMD and non-NMD population estimates in less positive scenarios than if the negative ratios were kept. This is an appropriately conservative step for this analysis, as it would avoid under-estimating NMD numbers and potential homestead applicants to DPL.

- The Model makes similar adjustments to zero values to adjust for situation when it would otherwise be dividing by zero or when there is any potential for negative new labor demand in some years, etc. This means the Model is able to address the possibility of visitor arrivals or visitor units *decreasing*, as could be the case in "Economic Contraction" scenarios.

Figure 9: Model Logic (for Particular Time Period, Island, and Population Group)



1.10 Assessment of Model Strengths and Weaknesses

Key Weaknesses:

- Most models are a patchwork of assumptions, some of them more valid than others. Due to CNMI data limitations, this Model may have more than the usual share of "heroic assumptions."

- Inputs particularly open to question include assumed 2016 island baseline populations, the "Non-NMD Resident" ratios of migration to natural increase (because they are based on Combined Non-NMD and Foreign), and some labor force characteristics from the 2016 HIES (the not-yet-available 2017 Labor Force Survey was actually designed to measure these things, as well as ethnicity, more precisely than the HIES). Also, the Model fundamentally assumes that population levels are a sole function of labor supply/demand, when in reality that is just one of many (but not all "model-able") factors affecting in- and out-migration.

- Given current economic and political uncertainties, particularly about CW-1 visas, there is a possibility that decisions may be made subsequent to Model finalization and analysis in very early 2018 that lead to conditions not envisioned in any of the scenarios used here.

Key Strengths

- This Model includes a fairly complete range of population and labor dynamics. It includes factors that to our knowledge were not previously considered – e.g., natural increase of labor supply, the role of unemployment and labor force participation rates in estimating total labor demand, the need to include multiplier ("ripple") effects in estimating overall demand, and the likelihood of some "natural in-migration" (mostly by Non-NMD in-migrants) in response to economic opportunity.

- It has been created in such a way as to allow DPL or other designated CNMI statisticians to update it if and as better input assumptions become available for many of the factors. This is true both for scenario inputs (casino jobs/timing, visitor arrival levels, etc.) and for other parameters (e.g., possible subsequent use of 2017 Labor Force Survey inputs for population or labor force characteristics).

- Although some restructuring may be needed, basic Model design could allow adaptation for re-use in the early 2020s if DPL does another plan in five years. (That is why the Model includes time projection periods going past 2028.) There are currently some uncertainties about how the 2020 Census will be designed and what data will be available for the CNMI, but hopefully there will be good 2020 age-sex numbers by island for the three population components of NMD, Non-NMD Residents, Foreign Non-Residents.

2. MODEL SPECIFICATIONS AND NEW LABOR DEMAND RESULTS

The previous chapter described the history and logic of Model development, culminating in a general description of its structure. This chapter begins with a description of specific quantitative inputs and then presents major results – with a focus on labor demand – for each island and each scenario. The following Chapter 3 presents and discusses more fully elaborated population results.

2.1 Specific Assumptions for Analysis

A critical initial assumption involves actual "present" (2016) population levels for each island, as these are the baseline numbers for future projections. We relied upon (a) the Pacific Community's estimate of 55,700 for the total CNMI population, as this suggests at least some growth over the 2010 Census population in light of recent increased economic activity; and (b) the CNMI's 2016 Household Income and Expenditure Survey (HIES) for *proportions* of the total population allocated by island and/or population component (NMD, Non-NMD, Non-Resident). In essence, we used the "2016B" numbers from Table 2 in Chapter 1.[26]

2.1.1 Economic Scenarios (Inputs and Overall Economic Conditions)

The Model necessarily requires many assumptions. This section presents assumptions that can vary by time period in the Model's calculations, while the following Section 2.1.2 presents the assumptions that are fixed across time periods. Additionally, Section 2.1.3 discusses assumptions pertaining to fertility, mortality, and NMD eligibility.

- The following Table 4 shows most of the major assumptions related to labor demand for Scenario A. Table 5 and Table 6 provide the same information for Scenarios B and C, respectively. Footnotes to these tables include important context and qualifications.

- While each scenario is generally dominated by the conditions implied by its overall name (e.g., "High-Growth"), particular time periods may have slightly different "economic conditions" – for Tinian and Rota in "High-Growth" Scenario A, nothing currently indicates continued growth after 2028 even for this scenario, and so "poor-negative" economic conditions may again prevail for these particular times. In effect, there's a little bit of Scenario C at the tail end of the overall Scenario A for these two islands.

  Table 7 specifies presumed labor force characteristics and other parameters for each "economic condition," each time-limited mini-scenario.

[26] Results in following tables (both Chapters 2 and 3) may not add up to the exact totals shown in the "2016B" column of Table 2 due to rounding at various different stages of the calculation process.

Table 4: Scenario A (High-Growth) Specific Assumptions and Matching "Overall Economic Conditions" by Time Period

	Period 1 (2016-2020)	Period 2 (2021-2025)	Period 3 (2026-2028)	Period 4 (2029-2030)	Period 5 (2031-2035)
Specific to Saipan					
Conceptual Description (Summary)	*Tourism growth unconstrained -- Horwath "averaged" projections*				
Visitor Arrivals, Base Year for Period	653,150	858,631	1,036,620	1,134,269	1,199,698
Change in Visitor Arrivals End Minus Beginning of Period	205,481	177,989	97,649	65,429	165,944
Change in Direct Casino Jobs Since Beginning of Period	0	0	1,500	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	1,000	800	700	500	355
Assumed "Overall Economic Conditions" for Each Period[a]	HiGrow	HiGrow	HiGrow	HiGrow	HiGrow
Specific to Tinian					
Conceptual Description (Summary)	*Two casino hotels, joint military training and divert airfield construction*				
Change in Standard Visitor Units Since Beginning of Period	400	0	300	0	0
Change in Budget/Automated Units Since Beginning of Period	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period[b]	1,020	0	640	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	95	0	0
Presumed On-Island Construction Worker Count at End of Period	0	1,096	0	0	0
Assumed "Overall Economic Conditions" for Each Period[a]	HiGrow	HiGrow	HiGrow	Poor-Neg	Poor-Neg
Specific to Rota					
Conceptual Description (Summary)	*Luxury tourism development (three small high-end hotels)*				
Change in Luxury Visitor Units Since Beginning of Period	75	75	75	0	0
Change in Budget/Automated Units Since Beginning of Period	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	95	95	0	0	0
Assumed "Overall Economic Conditions" for Each Period[a]	HiGrow	HiGrow	HiGrow	Poor-Neg	Poor-Neg

[a] The three different "Overall Economic Conditions" are each associated with varying Labor Force Participation Rates, Unemployment Rates, Ratios of Migration to Natural Increase, and Age-Sex Characteristics of In-Migrant Groups (specified in subsequent exhibit). Note that -- especially for Tinian and Rota -- an overall "High Growth" scenario can still have periods with lower growth.

[b] Tinian casino-specific jobs estimated as Total On-Site Jobs for each operation minus the separately-calculated hotel-related jobs.

Table 5: Scenario B (Medium-Growth/Status Quo) Specific Assumptions and Matching "Overall Economic Conditions" by Time Period

	Period 1 (2016-2020)	Period 2 (2021-2025)	Period 3 (2026-2028)	Period 4 (2029-2030)	Period 5 (2031-2035)
Specific to Saipan					
Conceptual Description (Summary)	*Tourism growth constrained by infrastructure: Horwath "sustainable"*				
Visitor Arrivals, Base Year for Period	653,150	750,000	750,000	750,000	750,000
Change in Visitor Arrivals End Minus Beginning of Period	96,850	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	355	0	0	0	0
Assumed "Overall Economic Conditions" for Each Period[a]	HiGrow	Medium	Poor-Neg	Poor-Neg	Poor-Neg
Specific to Tinian					
Conceptual Description (Summary)	*One casino-hotel by 2028; military training and divert airfield*				
Change in Standard Visitor Units Since Beginning of Period	0	0	400	0	0
Change in Budget/Automated Units Since Beginning of Period	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period[b]	0	0	1,020	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	95	0	0
Presumed On-Island Construction Worker Count at End of Period[c]	0	1,221	0	0	0
Assumed "Overall Economic Conditions" for Each Period[a]	Poor-Neg	HiGrow	HiGrow	Poor-Neg	Poor-Neg
Specific to Rota					
Conceptual Description (Summary)	*One small luxury hotel by 2025*				
Change in Luxury Visitor Units Since Beginning of Period	0	75	0	0	0
Change in Budget/Automated Units Since Beginning of Period	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	95	0	0	0	0
Assumed "Overall Economic Conditions" for Each Period[a]	Medium	HiGrow	Poor-Neg	Poor-Neg	Poor-Neg

[a] The three different "Overall Economic Conditions" are each associated with varying Labor Force Participation Rates, Unemployment Rates, Ratios of Migration to Natural Increase, and Age-Sex Characteristics of In-Migrant Groups (specified in subsequent exhibit). Note that -- especially for Tinian and Rota -- an overall "High Growth" scenario can still have periods with lower growth.

[b] Tinian casino-specific jobs estimated as Total On-Site Jobs for each operation minus the separately-calculated hotel-related jobs.

[c] Construction worker estimate for 2025 on Tinian higher than for Scenario B because a somewhat larger hotel (in addition to military activities) is assumed for this scenario.

Table 6: Scenario C (Poor-Negative Growth) Specific Assumptions and Matching "Overall Economic Conditions" by Time Period

	Period 1 (2016-2020)	Period 2 (2021-2025)	Period 3 (2026-2028)	Period 4 (2029-2030)	Period 5 (2031-2035)
Specific to Saipan					
Conceptual Description (Summary)	*Reduction in visitor arrivals (equivalent to revocation China parole)*				
Visitor Arrivals, Base Year for Period	653,150	354,153	394,153	418,153	434,153
Change in Visitor Arrivals End Minus Beginning of Period[a]	-298,997	40,000	24,000	16,000	40,000
Change in Direct Casino Jobs Since Beginning of Period	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	0	0	0
Change in Standard Visitor Units Since Beginning of Period	0	0	0	0	0
Change in Budget/Automated Units Since Beginning of Period	0	0	0	0	0
Assumed "Overall Economic Conditions" for Each Period[b]	Poor-Neg	Poor-Neg	Poor-Neg	Poor-Neg	Poor-Neg
Specific to Tinian					
Conceptual Description (Summary)	*Military training development only, no divert airfield, one budget hotel*				
Change in StandardVisitor Units Since Beginning of Period	0	0	0	0	0
Change in Budget/Automated Units Since Beginning of Period[a]	0	0	20	0	0
Change in Direct Casino Jobs Since Beginning of Period	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	95	0	0
Change in Luxury Visitor Units Since Beginning of Period	0	571	0	0	0
Change in Budget/Automated Units Since Beginning of Period	0	0	0	0	0
Assumed "Overall Economic Conditions" for Each Period[b]	Poor-Neg	HiGrow	Medium	Poor-Neg	Poor-Neg
Specific to Rota					
Conceptual Description (Summary)	*No growth other than one budget hotel*				
Change in Luxury Visitor Units Since Beginning of Period	0	0	0	0	0
Change in Budget/Automated Units Since Beginning of Period[a]	0	0	20	0	0
Change in Direct Casino Jobs Since Beginning of Period	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	0	0	0	0	0
Assumed "Overall Economic Conditions" for Each Period[b]	Poor-Neg	Poor-Neg	Medium	Poor-Neg	Poor-Neg

Assumptions About CW-1 Worker Caps Applied to All Three Islands

Each island assumed to bear proportionate burden (based on 2016 HIES data for Foreign Residents/Workers) of declining caps:

	2016	2017[c]	2018	2019	2020	2021
Construction	3,443	3,456	0	0	0	0
Non-Construction	9,856	9,892	9,998	4,999	2,499	0
Total (CNMI-Wide)	**13,299**	**13,348**	**9,998**	**4,999**	**2,499**	**0**

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[a] The exact impact of CW-1 workers loss on visitor arrivals has not been established, though the U.S. General Accounting Office has estimated a 26% to 62% drop from the CNMI's 2015 GDP. We applied the 26% figure to the 2015 visitor arrival number to estimate the 2020 visitor arrival figure, with the implicit assumption that other parts of the economy could suffer as well. Then, following presumed CW-1 worker loss, we assume some partial recovery from "adaptive response." On Tinian and Rota, this is explicitly assumed to be one small budget hotel each to meet remaining demand; on Saipan, implicitly assumed to be something like conversion of many standard hotels to be more automated, low-employee operations.

[b] The three different "Overall Economic Conditions" are each associated with varying Labor Force Participation Rates, Unemployment Rates, Ratios of Migration to Natural Increase, and Age-Sex Characteristics of In-Migrant Groups (specified in subsequent exhibit).

[c] U.S. H.R. 339 increased original 12,998 cap slightly but took Construction to zero for future years. The 2017 construction worker figure varied through the year and included illegal non-CW1 visas. This is a mid-year estimate based on proportions of Construction/Non-Construction from 2016.

Table 7: Labor Force and Net Migrant Characteristics Associated with Each "Overall Economic Condition"

All of these are derived from study of CNMI-wide change (island-specific data were unavailable from past Censuses) from three time periods in which actual general economic conditions roughly matched the three categories previously set forth, as follows:

	"Hi Growth"	*1990-2000*			*"Medium"*	*2010-16*			*"Poor-Neg"*	*2000-2010*		
	High Growth Scenario A				**Medium Growth Scenario B**				**Poor-Negative Scenario C**			
	Total	**NMD**	**Non-NMD**	**Foreign**	**Total**	**NMD**	**Non-NMD**	**Foreign**	**Total**	**NMD**	**Non-NMD**	**Foreign**
Ratio, In-Migration to Natural Increase for Pop. Groups[a]		0.05	0.51			0.05	0.51			-0.15	-0.44	
Labor Force Participation Rates[b]	77%	64%	71%	90%	77%	64%	71%	90%	70%	58%	65%	82%
Unemployment Rates[c]	3.5%	5.1%	3.3%	2.8%	3.5%	5.1%	3.3%	2.8%	20.0%	29.3%	18.8%	15.7%

Age-Sex Distribution of Any Resident In-Migrants[d]	**NMD Male**	**NMD Female**	**Non-NMD Male**	**Non-NMD Female**	**NMD Male**	**NMD Female**	**Non-NMD Male**	**Non-NMD Female**	**NMD Male**	**NMD Female**	**Non-NMD Male**	**Non-NMD Female**
0-4	22.8%	18.0%	0.3%	0.3%	1.9%	5.7%	6.7%	6.7%	1.3%	1.3%	5.2%	4.7%
5-9	17.3%	17.8%	0.3%	0.3%	4.2%	2.7%	16.4%	9.7%	1.8%	1.3%	4.6%	4.1%
10-14	15.5%	16.9%	0.3%	0.3%	10.3%	10.1%	17.9%	17.9%	0.7%	1.0%	1.9%	2.5%
15-19	0.0%	0.0%	0.2%	3.7%	12.4%	5.5%	13.1%	12.4%	4.2%	2.7%	1.1%	1.8%
20-24	-12.4%	-15.1%	4.6%	25.8%	8.0%	7.0%	2.0%	2.0%	13.9%	14.4%	1.3%	3.3%
25-29	-9.4%	-5.1%	13.2%	30.0%	5.1%	3.2%	1.7%	1.7%	11.9%	10.4%	0.9%	6.2%
30-34	10.4%	4.4%	12.6%	15.5%	4.6%	3.0%	-0.8%	-0.8%	5.0%	6.1%	1.9%	10.3%
35-39	3.2%	3.2%	5.7%	2.4%	1.3%	3.4%	-0.5%	-0.5%	4.3%	2.6%	2.8%	10.6%
40-44	11.5%	8.7%	1.2%	-0.3%	4.1%	2.4%	-0.5%	-0.5%	0.4%	1.9%	3.1%	7.5%
45-49	5.5%	1.1%	-2.5%	-0.8%	0.8%	3.3%	-1.1%	-1.1%	1.5%	2.5%	3.2%	5.2%
50-54	5.2%	5.3%	-3.2%	-1.2%	0.2%	0.2%	-0.2%	-0.2%	0.1%	0.4%	2.7%	2.8%
55-59	-7.8%	-6.0%	-3.4%	-0.9%	0.2%	0.2%	-0.3%	-0.3%	0.9%	1.0%	2.8%	1.8%
60-64	-1.5%	-1.4%	-2.1%	-0.4%	0.1%	0.2%	-0.3%	-0.3%	0.3%	0.3%	2.0%	1.4%
65-69	-3.8%	0.4%	-1.2%	-0.2%	0.0%	0.0%	-0.1%	-0.1%	2.0%	1.8%	1.3%	0.8%
70-74	-1.2%	-0.8%	-0.1%	-0.1%	0.0%	0.0%	-0.1%	-0.1%	0.8%	0.7%	0.6%	0.5%
75+	-1.7%	-1.1%	-0.1%	-0.1%	0.0%	0.0%	-0.1%	-0.1%	1.6%	1.1%	0.7%	0.3%

Footnotes on next page

[a] Negative values reported here for historical purposes, but actually set to zero by Model for calculation purposes.

[b] Assumes participation rates increase, for first two scenarios. Saipan 2016 LFPR rates were 57.5% for NMD; 64.2% for Non-NMD; and 81.7% for Foreign Non-Residents. Total was 69.7%, brought up by Non-Residents. Tinian 2016 LFPR rates were 65.4% for NMD; 71.9% for Non-NMD; and 71.4% for Foreign. Total was 69.6%, same as for Saipan. Rota 2016 LFPR rates were 69.7% for NMD; 78.5% for Non-NMD; and 88.0% for Foreign. Total was 77.2%, highest in CNMI. The U.S. average peaked at about 67%, though has recently averaged about 63%. Generally, LFPR increases in good economic times and falls back in less good times. The Model's judgmental assumptions reflect each scenario and preserve observed ratios (e.g., lower for NMD). Rates specific to each population group reflect proportions from 2016 HIES.

[c] Assumes unemployment rates decrease, for first two scenarios. Saipan 2016 unemployment rates were 18.9% for NMD; 12.1% for Non-NMD; and 10.2% for Foreign. Total was 17.5%. Tinian 2016 unemployment rates were 21.9% for NMD; 17.4% for Non-NMD; and 24.0% for Non-Residents. Total was 21.6%. Rota 2016 unemployment rates were 0% for NMD; 0% for Non-NMD; and 5.2% for Non-Residents. Total was 2.0%. The very low Rota unemployment rate (perhaps as well as the high labor force participation rate) according to the 2016 HIES is surprising, given the island's lack of economic development. This model assumes future figures more like those for Tinian. Generally,unemployment rates decrease in good economic times and increase in bad times. Economists often consider 4.0% to be "full employment," though Hawai'i dipped to 2.2% in Oct. 2017. The Model's judgmental assumptions reflect each scenario and utilize observed ratios (e.g., higher for NMD). Rates specific to each population group reflect proportions from 2016 HIES.

[d] The original intent was to have island- specific historical information for NMDs here. That did not prove possible with available Census data. The CNMI-wide historical info for NMD's seems like a reasonable proxy, however. It would be particularly valid for Saipan. Tinian and Rota Census or survey data tend to be less certain because of sample size issues at any rate. The percentages used here result from a "smoothed" estimate of NMD (and Non-NMD U.S. Resident) In-Migrant characteristics that preserve the overall distributional shape but eliminate some minor probable errors that tended to make the Model choke.

2.1.2 Fixed-Value Inputs

Table 10 (next page) shows assumptions about quantitative values fixed across time periods for estimating labor demand, while Table 11 shows factors associated with labor supply, particularly multipliers used to estimate total population (with dependents) for each population group. Again, footnotes (especially for Table 10) provide useful context and qualifications. Ways that each of these variables is used in the Model are set forth in Figure 9 (showing Model logic and structure) at the end of Chapter 1.

Additional Assumptions Specific to Scenario C: The foregoing Table 6 showed assumed declining caps of CW-1 workers for CNMI. Additionally –

- 80% of Non-Resident (Foreign) population were assumed to be linked to CW-1 visas.

- In the rare and limited cases within Scenario C that in-migrant labor might be needed in subsequent years (a few time periods for Tinian), this was assumed to be one-third NMD and two-thirds Non-NMD, no foreign.

2.1.3 Assumptions Related to Fertility, Mortality, and NMD Eligibility for Awards

As noted in Chapter 1, we worked with Dr. Michael Levin to develop these assumptions, the first two of which were used to "age" the population to estimate natural increase.[27]

Mortality: Based on a mix of CNMI vital statistics and HIES data, the one-year survival rates shown in
Table 8 (next page) were used across all time periods, islands, and population.

Fertility: This was more complex, because birth rates are known to be falling over the years. We needed annual estimates extending back to 1990 (as these were also used in the initial historical research phase) and extending out 2035. Dr. Levin provided Citizen vs. Non-Citizen age-specific female birth rates at various points in time back to the late 1970s, and JMK Associates used multiple regression analysis to develop year-by-year estimates for NMD and Non-NMD for each adult female age cohort of child-bearing years. We checked implied total population birth rates against several Pacific and national sources, and found results to be consistent and credible. Exact estimates are too complex to be summarized here but are available on request.

NMD Eligibility for DPL Homestead Awards: (1) *Dis*qualification of adults occurs if spouses is also NMD; (2) Remaining households *qualify* if below $70,000 household income and not already homeowners. The figures shown in Table 9 (following page) were based on HIES data analyzed by Dr. Levin and were used across all time periods, islands, and population.

[27] We made some additional calculations based on his inputs and are responsible for final figures.

Table 8: Assumed Annual CNMI Survival Rates by Age-Sex Cohort

	Male	Female
Infant	99.33%	99.33%
1-4	99.95%	99.95%
5-9	99.99%	99.99%
10-14	99.98%	99.98%
15-19	99.97%	99.97%
20-24	99.93%	99.93%
25-29	99.92%	99.92%
30-34	99.90%	99.90%
35-39	99.90%	99.90%
40-44	99.86%	99.86%
45-49	99.75%	99.75%
50-54	99.59%	99.59%
55-59	99.04%	99.04%
60-64	98.40%	98.40%
65-69	96.62%	96.62%
70-74	96.93%	96.93%
75+	90.46%	90.46%

Table 9: NMD Eligibility Criteria (Frequency in CNMI Population)

	% Adult NMD Females w/ NMD Spouses	% NMD HHs Under $70K, Not Homeowners
15-19	0.00%	100.00%
20-24	2.29%	83.44%
25-29	2.47%	65.47%
30-34	7.43%	59.77%
35-39	16.76%	46.49%
40-44	22.51%	24.16%
45-49	39.68%	9.73%
50-54	30.24%	22.04%
55-59	56.27%	18.08%
60-64	34.66%	11.31%
65-69	25.37%	11.31%
70-74	24.75%	11.31%
75+	24.75%	11.31%

Table 10: Labor Demand Assumptions Fixed Across All Time Periods

		Source
Common Across All Three Islands		
On-Site Jobs Per Visitor Unit, Standard Hotels	0.70	HANMI
(Exception: Rota Luxury Units, Scenarios A and B)	1.50	JMK assumption after interviews w/ various private, public figures
Party Size Per Unit, This Island	2.00	Industry Standard Assumption
Avg. Nights on This Island	4.20	JMK assumption based on review of MVA data[a]
Assumed Occupancy Levels	80%	Interviews: General Industry Target
Direct Hotel Construction Jobs Per Unit (avg. annual)[b]		
-- Saipan	1.127	Average of available jobs/hotel as summarized by BECQ
-- Tinian and Rota	1.25	Historical Tinian construction counts in news reports
Specific to Saipan		
On-Site Lodging Jobs as % of All Direct Tourism Jobs	50%	JMK assumption based on review of Hawai'i I-O, Other Data[c]
Type 2 Tourism Job Multiplier	1.45	JMK assumption after review of Hawai'i I-O, CNMI IMPLAN[d]
Type 2 Casino Job Multiplier	1.65	IMPLAN for CNMI (2015 Multipliers)
Type 2 Military Job Multiplier	1.73	IMPLAN for CNMI (2015 Multipliers)
Type 2 Construction Job Multiplier	1.34	IMPLAN for CNMI (2015 Multipliers)
Specific to Tinian and Rota		
On-Site Lodging Jobs as % of All Direct Tourism Jobs	67%	JMK assumption based on review of Hawai'i I-O, Other Data[c]
% All Indirect Jobs Assumed Exported to Saipan	70%	JMK judgmental assumption[e]
% All Induced Jobs Assumed Exported to Saipan	50%	JMK judgmental assumption[e]
Type 1 (Indirect) Tourism Job Multiplier	1.20	JMK assumption after review of Hawai'i I-O, CNMI IMPLAN[d]
Induced (Type 2 - Type 1 + 1) Tourism Job Multiplier	1.25	JMK assumption after review of Hawai'i I-O, CNMI IMPLAN[d]
Type 1 (Indirect) Casino Job Multiplier	1.5091	IMPLAN for CNMI (2015 Multipliers)
Induced (Type 2 - Type 1) Casino Job Multiplier	1.1391	IMPLAN for CNMI (2015 Multipliers)
Type 1 (Indirect) Military Job Multiplier	1.0000	IMPLAN for CNMI (2015 Multipliers)
Induced (Type 2 - Type 1) Military Job Multiplier	1.7282	IMPLAN for CNMI (2015 Multipliers)
Type 1 (Indirect) Construction Job Multiplier	1.2455	IMPLAN for CNMI (2015 Multipliers)
Induced (Type 2 - Type 1) Construction Job Multiplier	1.0959	IMPLAN for CNMI (2015 Multipliers)

Footnotes on next page

[a] The Marianas Visitors Authority had limited data (FY 2003 to 2012 for selected major markets) on length of stay, but it indicated a trend toward increasing times on island. The 2012 average was about 3.8, so we use 4.2 for updated figure. We use the same figure for all islands, which tends to imply single-island visits. This overlooks current short day trips from Saipan to Tinian and Rota, which do have some (but relatively minimal) economic benefits for the smaller islands.

[b] Construction job estimates for military projects came from respective military EIS studies previously cited.

[c] We also explored the 2012 CNMI Economic Census, the 2003 Labor Force Survey, and the 2000 Census American Community Survey for CNMI. These sources were more suggestive than specific. Data from various Hawai'i Input-Output (I-O) analyses over the years -- 2002, 2007, and 2012 -- indicate a trend toward higher proportions of off-hotel jobs (i.e., lower percentages of lodging jobs as percent of total) as the industry grows. The 2002 figures for Hawai'i's three "Neighbor Island" areas averages were in the 40% to 50% range, so we assume 50% for Saipan but much higher percentages (about 67% each) for the less developed Tinian and Rota.

[d] This is a key but necessarily judgmental assumption. The Hawai'i I-O Model since 2002 has had a form of overall "Tourism Industry" multipliers by counties (mostly equal to islands). Kaua'i and Maui are each larger than Saipan but are the islands closest in size of resident and visitor population to the smaller CNMI. The I-O values from 2002 (closer to CNMI levels now) for both these islands were about 1.35 for Type 1 and 1.77 for Type 2. The IMPLAN I-O for CNMI (2015) lacks an overall Tourism multiplier, but available multipliers for some key sectors such as Accom- modations and Food/Drink are clearly lower than similar sector-specific current numbers for Hawai'i, likely due to the high current proportions of CW1 workers who do not spend as much in the local economy. So we judgmentally assume overall CNMI "Tourism" multipliers somewhat higher than current IMPLAN multipliers for Accommodations for CNMI but lower than Hawai'i's figures for small counties. The selected figures of 1.45 for Type 2 and 1.20 for Type 1 may in future be replaced if better estimates become available.

[e] We did not find a statistical basis to guide this assumption, but islands as small as Tinian/Rota generally require businesses to purchase many of their needs from purveyors on Saipan (generating indirect jobs), though employees spend more of their money on island (generating induced jobs). The assumed 70% and 50% are definitely "guesstimates," which may be updated in the future if more solid evidence becomes available.

Table 11: Labor Supply Assumptions Fixed Across All Time Periods

	NMD	Non-NMD Resident	Foreign Worker	Source
Specific to Saipan				
Ratio of Group Population to Group Workers	2.46	2.98	1.28	Special Analysis of 2016 HIES Data
Specific to Tinian				
Ratio of Group Population to Group Workers	2.56	2.59	1.55	Special Analysis of 2016 HIES Data
Specific to Rota				
Ratio of Group Population to Group Workers	2.17	3.05	1.15	Special Analysis of 2016 HIES Data

Note: Also specific to each island are estimated population increases from natural increase derived from age-sex cohort calculations for each island. That information is difficult to summarize succinctly here.

2.2 Results: Summaries of Labor Demand and Population Estimates by Island

The Model has two different major sets of outputs:

- Summaries of labor demand and population estimates by island for each scenario. These are presented here in the following tables (Table 12 to Table 20) with brief textual discussion for each island. The tables include assumed construction figures but timing for construction is particularly uncertain and so emphasis in this section is more on relatively "permanent" labor demand from operational jobs.

- More detailed analyses of population estimates in particular, the main focus of this study. These are presented and discussed in the following Chapter 3, and so the focus of discussion in this section will be more on labor demand.

2.2.1 Saipan

Table 12 to Table 14 show Saipan results by scenario. The upper part of each table shows incremental results by each time projection period (mostly five-year periods, but with the 2026-2030 period split to allow calculation of 2028 results), with the lower part displaying cumulative effects over time.

The Saipan part of the Model begins first with projected Visitor Arrivals, and then calculates the implied number of new visitor units needed, rather than assuming every proposed new unit will be developed and well occupied. This means that Saipan unit counts may also include non-hotel lodging units (vacation rentals, condo-tels, etc.).

Total new labor demand is a function not only of direct jobs in primary economic sectors (tourism, gaming, military), but also of the multiplier or "ripple" effects from those industries. These have generally not been addressed in recent estimates of CNMI labor demand. Saipan will likely be the site of some "ripple effect" jobs from Tinian/Rota development. Normal unemployment rates also add a small amount to total worker demand absorbing natural increase or generating in-migration in Scenarios A and B.

The different scenarios generate very different estimates of new labor demand by 2028:

Figure 10: Cumulative 2028 New Operational Labor Demand by Scenario, Saipan

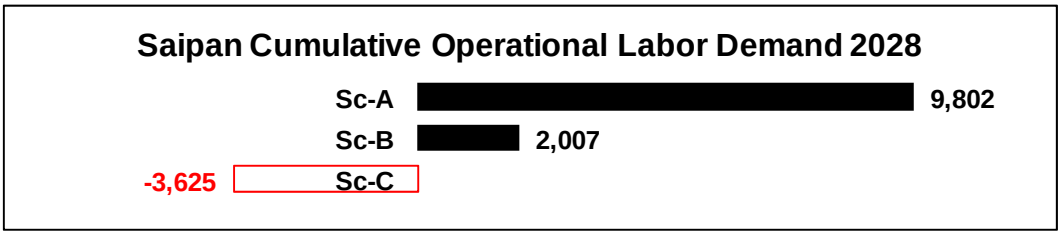


Table 12 for Scenario C suggests elimination of CW-1 visas and consequent impacts on tourism could cost about 4,700 in Saipan labor demand by 2020, but the assumption of some gradual recovery thereafter brings the net loss to 3,625 by 2028.

Table 12: Summary of New Labor Demand and Population for Saipan, Scenario A

SAIPAN

Scenario Name: Saipan Sc-A

Scenario Summary Description: Visitor Arrivals Unconstrained by Infrastructure or Labor; New Casino by 2028

	Period:	1	2	3	4	5
	End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions						
Change in Visitor Arrivals Since Beginning of Period:		205,481	177,989	97,649	65,429	165,944
Est. Change in Visitor Units Since Beginning of Period (80% Occupancy):		1,477	1,279	702	470	1,193
Change in Direct Casino Jobs Since Beginning of Period:		0	0	1500	0	0
Change in Direct Military Jobs Since Beginning of Period:		0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period		1000	800	700	500	355
(Point-in-time assumption linked to major projects presumed to open in next year or two.)						
Total New Workers (Direct and Ripple Effects) Required, This Island						
Assumed Unemployment Rate		*3.50%*	*3.50%*	*3.50%*	*3.50%*	*3.50%*
Effects of Change in Visitor Units		2,570	2,226	1,221	818	2,075
Effecs of Change in Casino Jobs		0	0	2,472	0	0
Effects of Change in Military Jobs		0	0	0	0	0
Ripple Effects from Operational Jobs on Tinian and Rota		566	0	405	0	0
Additions to Unemployment at Rate Assumed This Period		114	81	149	30	75
Sub-Total, Operational Sources		***3,249***	***2,307***	***4,247***	***848***	***2,150***
Effects of Change in Construction Worker Count (point-in-time estimate)		1,341	1,073	939	671	476
Ripple Effects from Construction Jobs on Tinian and Rota		21	262	0	0	0
Additions to Unemployment at Rate Assumed This Period		49	48	34	24	17
Sub-Total, Construction Sources		***1,412***	***1,383***	***973***	***695***	***493***
Cumulative Economic Changes (Operational) Defining Scenario						
Change in Visitor Arrivals Over Baseline		205,481	383,470	481,119	546,548	712,492
Change in Visitor Units Over Baseline		1,477	2,756	3,458	3,928	5,121
Change in Direct Casino Jobs Over Baseline		0	0	1,500	1,500	1,500
Change in Direct Military Jobs Over Baseline		0	0	0	0	0
Cumulative New Worker Demand This Island						
Operations Only		3,249	5,555	9,802	10,650	12,800
(Construction Work Counts by Nature Are Not Cumulative)						
Total Population Level, This Island -- Operations Only		**55,118**	**60,468**	**67,414**	**69,607**	**74,812**
NMD		17,186	18,234	18,798	19,138	19,876
Non-NMD		19,698	23,962	26,986	28,849	33,451
Foreign		18,233	18,271	21,630	21,620	21,486
Total Population Level, This Island -- Including Presumed Construction		**56,922**	**62,236**	**68,658**	**70,495**	**75,443**
NMD		17,186	18,234	18,798	19,138	19,876
Non-NMD		19,698	23,962	26,986	28,849	33,451
Foreign		20,038	20,039	22,874	22,508	22,116

Table 13: Summary of New Labor Demand and Population for Saipan, Scenario B

SAIPAN

Scenario Name: Saipan Sc-B

Scenario Summary Description: Visitor Arrivals Soon Plateau at Horwath's "Sustainable" Level; No 2nd Casino

	Period:	1	2	3	4	5
	End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions						
Change in Visitor Arrivals Since Beginning of Period:		96,850	0	0	0	0
Est. Change in Visitor Units Since Beginning of Period (80% Occupancy):		696	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period:		0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period:		0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period		355	0	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)						
Total New Workers (Direct and Ripple Effects) Required, This Island						
Assumed Unemployment Rate		*3.50%*	*7.00%*	*20.00%*	*20.00%*	*20.00%*
Effects of Change in Visitor Units		1,211	0	0	0	0
Effecs of Change in Casino Jobs		0	0	0	0	0
Effects of Change in Military Jobs		0	0	0	0	0
Ripple Effects from Operational Jobs on Tinian and Rota		0	0	601	0	0
Additions to Unemployment at Rate Assumed This Period		44	0	150	0	0
Sub-Total, Operational Sources		***1,255***	***0***	***752***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)		476	0	0	0	0
Ripple Effects from Construction Jobs on Tinian and Rota		21	268	0	0	0
Additions to Unemployment at Rate Assumed This Period		18	20	0	0	0
Sub-Total, Construction Sources		***515***	***289***	***0***	***0***	***0***
Cumulative Economic Changes (Operational) Defining Scenario						
Change in Visitor Arrivals Over Baseline		96,850	96,850	96,850	96,850	96,850
Change in Visitor Units Over Baseline		696	696	696	696	696
Change in Direct Casino Jobs Over Baseline		0	0	0	0	0
Change in Direct Military Jobs Over Baseline		0	0	0	0	0
Cumulative New Worker Demand This Island						
Operations Only		1,255	1,255	2,007	2,007	2,007
(Construction Work Counts by Nature Are Not Cumulative)						
Total Population Level, This Island -- Operations Only		**51,420**	**49,091**	**50,559**	**50,517**	**49,714**
NMD		17,110	17,462	17,958	18,073	18,164
Non-NMD		17,751	15,443	16,322	16,540	16,879
Foreign		16,560	16,186	16,279	15,904	14,672
Total Population Level, This Island -- Including Presumed Construction		**52,117**	**49,925**	**50,559**	**50,517**	**49,714**
NMD		17,158	17,589	17,958	18,073	18,164
Non-NMD		18,029	16,150	16,322	16,540	16,879
Foreign		16,930	16,186	16,279	15,904	14,672

Table 14: Summary of New Labor Demand and Population for Saipan, Scenario C

SAIPAN

Scenario Name: Saipan Sc-C

Scenario Summary Description: CW-1 Visas End; Labor Supply Issues Decimate Visitor Arrivals; Partial Recovery

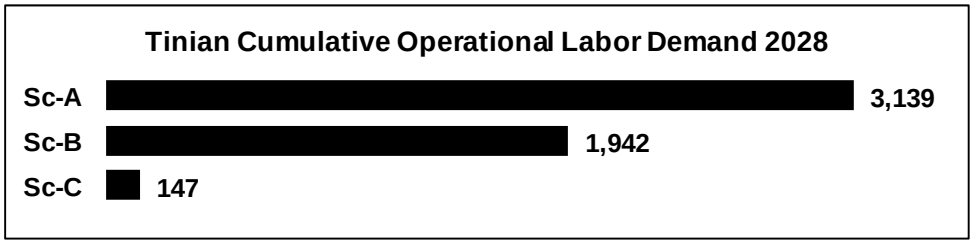
	Period:	1	2	3	4	5
	End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions						
Change in Visitor Arrivals Since Beginning of Period:		-298,997	40,000	24,000	16,000	40,000
Est. Change in Visitor Units Since Beginning of Period (80% Occupancy):		-2,149	287	172	115	287
Change in Direct Casino Jobs Since Beginning of Period:		0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period:		0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period		0	0	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)						
Total New Workers (Direct and Ripple Effects) Required, This Island						
Assumed Unemployment Rate		*20.00%*	*20.00%*	*20.00%*	*20.00%*	*20.00%*
Effects of Change in Visitor Units		-3,739	500	300	200	500
Effecs of Change in Casino Jobs		0	0	0	0	0
Effects of Change in Military Jobs		0	0	0	0	0
Ripple Effects from Operational Jobs on Tinian and Rota		0	0	39	0	0
Additions to Unemployment at Rate Assumed This Period		-935	125	85	50	125
Sub-Total, Operational Sources		***-4,674***	***625***	***424***	***250***	***625***
Effects of Change in Construction Worker Count (point-in-time estimate)		0	0	0	0	0
Ripple Effects from Construction Jobs on Tinian and Rota		0	125	-1	0	0
Additions to Unemployment at Rate Assumed This Period		0	31	0	0	0
Sub-Total, Construction Sources		***0***	***157***	***-2***	***0***	***0***
Cumulative Economic Changes (Operational) Defining Scenario						
Change in Visitor Arrivals Over Baseline		-298,997	-258,997	-234,997	-218,997	-178,997
Change in Visitor Units Over Baseline		-2,149	-1,861	-1,689	-1,574	-1,286
Change in Direct Casino Jobs Over Baseline		0	0	0	0	0
Change in Direct Military Jobs Over Baseline		0	0	0	0	0
Cumulative New Worker Demand This Island						
Operations Only		-4,674	-4,048	-3,625	-3,375	-2,749
(Construction Work Counts by Nature Are Not Cumulative)						
Total Population Level, This Island -- Operations Only		**41,693**	**40,334**	**40,457**	**40,477**	**40,509**
NMD		16,766	17,440	17,794	17,990	18,402
Non-NMD		15,455	15,253	15,469	15,634	16,234
Foreign		9,472	7,641	7,195	6,852	5,874
Total Population Level, This Island -- Including Presumed Construction		**41,693**	**40,763**	**40,457**	**40,477**	**40,509**
NMD		16,766	17,502	17,794	17,990	18,402
Non-NMD		15,455	15,620	15,469	15,634	16,234
Foreign		9,472	7,641	7,195	6,852	5,874

2.2.2 Tinian

Because the MVA's Horwath report did not include Visitor Arrival projections specific to Tinian and Rota, the Tinian and Rota (following Section 2.2.3) portions of the Model necessarily use possible new visitor-oriented developments – casino-hotels for Tinian; small luxury resorts for Rota – as the basis for estimating both Visitor Arrivals and related direct and indirect/induced jobs (with some of the latter "ripple effects" flowing to Saipan).

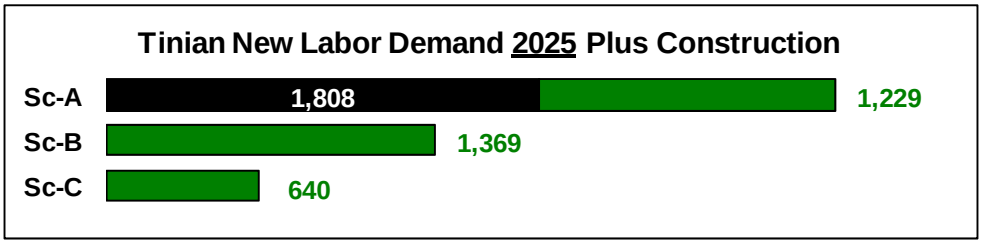
Table 15 to Table 17 show the various detailed economic-change and consequent worker demand assumptions on Tinian for the three scenarios. In reality, Scenario C (loss of CW-1 workers) would likely cost some jobs on Tinian and Rota as well, but given the current negligible on-island tourism sectors there, these effects would be far less pronounced than on Saipan and are therefore set to zero for these two islands.

Figure 11: Cumulative 2028 New Operational Labor Demand by Scenario, Tinian



Construction jobs could have a much greater impact (relative to more permanent operational jobs) on Tinian than other islands during this timeframe. This is illustrated below in Figure 12, which uses 2025 as the illustrative year. (This is because scenario assumptions assumed construction will have finished by 2028 for the various new projects assumed to be under construction in 2025 – variously by scenario including casino-hotel, joint military training facilities, and a divert airfield for the military.)

Figure 12: Estimated New Labor Demand with Construction, 2025, Tinian



In reviewing these estimates for all islands, it is important to recall that these are presumed *new* labor demands, above and beyond what exists at the present time (or in the 2016 baseline estimates derived from the CNMI's Household Income and Expenditure Survey).

Table 15: Summary of New Labor Demand and Population for Tinian, Scenario A

TINIAN

Scenario Name: Tinian Sc-A

Scenario Summary Description: New Hotels/Casinos by 2020 and 2028; Military Training and Divert Airfield

	Period: 1	Period: 2	Period: 3	Period: 4	Period: 5
End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions					
Est. Change in Visitor Arrivals Since Beginning of Period:	55,657	0	41,743	0	0
Change in Standard Hotel Units Since Beginning of Period (Assumed):	400	0	300	0	0
Change in Budget/Automated Units Since Beginning of Period:	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period:	1020	0	640	0	0
Change in Direct Military Jobs Since Beginning of Period:	0	0	95	0	0
Presumed On-Island Construction Worker Count at End of Period	0	1096	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)					
Total New Workers (Direct and Ripple Effects) Required, This Island					
Assumed Unemployment Rate	*3.50%*	*3.50%*	*3.50%*	*20.00%*	*20.00%*
Effects of Change in Visitor Units	498	0	373	0	0
Effecs of Change in Casino Jobs	1,247	0	782	0	0
Effects of Change in Military Jobs	0	0	130	0	0
Additions to Unemployment at Rate Assumed This Period	63	0	47	0	0
Sub-Total, Operational Sources	***1,808***	***0***	***1,332***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)	0	1,229	0	0	0
Additions to Unemployment at Rate Assumed This Period	0	45	0	0	0
Sub-Total, Construction Sources	***0***	***1,274***	***0***	***0***	***0***
Total Worker Ripple Effect Exported to Saipan *(Tinian and Rota Only)*	*566*	*0*	*405*	*0*	*0*
Cumulative Economic Changes (Operational) Defining Scenario					
Change in Visitor Arrivals Over Baseline	55,657	55,657	97,400	97,400	97,400
Change in Visitor Units Over Baseline	400	400	700	700	700
Change in Direct Casino Jobs Over Baseline	1,020	1,020	1,660	1,660	1,660
Change in Direct Military Jobs Over Baseline	0	0	95	95	95
Cumulative New Worker Demand This Island					
Operations Only	1,808	1,808	3,139	3,139	3,139
(Construction Work Counts by Nature Are Not Cumulative)					
Total Population Level, This Island -- Operations Only	**5,957**	**6,311**	**8,707**	**8,964**	**9,622**
NMD	1,263	1,165	1,229	1,243	1,279
Non-NMD	1,102	1,003	1,032	1,004	954
Foreign	3,592	4,143	6,446	6,717	7,389
Total Population Level, This Island -- Including Presumed Construction	**5,957**	**8,286**	**8,707**	**8,964**	**9,622**
NMD	1,263	1,342	1,229	1,243	1,279
Non-NMD	1,102	1,215	1,032	1,004	954
Foreign	3,592	5,729	6,446	6,717	7,389

Table 16: Summary of New Labor Demand and Population for Tinian, Scenario B

TINIAN

Scenario Name: Tinian Sc-B

Scenario Summary Description: One Casino/Hotel Developed ca. 2025-2028, Military Training and Divert Airfield

	Period: 1	Period: 2	Period: 3	Period: 4	Period: 5
End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions					
Est. Change in Visitor Arrivals Since Beginning of Period:	0	0	55,657	0	0
Change in Standard Hotel Units Since Beginning of Period (Assumed):	0	0	400	0	0
Change in Budget/Automated Units Since Beginning of Period:	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period:	0	0	1020	0	0
Change in Direct Military Jobs Since Beginning of Period:	0	0	95	0	0
Presumed On-Island Construction Worker Count at End of Period	0	1221	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)					
Total New Workers (Direct and Ripple Effects) Required, This Island					
Assumed Unemployment Rate	*7.00%*	*3.50%*	*3.50%*	*7.00%*	*7.00%*
Effects of Change in Visitor Units	0	0	498	0	0
Effecs of Change in Casino Jobs	0	0	1,247	0	0
Effects of Change in Military Jobs	0	0	130	0	0
Additions to Unemployment at Rate Assumed This Period	0	0	68	0	0
Sub-Total, Operational Sources	***0***	***0***	***1,942***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)	0	1,369	0	0	0
Additions to Unemployment at Rate Assumed This Period	0	50	0	0	0
Sub-Total, Construction Sources	***0***	***1,419***	***0***	***0***	***0***
Total Worker Ripple Effect Exported to Saipan *(Tinian and Rota Only)*	*0*	*0*	*601*	*0*	*0*
Cumulative Economic Changes (Operational) Defining Scenario					
Change in Visitor Arrivals Over Baseline	0	0	55,657	55,657	55,657
Change in Visitor Units Over Baseline	0	0	400	400	400
Change in Direct Casino Jobs Over Baseline	0	0	1,020	1,020	1,020
Change in Direct Military Jobs Over Baseline	0	0	95	95	95
Cumulative New Worker Demand This Island					
Operations Only	0	0	1,942	1,942	1,942
(Construction Work Counts by Nature Are Not Cumulative)					
Total Population Level, This Island -- Operations Only	**2,980**	**2,740**	**5,779**	**5,911**	**6,490**
NMD	1,154	1,041	1,097	1,104	1,136
Non-NMD	831	712	736	704	657
Foreign	994	986	3,946	4,103	4,698
Total Population Level, This Island -- Including Presumed Construction	**2,980**	**2,980**	**8,707**	**5,911**	**6,490**
NMD	1,154	1,210	1,097	1,104	1,136
Non-NMD	831	869	736	704	657
Foreign	994	2,732	3,946	4,103	4,698

Table 17: Summary of New Labor Demand and Population for Tinian, Scenario C

TINIAN

Scenario Name: Tinian Sc-C

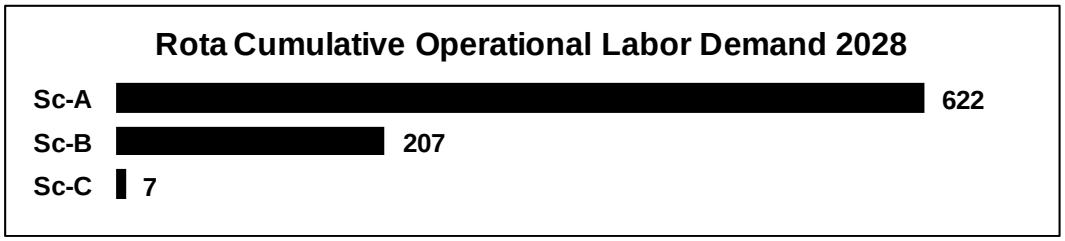
Scenario Summary Description: No Large Hotel/Casinos; Small Budget Hotel; Military Training, No Airfield

	Period: 1	Period: 2	Period: 3	Period: 4	Period: 5
End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions					
Est. Change in Visitor Arrivals Since Beginning of Period:	0	0	2,783	0	0
Change in Standard Hotel Units Since Beginning of Period (Assumed):	0	0	0	0	0
Change in Budget/Automated Units Since Beginning of Period:	0	0	20	0	0
Change in Direct Casino Jobs Since Beginning of Period:	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period:	0	0	95	0	0
Presumed On-Island Construction Worker Count at End of Period	0	571	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)					
Total New Workers (Direct and Ripple Effects) Required, This Island					
Assumed Unemployment Rate	*20.00%*	*3.50%*	*7.00%*	*20.00%*	*20.00%*
Effects of Change in Visitor Units	0	0	7	0	0
Effecs of Change in Casino Jobs	0	0	0	0	0
Effects of Change in Military Jobs	0	0	130	0	0
Additions to Unemployment at Rate Assumed This Period	0	0	10	0	0
Sub-Total, Operational Sources	***0***	***0***	***147***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)	0	640	0	0	0
Additions to Unemployment at Rate Assumed This Period	0	23	0	0	0
Sub-Total, Construction Sources	***0***	***664***	***0***	***0***	***0***
Total Worker Ripple Effect Exported to Saipan *(Tinian and Rota Only)*	*0*	*0*	*39*	*0*	*0*
Cumulative Economic Changes (Operational) Defining Scenario					
Change in Visitor Arrivals Over Baseline	0	0	2,783	2,783	2,783
Change in Visitor Units Over Baseline	0	0	0	0	0
Change in Direct Casino Jobs Over Baseline	0	0	0	0	0
Change in Direct Military Jobs Over Baseline	0	0	95	95	95
Cumulative New Worker Demand This Island					
Operations Only	0	0	147	147	147
(Construction Work Counts by Nature Are Not Cumulative)					
Total Population Level, This Island -- Operations Only	**2,521**	**2,187**	**2,325**	**2,283**	**2,206**
NMD	1,177	1,068	1,141	1,151	1,185
Non-NMD	861	739	822	784	717
Foreign	483	380	362	347	304
Total Population Level, This Island -- Including Presumed Construction	**2,521**	**2,521**	**2,325**	**2,283**	**2,206**
NMD	1,177	1,556	1,141	1,151	1,185
Non-NMD	861	1,544	822	784	717
Foreign	483	380	362	347	304

2.2.3 Rota

Finally, Table 18 to Table 20 show similar Model outputs for the same measures, by scenario, as previously reported for Saipan and Tinian. The Rota and Tinian portions of the Model are parallel – though Rota development is assumed to be less extensive, lacking casino or military components – and each would result in some "ripple effects" of employment to Saipan, at least for Scenarios A and B.

Figure 13: Cumulative 2028 New Operational Labor Demand by Scenario, Rota



The Rota economic development scenarios are the simplest and most straightforward of those for the three different islands. They are limited to small upscale luxury resorts – likely although not necessarily with some sort of eco-tourism base – for Scenarios A and B, or a very small new budget hotel for the economically disastrous Scenario C.

It should be noted that on Rota, as other islands, the Model's estimated worker demand figures are not limited to on-site direct jobs at the resorts. As per assumptions set forth in the first part of this chapter, they also include direct jobs off-site (e.g., possible tour activities or additional business at existing retail/restaurant operations), ripple effects of expenditures through the economy, and an associated small component reflecting the reserve labor pool reflected in unemployment rates.

Table 18: Summary of New Labor Demand and Population for Rota, Scenario A

ROTA

Scenario Name: Rota Sc-A

Scenario Summary Description: Three Small Luxury Hotels by 2028

	Period: 1	Period: 2	Period: 3	Period: 4	Period: 5
End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions					
Est. Change in Visitor Arrivals Since Beginning of Period:	10,436	10,436	10,436	0	0
Change in Standard Hotel Units Since Beginning of Period (Assumed):	75	75	75	0	0
Change in Budget/Automated Units Since Beginning of Period:	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period:	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period:	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	95	95	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)					
Total New Workers (Direct and Ripple Effects) Required, This Island					
Assumed Unemployment Rate	*3.50%*	*3.50%*	*3.50%*	*7.00%*	*7.00%*
Effects of Change in Visitor Units	200	200	200	0	0
Effecs of Change in Casino Jobs	0	0	0	0	0
Effects of Change in Military Jobs	0	0	0	0	0
Additions to Unemployment at Rate Assumed This Period	7	7	7	0	0
Sub-Total, Operational Sources	***207***	***207***	***207***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)	107	107	0	0	0
Additions to Unemployment at Rate Assumed This Period	4	4	0	0	0
Sub-Total, Construction Sources	***110***	***110***	***0***	***0***	***0***
Total Worker Ripple Effect Exported to Saipan (Rota and Rota Only)	*68*	*68*	*46*	*0*	*0*
Cumulative Economic Changes (Operational) Defining Scenario					
Change in Visitor Arrivals Over Baseline	10,436	20,871	31,307	31,307	31,307
Change in Visitor Units Over Baseline	75	150	225	225	225
Change in Direct Casino Jobs Over Baseline	0	0	0	0	0
Change in Direct Military Jobs Over Baseline	0	0	0	0	0
Cumulative New Worker Demand This Island					
Operations Only	207	414	622	622	622
(Constuction Work Counts by Nature Are Not Cumulative)					
Total Population Level, This Island -- Operations Only	**2,888**	**3,230**	**3,577**	**3,589**	**3,625**
NMD	1,464	1,567	1,624	1,641	1,676
Non-NMD	612	745	868	849	824
Foreign	812	918	1,084	1,098	1,126
Total Population Level, This Island -- Including Presumed Construction	**3,016**	**3,358**	**3,577**	**3,589**	**3,625**
NMD	1,464	1,567	1,624	1,641	1,676
Non-NMD	612	745	868	849	824
Foreign	940	1,046	1,084	1,098	1,126

Table 19: Summary of New Labor Demand and Population for Rota, Scenario B

ROTA

Scenario Name: Rota Sc-B

Scenario Summary Description: One Small Luxury Hotel Developed ca. 2025-28, No Other Economic Growth

	Period: 1	Period: 2	Period: 3	Period: 4	Period: 5
End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions					
Est. Change in Visitor Arrivals Since Beginning of Period:	0	10,436	0	0	0
Change in Standard Hotel Units Since Beginning of Period (Assumed):	0	75	0	0	0
Change in Budget/Automated Units Since Beginning of Period:	0	0	0	0	0
Change in Direct Casino Jobs Since Beginning of Period:	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period:	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	95	0	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)					
Total New Workers (Direct and Ripple Effects) Required, This Island					
Assumed Unemployment Rate	*5.00%*	*3.50%*	*7.00%*	*7.00%*	*7.00%*
Effects of Change in Visitor Units	0	200	0	0	0
Effecs of Change in Casino Jobs	0	0	0	0	0
Effects of Change in Military Jobs	0	0	0	0	0
Additions to Unemployment at Rate Assumed This Period	0	7	0	0	0
Sub-Total, Operational Sources	***0***	***207***	***0***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)	107	0	0	0	0
Additions to Unemployment at Rate Assumed This Period	6	0	0	0	0
Sub-Total, Construction Sources	***112***	***0***	***0***	***0***	***0***
Total Worker Ripple Effect Exported to Saipan (Rota and Rota Only)	*22*	*46*	*0*	*0*	*0*
Cumulative Economic Changes (Operational) Defining Scenario					
Change in Visitor Arrivals Over Baseline	0	10,436	10,436	10,436	10,436
Change in Visitor Units Over Baseline	0	75	75	75	75
Change in Direct Casino Jobs Over Baseline	0	0	0	0	0
Change in Direct Military Jobs Over Baseline	0	0	0	0	0
Cumulative New Worker Demand This Island					
Operations Only	0	207	207	207	207
(Construction Work Counts by Nature Are Not Cumulative)					
Total Population Level, This Island -- Operations Only	**2,599**	**2,899**	**2,868**	**2,845**	**2,796**
NMD	1,356	1,446	1,476	1,496	1,533
Non-NMD	612	745	691	658	606
Foreign	631	708	700	691	657
Total Population Level, This Island -- Including Presumed Construction	**2,722**	**2,899**	**2,868**	**2,845**	**2,796**
NMD	1,459	1,446	1,476	1,496	1,533
Non-NMD	612	745	691	658	606
Foreign	651	708	700	691	657

Table 20: Summary of New Labor Demand and Population for Rota, Scenario C

ROTA

Scenario Name: Rota Sc-C

Scenario Summary Description: No Growth Except Small Budget Hotel by 2028

	Period: 1	Period: 2	Period: 3	Period: 4	Period: 5
End Yr:	2020	2025	2028	2030	2035
Scenario Economic Assumptions					
Est. Change in Visitor Arrivals Since Beginning of Period:	0	0	2,783	0	0
Change in Standard Hotel Units Since Beginning of Period (Assumed):	0	0	0	0	0
Change in Budget/Automated Units Since Beginning of Period:	0	0	20	0	0
Change in Direct Casino Jobs Since Beginning of Period:	0	0	0	0	0
Change in Direct Military Jobs Since Beginning of Period:	0	0	0	0	0
Presumed On-Island Construction Worker Count at End of Period	0	0	0	0	0
(Point-in-time assumption linked to major projects presumed to open in next year or two.)					
Total New Workers (Direct and Ripple Effects) Required, This Island					
Assumed Unemployment Rate	*7.00%*	*7.00%*	*5.00%*	*7.00%*	*7.00%*
Effects of Change in Visitor Units	0	0	7	0	0
Effecs of Change in Casino Jobs	0	0	0	0	0
Effects of Change in Military Jobs	0	0	0	0	0
Additions to Unemployment at Rate Assumed This Period	0	0	0	0	0
Sub-Total, Operational Sources	***0***	***0***	***7***	***0***	***0***
Effects of Change in Construction Worker Count (point-in-time estimate)	0	0	1	0	0
Additions to Unemployment at Rate Assumed This Period	0	0	0	0	0
Sub-Total, Construction Sources	***0***	***0***	***1***	***0***	***0***
Total Worker Ripple Effect Exported to Saipan (Rota and Rota Only)	*0*	*0*	*0*	*0*	*0*
Cumulative Economic Changes (Operational) Defining Scenario					
Change in Visitor Arrivals Over Baseline	0	0	2,783	2,783	2,783
Change in Visitor Units Over Baseline	0	0	0	0	0
Change in Direct Casino Jobs Over Baseline	0	0	0	0	0
Change in Direct Military Jobs Over Baseline	0	0	0	0	0
Cumulative New Worker Demand This Island					
Operations Only	0	0	7	7	7
(Construction Work Counts by Nature Are Not Cumulative)					
Total Population Level, This Island -- Operations Only	**2,357**	**2,261**	**2,284**	**2,302**	**2,293**
NMD	1,357	1,474	1,590	1,642	1,676
Non-NMD	612	461	387	368	368
Foreign	388	325	307	292	250
Total Population Level, This Island -- Including Presumed Construction	**2,357**	**2,261**	**2,287**	**2,302**	**2,293**
NMD	1,357	1,474	1,591	1,642	1,676
Non-NMD	612	461	390	368	368
Foreign	388	325	307	292	250

3. DETAILED POPULATION RESULTS

3.1 Introductory Comments

Preceding tables at the end of Chapter 2 included population estimates, but the discussion of focus there was on the labor demand portions of the table because this chapter expands and reports on the population figures, which comprise the primary outcomes from the Model for DPL planning purposes.

In this chapter, the detailed population forecasts are organized first by population component (Total, NMD, Non-NMD, and Foreign/Non-Resident), and each therein by geography (CNMI-wide, Saipan, Tinian, and Rota). Specific figures are in Table 21 through Table 50, each of which specifies results by age.

These age-specific numbers are actually the sum of numbers for both genders for the age-sex matrices that power the Model's estimates of natural increase in labor supply – which in turn indicate how much in- or out-migration is likely to occur given presumed labor demand during each time projection period. (See preceding Figure 9 on Model logic and structure for an appreciation of the importance of the age-sex structure of the population for Model workings.)

Each table also shows total adult (18+) figures and, at bottom, results when hypothetical population related to major construction "spikes" is included. (Again, construction timing is particularly uncertain, and the additional temporary population associated with construction could materialize at somewhat different times than the exact years presumed here, even if new tourism or military activities come online as envisioned for each scenario.)

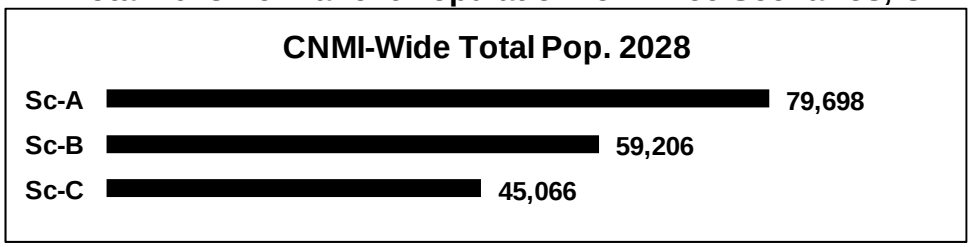
Sections 3.2 through 3.6 provide detailed and summary (2028) figures for Overall Population, NMD, *Eligible* NMD Applicants, Non-NMD, and Non-Resident (Foreign) components respectively. A final Section 3.7 summarizes additional implications found in the tables for construction-related population and for percentage breakdowns of the permanent population by component (NMD, etc.) by geography and economic development scenario.

3.2 Results: Overall Population Estimates

This page summarizes total 2028 estimates by island and CNMI-wide for population associated with change in labor demand for permanent (i.e., operational, not temporary construction) jobs. Thereafter, Table 21 through Table 23 show detailed CNMI-wide and Saipan total population results for each of the three scenarios, while subsequent Table 24 through Table 26 show the same for Tinian and Rota.

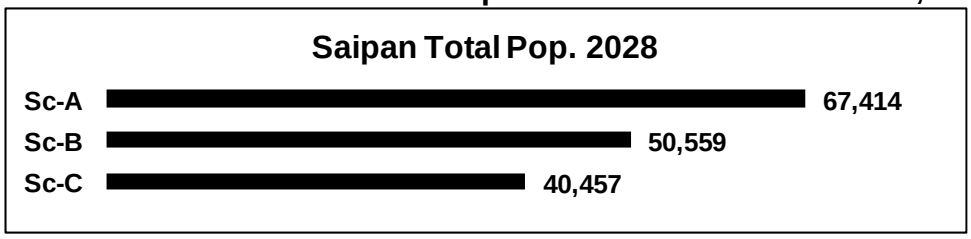
3.2.1 Total CNMI

Figure 14: Total 2028 Permanent Population for Three Scenarios, CNMI-Wide



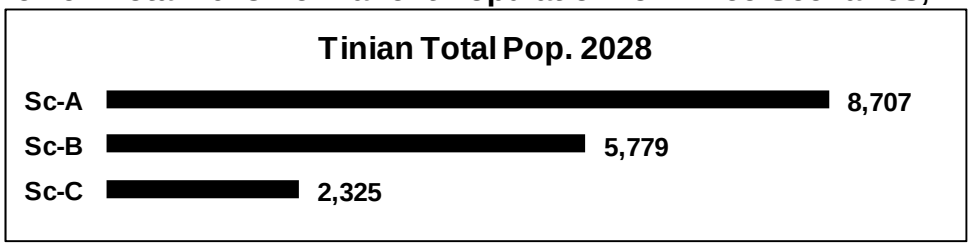
3.2.2 Saipan

Figure 15: Total 2028 Permanent Population for Three Scenarios, Saipan



3.2.3 Tinian

Figure 16: Total 2028 Permanent Population for Three Scenarios, Tinian



3.2.4 Rota

Figure 17: Total 2028 Permanent Population for Three Scenarios, Rota

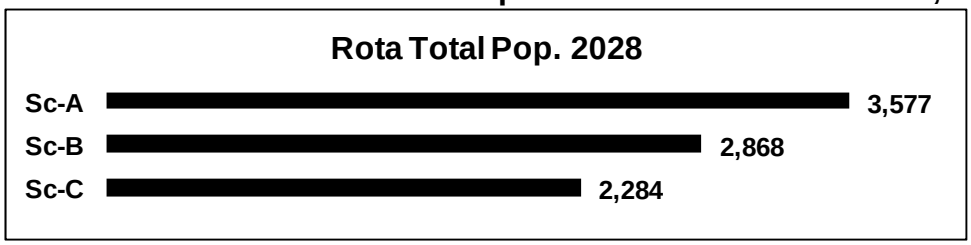


Table 21: Results, Total Population Estimates, Scenario A, CNMI-Wide and Saipan

RESULTS -- TOTAL POPULATION -- CNMI-WIDE

Island Scenarios: **A** **A** **A**

	2016	2020	2025	2028	2030	2035
All ages	55,662	63,964	70,009	**79,698**	82,160	88,059
(18+)	*37,905*	*46,896*	*51,527*	***59,812***	*61,154*	*64,554*
0-4	3,920	4,043	5,902	6,378	6,931	7,497
5-9	5,443	4,589	4,786	5,463	5,843	6,801
10-14	5,337	5,166	4,711	4,915	5,148	5,948
15-19	5,094	5,449	5,139	5,214	5,141	5,433
20-24	3,454	6,322	6,093	7,690	6,926	6,188
25-29	2,883	6,174	6,656	9,281	8,813	7,674
30-34	2,544	4,621	6,014	8,211	8,651	8,510
35-39	3,576	3,537	4,762	5,988	6,842	8,021
40-44	4,577	3,856	3,977	4,550	5,135	6,699
45-49	4,897	4,263	3,882	3,768	4,059	5,213
50-54	5,051	4,544	4,089	3,662	3,674	4,181
55-59	3,568	4,046	4,095	3,707	3,603	3,616
60-64	2,691	3,163	3,611	3,549	3,485	3,349
65-69	1,342	2,049	2,710	2,881	2,944	2,935
70-74	592	1,147	1,815	2,126	2,272	2,467
75+	692	996	1,765	2,314	2,690	3,529

Population Including Any Presumed Intensive Construction Activity

All ages	65,895	73,879	80,941	83,049	88,690
(18+)	*48,752*	*55,063*	*61,007*	*62,007*	*65,160*

RESULTS -- TOTAL POPULATION -- SAIPAN

Saipan Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	49,866	55,118	60,468	**67,414**	69,607	74,812
(18+)	*34,111*	*39,983*	*44,235*	***50,133***	*51,462*	*54,757*
0-4	3,502	3,656	5,042	5,439	5,856	6,271
5-9	4,803	4,077	4,251	4,744	5,043	5,780
10-14	4,676	4,541	4,220	4,355	4,529	5,144
15-19	4,623	4,767	4,533	4,573	4,529	4,768
20-24	3,250	5,071	5,232	6,301	5,826	5,424
25-29	2,635	4,678	5,498	7,349	7,127	6,538
30-34	2,202	3,539	4,811	6,449	6,874	7,025
35-39	3,160	2,954	3,778	4,728	5,418	6,472
40-44	4,008	3,367	3,312	3,688	4,129	5,373
45-49	4,351	3,830	3,369	3,221	3,399	4,227
50-54	4,459	4,109	3,653	3,270	3,225	3,500
55-59	3,323	3,707	3,673	3,342	3,236	3,145
60-64	2,472	2,941	3,296	3,220	3,156	2,991
65-69	1,228	1,910	2,496	2,637	2,687	2,656
70-74	542	1,056	1,680	1,962	2,090	2,251
75+	631	915	1,624	2,137	2,485	3,247

Population Including Any Presumed Intensive Construction Activity

All ages	56,922	62,236	68,658	70,495	75,443
(18+)	*41,717*	*45,933*	*51,327*	*52,316*	*55,362*

Table 22: Results, Total Population Estimates, Scenario B, CNMI-Wide and Saipan

RESULTS -- TOTAL POPULATION -- CNMI-WIDE

Island Scenarios: B B B

	2016	2020	2025	2028	2030	2035
All ages	55,662	56,998	54,730	**59,206**	59,273	59,000
(18+)	*37,905*	*40,386*	*42,717*	***46,464***	*46,202*	*45,398*
0-4	3,920	3,943	3,636	3,999	4,139	4,064
5-9	5,443	4,497	3,102	3,476	3,641	3,915
10-14	5,337	5,072	2,986	3,137	3,258	3,604
15-19	5,094	5,168	3,816	3,550	3,387	3,367
20-24	3,454	4,333	4,609	5,035	4,401	3,525
25-29	2,883	3,355	4,070	5,528	5,208	4,213
30-34	2,544	2,761	3,448	4,666	4,874	4,654
35-39	3,576	2,985	3,035	3,591	3,937	4,439
40-44	4,577	3,749	3,160	3,209	3,335	3,882
45-49	4,897	4,444	3,776	3,410	3,296	3,420
50-54	5,051	4,802	4,261	3,841	3,627	3,354
55-59	3,568	4,292	4,388	4,094	3,899	3,466
60-64	2,691	3,306	3,865	3,883	3,824	3,525
65-69	1,342	2,127	2,873	3,120	3,200	3,170
70-74	592	1,157	1,895	2,257	2,431	2,665
75+	692	1,006	1,812	2,411	2,815	3,738

Population Including Any Presumed Intensive Construction Activity

All ages	57,818	57,635	59,206	59,273	59,000
(18+)	*41,063*	*44,664*	*46,464*	*46,202*	*45,398*

RESULTS -- TOTAL POPULATION -- SAIPAN

Saipan Scenario: B

	2016	2020	2025	2028	2030	2035
All ages	49,866	51,420	49,091	**50,559**	50,517	49,714
(18+)	*34,111*	*36,510*	*38,424*	***39,237***	*39,005*	*38,250*
0-4	3,502	3,606	3,344	3,629	3,582	3,165
5-9	4,803	4,031	2,777	3,149	3,292	3,330
10-14	4,676	4,497	2,572	2,758	2,902	3,190
15-19	4,623	4,627	3,289	2,979	2,893	2,964
20-24	3,250	3,993	4,088	3,645	3,329	2,893
25-29	2,635	3,126	3,665	3,814	3,661	3,168
30-34	2,202	2,512	3,183	3,514	3,555	3,377
35-39	3,160	2,656	2,769	3,090	3,200	3,321
40-44	4,008	3,318	2,854	2,908	2,950	3,126
45-49	4,351	3,943	3,368	3,138	3,020	2,965
50-54	4,459	4,258	3,795	3,526	3,337	3,039
55-59	3,323	3,873	3,893	3,736	3,570	3,179
60-64	2,472	3,032	3,481	3,542	3,492	3,233
65-69	1,228	1,961	2,613	2,856	2,927	2,901
70-74	542	1,065	1,737	2,062	2,224	2,438
75+	631	924	1,662	2,215	2,584	3,425

Population Including Any Presumed Intensive Construction Activity

All ages	52,117	49,925	50,559	50,517	49,714
(18+)	*37,130*	*38,560*	*39,237*	*39,005*	*38,250*

Table 23: Results, Total Population Estimates, Scenario C, CNMI-Wide and Saipan

RESULTS -- TOTAL POPULATION -- CNMI-WIDE

Island Scenarios: C C C

	2016	2020	2025	2028	2030	2035
All ages	55,662	46,571	44,782	**45,066**	45,062	45,008
(18+)	*37,905*	*31,768*	*31,737*	***32,474***	*32,692*	*32,953*
0-4	3,920	3,230	3,253	3,368	3,395	3,392
5-9	5,443	3,980	3,281	3,238	3,246	3,287
10-14	5,337	4,727	3,874	3,554	3,425	3,295
15-19	5,094	4,778	4,396	4,052	3,840	3,470
20-24	3,454	3,809	4,171	4,163	4,044	3,672
25-29	2,883	2,799	3,450	3,756	3,831	3,765
30-34	2,544	1,916	2,469	2,937	3,171	3,497
35-39	3,576	1,677	1,779	2,130	2,379	2,943
40-44	4,577	2,296	1,625	1,705	1,835	2,332
45-49	4,897	3,255	2,053	1,801	1,745	1,896
50-54	5,051	3,992	2,837	2,350	2,105	1,838
55-59	3,568	3,635	3,268	2,868	2,595	2,055
60-64	2,691	2,829	3,036	2,950	2,804	2,325
65-69	1,342	1,805	2,295	2,455	2,470	2,276
70-74	592	990	1,531	1,798	1,921	2,019
75+	692	854	1,464	1,939	2,256	2,949

Population Including Any Presumed Intensive Construction Activity

All ages	46,571	46,503	45,069	45,062	45,008
(18+)	*31,768*	*32,792*	*32,475*	*32,692*	*32,953*

RESULTS -- TOTAL POPULATION -- SAIPAN

Saipan Scenario: C

	2016	2020	2025	2028	2030	2035
All ages	49,866	41,693	40,334	**40,457**	40,477	40,509
(18+)	*34,111*	*28,518*	*28,473*	***28,999***	*29,209*	*29,499*
0-4	3,502	2,930	3,017	3,086	3,101	3,087
5-9	4,803	3,537	3,009	2,972	2,978	3,008
10-14	4,676	4,161	3,494	3,227	3,119	3,021
15-19	4,623	4,246	3,901	3,621	3,449	3,157
20-24	3,250	3,507	3,752	3,706	3,611	3,305
25-29	2,635	2,617	3,180	3,389	3,444	3,379
30-34	2,202	1,732	2,319	2,698	2,893	3,159
35-39	3,160	1,429	1,609	1,947	2,179	2,676
40-44	4,008	1,968	1,429	1,519	1,653	2,123
45-49	4,351	2,843	1,762	1,557	1,530	1,703
50-54	4,459	3,509	2,472	2,033	1,823	1,620
55-59	3,323	3,266	2,858	2,500	2,254	1,790
60-64	2,472	2,590	2,710	2,604	2,461	2,028
65-69	1,228	1,665	2,080	2,197	2,198	2,000
70-74	542	910	1,400	1,629	1,730	1,793
75+	631	783	1,340	1,769	2,054	2,660

Population Including Any Presumed Intensive Construction Activity

All ages	41,693	40,763	40,457	40,477	40,509
(18+)	*28,518*	*28,798*	*28,999*	*29,209*	*29,499*

Table 24: Results, Total Population Estimates, Scenario A, Tinian and Rota

RESULTS -- TOTAL POPULATION -- TINIAN

Tinian Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	3,158	5,957	6,311	**8,707**	8,964	9,622
(18+)	*2,038*	*4,851*	*4,890*	***6,989***	*7,018*	*7,143*
0-4	185	208	634	664	775	913
5-9	344	267	320	489	556	743
10-14	420	362	254	331	391	561
15-19	285	449	354	391	372	435
20-24	101	1,035	575	1,057	807	520
25-29	118	1,288	863	1,553	1,337	852
30-34	193	895	949	1,430	1,441	1,179
35-39	202	397	779	1,009	1,153	1,255
40-44	319	270	466	652	788	1,073
45-49	295	199	306	351	465	772
50-54	295	177	211	188	253	486
55-59	143	143	208	162	171	286
60-64	126	101	144	149	148	183
65-69	59	64	101	112	117	130
70-74	41	52	67	77	84	99
75+	33	48	79	93	104	135
Population Including Any Presumed Intensive Construction Activity						
All ages		5,957	8,286	8,707	8,964	9,622
(18+)		*4,851*	*6,606*	*6,989*	*7,018*	*7,143*

RESULTS -- TOTAL POPULATION -- ROTA

Rota Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	2,637	2,888	3,230	**3,577**	3,589	3,625
(18+)	*1,756*	*2,063*	*2,401*	***2,690***	*2,673*	*2,654*
0-4	233	178	226	275	300	313
5-9	297	245	215	231	243	278
10-14	241	262	238	230	229	243
15-19	186	233	251	250	240	230
20-24	102	216	286	332	293	244
25-29	130	208	295	378	349	284
30-34	149	186	254	332	336	306
35-39	214	186	206	250	271	293
40-44	250	218	199	209	219	253
45-49	251	235	208	196	195	214
50-54	297	258	225	204	197	194
55-59	102	195	214	203	196	185
60-64	93	122	171	180	181	175
65-69	56	74	113	132	140	149
70-74	9	39	69	88	98	117
75+	28	33	61	85	102	147
Population Including Any Presumed Intensive Construction Activity						
All ages		3,016	3,358	3,577	3,589	3,625
(18+)		*2,185*	*2,524*	*2,690*	*2,673*	*2,654*

Table 25: Results, Total Population Estimates, Scenario B, Tinian and Rota

RESULTS -- TOTAL POPULATION -- TINIAN

Tinian Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	3,158	2,980	2,740	**5,779**	5,911	6,490
(18+)	*2,038*	*2,043*	*2,129*	***5,096***	*5,086*	*5,078*
0-4	185	170	109	153	335	683
5-9	344	231	131	142	157	382
10-14	420	336	193	178	162	222
15-19	285	334	296	352	285	209
20-24	101	193	268	1,160	853	432
25-29	118	108	165	1,483	1,323	839
30-34	193	122	77	954	1,119	1,081
35-39	202	163	110	342	573	944
40-44	319	222	134	147	235	602
45-49	295	265	212	101	119	309
50-54	295	281	242	116	108	161
55-59	143	216	276	151	133	119
60-64	126	148	208	156	146	120
65-69	59	88	143	129	129	117
70-74	41	54	88	106	107	106
75+	33	49	88	110	128	163
Population Including Any Presumed Intensive Construction Activity						
All ages		2,980	4,811	5,779	5,911	6,490
(18+)		*2,043*	*3,941*	*5,096*	*5,086*	*5,078*

RESULTS -- TOTAL POPULATION -- ROTA

Rota Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	2,637	2,599	2,899	**2,868**	2,845	2,796
(18+)	*1,756*	*1,833*	*2,164*	***2,132***	*2,112*	*2,070*
0-4	233	167	182	217	221	216
5-9	297	235	194	186	192	203
10-14	241	239	221	201	194	192
15-19	186	208	231	218	209	193
20-24	102	147	253	230	220	200
25-29	130	122	239	231	223	206
30-34	149	127	188	198	200	196
35-39	214	166	155	159	165	175
40-44	250	209	171	154	150	154
45-49	251	236	196	171	158	145
50-54	297	264	223	198	183	155
55-59	102	203	218	207	196	168
60-64	93	126	176	185	185	172
65-69	56	77	117	136	144	151
70-74	9	39	71	89	101	120
75+	28	34	62	86	103	150
Population Including Any Presumed Intensive Construction Activity						
All ages		2,722	2,899	2,868	2,845	2,796
(18+)		*1,891*	*2,164*	*2,132*	*2,112*	*2,070*

Table 26: Results, Total Population Estimates, Scenario C, Tinian and Rota

RESULTS -- TOTAL POPULATION -- TINIAN

Tinian Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	3,158	2,521	2,187	**2,325**	2,283	2,206
(18+)	*2,038*	*1,664*	*1,669*	***1,754***	*1,750*	*1,727*
0-4	185	144	83	126	129	132
5-9	344	212	105	126	122	122
10-14	420	312	168	174	154	129
15-19	285	314	271	242	213	161
20-24	101	177	245	252	239	198
25-29	118	93	144	199	211	210
30-34	193	80	49	106	136	178
35-39	202	111	68	70	84	132
40-44	319	153	76	71	69	92
45-49	295	208	142	107	89	78
50-54	295	241	178	151	130	91
55-59	143	185	226	193	171	122
60-64	126	126	170	184	178	147
65-69	59	74	117	137	144	142
70-74	41	47	72	91	102	118
75+	33	43	73	96	112	156
Population Including Any Presumed Intensive Construction Activity						
All ages		2,521	3,479	2,325	2,283	2,206
(18+)		*1,664*	*2,399*	*1,754*	*1,750*	*1,727*

RESULTS -- TOTAL POPULATION -- ROTA

Rota Scenario: **C**

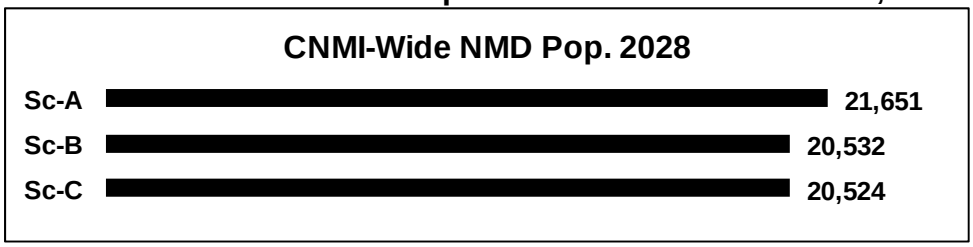
	2016	2020	2025	2028	2030	2035
All ages	2,637	2,357	2,261	**2,284**	2,302	2,293
(18+)	*1,756*	*1,586*	*1,595*	***1,722***	*1,733*	*1,727*
0-4	233	156	152	156	166	172
5-9	297	231	167	140	145	157
10-14	241	253	212	153	151	145
15-19	186	218	224	189	178	152
20-24	102	126	174	204	194	169
25-29	130	89	126	168	176	176
30-34	149	103	101	132	142	160
35-39	214	136	101	113	116	135
40-44	250	174	120	115	114	117
45-49	251	204	148	136	126	115
50-54	297	242	188	166	152	127
55-59	102	184	184	175	170	143
60-64	93	113	156	162	164	150
65-69	56	65	98	121	129	135
70-74	9	33	59	78	89	107
75+	28	29	51	74	90	133
Population Including Any Presumed Intensive Construction Activity						
All ages		2,357	2,261	2,287	2,302	2,293
(18+)		*1,586*	*1,595*	*1,722*	*1,733*	*1,727*

3.3 Results: Overall NMD Population Estimates

NMD numbers vary little over scenarios, and on Tinian/Rota are actually a little higher for Scenario C than Scenario B. This is primarily because of the finding from the initial historical research phase that ***NMD population is, on a net basis, not very responsive to economic conditions***. Change in historical NMD figures appears to come largely from natural increase, and the NMD population has shrunk over time.

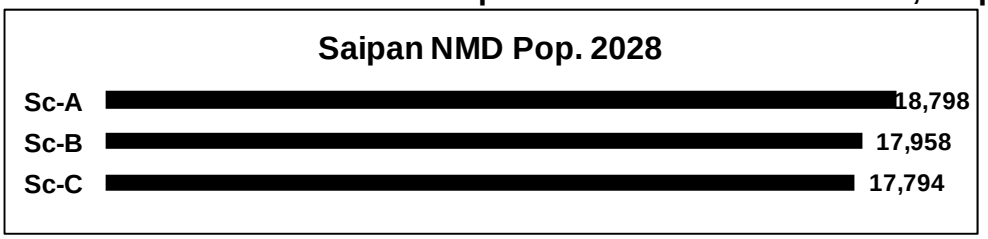
3.3.1 Total CNMI

Figure 18: Estimated 2028 NMD Population for Three Scenarios, CNMI-Wide



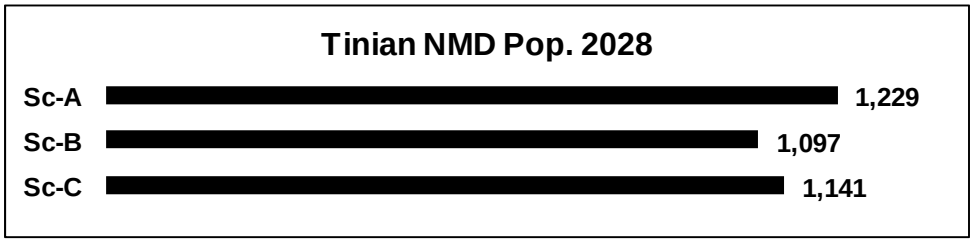
3.3.2 Saipan

Figure 19: Estimated 2028 NMD Population for Three Scenarios, Saipan



3.3.3 Tinian

Figure 20: Estimated 2028 NMD Population for Three Scenarios, Tinian



3.3.4 Rota

Figure 21: Estimated 2028 NMD Population for Three Scenarios, Rota

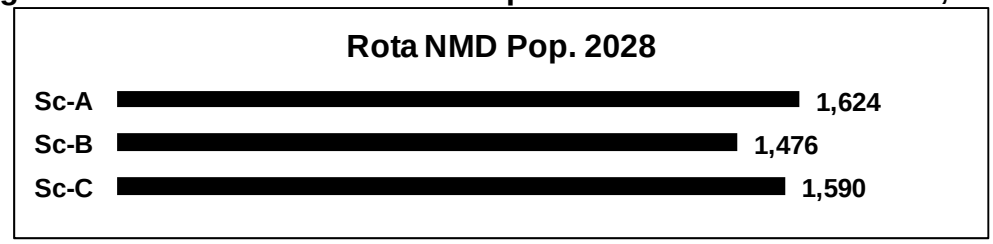


Table 27: Results, NMD Population Estimates, Scenario A, CNMI-Wide and Saipan

RESULTS -- NMD POPULATION -- CNMI-WIDE

Island Scenarios: A A A

	2016	2020	2025	2028	2030	2035
All ages	18,867	19,914	20,967	**21,651**	22,022	22,830
(18+)	*12,276*	*13,271*	*14,472*	***15,105***	*15,469*	*16,334*
0-4	1,779	1,787	1,770	1,829	1,830	1,776
5-9	2,139	1,934	1,795	1,802	1,815	1,817
10-14	1,603	1,865	1,827	1,818	1,816	1,818
15-19	1,784	1,762	1,839	1,828	1,821	1,808
20-24	1,553	1,657	1,793	1,803	1,797	1,791
25-29	1,369	1,505	1,656	1,720	1,739	1,769
30-34	1,124	1,309	1,460	1,570	1,623	1,712
35-39	1,196	1,201	1,319	1,407	1,468	1,599
40-44	1,066	1,139	1,185	1,268	1,323	1,464
45-49	1,109	1,099	1,129	1,166	1,203	1,320
50-54	1,283	1,164	1,102	1,114	1,130	1,204
55-59	845	1,036	1,091	1,070	1,068	1,094
60-64	972	922	972	990	992	1,000
65-69	468	684	788	821	834	853
70-74	297	431	581	639	667	710
75+	280	418	660	806	897	1,094

Population Including Any Presumed Intensive Construction Activity

All ages	19,914	21,144	21,651	22,022	22,830
(18+)	*13,271*	*14,458*	*15,105*	*15,469*	*16,334*

RESULTS -- NMD POPULATION -- SAIPAN

Saipan Scenario: A

	2016	2020	2025	2028	2030	2035
All ages	16,288	17,186	18,234	**18,798**	19,138	19,876
(18+)	*10,709*	*11,507*	*12,464*	***13,005***	*13,350*	*14,152*
0-4	1,607	1,578	1,603	1,600	1,590	1,545
5-9	1,788	1,677	1,623	1,619	1,615	1,593
10-14	1,263	1,547	1,617	1,625	1,626	1,620
15-19	1,535	1,463	1,546	1,580	1,595	1,609
20-24	1,481	1,467	1,482	1,511	1,533	1,568
25-29	1,209	1,365	1,429	1,455	1,474	1,521
30-34	957	1,156	1,322	1,380	1,408	1,470
35-39	957	1,008	1,164	1,251	1,298	1,389
40-44	867	929	1,033	1,115	1,169	1,289
45-49	976	923	950	1,001	1,044	1,160
50-54	1,048	978	936	945	964	1,046
55-59	759	884	899	895	899	935
60-64	885	816	830	832	833	845
65-69	433	620	687	704	711	721
70-74	271	394	519	561	579	605
75+	253	381	595	722	800	958

Population Including Any Presumed Intensive Construction Activity

All ages	17,186	18,234	18,798	19,138	19,876
(18+)	*11,507*	*12,464*	*13,005*	*13,350*	*14,152*

Table 28: Results, NMD Population Estimates, Scenario B, CNMI-Wide and Saipan

RESULTS -- NMD POPULATION -- CNMI-WIDE

Island Scenarios: B B B

	2016	2020	2025	2028	2030	2035
All ages	18,867	19,620	19,949	**20,532**	20,673	20,833
(18+)	*12,276*	*13,131*	*13,921*	***14,440***	*14,587*	*14,899*
0-4	1,779	1,741	1,685	1,726	1,716	1,605
5-9	2,139	1,893	1,703	1,702	1,704	1,668
10-14	1,603	1,814	1,635	1,667	1,677	1,679
15-19	1,784	1,737	1,675	1,660	1,649	1,636
20-24	1,553	1,636	1,666	1,658	1,599	1,497
25-29	1,369	1,487	1,580	1,615	1,582	1,493
30-34	1,124	1,277	1,381	1,481	1,505	1,502
35-39	1,196	1,184	1,262	1,336	1,377	1,443
40-44	1,066	1,112	1,112	1,195	1,244	1,350
45-49	1,109	1,085	1,079	1,104	1,129	1,217
50-54	1,283	1,154	1,081	1,073	1,079	1,131
55-59	845	1,046	1,086	1,058	1,044	1,043
60-64	972	924	972	986	983	972
65-69	468	683	790	821	827	823
70-74	297	431	582	640	665	698
75+	280	418	660	807	894	1,077

Population Including Any Presumed Intensive Construction Activity

All ages	19,771	20,245	20,532	20,673	20,833
(18+)	*13,183*	*13,976*	*14,440*	*14,587*	*14,899*

RESULTS -- NMD POPULATION -- SAIPAN

Saipan Scenario: B

	2016	2020	2025	2028	2030	2035
All ages	16,288	17,110	17,462	**17,958**	18,073	18,164
(18+)	*10,709*	*11,513*	*12,081*	***12,534***	*12,664*	*12,920*
0-4	1,607	1,547	1,546	1,526	1,505	1,399
5-9	1,788	1,650	1,549	1,544	1,530	1,470
10-14	1,263	1,522	1,443	1,493	1,507	1,502
15-19	1,535	1,463	1,405	1,433	1,444	1,456
20-24	1,481	1,488	1,387	1,398	1,360	1,294
25-29	1,209	1,376	1,387	1,386	1,349	1,270
30-34	957	1,145	1,271	1,324	1,324	1,289
35-39	957	1,003	1,128	1,206	1,236	1,263
40-44	867	913	974	1,061	1,111	1,201
45-49	976	918	911	953	986	1,078
50-54	1,048	970	921	914	925	988
55-59	759	895	898	888	881	894
60-64	885	819	832	832	828	824
65-69	433	623	691	708	706	695
70-74	271	396	521	564	580	595
75+	253	383	599	727	800	945

Population Including Any Presumed Intensive Construction Activity

All ages	17,158	17,589	17,958	18,073	18,164
(18+)	*11,509*	*12,150*	*12,534*	*12,664*	*12,920*

Table 29: Results, NMD Population Estimates, Scenario C, CNMI-Wide and Saipan

RESULTS -- NMD POPULATION -- CNMI-WIDE

Island Scenarios: C C C

	2016	2020	2025	2028	2030	2035
All ages	18,867	19,300	19,982	**20,524**	20,783	21,262
(18+)	*12,276*	*12,765*	*13,736*	***14,310***	*14,599*	*15,231*
0-4	1,779	1,756	1,661	1,700	1,697	1,638
5-9	2,139	1,902	1,727	1,701	1,699	1,674
10-14	1,603	1,842	1,784	1,749	1,734	1,694
15-19	1,784	1,723	1,790	1,774	1,758	1,709
20-24	1,553	1,505	1,643	1,689	1,685	1,658
25-29	1,369	1,383	1,492	1,568	1,587	1,616
30-34	1,124	1,240	1,331	1,423	1,465	1,544
35-39	1,196	1,159	1,232	1,295	1,337	1,438
40-44	1,066	1,118	1,134	1,191	1,229	1,327
45-49	1,109	1,074	1,089	1,114	1,137	1,214
50-54	1,283	1,157	1,081	1,081	1,088	1,133
55-59	845	1,031	1,073	1,049	1,046	1,053
60-64	972	919	969	978	980	976
65-69	468	663	769	806	819	832
70-74	297	423	569	626	653	695
75+	280	405	637	782	870	1,063

Population Including Any Presumed Intensive Construction Activity

All ages	19,300	20,532	20,525	20,783	21,262
(18+)	*12,765*	*13,750*	*14,310*	*14,599*	*15,231*

RESULTS -- NMD POPULATION -- SAIPAN

Saipan Scenario: C

	2016	2020	2025	2028	2030	2035
All ages	16,288	16,766	17,440	**17,794**	17,990	18,402
(18+)	*10,709*	*11,162*	*11,880*	***12,296***	*12,545*	*13,116*
0-4	1,607	1,557	1,511	1,485	1,468	1,414
5-9	1,788	1,655	1,565	1,530	1,509	1,459
10-14	1,263	1,531	1,580	1,564	1,548	1,504
15-19	1,535	1,436	1,507	1,531	1,534	1,515
20-24	1,481	1,364	1,367	1,404	1,423	1,438
25-29	1,209	1,282	1,300	1,316	1,330	1,372
30-34	957	1,108	1,217	1,248	1,263	1,311
35-39	957	979	1,094	1,151	1,180	1,240
40-44	867	914	990	1,047	1,084	1,163
45-49	976	905	918	954	984	1,063
50-54	1,048	973	918	916	926	980
55-59	759	881	890	881	879	898
60-64	885	815	825	825	822	823
65-69	433	606	673	691	697	701
70-74	271	389	509	549	567	592
75+	253	371	577	701	776	930

Population Including Any Presumed Intensive Construction Activity

All ages	16,766	17,502	17,794	17,990	18,402
(18+)	*11,162*	*11,935*	*12,296*	*12,545*	*13,116*

Table 30: Results, NMD Population Estimates, Scenario A, Tinian and Rota

RESULTS -- NMD POPULATION -- TINIAN

Tinian Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	1,184	1,263	1,165	**1,229**	1,243	1,279
(18+)	*665*	*775*	*918*	***958***	*960*	*974*
0-4	51	93	34	92	103	99
5-9	193	121	44	51	66	91
10-14	210	177	75	61	59	72
15-19	110	162	156	113	93	72
20-24	17	87	186	162	138	98
25-29	67	56	122	149	148	126
30-34	84	68	46	90	110	129
35-39	118	93	64	64	74	106
40-44	59	88	48	55	59	79
45-49	59	68	69	60	58	64
50-54	76	67	53	59	58	58
55-59	50	60	89	71	65	58
60-64	51	52	61	68	67	60
65-69	17	34	49	53	55	55
70-74	17	20	33	39	41	46
75+	8	17	35	44	50	66

Population Including Any Presumed Intensive Construction Activity

All ages	1,263	1,342	1,229	1,243	1,279
(18+)	*775*	*903*	*958*	*960*	*974*

RESULTS -- NMD POPULATION -- ROTA

Rota Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	1,395	1,464	1,567	**1,624**	1,641	1,676
(18+)	*902*	*989*	*1,090*	***1,142***	*1,159*	*1,208*
0-4	121	116	133	137	138	131
5-9	158	135	128	131	133	133
10-14	130	141	134	132	132	127
15-19	140	138	137	135	133	127
20-24	56	103	125	130	127	126
25-29	93	85	105	116	117	122
30-34	84	85	92	101	105	113
35-39	121	100	91	93	95	103
40-44	140	122	104	98	96	96
45-49	74	108	110	105	101	96
50-54	158	119	113	110	107	100
55-59	37	92	104	105	105	101
60-64	37	54	81	89	93	95
65-69	19	30	52	63	69	78
70-74	9	16	29	40	46	59
75+	19	20	29	39	47	70

Population Including Any Presumed Intensive Construction Activity

All ages	1,464	1,567	1,624	1,641	1,676
(18+)	*989*	*1,090*	*1,142*	*1,159*	*1,208*

Table 31: Results, NMD Population Estimates, Scenario B, Tinian and Rota

RESULTS -- NMD POPULATION -- TINIAN

Tinian Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	1,184	1,154	1,041	**1,097**	1,104	1,136
(18+)	*665*	*684*	*824*	***863***	*861*	*872*
0-4	51	88	18	76	87	88
5-9	193	116	37	39	53	77
10-14	210	174	73	55	50	60
15-19	110	155	151	109	87	64
20-24	17	60	171	152	129	90
25-29	67	34	101	132	133	116
30-34	84	56	28	71	92	115
35-39	118	86	51	48	57	90
40-44	59	84	42	45	46	64
45-49	59	64	64	54	50	52
50-54	76	66	51	55	54	50
55-59	50	59	86	68	62	53
60-64	51	51	60	66	64	56
65-69	17	30	47	51	53	52
70-74	17	19	31	37	40	44
75+	8	14	31	41	47	62
Population Including Any Presumed Intensive Construction Activity						
All ages		1,154	1,210	1,097	1,104	1,136
(18+)		*684*	*810*	*863*	*861*	*872*

RESULTS -- NMD POPULATION -- ROTA

Rota Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	1,395	1,356	1,446	**1,476**	1,496	1,533
(18+)	*902*	*934*	*1,016*	***1,043***	*1,062*	*1,108*
0-4	121	106	121	124	124	118
5-9	158	126	117	119	121	120
10-14	130	118	120	119	119	117
15-19	140	119	120	118	118	116
20-24	56	89	108	109	110	113
25-29	93	77	92	97	100	107
30-34	84	77	82	86	90	98
35-39	121	95	83	82	84	90
40-44	140	115	97	89	87	85
45-49	74	103	104	98	94	87
50-54	158	118	108	104	101	92
55-59	37	92	102	102	101	95
60-64	37	54	81	88	91	91
65-69	19	30	52	62	68	76
70-74	9	16	30	39	46	58
75+	19	20	30	39	47	70
Population Including Any Presumed Intensive Construction Activity						
All ages		1,459	1,446	1,476	1,496	1,533
(18+)		*990*	*1,016*	*1,043*	*1,062*	*1,108*

Table 32: Results, NMD Population Estimates, Scenario C, Tinian and Rota

RESULTS -- NMD POPULATION -- TINIAN

Tinian Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	1,184	1,177	1,068	**1,141**	1,151	1,185
(18+)	*665*	*704*	*844*	***893***	*895*	*907*
0-4	51	88	22	79	92	93
5-9	193	117	38	42	56	81
10-14	210	174	73	59	54	63
15-19	110	156	151	113	91	67
20-24	17	66	174	157	134	94
25-29	67	39	106	137	139	121
30-34	84	58	32	76	97	120
35-39	118	88	54	52	62	95
40-44	59	85	43	48	50	69
45-49	59	65	65	56	52	55
50-54	76	66	51	55	55	52
55-59	50	59	86	69	63	55
60-64	51	51	60	67	65	57
65-69	17	31	48	52	54	53
70-74	17	19	32	37	40	45
75+	8	15	32	42	48	63

Population Including Any Presumed Intensive Construction Activity

All ages		1,177	1,556	1,141	1,151	1,185
(18+)		*704*	*804*	*893*	*895*	*907*

RESULTS -- NMD POPULATION -- ROTA

Rota Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	1,395	1,357	1,474	**1,590**	1,642	1,676
(18+)	*902*	*900*	*1,012*	***1,120***	*1,159*	*1,208*
0-4	121	111	129	135	138	131
5-9	158	130	124	129	133	133
10-14	130	138	131	127	132	127
15-19	140	131	131	131	133	127
20-24	56	75	102	127	127	126
25-29	93	63	87	114	117	122
30-34	84	73	82	99	105	113
35-39	121	92	85	92	95	103
40-44	140	119	101	96	96	96
45-49	74	104	106	104	101	96
50-54	158	118	112	109	107	100
55-59	37	91	97	99	105	101
60-64	37	54	83	87	93	95
65-69	19	26	48	63	69	78
70-74	9	15	28	40	46	59
75+	19	19	27	39	47	70

Population Including Any Presumed Intensive Construction Activity

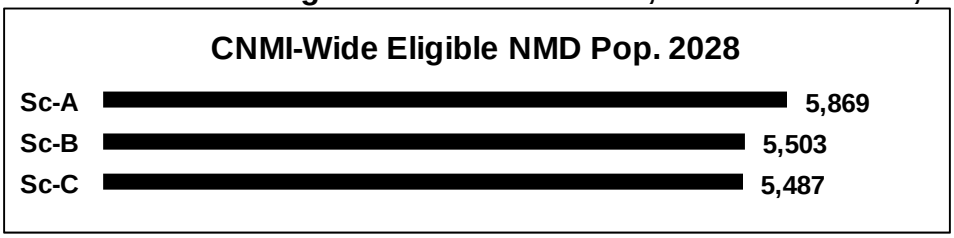
All ages		1,357	1,474	1,591	1,642	1,676
(18+)		*900*	*1,012*	*1,121*	*1,159*	*1,208*

3.4 Results: Eligible NMD Household Head Estimates

Based on the eligibility criteria and related assumptions in Section 2.1.3, results below indicate roughly 38% of NMD adults in 2028 (roughly 43% on Tinian) would qualify for DPL homestead awards. Note, however, (1) these numbers do not subtract awards already given, as per Section 1.3; and (2) effects of inflation may erode numbers of eligible households over time unless eligibility criteria are legally changed to be inflation-adjusted. (We do not hazard estimates of how inflation may otherwise affect eligibility estimates because the CNMI has not produced a Consumer Price Index for years past 2013, and that analysis suggested tremendous volatility in prices was occurring.)

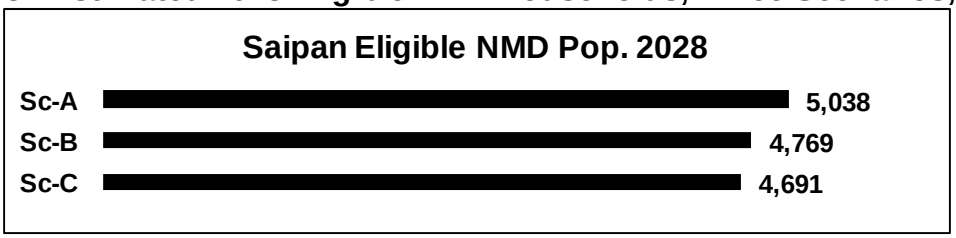
3.4.1 Total CNMI

Figure 22: Estimated 2028 Eligible NMD Households, Three Scenarios, CNMI-Wide



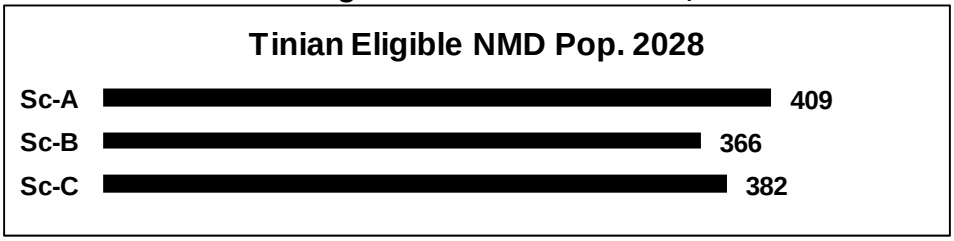
3.4.2 Saipan

Figure 23: Estimated 2028 Eligible NMD Households, Three Scenarios, Saipan



3.4.3 Tinian

Figure 24: Estimated 2028 Eligible NMD Households, Three Scenarios, Tinian



3.4.4 Rota

Figure 25: Estimated 2028 Eligible NMD Households, Three Scenarios, Rota

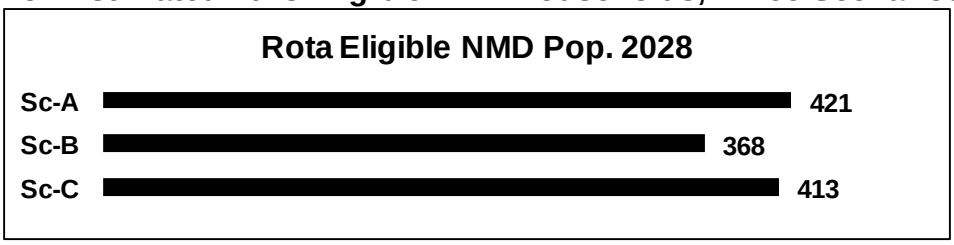


Table 33: Results, Eligible NMD Household Head Estimates, Scenario A, CNMI-Wide and Saipan

RESULTS -- ELIGIBLE NMD POPULATION -- CNMI-WIDE

			A	A	A
Final Estimate of Potentially Qualified Household Heads					
After Applying Marriage, Household Income, and Ownership Screens					
	2020	2025	2028	2030	2035
All ages					
(18+)	*5,247*	*5,681*	***5,869***	*5,959*	*6,156*
(18+ = Qualified HH Heads)					
18-19	705	736	731	728	723
20-24	1,365	1,479	1,487	1,483	1,478
25-29	973	1,071	1,112	1,124	1,144
30-34	753	839	902	933	985
35-39	513	561	598	623	679
40-44	245	254	272	283	313
45-49	87	89	91	94	103
50-54	222	209	210	213	226
55-59	144	148	144	143	144
60-64	89	94	95	95	95
65-69	68	79	83	84	86
70-74	42	58	64	67	72
75+	41	65	80	89	110
Population Including Any Presumed Intensive Construction Activity					
All ages					
(18+)		*5,651*	*5,869*	*5,959*	*6,156*

RESULTS -- ELIGIBLE NMD POPULATION -- SAIPAN

			A		
Final Estimate of Potentially Qualified Household Heads					
After Applying Marriage, Household Income, and Ownership Screens					
	2020	2025	2028	2030	2035
All ages					
(18+)	*4,569*	*4,874*	***5,038***	*5,139*	*5,352*
(18+ = Qualified HH Heads)					
18-19	585	618	632	638	644
20-24	1,209	1,222	1,246	1,264	1,294
25-29	882	923	940	953	983
30-34	665	760	793	810	846
35-39	431	495	532	552	590
40-44	200	222	239	250	276
45-49	73	75	79	82	90
50-54	186	177	178	182	196
55-59	122	121	120	120	123
60-64	78	80	80	79	80
65-69	62	69	71	71	72
70-74	39	52	56	58	61
75+	37	59	72	80	96
Population Including Any Presumed Intensive Construction Activity					
All ages					
(18+)		*4,874*	*5,038*	*5,139*	*5,352*

Table 34: Results, Eligible NMD Household Head Estimates, Scenario B, CNMI-Wide and Saipan

RESULTS -- ELIGIBLE NMD POPULATION -- CNMI-WIDE

	B	B	B

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*5,174*	*5,367*	***5,503***	*5,480*	*5,416*
(18+ = Qualified HH Heads)					
18-19	695	670	664	660	654
20-24	1,348	1,374	1,368	1,319	1,235
25-29	961	1,021	1,043	1,022	965
30-34	734	793	851	865	863
35-39	505	537	567	584	612
40-44	239	238	256	266	288
45-49	86	85	87	88	95
50-54	220	205	203	203	212
55-59	145	148	143	140	138
60-64	89	94	95	94	92
65-69	68	80	83	83	83
70-74	42	58	64	67	70
75+	41	65	80	89	108

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*5,381*	*5,503*	*5,480*	*5,416*

RESULTS -- ELIGIBLE NMD POPULATION -- SAIPAN

	B

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*4,582*	*4,649*	***4,769***	*4,752*	*4,694*
(18+ = Qualified HH Heads)					
18-19	585	562	573	578	582
20-24	1,226	1,143	1,153	1,122	1,067
25-29	889	896	896	872	821
30-34	658	730	760	761	741
35-39	429	480	513	525	536
40-44	197	209	227	238	257
45-49	73	72	75	77	84
50-54	184	174	173	174	186
55-59	123	121	119	118	118
60-64	79	80	80	79	78
65-69	62	69	71	71	70
70-74	39	52	57	58	60
75+	38	59	72	80	95

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*4,691*	*4,769*	*4,752*	*4,694*

Table 35: Results, Eligible NMD Household Head Estimates, Scenario C, CNMI-Wide and Saipan

RESULTS -- ELIGIBLE NMD POPULATION -- CNMI-WIDE

	C	C	C

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*4,956*	*5,295*	***5,487***	*5,553*	*5,677*
(18+ = Qualified HH Heads)					
18-19	689	716	710	703	684
20-24	1,240	1,355	1,393	1,390	1,368
25-29	894	964	1,013	1,026	1,045
30-34	713	764	817	842	888
35-39	494	524	549	567	611
40-44	241	243	255	263	283
45-49	85	86	87	89	94
50-54	221	205	204	205	212
55-59	143	147	142	140	139
60-64	89	94	94	94	93
65-69	66	77	81	82	83
70-74	42	57	63	66	70
75+	39	63	78	87	107

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*5,246*	*5,487*	*5,553*	*5,677*

RESULTS -- ELIGIBLE NMD POPULATION -- SAIPAN

	C

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*4,371*	*4,569*	***4,691***	*4,759*	*4,895*
(18+ = Qualified HH Heads)					
18-19	574	603	612	614	606
20-24	1,124	1,127	1,158	1,174	1,186
25-29	828	840	851	860	887
30-34	637	699	717	726	754
35-39	418	465	489	501	526
40-44	197	213	225	232	249
45-49	72	72	75	77	83
50-54	185	174	173	175	184
55-59	121	120	118	118	119
60-64	78	79	79	79	78
65-69	60	67	69	70	70
70-74	39	51	55	57	60
75+	36	57	70	77	93

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*4,601*	*4,691*	*4,759*	*4,895*

Table 36: Results, Eligible NMD Household Head Estimates, Scenario A, Tinian and Rota

RESULTS -- ELIGIBLE NMD POPULATION -- TINIAN

A

Final Estimate of Potentially Qualified Household Heads

After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*307*	*402*	***409***	*398*	*373*
(18+ = Qualified HH Heads)					
18-19	65	62	45	37	29
20-24	72	154	134	114	81
25-29	36	79	96	96	82
30-34	39	26	52	63	74
35-39	39	26	26	31	45
40-44	19	10	11	12	17
45-49	6	5	4	4	5
50-54	13	10	11	11	11
55-59	8	12	9	9	7
60-64	5	6	6	6	6
65-69	3	5	5	6	5
70-74	2	3	4	4	5
75+	2	3	4	5	7

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*373*	*409*	*398*	*373*

RESULTS -- ELIGIBLE NMD POPULATION -- ROTA

A

Final Estimate of Potentially Qualified Household Heads

After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*371*	*405*	***421***	*422*	*432*
(18+ = Qualified HH Heads)					
18-19	55	55	54	53	51
20-24	84	103	107	105	104
25-29	55	68	75	76	79
30-34	49	53	58	60	65
35-39	43	39	40	40	44
40-44	26	22	21	21	20
45-49	9	9	8	8	7
50-54	24	22	21	20	19
55-59	14	15	15	14	14
60-64	5	8	9	9	9
65-69	3	5	7	7	8
70-74	1	3	4	5	6
75+	2	3	4	5	7

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*405*	*421*	*422*	*432*

Table 37: Results, Eligible NMD Household Head Estimates, Scenario B, Tinian and Rota

RESULTS -- ELIGIBLE NMD POPULATION -- TINIAN

B

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*255*	*355*	***366***	*355*	*335*
(18+ = Qualified HH Heads)					
18-19	62	60	43	35	26
20-24	49	141	125	106	75
25-29	22	65	85	86	75
30-34	32	16	41	53	66
35-39	36	21	20	24	38
40-44	18	8	9	9	14
45-49	5	5	4	4	4
50-54	13	10	10	10	9
55-59	8	12	9	8	7
60-64	5	6	6	6	5
65-69	3	5	5	5	5
70-74	2	3	4	4	4
75+	1	3	4	5	6

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*327*	*366*	*355*	*335*

RESULTS -- ELIGIBLE NMD POPULATION -- ROTA

B

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*338*	*363*	***368***	*373*	*387*
(18+ = Qualified HH Heads)					
18-19	48	48	47	47	46
20-24	73	89	89	90	93
25-29	50	59	63	64	69
30-34	44	47	49	51	56
35-39	41	36	35	35	38
40-44	24	21	19	19	18
45-49	8	8	8	7	7
50-54	24	21	20	19	17
55-59	14	15	14	14	13
60-64	5	8	9	9	9
65-69	3	5	6	7	8
70-74	1	3	4	5	6
75+	2	3	4	5	7

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*363*	*368*	*373*	*387*

Table 38: Results, Eligible NMD Household Head Estimates, Scenario C, Tinian and Rota

RESULTS -- ELIGIBLE NMD POPULATION -- TINIAN

C

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*266*	*365*	***382***	*372*	*350*
(18+ = Qualified HH Heads)					
18-19	63	61	45	37	27
20-24	54	144	130	111	78
25-29	25	69	89	90	79
30-34	33	18	44	56	70
35-39	37	22	21	26	41
40-44	18	9	10	10	14
45-49	5	5	4	4	4
50-54	13	10	10	10	9
55-59	8	12	9	8	7
60-64	5	6	6	6	5
65-69	3	5	5	5	5
70-74	2	3	4	4	5
75+	1	3	4	5	6

Population Including Any Presumed Intensive Construction Activity

All ages					
(18+)		*284*	*382*	*372*	*350*

RESULTS -- ELIGIBLE NMD POPULATION -- ROTA

C

Final Estimate of Potentially Qualified Household Heads
After Applying Marriage, Household Income, and Ownership Screens

	2020	2025	2028	2030	2035
All ages					
(18+)	*319*	*362*	***413***	*422*	*432*
(18+ = Qualified HH Heads)					
18-19	52	53	52	53	51
20-24	62	84	105	105	104
25-29	41	56	74	76	79
30-34	42	47	56	60	65
35-39	40	36	39	40	44
40-44	25	22	21	21	20
45-49	8	8	8	8	7
50-54	24	21	21	20	19
55-59	14	15	15	14	14
60-64	5	9	9	9	9
65-69	3	5	7	7	8
70-74	1	3	4	5	6
75+	2	2	4	5	7

Population Including Any Presumed Intensive Construction Activity

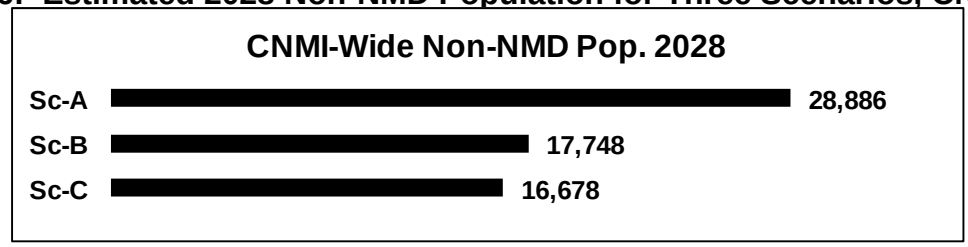
All ages					
(18+)		*362*	*414*	*422*	*432*

3.5 Results: Non-NMD CNMI Resident Population Estimates

The Non-NMD Resident population of the CNMI (citizens or green card holders from the Philippines, Freely Associated States, U.S., etc.) in contrast to the NMD population *has* historically responded to economic change with in- or out-migration. Therefore, the estimates below show much wider variation, especially for High-Growth Scenario A on Saipan. Tinian's higher Non-NMD figure for Scenario C is due primarily to that island's apparently greater proportion of foreign workers who would leave if CW-1 visas are eliminated (following Section 3.6) and subsequent small Non-NMD in-migration in response to limited military development.

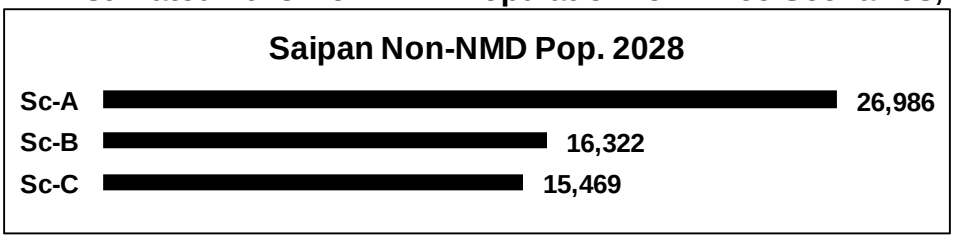
3.5.1 Total CNMI

Figure 26: Estimated 2028 Non-NMD Population for Three Scenarios, CNMI-Wide



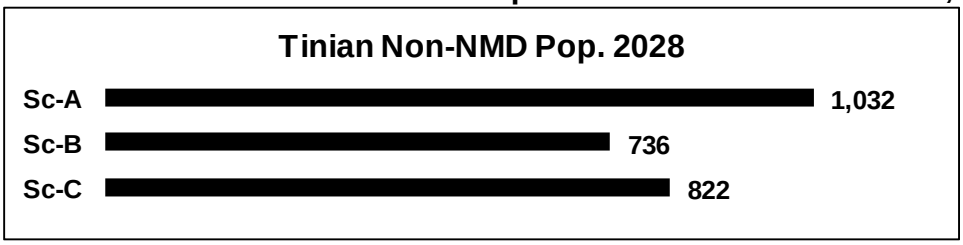
3.5.2 Saipan

Figure 27: Estimated 2028 Non-NMD Population for Three Scenarios, Saipan



3.5.3 Tinian

Figure 28: Estimated 2028 Non-NMD Population for Three Scenarios, Tinian



3.5.4 Rota

Figure 29: Estimated 2028 Non-NMD Population for Three Scenarios, Rota

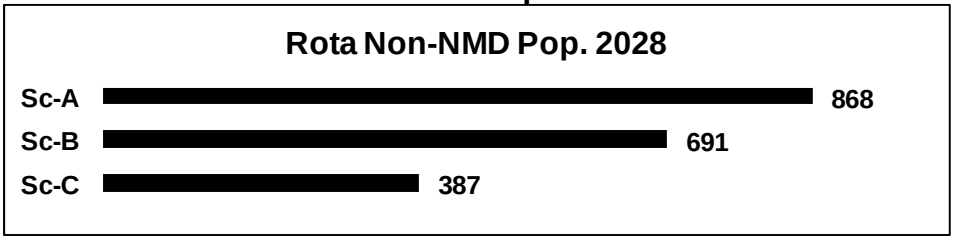


Table 39: Results, Non-NMD Population Estimates, Scenario A, CNMI-Wide and Saipan

RESULTS -- NON-NMD RESIDENT POPULATION -- CNMI-WIDE

Island Scenarios: A A A

	2016	2020	2025	2028	2030	2035
All ages	18,860	21,412	25,710	**28,886**	30,702	35,229
(18+)	*8,694*	*12,562*	*16,445*	***18,967***	*20,231*	*23,565*
0-4	2,035	1,640	2,835	3,251	3,508	3,691
5-9	3,044	2,327	2,249	2,621	2,869	3,388
10-14	3,431	3,008	2,449	2,424	2,518	2,943
15-19	2,761	3,124	2,888	2,705	2,629	2,735
20-24	1,560	2,910	3,412	3,494	3,357	3,302
25-29	739	2,218	3,346	3,867	3,925	3,970
30-34	459	1,300	2,507	3,272	3,605	4,007
35-39	542	709	1,499	2,177	2,620	3,405
40-44	735	628	903	1,313	1,657	2,553
45-49	746	639	639	791	983	1,665
50-54	824	683	586	582	644	1,018
55-59	720	669	583	524	516	640
60-64	502	573	565	520	492	490
65-69	360	418	468	460	445	412
70-74	125	259	353	379	383	373
75+	278	308	428	506	553	636

Population Including Any Presumed Intensive Construction Activity

All ages	21,412	25,922	28,886	30,702	35,229
(18+)	*12,562*	*16,648*	*18,967*	*20,231*	*23,565*

RESULTS -- NON-NMD RESIDENT POPULATION -- SAIPAN

Saipan Scenario: A

	2016	2020	2025	2028	2030	2035
All ages	17,241	19,698	23,962	**26,986**	28,849	33,451
(18+)	*7,955*	*11,566*	*15,353*	***17,680***	*18,965*	*22,340*
0-4	1,805	1,533	2,673	3,103	3,351	3,529
5-9	2,780	2,117	2,092	2,464	2,723	3,245
10-14	3,161	2,753	2,249	2,244	2,351	2,796
15-19	2,564	2,882	2,659	2,491	2,431	2,570
20-24	1,480	2,719	3,221	3,257	3,135	3,117
25-29	704	2,091	3,208	3,656	3,714	3,776
30-34	397	1,215	2,406	3,118	3,444	3,838
35-39	489	646	1,416	2,072	2,510	3,277
40-44	631	553	830	1,232	1,577	2,461
45-49	631	544	557	715	913	1,596
50-54	758	597	497	502	572	956
55-59	686	614	503	446	444	580
60-64	486	543	510	457	429	432
65-69	307	387	432	417	400	364
70-74	109	231	326	349	351	335
75+	252	275	386	461	505	580

Population Including Any Presumed Intensive Construction Activity

All ages	19,698	23,962	26,986	28,849	33,451
(18+)	*11,566*	*15,353*	*17,680*	*18,965*	*22,340*

Table 40: Results, Non-NMD Population Estimates, Scenario B, CNMI-Wide and Saipan

RESULTS -- NON-NMD RESIDENT POPULATION -- CNMI-WIDE

Island Scenarios: **B** **B** **B**

	2016	2020	2025	2028	2030	2035
All ages	18,860	19,194	16,900	**17,748**	17,901	18,141
(18+)	*8,694*	*10,472*	*12,496*	***12,952***	*12,931*	*12,954*
0-4	2,035	1,610	1,427	1,741	1,758	1,569
5-9	3,044	2,299	913	1,216	1,378	1,544
10-14	3,431	2,989	984	1,002	1,083	1,345
15-19	2,761	3,039	1,802	1,396	1,251	1,214
20-24	1,560	2,281	2,544	2,099	1,811	1,372
25-29	739	1,321	2,005	2,188	2,098	1,690
30-34	459	709	1,459	1,767	1,865	1,812
35-39	542	531	900	1,217	1,380	1,637
40-44	735	589	674	831	952	1,293
45-49	746	690	704	702	729	951
50-54	824	761	697	683	669	742
55-59	720	748	734	693	662	641
60-64	502	616	687	673	648	599
65-69	360	441	538	565	563	537
70-74	125	260	385	432	450	465
75+	278	310	449	544	603	729

Population Including Any Presumed Intensive Construction Activity

All ages	19,472	17,763	17,748	17,901	18,141
(18+)	*10,739*	*12,710*	*12,952*	*12,931*	*12,954*

RESULTS -- NON-NMD RESIDENT POPULATION -- SAIPAN

Saipan Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	17,241	17,751	15,443	**16,322**	16,540	16,879
(18+)	*7,955*	*9,695*	*11,575*	***11,992***	*11,999*	*12,075*
0-4	1,805	1,523	1,325	1,640	1,653	1,456
5-9	2,780	2,107	790	1,112	1,283	1,451
10-14	3,161	2,742	802	856	957	1,244
15-19	2,564	2,807	1,585	1,205	1,081	1,087
20-24	1,480	2,128	2,367	1,900	1,622	1,219
25-29	704	1,250	1,875	2,023	1,929	1,531
30-34	397	668	1,384	1,663	1,752	1,683
35-39	489	488	853	1,164	1,319	1,554
40-44	631	535	627	794	916	1,243
45-49	631	608	641	658	696	921
50-54	758	682	621	624	622	714
55-59	686	697	663	630	607	605
60-64	486	590	637	620	596	558
65-69	307	413	506	528	525	499
70-74	109	234	360	405	422	433
75+	252	278	410	502	560	681

Population Including Any Presumed Intensive Construction Activity

All ages	18,029	16,150	16,322	16,540	16,879
(18+)	*9,962*	*11,642*	*11,992*	*11,999*	*12,075*

Table 41: Results, Non-NMD Population Estimates, Scenario C, CNMI-Wide and Saipan

RESULTS -- NON-NMD RESIDENT POPULATION -- CNMI-WIDE

Island Scenarios: C C C

	2016	2020	2025	2028	2030	2035
All ages	18,860	16,927	16,453	**16,678**	16,787	17,319
(18+)	*8,694*	*8,826*	*9,712*	***10,354***	*10,649*	*11,326*
0-4	2,035	1,359	1,575	1,659	1,692	1,752
5-9	3,044	2,078	1,527	1,517	1,531	1,606
10-14	3,431	2,879	2,082	1,789	1,674	1,587
15-19	2,761	2,975	2,595	2,267	2,068	1,746
20-24	1,560	2,249	2,509	2,460	2,345	1,999
25-29	739	1,260	1,904	2,153	2,217	2,131
30-34	459	472	1,039	1,441	1,647	1,919
35-39	542	216	401	718	943	1,442
40-44	735	321	196	299	429	893
45-49	746	468	211	177	209	457
50-54	824	607	369	252	201	241
55-59	720	619	469	364	292	197
60-64	502	524	484	424	370	245
65-69	360	383	409	395	370	282
70-74	125	233	305	324	324	290
75+	278	285	377	440	475	532

Population Including Any Presumed Intensive Construction Activity

All ages	16,927	17,625	16,681	16,787	17,319
(18+)	*8,826*	*10,753*	*10,354*	*10,649*	*11,326*

RESULTS -- NON-NMD RESIDENT POPULATION -- SAIPAN

Saipan Scenario: C

	2016	2020	2025	2028	2030	2035
All ages	17,241	15,455	15,253	**15,469**	15,634	16,234
(18+)	*7,955*	*8,029*	*9,004*	***9,556***	*9,855*	*10,539*
0-4	1,805	1,268	1,492	1,592	1,627	1,672
5-9	2,780	1,882	1,419	1,423	1,454	1,541
10-14	3,161	2,630	1,907	1,649	1,556	1,505
15-19	2,564	2,742	2,385	2,081	1,903	1,628
20-24	1,480	2,094	2,372	2,291	2,177	1,855
25-29	704	1,187	1,832	2,042	2,091	1,991
30-34	397	431	1,008	1,383	1,576	1,819
35-39	489	172	378	686	905	1,379
40-44	631	263	169	273	404	856
45-49	631	383	159	138	182	433
50-54	758	526	296	193	154	216
55-59	686	566	401	297	234	160
60-64	486	496	436	368	315	200
65-69	307	355	378	357	329	241
70-74	109	206	282	298	295	257
75+	252	253	339	398	432	482

Population Including Any Presumed Intensive Construction Activity

All ages	15,455	15,620	15,469	15,634	16,234
(18+)	*8,029*	*9,274*	*9,556*	*9,855*	*10,539*

Table 42: Results, Non-NMD Population Estimates, Scenario A, Tinian and Rota

RESULTS -- NON-NMD RESIDENT POPULATION -- TINIAN

Tinian Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	1,000	1,102	1,003	**1,032**	1,004	954
(18+)	*499*	*696*	*603*	***692***	*693*	*694*
0-4	118	64	119	67	62	61
5-9	134	110	96	97	83	63
10-14	159	140	110	105	99	79
15-19	151	154	126	118	112	95
20-24	52	141	79	112	112	104
25-29	26	102	40	81	90	98
30-34	34	64	40	56	61	76
35-39	25	38	50	49	47	54
40-44	67	44	47	48	44	43
45-49	59	53	54	49	45	39
50-54	58	54	59	53	49	41
55-59	34	43	57	54	51	43
60-64	17	27	44	47	47	43
65-69	34	23	30	35	37	38
70-74	17	21	22	25	27	30
75+	17	24	32	35	38	45

Population Including Any Presumed Intensive Construction Activity

All ages	1,102	1,215	1,032	1,004	954
(18+)	*696*	*806*	*692*	*693*	*694*

RESULTS -- NON-NMD RESIDENT POPULATION -- ROTA

Rota Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	619	612	745	**868**	849	824
(18+)	*240*	*300*	*489*	***596***	*573*	*531*
0-4	112	43	43	81	95	102
5-9	129	100	61	59	63	80
10-14	111	116	90	75	67	68
15-19	47	87	103	96	86	70
20-24	28	51	113	124	110	82
25-29	9	25	98	130	121	96
30-34	28	21	62	97	100	93
35-39	28	25	33	56	63	74
40-44	36	31	27	34	36	50
45-49	56	42	29	27	24	30
50-54	8	32	31	27	23	21
55-59	0	13	22	23	21	16
60-64	0	3	12	16	16	14
65-69	19	7	6	8	9	11
70-74	0	7	5	6	6	7
75+	9	9	10	10	10	10

Population Including Any Presumed Intensive Construction Activity

All ages	612	745	868	849	824
(18+)	*300*	*489*	*596*	*573*	*531*

Table 43: Results, Non-NMD Population Estimates, Scenario B, Tinian and Rota

RESULTS -- NON-NMD RESIDENT POPULATION -- TINIAN

Tinian Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	1,000	831	712	**736**	704	657
(18+)	*499*	*477*	*432*	***510***	*506*	*494*
0-4	118	44	58	33	33	42
5-9	134	92	62	55	44	35
10-14	159	131	92	77	66	46
15-19	151	145	114	102	90	66
20-24	52	102	65	98	96	81
25-29	26	45	33	70	77	81
30-34	34	20	13	37	45	62
35-39	25	18	13	19	22	37
40-44	67	23	20	17	16	23
45-49	59	40	34	25	19	16
50-54	58	47	46	36	29	17
55-59	34	38	49	43	38	25
60-64	17	23	38	40	39	31
65-69	34	21	27	30	31	30
70-74	17	19	19	22	23	26
75+	17	22	29	32	34	40

Population Including Any Presumed Intensive Construction Activity

All ages	831	869	736	704	657
(18+)	*477*	*580*	*510*	*506*	*494*

RESULTS -- NON-NMD RESIDENT POPULATION -- ROTA

Rota Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	619	612	745	**691**	658	606
(18+)	*240*	*300*	*489*	***450***	*427*	*385*
0-4	112	43	43	69	72	72
5-9	129	100	61	49	51	58
10-14	111	116	90	69	60	54
15-19	47	87	103	90	80	61
20-24	28	51	113	101	93	72
25-29	9	25	98	95	92	78
30-34	28	21	62	66	69	67
35-39	28	25	33	35	38	47
40-44	36	31	27	21	20	27
45-49	56	42	29	19	14	14
50-54	8	32	31	23	18	11
55-59	0	13	22	20	18	11
60-64	0	3	12	13	13	11
65-69	19	7	6	7	7	8
70-74	0	7	5	4	4	6
75+	9	9	10	9	9	8

Population Including Any Presumed Intensive Construction Activity

All ages	612	745	691	658	606
(18+)	*300*	*489*	*450*	*427*	*385*

Table 44: Results, Non-NMD Population Estimates, Scenario C, Tinian and Rota

RESULTS -- NON-NMD RESIDENT POPULATION -- TINIAN

Tinian Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	1,000	861	739	**822**	784	717
(18+)	*499*	*497*	*449*	***502***	*510*	*518*
0-4	118	48	61	47	37	39
5-9	134	96	65	83	65	40
10-14	159	132	94	114	99	65
15-19	151	146	116	127	120	92
20-24	52	104	65	91	102	101
25-29	26	48	34	57	68	86
30-34	34	20	14	26	35	54
35-39	25	19	14	16	19	33
40-44	67	27	22	17	15	20
45-49	59	43	37	26	19	14
50-54	58	49	49	40	32	16
55-59	34	40	51	47	41	25
60-64	17	25	40	43	41	32
65-69	34	21	28	32	33	31
70-74	17	20	20	23	24	27
75+	17	23	30	33	35	41

Population Including Any Presumed Intensive Construction Activity

All ages	861	1,544	822	784	717
(18+)	*497*	*1,220*	*502*	*510*	*518*

RESULTS -- NON-NMD RESIDENT POPULATION -- ROTA

Rota Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	619	612	461	**387**	368	368
(18+)	*240*	*300*	*259*	***296***	*283*	*270*
0-4	112	43	22	21	27	41
5-9	129	100	43	10	12	24
10-14	111	116	81	26	19	17
15-19	47	87	93	58	45	25
20-24	28	51	72	77	67	43
25-29	9	25	39	54	59	54
30-34	28	21	17	33	37	46
35-39	28	25	9	16	18	31
40-44	36	31	6	9	10	17
45-49	56	42	16	13	9	10
50-54	8	32	24	19	15	9
55-59	0	13	18	20	17	12
60-64	0	3	7	13	14	13
65-69	19	7	3	6	8	10
70-74	0	7	4	4	4	7
75+	9	9	9	9	8	9

Population Including Any Presumed Intensive Construction Activity

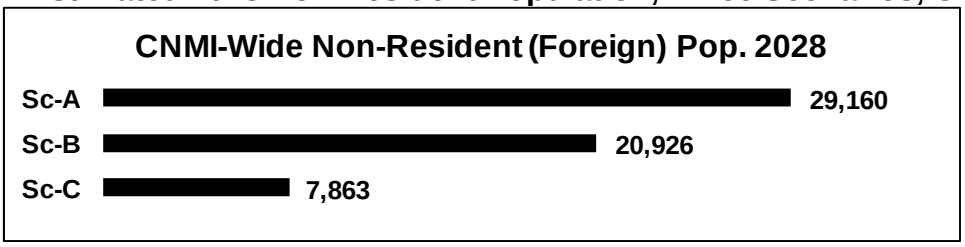
All ages	612	461	390	368	368
(18+)	*300*	*259*	*296*	*283*	*270*

3.6 Results: Non-Resident (Foreign) Population Estimates

Almost by definition, this has been the population component *most* responsive to economic change in the CNMI, and so both the summary figures below and the detailed figures in the following tables show the greatest variation by scenario. Note that Tinian's population below indicates the greatest exodus (proportionally) of CW-1 population, including dependents, for Scenario C, thus explaining that island's other unique responses to Scenario C in the foregoing sections.

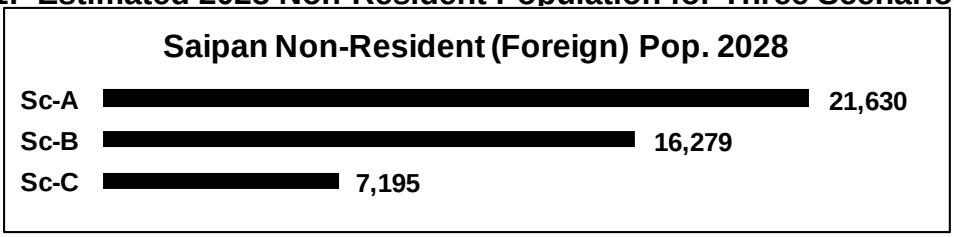
3.6.1 Total CNMI

Figure 30: Estimated 2028 Non-Resident Population, Three Scenarios, CNMI-Wide



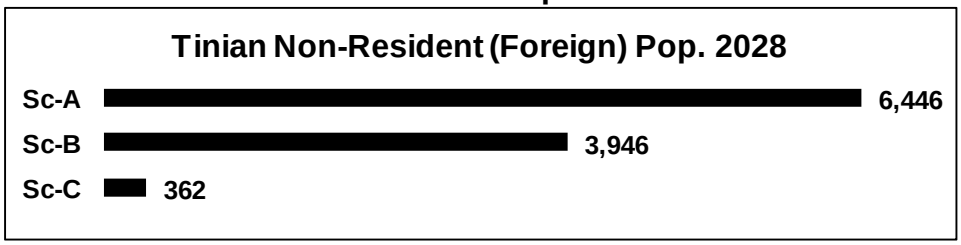
3.6.2 Saipan

Figure 31: Estimated 2028 Non-Resident Population for Three Scenarios, Saipan



3.6.3 Tinian

Figure 32: Estimated 2028 Non-Resident Population for Three Scenarios, Tinian



3.6.4 Rota

Figure 33: Estimated 2028 Non-Resident Population for Three Scenarios, Rota

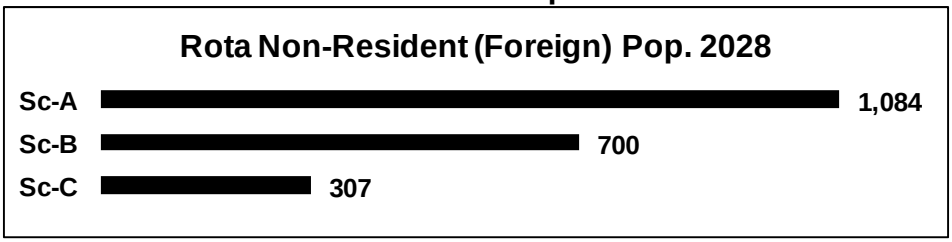


Table 45: Results, Non-Resident (Foreign) Population Estimates, Scenario A, CNMI-Wide and Saipan

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- CNMI-WIDE

Island Scenarios: A A A

	2016	2020	2025	2028	2030	2035
All ages	17,935	22,638	23,332	**29,160**	29,435	30,000
(18+)	*16,936*	*21,064*	*20,609*	***25,740***	*25,454*	*24,655*
0-4	106	615	1,297	1,298	1,593	2,030
5-9	260	328	743	1,040	1,159	1,596
10-14	303	293	436	673	814	1,186
15-19	549	563	412	681	691	889
20-24	341	1,755	888	2,393	1,773	1,094
25-29	775	2,451	1,653	3,694	3,150	1,935
30-34	961	2,012	2,047	3,369	3,423	2,791
35-39	1,839	1,627	1,944	2,404	2,755	3,017
40-44	2,777	2,089	1,889	1,969	2,155	2,682
45-49	3,042	2,525	2,114	1,810	1,874	2,228
50-54	2,944	2,696	2,402	1,967	1,901	1,959
55-59	2,002	2,340	2,422	2,112	2,019	1,882
60-64	1,216	1,668	2,073	2,039	2,001	1,859
65-69	515	948	1,455	1,601	1,665	1,670
70-74	171	458	881	1,108	1,223	1,383
75+	134	270	677	1,002	1,240	1,799

Population Including Any Presumed Intensive Construction Activity

All ages	24,570	26,814	30,404	30,324	30,631
(18+)	*22,919*	*23,957*	*26,935*	*26,308*	*25,261*

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- SAIPAN

Saipan Scenario: A

	2016	2020	2025	2028	2030	2035
All ages	16,338	18,233	18,271	**21,630**	21,620	21,486
(18+)	*15,447*	*16,910*	*16,417*	***19,448***	*19,147*	*18,265*
0-4	90	545	766	736	915	1,197
5-9	235	283	536	660	705	941
10-14	252	242	354	486	551	728
15-19	524	422	328	501	502	589
20-24	289	885	529	1,532	1,159	739
25-29	722	1,223	861	2,238	1,940	1,242
30-34	848	1,169	1,083	1,951	2,022	1,716
35-39	1,715	1,300	1,197	1,405	1,610	1,807
40-44	2,509	1,885	1,449	1,341	1,382	1,624
45-49	2,744	2,363	1,862	1,504	1,442	1,470
50-54	2,654	2,533	2,221	1,822	1,689	1,498
55-59	1,878	2,209	2,272	2,001	1,893	1,630
60-64	1,102	1,582	1,955	1,930	1,894	1,713
65-69	488	903	1,378	1,516	1,577	1,572
70-74	162	431	836	1,052	1,160	1,310
75+	126	259	643	954	1,180	1,709

Population Including Any Presumed Intensive Construction Activity

All ages	20,038	20,039	22,874	22,508	22,116
(18+)	*18,644*	*18,116*	*20,643*	*20,001*	*18,871*

Table 46: Results, Non-Resident (Foreign) Population Estimates, Scenario B, CNMI-Wide and Saipan

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- CNMI-WIDE

Island Scenarios: B B B

	2016	2020	2025	2028	2030	2035
All ages	17,935	18,185	17,880	**20,926**	20,699	20,027
(18+)	*16,936*	*16,783*	*16,300*	***19,072***	*18,684*	*17,544*
0-4	106	592	524	532	665	889
5-9	260	305	486	558	559	703
10-14	303	269	368	468	498	580
15-19	549	392	339	493	487	517
20-24	341	417	399	1,277	992	656
25-29	775	548	484	1,726	1,528	1,030
30-34	961	775	609	1,418	1,504	1,340
35-39	1,839	1,270	873	1,037	1,180	1,359
40-44	2,777	2,048	1,373	1,182	1,139	1,239
45-49	3,042	2,669	1,993	1,604	1,438	1,251
50-54	2,944	2,888	2,483	2,084	1,878	1,481
55-59	2,002	2,498	2,568	2,343	2,194	1,782
60-64	1,216	1,766	2,206	2,224	2,192	1,954
65-69	515	1,003	1,545	1,734	1,809	1,810
70-74	171	466	928	1,185	1,316	1,503
75+	134	278	703	1,060	1,318	1,932

Population Including Any Presumed Intensive Construction Activity

All ages	18,575	19,626	20,926	20,699	20,027
(18+)	*17,141*	*17,977*	*19,072*	*18,684*	*17,544*

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- SAIPAN

Saipan Scenario: B

	2016	2020	2025	2028	2030	2035
All ages	16,338	16,560	16,186	**16,279**	15,904	14,672
(18+)	*15,447*	*15,302*	*14,768*	***14,710***	*14,343*	*13,255*
0-4	90	536	473	462	424	310
5-9	235	274	438	493	478	409
10-14	252	233	328	409	438	445
15-19	524	357	299	341	369	422
20-24	289	377	334	346	347	381
25-29	722	500	404	405	383	367
30-34	848	699	529	527	480	405
35-39	1,715	1,164	788	720	644	504
40-44	2,509	1,870	1,253	1,053	923	682
45-49	2,744	2,418	1,817	1,528	1,338	966
50-54	2,654	2,606	2,253	1,988	1,790	1,336
55-59	1,878	2,281	2,332	2,218	2,082	1,679
60-64	1,102	1,623	2,012	2,090	2,068	1,850
65-69	488	925	1,416	1,620	1,696	1,708
70-74	162	434	855	1,093	1,222	1,409
75+	126	262	654	986	1,223	1,799

Population Including Any Presumed Intensive Construction Activity

All ages	16,930	16,186	16,279	15,904	14,672
(18+)	*15,658*	*14,768*	*14,710*	*14,343*	*13,255*

Table 47: Results, Non-Resident (Foreign) Population Estimates, Scenario C, CNMI-Wide and Saipan

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- CNMI-WIDE

Island Scenarios: C C C

	2016	2020	2025	2028	2030	2035
All ages	17,935	10,344	8,347	**7,863**	7,492	6,427
(18+)	*16,936*	*10,176*	*8,289*	***7,811***	*7,444*	*6,395*
0-4	106	114	16	9	6	2
5-9	260	0	27	20	16	8
10-14	303	6	8	16	17	14
15-19	549	79	12	12	13	15
20-24	341	56	18	14	14	14
25-29	775	156	54	35	28	18
30-34	961	204	99	73	58	34
35-39	1,839	302	145	117	100	63
40-44	2,777	857	294	216	178	112
45-49	3,042	1,713	753	510	398	224
50-54	2,944	2,228	1,387	1,017	817	464
55-59	2,002	1,986	1,725	1,455	1,256	806
60-64	1,216	1,386	1,584	1,548	1,455	1,105
65-69	515	758	1,118	1,254	1,281	1,162
70-74	171	335	657	849	944	1,033
75+	134	164	450	718	911	1,354

Population Including Any Presumed Intensive Construction Activity

All ages	10,344	8,347	7,863	7,492	6,427
(18+)	*10,176*	*8,289*	*7,811*	*7,444*	*6,395*

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- SAIPAN

Saipan Scenario: C

	2016	2020	2025	2028	2030	2035
All ages	16,338	9,472	7,641	**7,195**	6,852	5,874
(18+)	*15,447*	*9,327*	*7,589*	***7,147***	*6,808*	*5,844*
0-4	90	105	15	8	6	2
5-9	235	0	25	19	15	8
10-14	252	0	7	15	16	13
15-19	524	67	9	10	12	14
20-24	289	49	13	11	10	12
25-29	722	149	49	31	23	15
30-34	848	193	94	68	54	30
35-39	1,715	278	137	111	94	58
40-44	2,509	791	270	199	165	104
45-49	2,744	1,555	686	466	365	207
50-54	2,654	2,010	1,257	924	742	424
55-59	1,878	1,819	1,568	1,321	1,140	733
60-64	1,102	1,279	1,449	1,411	1,324	1,004
65-69	488	704	1,030	1,150	1,172	1,058
70-74	162	315	610	783	868	945
75+	126	158	424	670	846	1,248

Population Including Any Presumed Intensive Construction Activity

All ages	9,472	7,641	7,195	6,852	5,874
(18+)	*9,327*	*7,589*	*7,147*	*6,808*	*5,844*

Table 48: Results, Non-Resident (Foreign) Population Estimates, Scenario A, Tinian and Rota

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- TINIAN

Tinian Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	974	3,592	4,143	**6,446**	6,717	7,389
(18+)	*875*	*3,380*	*3,369*	***5,340***	*5,365*	*5,476*
0-4	17	51	481	505	611	753
5-9	17	36	181	340	407	589
10-14	51	45	69	165	233	410
15-19	25	133	72	160	168	267
20-24	33	807	310	784	557	319
25-29	25	1,131	700	1,322	1,099	628
30-34	75	763	864	1,284	1,270	974
35-39	59	266	665	897	1,031	1,094
40-44	193	138	371	550	685	951
45-49	177	77	184	242	363	669
50-54	160	56	99	76	146	387
55-59	59	41	62	37	55	184
60-64	59	22	40	34	34	79
65-69	8	7	22	24	26	37
70-74	8	11	12	13	16	22
75+	8	7	13	13	15	24

Population Including Any Presumed Intensive Construction Activity

All ages	3,592	5,729	6,446	6,717	7,389
(18+)	*3,380*	*4,897*	*5,340*	*5,365*	*5,476*

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- ROTA

Rota Scenario: **A**

	2016	2020	2025	2028	2030	2035
All ages	623	812	918	**1,084**	1,098	1,126
(18+)	*614*	*773*	*823*	***953***	*942*	*914*
0-4	0	19	50	57	67	80
5-9	9	10	26	40	47	65
10-14	0	5	13	23	30	48
15-19	0	8	11	20	21	33
20-24	19	63	49	77	57	36
25-29	28	97	92	133	111	65
30-34	37	80	100	134	131	101
35-39	65	61	82	102	113	116
40-44	74	65	68	78	88	107
45-49	121	84	68	64	70	89
50-54	130	107	82	68	67	74
55-59	65	90	88	75	71	68
60-64	56	65	78	75	73	66
65-69	19	38	56	60	62	61
70-74	0	16	34	42	46	51
75+	0	4	21	35	45	67

Population Including Any Presumed Intensive Construction Activity

All ages	940	1,046	1,084	1,098	1,126
(18+)	*896*	*945*	*953*	*942*	*914*

Table 49: Results, Non-Resident (Foreign) Population Estimates, Scenario B, Tinian and Rota

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- TINIAN

Tinian Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	974	994	986	**3,946**	4,103	4,698
(18+)	*875*	*882*	*873*	***3,723***	*3,719*	*3,712*
0-4	17	38	33	45	215	553
5-9	17	23	32	47	60	270
10-14	51	31	29	46	45	115
15-19	25	34	31	142	107	80
20-24	33	32	32	910	628	261
25-29	25	29	31	1,282	1,114	642
30-34	75	47	35	846	983	904
35-39	59	59	46	275	493	817
40-44	193	115	73	85	173	515
45-49	177	161	113	22	50	241
50-54	160	167	145	25	24	93
55-59	59	119	142	40	33	41
60-64	59	74	110	50	43	33
65-69	8	38	69	47	44	35
70-74	8	16	37	47	44	37
75+	8	12	27	37	47	61

Population Including Any Presumed Intensive Construction Activity

All ages	994	2,732	3,946	4,103	4,698
(18+)	*882*	*2,551*	*3,723*	*3,719*	*3,712*

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- ROTA

Rota Scenario: **B**

	2016	2020	2025	2028	2030	2035
All ages	623	631	708	**700**	691	657
(18+)	*614*	*599*	*659*	***638***	*622*	*577*
0-4	0	18	18	24	26	26
5-9	9	9	16	18	21	24
10-14	0	4	10	13	15	20
15-19	0	1	9	10	11	16
20-24	19	8	32	21	17	15
25-29	28	19	49	39	32	21
30-34	37	29	45	45	42	31
35-39	65	46	39	42	43	38
40-44	74	63	47	44	43	42
45-49	121	90	63	54	50	45
50-54	130	114	85	72	64	52
55-59	65	98	94	85	78	62
60-64	56	69	84	84	81	70
65-69	19	40	60	67	69	67
70-74	0	16	36	46	51	57
75+	0	4	23	38	48	72

Population Including Any Presumed Intensive Construction Activity

All ages	651	708	700	691	657
(18+)	*601*	*659*	*638*	*622*	*577*

Table 50: Results, Non-Resident (Foreign) Population Estimates, Scenario C, Tinian and Rota

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- TINIAN

Tinian Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	974	483	380	**362**	347	304
(18+)	*875*	*463*	*376*	***359***	*345*	*302*
0-4	17	7	0	0	0	0
5-9	17	0	1	1	1	0
10-14	51	6	1	1	1	1
15-19	25	12	3	2	2	1
20-24	33	7	5	4	3	2
25-29	25	6	5	5	4	3
30-34	75	2	3	4	4	4
35-39	59	5	1	2	3	4
40-44	193	42	11	6	5	4
45-49	177	100	41	25	18	9
50-54	160	125	78	56	44	22
55-59	59	86	88	77	67	42
60-64	59	50	70	75	73	57
65-69	8	22	42	53	58	57
70-74	8	8	20	31	37	47
75+	8	5	12	21	29	52

Population Including Any Presumed Intensive Construction Activity

All ages	483	380	362	347	304
(18+)	*463*	*376*	*359*	*345*	*302*

RESULTS -- NON-RESIDENT FOREIGN POPULATION -- ROTA

Rota Scenario: **C**

	2016	2020	2025	2028	2030	2035
All ages	623	388	325	**307**	292	250
(18+)	*614*	*386*	*324*	***305***	*291*	*249*
0-4	0	2	1	0	0	0
5-9	9	0	1	0	0	0
10-14	0	0	0	0	0	0
15-19	0	0	0	0	0	0
20-24	19	0	0	0	0	0
25-29	28	1	0	0	0	0
30-34	37	9	2	1	1	0
35-39	65	19	8	5	3	1
40-44	74	25	13	10	8	4
45-49	121	58	26	19	16	9
50-54	130	92	52	38	31	18
55-59	65	81	69	57	48	31
60-64	56	57	65	63	58	43
65-69	19	32	46	52	52	46
70-74	0	12	27	35	39	42
75+	0	1	14	27	35	54

Population Including Any Presumed Intensive Construction Activity

All ages	388	325	307	292	250
(18+)	*386*	*324*	*305*	*291*	*249*

3.7 Additional Implications of Results

3.7.1 Construction-Related Population

We have emphasized that it is particularly hard to predict exactly when construction "spikes" on large projects will occur, and the somewhat arbitrary nature of our assumptions about this in scenario specifications. That is why the principal focus of the analysis has been on population linked to relatively "permanent" operational jobs.

But to give some sense of how construction booms can swell population, the following charts show "permanent" population plus additional construction-related population. We do this for the year 2025 instead of 2028, because overall our scenarios hypothesize relatively little construction activity in 2028 and much more in 2025 – thus, 2025 for most islands is not typical of normal conditions but may typify a construction "boom." Given our scenarios, Rota shows this least and Tinian (with both casino-hotel and military projects in the first two scenarios) shows the greatest proportionate impact.

Figure 34: Estimated 2025 Pop. with Construction for Three Scenarios, CNMI-Wide

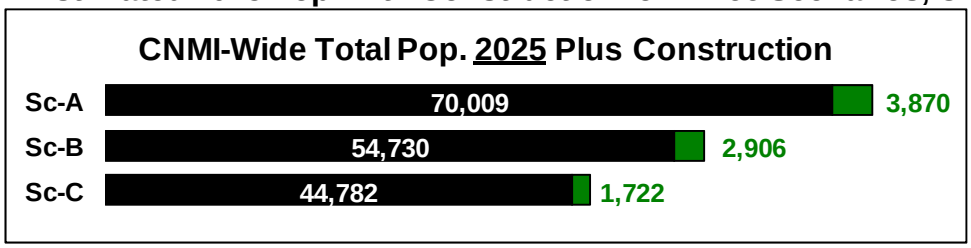


Figure 35: Estimated 2025 Pop. with Construction for Three Scenarios, Saipan

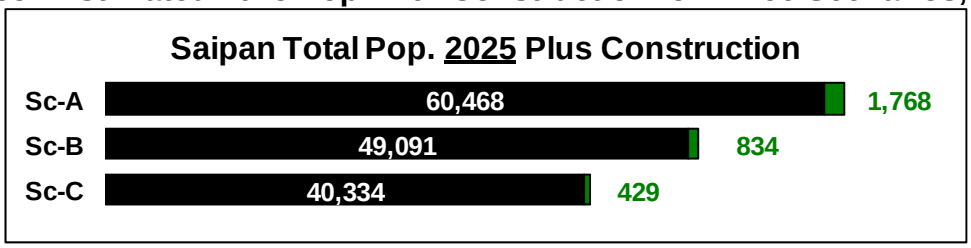


Figure 36: Estimated 2025 Pop. with Construction for Three Scenarios, Tinian

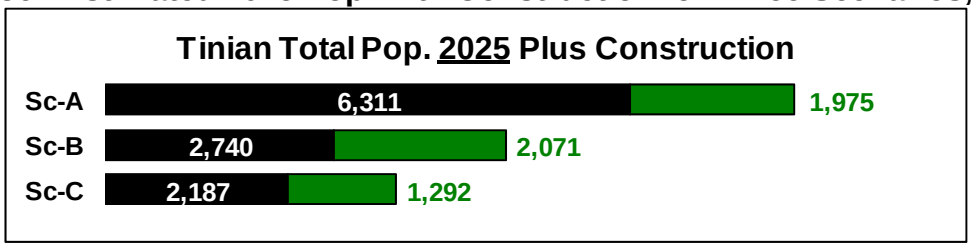
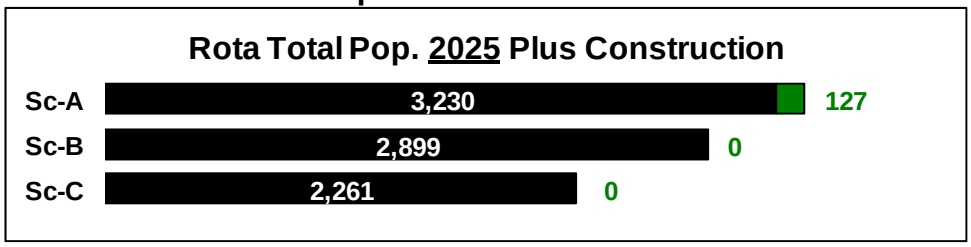


Figure 37: Estimated 2025 Pop. with Construction for Three Scenarios, Rota



As indicated in preceding tables, construction-related population by 2025 is estimated in the Model to consist overwhelmingly of Non-Resident (Foreign) workers and a limited number of dependents for Scenarios A and B, predominantly Non-NMD people for Scenario C. Again, this analysis focuses on major construction "spikes," above and beyond normal construction for housing, warehouses, or commercial buildings.

3.7.2 Population Components as Proportions of Overall Populations

For this final analysis, we return to the target year of 2028 and the regular population linked to relatively permanent operational jobs.

Figure 38 and Figure 39 show the 2028 percentages for each population component implicit in foregoing tables of results. These charts show *percentages*, but note that they are applied to very different estimated *overall population figures*.

- The NMD percentages vary widely over scenarios, but that is because the absolute numbers of NMD residents are estimated to remain relatively constant over scenarios (Section 3.3), given historical evidence of minimal net NMD population response to different economic conditions since 1990. So NMD residents are fairly dominant in Scenario C, but that scenario envisions a depressed economy.

- The Non-NMD "slice of the pie" is roughly similar across scenarios for most geographies, except for Tinian in Scenario C – where it grows due to the assumption of unavailability of CW-1 workers and the other assumption that joint military training activity will bring in some Non-NMD in-migrants.

- The Non-Resident (Foreign) visa worker percentage declines slightly from Scenario A to Scenario B, but then drops sharply for Scenario C, when remaining population is limited to people with H-1 and H-2 visas or other ways of being in the islands.

Figure 38: Population Component Breakdown for Three Scenarios, CNMI-Wide and Saipan

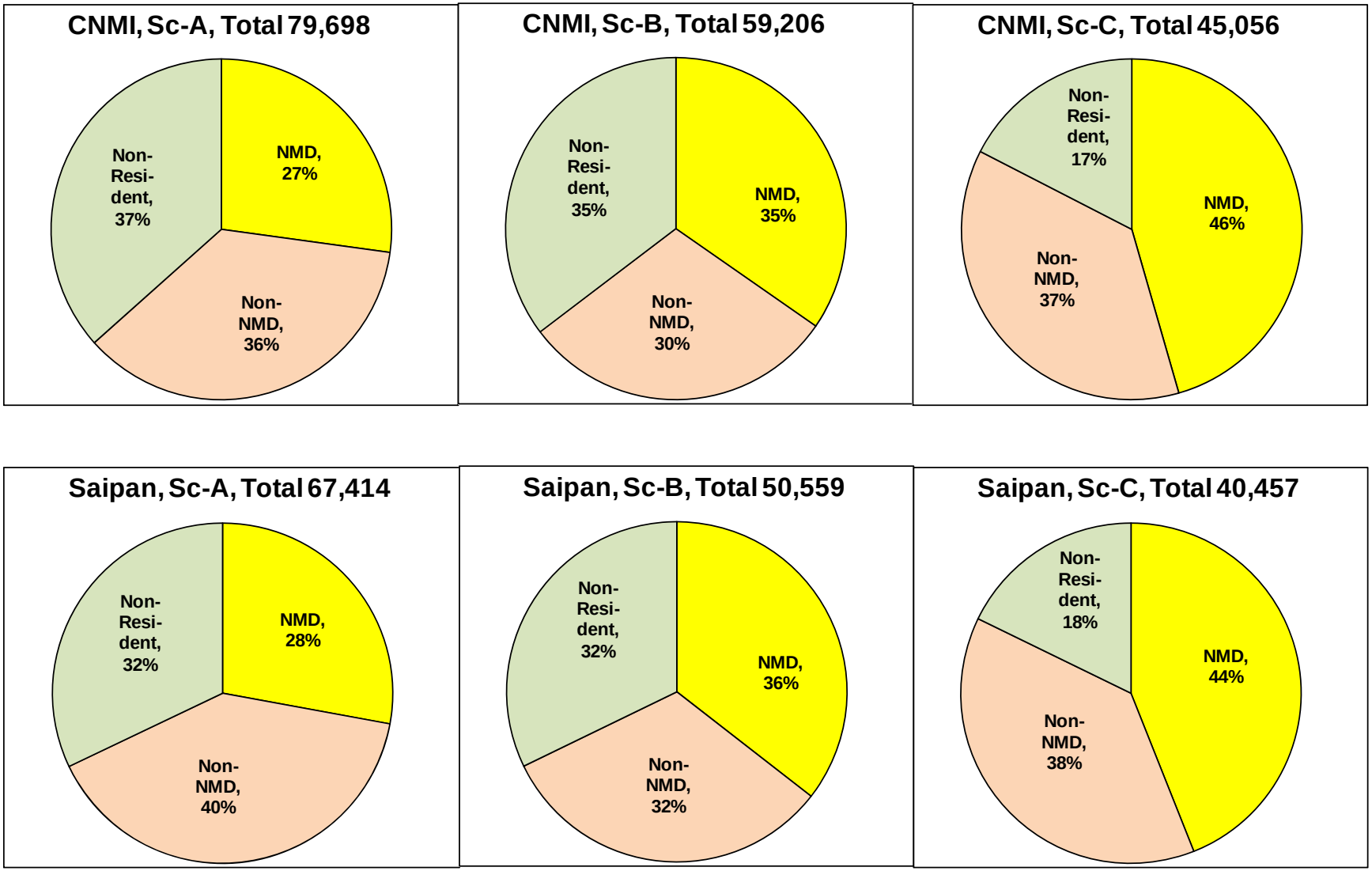
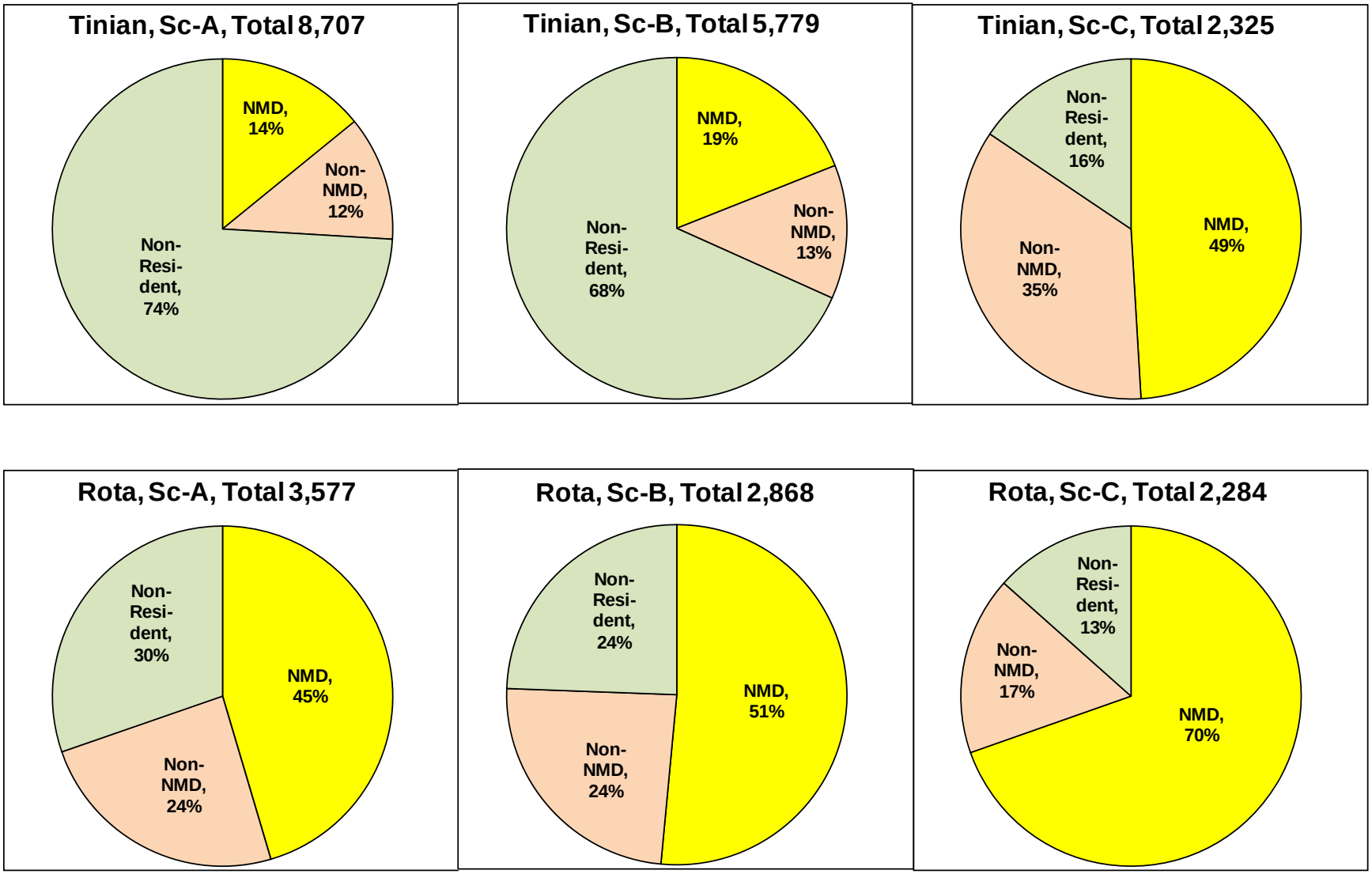


Figure 39: Population Component Breakdown for Three Scenarios, Tinian and Rota



4. SUMMARY OF KEY RESULTS FOR PLANNING PURPOSES

Preceding population results in Chapter 3 were comprehensive and reported in the logical order according to Model structure. This chapter is primarily for the purpose of reiterating and summarizing the particular results of most importance for DPL master planning: (1) estimates of NMD adults eligible for DPL homestead awards; and (2) estimates of total population.

4.1 Eligible NMD Adults

The Model estimates the number of Eligible NMD adults (including those who may already have awards) as the sub-set of total NMD population who are not disqualified due to being married to an NMD spouse and who meet the eligibility criteria of not being current homeowners *and* having household incomes under $70,000.[28] Historical research reported in Chapter 1 (Section 1.4) established that NMD net migration patterns have been much less responsive to changes in economic conditions than other CNMI population groups.

Therefore, overall NMD population and its "eligible" sub-set show much less variation across economic scenarios than will be the case for Total Population in the following section. There are also apparent minor inconsistencies according to scenario (i.e., the highest and lowest estimates over time are not always for the same economic scenarios) that do not appear for total population estimates.

To reiterate, Scenario A is, overall, a High-Growth scenario for each island. Scenario B assumes Moderate Growth (and for Saipan a sort of "status quo" situation in which visitor arrivals will soon plateau at "sustainable" levels), while Scenario C is for Poor to Negative economic conditions associated with ending CW-1 visas.

Figure 40 to Figure 42 show Model estimates for each island, by scenario. For the 2028 target year, Saipan estimates vary from 4,691 to 5,038; Tinian, from 382 minimum to 409 maximum; and Rota, a similar range of from 368 minimum to 421 maximum. On a CNMI-wide base, the 2028 numbers vary from 5,487 to 5,869.

This is a relatively narrow range of estimates, with the lowest estimate representing 93% of the highest estimate for Saipan, 89% for Tinian, and 87% for Rota.

[28] As noted in foregoing Chapter 3, Section 3.4, inflation trends are difficult to predict for CNMI due to lack of data, so it is difficult to tell to what extent Model output numbers may be eroded in outlying future years due to inflation. (However, high inflation can also present challenges to homeownership, so decreases in eligibility due to rising incomes could also be offset by increases in eligibility due to falling ownership rates.) All the assumptions about percentages of NMD population affected by the disqualification/eligibility criteria come from the 2016 Household Income and Expenditure Survey (HIES), and are set forth in the discussion of Model design and assumptions – see Chapter 2, Section 2.1.3.

Figure 40: Summary of Eligible NMD Adult Estimates by Scenario, Saipan

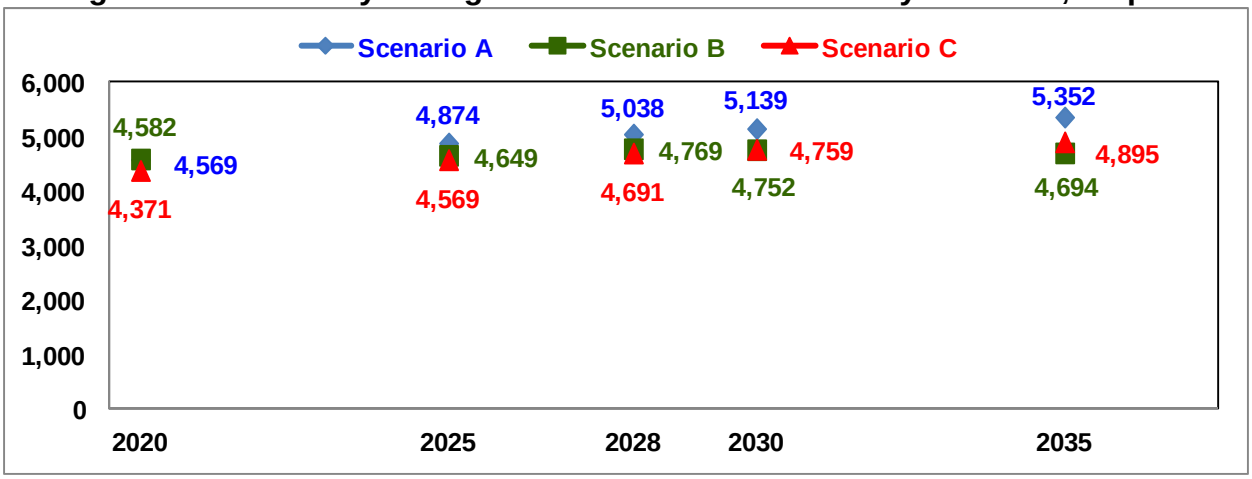


Figure 41: Summary of Eligible NMD Adult Estimates by Scenario, Tinian

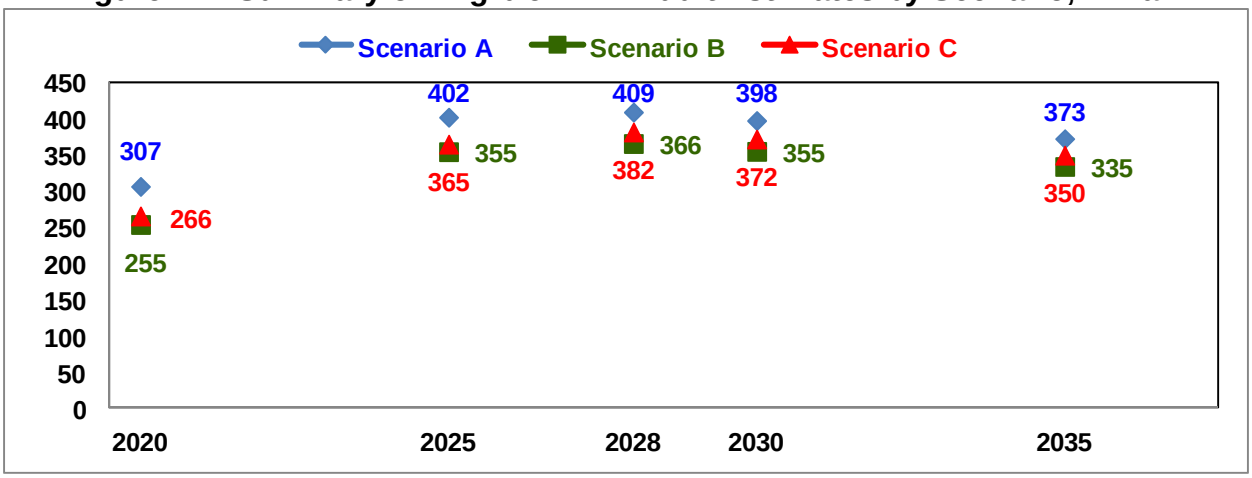
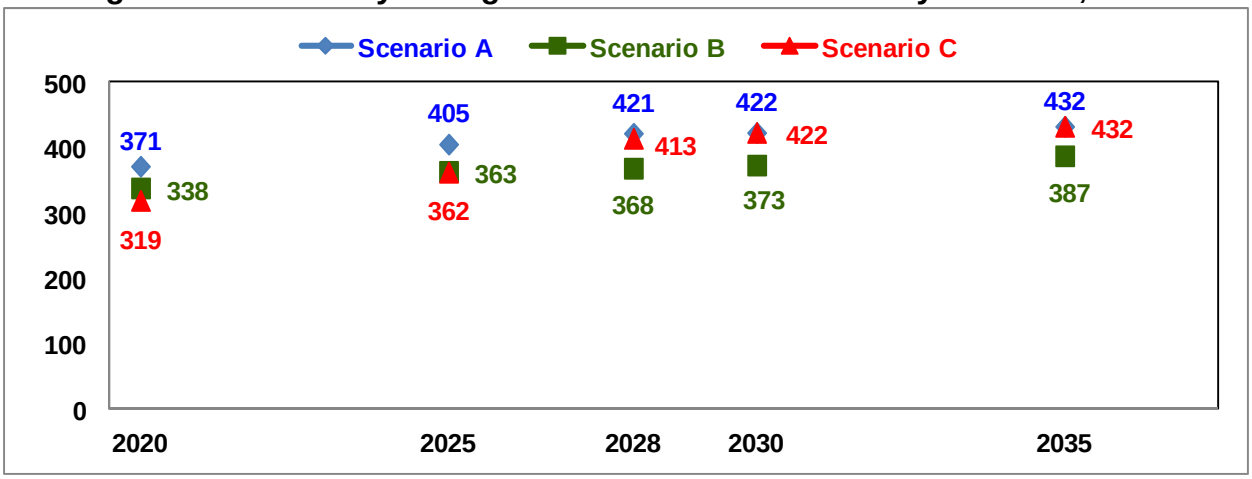


Figure 42: Summary of Eligible NMD Adult Estimates by Scenario, Rota



Not discussed in Chapter 3, but of some import to DPL – there are important differences between these population-based estimates and data obtained from DPL about awards already made. For Saipan, the estimated number of eligible NMD applicants (including any who may already have received awards) ten years from now is far greater than the number of awards as of 2017. But on Tinian and particularly on Rota, there have already been far more awards made than the estimated future number of eligible applicants. The Rota figure is roughly equal to the island's current population.

Table 51: Homestead Awards as of 2017 Versus Estimated 2028 "Eligible NMD"

	Saipan	Tinian	Rota	Total
TOTAL Homesteads Awarded by 2017:	**1,997**	**912**	**2,597**	**5,506**
Elligible NMD Applicants by 2028 (Scenario A)	5,038	409	421	5,869
Elligible NMD Applicants by 2028 (Scenario B)	4,769	366	368	5,503
Elligible NMD Applicants by 2028 (Scenario C)	4,691	382	413	5,487

It should be understood that some of the awards made by DPL may have lapsed (due to death of awardees with no heirs). Additionally, for Saipan, about 400 homesteaders who have received agricultural lots under the Homestead Waiver Act remain eligible for village lots on the island, though without further research there is no way to know if a homesteader has already been awarded both.

4.2 Total Population

Total population was calculated as the sum of specific estimates on each island of three different components: (1) NMD; (2) Non-NMD Residents of CNMI; and (3) (Foreign) Non-Residents. Historical data indicate that population levels for the latter two components – which represent the majority of the CNMI population – have varied much more greatly as prevailing economic conditions changed.

Therefore, the total population levels for different islands show much greater variation according to the economic scenarios. Figure 43 to Figure 45 show these estimates for Saipan, Tinian, and Rota by scenarios. Saipan estimates for 2028 vary from a low of 40,457 to a high of 67,414; Tinian, from 2,325 to 8,707; and Rota, from 2,284 to 3,577. On a CNMI-wide basis, the numbers add to represent a range from 45,066 to 79,698.

These numbers are significantly different by scenario, and that is because of the wide range of economic futures that now appear possible for the Commonwealth. The most optimistic Scenario A – primarily driven by some of the visitor arrival assumptions in the Horwath Report commissioned by the Marianas Visitor Authority – assumes ongoing strong increases in tourism (and, implicitly, some sort of solutions to potential infrastructure and labor constraints, as well as political support by residents).

Figure 43: Summary of Total Population Estimates by Scenario, Saipan

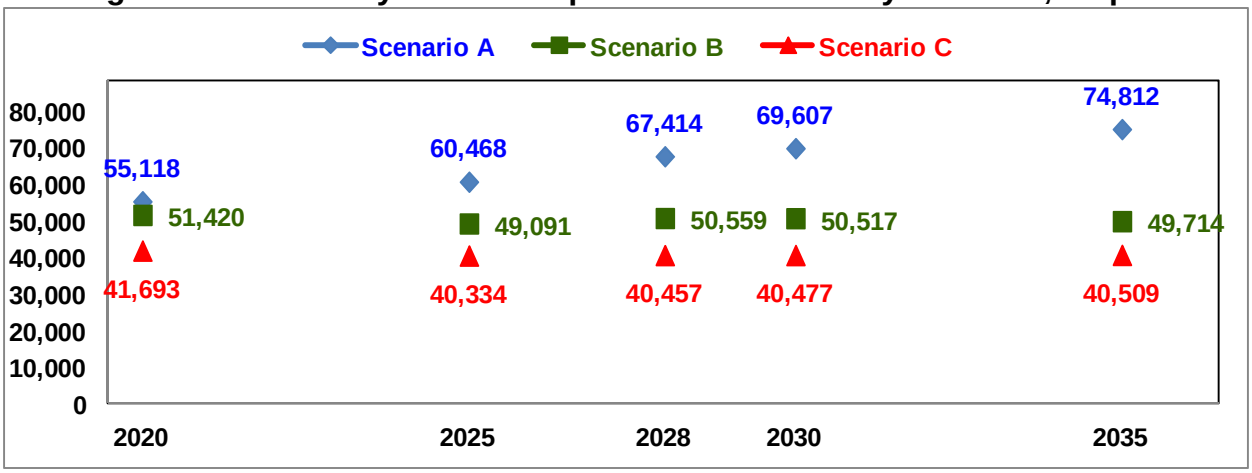


Figure 44: Summary of Total Population Estimates by Scenario, Tinian

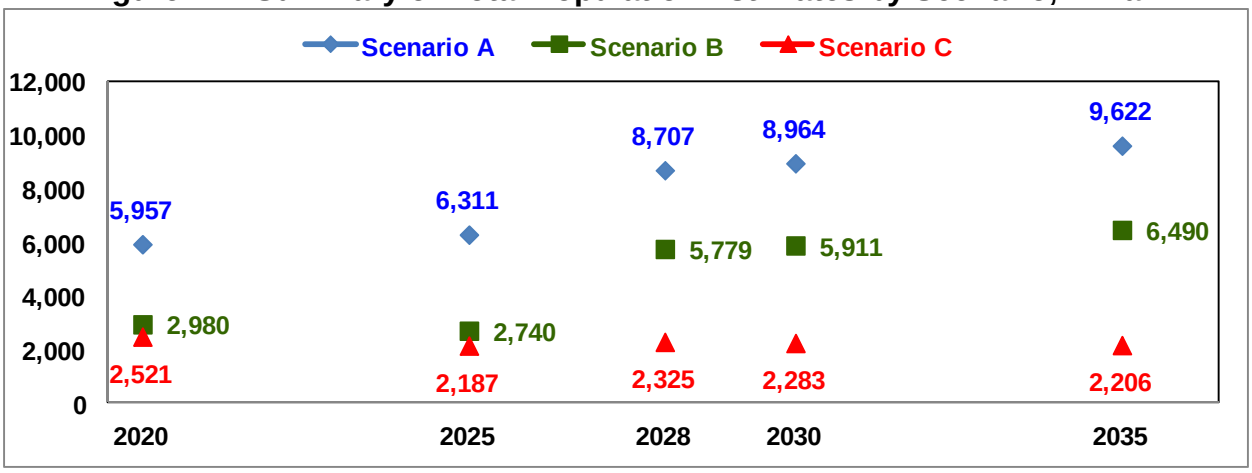
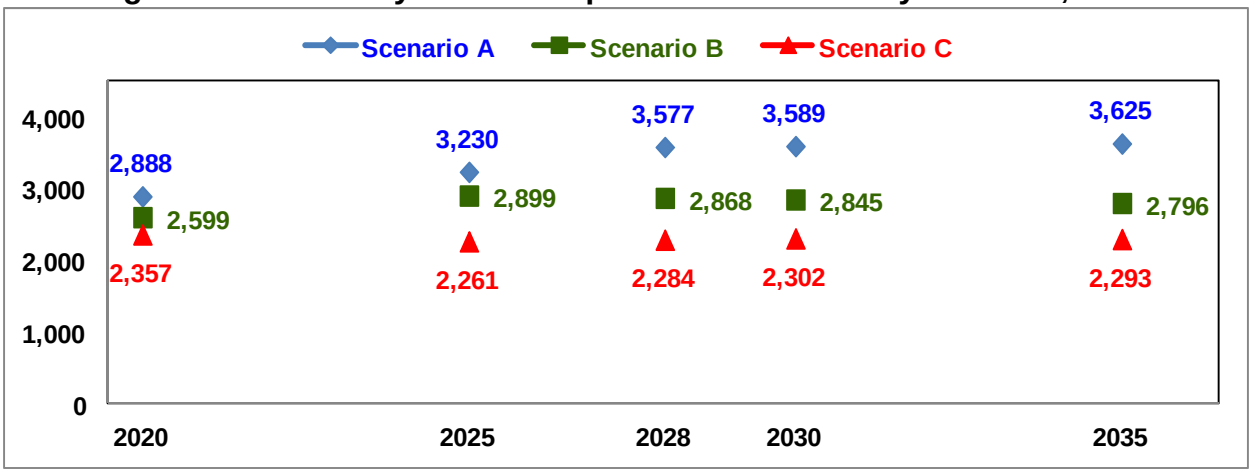


Figure 45: Summary of Total Population Estimates by Scenario, Rota



By contrast, the essentially catastrophic Scenario C is based on an equally possible future, characterized by loss of CW-1 workers and a reduction in tourism equivalent to what could happen if the Chinese market is blocked by elimination of "paroles" for visitors from China.

In this much greater range of possibilities (compared to the Eligible NMD figures previously summarized), the minimal 2028 Scenario C number is 64% of the maximal Scenario A number for Rota, 60% for Saipan, and just 27% for Tinian. The range is relatively greater for Tinian because economic activities proposed for that island – particularly casino-hotels, but also military activities[29] – is so wide, especially in comparison to existing population. These activities could involve labor demand far in excess of the island's supply and so require substantial in-migration.

4.3 Closing Comment: Future Population Data

This report has attempted to stress not only the CNMI's great uncertainty over economic futures, but also data limitation challenges facing Model development and validity. For example, the fundamental issue of "current" (2016) population baseline figures for each island and the Commonwealth as a whole required a judgmental choice between different available estimates, and may not have been accurate.

The Model could be modified and re-used in future years once 2020 Census data become available. However, this assumes that:

- The 2020 Census for the CNMI overall includes the detailed race/ethnic and other characteristics normally gathered in the American Community Survey (ACS). The Census Bureau has not conducted the ACS in the CNMI or American Samoa in inter-censal years – the only two U.S. areas for which ACS numbers have not been collected. It is likely but not certain that the ACS will be done in CNMI in 2020.

- These data will actually be *available* (either as tables or in Public Use Microdata Samples [PUMS]) in ways that permit separating age-sex characteristics for each of the three key population components considered here – i.e., NMD, Non-NMD CNMI Residents, and (Foreign) Non-Residents. That availability needs to be by island. Additionally, for DPL purposes, it would be very useful to have published data that permits identification of Chamorro *and/or* Carolinian age-sex characteristics (in cases where people report two or more race/ethnic categories).

Whether directly or through the Central Statistics Division, we suggest that DPL stay in touch with both the Census Bureau and its Congressional delegate to monitor debates in Congress about adequate funding and questionnaire content for the 2020 Census. These debates involve national budgetary and ideological issues that go far beyond what is fair or useful for CNMI, but it cannot hurt for the Commonwealth's voice to be heard in these decisions.

[29] There are significant questions about the compatibility of Tinian military activities with tourism activities on that island and perhaps other islands as well. See discussions in preceding Section 1.7.1.