COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

PUBLIC LAND USE PLAN

Prepared Under Authority of the

MARIANAS PUBLIC LAND CORPORATION

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DECEMBER 1989

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FOREWORD

The development of the Public Land Use Plan for the CNMI has taken place over the course of two years, ending December 1989. Efforts over the previous two years have culminated in four interrelated products, these are:

- The Public Land Use Plan Document
- A Public Lands Data Base
- Base Maps and Overlays
- Establishment of the Capability for a Geographic Information System (GIS)

The plan document, base maps, and setting up the GIS capability (mapping and organizing the data base) was the work of Duenas & Swavely, Incorporated. The field information for the data base was collected by the firm of P & R Enterprises.

This component is the Public Land Use Plan Document. While each component has aspects that can act individually they are also inexorably interconnected. In many ways it is this Plan Document that serves as the unifying element among the parts.

The Tables presenting the data base for public lands is contained in Appendix B, and because of its size has been produced as a separate document. The base maps and overlays number over 200 sheets and are each individual products delivered to the Marianas Public Land Corporation. The Geographic Information System capability is created by delivering the data base and maps in computer format suitable for use with the GIS software.

This planning effort is breaking new ground, doing things never done before. Because of this we anticipate errors and omissions. Errors and omissions are not unusual in a work of this nature. As a plan, this document must be routinely updated and improved. Chapter VII of the document discusses this in some detail. Both the general public and government agencies are encouraged to let MPLC know, verbally or in writing, when errors and omissions are found. In this way, we can collectively build upon this work and make it better.

CHAPTER I INTRODUCTION

The Commonwealth of the Northern Marianas Islands' most precious resources are its people and land. Unlike the people, land does not multiply. And as the population grows the amount of land available for each person becomes less. Therefore, management of land resources is crucial for the Commonwealth government to meet the challenges of the future.

This challenge is particularly true for public lands. While more than one third of Saipan and the majority of the other islands are in the public domain, the pressures of population and development are quickly diminishing this resource. Within 30 years developable public land on Saipan may be fully committed. Without publicly owned lands the CNMI government would be required to purchase land in order to meet demands for public services such as schools and homesteads.

Rota, Tinian, and the Northern Islands are not in the same position as Saipan due to their small populations and limited economic activities. This may change radically in the next few years with the advent of mega-resorts on Rota and casino gambling on Tinian. And as Saipan becomes overcrowded, persons seeking homesteads will relocate to other islands, as will growth and economic development.

The CNMI is in a position to plan, monitor, and direct growth through strategic use of public lands. Although THIS DOCUMENT IS NOT THE PLAN it is the plan document, a product of a planning process intended to address the issues mentioned above. This document represents a strategy from a point in time and how the future is viewed from what we know today. In the future, the plan should be changed to reflect better understanding, new information, and public aspirations.

A. SCOPE OF THE PUBLIC LAND USE PLAN

A Land Use Plan is an official document that serves as a guide to long range physical development. The plan is also an expression of public policy and community values. Lastly, this land use plan is comprehensive in that it covers the entire geographic area of the CNMI where public lands are found.

This CNMI Public Land Use Plan (hereinafter referred to as the Plan) encompasses the public land areas for the islands of Saipan, Rota, Tinian and the Northern Islands through the year 2015. The Plan includes the following components:

- Formulation of goals, objectives, and policies for planning and management of CNMI public lands.
- The development and synthesis of three growth scenarios into a projected growth pattern and scheme of land usage for the CNMI.
- Socioeconomic analyses and projections of aspects important for the land use planning process of public lands and consistent with the formulated goals, objectives, and policies. This is accomplished through the development of analytical models; the development of a Planning Information System and Geographic Information System; the location, space and land suitability criteria and analysis for public uses.

In simple terms the Plan introduces rules or policy statements that set out how lands should be allocated. Secondly, the Plan designates lands for particular uses or estimates gross land areas that will be required to meet public responsibilities. The Plan speaks directly to the demands placed on public land resources and how those demands can be met with the available public land base. During the coming years the Plan must be maintained through proper plan management that includes public participation, updates and revisions. Management also requires the technical tools and staff.

Within the Plan is recommended policy. The administration or management of policy is a different issue that relates to public capacity to manage. Public capacity is not and should not be a topic of a land use plan. However, public administration and management are key ingredients to plan implementation and so are related to public plan making. If plan implementation problems arise it is time for any government to take an introspective examination of capacity.

The Plan also focuses on land use requirements for public services. Public services are generated by population and rising expectations. As population and expectations increase there are greater demands on public land. For planning purposes there are three categories of people to plan for in the CNMI: resi-

dents, non-residents, and visitors. Each of these groups place different demands on public services.

In the resident category it is not difficult to be specific as to what public service needs will be in terms of overall land demands. This comes in the form of homesteads and community support facilities. Some of the public lands needed for such growth will come from the public domain while other land will be obtained through dedication of private lands such as subdivision streets and parks.

Land requirements for public services for visitors and non-residents should be met through the application of impact fees and exactions, so that demands placed on the system by these groups do not reduce existing public land resources.

The key in planning for these groups is making reasonable projections about the future situation in terms of numbers of residents, non-residents and visitors. While it is fairly easy to estimate residents, the task of estimating non-residents and visitors is based on a complicated set of issues and assumptions. These generators of demand must be monitored closely over the years regardless of the numbers presented in the plan document. This is an expected part of planning.

B. DOCUMENT ORGANIZATION AND SUMMARY

Chapter II - Proposed Goals, Objectives and Policies

Goals, objectives and policies are presented as the first substantive part of the plan. They are placed first because the remaining elements of the plan must be consistent and supportive of the intentions found in these statements. They include assumptions on how government will respond to growth; they indicate priorities, contain strategies, and give direction for Commonwealth-wide development, as well as specific recommendations for public lands.

Chapter III - Planning Scenario for the CNMI

To support this planning effort an Expected Growth Scenario was created for setting the level of development for the Commonwealth, and by island, for both public and private lands. This expected level of development is not necessarily that which is desired or recommended, but simply what can be expected and therefore forms the basis for planning.

Chapter IV - Public Land Use Plan for Saipan

The public land use plan for Saipan pays particular attention to the impacts of community development and the homestead program, and their impacts on public lands. Even without further leases for commercial purposes developable public lands on Saipan may be fully committed by 2018.

Chapter V - Public Land Use Plan for Rota

The plan for public lands on Rota accommodates community growth and assesses the pending impact of large-scale resort development on the island. The conclusion is that, although growth must be monitored, except for the possible shortage of water, resort development should not be curtailed for technical reasons.

Chapter VI - Public Land Use Plan for Tinian

The plan for public lands on Tinian accommodates community growth and deals with the federal lease situation which accounts for 80% of the island. It is recommended that if casino gambling facilities request public lands that it be allowed when it results in urban infill and is for hotel-style rather than resort development, including golf courses.

Chapter VII - Management of the Public Land Use Plan

As stated earlier this document is not the Plan but a result of a planning process. Chapter VII provides the guidelines for how to manage the process of planning for public lands.

CHAPTER II PROPOSED GOALS, OBJECTIVES AND POLICIES

Proposed goals, objectives and policies are presented first because once adopted they will influence the way the CNMI plans and manages its public lands in the future. Moreover, these statements establish a set of assumptions, principles, priorities, strategies and specific recommendations for the use of public lands. The remainder of the plan document must be consistent with and supportive of the intentions contained herein.

The terms "goal", "objective", and "policy" can have different meanings depending upon the context they are used. For the purposes of this Plan, they are defined as follows.

Goal
The long-term ideal or desired end product.

Objective
A statement that establishes a guideline for actions which achieve the goal, and may be quantitative.

Policy
Either an assumption or an action statement that is a step in implementation of an objective.

A. THE GOAL

The goal of the Public Land Use Plan is to assure that there are sufficient land resources to meet demands on public lands for services and the homestead program through the year 2015 and, as a second priority, to support the economic development of the CNMI.

B. THE OBJECTIVES

Four objectives have been identified for the CNMI Public Land Use Plan. These objectives are intended to provide guidance but also to allow for flexibility in response to various situations that cannot be anticipated.

1. Utilize the public land resources of the CNMI in an equitable* and efficient** manner.

   * equitable refers to equal access, allowing people of various income categories the use/access of public lands.

   ** efficient refers to land used at its highest and best use and in a manner which provides for public services in a cost effective manner.

2. Manage public lands to direct overall physical growth in a socially responsible manner.

3. Provide land resources to supply the demand for housing for the residents of the CNMI as provided by law.

4. Utilization of public lands to provide revenues for the management of public lands and for physical development that serves a public purpose.

C. THE POLICIES

The policies are divided into three categories.

- Overall policies are actions by the CNMI government which have an impact on the development of both private and public lands throughout the Commonwealth. These policies can be considered as assumptions since this planning effort has no direct ability to influence overall CNMI policy or enforcement measures. It is necessary to make these assumptions as they set the context for growth and are integral to an expected growth scenario.
- Public land-specific policies are those actions intended to apply only to publicly owned land.
- Island-specific policy is focused on a particular island and can be for either island-wide public and private lands, or specifically for public land.

1. Overall Policies

1.1 The CNMI will emphasize reserving land resources (public and privately owned) so that they will be available for future generations; appropriate sites will be developed as the long-term need is established.

1.2 The CNMI government will limit leases for large foreign-owned hotel and other foreign-owned commercial developments in favor of management policies and practices that emphasize developed and undeveloped uses by present and future generations of residents.

1.3 The agencies of the CNMI government will work together to coordinate all development efforts, and to ensure that infrastructure improvements keep pace with, and are appropriately located for commercial and residential development.

1.4 The CNMI will aggressively pursue policies that promote the protection of water resources by not allowing any use that could potentially contaminate aquifers and surface waters.

1.5 The CNMI will manage land resources through effective zoning and building codes for public and private lands.

1.6 Major developments on public or private lands that demand utility and other services must provide for their own infrastructure requirements on a self-sufficient basis, or pay an appropriate impact fee for upgrading infrastructure capacity. In addition, these developments must provide living quarters for their non-resident employees.

2. Public Land-Specific Policies

2.1 The CNMI government will set aside and protect prime agricultural land and other open space land uses that do not conflict with the provision of public services and programs.

2.2 The CNMI government will limit lands to be developed; lands that are developed will be developed according to an established priority order for each island, and be adequately supported by infrastructure and public services.

In particular, public lands served with existing infrastructure and public services will be developed before lands which are not served by infrastructure and services.

2.3 Labor-intensive industries will not be eligible for public land leases, the visitor industry excepted.

2.4 Lease pricing policies will reflect the social value of the use, and not necessarily maximize total lease revenues to the CNMI; such leases will contain provisions to ensure future uses are consistent with the original intent of the lease.

When, for social reasons, lease prices are not maximized based on the "highest and best" use of the land, this will be recognized as a subsidy for this use. This subsidy will be itemized on a case-by-case basis so that decision makers are aware of the actual cost, so as to make informed decisions.

2.5 When public lands are leased for private uses and developed in an "irreversible manner" (i.e. major construction) which is the "highest and best" (maximized economic return) use of the land, assuming this use is suitable to the site, the use will be allowed to remain; the lease amount will be based on market rates. Market rates are calculated by one of the following methods: comparable rents on private property, replacement cost, value of sales price of comparable land, all of the sale prices within the last six months.

2.6 The CNMI will adopt a land exchange policy whereby public lands will be offered in exchange for private lands in particular areas where existing public land resources are not sufficient to service the community.

As a corollary, when homestead areas that, due to land configuration and site planning, do not provide private lands suitable and convenient for private sector neighborhood commercial development, (an important form of community economic base,) public lands will be offered to private entrepreneurs for sale or exchange. In this situation the CNMI government will pursue a policy of land exchange to encourage neighborhood commercial development on privately owned land within homestead areas.

2.7 Existing conservation areas (forests, wildlife habitats, wetlands) should be exchanged for other vacant public land when all the conditions below are true:

a) The other public land is of equal or better utility;
b) The conservation area to be exchanged is suitable for development for a public purpose, and;
c) The other public land is not suitable for development, i.e., a slope of 20% or greater.

2.8 Priority for public land allocations will be given first to health and public safety, secondly to homesteads and other public services, then for economic activities including industry, tourism, commerce, and agriculture.

2.9 Not all public land resources are designated for a specific use at this time. Some lands are kept in a reserve category so that future decision makers may decide the best use of the land as the socioeconomic situation evolves. Lands in reserve capacity could be used in temporary status for conservation, recreation or agriculture.

2.10 The Homestead Program will include alternative housing styles so as to allow town houses and walk-up condominiums.

2.11 Selected public lands will be identified as multi-family home sites that will be sold at a discount to residents. This would be particularly suitable on small, isolated public lots and, in the case of Saipan, in the "Strategic Corridor."

2.12 Public land in the immediate vicinity of a wastewater treatment facility and/or power generation facility should be reserved for the anticipated expansion of these activities to meet current unmet and projected demand. The land may be developed in a non-permanent fashion until expansion needs are realized. In addition, public lands already developed in this vicinity for non-priority activities may be condemned and replaced. Privately owned land in the vicinity may also be condemned if needed for expansion purposes.

3. Island-Specific Policies

3.1 As currently practiced on Saipan, non-resident labor residential quarters will not be allowed on public land. However, if it can be demonstrated that public land proposed for non-resident housing is not suitable for a public use, then the request may be justified, particularly when this results in urban in-fill. Alternatively, the public land could be exchanged for private lands thereby maintaining net public land resources. This type of exchange can be executed on the same island or on an interisland basis.

3.2 Zoning within the Saipan Strategic Corridor will support and encourage increased density and urban in-fill.

3.3 Given the particular situation on Saipan, that it is experiencing rapid growth with a limited amount of developable public land resources, it is not prudent to allow additional private use of public land through leases which result in development in an irreversible manner (including golf courses) for non-public purposes unless one of the situations below is true:

a) The land is unsuitable for any public purpose;
b) The prospective developer will replace the public land with private land of equal or better utility and value for a public purpose; or,
c) Public use of the land is not compatible with the existing surrounding development, or the public use would not have a "synergistic"* impact on the surrounding area.

* *The term synergistic is used to denote that land uses, in addition to being compatible, are actually supportive of each other and add to each other's value. In such a case the value of synergistic uses are greater than the sum of the individual parts. For example, an elementary school and a housing development, a drug store and a food market, a hotel and a restaurant. Each of these pairs demonstrates land uses and activities that are supportive of each other, thereby giving them greater value than if they were not located near each other.*

Note: the purpose of Policy 3.3 is not meant to freeze public lands as public. This policy is intended to maintain the amount of public lands. A land exchange between public and private ownership which does not diminish the amount of usable public lands on Saipan is consistent with this policy.

3.4 On Saipan, the relative share of homestead units in the multifamily category will reach 50% by the year 2015. Rota and Tinian will have a lower percentage unless demand is expressed for multi-family style housing.

3.5 Public lands in the Northern Islands will remain in their current designation as conservation areas.

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CHAPTER III THE CNMI PLANNING SCENARIO

The Public Land Use Plan is developed without the advantage of a Commonwealth-wide land use scheme for both public and private lands. Plans for the use of public and private lands are generally developed concurrently. In this way, the plans provide a proper context for each other and are, by design, integrated under the same legal and administrative framework and based on the same development scenario. As an example, most communities have an area designated as residential development at a certain density of units per specified area. From this, the government can estimate future demands for utilities, roads, parks, and services such as schools, fire and police. In addition, there is no explicit legal and administrative structure for land development and control (with the exception of certain Coastal Resources Management regulations and impending regulations for a zoning code).

Given this situation, there is a critical need to establish a contextual base line (an expected growth scenario) prior to the development of a plan for public lands.

Two levels of analysis have been pursued in the formulation of the CNMI Public Land Use Plan. The first level of analysis is at the macro level, evaluating socioeconomic trends and public policy implications and estimating the impact of land use overall on Saipan, Rota, and Tinian, referred to here as the Planning or Expected Growth Scenario. The second approach is to specifically analyze the demands and supply of public land resources through the year 2015 with a variety of analytic models utilizing socioeconomic data and principles of land use planning. There are a total of 11 analytic computer-assisted planning models that support the plan. These models are further described in the Plan Management chapter under "Prediction and Decision Models."

A. FIRST LEVEL ANALYSIS: THE EXPECTED GROWTH SCENARIO

Three growth scenarios were developed for the MPLC and discussed in detail at a three-day workshop among government and private sector representatives in March 1989. The results of that workshop form the foundation for the CNMI Planning Growth Scenario used as the basis for this Public Land Use Plan.

It should be noted that the Planning Growth Scenario is not necessarily the "preferred" path for growth but, instead, the "most likely" path of growth. Consequently, it is that "most likely" growth which forms the background for this Public Land Use Plan.

The First Level Analysis of the Expected Growth Scenario covers three areas:

- The levels of economic activity for the "basic" sectors of the CNMI economy: the visitor industry, garment industry, fishing and agriculture, and government, including resultant population projections for residents, non-residents, and visitors.
- Land use estimates for the major categories of land uses: residential, commercial, agricultural, institutional, industrial, recreation and an undesignated reserve for future planning purposes.
- Anticipated spatial growth patterns in terms of predominate land uses and densities.

1. ECONOMIC AND EMPLOYMENT PROJECTIONS FOR THE EXPECTED GROWTH SCENARIO

As a result of the economic forces impacting the CNMI and due to the influence of the proposed public policy, projections can be made about the future in terms of economic activity, employment, overall land use demands, and the spatial consequences of these demands.

The expected economic and employment projections for the CNMI through the year 2015 are presented in Table III-1, "Economic and Employment Projections Model." This model presents estimated growth in value of output (in constant dollars) for the visitor industry, garment and other manufactures, government, and agriculture and fisheries. Employment is estimated by using a ratio of Basic GIP per job. This model assumes that all employment in the CNMI is related to one of these sectors. It is assumed that resident workers will be employed first, and as 100% employment is reached the remaining labor demand will be supplied by non-resident workers.

Table III-1 provides a conservative estimate of growth, although only a few years ago such a projection would have seemed excessively high. For comparison purposes, a model has been constructed as Table III-1A, Rapid Visitor Industry Growth. This table indi-

TABLE III-1 ECONOMIC AND EMPLOYMENT PROJECTIONS

Year	Visitor Expenditure ($1,000)		Garment & Manufacture ($1,000)		Government ($1,000)		Agriculture & Fishery ($1,000)		Basic GIP ($1,000)	% Change	Employ-ment	Annual Change	Resident Workers	Annual Change	Effic-iency	Change Foreign Workers	Total Foreign Workers
1987	$196,407		$30,000		$130,000		$2,000		$358,407		14,651		5,174		1.00		9,477
1988	$246,075	20%	$33,000	10%	$145,600	12%	$2,000	0%	$426,675	19.0%	17,442	2,791	5,389	216	1.00	2,575	12,052
1989	$318,358	23%	$34,650	5%	$151,424	4%	$2,000	0%	$506,432	18.7%	20,702	3,260	5,614	225	1.00	3,036	15,088
1990	$382,029	20%	$34,650	0%	$157,481	4%	$2,000	0%	$576,160	13.8%	23,377	2,675	5,839	225	1.03	2,451	17,539
1991	$439,334	15%	$34,650	0%	$163,780	4%	$2,000	0%	$639,764	11.0%	25,909	2,532	6,072	234	1.04	2,299	19,837
1992	$500,840	14%	$34,650	0%	$170,331	4%	$2,000	0%	$707,822	10.6%	28,619	2,709	6,315	243	1.05	2,466	22,304
1993	$560,941	12%	$34,650	0%	$177,145	4%	$2,000	0%	$774,736	9.5%	31,341	2,723	6,568	253	1.05	2,470	24,774
1994	$617,035	10%	$34,650	0%	$184,230	4%	$2,000	0%	$837,916	8.2%	33,911	2,570	6,830	263	1.05	2,307	27,081
1995	$678,739	10%	$34,650	0%	$191,600	4%	$2,000	0%	$906,988	8.2%	36,721	2,810	7,104	273	1.05	2,537	29,617
1996	$712,676	5%	$34,650	0%	$199,264	4%	$2,000	0%	$948,589	4.6%	38,407	1,686	7,388	284	1.05	1,402	31,020
1997	$748,309	5%	$34,650	0%	$207,234	4%	$2,000	0%	$992,194	4.6%	40,175	1,768	7,683	296	1.05	1,472	32,492
1998	$785,725	5%	$34,650	0%	$215,524	4%	$2,000	0%	$1,037,898	4.6%	42,028	1,853	7,990	307	1.05	1,546	34,037
1999	$825,011	5%	$34,650	0%	$224,145	4%	$2,000	0%	$1,085,806	4.6%	43,970	1,942	8,310	320	1.05	1,623	35,660
2000	$866,262	5%	$34,650	0%	$233,110	4%	$2,000	0%	$1,136,022	4.6%	46,006	2,036	8,642	332	1.05	1,704	37,364
2001	$883,587	2%	$34,650	0%	$242,435	4%	$2,000	0%	$1,162,672	2.3%	47,078	1,072	8,988	346	1.05	726	38,090
2002	$901,259	2%	$34,650	0%	$252,132	4%	$2,000	0%	$1,190,041	2.4%	48,179	1,101	9,348	360	1.05	741	38,832
2003	$919,284	2%	$34,650	0%	$262,217	4%	$2,000	0%	$1,218,151	2.4%	49,310	1,130	9,722	374	1.05	756	39,588
2004	$937,669	2%	$34,650	0%	$272,706	4%	$2,000	0%	$1,247,026	2.4%	50,471	1,161	10,110	389	1.05	772	40,360
2005	$956,423	2%	$34,650	0%	$283,614	4%	$2,000	0%	$1,276,687	2.4%	51,663	1,192	10,515	404	1.05	788	41,148
2006	$975,551	2%	$34,650	0%	$294,959	4%	$2,000	0%	$1,307,160	2.4%	52,888	1,225	10,936	421	1.05	804	41,952
2007	$995,062	2%	$34,650	0%	$306,757	4%	$2,000	0%	$1,338,470	2.4%	54,146	1,258	11,373	437	1.05	821	42,773
2008	$1,014,964	2%	$34,650	0%	$319,028	4%	$2,000	0%	$1,370,641	2.4%	55,438	1,292	11,828	455	1.05	837	43,610
2009	$1,035,263	2%	$34,650	0%	$331,789	4%	$2,000	0%	$1,403,701	2.4%	56,766	1,328	12,301	473	1.05	855	44,465
2010	$1,055,968	2%	$34,650	0%	$345,060	4%	$2,000	0%	$1,437,678	2.4%	58,130	1,364	12,793	492	1.05	872	45,337
2011	$1,066,528	1%	$34,650	0%	$358,863	4%	$2,000	0%	$1,462,040	1.7%	59,100	970	13,305	512	1.05	459	45,796
2012	$1,077,193	1%	$34,650	0%	$373,217	4%	$2,000	0%	$1,487,060	1.7%	60,096	996	13,837	532	1.05	464	46,260
2013	$1,087,965	1%	$34,650	0%	$388,146	4%	$2,000	0%	$1,512,761	1.7%	61,119	1,023	14,390	553	1.05	469	46,729
2014	$1,098,845	1%	$34,650	0%	$403,672	4%	$2,000	0%	$1,539,166	1.7%	62,170	1,051	14,966	576	1.05	475	47,204
2015	$1,109,833	1%	$34,650	0%	$419,818	4%	$2,000	0%	$1,566,302	1.8%	63,249	1,079	15,565	599	1.05	481	47,685

TABLE III-1A RAPID VISITOR INDUSTRY GROWTH ECONOMIC AND EMPLOYEMENT PROJECTIONS

Year	Visitor Expenditure ($1,000)		Garment & Manufacture ($1,000)		Government ($1,000)		Agriculture & Fishery ($1,000)		Basic GIP ($1,000)	% Change	Employ-ment	Annual Change	Resident Workers	Annual Change	Effic-iency	Change Foreign Workers	Total Foreign Workers
1987	$196,407		$30,000		$130,000		$2,000		$358,407		14,651		5,174		1.00		9,477
1988	$246,075	20%	$33,000	10%	$145,600	12%	$2,000	0%	$426,675	19.0%	17,442	2,791	5,389	216	1.00	2,575	12,052
1989	$318,358	23%	$34,650	5%	$151,424	4%	$2,000	0%	$506,432	18.7%	20,702	3,260	5,614	225	1.00	3,036	15,088
1990	$382,029	20%	$34,650	0%	$157,481	4%	$2,000	0%	$576,160	13.8%	23,377	2,675	5,839	225	1.03	2,451	17,539
1991	$458,435	20%	$34,650	0%	$163,780	4%	$2,000	0%	$658,865	14.4%	26,690	3,313	6,072	234	1.04	3,080	20,618
1992	$550,122	20%	$34,650	0%	$170,331	4%	$2,000	0%	$757,103	14.9%	30,633	3,943	6,315	243	1.05	3,700	24,318
1993	$660,146	20%	$34,650	0%	$177,145	4%	$2,000	0%	$873,941	15.4%	35,397	4,763	6,568	253	1.05	4,511	28,829
1994	$858,190	30%	$34,650	0%	$184,230	4%	$2,000	0%	$1,079,071	23.5%	43,769	8,372	6,830	263	1.05	8,109	36,939
1995	$1,115,647	30%	$34,650	0%	$191,600	4%	$2,000	0%	$1,343,897	24.5%	54,581	10,812	7,104	273	1.05	10,539	47,477
1996	$1,450,342	30%	$34,650	0%	$199,264	4%	$2,000	0%	$1,686,255	25.5%	68,562	13,981	7,388	284	1.05	13,697	61,174
1997	$1,812,927	25%	$34,650	0%	$207,234	4%	$2,000	0%	$2,056,811	22.0%	83,695	15,133	7,683	296	1.05	14,837	76,011
1998	$2,266,159	25%	$34,650	0%	$215,524	4%	$2,000	0%	$2,518,332	22.4%	102,545	18,851	7,990	307	1.05	18,543	94,555
1999	$2,719,390	20%	$34,650	0%	$224,145	4%	$2,000	0%	$2,980,185	18.3%	121,409	18,864	8,310	320	1.05	18,544	113,099
2000	$3,127,299	15%	$34,650	0%	$233,110	4%	$2,000	0%	$3,397,059	14.0%	138,433	17,024	8,642	332	1.05	16,692	129,791
2001	$3,283,664	5%	$34,650	0%	$242,435	4%	$2,000	0%	$3,562,749	4.9%	145,189	6,756	8,988	346	1.05	6,410	136,201
2002	$3,447,847	5%	$34,650	0%	$252,132	4%	$2,000	0%	$3,736,629	4.9%	152,279	7,090	9,348	360	1.05	6,730	142,931
2003	$3,620,240	5%	$34,650	0%	$262,217	4%	$2,000	0%	$3,919,107	4.9%	159,720	7,441	9,722	374	1.05	7,067	149,998
2004	$3,801,252	5%	$34,650	0%	$272,706	4%	$2,000	0%	$4,110,608	4.9%	167,529	7,809	10,110	389	1.05	7,420	157,418
2005	$3,991,314	5%	$34,650	0%	$283,614	4%	$2,000	0%	$4,311,578	4.9%	175,724	8,195	10,515	404	1.05	7,791	165,209
2006	$4,190,880	5%	$34,650	0%	$294,959	4%	$2,000	0%	$4,522,489	4.9%	184,324	8,601	10,936	421	1.05	8,180	173,389
2007	$4,400,424	5%	$34,650	0%	$306,757	4%	$2,000	0%	$4,743,831	4.9%	193,351	9,026	11,373	437	1.05	8,589	181,978
2008	$4,620,445	5%	$34,650	0%	$319,028	4%	$2,000	0%	$4,976,123	4.9%	202,823	9,473	11,828	455	1.05	9,018	190,996
2009	$4,851,467	5%	$34,650	0%	$331,789	4%	$2,000	0%	$5,219,906	4.9%	212,765	9,942	12,301	473	1.05	9,469	200,464
2010	$5,094,041	5%	$34,650	0%	$345,060	4%	$2,000	0%	$5,475,751	4.9%	223,199	10,434	12,793	492	1.05	9,942	210,406
2011	$5,144,981	1%	$34,650	0%	$358,863	4%	$2,000	0%	$5,540,494	1.2%	225,820	2,621	13,305	512	1.05	2,109	212,515
2012	$5,196,431	1%	$34,650	0%	$373,217	4%	$2,000	0%	$5,606,298	1.2%	228,483	2,663	13,837	532	1.05	2,131	214,646
2013	$5,248,395	1%	$34,650	0%	$388,146	4%	$2,000	0%	$5,673,191	1.2%	231,190	2,707	14,390	553	1.05	2,153	216,800
2014	$5,300,879	1%	$34,650	0%	$403,672	4%	$2,000	0%	$5,741,201	1.2%	233,941	2,751	14,966	576	1.05	2,176	218,975

cates growth rates that are necessary to meet all the currently planned or proposed projects on Saipan, the full development of the mega-resorts on Rota in two to three years, and the impact of casino gambling on Tinian which may come into play in about five years. After 1997, these developments will begin to mature with declining growth rates; after the year 2000 the growth rate steadily declines. The results of such a growth scenario depicted in Table III-1A are startling and are included in the plan document as a reference point for rapid growth in tourism. Table III-1A does not constitute a recommendation or represent what is expected to occur. Table III-1 illustrates the expected growth scenario.

The results of the Expected Growth Model are described below, sector by sector, with reference to the Rapid Visitor Growth Scenario when appropriate.

a. The Visitor Industry

Growth in the visitor industry has been accelerating. There was 15% growth in 1987 over 1986, 25% growth in 1988 over 1987, and there was a 36% growth in arrivals during 1989 as compared to arrivals in 1988. It seems clear that moderate to high growth will continue into the near future.

Eventually, however, growth rates are expected to decline for several reasons, including:

- Competing destinations will divert visitors from the CNMI.
- Insufficient water supplies.
- Increasing costs of development due to marginal costs of infrastructure improvements.
- Air transportation facilities and carriers will be inadequate to support rapid growth.
- Labor shortages will hinder the construction and operation of tourist related activities.
- Hotel construction will not be able to keep pace with demand.
- The impact of gambling on Tinian will not be significant.
- The social/political response to growth will become increasingly negative.
- Introduction of government regulations and land use controls will slow the pace of growth and make it more expensive.

Based on these assumptions the current surge in visitor arrivals will steadily decline to an annual growth rate of approximately 2% beginning in the year 2001, and to 1% in 2010. Even so, it is estimated that by 2015 there will be over a million visitors to the CNMI (Table III-2). The assumptions presented here must be monitored with adjustments made to growth projections accordingly.

If these assumptions are relaxed the Rapid Visitor Industry Expansion Model sets the high end of growth possibilities. In this model the number of yearly visitors approaches 5 million by the year 2015 and, to support this, there must be over 35,000 hotel rooms and visitor-used condominiums.

In Tables III - 3, 3A and III - 4, 4A, are presented the change in the number of visitors, hotel rooms and condos, and the number of non-residents necessary to fill the direct and indirect jobs created by the visitor industry, for both expected and rapid growth possibilities (rapid growth tables demoted by "A"). In Table 4 and 4A the figures are broken down by island: Saipan, Rota, and Tinian.

b. Garment And Other Manufacturing

After dramatic increases in the garment industry in recent years manufacturing growth will slow to 5% in 1989 and no growth in 1990. Interest has been expressed for as many as five new garment factories to be located on Tinian (all on private land). Because of this, increases in the garment industry over the next several years are a possibility. Until these plans are realized, however, the garment industry is actually expected to decline but this decrease will be offset by other manufacturing gains so that the net result will remain the same. This sector must be closely monitored with projections updated if new garment industries start up.

c. Government

Government expenditures were expected to decrease by 4% in 1989 after annual increases of 24% and 12% in 1987 and 1988 respectively. Government expenditures should remain at a 4% annual increase matching resident population growth, and perhaps a little more for current unmet demands for services. Land demands for government administration on Saipan will be marginal, as use of existing public lands on Capitol Hill and Lower Base can be intensified.

However, while growth in government administration is not expected to result in marked demand for public land resources, the growth in general community based services, such as for schools and neighborhood recreation, will be significant and will exert concurrent demand for additional public land. Those increases will be directly related to growth in the resident population and, to a lesser degree, to non-residents and visitors.

TABLE III-2 EXPECTED AND RAPID VISITOR INDUSTRY GROWTH IMPACTS MODEL

	EXPECTED GROWTH SCENARIO					RAPID VISITOR INDUSTRY GROWTH SCENARIO				
Year	Visitor Expenditure ($1,000)	% Change	Estimated Arrivals	Rooms Required	Rooms @ 75% Occupancy	Visitor Expenditure ($1,000)	% Change	Estimated Arrivals	Rooms Required	Rooms @ 75% Occupancy
1987	$196,407		186,203	1,020	1,360	$196,407		186,203	1,020	1,360
1988	$246,075	20%	233,291	1,278	1,704	$246,075	20%	233,291	1,278	1,704
1989	$318,358	23%	301,818	1,654	2,205	$318,358	23%	301,818	1,654	2,205
1990	$382,029	20%	362,182	1,985	2,646	$382,029	20%	362,182	1,985	2,646
1991	$439,334	15%	416,509	2,282	3,043	$458,435	20%	434,618	2,381	3,175
1992	$500,840	14%	474,820	2,602	3,469	$550,122	20%	521,542	2,858	3,810
1993	$560,941	12%	531,798	2,914	3,885	$660,146	20%	625,850	3,429	4,572
1994	$617,035	10%	584,978	3,205	4,274	$858,190	30%	813,605	4,458	5,944
1995	$678,739	10%	643,476	3,526	4,701	$1,115,647	30%	1,057,686	5,796	7,727
1996	$712,676	5%	675,650	3,702	4,936	$1,450,342	30%	1,374,992	7,534	10,046
1997	$748,309	5%	709,432	3,887	5,183	$1,812,927	25%	1,718,740	9,418	12,557
1998	$785,725	5%	744,904	4,082	5,442	$2,266,159	25%	2,148,425	11,772	15,696
1999	$825,011	5%	782,149	4,286	5,714	$2,719,390	20%	2,578,110	14,127	18,836
2000	$866,262	5%	821,257	4,500	6,000	$3,127,299	15%	2,964,827	16,246	21,661
2001	$883,587	2%	837,682	4,590	6,120	$3,283,664	5%	3,113,068	17,058	22,744
2002	$901,259	2%	854,436	4,682	6,242	$3,447,847	5%	3,268,721	17,911	23,881
2003	$919,284	2%	871,524	4,775	6,367	$3,620,240	5%	3,432,157	18,806	25,075
2004	$937,669	2%	888,955	4,871	6,495	$3,801,252	5%	3,603,765	19,747	26,329
2005	$956,423	2%	906,734	4,968	6,625	$3,991,314	5%	3,783,953	20,734	27,645
2006	$975,551	2%	924,869	5,068	6,757	$4,190,880	5%	3,973,151	21,771	29,028
2007	$995,062	2%	943,366	5,169	6,892	$4,400,424	5%	4,171,809	22,859	30,479
2008	$1,014,964	2%	962,233	5,273	7,030	$4,620,445	5%	4,380,399	24,002	32,003
2009	$1,035,263	2%	981,478	5,378	7,171	$4,851,467	5%	4,599,419	25,202	33,603
2010	$1,055,968	2%	1,001,107	5,486	7,314	$5,094,041	5%	4,829,390	26,462	35,283
2011	$1,066,528	1%	1,011,118	5,540	7,387	$5,144,981	1%	4,877,684	26,727	35,636
2012	$1,077,193	1%	1,021,230	5,596	7,461	$5,196,431	1%	4,926,461	26,994	35,992
2013	$1,087,965	1%	1,031,442	5,652	7,536	$5,248,395	1%	4,975,725	27,264	36,352
2014	$1,098,845	1%	1,041,756	5,708	7,611	$5,300,879	1%	5,025,483	27,537	36,716
2015	$1,109,833	1%	1,052,174	5,765	7,687	$5,353,888	1%	5,075,737	27,812	37,083

TABLE III - 3

VISITOR, ROOM DEMAND, AND NON-RESIDENT LABOR PROJECTIONS
1989 - 2015

Year	Visitors	Visitors Per Day	Hotel Rooms/Condos Demanded	Non-resident Labor Less Garment Workers
1989	301,818	2,977	2,205	11,388
2015 (est.)	1,052,174	10,378	7,687	43,985
Change	750,356	7,401	5,482	32,597

TABLE III - 3A

RAPID VISITOR INDUSTRY GROWTH
VISITOR, ROOM DEMAND, AND NONRESIDENT LABOR PROJECTIONS
1989 - 2015

Year	Visitors	Visitors Per Day	Hotel Rooms/Condos Demanded	Non-resident Labor Less Garment Workers
1989	301,818	3,002	2,223	11,388
2015 (est.)	5,075,737	50,479	37,392	217,474
Change	4,773,919	47,478	35,169	206,086

These models assume that visitors stay an average of 3.63 days, spend $293 per day and generate an occupancy rate of 1.8 persons per hotel room with hotels at 75% occupancy.

TABLE III - 4

NUMBER OF HOTEL ROOMS, VISITORS, AND NON-RESIDENT WORKERS
BY ISLAND, 1989 - 2015

	No. Existing 1989	Rooms Projected 2015	Percent of Total	No. of Visitors in 2015	No. Daily Visitors in 2015	Non-resident Labor Less Garment in 2015
Saipan	2,000	5,937	77%	812,639	8,015	33,971
Rota	100	1,250	16%	171,096	1,688	7,152
Tinian	40	500	7%	68,439	675	2,861
Total	2,140	7,687	100%	1,052,174	10,378	43,985

d. Agriculture And Fisheries

Agriculture and fisheries are expected to remain constant in terms of value of GIP. But this steady state will only be possible with increases in fisheries as agriculture declines. Agriculture will necessarily decline as demand for developable land for community development supplants agricultural uses both in the private and public domain. With careful programing, however, agriculture (especially cultivation) can become more efficient and target specific local and visitor markets with high value added crops.

e. Employment and Economic Growth

Employment will increase from an estimated 20,702 in 1989 to 59,137 in 2015. Of this number 15,565 will be from the resident work force and 43,572 must be supplied from non-resident labor. If there is rapid expansion of the visitor industry as depicted in Table

TABLE III - 4A

RAPID VISITOR INDUSTRY GROWTH
NUMBER OF HOTEL ROOMS, VISITORS, AND NON-RESIDENT WORKERS
BY ISLAND, 1989 - 2015

	No. Existing 1989	Rooms Projected 2015	Percent of Total	No. of Visitors in 2015	No. Daily Visitors in 2015	Non-resident Labor Less Garment in 2015
Saipan	2,000	17,500	49%	2,478,042	24,645	106,174
Rota	100	10,745	30%	1,521,518	15,132	65,191
Tinian	40	7,600	21%	1,076,178	10,703	46,110
Total	2,140	35,845	100%	5,075,737	50,479	217,474

III - 1A, there will be 216,634 jobs in the year 2015 with 201,069 positions filled by non-residents. Residents are fully employed under both scenarios at the 15,565 level.

f. Population

Population estimates for the resident population are made irrespective to economic growth. Non-residents, however, are estimated by the number of jobs left vacant due to lack of resident work force. The non-residents are divided by island according to the relative number of hotel rooms per island projected by the year 2015. This projection method is reasonably accurate, but the factors upon which the model is based are subject to the changing economy experienced by CNMI overall, and by each island. The results are provided in Table III - 5. Table III - 5A presents population growth with rapid growth of the visitor industry.

TABLE III - 5

ESTIMATED RESIDENT, NON-RESIDENT AND VISITOR POPULATION BY 2015

	Total	Resident	Non-resident	Visitor
Saipan	97,995	52,309	37,671	8,015
Rota	13,161	4,321	7,152	1,688
Tinian	5,910	2,374	2,861	675
Total	117,066	59,004	47,685	10,378

TABLE III - 5A

RAPID VISITOR INDUSTRY GROWTH
ESTIMATED RESIDENT, NON-RESIDENT AND VISITOR POPULATION BY 2015

	Total	Resident	Non-resident	Visitor
Saipan	186,827	52,309	109,874	24,645
Rota	84,643	4,321	65,191	15,132
Tinian	59,186	2,374	46,110	10,703
Total	330,657	59,004	221,174	50,479

2. PROJECTING LAND USES FOR THE PLANNING GROWTH SCENARIO

A model for projecting land use has been developed for the CNMI Public Land Use Plan. This model projects land uses based on population increases and assumed densities of persons per acre for each land use. Independent models have been constructed for Saipan, Rota and Tinian. The estimated land demanded to support this scenario was based on estimated population and an assumed density level. Estimates for land demands must be an ongoing process of a planning program as actual development trends are realized.

Land uses have been categorized as:

Undeveloped
Residential
Commercial
CNMI Government
Industrial
Tourist
Agricultural (cultivation only)
Recreation
Private Institutional

Changes in land uses (public and private) as generated by the model for the years 1989 and 2015 are provided below by island (Table III - 6).

3. LOCATION AND DENSITIES OF LAND USES

Using the projected land use and development patterns as a guide, it is possible to project future predominant land uses and densities on Saipan, Rota and Tinian. Maps for each island are provided, illustrating projected predominant land uses and densities. Note: The uses of land and densities presented on these maps are a reflection of what is expected to occur, not necessarily what is recommended. (MAP III-1,-2,&3)

These maps use the terminology "low density," "medium density" and "high density." These terms are defined below.

Low Density

- Agricultural use is for grazing or small scale cropping
- Single-family houses are on large lots or surrounded with many vacant lots.
- Commercial activity is not concentrated and is located in buildings less than three stories in height.
- Light industry is present.
- Hotels and resorts are present but generally isolated from each other.

Medium Density

- Typically, land for agricultural uses which is declining in favor of urban uses.
- Single-family houses are concentrated with little open space between lots; few if any vacant lots exist, some multifamily structures may be present.
- There are concentrations of commercial activity (wholesale and retail) with some shopping malls and structures that may exceed three stories.
- Hotels and resorts may form a dominant presence around the shore or other attraction.
- Light industrial uses may be in substantial buildings or clustered in close proximity.

High Density

- Agricultural uses are generally not present.
- Single-family residential areas are fully developed, multifamily structures make up the majority of new residential construction and older single family areas are being replaced with multifamily structures rising above 3 stories.
- Commercial uses occupy the frontage of all major roads and there are major shopping districts/malls with high rise mixed use commercial/office developments.
- Hotels and resorts will become dominant features around the shore and other attractions.
- Light; industries may be in large buildings or clustered in close proximity to each other.

The planning growth scenario; economic, employment and population projections; overall land use projections; and the density and location of growth are macro-factors shaping the CNMI's land use future. The next section focuses on the micro-factors and their impact on public lands specifically.

TABLE III - 6

CURRENT AND PROJECTED LAND NEEDS BY ISLAND
BASED ON THE EXPECTED GROWTH SCENARIO
1989 - 2015

SAIPAN

EXPECTED GROWTH SCENARIO	Total 84,671	Resident 52,309 Non-residents	Non-resident 26,600 Per/Ac	Visitors 5,762 80

LAND USED AS:	ESTIMATED ACRES 1989	CURRENT DENSITY Per/Ac	EXPECTED DENSITY Per/Ac	ACREAGE NEEDS IN 2015	NEEDS - CURRENT
Undeveloped	26,279	2	4	22,428	(3,851)
Residential	1,275	34	20	3,037	1,762
Commercial	235	195	225	409	174
CNMI Government	409	80	80	903	494
Industrial	321	143	270	341	20
Tourism	520	51	25	1,591	1,071
Agriculture	311	147	450	205	(106)
Recreation	385	119	114	808	423
Private Inst.	25	1833	2400	38	13
TOTAL	29,760			29,760	(0)

Residential density is calculated as marginal increases. For planning purposes the existing residential density is assumed to remain constant; the density figures are for the marginal increases in population. Note: The density figure in the table is for resident population, while the density figure in the title block is for nonresidents.

Government density is calculated with non-residents and visitors having half the weight of residents.

Tourist density is the number of visitors and non-residents.

All other activities use total population.

Needs-Current is the difference between land currently used by a particular activity and that demanded in 2015.

TABLE III - 6(CONTINUED)

ESTIMATED PUBLIC AND PRIVATE LAND USES: 1989 - 2015

ROTA

EXPECTED GROWTH SCENARIO		Total 19,494	Residents 4,321 Non-residents	Non-residents 12,123 Per/Ac	Visitors 3,050 80
LAND USED AS:	ESTIMATED ACRES 1989	CURRENT DENSITY Per/Ac	EXPECTED DENSITY Per/Ac	ACREAGE NEEDS IN 2015	NEEDS - CURRENT
Undeveloped	18,370	0.12	2	14,335	(4,035)
Residential	88	25	20	443	355
Commercial	9	253	250	104	95
CNMI Government	104	19	25	606	502
Industrial	16	142	1000	26	10
Tourism	25	26	10	2,165	2,140
Agriculture	2,151	1	10	2,597	446
Recreation	40	57	50	519	479
Private Inst.	9	253	1500	17	8
TOTAL	20,812			20,812	(0)

TINIAN

EXPECTED GROWTH SCENARIO		Total 8,443	Residents 2,374 Non-residents	Non-residents 4,849 Per/Ac	Visitors 1,220 80
LAND USED AS:	ESTIMATED ACRES 1989	CURRENT DENSITY Per/Ac	EXPECTED DENSITY Per/Ac	ACREAGE NEEDS IN 2015	NEEDS - CURRENT
Undeveloped	5,475	0.33	2	4,460	(1,015)
Residential	79	20	20	190	111
Commercial	39	46	60	119	80
CNMI Government	64	22	25	190	126
Industrial	14	128	300	24	10
Tourism	40	19	12	396	356
Agriculture	522	3	10	712	190
Recreation	5	358	50	142	137
Private Inst.	2	895	1000	7	5
TOTAL	6,240			6,240	0

B. SECOND LEVEL ANALYSIS: PUBLIC LANDS SPECIFIC

The second level analysis involves the process of estimating demand for public lands through the year 2015 and allocates those demands to either a specific site/vicinity or to designated areas. In determining the amount of land demanded we utilize existing plans and programs (although these do not usually extend to the year 2015), growth trends, and a series of models that translate population growth into public land use characteristics. These models are described later and include the Homestead Demand Model, and the Community Development Land Use Allocation Model, and the "As Built" Demand Model.

1. CATEGORIES OF PUBLIC LAND USES

Several categories of public land uses are accommodated by this Plan, they are:

a. Nuisance activities

b. Other public facilities, including infrastructure

c. CNMI homestead program

d. Conservation land

e. Land for commercial use

a. Nuisance Activities

Public lands for nuisance activities are designated to either a particular site or a vicinity. A particular site is designated wherever a nuisance facility exists or where an approved CNMI plan identifies land for such a facility. It is not the intention of this planning process to supplant the detailed analyses that have preceded siting for such facilities. Rather, it is this Plan's aim to recognize where such decisions have been made, support those land use designations, and to plan for adjacent public lands accordingly.

A general site is designated wherever an existing facility is to be expanded. This designation is particularly appropriate for power generation and wastewater treatment facilities. In these cases, vicinity designations are usually made adjacent to existing facilities.

Nuisance activities include:

Landfills and refuse transfer stations

Hazardous waste disposal sites

Power generation facilities

Correctional facilities

Wastewater treatment facilities

b. Other Public Facilities

Other public facilities are of two types: central administration; and community services and infrastructure. Central administration refers to the governor's office (generally the Capitol Hill area of Saipan), offices of the mayor, the CNMI Legislature (Saipan only), and agencies that provide multi-island or multi-village services such as the government offices at Lower Base, Saipan, such as the Commonwealth Utilities Corporation and the Department of Public Works. Land for these types of uses does not expand proportionally with the population. For example, as the population increases there is still need for only one governor's office. Therefore, the need for expanded land areas is marginal, because growth is absorbed through more intense development of existing land areas and buildings.

The second type of land requirement for public facilities is for community based services and infrastructure. These include such uses as:

Schools

Community centers

Public safety

Recreation

Infrastructure, such as roads and rights of way.

Public lands for these kinds of uses are allocated on an area basis. That is, the exact site will be a function of a detailed site plan. However, the overall land area requirements for these services and infrastructure can be estimated based on population and number of housing units.

c. Homestead Program

Through the homestead process public lands are given to qualified residents. While the homestead lots are eventually transferred to private owners and, therefore, are no longer part of the public domain, it is necessary to recognize how much public land must be committed/obligated for this program.

The homestead program and the ensuing demand for community services and infrastructure are estimated for each island using a "Community Development Land Use Allocation Model." This model is itself driven by another model developed for the CNMI Public Land Use Plan, termed the "Homestead Demand Model." The Homestead Demand Model estimates the number of residents turning age 18 between the years 1989 through 2015 who will be eligible for a homestead. Unless there are changes to the CNMI constitution, the only technical variable that

can be controlled by the CNMI government is the number of residential lots per acre (density).

The Community Development Land Use Allocation Model takes the figures from the Homestead Demand Model and calculates land demand for each island for residential lots, infrastructure and other public services for:

Single family residences,

Town houses, and,

Condominiums.

In order to establish reasonable estimates of land demand several kinds of community development styles are examined. The typical residential configurations include a typical homestead layout, town houses, and a three-story condominium. Each style of housing generates different demands on public services; and these uses are summarized in Table III-7 below. By utilizing all three housing schemes, the total amount of public land required for the homestead program can be projected through 2015, including the demand utilized by attendant community services. Utilizing a mix of housing schemes is noteworthy because virtually all homesteads to date have been the single-family style development. Utilizing a mix of styles is a significant departure from past practice.

It is significant to note the amount of land identified for commitment to the homestead program and attendant community services by 2015 is not the same as that expected to be actually developed. For instance, all those persons turning 18 in 2014 are not expected to be moved into their homesteads and all the community support activities in place by 2015. But the land necessary to provide the homestead lots and community services should be irrevocably committed for that use by 2015, barring a change in the CNMI Constitution regarding homesteads.

TABLE III - 7

LAND USE REQUIREMENTS FOR VARIOUS HOUSING STYLES

	Single Family Typical Homestead		MultiFamily 3 Story		T. House	
Land Uses	Ac./Unit	%	Ac./Unit	%	Ac./Unit	%
Residential	.25	49%	.03	31%	.16	49%
Public Uses	.10	19%	.03	33%	.03	21%
Roads	.13	26%	.01	16%	.02	16%
Recreation Open Space	.03	6%	.02	20%	.02	13%
Total	.51	100%	.09	100%	.23	100%

A separate model has been constructed to predict the actual or "As Built" community with residential and public services, including both those emanating from the homestead program and those developed on private land (Table III - 8). This is based on the resident population size with a household size of five persons which is based on data from the 1980 Census. The household size figure should be adjusted to reflect the 1990 Census. Non-residents are assumed to reside in multifamily style housing with reduced demand for public services compared with their resident counterparts.

This model assumes there are five persons per single-family resident household. For non-residents the model assumes that there is an equivalence between a five family multifamily household and land use characteristics for five non-residents, with the exception that demand for public uses is less but demand for recreation is higher. If studies are eventually conducted to measure actual land use demand characteristics of non-residents, then this model should be adjusted to reflect this information.

d. Conservation Areas

Conservation areas represent another major public land use. This use is set apart from other categories in that it is not expanding. Conservation areas have been identified to protect critical habitats, forests, wetlands, and historical/cultural sites. It is not anticipated that there will be a change in the amount of land allocated to this designation.

e. Land for Commercial Uses

The last category of public land designations is lands which generate revenues through leases. These are typically commercial activities, mostly hotels and resorts.

2. PUBLIC LAND SUPPLY

Public land supply is determined by current use of public lands and the existence of vacant land. In general, lands developed and used in an irreversible fashion at their highest and best use are not considered for a change in use (see Policy 2). Public lots that are surrounded by private or other public development will influence how planned uses for that land are designated. The public lot, whether developed or vacant, should be consistent/ compatible and add to area synergism (see Objectives 1 and 2, Policy 2.5 and 3.3). Public lands currently used for agriculture are considered a non-irreversible use and, therefore, subject to development. Land in excess of 20% slope is generally not considered suitable for public development as it is too costly.

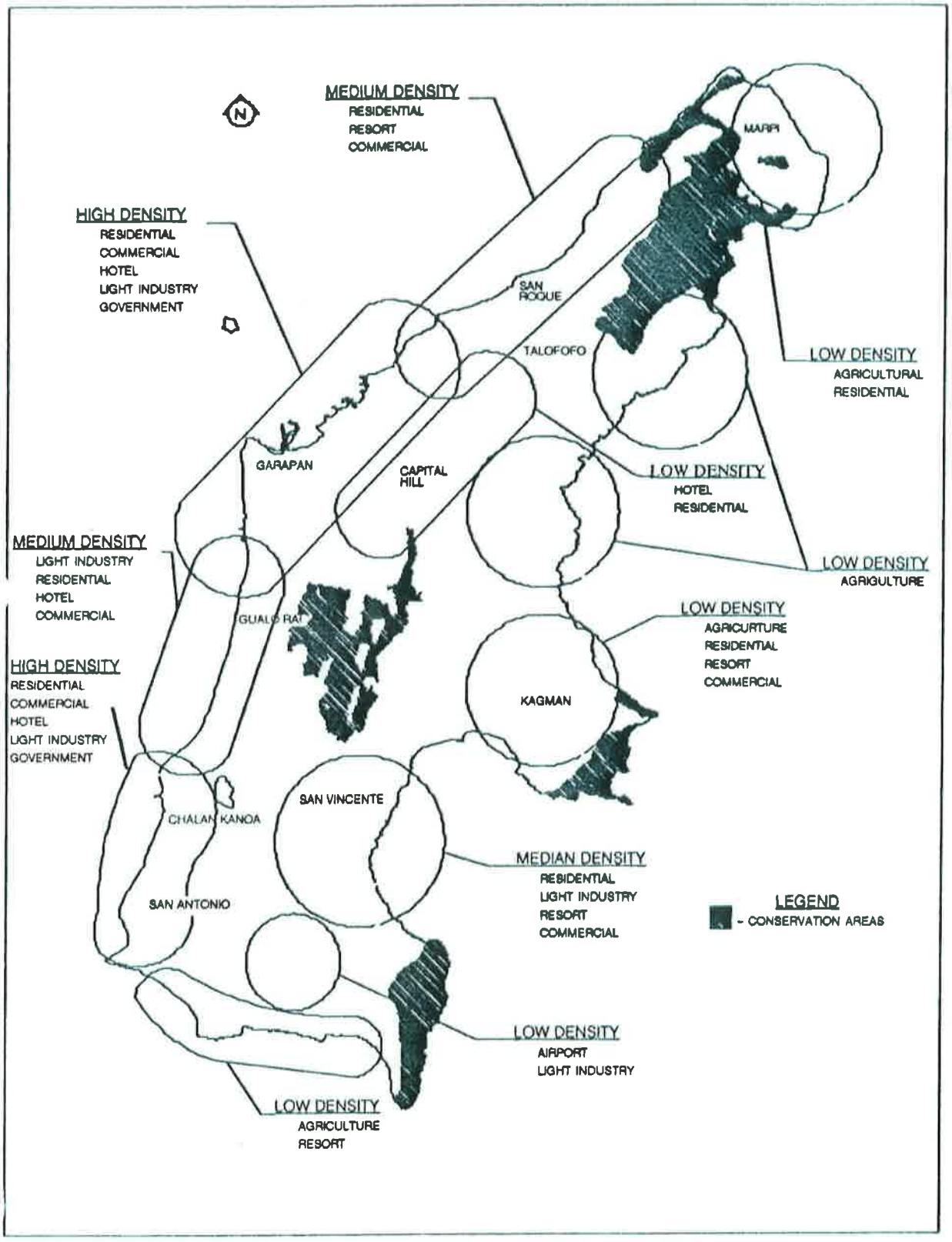
In this section, categories of public uses for the Plan have been identified, and the principles for estimating land supply examined. In the next chapters the analysis is provided for each island, with assessments of existing public land resources, anticipated demands, and how those demands should be met.

TABLE III - 8

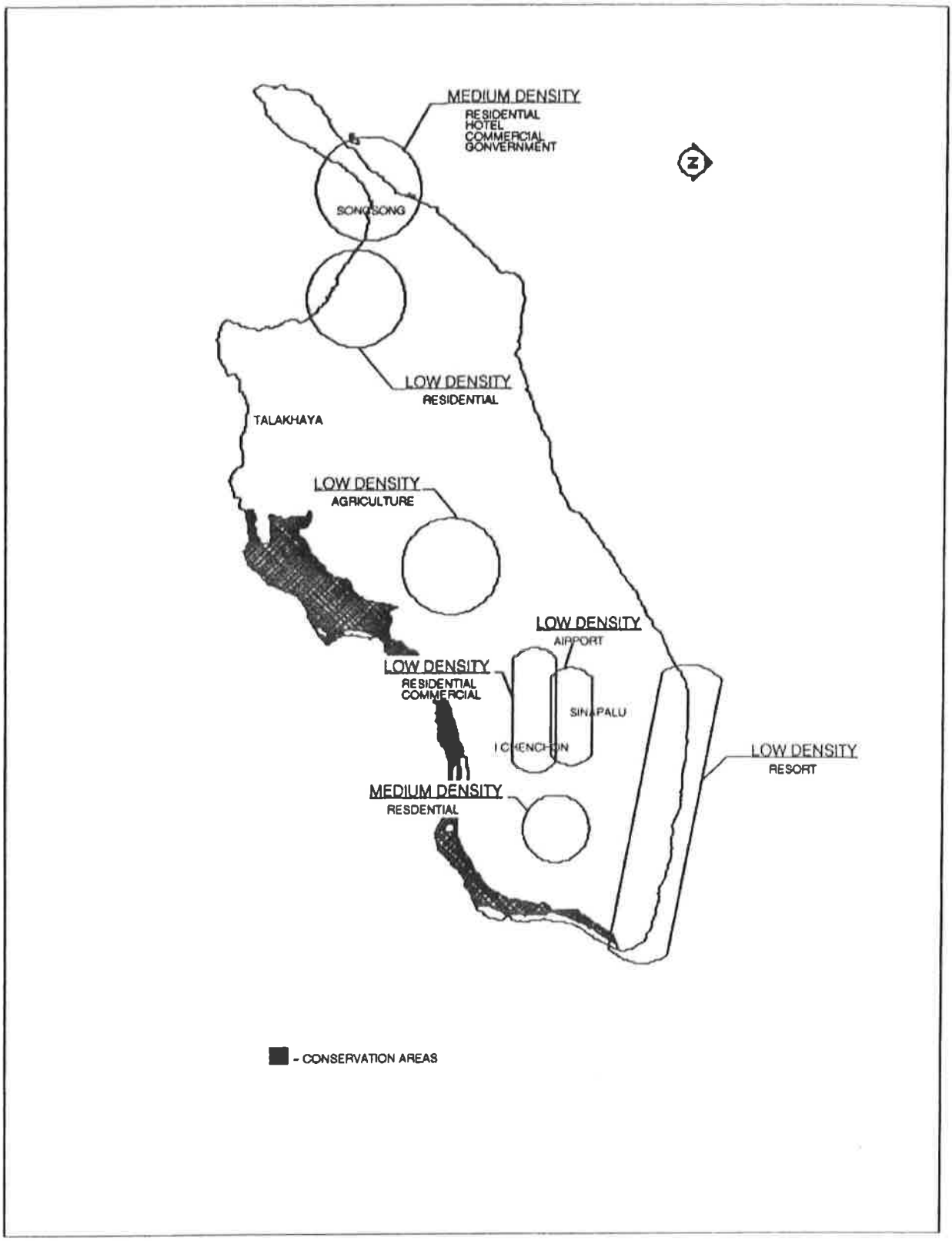
"AS BUILT" LAND USE PROJECTION MODEL FOR COMMUNITY PUBLIC SERVICES BY RESIDENTS AND NON-RESIDENTS

	Resident SF Land Use Demands Per Unit	Nonresident MF Land Use Demands Per Unit
Land Uses	Ac.	Ac.
Residential	0.25	0.03
Public Uses	0.10	0.01
Roads	0.13	0.02
Recreation Open Space	0.03	0.04
Total	0.51	0.10

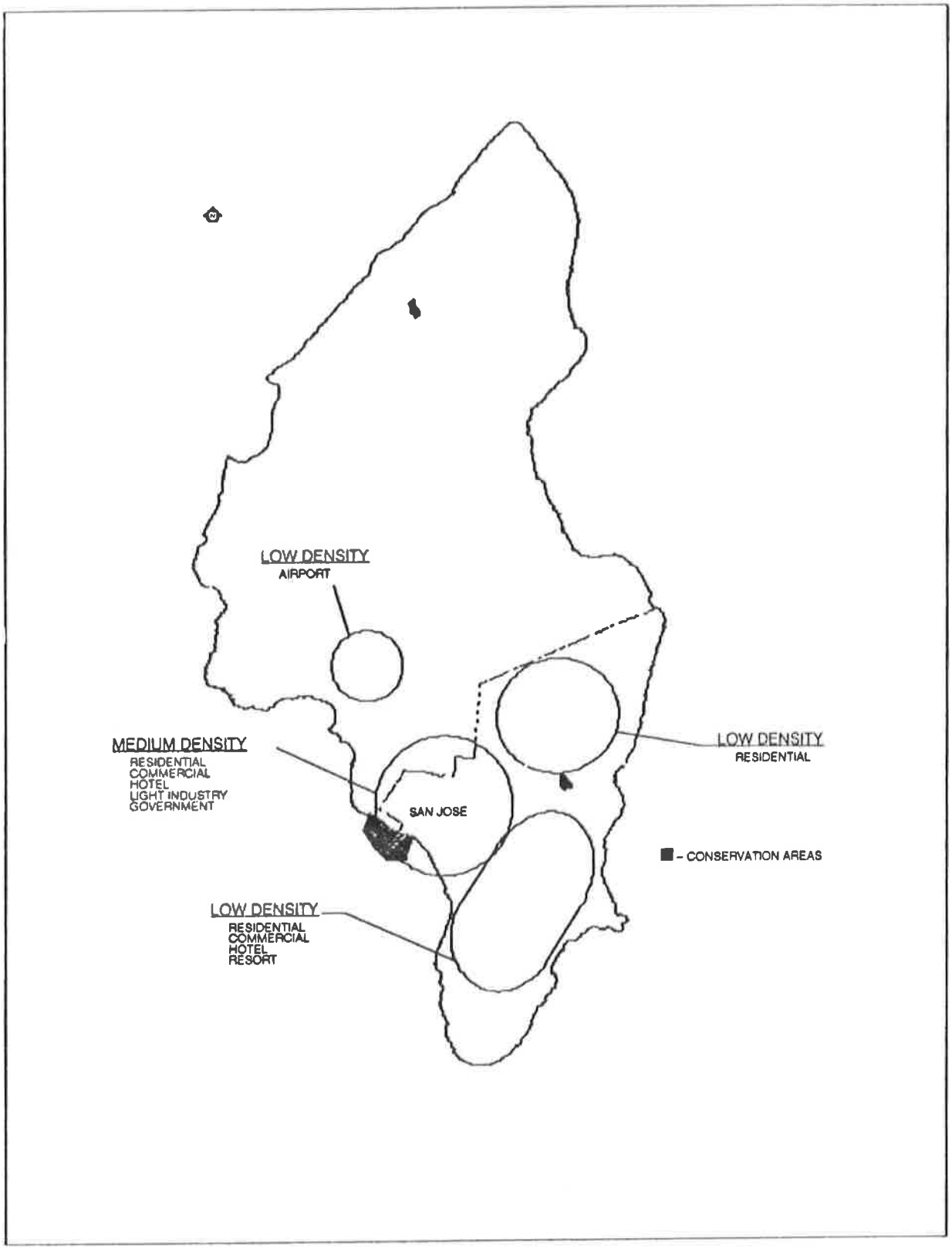
MAP III-1
PROJECTED PREDOMINANT LAND USES AND RELATIVE DENSITIES BY AREA IN YEAR 2015: SAIPAN



MAP III-2
PROJECTED PREDOMINATED LAND USES AND RELATIVE DENSITES BY AREA IN YEAR 2015: ROTA



MAP III-3
PROJECTED PREDOMINATED LAND USES AND RELATIVE DENSITES BY AREA IN YEAR 2015: TINIAN



CHAPTER IV PUBLIC LAND USE PLAN FOR SAIPAN

A. OVERVIEW

The plan for the use of public lands on Saipan has a different character than those for Rota and Tinian. Saipan has a much smaller amount of public land available relative to the population than Rota or Tinian. And, because of the Constitutional mandate to provide homesteads for eligible residents, virtually all of the public land available for development on Saipan is committed in the planning time frame of 25 years. The islands of Rota and Tinian, to be presented later, have lands available for development after 2015. While public land areas on Rota and Tinian remain undesignated for a particular use, land on Saipan is virtually all committed (Table IV-1).

As of December 1989, there were 17,380 acres of public land on Saipan. This land is divided into public and private uses as depicted in Table IV - 2, "Public Land Uses for Saipan" and illustrated graphically in Figure IV - 1. In addition, estimates are made for how all public lands will be used through the year 2015. These estimates for public land usage by 2015 are the product of the policies stated in Chapter II, existing public land resources, CNMI development trends, and the application of the Homestead Demand Model and the Community Development Land Use Allocation Model.

TABLE IV - 1

SAIPAN: AVAILABLE PUBLIC LAND FOR DEVELOPMENT (In Acres)
1989 - 2015

Developable public land in 1989	Acres	
Vacant less than 20% slope	4,626	
Grazing	3,715	
Other Agriculture	311	
TOTAL FOR 1989	8,652	
Land Demand by 2015		
Existing Commiteed Homestead Land	225	
Additional Homestead Land Committed by 2015	1,681*	or 2,733**
Exchange Reserve	1,235	
Regional Roads	115	
Community Facilities	1,794*	or 2,855**
Miscellaneous Public Use	250	
Commercial Use	64	
Golf Course	300***	
TOTAL	5,664*	or 7,777*
Remaining Developable Public Land in 2015	2,988*	or 875**

*Multifamily Homestead Option, ** Single-Family Homestead Option
*** Assumes Development of Shimizu Golf Course

TABLE IV - 2

PUBLIC LAND USES ON SAIPAN
In Acres

Land Uses	1989 Estimated	2015 Projected	Change
Vacant < 20% Slope*	4,626	1,521	(3,105)
Vacant > 20% Slope	1,780	1,780	0
Homestead (Estimated)**	(225)	(1,681)	N/A
Grazing	3,715	1,500	(2,215)
Other Agriculture	311	200	(111)
Conservation***	4,062	4,062	0
Roads	667	1,626	959
Government Facilities	209	908	699
Air Terminal	1,192	1,192	0
Exchange Reserve****	0	1,235	N/A
Recreation	365	624	259
Golf Courses	306	606	300
Hotels	116	156	40
Commercial	170	190	20
Manufacturing	28	28	0
Housing	46	50	4
Infra/Easements	10	20	10
Other	2	2	0
Totals	17,380	15,700	(1,681)

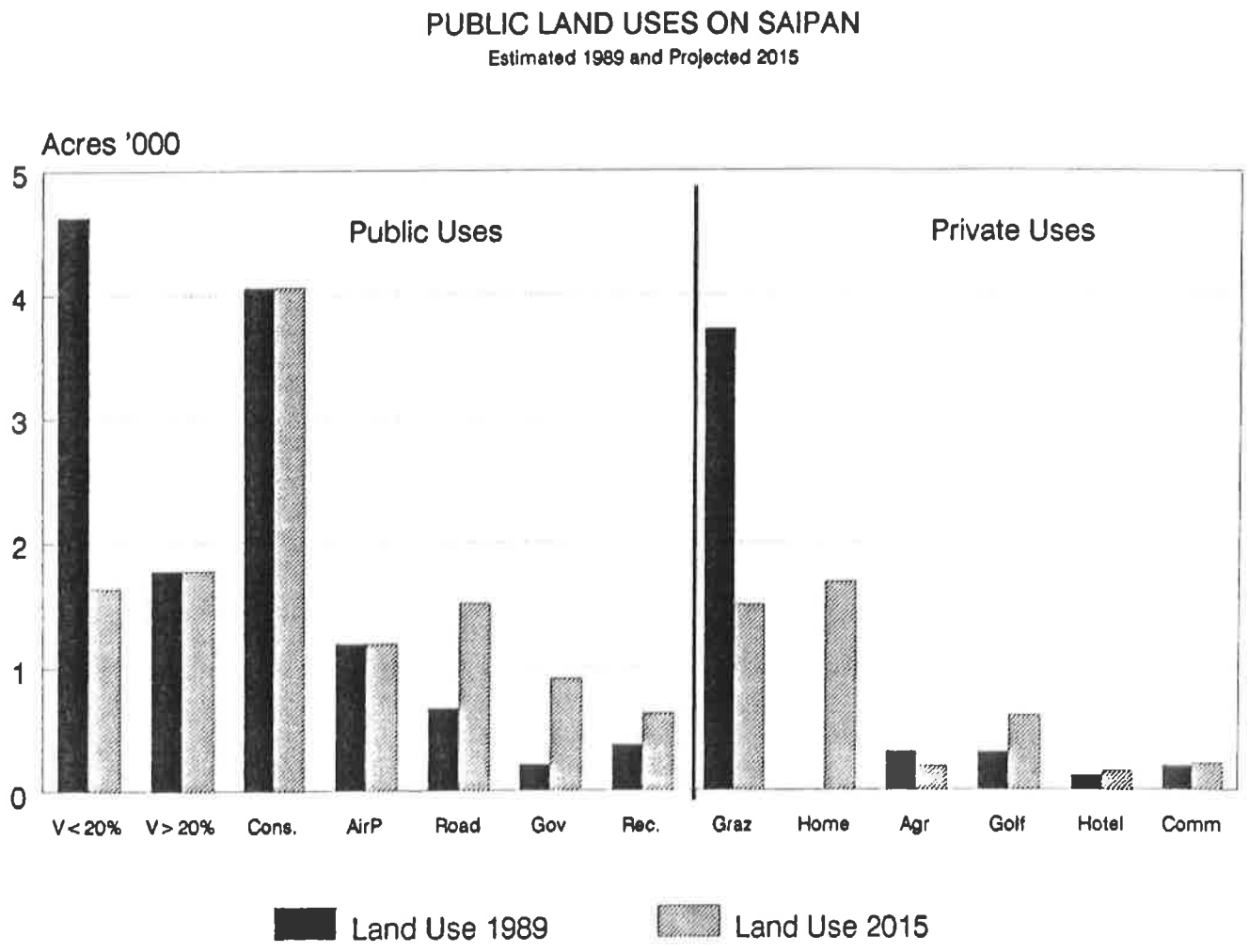
* Vacant includes abandoned uses.

** This accounts for public lands committed for homesteads, and is subtracted from the total.

*** Conservation includes forests, wetlands and critical habitats.

**** Exchange Reserve is a one-time use of public lands necessary to settle disputes and to exchange for

FIGURE IV-1


PUBLIC LAND USES ON SAIPAN
Estimated 1989 and Projected 2015
Acres '000
5
4
3
2
1
0
Public Uses
Private Uses
V<20%
V>20%
Cons.
AirP
Road
Gov
Rec.
Graz
Home
Agr
Golf
Hotel
Comm
Land Use 1989
Land Use 2015

B. PUBLIC LAND USE REQUIREMENTS

Requirements for public lands are projected primarily as a result of resident population growth and the corresponding demand created for public services. Based on Policy 3.3, additional public lands on Saipan will not be leased for private use except in certain specified situations. Public land requirements are presented according to the categories established in Chapter III, Part B: Nuisance Activities, Other Public Services, Homestead Program, Conservation Areas, and land for Commercial Uses.

1. Nuisance Activities

Nuisance activities on Saipan include the following:

a: Landfills for Solid Waste, and Solid Waste Transfer Stations

b: Hazardous Waste Storage

c: Power Generation

d: Correctional Facilities

e: Wastewater Treatment Facilities

f: Airport

The site/vicinity for each of these activities on Saipan have been designated on Map IV - 1. A description of each nuisance site is provided below.

a. Solid Waste Disposal

The current dump operation at Puerto Rico is scheduled for relocation to the Marpi Depression area. This site has an expected maximum life of 20 years. After that, an alternate site has been proposed at the Marpi Quarry. As the Marpi Depression reaches capacity a re-evaluation should be conducted of other alternate sites prior to using the Marpi Quarry.

Community based solid waste collection and transfer stations are accommodated in the Community Development Land Use Allocation Model under Public Uses. The exact location and size of this use will be a function of neighborhood size and overall community design.

b. Hazardous Wastes Transfer And Storage

The storage of hazardous wastes is not specifically addressed by the CNMI government. When hazardous waste disposal is officially addressed, however, land demands will be minimal, as this operation will take the form of a transfer station for temporary storage of the wastes until shipment off-island for proper disposal.

The land requirements for such a facility will be a maximum of one-half acre and should be situated close to the shipping point, in this case the commercial port area. This is a health related use and therefore is a top priority for public land use allocation (Policy 2.8).

c. Wastewater Treatment Facilities

Presently, the CUC's primary focus is to overcome existing operating deficiencies in the wastewater treatment system. There are no long range plans for developing additional treatment or disposal facilities, although plans to improve the existing Sadog Tase facility are currently underway. As Saipan continues to develop and require additional wastewater treatment and disposal services, it is anticipated that the wastewater will be transported to either the Sadog Tase or the Agingan Sewage Treatment Plants. By the year 2015, the capacity of wastewater treatment may have to be expanded significantly.

The amount of public lands needed for these expansions is dependent upon the method of treatment selected and the wastewater flows to be processed. Locations for existing facilities are on the western coast of Saipan taking advantage of prevailing offshore winds and currents. Locations along the eastern shore should only be considered for tertiary treatment and only located where construction of outfalls is possible. At present, it is expected that all wastewater will be transported to the existing facility sites for treatment.

A very rough estimate of land required for wastewater treatment can be calculated. To do this it is estimated that approximate per capita wastewater flows for residents and non-residents are 100 gpd and 200 gpd for visitors. This amounts to 4,163,800mgd of additional wastewater by the year 2015 (Table IV- 3). A wastewater treatment facility required to handle such a flow will require about 25 acres of land for nonmechanical processing (aerated stabilization ponds) or about 10 acres for mechanical treatment.

The need for additional land area for wastewater treatment facilities is inevitable. These uses are public health related and therefor have priority for use of public lands (Policy 2.8). In addition, if sufficient public lands cannot be found at sites judged suitable for either the expansion of an existing plant or the development of a new facility, private land should be condemned for this purpose and either purchased or exchanged for public land.

Vacant public land resources in the vicinity of the Commercial Port and Agingan have been identified. In addition, commercial activities on public lands in the Lower Base area are subject to relocation or removal if the land was needed for a priority activity such as wastewater treatment. Vacant public land in

MAP IV-1
NUISANCE SITE/VICINITY: SAIPAN

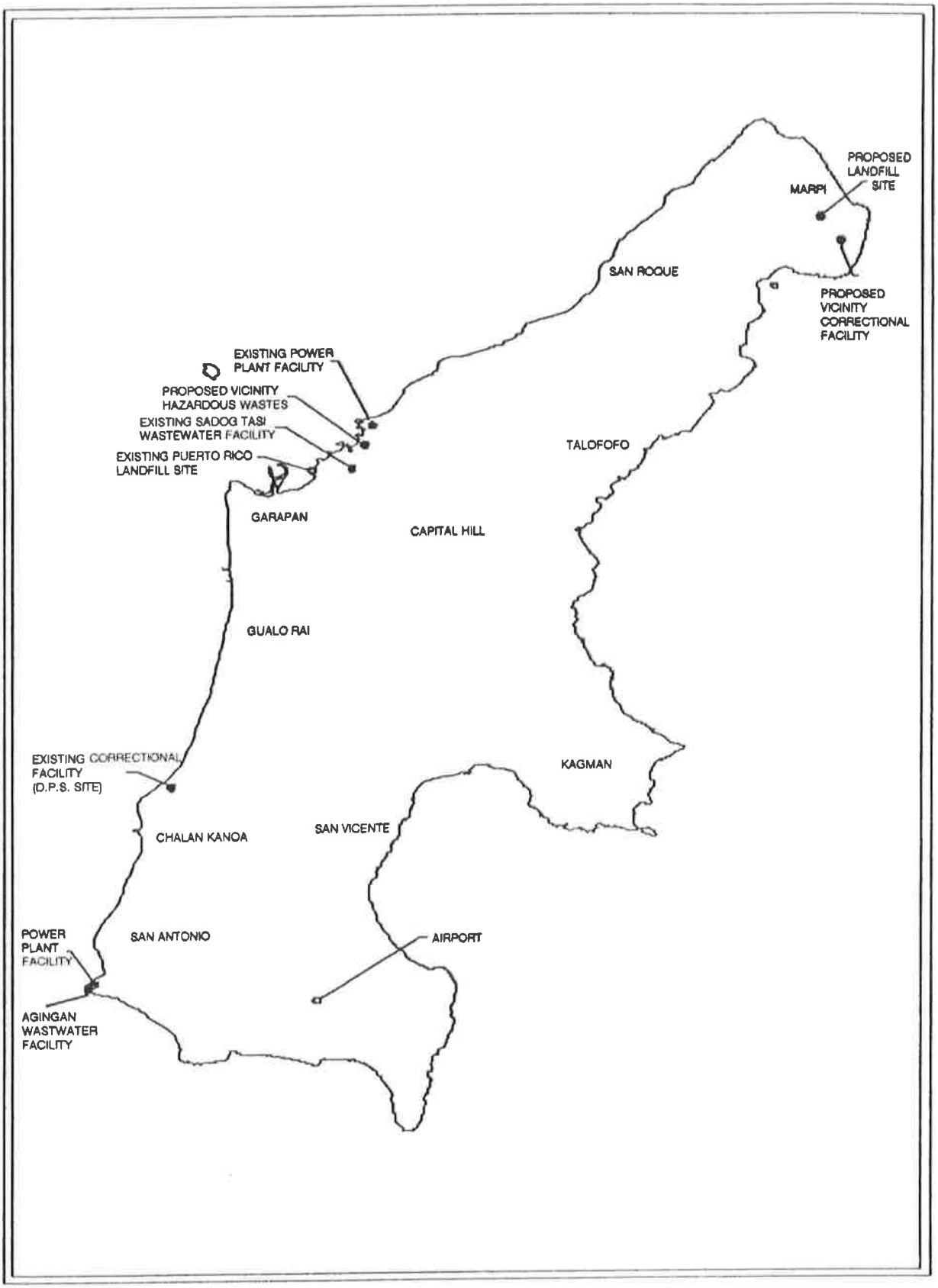


TABLE IV - 3

CHANGE IN THE NUMBERS OF RESIDENTS, NON-RESIDENTS, AND VISITORS IN SAIPAN 1989 - 2015

Residents & Non-residents:	35,114	X	100gpd	=	3,511,400gpd
Visitors	3,262		X 200gpd	=	652,400gpd
Total					4,163,800gpd

the commercial port area amounts to 363 acres, and 15 acres for Agingan (Table IV-4). Commercial activities on public lands in Lower Base currently occupy 123 acres of land that is designated by this plan document as a reversible use (Table IV- 5)(Map IV-2).

TABLE IV - 4

VACANT OR AGRICULTURAL PERMIT LAND IN VICINITY OF COMMERCIAL PORT AND LOWER BASE

LOT NO.	AMOUNT VACANT (In Acres)
022 B 02	8
057 E 01	5
057 E 06	2
13-9	5
15-2(REM)	20
16-4	2
16-5(REM)	103
23-1	14
23-7	33
25-1	26
26-9	140
AGP86-26S	5
TOTAL	363

VACANT LAND IN VICINITY OF AGINGAN

LOT NO.	AMOUNT VACANT (In Acres)
56-8	5
56-6	10
TOTAL	15

d. Correction Facilities

A correctional facility currently planned for the Kagman area will require approximately 70 acres of land. This use is incompatible with the proposed use of Kagman as a resort or for community and homestead development. An alternate location should be considered for the correctional facility, perhaps in the Marpi or Talofofo areas, or near an area not expected to be developed, such as a Conservation Area.

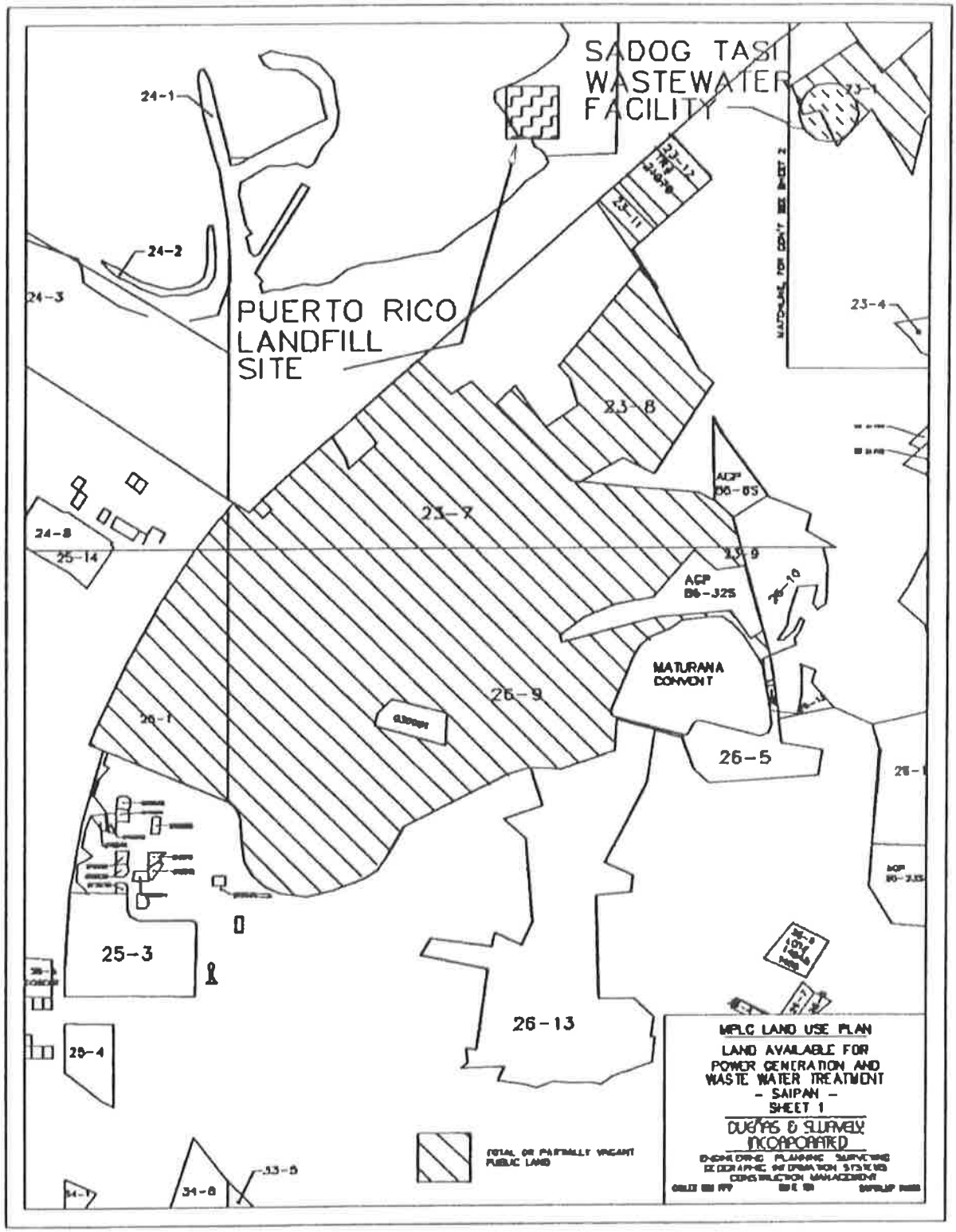
TABLE IV - 5

COMMERCIAL ACTIVITIES IN LOWER BASE SUBJECT TO REVERSION FOR PUBLIC USE

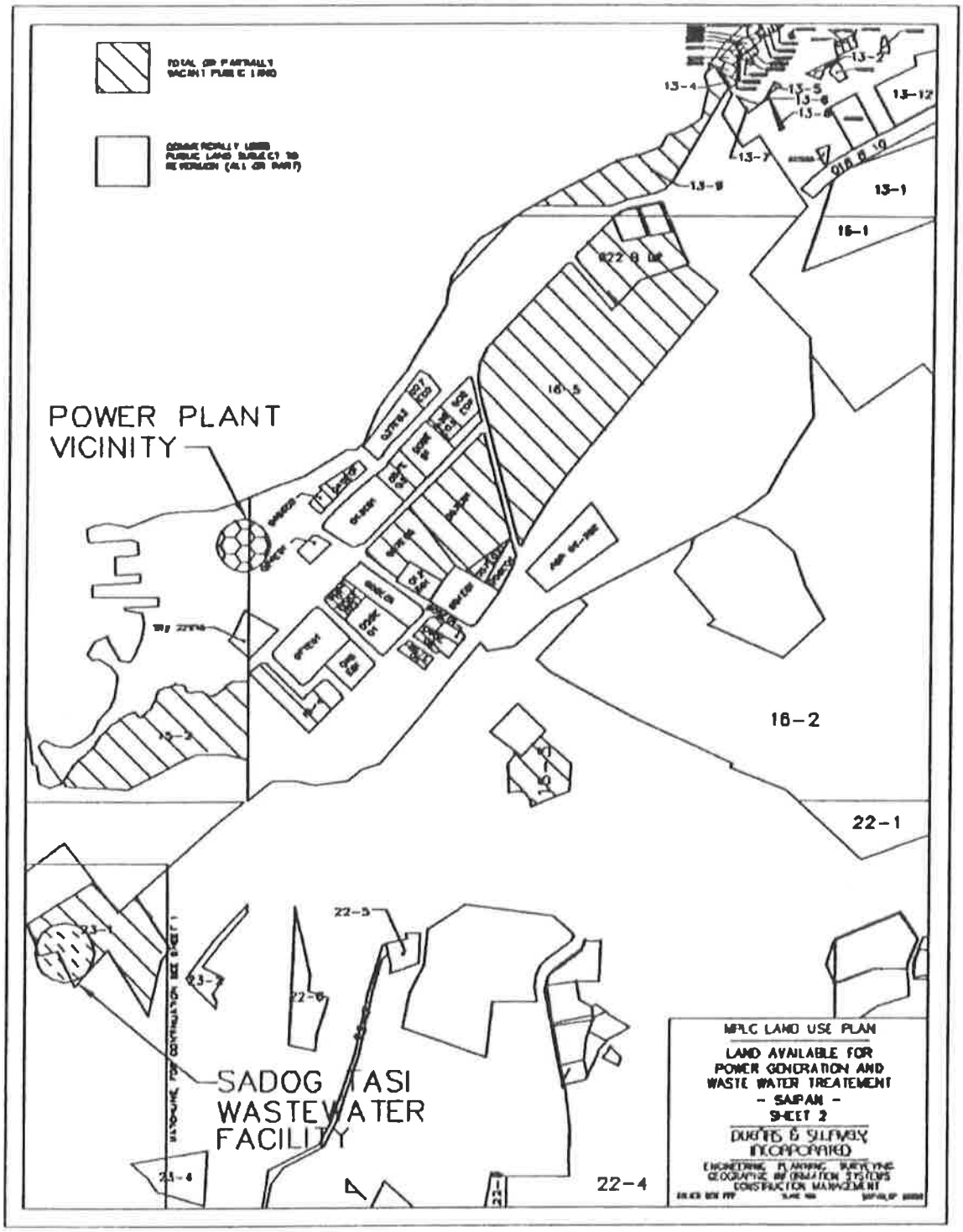
LOT NO.	AMOUNT VACANT (In Acres)
012 E 01	2
013 E 01	5
025 E 01	3
TR22916	2
16-5(REM)	103
008 E 01	2
027 E 02	1
016 E 01	2
024 E 01	1
027 E 03	2
TOTAL	123

e. Power Generation

Currently the CNMI, through the Commonwealth Utilities Corporation, has a seven-year perspective on the anticipated demand for power generation. However, the overall policies of the CUC have implications beyond the seven-year time frame, particularly in regard to demands on public lands.


SADOG TASI
WASTEWATER
FACILITY
PUERTO RICO
LANDFILL
SITE
24-1
24-2
24-3
24-8
25-14
23-1
23-4
23-8
23-7
23-9
ACP
86-325
26-10
MATURANA
CONVENT
26-9
26-1
26-5
25-3
25-4
26-13
34-8
33-5
MPLC LAND USE PLAN
LAND AVAILABLE FOR
POWER GENERATION AND
WASTE WATER TREATMENT
- SAIPAN -
SHEET 1
DUENAS & SLUMVEY
INCORPORATED

MAP IV-2


POWER PLANT
VICINITY
SADOG TASI
WASTEWATER
FACILITY
13-1
13-2
13-4
13-5
13-6
13-7
13-8
13-12
16-1
16-2
16-5
22-1
22-3
22-4
22-5
22-6
23-1
23-4
MPLC LAND USE PLAN
LAND AVAILABLE FOR
POWER GENERATION AND
WASTE WATER TREATEMENT
- SAIPAN -
SHEET 2
DUENAS & SLEMBY
INCORPORATED

MAP IV-2 (cont.)

It is CUC policy that island-wide power demands be served via transmission lines rather than satellite power generation stations. There are currently two power generation sites on Saipan: one at Lower Base and the other at Agingan. The Lower Base station is currently undergoing expansion. It is planned that the station at Agingan will be phased out as power needs are met from the Lower Base facility.

There is existing land at the Lower Base site to accommodate additional expansion and for fuel and water storage. This land should be designated for such future use. The amount of land required for future power generation needs is best met in an incremental fashion adding capacity as demand increases. It is roughly estimated however, that to accommodate the increases in residents, non-residents, and visitors there should be approximately 20 acres of land set aside for power generation and associated facilities. An amount of 20 acres is believed to be a conservative figure, conservative in that it sets aside more land than what will actually be demanded. However, development trends and consumption characteristics must be monitored over time to assess actual land demands.

Public land for transmission line right of way and power transmission facilities is provided in the Community Development Land Use Allocation Model under Public Uses.

f. Airport

A master plan is currently being prepared for the Saipan International Air Terminal. A preliminary finding states that public lands currently designated for airport use are sufficient and, therefore, additional land is not required.

2. Other Public Facilities

a: Government Administrative Offices

With the exception of certain leased commercial space, government offices are located in public buildings on public land. These offices are typically in low density settings, situated adjacent to undeveloped public land such as Capitol Hill and Lower Base. Increased demands for land to accommodate government offices can be met by utilizing adjacent public parcels.

The hospital on Saipan deserves a particular notation due to its size and function. In general it falls under the category of Government Administrative Office and provides CNMI coverage. The present hospital site is surrounded by vacant land. Future land demands for hospital functions can be met by intensifying the development on this site.

Port facilities also deserve particular mention. There is currently a port expansion project underway which will increase the wharf and container storage yard by developing lagoon areas. Capacity may also be increased by the port displacing private operators on existing public land when leases expire.

b: Community Based Services

There are many activities that fall under the category of Community Based Services, the most important being schools, roads, and police and fire protection. Each of these will be discussed separately. For the many other activities under this category such as community centers, clinics, etc., there is an allocation of land based on the Community Development Land Use Allocation Model (CDLUAM) described under the Homestead section.

Schools

School planning to accommodate Saipan's increasing student population has been achieved by intensifying the use of existing school sites through constructing additional classrooms. This can be viewed only as a short-term response, however, as the number of school age children (ages 5 to 19) will increase from about 6,500 in 1989 to around 18,000 in the year 2015 (almost a 300% increase).

While intensification of existing school sites can absorb some of this increase, it must be anticipated that multi-story structures and additional school sites will be needed.

Land allotment for elementary schools is provided in the Community Development Land Use Allocation Model under the category of Public Uses. Land requirements for junior and senior high schools as well as post high school education are not specifically allocated by the model as these are island wide rather than community services. Land demands for these functions is not major; an additional 50 acres for another high school, or less if only one centralized high school is developed. Locations for elementary schools are a function of community site design. Locations for junior and senior high schools should be designated according to accessibility and proximity to students.

Roads

There are two methods of providing land for public roads. The first is to exchange public land for roads that are currently on private land; and, second, to designate existing public land that will be required to develop new roads. Currently there is no program for new road development.

At the direction of MPLC, 1,235 acres has been set aside for settlement of land exchanges to accommodate roadways now located on private property. The Community Development Land Use Allocation

Model provides for land for new streets within subdivisions. Additional land may be required for improvement of off-site access.

Additional land will be required for primary roads. It is estimated that 115 acres of land will be needed for this purpose. This is calculated by assuming that a primary road will be built around Marpi and down the eastern coast through Talofofo connecting into the Kagman area. Plus there will likely be one cross-island secondary road from the Talofofo area into Capitol Hill. These roads will be approximately 12 miles in length and will have a 100-foot right of way.

Police and Fire Services

Overall, accommodating expanded police, fire and emergency services is not land intensive. At least four police support stations are planned, but not sited, for San Roque, Garapan, Kagman and San Vicente. These support stations require approximately one acre each for ultimate operations.

There are also four fire stations planned, one each at Koblerville, Capitol Hill, the Kagman area, and the Garapan area. Specific sites have not been designated, but approximately one- half acre of public land is required for each station.

Land areas for police support stations and branch fire stations are included in the Community Development Land Use Allocation Model under the Public Uses category.

3. Homesteads

The driving force behind the demand for public lands on Saipan is residential growth, especially for the homestead program. In order to quantify these impacts, two interdependent models were constructed to simulate the homestead program and the specific

TABLE IV - 6

SAIPAN HOMESTEAD DEMAND MODEL

Projection	No. Persons Becoming 18 By 2015	Percent Married	% Population Eligible	Units Demanded
High	18,494	25%	100%	16,182
Middle	17,613	50%	75%	11,008
Low	16,733	75%	50%	8,366

TABLE IV-7

COMMUNITY DEVELOPMENT LAND USE ALLOCATION MODEL: Saipan

Variables:				
	Number SF	5,508	Net Density	33 Per/Acre
	Number MF-3	1,500	Overall	
	Number TH	4,000	Unit/Acre	3.17
	Total Units	11,008		

	Koblerville Model SF 450 Units		Multi-Family Model 3 Story 550 Units		T. House 550 Units		Community Land Uses In 2015 SF	MF-3	TH	Total
Land Uses	Ac.	%	Ac.	%	Ac.	%	Ac.	Ac.	Ac.	Ac.
Residential	112	49%	15	31%	37	49%	1,368	41	269	1,678
Public Uses	44	19%	16	33%	16	21%	537	44	116	697
Roads	60	26%	8	16%	12	16%	733	22	87	842
Recreation Open Space	13	6%	10	20%	10	13%	159	27	73	259
Total	229	100%		100%		100%	2,796	134	545	3,475

Land Demanded If All SF	5,588
Land Savings With MF Combination	2,113

Key SF Single Family Detached, MF-3 3 Story MF Structure, TH Town House

demands on public lands that homesteading creates. These models are the Homestead Demand Model (Table IV - 6) and the Community Development Land Use Allocation Model (Table IV - 7).

In the Homestead Demand Model the number of people turning 18 years of age between 1989 and 2015 is projected. This model does not include eligible persons over 18 now, but who have not applied for a homestead. The "percent married" refers to estimated marriage between two eligible parties prior to receiving a homestead (only one homestead is allowed per married couple). "Percent of the population eligible" for the homestead program is determined by existing laws and regulations, which, among other restrictions, excludes anyone who already owns developable land.

Using the middle range of projections, it is estimated that the CNMI must identify 11,008 homestead lots to meet anticipated demand generated between 1989 and 2015. These homestead lots have been allocated in two versions of the Community Development Land Use Allocation Model; one with a 50% mix of multifamily housing (Policy 3.4); and for comparison purposes, one all single-family development. The mix of multifamily and single-family housing yields a savings of over 2,000 acres compared to the exclusive single-family option.

In summary, using the multifamily and single-family combination, 1,681 acres will be required to fill the homestead program for house lots, 842 acres for roads, 259 acres for open space and recreation, and 697 acres for other community based public services.

4. Conservation Areas

As mentioned earlier, conservation areas represent a major public land use. This use is set apart from other categories in that it is not projected to change in area between 1989 and 2015. Conservation areas have been identified to protect critical habitats, forests, wetlands, and historical/cultural sites. It is not anticipated that there will be a change in the amount of land allocated to this designation on Saipan. The existing amount of land in this category is approximately 4,062 acres. These sites are designated on Map III - 1.

5. Land for Commercial Uses

Except under specific circumstances additional public lands will not be leased for private commercial purposes. An estimated 64 acres of public land may be leased by 2015 for commercial purposes, most of these occurring in the Strategic Corridor or on land with slopes greater than 20%.

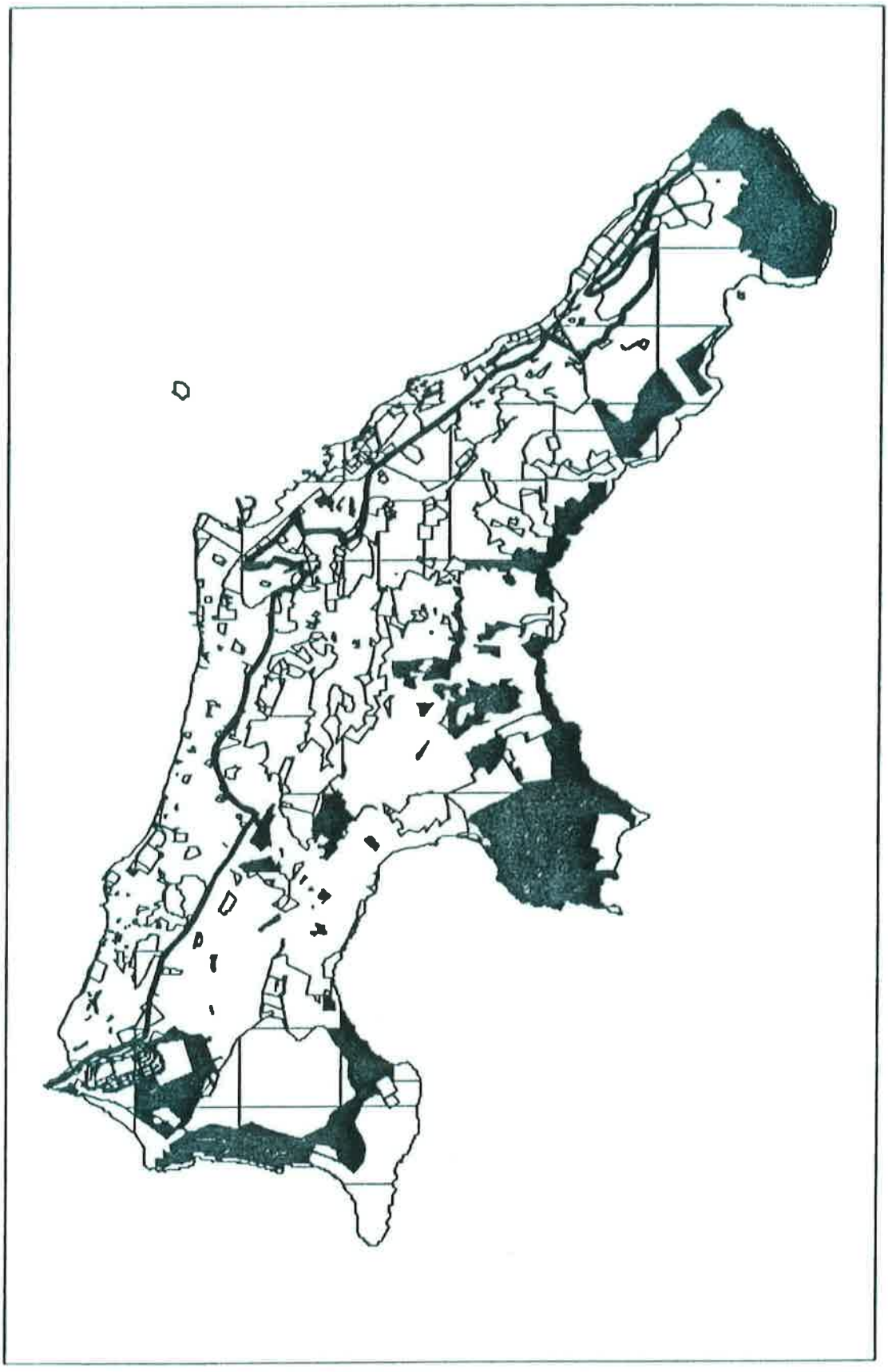
C. LOCATION AND AMOUNT OF PUBLIC DEVELOPABLE LAND ON SAIPAN

Public developable land is defined as land that is publicly owned, vacant or in temporary use, land used for agriculture, land which is not part of a conservation area, and land with a slope of less than 20% (Map IV - 3, insert). Developable tracts of land on Saipan have been identified that are potentially suitable for community use. These lots are predominately vacant or used for agriculture. They represent an approximate land area of 3,905 acres (Table IV - 8, Map IV - 3). There are additional developable land areas suitable for community use as vacant sections of other public lots. Note that an additional 1,780 acres of vacant land have a slope greater than 20%. These lands should be considered for exchange for conservation areas (Policy 2.7), where appropriate, and for land exchange in general.

There are two primary development areas on Saipan. One area is on the western, lagoon side of the island, referred to in this Plan as the Strategic Corridor; the second area is the remainder of the island. The term "strategic" is selected since the area is experiencing rapid development but has a limited amount of public land. Consequently, public land in the strategic corridor should be carefully designated so as to provide for key services and thereby direct uses of the surrounding land. It is assumed that the zoning designations in the Strategic Corridor will support and encourage increased density (Policy 3.2). In addition, it is an objective of the Plan that public lands are managed in a way to direct overall physical growth (Objective 2) and that public uses in the Strategic Corridor be compatible and synergistic with the surrounding areas (Policy 3.3.C). Therefore, public lands located within Saipan's strategic corridor should not be designated for single-family residential development.

Of the 3,900 acres potentially usable for community development, over 1,000 acres are identified as suitable for multifamily development (including certain areas within the Strategic Corridor) (Table IV - 8). In this case, the primary criterion for suitability is slope. All vacant or agricultural land on slopes of between 10% and 20% is considered suitable for multifamily housing. In general, since site preparation costs are more expensive for sloping land than for level terrain, it is necessary to achieve higher density so that the ratio of cost-to-units developed on sloping land provides a similar return to that for developing level land.

MAP IV-4
POTENTIAL AREAS FOR COMMUNITY DEVELOPMENT



MAP IV-5
POTENTIAL AREAS FOR MULTIFAMILY DEVELOPMENT

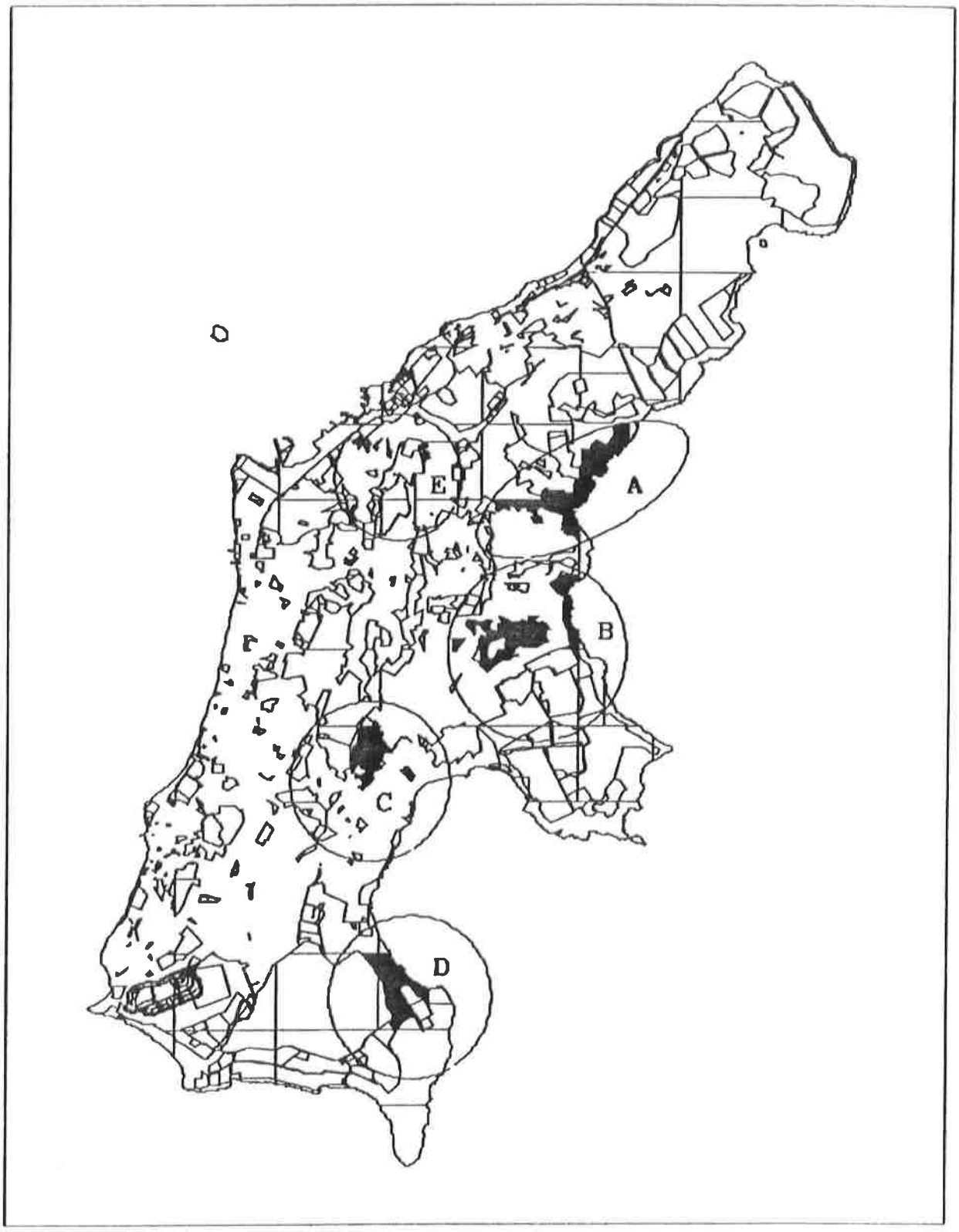


TABLE IV - 8

SELECTED PUBLIC LOTS
POTENTIALLY SUITABLE FOR COMMUNITY DEVELOPMENT
INCLUDING AREAS FOR MULTIFAMILY HOUSING
EXISTING LAND USES

Lot Number	Grazing	Other Agri.	Vacant	Pub. Facil.	Road
27-3	0	0	4	0	0
28-5	2	8	11	0	0
41-1 (REM)	0	0	75	0	0
50-1 (REM)	0	0	90	0	0
57-3 (REM)	0	0	222	3	11
43-7	0	0	29	0	0
48-10	0	1	4	0	0
48-5	0	2	3	0	0
48-9	0	0	1	0	0
54-2	0	0	4	0	0
57-8	0	0	1	0	0
AGP 86-1S	0	6	6	0	0
AGP 86-22S	0	4	10	0	0
AGP 86-24S	0	6	14	0	0
AGP 86-29S	0	4	16	0	0
AGP 86-30S	5	20	0	0	0
AGP 87-14S	0	1	6	0	0
AGP 87-15S	183	0	0	0	0
AGP 87-1S	0	25	0	0	0
AGP 87-2S	1	3	3	0	0
AGP 87-8S	0	0	10	0	0
AGP 88-24S	0	0	7	0	0
AGP 88-25S	0	0	5	0	0
AGP 88-26S	0	0	5	0	0
AGP 88-28S	0	0	7	0	0
AGP 88-29S	0	0	5	0	0
AGP 88-32S	0	0	86	0	0
AGP 88-34S	0	0	20	0	0
1-4	0	0	157	0	34
26-6	0	0	3	0	0
26-8	0	0	1	0	0
28-4	0	0	14	0	2
31-3	0	0	22	0	1
31-4	0	0	2	1	0
31-5	14	1	0	0	0
39-2	0	0	6	0	0
40-2	0	0	11	0	0
42-6	0	0	3	0	0
AGP 86-10S	12	0	0	0	0
AGP 86-11S	49	0	0	0	0
AGP 86-14S	237	0	0	0	0
AGP 86-20S	153	0	0	0	0
AGP 86-25S	3	2	0	0	0
AGP 86-36S	79	0	0	0	0
AGP 86-37S	467	0	0	0	0
AGP 86-38S	54	0	0	0	0
AGP 86-4S	49	0	0	0	0
AGP 86-8S	62	0	0	0	0
AGP 87-12S	12	0	0	0	0
AGP 87-4S	59	0	0	0	0
AGP 87-5S	62	0	0	0	0
AGP 87-6S	75	0	0	0	0
AGP 88-14S	2	3	0	0	0
AGP 88-17S	107	8	0	0	0
AGP 88-36S	47	0	0	0	0
AGP 88-37S	47	0	0	0	0
AGP 88-4S	25	0	0	0	0
TOTAL	1,882	95	862	4	49
TOTAL	2,891 Acres				

SELECTED POTENTIAL MULTIFAMILY LOTS
EXISTING LAND USES (in Acres)

Lot Number	Grazing	Other Agri.	Vacant	Pub. Facil.	Road
Area A					
87-6(6)	75	0	0	0	0
20-1	0	0	107	0	0
Agp86-7S	25	3	0	0	0
28-1	0	0	114	0	0
AGP88-33S	8	2	0	0	0
AGP86-15S	0	0	0	0	0
Sub Total	108	5	221	0	0
Area B					
31-1	0	0	0	0	0
32-1	0	0	7	0	0
31-2	0	3	150	0	0
32-2	0	0	11	0	0
38-9	0	0	41	0	0
32-4	0	0	3	0	0
37-2	0	0	0	0	0
37-4	0	0	3	0	0
001007	0	0	0	0	0
Sub Total	0	3	215	0	0
Area C					
43-10	0	0	0	0	0
45-2	0	0	0	0	0
42-2	0	0	8	0	0
42-4	0	0	15	0	0
43-1	0	6	138	0	0
48-2	0	0	0	0	0
Sub Total	0	6	161	0	0
Area D					
58-3	0	0	22	0	0
59-2	0	0	0	0	0
59-2(REM)	0	0	170	0	0
AGP87-18S	0	1	6	0	0
AGP8810S	0	0	7	0	0
AGP889S	6	6	0	0	0
AGP-30S	0	0	10	0	0
AGP88-31S	0	0	10	0	0
Sub Total	6	7	225	0	0
Area E					
23-2	0	1	0	0	0
22-6	0	0	5	0	0
23-1	0	0	14	0	0
27-9	0	0	34	0	0
27-8	0	0	1	0	0
27-7	0	0	5	0	0
27-15	0	0	1	0	0
Sub Total	0	1	60	0	0
TOTAL	114	22	882	0	0
TOTAL MF	1,018				

TOTAL SELECTED POTENTIAL COMMUNITY AND MULTIFAMILY AREA
BY EXISTING LAND USE

	Grazing	Other Agri.	Vacant	Pub. Facil.	Road
	1,996	116	1,744	4	49
GRAND TOTAL	3,905				

TABLE IV - 9

SUPPLY AND DEMAND OF PUBLIC DEVELOPABLE LAND: SAIPAN
In Acres

Year	Public Developable Land	Demand*	Public Developable Land	Demand**
1989	6,892	780	6,892	1,205
1994	6,112	780	5,687	1,205
1999	5,332	780	4,482	1,205
2004	4,552	780	3,277	1,205
2009	3,772	780	2,072	1,205
2014	2,992	780	867	1,205
2019	2,212	780	-338	1,205
2024	1,432	780	-1,543	1,205
2029	652		-2,740	

* Demand assumes that the homestead program is developed with a 50% mix of multifamily homes.

** Demand assumes that the homestead program is developed with 100% single-family homes.

Negative land figures indicate the amount of land the CNMI government will be required to purchase if it is to maintain the same programs and services.

There are five areas designated as potentially suitable for multifamily development. These areas have been denoted by the letters A, B, C, D and E (Map IV - 5).

D. SUPPLY AND DEMAND OF PUBLIC LAND ON SAIPAN

From all these factors public land use demands can be projected for Saipan. Overall, there are approximately 8,652 acres of developable public land on Saipan (vacant with slope less than 20%, grazing, and other agriculture). This amount is reduced by 225 acres allocated for existing homestead lots, 300 acres that have been set aside for a golf course in the Kagman area, a commitment for 1,235 acres for exchange reserve. This leaves a net unallocated reserve in 1989 of 6,892 acres of developable public land.

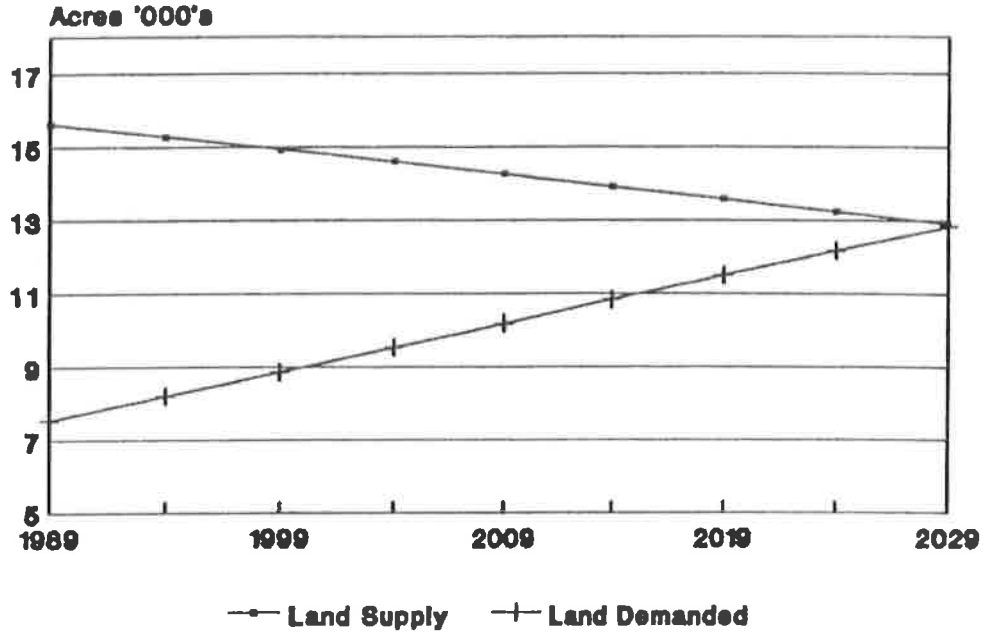
Over the next 25 years it is roughly estimated that there will be approximately 64 acres leased for commercial purposes. These 64 acres will be the exception to the no more commercial leases on Saipan, policy 3.3. In addition, 115 acres will be utilized for primary and secondary roads. Assuming a multifamily combination of the homestead program there will also be a demand for 1,681 acres for homestead lots and 1,794 acres for community services between 1990 and 2015. Spread out over the 25-year time frame of the plan this equates to an average of 68 acres per year for homestead lots, and 79 acres per year for the commercial leases, regional roads, and community services. An additional allocation of 10 acres per year for unaccounted-for public uses is prudent. This is a total average yearly demand for 156 acres.

If the homestead program utilizes a 100% single-family option, the required acres for residences is 2,733 or 109 acres per year and 2,855 acres for community facilities for 114 acres a year. With the 64 acres for commercial leases and 10 acres per year for miscellaneous uses, and 115 acres for regional roads the average annual total is 241 acres.

Assuming that all agricultural land is developed for community uses, and conservation land area remains the same, the CNMI will have committed all public land supply on Saipan by approximately 2029. If the homestead program is pursued as an exclusive

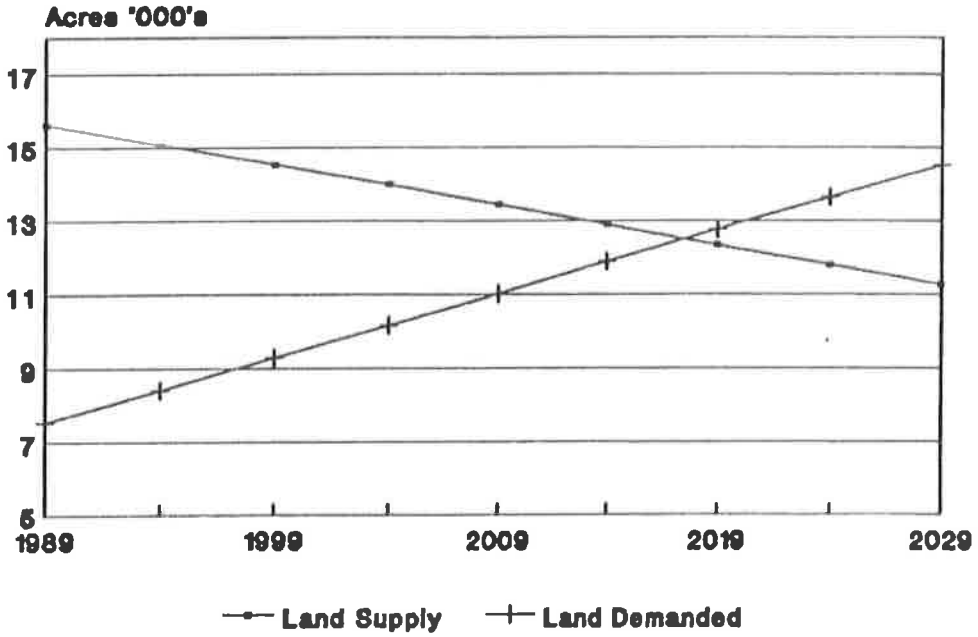
FIGURES IV-2 and IV-3

SUPPLY AND DEMAND OF PUBLIC LAND*
Saipan 1989 - 2029



* With 50% Mix of Multifamily Homesteads

SUPPLY AND DEMAND OF PUBLIC LAND*
Saipan 1989 - 2029



* 100% Single Family Homesteads

single-family option, without the land-saving benefits of multifamily housing, then land supplies will be committed by about the year 2014. After all public lands are committed the CNMI government will be forced to purchase private land to continue any activity that requires public land in an irreversible manner (Table IV - 9). This relationship is also presented graphically in Figure IV - 2 and Figure IV - 3 for supply and demand of public lands based on a mix of single and multifamily homesteads and homesteads at 100% single-family development, respectively.

E. "AS BUILT" RESIDENTIAL DEVELOPMENT AND COMMUNITY SERVICES

As noted earlier, it is not anticipated that the amounts of land indicated as committed will be 100% utilized by 2015. Although the land should be irrevocably committed for the designated public use, as it reflects constitutional mandates as well as basic public responsibilities, there is a lag time between commitment and development. What can be expected as actually being in place is presented by the "As Built" Land Use Projection Model for Community and Public Services (Table IV - 10). From this model it is estimated that an additional 1,700 acres of land (public and private) will become residential and 1,840 acres used for public purposes. Some of this land will come from dedications and exactions from private developers. Note that the model uses a conservative assumption that all residents reside in single-family housing. This may actually overestimate actual land utilization.

TABLE IV-10

AS BUILT" LAND USE PROJECTION MODEL FOR COMMUNITY PUBLIC SERVICES: Saipan

Variables					
	Number SF	Resident	10,462	Net Densit	31 Per/Acre
	Number MF	NonRes.	6,781	Overall Unit/Acre	2.87
	Total Units		17,243		

	Resident SF Land Use Demands Per Unit	NonRes. MF Land Use Demands Per Unit	Community Land Uses In 2015			Change 1989-2015
			Residents	NonRes.	Total	
Land Uses	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Residential	0.25	0.03	2,615	203	2,819	1,702
Public Uses	0.10	0.01	1,046	68	1,114	677
Roads	0.13	0.02	1,360	136	1,496	893
Recreation Open Space	0.03	0.04	314	271	585	274
Total	0.51	0.10	5,336	678	6,014	3,545

F. SITE/AREA SELECTION FOR MULTIFAMILY HOMESTEAD DEVELOPMENT

As indicated in section IV-C there are five areas designated as potentially suitable for multifamily development. These areas have been denoted by the letters A, B, C, D and E (Map IV - 4). Each area is a collection of individual parcels. Although these sites may not share specific characteristics, they do share a similar location and proximity to public infrastructure and services. In addition, we are assuming that areas share compatibility measures and have similar competing uses. Finally, each site in an area will likely have the same or similar environmental constraints. By definition all areas have the same general slope.

These areas have been analyzed by the Development Selection and Scheduling Model (Table IV - 11). The she selection criteria used in the model are:

slope,

access to infrastructure,

environmental sensitivity,

access to community services, and

competing uses.

Each area was judged on a five-point scale of excellent, good, fair, poor, and fail, with "5" being high or best. Further, each criterion was given a weight, and the score was multiplied by the weight to give a weighted score. This weighted score is then ranked for determining the sequence of development from first to last. In the multifamily case, the factors that determined which areas should be developed were accessibility to services and to infrastructure. Also, competing uses played a role, as some areas have agricultural potential. As expected, remote areas scored low as places to be developed.

This evaluation of multifamily areas is meant, in part, to demonstrate the methodology whereby lots, sites, or areas may be evaluated and scheduled for development. Other proposed uses may be evaluated in similar fashion with changes to evaluation criteria and weighing. Such an approach is a flexible tool which aids but does not substitute for decision making. The methodology and model are further described in the Management Plan under the subsection "Prediction and Decision Making Models in the CNMI Public Land Use Plan."

TABLE IV-11

DEVELOPMENT SELECTION AND SCHEDULING MODEL

Area or Lot No.	Slope Score	Wt.	Total	Access to Infrastr. Score	Wt.	Total	Environmental Sensitivity Score	Wt.	Total	Compatibility To Surroundings Score	Wt.	Total	Access Community Services Score	Wt.	Total	Competing Uses Score	Wt.	Total	Other		Total Score	Rank
A	4	2	8	0	2	0	2	4	8	2	3	6	0	2	0	1	4	4	0	0	26	5
B	4	2	8	1	2	2	2	4	8	2	3	6	0	2	0	1	4	4	0	0	28	4
C	4	2	8	2	2	4	1	4	4	3	3	9	3	2	6	2	4	8	0	0	39	3
D	4	2	8	4	2	8	4	4	16	4	3	12	4	2	8	4	4	16	0	0	68	1
E	4	2	8	4	2	8	4	4	16	2	3	6	4	2	8	2	4	8	0	0	54	2
F		2	0		2	0		4	0		3	0		2	0		4	0	0	0	0	0
G		2	0		2	0		4	0		3	0		2	0		4	0	0	0	0	0
H		2	0		2	0		4	0		3	0		2	0		4	0	0	0	0	0
I		2	0		2	0		4	0		3	0		2	0		4	0	0	0	0	0

Excellent = 4, Good = 3, Fair = 2, Poor = 1, Fail = 0

Weighting 17 points over 7 criteria Weight total = 17

Slope 2 Access 2 Envir. 4 Comp. 3 Serv. 2 Uses 4 Other 0

CHAPTER V PUBLIC LAND USE PLAN FOR ROTA

A. OVERVIEW

There are approximately 18,500 acres of public land on Rota. Of this land 3,575 acres are developed or committed, 2,495 acres are in steep terrain, an additional 1,675 acres are reserved as areas of particular concern, and homesteads and community development will demand an additional 350 acres through the year 2015. There is a remainder of 10,405 acres which is vacant or in agricultural use (Map V - 1).

Recently, there have been proposals to develop large sections of Rota's northeastern corner for resort use. Such proposed resorts incur substantial land commitments and represent (through leases) the major demands for public lands on Rota. At present two developments are proceeding. One development has an approved lease for 375 acres with another 875 acres pending. The second development has an approved lease agreement for 375 acres. In total, these developments potentially lease 1,625 acres of land.

TABLE V - 1

PUBLIC LAND ON ROTA 1989 and 2015

Total Public Land 1989	18,500 Acres
Committed or Developed	3,575
Steep Terrain	2,495
Conservation	1,675
Homestead & Community Development	350
Permitted and Potential Resort Use	1,625
Remaining Developable Land by 2015	8,780 Acres

B. PUBLIC LAND USE REQUIREMENTS

There are two major consumers of public lands on Rota: the homestead program and community services; and the leasing of government lands for resort-style developments. Due to the small population and relatively large land base, nuisance activities are not significant.

1. Nuisance Activities

Nuisance activities on Rota include the following:

a: Landfills for Solid Waste

b: Power Generation

c: Wastewater Treatment Facilities

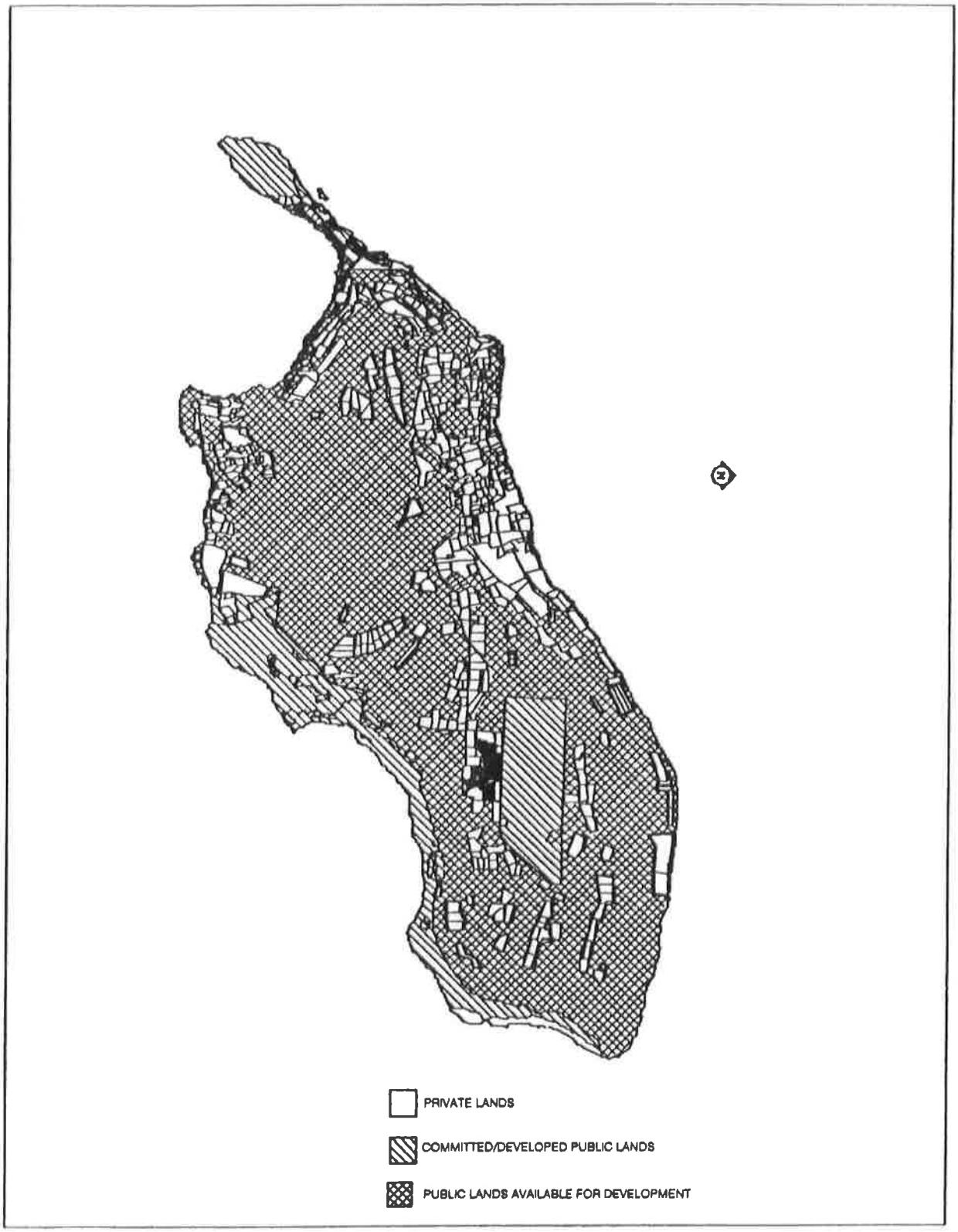
d: Airport

The site/vicinity for each of these activities on Rota has been designated on Map V - 2. A description of each is provided below.

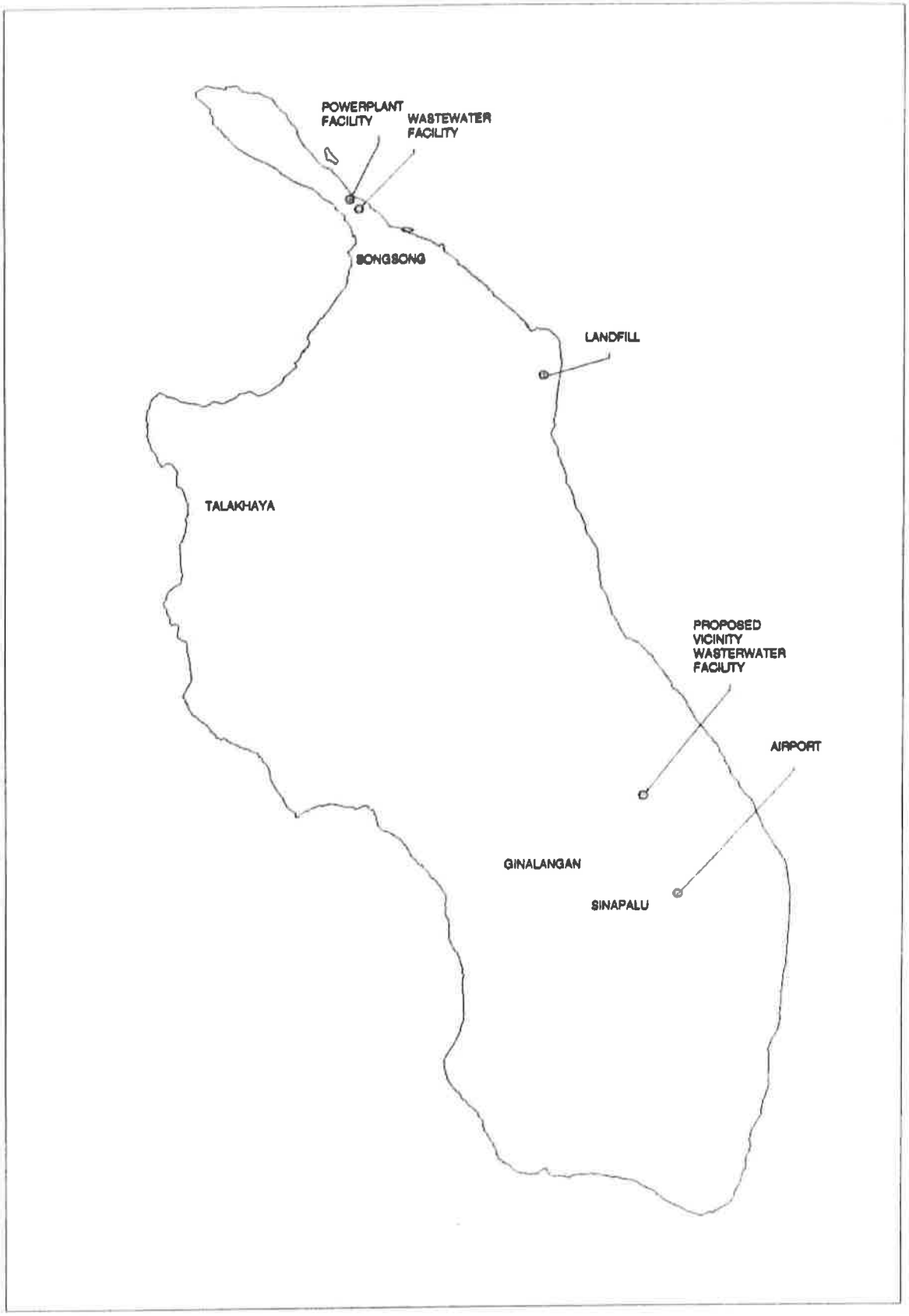
a. Currently the landfill (dump) on Rota is located northeast of Songsong on the road to the airport. The dump is physically located in a depression. The site is marked by a low level of activity.

As Rota develops as a resort destination there will be increased pressures for solid waste disposal to accommodate solid wastes generated by visitors and the thousands of expected non-resident labor that will be employed at the resorts. The daily population by 2015 could be around 25,000 persons. For this population a landfill area of 56 acres would provide approximately 20 years of service. A specific area has not been designated for a new site as this is now premature and such a study involves detailed engineering analysis. In addition, Rota has extensive land areas that can offer potential sites for a landfill.

MAP V-1
DEVELOPABLE LAND: ROTA



MAP V-2
NUISANCE SITE/VICINITY: ROTA



b. Power generation facilities are located near the port area. As in Saipan, it is policy to serve increased demand through transmission lines utilizing a single plant. There is vacant pubic land in the area adjacent to the existing power facility to accommodate increased capacity. These areas should be reserved for this purpose. A conservative estimate would put the land required for power generation at 10 acres.

As resort areas are developed they may be required to provide for their own power generation either by a separate facility or by increasing the capacity of the present site. This is a decision that is best made through negotiations with the CNMI government and the developer.

c. Wastewater treatment facilities currently exist for the Songsong area only. The current site of the wastewater treatment facility has adjacent public land that should be reserved for increased treatment plant capacity. An additional area of two acres should be set aside for expansion of the Songsong Wastewater Treatment Plant.

The village of Sinapalo will eventually require wastewater treatment. When this is decided a land disposal technology may be used due to the distance from the ocean for an outfall. In this event land area requirements for wastewater treatment will be around 15 acres.

The resort areas and the residential areas for non-resident labor working at the resort will likely have a separate wastewater disposal system. The system would be self sufficient and perhaps extend services to the surrounding community. The facility should be an integral component of the resort so that additional public lands are not required.

d. The location and size of the airport is not expected to change appreciably and the need for additional public lands for this use is not anticipated.

2. Government Administrative Offices

The office of the mayor and branch offices of CNMI agencies are not expected to increase their demand for land. The port is not expected to require additional land.

3. Homesteads and Community Services

Lands required for the homestead program and related public services are estimated utilizing the Homestead Demand Model and Community Development Land Use Allocation Model.

Given the relative availability of developable land on Rota the Community Development Land Use Allocation Model (Table V - 3) calculates a 26% ratio for multifamily homestead residences. Therefore, out of the 861 total lots demanded, 225 are calculated as multifamily.

In summary, 170 acres are set aside for homestead sites, 89 acres for public roads, 22 acres for recreation and open space, and 69 acres for public services including elementary schools, health clinics, police and fire support stations, etc.

4. Conservation Areas

Approximately 1,675 acres of land have been designated as "Areas of Particular Concern" on Map III - 3 as Conservation Areas. Conservation Areas are assumed to be stable in size. Additional use of public lands is not anticipated.

5. Land for Commercial Uses

Both agriculture and resorts are commercial developments. Of these two it is anticipated that resort use will increase significantly, with possibly 1,625 acres of public land committed for lease in the near future. Trends in the visitor industry are generally not a reliable base for long term projections. Constant monitoring and updating must be done in order to provide useful forecasts of growth in the visitor industry and resulting land demands. Given the extent of public lands on Rota and the small resident population, there is, at this time, no specific reason to limit growth in the visitor industry on public lands due to land availability. However, issues such as the availability of water, labor force availability to build and operate the facilities, and social impacts are potentially serious obstacles for visitor industry growth.

TABLE V-2

ROTA HOMESTEAD DEMAND MODEL

Projection	No. Persons Becoming By 2015	Percent Married	% Population Eligible	Units Demanded
High	1,447	25%	100%	1,266
Middle	1,378	50%	75%	861
Low	1,309	75%	50%	654

TABLE V-3

COMMUNITY DEVELOPMENT LAND USE ALLOCATION MODEL: Rota

Variables:	Number SF	636	Net Density	25 Per/Acre
	Number MF-3	75	Overall	
	Number TH	150	Unit/Acre	2.45
	Total Units	861		

	Koblerville Model SF 450 Units		Multi-Family Model 3 Story 550 Units		T. House 550 Units		Community Land Uses In 2015 SF	MF-3	TH	Total
Land Uses	Ac.	%	Ac.	%	Ac.	%	Ac.	Ac.	Ac.	Ac.
Residential	112	49%	15	31%	37	49%	158	2	10	170
Public Uses	44	19%	16	33%	16	21%	62	2	4	69
Roads	60	26%	8	16%	12	16%	85	1	3	89
Recreation Open Space	13	6%	10	20%	10	13%	18	1	3	22
Total	229	100%	49	100%	75	100%	324	7	20	351

Land Demanded If All SF 437

Land Savings With MF Combination 86

Key SF Single Family Detached, MF-3 3 Story MF Structure, TH Town House

C. "AS BUILT" RESIDENTIAL DEVELOPMENT AND COMMUNITY SERVICES

The "As Built" Land Use Model for Community Development and Public Services (Table V - 4) indicates that there can be an additional 241 acres of residential development and 387 acres of public uses actually developed by the year 2015. The source of this land will come from both public and private supplies.

TABLE V-4

"AS BUILT" LAND USE PROJECTION MODEL FOR COMMUNITY PUBLIC SERVICES: Rota

Variables	Number SF	Resident	864	Net Densit	69 Per/Acre
	Number MF	NonRes.	3,624	Overall	
				Unit/Acre	5.59
	Total Units		4,489		

	Resident SF Land Use Demands Per Unit	NonRes. MF Land Use Demands Per Unit	Community Land Uses In 2015 Residents	NonRes.	Total	Change 1989-2015
Land Uses	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Residential	0.25	0.03	216	109	325	241
Public Uses	0.10	0.01	86	36	123	89
Roads	0.13	0.02	112	72	185	141
Recreation Open Space	0.03	0.04	26	145	171	157
Total	0.51	0.10	441	362	803	628

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CHAPTER VI PUBLIC LAND USE PLAN FOR TINIAN

A. OVERVIEW

There are approximately 23,060 acres of public land on Tinian; of this acreage, 18,924 are leased to the U.S. Department of Defense (known as the Federal Retention Area). There are 4,136 acres which remain under the direct control of the CNMI government.

Of these 4,136 acres 1,286 are already developed or committed, 923 are steep terrain, 165 are in areas of particular concern, and 173 acres will be demanded by the homestead program and for community services. There are also 750 acres of public land that have been designated for agricultural homesteads (Tinian Agricultural Homestead Act of 1988, Public Law 6-15). There is a remainder of 839 acres. (Map VI - 1)

TABLE VI - 1

PUBLIC LAND ON TINIAN

Total Public Land	23,060 Acres
Federal Leased	18,924
Developed/Committed	1,286
Steep Terrain	923
Conservation	165
Agricultural Homesteads	750
Homesteads/Community Development	173
Remaining Developable Land	839 Acres

B. PUBLIC LAND USE REQUIREMENTS

Traditionally, public lands have been used on Tinian for community services and leased for agricultural uses. Community services will remain as a consumer of public land. Agriculture will likely not grow but rather decline in importance. It is anticipated that within the next several years casino-style hotels/resorts will be requesting government land to lease.

1. Nuisance Activities

Nuisance activities on Tinian include the following:

a: Landfills for Solid Waste

b: Power Generation

c: Wastewater Treatment Facilities

d: Airport

The site/vicinity for each of these activities on Tinian has been designated on Map IV - 2. A description of each is provided below.

a. The current landfill (dump) is a low-activity area located in the Federal Retention Area. As Tinian develops, there may be as many as 5,000 or more persons (depending upon the popularity of casinos as a visitor destination). This projection should be updated as the visitor industry expands with the concurrent need for solid waste disposal.

It is a possibility (and it is preferable) to locate an additional landfill site in the Federal Retention Area, but since the land is under federal control this is not a given. Therefore, a site suitable for a landfill should be selected from the available public land. Although a proposed site is not specified, the land required to serve a population of 5,000 for 20 years would be 12 acres, given certain site assumptions.

b. Power generation facilities are currently located within the village of San Jose. There is sufficient land in the vicinity of the existing plant to provide additional land for growth. A land area of approximately six acres will be required. Again, as with Rota, development trends on Tinian can change rapidly, so it is important to monitor growth and update regularly land requirements for all public services.

c: There is currently no wastewater treatment facility on Tinian and no central collection system. With increasing population and densities it will become necessary to consider providing a centralized collection system and wastewater treatment facility.

In a previous study (Facilities Plan for the Island of Tinian, 1979) it was recommended that a centralized treatment facility be located in the Federal Retention Area, at a site either one-half mile or three miles northwest of San Jose village, depending upon the form of treatment and disposal. These locations take advantage of prevailing winds and currents. While these sites may be an option, as with the landfill situa-

tion, since this land is federally controlled an alternative site on public lands should be considered as a fallback position. It is estimated that an area of 10 acres should be set aside for this use.

d. The location and size of the airport is not expected to change appreciably, and additional public lands are not anticipated for this use. With the passage of the casino gambling initiative the visitor industry could expand appreciably, requiring additional airport capacity. A master plan is now in the process of being contracted. The area for expansion, if required, would come from the Federal Retention Area, possibly as a shared use facility with the U.S. Department of Defense. As such, airport expansion would not require "available" public lands.

2. Government Administrative Offices

The office of the mayor and branch offices of CNMI agencies are not expected to increase their demand for land.

3. Homesteads and Community Services

Public land areas for Tinian's homesteads and their associated public services can be estimated through the Homestead Demand Model (Table VI-2) and the Community Development Land Use Allocation Model (Table VI-3).

5. Land for Commercial Use

Similar to Rota, commercial use includes resorts/hotels and agricultural developments. Resort and hotel use is expected to increase while agriculture is expected to remain stable or decline. Without considering demands on public lands for resort/ hotel leases, there is a remainder of undeveloped land of less than 900 acres in the year 2015. Leases of government land for the visitor industry should be for activities that are land intensive; i.e., a hotel development rather than a sprawling resort with golf course-style project. Commercial leases should also encourage infill of the existing community area.

Leases should not be granted to labor intensive activities such as garment factories (Policy 2.3).

C. "AS BUILT" RESIDENTIAL DEVELOPMENT AND COMMUNITY SERVICES

The "As Built" Land Use Model for Community Development and Public Services (Table VI - 4) indicates that there can be expected to be an additional 241 acres of residential areas and 387 acres of public uses by the year 2015. The source of land for these uses will come from private and public supplies.

TABLE VI - 2

TINIAN HOMESTEAD DEMAND MODEL

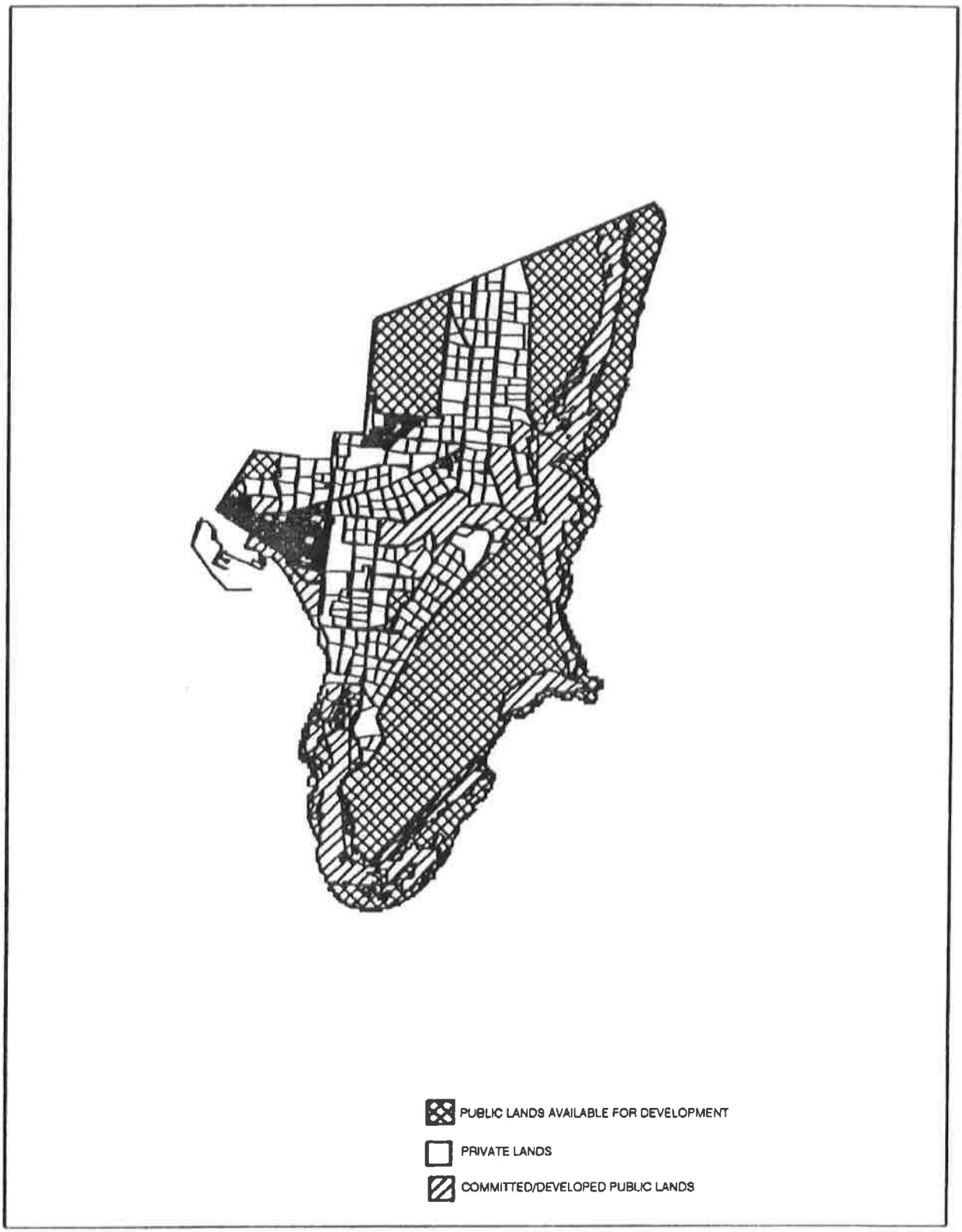
Projection	No. Persons Becoming 18 By 2015	Percent Married	% Population Eligible	Units Demanded
High	896	25%	100%	784
Middle	853	50%	75%	533
Low	810	75%	50%	405

Tinian will require 533 homestead lots by the year 2015. Utilizing a 47% mix for multifamily housing, the total land area required will be 173 acres. Of that total, 83 will be for residential use, 42 acres for roads, 13 acres for recreation and open space, and 35 acres for public services such as schools, health clinics, police and fire support stations, etc.

4. Conservation Areas

There are 165 acres in the "Areas of Particular Concern" category. This amount of land is assumed to remain stable.

MAP V1-1
DEVELOPABLE LAND: TINIAN



MAP VI-2
NUISANCE SITE/VICINITY: TINIAN

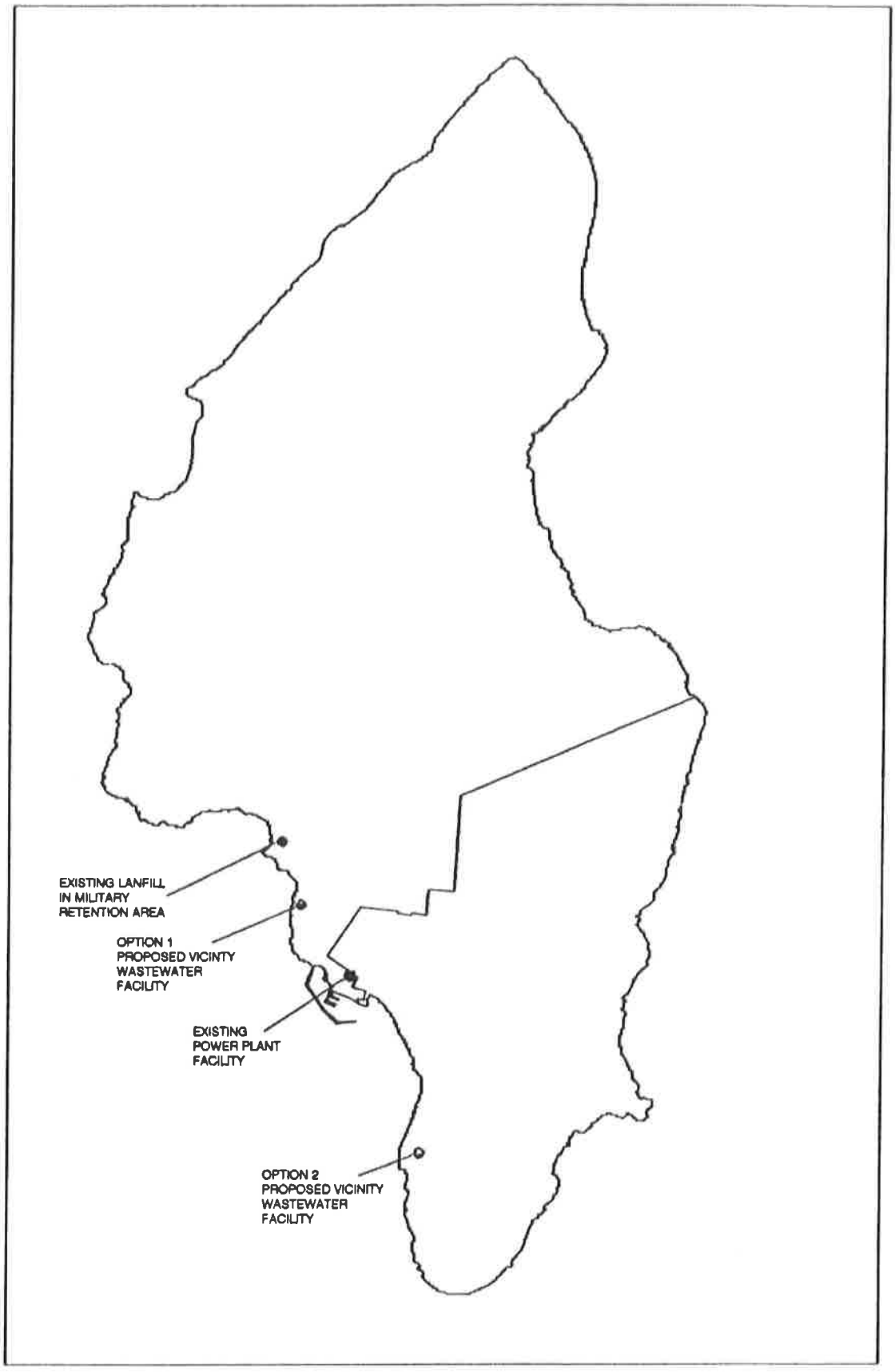


TABLE VI-3

COMMUNITY DEVELOPMENT LAND USE ALLOCATION MODEL: Tinian

Variables:	Number SF	283	Net Density	32 Per/Acre
	Number MF-3	100	Overall	
	Number TH	150	Unit/Acre	3.07
	Total Units	533		

	Koblerville Model SF 450 Units		Multi-Family Model 3 Story 550 Units		T. House 550 Units		Community Land Uses In 2015 SF	MF-3	TH	Total
Land Uses	Ac.	%	Ac.	%	Ac.	%	Ac.	Ac.	Ac.	Ac.
Residential	112	49%	15	31%	37	49%	70	3	10	83
Public Uses	44	19%	16	33%	16	21%	28	3	4	35
Roads	60	26%	8	16%	12	16%	38	1	3	42
Recreation Open Space	13	6%	10	20%	10	13%	8	2	3	13
Total	229	100%	49	100%	75	100%	144	9	20	173

Land Demanded If All SF 271

Land Savings With MF Combination 97

Key SF Single Family Detached, MF-3 3 Story MF Structure, TH Town House

TABLE VI-4

"AS BUILT" LAND USE PROJECTION MODEL FOR COMMUNITY PUBLIC SERVICES: Tinian

Variables	Number SF	Resident	475	Net Densit	45 Per/Acre
	Number MF	NonRes.	3824	Overall	
				Unit/Acre	4.00
	Total Units		1,299		

	Resident SF Land Use Demands Per Unit	NonRes. MF Land Use Demands Per Unit	Community Land Uses In 2015 Residents	NonRes.	Total	Change 1989-2015
Land Uses	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Residential	0.25	0.03	119	25	143	88
Public Uses	0.10	0.01	47	8	56	34
Roads	0.13	0.02	62	16	78	49
Recreation Open Space	0.03	0.04	14	33	47	37
Total	0.51	0.10	242	82	325	208

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CHAPTER VII PLAN MANAGEMENT

A. INTRODUCTION

For the purpose of this CNMI Public Land Use Plan, "plan management" means administering and implementing the results of the planning process as reported in this plan document. However, since public lands are only one component of the CNMI' overall land base, the management of this plan is not intended to occur independent of comprehensive land use planning, which encompasses regulations for the use of private properties. Management will also require the adjustment of this plan document to bring it in line with future public planning efforts from utility master plans to recreation planning.

This chapter explains three primary aspects of managing this Public Land Use Plan:

- Administering the Plan
- Implementing the Plan
- Using the Plan's predictive models and GIS data base

B. Administration of the Public Land Use Plan

Administration of the Plan refers to the ongoing responsibility for monitoring/updating and coordinating the various aspects of implementation, as carried-out by CNMI government agencies.

1. Administering Agency

The Marianas Public Land Corporation is in the process of being phased out. As of December 1989, the CNMI government is considering several alternatives for creating a centralized planning agency in the executive branch. The administration of this Public Land Use Plan properly falls within the purview of such an agency.

Because public lands will always serve as a major determinate for directing the CNMI's growth and development, they must be planned and managed by an executive branch agency with a broad perspective on the Commonwealth's development issues. Consequently, it is not appropriate to assign the management of this plan to a line or staff agency with limited planning authority or perspective. Instead, public land planning should be consolidated with similar master planning functions for the Commonwealth, especially economic planning, comprehensive land use, housing, and social services. Commonwealth-wide master planning must be supported, in turn, by functional planning among the appropriate line agencies such as:

- Infrastructure planning by Public Works, Commonwealth Utilities Commission, and the Commonwealth Ports Authority
- Zoning to be created by the by the Commonwealth Zoning Board
- Education planning by the Department of Education and the Marianas Community College
- Health and environmental resource planning by the Department of Public Health and Environmental Services and the Coastal Resources Management Office.
- Park and recreation planning by the Department of Natural Resources
- Visitor industry development planning by the Marianas Visitors Bureau

Consequently, the exact position of the administering agency for this Public Land Use Plan within the executive branch of the CNMI government is not as critical as is such an agency's base of authority to perform Commonwealth-wide master planning and to establish an ongoing planning process for the CNMI.

2. Monitoring the Plan

The monitoring and updating aspects of administering the Public Land Use Plan can be performed simultaneously by planning staff assigned to collateral responsibilities. Further, plan monitoring and updating must be an ongoing process, because these steps are vital to maintaining a plan's relevance to the changes occurring within the Commonwealth.

"Monitoring" refers to the periodic observation and recording of public land uses. Inasmuch as the plan identifies the current and long-term uses (and the bases for recommending those uses) for all public parcels, it is important to routinely ascertain compliance with the planned uses. Wherever inconsistencies are detected, planning staff must determine whether to recommend action for reverting the use or to amend the Public Land Use Plan accordingly. Each

public parcel that has not achieved its ultimate use should be checked on an annual basis, and all such observations should be recorded on the data base of the public land GIS.

In addition to category of use, the recorded observation should also include, where applicable, intensity of use, specific locations of new development as well as any other data of use to maintaining a current file of the parcel's use.

Further, the eventual scope of this effort should include private lands of the CNMI. While monitoring land uses and collecting field data are typically internal staff functions, consultants should be considered for design of the data collection format and subsequent updating of the data base.

3. Plan Updating

Plan updating has several components. First, it entails the formal review of all data bases used to determine the Plan's various projections, such as the economic growth scenario, demand for homesteads, visitor arrivals and demography. In some cases, these updates can be accomplished by other government agencies with ongoing responsibility for data collection and analyses, such as census and employment statistics by the Department of Labor and Commerce, and visitor arrivals by the Marianas Visitors Bureau. Certain updates may be best accomplished though short-term consultant services for more specialized projections and modeling. Lastly, the agency planning staff should undertake this task to the extent that resources permit.

This component of data updating is not restricted to collecting the most current data, but should generally advance the overall quality data collection and analysis to higher levels of detail and accuracy.

Second, plan updating should encompass new information that is valuable to improving the Plan's original data base, analyses and recommendations. Such updating will most likely occur by incorporating new plans and studies which are undertaken by the Commonwealth, especially in the area of zoning and comprehensive land use planning. New laws and regulations affecting the use, management or disposition of public lands must also be integrated into this plan document. Even non-quantitative trends, such as community attitudes and general changes within the CNMI planning environment, should be tracked and applied wherever applicable to the plan.

Last but most important, updating should involve the general public, other government agencies and officials, and the business community through forums such as workshops, formal presentations and public hearings in order to attain the broadest possible exposure for the Plan.

Professional planners should be assigned the responsibility for analyzing the results of plan monitoring and updating to determine the relevance of new data on public land use planning.

C. Implementation of the Plan

Implementing the Public Land Use Plan refers to disposition of the public parcels in accordance with the approved uses and time schedule, where appropriate.

1. Immediate Designations of Agencies for Implementation

The Public Land Use Plan commits all public parcels for particular uses which are consistent with the proposed policies, established growth scenario, and CNMI laws. Certain uses fall within the vested responsibility of a governmental agency (such as areas designated for conservation use will be managed by the Department of Natural Resources). The responsibility for managing other lands (such as homestead development, commercial leases, and those lands not yet designated for an ultimate use) is not yet reassigned within the CNMI government staff and line agencies to accommodate the reintegration of MPLC's functions.

Land uses that are associated with a particular CNMI agency are identified in Table VII-1.

2. Future Designations for Implementation

As mentioned, certain uses cannot be properly assigned for implementation at the time of completing this Public Land Use Plan, because the land management functions of the (former) MPLC have not been assigned to other existing or new agencies. These uses include community facilities, commercial uses, homesteads, and undesignated lands.

These uses are categorized into two types:

a. Land areas to be held in a temporary use until their ultimate disposition and development are scheduled. These include areas allocated for future homesteads and related community facilities as well as "undesignated lands" which are presently undeveloped.

b. Land areas currently under commercial lease arrangements, for which ongoing lease contracts must be administered. (These areas include such activities as hotels, golf courses, agricultural lease areas,

Table VII-1

PRIMARY AGENCY FOR PLAN IMPLEMENTATION

Exchange reserve	Public Works - rights of way acquisition for streets and highways
	CUC - rights of way acquisition for utilities
New regional roads	Public Works - highway planning
Grazing and agriculture	Department of Natural Resources
Nuisance activities	
Wastewater STP	Commonwealth Utilities Corporation Wastewater Division
Landfill	Public Health and Environmental Services Division of Environmental Quality
Toxic waste	Public Health and Environmental Services Division of Environmental Quality
Prison	Public Safety - Corrections Division
Ports	Commonwealth Ports Authority
Community facilities	
Parks	Natural Resources
Police and fire	Public Safety
Schools	Education
Commercial uses	(see next section)
Homesteads	(see next section)
Undesignated lands	(see next section)

Managaha Island recreation areas and other commercial uses now occupying public lands.)

Both categories of public land uses must be assigned as new responsibilities within the government of the Northern Mariana Islands. This matter is expected to be resolved between the executive and the legislative branches during 1990.

The following two sections have been included as an aid to updating the plan document. These sections contain technical reports: Management of the Predictive Models; and Management of the GIS Data Base. These reports are not intended for casual reading but are designed to assist with the hands-on updating work by technicians, data base managers, and planners.

D. USING PREDICTION AND DECISION MODELS

In the course of developing the CNMI Public Land Use Plan 10 analytic computer-assisted models were created. These models help in establishing the context, predicting future conditions, and aid in decision making. The models are as follows:

1. Economic and Employment Projection Model
2. Expected and Rapid Visitor Industry Growth Impacts Model
3. Visitor, Rooms Demanded, and Non-resident Labor Projections Model
4. Number of Hotel Rooms, Visitors, and Non-resident Workers Model by Island
5. Island Population Figures

6. Estimated Public and Private Land Use Model
7. The Homestead Demand Model
8. The Community Development Land Use Allocation Model
9. The "As Built" Community Land Use Model
10. Land Development and Scheduling Model

Utilizing these models for future planning for public land use is an essential part of an ongoing planning and management process. In addition, models are by nature in need of continual monitoring and updating as better and more current information is found and as development trends change. It is the purpose of this section to present each model, explain its purpose and limitations, describe the way the model is updated, and how modifications can be made if necessary. Copies of the computer files for the models are included with the submission of the final plan document; backup files should be made before using the models.

All the models described here are templates that utilize either Symphony or Lotus 1-2-3 version 2. The user is required to have one of these programs and know how to use it, and an IBM or compatible computer with a memory capacity of at lease 512kb. The models are not overly complex for an experienced spreadsheet user. Once called up on the screen, the operator after reviewing the description below (and referring to the relevant section of the CNMI Public Land Use Plan where the model is utilized), can trace the necessary relationships and make the desired changes.

1. ECONOMIC AND EMPLOYMENT PROJECTION MODEL: 1989 - 2015,
Computer File SCEN1.WK1,
Refer to Table III - 1.

This model is designed to provide the general economic and employment context within which the CNMI Land Use Plan will operate. The model is based on the assumption that all employment within the CNMI can be traced to one of four basic economic sectors, these are the Visitor Industry, Garment and Other Manufacturing, Government, and Agriculture and Fisheries. The total basic Gross Island Product (GIP) is divided by the estimated total employment for 1989. This ratio becomes a multiplier, whereby increases in GIP over the next 25 years can be interpreted in terms of jobs created, such that Basic GIP Year A x (JOBS '89/Basic GIP '89) = JOBS YEAR A. The model provides estimates of resident and total foreign work force. It is assumed that residents will be employed first with the remaining jobs being taken by non-residents. The foreign work force is assumed to comprise totally non-resident population.

This model provides estimates that are used in other models that relate to demands on both public and private land.

The model is not without some qualifications. First, different sectors of the economy will have different employment growth factors; the ratio used in the model is an average. Second, the ratio for each sector may change, usually requiring a higher level of Basic GIP for marginal increases in employment. This is partly accounted for by including an efficiency factor in the model.

The model is driven by manipulation of the percentage growth figures following each year's figure for the respective sector. The percentage is the percent change between the current and previous year. These percentages are manually inserted. Once inserted the total number of jobs, and the allocation of jobs between resident and non-residents, is provided. The model must be monitored each year, with insertion of actual data. The real growth rates can then be calculated and inserted.

When actual employment is known, as will be the case from data provided in the 1990 Census, the ratio of number of jobs created per measure of Basic GIP can be updated.

There are related models within this same file; these are described below.

A variation of this model assesses the impact of rapid growth in the visitor industry. This model is located just below the Expected Growth Model. The models are the same except that the percentage growth figures for the visitor industry are higher in the rapid growth scenario. The estimates produced by the rapid growth scenario are utilized for comparative purposes.

2. EXPECTED AND RAPID VISITOR INDUSTRY GROWTH IMPACTS MODEL
Refer to Table III - 1A.

To the right of the Economic and Employment Projection Model, are a pair of impact analyses of the visitor industry given the Expected Growth Scenario and the Rapid Visitor Industry Growth Scenario. These models will self adjust as their respective Economic and Employment Projection Models, are changed. The percent growth figure displayed in the Visitor Industry Growth Impacts Model is taken directly from these models. The percent growth factors should be changed in the respective Economic and Employment Projection Model, if changes in the Visitor Industry Growth Impacts Model are desired.

These two analyses present estimated visitor arrivals, hotel rooms required, and the total number of hotel rooms given a certain hotel occupancy rate. Within these spreadsheets are the assumptions that the average visitor stays 3.63 days, spends $293 per day, that there are 1.8 persons per room, and that hotels are 75% occupied. Any of these assumptions may change over time requiring adjustment of the model. Note however that the amount of money spent is in constant dollars, so that increases in expenditures using current dollars must be deflated using a consumer price index.

3. VISITOR, ROOM DEMAND, AND NON-RESIDENT LABOR PROJECTIONS MODEL, 1989 - 2015.
Refer to Table III - 3.

To the right of the Visitor Industry Growth Impacts Model is a table (title as above) which illustrates the changes between 1989 and the year 2015 for total visitors, average number of visitors per day, hotel rooms demanded and non-resident labor generated. The figures are taken from other models. Direct changes in this model should be minimal except where statistics such as average stay and persons per room change.

4. NUMBER OF HOTEL ROOMS, VISITORS, AND NON-RESIDENTS WORKERS MODEL BY ISLAND, 1989 - 2015.
Refer to Table III - 4.

Following to the right is a further breakdown of the previous two models by island (Saipan, Rota, and Tinian). This model is driven by the number of hotel rooms located on each island. This figure is manually inserted. This allocation must be monitored and updated.

Each of the previous two models is paired for the Expected and Rapid Growth Scenarios. The Rapid Growth projection is below the Expected Growth projection.

5. ISLAND POPULATION FIGURES
Refer to Table III - 5.

Finally, island population figures are summarized for each scenario, Expected and Rapid Growth. Resident Population is given with the other figures generated by the other models and automatically inserted. The only changes that need to take place in this model is if the projection of resident population figure changes, or if there are unexpected increases in the garment industry or other activity needing large numbers on non-resident workers.

This ends the models found on computer file SCEN1.WK1.

6. ESTIMATED PUBLIC AND PRIVATE LAND USE MODEL.
Computer File SAI2.WK1, Refer to Table III - 6.

Each island has an independent Land Use Model. These models are intended to provide general estimates of land usage between 1989 and 2015 for all lands both public and private. The model is driven by two variables; population growth and expected density. (Population in 2015 is provided by the Island Population figure found in the previous model and inserted manually.) Both density and population must be monitored and revised. In addition, the estimated acreage per activity figure for 1989 is only a rough approximation. To obtain more accurate data a detailed existing land use survey should be conducted with clear and specific definitions of land use activities.

The variables that are the most volatile are non-residents and visitors (average daily number). These figures can be altered to see the changing land use demands. Expected density is also a variable that can be manipulated. The exception is for undeveloped land. The density for this category is calculated as a residual after all other uses are totaled. The remaining acres are assumed to be undeveloped and used with total population to determine density for undeveloped land.

Acreage needs are generated as a function of population and density (with the exception of undeveloped land as noted above). This model is intended to be used in "what if" situations where population figures are adjusted upward to see approximate impacts. This approach is reasonable as long as population gains are not exorbitant. If population gains are significantly higher than estimated, the figure for agricultural acreage needs (refers to cultivation not grazing) becomes irrelevant. This is because as population increases pressures for urbanization of agricultural land will increase, but the model will indicate increasing acreage for agriculture. This situation is accounted for in the model.

There are two kinds of "governors" within the formula that calculates agricultural acreage needs. The first governor limits the amount of land that is allowed to be used as agricultural regardless of the population. The maximum for Saipan is 311 acres, for Rota 3,000 acres, and for Tinian 1,000 acres. The second governor sets a minimum amount of agricultural land when the numbers of non-residents and visitors increase to the point that all undeveloped land is used. This minimum agricultural acreage is triggered on Saipan when the number of non-residents and visitors reaches 300,000 (to 0 acres); it is triggered on Rota when non-residents and visitors reach 100,000 for

a minimum of 200 acres, and the governor is triggered on Tinian when the number of non-residents and visitors reaches 300,000 for a minimum of 150 acreage of cultivated land.

In addition, if growth is significantly higher than expected the density figures for all activities will likely increase. This requires manual changes.

7. THE HOMESTEAD DEMAND MODEL
Computer File DEVMOD1.WK1,
Refer to Table IV - 6, V - 2, and VI - 2.

One of the largest consumers of public land is the homestead program. This program is constitutionally mandated and must therefore be provided for in anticipated land allocation. The variables are age, marital status and eligibility. The model calculates all members of the indigenous resident population who will turn 18 between now and the year 2015, based on CNMI government projections. Married couples are allowed only one homestead even though they would otherwise be eligible for one each. Other eligibility factors include existing ownership of land and presence/legal residence on island. The model estimates factors for each of these variables with a high, expected and low range. This is done separately for each island.

Each of the variables should be monitored and adjusted. A population table by age is provided in the model, these figures should be updated especially with data from the 1990 Census. The model calculates the number of persons turning 18 directly from this table. Therefore, the population table should be adjusted if changes in the number of those turning 18 by the year 2015 is desired. The high is plus 5%, the low minus %5. Figures for the other variables can be taken from actual homestead applications and monitored. These changes if indicated may be made directly in the model.

8. THE COMMUNITY DEVELOPMENT LAND USE ALLOCATION MODEL
Refer to Table IV - 7, V - 3, and VI - 3.

Residential public services are a major consumer of land for activities such as schools, community centers, local roads, utilities, recreation, police and fire support stations, trash collection points, clinics, and more. Land requirement standards per household have been estimated. For single-family development this has been based on a typical homestead layout. The multifamily standards are based on U.S. mainland standards.

Two points concerning the land use standards should be stated here. First, the homestead layout is a conservative one to follow. Generally, homesteads have been designed with more land allocated to public uses than may be required. Perhaps more efficient community designs can be developed in the future, and in that event, the land allocated for particular uses in the model should be revised accordingly. Second, because there are few examples of multifamily housing the standards used were derived from U.S. mainland experience. These standards need to be monitored as multifamily land uses become more prevalent in the CNMI, with adjustments made to the model as necessary.

This model is driven by the number of multifamily units estimated. Total units are given from the Homestead Demand Model. After the number of multifamily units is manually inserted, the residual is automatically made as single-family units. Changing the number of estimated multifamily units from 0 to the total number of units will give the range of land usage for both the residential lot and the land needed to support public services.

9. "AS BUILT" COMMUNITY LAND USE MODEL
Computer File: ASBUILT.WK1, Refer to Table IV - 10, V - 4, VI - 4.

The "As Built" Model provides an estimate of what is actually expected to be developed in terms of housing and community services. This estimate is contrasted to the Community Development Land Use Allocation Model, in that the CDLUAM estimates amounts of public land that will be committed for use but not necessarily developed. The "As Built" estimates the numbers of households to be established as well as an equivalence for what is called a non-resident household. In addition, these estimates include both private land development and public parcels.

The model is in two parts. The first section is a table of factors, such as current and projected population and an assumed household size. The difference in population between the current and that estimated is divided by average household size to provide an estimate of additional housing units. Being conservative, this model assumes that all resident housing units are single family. The same factors as for the CDLUAM are utilized here to estimate land usage. Five non-residents are assumed to be equivalent to a five-member resident multifamily household in terms of land area for dwelling. The factors for public services demanded by non-residents have been adjusted downward except for recreation and open space, which is assumed to be larger. These are only estimates and should be updated if empirical data on non-resident demands on public services is researched.

The model is basically self driven once the current and projected population figures are entered. These

figures come from Table III - . Adjustments should be made when results of the 1990 Census provides current data on household size.

10. LAND DEVELOPMENT AND SCHEDULING MODEL

Computer File SITEMOD.WK1,
Refer to Table IV - 11.

This model serves as an aid to decision making when several lots or areas are being considered for development. The model will rank each lot/area as to its suitability for a particular type of use. This ranking will aid in selecting which areas/lots are developed and the order in which they are developed.

The model is basically a goals achievement matrix whereby each lot/area is measured against certain criteria. In the case of this model the characteristics measured are slope, access to infrastructure, environmental sensitivity, compatibility to surroundings, access to community services, and relationship to competing uses. Each characteristic is weighted, the weights are entered manually at the discretion of the user at the bottom row. Once inserted here they are automatically placed inside the model.

Each site/area is then given a score as to how it meets the particular characteristic. The score is on a scale of 0 - 4, with 4 being excellent. These scores are entered manually, again at the discretion of the user. It is possible to construct measurement instruments based on objective criteria, but in this case the measures are done on a relative scale based on knowledge of the site. Several users may be asked to do the same evaluation to see if there is significant variation in outcome.

Once the weight and score are entered the model calculates the total score (the higher the number the better the score). The total scores can be ranked manually by simply observing which is highest to lowest in numerical score (score of 1 through x with 1 being best, corresponding to the highest scorer). The ranking can also be calculated by the computer by taking two more steps. First copy the value from the Total Score column and place them under the Total Score column to the right of the model. Then perform a data base function and sort the values in descending order. The model is set up to do this function. Once performed, the Rank column in the model will have the correct Ranking for the respective score. Note: this will not self-correct if any factors in the model are changed. The data base function must be repeated with every change.

The variables that can be modified are the characteristics used, the weighing per characteristic, and the score.

E. MONITORING AND UPDATING THE CNMI PUBLIC LANDS GEOGRAPHIC INFORMATION SYSTEM

This section provides a description of the Geographic Information System, an overview of the CNMI's Public Lands GIS, how to retrieve information and update the system, and the status of the system as of December 31, 1989.

1. WHAT IS A GIS?

A Geographical Information System (GIS) is a computer system composed of hardware and software which integrates computer graphics with a relational data base management system. The system is designed to capture, store, process, manipulate and output data both graphically and in tabular form.

Data in a GIS is both spatial (graphic) and descriptive (tabular) in form. Spatial data has a location or an address. Descriptive data or attribute data is information associated with an object. It describes the entity.

A GIS has two important capabilities: Forward Data Mapping and Backward Data Mapping. Forward Data Mapping is simply displaying selected attribute data, stored in the relational data base, in map form. An example of this would be, "Show me all the lots with area greater than 2,000 square meters that are vacant." Backward Data Mapping occurs when the user selects certain areas of a displayed map and manipulates the attributes in the data base. An example of this would be to isolate a subdivision on a map and query the data base to identify all the owners in that subdivision.

Another important feature of GIS is the overlay capability. The foundation of a GIS is a Base Map showing all parcels. Layers of information or Overlays are placed on top of the Base Map. The user is allowed to perform data searches based on specific map location. The user can also query the system to analyze intersections of several layers. Any combination of information can be viewed and plotted at any scale based on the specific needs of the user.

2. THE CNMI's PUBLIC LANDS GIS

The CNMI's Geographical Information System was designed for the maintenance of public land use

information. The three components of the system are:

A. A base map for each of the three islands: Saipan, Rota, and Tinian,
B. Several overlays; and,
C. Land use data stored in the tabular database.

The Base Maps:

The Base Maps are the foundation from which a GIS is built. The Base Map for each island contains both public and private lot lines. Public lots were determined from coordinate data. The private lots were digitized from Cadastral Parcels Index Maps. The composite of the public and private lots make up the Base Maps for each of the three islands. Lot numbers are identified for public lots only.

Map Overlays:

In addition to the base map several overlays are provided. Overlays are simply layers of information the can be used in conjunction with the base maps as well as with each other. The following is a list of overlays which are stored in the Spatial data base:

Areas of Particular Concern

Wetlands

Vegetation

Watersheds

Critical Habitats

Slopes

Geology

Historical Land Sites

Prominent land Marks

Public Beaches

Aquifer Recharge Areas

Hazardous Areas

Infrastructure: Power
Water Lines and Wells
Wastewater

Topography

Election Districts

Surface Permeability

Island-wide maps are prepared at the meter scale of 1:10,000 and for selected maps at the meter scale of 1:25,000. Not all of the islands have all 18 overlays. In many cases, information was not available or could not be extrapolated from existing references. A summary of the completion status of each overlay is included.

Tabular Data

A land survey was conducted for the collection of all public land use information by P&R Enterprises. The information was recorded on data sheets and reviewed by MPLC before being inputted. Information such as Recorded Area, Tenure, General Topography for Vacant Land, Classification of Existing Land Use, Public Facility (Government Use), Availability of Infrastructure, General Soil Characteristics, and General Land Cover (Vegetation) were gathered for each public lot. Approximately 800 data sheets were collected for Saipan. Twenty-five data sheets were collected for Tinian and no data sheets were collected for Rota as of December 1989.

All the information received was inputted into the tables of the relational data base Ingres. The following is the list of the tables that makeup the tabular data base portion of the CNMI's GIS, these tables are presented in Appendix B:

Public: This table contains all the lots under the same Lease or Permit Number.

Tenure: This table contains the tenure information for each lease or permit. Information in this table includes Lease or Permit, Lessee Name or Permittee Name, Initial Term, Renewal Term, Effective Date and Annual Rental.

Land_use: This table contains the different classifications of existing land use and the percentage of utilization for each of the public lots. The major land use categories include Designated Conservation or Protection, Agricultural, Commercial, Dwelling, Resort, Industrial, Institutional, Transportation, Communication, Vacant and Other. The detail subdivisions of the major categories are on the sample of Public Data Sheet.

Infrastruct: This table stores the availability of infrastructure for each lot. Categories include Served by, Not Available, Readily Served, and Available.

Soil: This table stores information concerning the soil characteristics for each of the Public lots. This is to be used in conjunction with the soils map. General soil characteristics include Sandy, Clay, Limestone, Rocky Surface and Other.
Veg: This table stores general land cover, density of vegetation for each of the public lots. This

table should be used in conjunction with the vegetation map. General land cover characteristics include High Density, Heavy Foliage, Medium, Light and None.

Vacant: Although the table name is "Vacant," it only refers to slopes on vacant land. This table stores the percent slope for only partial or completely vacant lots. The percent slopes are divided into the following intervals: 0%- 2%, 3%-8%, 9%-15%, 16%-30%, 31%-45%, and over 45%.

Information for Public Facilities is divided into five tables.

Using_agency: This table contains information on the using agency for a public facility.

Man_agency: This table contains information on the managing agency for each of the public facilities.

Method_acq: This table contains information on the method of acquisition of a public facility.

Pub_fac: This table stores descriptive information on the type of facility and the services provided.

Fac_data: This table stores additional information for each public facility, including the following: estimated gross built up, estimated open space/ none built up, date of original construction and/or usage, estimated useful life remaining.

TABLE TYPE AND ENTITIES

With the exception of the table "Tenure" all relations are 1:M. The relationship between lot to Tenure is a 1:1 relationship.

The following are the domains for the entities identified:

Alpha: Lot/Tract Number or Agriculture Permit Number
T_no: Tenure Number
T_Type: Lease or Permit
Name: Lessee or Permittee Name
Int_Tern: Initial Term
Ren_Term: Renewal Term
Eff_Date: Effective Date
Ann_Rental: Annual Rental
Land_Use_Cat: Land Use Category
Land_Use_Ty: Land Use Type
Per_Util: Percent Utilization
No_Units: Number of Units for Multifamily Apartments or Number of Sleeping nits for Barracks
Status: Categories of Infrastructure
Util: Type of Utility
Soil_Char: General Soil Characteristics
Veg_Char: General Land Cover
Per_Vacant: Percent Vacant
Per_Slope: Percent Slope
Using_Ag: Using Agency
Man_Ag: Managing Agency
Met_Acq: Method of Acquisition
Type_Fac: Type of Facility
Ser_Provided: Service Provided
Acq_Date: Date of Acquisition
Est_Gross: Estimated Gross Built-up Area
Non_Built: Estimated Open Space/None Built-up Area
Date_Org_Con: Date of Original Construction and or Usage
Str_Build: Estimated Useful Life Remaining
Recarea: Recorded Area

The underlined entity is the candidate key in each of the tables.

Public (alpha, t_no)

Tenure (t_no, t_type ,name,int_term, ren_term, eff_date, ann_rental)

Land_use (alpha, land_use_cat, land_use_ty, per_util, no_units)

Infrastruct (alpha, status, util)

Soil (alpha, soil_char)

Veg (alpha, veg_char)

Vacant (alpha, per_slope)

Using_agency (alpha, using_agency)

Man_agency (alpha, man_ag)

Method_acq (alpha, met_acq)

Acq_date (alpha, acq_date)

Pub_fac (alpha, type_fac, ser_provided)

Fac_data (alpha, est_gross, non_built, condition, date_org_con, str_build)

Recarea (alpha, recarea)

DATA TYPE CORRESPONDING TO TABLE ENTITY

alpha: vchar(32)	area: float4
t_no: vchar(15)	date_org_con: vchar(12)
int_term: vchar(5)	ren_term: vchar(5)
eff_date: date	ann_rental: money
land_use_cat: vchar(25)	str_build: integer1
land_use_ty: vchar(28)	per_util: integer1
no_units: integer1	status: vchar(15)
util : vchar(11)	name: vchar(60)
soil_char: vchar(13)	t_type: vchar(7)
veg_char: vchar(13)	per_vacant: vchar(5)
per_slope: vchar(9)	using_agency: vchar(30)
man_ag: vchar(30)	acq_date: vchar(12)
met_acq: vchar(20)	type_fac: vchar(50)
ser_provided: vchar(35)	est_gross: integer1
non_built: integer1	condition: vchar(7)

3. UPDATING PROCEDURES

Updating should occur at least quarterly. The intent is to build the foundation from which other applications can be developed to best meet the needs of the CNMI government. It is vital that all three components-the base maps, the overlay, and the tabular information-be updated and reviewed regularly.

Updating the Base Maps:

The boundary for the base maps should be changed and updated when the following events occur:

1) Leases or Permits expire

2) Leases or Permits are granted

3) Lots designated for Homesteads become private property

Changes should be recorded by hand on the Base Maps and then digitized all changes should be stored on computer files, so future updating can be accomplished with relative ease.

The following steps should be taken to update the Base Maps:

1) Changes to Base Map should be reviewed and recorded on the hard copy Base Maps by the managing agency.

2) All changes should be submitted to the agency responsible for all public lands.

3) All changes should be digitized and saved on new files, so that an archive of changes is kept for record purposes.

4) Polygons should be edited for each of the lots where lot lines are adjusted or where lots have been deleted. Polygons should be built for new Leases or Permits.

5) All changes made to the spatial data base must be changed in the tabular data base as well.

6) The updated Base Maps should be plotted at the desirable scale, with the date on which the map was updated clearly printed on each map.

Updating the Overlays:

When more information becomes available and as other agencies begin to invest in converting their information to computer files, the CNMI's GIS should reflect those updates and changes. The Project Status section provides a list and degree of completeness of the overlays.

Each CNMI Government agency responsible for activities on public lands should be responsible for periodic submittal of overlay updates to the government agency responsible for centralizing and updating the CNMI's GIS. Changes to the existing overlays should be made manually, directly on the maps by each agency. This information should then be updated on the computer files. This may entail digitizing the updated areas. The date on which changes are made should be recorded on each map, so that users will immediately recognize the most recent update.

When other government agencies convert from a manual mapping system to an automated mapping system, these files should be converted to compatible formats and added to the CNMI's graphic data base.

The following are the steps that should be taken to update the Overlay files:

1) Changes should be reviewed and recorded directly on a hard copy of the overlay map.

2) All changes should be submitted to the government agency handling the updating.

3) All changes should be digitized and saved on new files so that an archive is kept for record purposes.

4) Updated Overlays should be plotted at the desirable scale with the date the map was updated clearly printed on each map.

5) A hard copy should be given to the submitting agency for its review.

6) Steps should be taken to ensure that the updates are part of the CNMI's spatial data base.

Updating Tabular information:

The tabular portion of the CNMI's GIS stores information about land use of public lots. The tables were created as a foundation upon which additional information can be stored, depending on the needs of the users.

The following are steps by which updating of tabular information can be accomplished:

1) Data sheets should be compiled for each of the new leases or permits. These data sheets should be consistent with the forms used to develop the CNMI's original GIS.

2) Existing land use data should be reviewed quarterly or as often as necessary. Updates to the existing Tenure, Land Use, Infrastructure, etc... data should be recorded on new data sheets for the lots where changes have occurred by the government agency responsible for the activity.

3) These sheets should be submitted to the government agency responsible for updating the CNMI's GIS

4. GIS PRODUCT STATUS

The following status of GIS products for the CNMI's Public Land Use Plans effective as of December 31, 1989.

The Base Maps:

Base Maps were developed for all three islands. Using the data sheets, we were able to identify the public lots on Saipan. We were unable to located approximately 300 lots from the Cadastral Parcel Index Maps.

Land use data were collected for 25 lots (of the total 200 public lots) identified by the coordinate information for Tinian. No data sheets were collected for Rota.

The Overlays:

The following is the list of overlays both available and unavailable for each island. Overlays in the unavailable category are maps where information has not yet been complied or information was not received by December 31, 1989.

SAIPAN

Available	Unavailable
Areas of Particular Concern	Erosion Zones
Wetlands	Soils
Vegetation	Permitted Activities
Watershed	
Critical Habitats	
Slopes	
Geology	
Historical Sites	
Prominent Landmarks	
Public Beaches	
Water Wells	
Aquifer Recharge	
Hazardous Area	
Infrastructure:	
Power	
Water	
Wastewater	
Topography	
Election Districts	

ROTA

Available	Unavailable
Areas of Particular Concern	Wetlands
Vegetation	Erosion Zones
Critical Habitats	Geology
Slopes	Soils
Historical Sites	Permitted Activities
Prominent Landmarks	Water Wells
Public Beaches	Aquifer Recharge
Wastewater	Hazardous Areas
Topography	Infrastructure:
Election Districts	Power
	Wells
	Water

TINIAN

Available	Unavailable
Areas of Particular Concern	Erosion Zones
Wetlands	Geology
Vegetation	Soils
Watershed	Permitted Activities
Critical Habitats	Wells
Slopes	Aquifer Recharge
Historical Sites	Hazardous Areas
Prominent Landmarks	Power
	Wastewater

Public Beaches
Infrastructure:
Water
Wells
Topography
Election Districts

Tabular Data:
Approximately 800 public data sheets for Saipan were inputted. Table VII-2 provides a list of public lots on Saipan for which data sheets were not received.

The following is the list of data sheets that were not acceptable and corrections were not made by P&R Enterprises as of December 31, 1989. These lots were, therefore, not inputted into the tabular data base.

Pub data sheet no.	Lot Number
Pub 15	AGP 86-28S
Pub 17	AGP 88-23S
Pub 18	AGP 86-13S
Pub 20,21	AGP 86-20S
Pub 82	001 B 55
Pub 90	008 B 03 (12-32)
Pub 97	014 B 08 (12-21)
Pub 518	AGP 88-14S
Pub 555	No lot number
Pub 579	45-2 (Part)
Pub 580,581, 583	Part of 45-3
Pub 678	55-7
Pub 695	004 I 38
Pub 759	53-1, 57-7, 58-1, 59- 1, 61-1, 62-1

TABLE VII - 2

UNIDENTIFIED PUBLIC LOTS

016B05	27-18	005I114
016B11	28-8	005I115
016B04	29-1	009L01
016B16	29-2	005I174
0031304 (13-2)	30-1	005I213
005B11 (13-6)	30-2	005I214
13-8	31-2	005I215
13-9	32-3	005I216
13-11	32-5	005I217
023B10 (14-1)	32-8 (CP87-25)	005I245
15-3	1848 vs. 33-7	005I247
011E01	34-2	005I249
066E01	010D38	005I309
PART OF 15-2	010D40	005I310
PART OF 15-2	010D41	005I311
15-2 (REM)	010D46	005I312
014E01	010D47	005I313
025E01	010D48	005I351
16-5 REM	010D49	005I368
17-2	011D24	005I369
22-11	35-2	005I396
22-4	35-12	005I478
22-10	1794-1	005I479
22-9	1792-1	005I480
22-8	1794 REM	005I481
23-3	1792 REM	005I482
23-5	1775-1	005I483
TR21709	1777-1	005I484
TR21710	37-1	005I485
TR22753	38-1 TR.22810	005I486
23-10 (REM)	38-7 TR.22811	005I487
PART OF 23-10 (TR22866) 38-8 REM	005I488	
PART OF 062 E01-A	001G04-001G163	005I489
032E02	PART OF 38-8	005I491
032E03	44-2	017I01
PW-3	44-4	58-2
PW-4	LOT II 347,349	58-3
PW-5	44-16(347,349)	003J01
24-10	44-17	AGP87-185

24-3
24-6
25-8, 25-14 (003 D 62)
24-9
014D05
014D06
003D02
003D22
003D16
003D22
TR21047
25-1
013A01 & PART OF 013D03
46-8 (012H08)
25-15
014D73
014D38
014D39
014D40
014D41
014D42
014D43
014D44
014D45
014D48
014D49
014D50
014D51
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014D64
014D65
014D66
014D67
014D68
014D79
014D70
009D04
009D05
009D14
009D15
009D18
009D19
009D20
009D21
010D30

010D31
015D10
015D11
015D14
015D21
015D22
015D58
015065
015D70
015D66
016D11

002F10
002F16
44-10 (TR. 22914)
45-21 PART I
PART OF 45-3
PART OF 45-3
PART OF 45-3
46-5 (003H01)
46-6
46-7
46-8
012H07
AGP88-255

46-8 (012H06)
46-9 (012H10)
012H11
002H22
002H23
003H27
004H08
005H09
006H17
006H31
007H02
007H26
008H05
012H17
014H01
014H08
014H32
014H35
014H36
015H01
015H51
016H29
016H33
016H34
017H49
47-1
47-2 (21699)
47-B
TR22901
CP86-2S
48-1 (REM)
48-11
48-12 (TR22917)
48-13
48-14
48-15
001J23
001J28
49-1
52-1
52-2
PART OF 53-2
(010K504-010K509)
016K53
010K502
53-2 (REM)
54-5
EA 168 (1 OF 3)(55-2)
55-10
98.H37
019H10
001I02
001I03
001I04

AGP88-105
AGP88-95
AGP88-115
AGP88-125
AGP88135
AGP88315
AGP88-345
60-11 (REM)
AGP88-295
AGP88-285
AGP88-265
AGP88-245

AGP87-155
61-2 (REM)
AGP86-295
AGP86-15
AGP87-25
AGP86-225
AGP86245
017LO1
62-2 (REM)
62-3 (REM)
011L01
63-2 (REM)
64-1

016D14	001I05
016D15	001I22
016D37	002I34
016D56	002I42
016D57	002I43
016D58	003I15
017D06	004I38
017D40	004I36
017D41	004I37
017D42	LOT 592,594 (56-6)
26-9	005I109
064001	005I110
062D01	005I111
27-9	005I112
27-13	005I113

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

PUBLIC LAND USE PLAN

APPENDIX A

COMMENTS RECEIVED FROM PUBLIC HEARINGS
HELD DECEMBER 11, 12, 13 AND 15 1989 ON
TINIAN, SAIPAN (2 Nights), AND ROTA

The comments presented here are in response to the PUBLIC HEARING DRAFT of the CNMI PUBLIC LAND USE PLAN. The responses are not necessarily verbatim remarks as made at the public hearing. The comments are instead summaries or composite remarks retaining the meanings as they were perceived. Following each comment is the manner of response within the Plan Document.

COMMENTS MADE ON TINIAN

1. Sites for nuisance activities should be located on lands outside of the federal lease area.

PLAN RESPONSE: Agreed, resiting of these activities will be made in the final Plan, with the exception of the airport.

COMMENTS MADE ON SAIPAN

1. Exceptions to the policy of no commercial leases on public land should be deleted entirely, resulting in a no-exception prohibition of leasing public lands on Saipan.

PLAN RESPONSE: The exceptions as recommended are reasonable and stand as written.

2. The land use policies should be "tight" so as to reduce the possibilities of loopholes or other efforts that negate the intent of the policy.

PLAN RESPONSE: The policies will be revised to the point appropriate for this plan. However, it is not possible to anticipate every possible managerial discretion with proposed policies.

3. Provide better definition for the term "value" as used in the policies regarding exchange.

PLAN RESPONSE: Acknowledged, additional clarification will be provided.

4. The homestead program needs to have tighter requirements; the intent of the program is not being followed due to poor program design.

PLAN RESPONSE: The eligibility of the homestead program is established by the CNMI Constitution and, as such, cannot be pre-empted by this Plan. Consequently, it is appropriate to accommodate the homestead program as it is currently defined and implemented. If changes are made in the homestead program the Plan should be adjusted accordingly. Evaluating or commenting upon program implementation is not a task of this land use planning effort.

5. An objection was raised concerning the location of a landfill at the Marpi Depression because it can be seen from a scenic overlook. It was suggested that alternative sites be considered.

PLAN RESPONSE: We will stay with the current approved CNMI government plan to use the Marpi Depression.

6. Include solid waste transfer sites on Saipan as nuisance land uses.

PLAN RESPONSE: This will be done.

7. The plan should bring out the importance of recycling wastes so as to reduce volume.

PLAN RESPONSE: This is an important area of concern but not appropriate for inclusion in a land use plan.

8. Clarify exhibits regarding predominate land uses so they are not interpreted as recommendations.

PLAN RESPONSE: This will be done.

9. Distinguish between prime and other categories of agricultural lands.

PLAN RESPONSE: This will be done.

10. The policy section should be clearly indicated as "recommended proposed" policies. They should not be interpreted as a statement of policies in place.

PLAN RESPONSE: Although it is implicit that policies are proposed, in that this is a plan, it will be stated explicitly that these are proposed policies.

11. The plan was criticized for not indicating interisland relationships especially for homestead allocation; i.e., looking at land resources as a whole so that demand from persons on Saipan could be analyzed against available land on Rota.

PLAN RESPONSE: The interisland dynamics are not considered a critical component of the plan. Moreover, eligible residents can obtain homesteads on other islands by establishing residency there.

12. Agricultural lands should be categorized as prime and unique and important according to USDA criteria. There are 200 acres in Kagman in this category as well as the Sabana and Marco Valley. It was suggested that these areas be reserved.

PLAN RESPONSE: Reserving these areas for economic reasons alone is insufficient as economic use is a low criterion use, although they may be the last to be developed. Reserving for environmental reasons is also not compelling as even aquifer areas can be developed without danger, if done correctly. Finally, these areas have not been included by the government of the CNMI as areas of particular concern. If this situation changes the plan can be revised.

13. The Objective indicating revenue generation as a plan objective should be stricken from the plan. It was feared that this objective could be abused.

PLAN RESPONSE: This policy is reasonable and will stand, but may be reworded so that the intent is more specific.

14. Rethink the policy of retaining existing permanent uses under lease arrangements.

PLAN RESPONSE: The policy as stated is reasonable from an economic and land use planning perspective. Lease payments at fair market value may include impact assessments to offset social costs such as loss of beach access.

COMMENTS MADE ON ROTA

1. There are some private parcels inside the Rota Commonwealth Forest which should be exchanged for other public parcels so that the forest can remain intact.

PLAN RESPONSE: This appears to be a good idea, and is covered under existing proposed policy for exchange. It will be identified as a legitimate use of the public lands reserved for exchange.

2. The Rota landfill and power generation sites are OK. However, a sewage treatment plant site is needed.

PLAN RESPONSE: Noted and agreed.

3.

The Homestead Demand Model has not included persons of Micronesian descent who are currently living in the mainland but could return and become eligible for a homestead.

PLAN RESPONSE: There will be adjustments necessary with any model that projects the future. Updating and adjustment procedures will be included in the Plan Management section of the document. If returning Micronesians upset the figures in the model then the model should be modified at a later point.

4. The amount of land indicated as Commonwealth Forest is too low.

PLAN RESPONSE: This was due to a computational error; the number of acres will be corrected.