COMMUNITY DESIGN PLANS

GUAM: 1977 - 2000

BUREAU OF PLANNING
GOVERNMENT OF GUAM
AGANA , GUAM

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(Separate Sheets)

INTRODUCTION

The Bureau of Planning has completed an inventory of local physical resources and conditions along with analysis of basic demographic, economic and social trends and has projected them into the future. The focus has been on assessing conditions which will affect future demands for an improved lifestyle within communities. On the basis of a determination of the individual communities' development objectives and a utilization of the Bureau of Planning's understanding of the amount and character of growth that will inevitably occur and be distributed, the planners have formulated a plan for the future development of Guam's communities to the Year 2000. This element of the Comprehensive Development Plan consists of Community Design maps, descriptions of use classifications and a synopsis of the significant features and input from individual community areas.

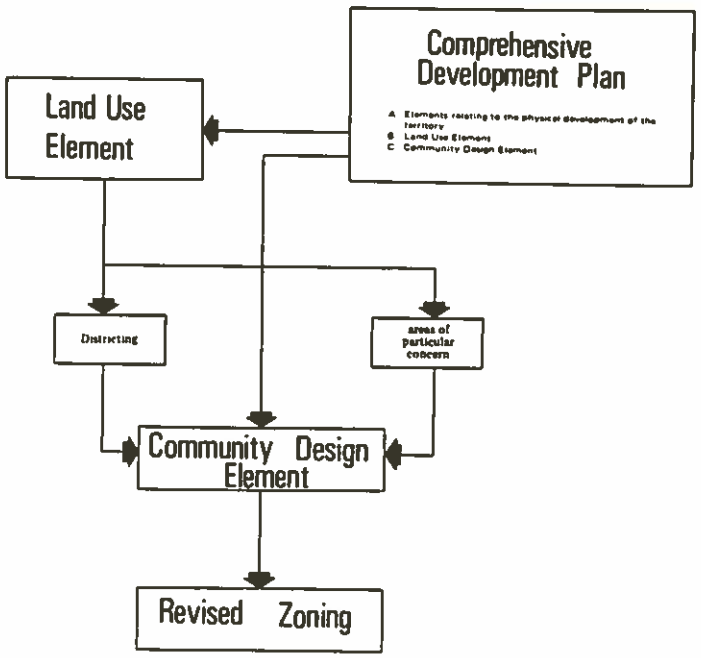
Community design plans primarily bring different land uses within an area of human settlement into a composite plan. As communities, these are areas where residents have a strong identification with the area, continued social interaction, and reside within a specific geographic location. In the past, there has been little systematic structuring of land uses into compatible relationships or an efficient environment. Development has often been in response to short-term economic conditions and personal objectives. Community design plans provide a basis for the responsible decision-making of both private citizens and governmental agencies. Comprehensive plans assist in such specific planning as recreational parks, utilities and traffic circulation.

The community formation that is depicted on design maps is projected more importantly by historic, current and proposed uses rather than municipality lines. For example, separate municipalities such as Agat and Santa Rita are both within one community design area. Their close proximity and similar adjacent uses necessitates a cohesive plan. Another example is that Baza Garden's infrastructure, identity formation and land proximity are more associated with Talofofo than Yona despite its political jurisdiction within the Yona district.

Incorporated into use classifications are the areas of particular concern, delineated by the Coastal Management Program within the Bureau of Planning and included in the Land-Use Element of the Comprehensive Development Plan. (See Figure 1). Areas of particular concern are geographic areas of a fragile nature which contain resources of high economic, ecological, historical or aesthetic value. They are also areas of significant hazard such as, slide and erosion zones, seismic fault zones, and airport sound and accident potential zones.

Use classifications are delineated on ortho-topographic maps, based on aerial photographs taken in 1975. A uniform grid system, at a scale of 1:12,500 for Community Design, allows for the location of points on the maps by the use of coordinates. (See Appendix No. 1). Use classifications are color-keyed for easy reference and contrast. Municipality lines are depicted for jurisdictional delineation, however, they are generally not associated with use classifications or community design perimeters. Major existing and proposed roads depict the relationship of traffic circulation to use classifications. Rivers are shown to relate major surface drainage to associated land use.

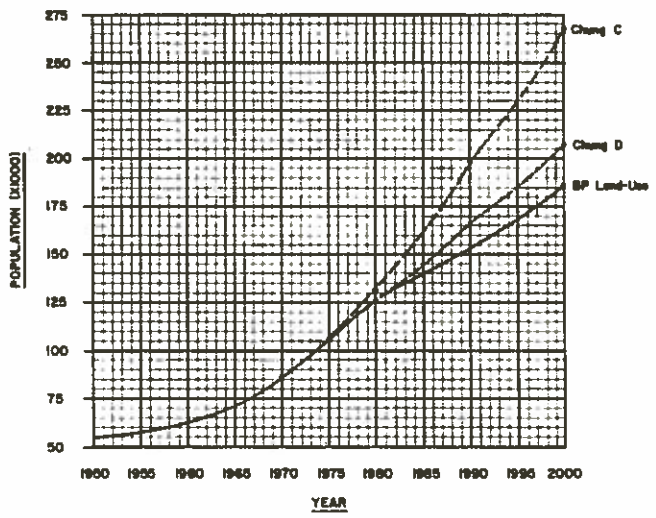
Figure 1: The Relationship Between the Community Design and Land-Use Elements of the Comprehensive Development Plan.



POPULATION PROJECTIONS

The uses projected on design plans are presented as a logical progression of developmental needs and preservation requirements to fit the unique resources and expansion needs within an area. Population projections are a dominant factor in the consideration of use classifications. The population of Guam is in a constant state of change, shift and relocation. Although the 1970 census provided base data for the preparation of population projections, a final analysis was not completed. The Bureau of Planning recognized the need to prepare an interim set of projections which could be used by the numerous agencies in their planning efforts. Memoranda prepared by the Bureau and approved by the Department of Commerce and Bureau of Labor Statistics provided estimations of island-wide population growth based on the data generated by the 1970 census. This series of three population projections was developed by Professor Roy Chung, a demographer, and Quinton-Budlong (QB), a firm contracted to prepare a portion of the 1972 Guam Master Plan. The three provide a useful range of island-wide population projections to the year 2000. (See Figure 2).

Figure 2: Population Projections for Guam.



Using aerial photos, completed in 1975, actual densities of recent housing developments, data relative to planned developments, as well as certain geographic constraints to development, the Bureau of Planning in cooperation with several agencies developed area-specific growth projections. While the overall projection (Line 4, Table 1) is somewhat less than the Chung Series D, (Line 1), planners feel these figures are the most realistic available, as far as planning for the type and intensity of growth to occur in the next 25 years.

Table 2 — A Summary of Municipality Growth Rates to the Year 2000 *(See Appendix No. 2 for Specific Community areas)

Municipality	Estimated Existing Population	Projected Population Year 2000
Umatac	700	1,600
Agana	1,094	2,550
Asan	1,440	2,700
Piti	1,570	2,645
Merizo	1,635	2,580
Inarajan	1,790	2,765
Agana Heights	2,125	4,000
Talofofo	2,155	2,675
Sinajana	2,545	4,750
Chalan Pago-Ordot	2,762	4,958
Santa Rita	3,200	5,050
Mongmong-Toto-Maite	4,022	5,100
Yona	4,098	8,460
Agat	4,230	9,450
Mangilao	5,694	19,482
Barrigada	5,818	11,474
Yigo	6,097	13,600
Tamuning	11,849	27,500
Dededo	21,877	36,250
TOTALS	84,701	167,589

*Does not include military personnel and dependents.

Table 1 — Selection of Population Projections, 1970 - 2000*

		1970	1975	1980	1990	2000
1.	Chung (D)	85,380	105,400	126,000	165,400	206,660
	(no military)	(63,380)	(83,400)	(104,000)	(143,400)	(183,660)
2.	QB	89,890	106,310	126,956	179,352	236,000
	(no military)	(67,890)	(84,310)	(104,956)	(157,352)	(214,000)
3.	Chung (C)	85,380	107,400	132,200	198,000	268,000
	(no military)	(63,380)	(85,400)	(110,200)	(176,000)	(246,660)
4.	BP L-USE		106,700			188,500
	(no military)		(84,700)			(167,500)

*Note: Parentheses ( ) indicate that the constant 22,000 military population is not included.

Table 3 — Population Changes and Percentages in Northern, Central and Southern Guam

	Present	Percentage of Present	Projected	Percentage of Projected	Percentage Increases*
North	42,333	49.98	86,684	51.74	104.77
Central	21,990	25.96	43,680	26.07	98.64
South	20,378	24.06	37,225	22.22	82.67
TOTALS	84,701	100.00	167.589	100.00	

*Projected-Present / Present X 100

THE PLANNING PROCESS

Existing uses and analysis of their environmental and economic value is central to the land-use planning process. Previous planning efforts and ongoing specific area plans of different agencies are all important to community design. The plans are largely a unique effort in response to very specific relationships and social factors within a given area, however, major supporting documents provided a basis for much of the planning. These references are listed in the bibliography. In addition, many ongoing specific plans, yet to be addressed in published documents, were incorporated into the plans and required an active liaison with different agencies to insure an up-to-date, comprehensive planning effort. (See Figure 3).

Inherent in the planning process is public involvement. The conceptual community design plans were presented in informal public meetings in all communities for the essential input of area expertise by community residents. (See Appendix No. 3). Public input was recorded and incorporated into modifications. After modification, design plans were returned to commissioners' offices for further review and input from area residents before being presented at a public hearing. In addition, planners encouraged and received all visitors who wished to view the maps and provide input at the Office of the Bureau of Planning. Assisting in the familiarization of community design plans was a television series, newsletters, news articles and brochures. Community design plans are ultimately presented in the interests of area residents and an island-wide society.

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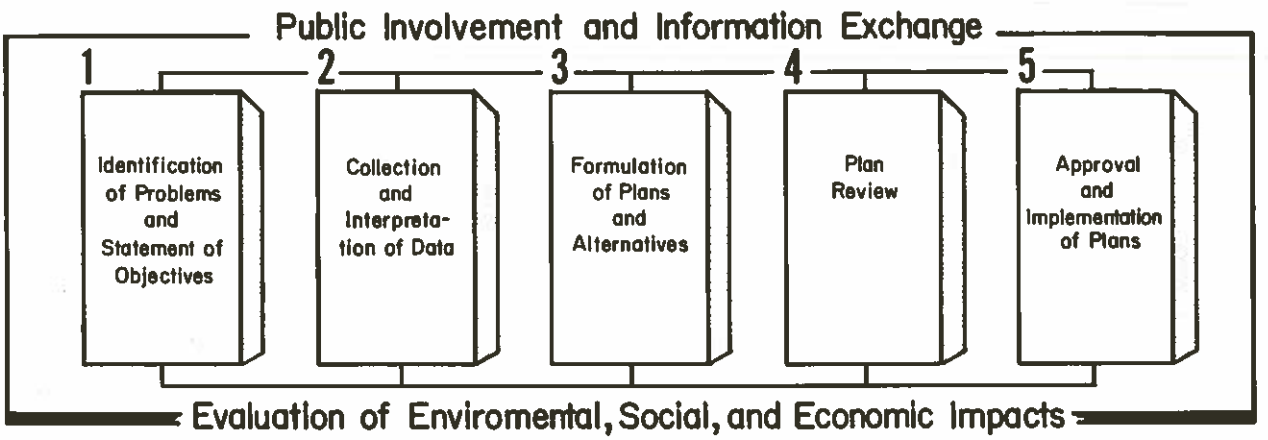
Figure 3: The Planning Process.



OBJECTIVES

The major objectives of the Community Design Element seek to:

1. Depict a logical progression of compatible land use, both existing and proposed, thereby creating public awareness of comprehensive planning and demonstrating the social, economic and ecological value of responsible planning.

2. Provide a mechanism for the long-range projection of land uses to the year 2000 so that the balance between preservation and developmental needs can optimally be met in the future.

3. Facilitate comprehensive planning for the developmental and preservation needs of island communities by providing an essential element of the Comprehensive Development Plan and a compliment to the Land-Use Element.

4. Provide a mechanism through which public involvement can effectively incorporate the desires of area residents into comprehensive land-use planning.

5. Delineate and define land-use areas and establish use classifications for residents and private developers to promote responsible resource use and development in the interest of the larger society.

6. Provide a base study for the specific area planning interests of various Government of Guam agencies.

7. Provide a median between the specificity of districting and zoning as a base for zoning revision of urbanized areas, which provides more accurate property tax evaluation and analysis of lot-level land-use compatibility and conflict.

8. Encourage appropriate legislative bodies to participate in the planning process and give official recognition to the policies and goals embodied in the Comprehensive Development Plan.

9. Provide a base study for legislative establishment of improved regulatory mechanisms for land-use controls.

10. Promote increased cooperation between local and federal agencies in planning for compatible land-uses on adjacent locally and federally-owned land.

USE CLASSIFICATIONS

As land-use plans, community design plans represent a step towards more specificity from the more general classification of Guam into four districts. The districts, outlined in the Land-Use Plan, are Urban, Rural, Agriculture, and Conservation lands. Utilizing more specific breakdowns of the four districts and incorporating designations of areas of particular concern, community design plans provide a partial basis for more specific and forthcoming revised zoning in urbanized areas. Districted land is classified into the following uses which are keyed on the Community Design Maps:

A. Urban

1. Residential. (Low-Density). These are present and projected areas of single-family dwelling residential use. This classification encourages developmental growth within the limits of planned urban areas to assure a maximum provision of services and infrastructure as well as the conservation of other land areas.

2. Residential. (Medium-High Density). These are present and projected areas of multiple-family dwellings or apartments and condominiums. High density areas are planned to compliment the environment and provide maximum benefit to residents. Visual access, adjacent land use, central location, and traffic circulation are most important in the delineation of this use. A random mix of high and low density use is discouraged.

3. Resort. These are existing and projected areas of resort development such as hotels and related support services. They are centralized locations with scenic beauty and available services. Resort development, recreation, and preservation of the aesthetic character are encouraged uses. A low-density of single-family dwellings is also a compatible use with resort development. Industrial, agricultural, or random commercial land use is discouraged within these areas.

4. Commercial. These are existing and projected areas of concentrated commercial development or the major trade centers where goods and services are allocated to a community area. Small neighborhood stores and zoning variance lots are not outlined within this classification. Centralized commercial areas, as opposed to strip-zoning and randomly placed services are planned to ensure maximum efficiency, traffic circulation, and physical design in relation to surrounding urban uses.

5. Industrial. (Heavy). These are relatively isolated, existing areas of a specific type of industrial activity such as a refinery or a port facility. They are not areas for future expansion of light industry on adjacent lands. They are critical production areas for an essential product.

6. Industrial (Light). These are large areas of varied industrial use. They encompass land for future industrial expansion. These centralized industrial areas service the expanding demands of the entire island. Delineation of areas of industrial use assists in the isolation of the effects of noise, visual, air and water pollution that can accompany industrial activity. Industrial areas are generally planned in areas of recommended low-density land-use such as airport sound and hazard zones.

7. Airport. These are areas solely specified for land-use activities needed to maintain an essential air installation to meet international transportation and air shipment demands. Adjacent uses must be planned in compatibility with sound and accident potential zones that accompany airport land use.

8. Public and Semi-Public. These are centralized areas of public use. They include such uses as schools, churches, cemeteries, community centers, and Government of Guam agency installations. The location of public institutions is often restricted by existing uses and the non-feasibility of relocation. Future public-use areas, however, can be planned in conjunction with compatible adjacent uses and the centralized needs of urban areas.

B. Rural

1. Residential. In these areas, single-family dwellings are of extremely sparse density or have more open space than low-density urban areas. Infrastructure development is minimal. These areas are usually adjacent to urban districts and available for future urban expansion or for the maintenance of traditional rural lifestyle. Mineral extraction sites are within rural areas. Extractive lands include areas of surface mining of coralline sand, aggregates, and armor stone for construction, landfill, and pavement purposes.

C. Agriculture

1. Cultivation. These are areas of prime agricultural land of relatively flat terrain and fertile topsoil. Due to self-sufficiency demands and the limited amount of land, uses other than agriculture are discouraged within these areas. Presently, minimal utilization of prime agricultural land necessitates importation of the bulk of the island's demand for agricultural goods. Delineation of agricultural land, whether currently in use or preserved for future use, maintains a resource base from which to strive for greater agricultural growth.

2. Aquaculture. These are areas of present aquaculture development. A constant flow of water is required for growing fish, eels, shrimps, prawns, and other developable species. These areas are adjacent to the coast, river estuaries, or wetlands and must be environmentally sensitive to the fragile nature of these areas of particular concern.

D. Conservation

1. Open Space. Essentially, open spaces are undeveloped, visually attractive natural areas, strategically located where most needed to exclude intensifying urbanization patterns. These are areas of natural ter-

rain where nature observation and preservation of scenic beauty is emphasized. Preservation of open space enhances the quality of life for both the resident and the economically important tourist industry. Urban, rural, and agricultural uses are discouraged in these areas, particularly in relatively untouched areas of the Seashore Reserve and on slopes in excess of 15%. Within the Seashore Reserve, open space promotes visual and public access as well as wildlife preservation and shoreline continuity. Open space on slopes assists erosion control, visual aesthetics, and wildlife preservation. Also of particular importance is the maintenance of open space over aquifer recharge areas to protect the quantity of groundwater resources.

2. Low-Density. Within these areas, existing residential density and other uses pose an increasing threat to the visual, economic, and ecological resources that characterize the areas. Additional large lot structures will be examined on a site-by-site basis. Of particular importance are areas within the Seashore Reserve where public and visual access are important for recreation and becoming increasingly restricted by unplanned development. In specific cases, relocation of residences to urban areas is recommended. Low-density conservation uses also act as a buffer around less-developed open space in certain areas.

3. Historical Sites. Within these areas, preservation of historical features is emphasized. They include architectural features, where residential development follows area guidelines. They also include areas containing pre-contact latte and village locations. Within pre-contact sites, land use is restricted to recreational site observation, wildlife preservation, and professional archaeological investigation. Also included within this designation are park areas containing Spanish architecture and World War II relics.

4. Parks. These are major land areas delineated for recreational use and development that are sensitive to the resources within the area. Hiking, camping, picnicking, swimming, and nature observation are the typical uses within these areas.

5. Recreation. These are small land areas set aside for recreational activities related to sports and relaxation. They include ball fields and urban parks that are centralized within urban areas. They rely upon infrastructure and central location for convenience. They are also important within commercial areas and subdivisions as an aesthetic provision of open space within an area of extensive development. Particularly, the youth within urban areas need recreational land.

6. Wetlands. These are areas of aquatic plant and animal life. They include swamps, marshes, and river estuaries that are constantly inundated with water. Due to their fragile nature, they are delineated for scientific and nature observation study of a wildlife habitat, their unique aesthetic appeal, and flood control management.

7. Lowland Basins and Sinkholes. Lowland basins are low grassy areas intersecting the slopes that characterize the para-basal lens area and topography of Central Guam. In these areas, the northern limestone plateau and the southern volcanic uplands meet. These low areas act as drainage basins for aquifer recharge. Because they are periodically flooded and protect water quantity and quality, they are kept untouched and surrounded by open space when possible. Sinkholes, though structurally different, also function to assist aquifer recharge and are kept as open space. They are areas where solution has created a major opening in the surface of the limestone plateau such that rainwater rapidly filters into the lens system.

8. Watersheds. These are areas in the southern volcanic uplands and ravine valleys that have been outlined as regions where uninterrupted or unpolluted surface drainage is important for surface aquifer recharge. Development that would adversely affect water quality or quantity is discouraged.

9. Wildlife Reserves. These are wildlife conservation areas that have been set aside by the government for intensive protection of plants and animals. Resource use, beyond nature observation is prohibited within these areas. They are usually the most untouched ecological habitats and given priority level protection because of their aesthetic appearance and the presence of endangered and threatened species of plant and animal life.

URBAN GROWTH CONSIDERATIONS

Subdivision Development. Urbanization and suburbanization have been the predominant characteristic land use accompanying population growth in the United States over the past two decades. As Westernization has occurred on Guam, a trend toward subdivision development has been one of the most visible components of change (See Figure 4). Aside from socio-cultural changes that accompany subdivision development, provision of low-cost housing and urban renewal; the urbanization process changes the characteristics of the land and its use. Despite its seemingly progressive nature, subdivision development without guidelines, can become as damaging (aesthetically, culturally and ecologically) as random urban sprawl. For example, poorly planned subdivision development on slopes in excess of 15% can invite erosion and sedimentation with irreversable impacts on water quality, visual quality and reef ecosystems. Subdivision development over groundwater recharge areas must consider water quality and quantity. The Department of Parks and Recreation has established quidelines for recreational space in subdivisions and zoning regulations must ensure proper lot sizes, setbacks, etc. For the cultural considerations involved in land-use and community design planning, see the Land-Use Plan, Chapter III, Section B.

Human settlement and developmental needs are an inevitable aspect of island life. For social and economic purposes, urban development has historically consolidated at major trade centers. Because of terrain restrictions, relatively flat land adjacent to the coast has been the primary location for development of a wide range of urban developmental needs. With post-war reconstruction and the building boom there has been a notable trend toward subdivision of land further inland, adjacent to existing villages and in new locations.

With an increasing population desiring to utilize coastal resources for recreation and tourist industry development coupled with the man-land ratio inefficiency and adverse ecological impacts associated with random urban sprawl, it has been necessary that increased planning for subdivision development provide the responsible mechanisms for change.

Urban renewal of existing communities not only seeks to eliminate substandard housing, but produces an urban design that makes better use of land space. Urban renewal is projected for almost every major village proper area on Guam except Yona and Sinajana which have already been transformed by planned urban development. In addition to urban renewal, low-cost housing tracts and government subdivisions are other GovGuam mechanisms with the objective of providing housing and land space for the emerging generations. GovGuam is currently completing the Pigua, Pagachao and Umatac subdivisions and initiating construction of the GHURA 500 low-cost housing tracts in Dededo and Yigo.

Private developers have greatly supplemented the trend towards subdivision development. Existing, insular neighborhood-type areas such as Liguan Terrace and Barrigada Heights are rapidly affecting the traditional appearance, lifestyle and land-use patterns which have characterized urban residential areas in the past. Projected subdivision development and expansion are currently proposed for Ypapao Estates, Baza Gardens and Sasajyan. Undoubtedly, as cyclical demands for housing occur, even more subdivision expansion and planning will occur between the present and the Year 2000. The Subdivision and Development Review Committee, an advisory committee, reviews subdivision plans for responsible development. At this stage, various agency guidelines are enforced. Planned subdivision development assists in the provision for developmental needs while ensuring that unnecessary expansion into other less developable areas of particular concern is prevented and that subdivision land use is compatible with the adjacent environment.

Unplanned Urban Form. The protection of scenic and natural resources is partially accomplished through the designation of a Seashore Reserve and development of performance guidelines for APCs. However, a large portion of the Seashore Reserve is already urbanized and the majority of communities lie in coastal areas of high scenic quality. The majority of the population lives in these communities which need corrective actions for environmental protection and innovative approaches to community design and development.

The most striking characteristic of the urban pattern on the island of Guam has been the adoption of a random pattern of land utilization and building typology which has resulted in the misuse of land and an urban form unsuited for the whole of society.

Particularly evident is the lack of neighborhood design, since all design efforts are limited to the scale of single buildings. No improvement for the protection of scenic or aesthetic resources in an urban setting can be undertaken unless urban development is conceived within the framework of responsible community design.

Any type of land development is expensive, however, there is substantial evidence that the economic costs are strongly affected by development patterns. In terms of total public and private investment costs to developers, occupants, taxpayers and local government, a study entitled Costs of Sprawl has found that a high density planned community costs 21% less than the combination mix community and 44% less than the low-density sprawl community. Figure 5 shows that sprawl is the most costly development pattern.

Figure 5: Community Land-Use Cost Comparison.

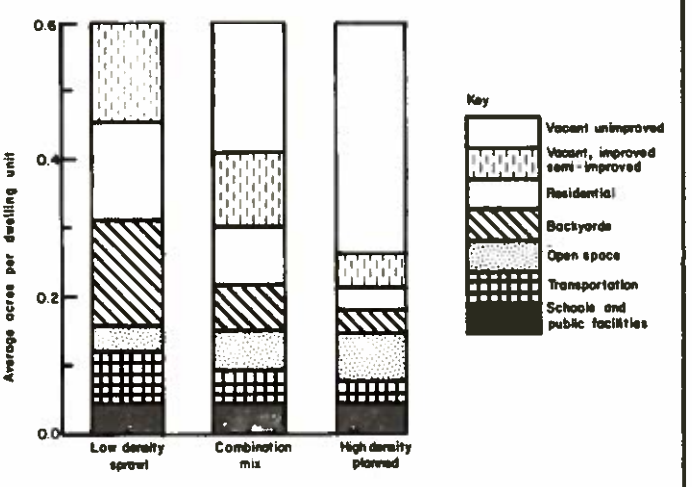
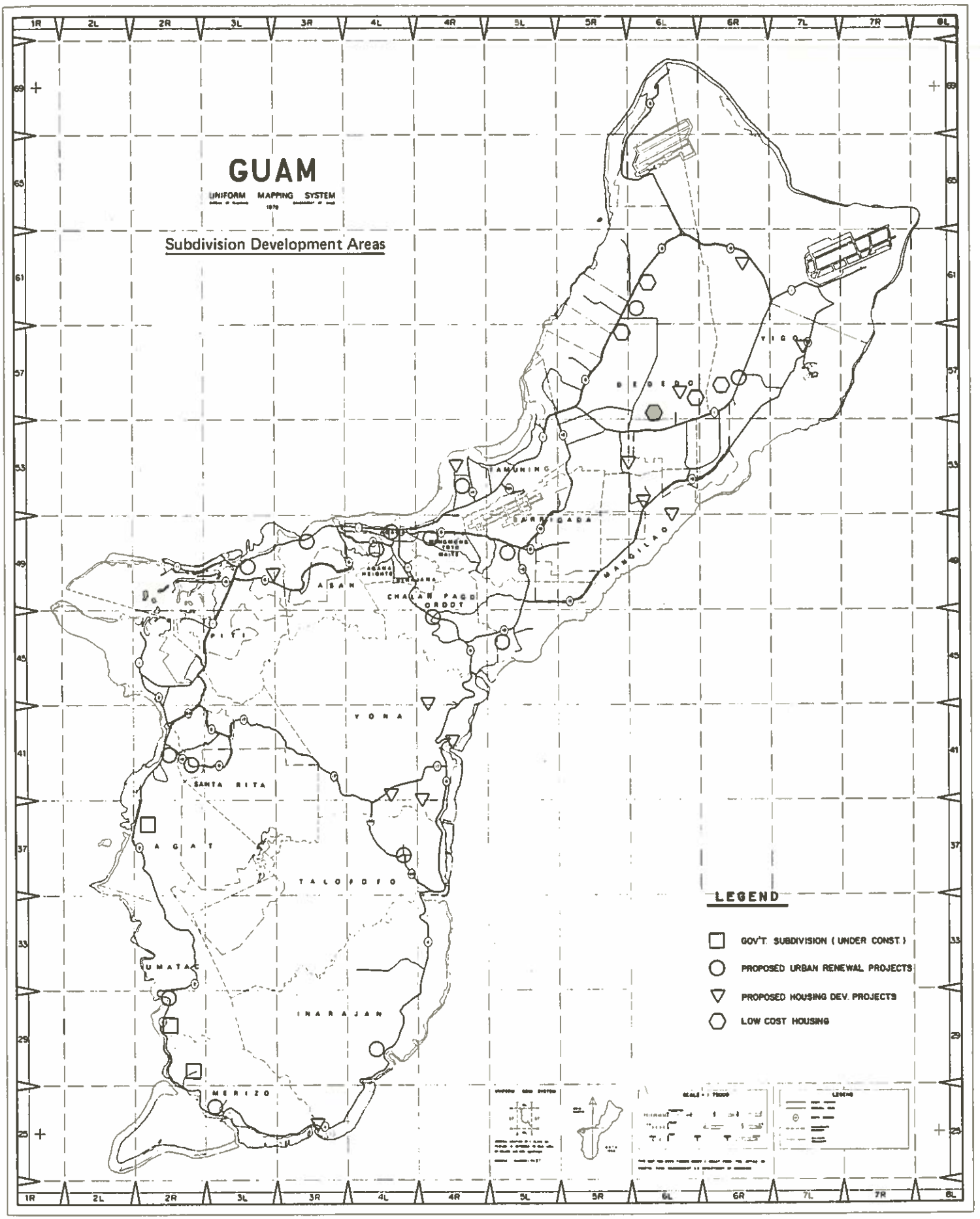


Figure 4: Subdivision Development Areas.



Urban Design. The urban design tools which allow for the protection of natural resources and a responsible human environment within developed areas, suited to a wide range of resident's needs include:

Block design or cluster housing instead of random single building design. This requires that the buildings in a given area be planned in a coordinated scheme, and the discouragement of individual building typologies.

Greater variety of building height in high-density districts.

Neighborhood density and neighborhood open space ratios.

Neighborhood view corridors.

Separation of traffic flow (bicycle, pedestrian, cars) at the neighborhood scale.

View corridors from densely built areas towards the ocean shoreline, or sloping terrain.

Integration of neighborhood parks with an urban network of green space pedestrian and bicycle lanes.

Planned urban form is based on human scale, community design and neighborhood organization. It provides for greater access to and protection of natural resources, greater energy saving and responsible, aesthetic and efficient development to meet human needs.

Cluster Housing as an Alternative to Random Urban Sprawl. Where possible, low-density residential development should be clustered to retain as much open space as possible. Cluster housing gives an area an aesthetic residential appearance as compared with the symmetrical arrangement of houses in rows and at right angles, where people tend to feel that they occupy one equal place in a rigid pattern of conformity. Even more socially, economically and aesthetically inefficient is random urban sprawl. Traditionally, urban development has randomly consumed vast amounts of land space, leaving little open space for recreation or ecology. This program can be greatly alleviated with planned cluster housing. People living in the increasing number of subdivisions can only benefit from more carefully planned subdivision development that is both in the developer's and the public interest. (See Figure 6).

1. Asan-Piti Community Design

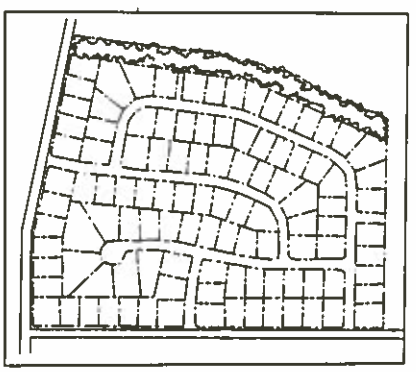
The Asan-Piti community design area is bounded by the Atantano River Valley at the southern extreme and extends nearly to Adelup Point at the northern boundry. Restricted by the ocean and federal properties on the inland and seaward boundaries, the area is truly a coastal community. A large expanse of federal property, along the coast, isolates portions of locally-owned land. The Sasa-Laguas-Agueda River estauries, Atantano Mangrove Swamp and Apra Harbor are all federal properties within the general span of community design. Government of Guam land use in the Apra Harbor area is shown in Figure 7.

Bounded by topographical features of clifflines and the sea and dissected by federal properties, the Asan-Piti community design area is severely restricted. Thus, much of the locally-owned land is actively utilized. When viewing land uses within this area or viewing the delineations on the design plan, three major land uses dominate the area. They are industrial, urban residential and park. The industrial and residential uses occupy most of all areas of suitable terrain, some of it man-made by landfill of coastal reef area.

The industrial areas are not areas of expanding light industry. Rather, they are confined areas of intensive in-

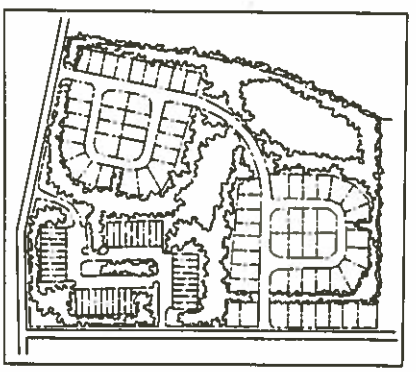
Figure 6: Comparison of Conventional Subdivision and Cluster Development.

CONVENTIONAL SUBDIVISION



Number of lots: 108
Open space: 10%
Linear feet of streets: 5,400
Linear feet of sewer lines: 5,400

CLUSTER DEVELOPMENT



Number of lots: 108
Open space: 50%
Linear feet of streets: 4,900
Linear feet of sewer lines: 3,900

Source: How Will America Grow?: A Citizen Guide to Land-Use Planning, Citizens' Advisory Committee on Environmental Quality, Wash., D.C., April, 1976, p. 15.

dustrial use and are vital to meet the energy and import needs of a developing territory. They include the GORCO refinery and Piti and Cabras power plants. The large storage tanks adjacent to the power plants supply the necessary fuel for the generators. The Government of Guam Commercial Port in Apra Harbor, is the critical link between transshipment of supplies between Guam and the rest of the world. Proposed plans for the expansion of the existing port facility will undoubtedly become a reality. Due to the location of the Commercial Port, the entire Asan-Piti area is the logical location for expansion of industrial facilities which serve the entire island.

People are a major resource for industry and are obviously the primary recipient of its goods and services. Thus, urban settlement is the natural land-use compliment to industrial land use. Asan and Piti are old traditional village locations. Today, however, traditional village lifestyle is superceded by flourishing new subdivisions and condominiums that utilize nearly all available terrain and extend inland to include Nimitz Hill. The village of Asan will soon be subject to the urban renewal development depicted on the map and Piti will undoubtedly follow. Area residents have expressed a notable desire for improvement of their urban lifestyle.

The Asan Community Redevelopment Project Report addresses the urban renewal of the entire Asan Village Proper and includes the acquisition and disposition of residential, commercial, recreational and institutional structures; demolition, rehabilitation and reconstruction of residential and community facilities; and relocation of displaced individuals and families. It also involves the reconstruction of the community's transportation, water, sewage, drainage, power and communication infrastructure. The project area encompasses approximately 115 acres of land situated on the northern slopes and at the base of Nimitz Hill facing the Philippine Sea.

Urban settlement of relatively level and drained land in Asan and Piti is so extensive that virtually no significant areas of agricultural land exist and rural land use is minimal. Asan and Piti villages proper are delineated as urban residential land-use areas. Included in this classification are the Kaiser-Piti subdivision and the Pacific-Tokyu subdivision on Nimitz Hill. Existing areas of multiple-family condominiums are delineated on Nimitz Hill as well as another R-2 zone within Piti village proper which is currently not in use and projected high-density areas within the Asan urban renewal plan. An existing rural residential land-use area is adjacent to existing urban land use and lies between Piti village proper and Nimitz Hill subdivisions. Projected rural use is also located inland between Piti and the Atantano River Valley.

Nino Perdido Church in Asan and Our Lady of Assumption Church in Piti, commissioner's offices, community centers and two public schools are the public and semi-public uses which provide social focal points within the urbanized area. The Tiguag Public Cemetery also has a public-semi-public use classification. The present New Piti School and Piti Elementary are projected to be replaced by a new school in Asan. At this time, the present sites should optimally be utilized for recreational purposes.

Offsetting the presence of urbanization and industrialization within the design area, large areas of conservation land are preserved for either historical, ecological or recreational importance, or are not suitable for development due to terrain features. The Seashore Reserve, between Marine Drive and the sea in Piti is an exception within the conservation delineations. It is heavily populated in places. It is recommended that residential density not increase in this area, but decrease or stabilize at its present level. Residents of this area have generally been residing there for a long time period and have extremely strong and favorable ties to their land. Public input into the planning process has pointed out that social ties and extended family relationships are important to residents along the seashore in this area. The reef flat along the shore is much wider than with other seashore residential areas of southern Guam and protects homes from wave damage. Also, public and visual access to the seashore is not a dominant problem in this area.

A more natural area of conservation land-use involves the extensive area proposed as park. The large size of the major park area suggests that it will not only serve residents of Asan and Piti, but benefit the entire island and its growing tourist industry. The proposed War in the Pacific National Historic Park encompasses much of the inland terrain, and Seashore Reserve in Asan. Adding to the beauty of the natural terrain in this area are the fascinating relics of World War II. Asan and Piti were the sites of some of the most intensive combat and extensive damage during Guam's role in the war. Japanese planes dropped the first bombs into the Naval Yard at Piti on December 8, 1941. In 1944, 20,000 marines landed at Asan and fought the Japanese Imperial forces in what is today the projected park area. The old villages were reduced to rubble and the present urban design

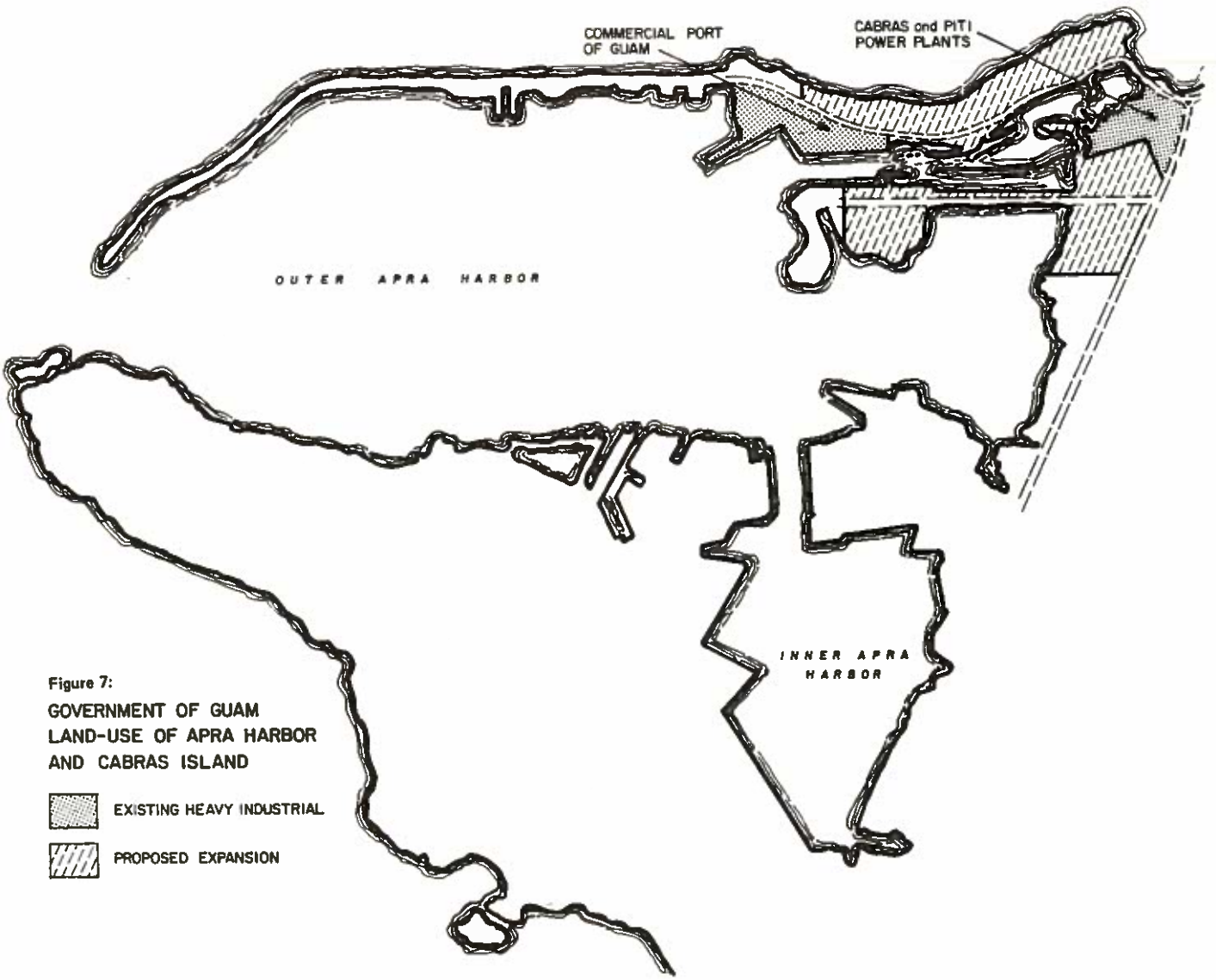


Figure 7:
GOVERNMENT OF GUAM
LAND-USE OF APRA HARBOR
AND CABRAS ISLAND

is a postwar development. Cannons, bunkers, command posts and other historic locations remain as testimony to the time of fierce conflict.

Conservation areas include small fringes of open-space delineation along the Seashore Reserve and inland cliff-lines and slopes. The most expansive conservational uses, however, are park and recreational. They are the proposed War in the Pacific National Historic Park area, National Park Service property on Asan Point (former Camp Asan) and the Masso River Reservoir. The 7.5 acre abandoned reservoir may be leased by the Government of Guam and developed for fishing and recreation by the Division of Aquatic and Wildlife Resources. The Atantano River Valley is delineated as a wetland conservation area in accordance with the Land-Use Plan's delineation of areas of particular concern. The diversity of aquatic life within the area has long made it the favorite of scientists and professors who conduct field-trips for the purpose of introducing students to the unique character of one of Guam's few and fragile wetland habitats.

The community design for Agat-Santa Rita extends from Facpi Point at the southern extreme to the Naval Station boundary at Rizal Beach at the northern end. It extends inland to encompass coastal lowlands and hilly terrain between the seashore and the federally-owned property on the Naval Magazine. Characterized by urban expansion, large single-family dwelling urban areas include Agat and Santa Rita villages proper as well as Hyundai-Santa Rita and Agat-Pagachao subdivision. A limited amount of rural land use is designated between the Pagachao subdivision and the coast. Several small areas of multiple-family residential use are also delineated on the design plan map. Commercial areas are located within Santa Rita and Agat villages proper and along Route 2 and Route 12, with the most intensive use at the junction of these two main through-ways in the community area. A proposed commercial area is located within the Pagachao subdivision.

In the aftermath of World War II, Agat and Santa Rita have rapidly developed into flourishing urban communities. Their close proximity, compatible land use and area identification have all facilitated the combined distinc-

tion of a major community. Historically, Agat village proper was a small seashore community when the hillside, now enveloped by Santa Rita, was still natural terrain. The war became the agent of change which drastically changed the appearance and direction of community growth. Extensive destruction necessitated the postwar establishment of a new subdivision and Agat village proper became a rapidly expanding residential area.

As the Naval Station emerged, residents of Sumay were displaced when required to sell their land. They chose to start a new residential area within Santa Rita, where the community is now situated on the side of hilly terrain, inland of Agat and the coast. With random settlement, due to property ownership and terrain restrictions, Santa Rita's expansion is characterized by a random housing arrangement that provides unique aesthetic appeal. In contrast to Agat, the roads and infrastructure layout were developed after the establishment of houses rather than prior to their development. However, like the residents of Agat, residents of Santa Rita still maintain a close identification with the sea despite their inland location.

Rapid population increase, since the emergence of Agat and Santa Rita villages proper, has necessitated even further urban development by both private enterprise and the Government of Guam. The precisely blocked Hyundai residential subdivision and the Pagachao government subdivision are two major areas of present and projected urban land use.

With homes, schools, commercial interests and proposed and existing parks, almost all terrain that is potentially developable has been utilized. Inland slopes provide the natural offset to rapidly expanding human settlement in southern hills. Hiking, nature observation and small-scale agricultural efforts are environmentally sensitive activities that characterize resource use in this area. The prevalence of slopes in excess of 15% and the aesthetic appeal of natural open-space habitats are not compatible with industrial or resort uses that would scar the land and invite erosion and other adverse affects.

Conservation designations include vast open spaces of cliffline and hilly savannah terrain inland and south of the areas of urban density. The Seashore Reserve, between the ocean and the road, is also designated for conservation use. Specific conservation designations for recreation and wetland areas are also delineated. An existing park at Nimitz Beach and a proposed park area are designated for recreational use. The proposed park, located between Pagachao and Santa Rita Village Proper and inland of Agat Village Proper, could potentially serve the main centers of urban density and further closer community identification between distinct areas within the area of community design. Open-space park areas, within urban land-use areas include small strips of land in the Pagachao subdivision and the flood control drainage area through the center of Agat Village Proper.

The Namo River floodplain is a hazard area and subject to periodic flooding. A U.S. Army Corps of Engineers flood control project plans to channel the water, reducing the hazard area and providing additional land for urban or agricultural use. The concrete channelization project is delineated as open space on the design map.

A shortage of prime agricultural land within the community area, further reinforces the identification with the sea and open-space or low-density use along the sea is encouraged with the establishment of the Seashore Reserve as a conservational use area. Area residents have persistently expressed the need for a small boat harbor which would assist in the potential for fishing and recreation in offshore areas. Gaan Point is the location of a proposed small boat harbor to serve area residents. Fishing is perhaps the greatest potential economic base within the Agat-Santa Rita area and would have

the least adverse affect upon residential urban expansion in the lowlands and preservation of the aesthetic appearance of upland terrain.

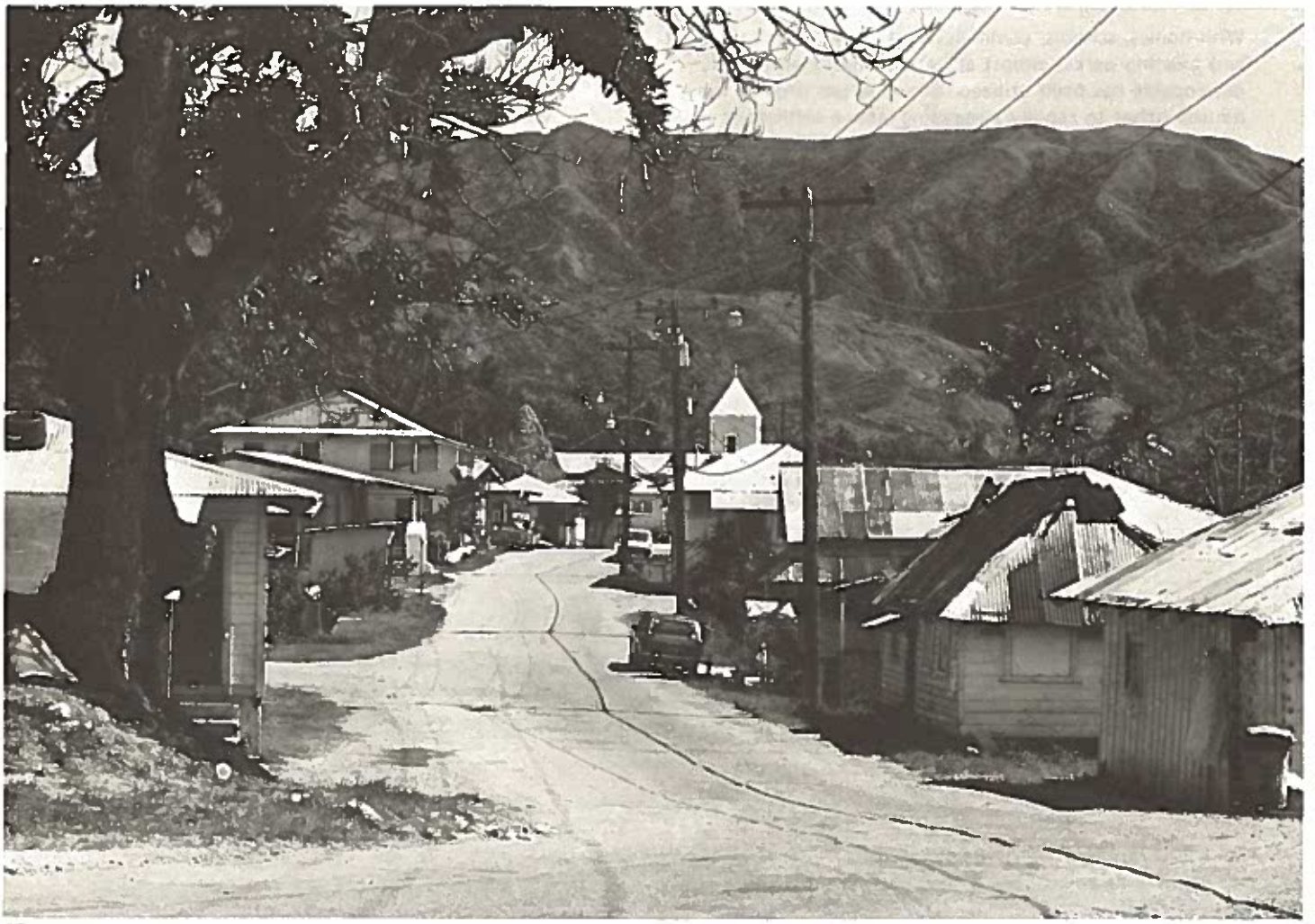
Public and semi-public land use in the Agat-Santa Rita community area includes the Agat Community Center, DPS and Fire Station, Sewage Treatment Facility and Mt. Carmel Cemetery complex. Also delineated are Our Lady of Mt. Carmel Church, St. Andrews of the Philippine Sea Episcopal Church, Agat Faith Assembly Church, Marianas Baptist Church, Our Lady of Guadalupe Church, four existing and two proposed school sites, as well as the Santa Rita Community Center. The proposed site of the Agat-Santa Rita Sr. High is adjacent to the existing Truman Elementary School.

3. Umatac Community Design

The community design plan for the Umatac area considers a projected population increase and two main area features -- topography and lifestyle. Because the village proper is bounded by the sea and steep terrain, population density has placed increasing stress on the community environment. The percentage of terrain, in excess of 15% slope, is higher in the Umatac area than in any other community on Guam. Thus Umatac is severely restricted concerning the directions for urban expansion. Fortunately, the existing government subdivision in Umatac contains enough urban land area for both residents currently living within the Seashore Reserve and future population growth to the year 2000. Legislation has been proposed which outlines priorities for the occupation of subdivision lots. A proposed bill recommends that persons currently living within the Seashore Reserve be given a high priority in the aquisition of subdivision lots.

The protection of scenic and natural resources is partially accomplished through the designation of a Seashore Reserve and development of performance guidelines. However, a large portion of the Seashore Reserve in Umatac is already urbanized. Public and visual access to the seashore is almost totally absent within the village proper. In public meetings, this fact was recognized as a problem by residents themselves. It was also recognized that housing is crowded and many are in disrepair or unoccupied. Restricted right-of-way in the village causes traffic problems that are incongruous with the amount of traffic in the area. Over 90 adult residents attended public participation meetings concerning community design and when asked for input, residents living within the Seashore Reserve expressed a desire to relocate. Offsetting the need to improve problem areas is the fact that many people value the traditional appearance and lifestyle within the village proper. The community design seeks a balance between developmental, environmental and cultural needs.

Improvements in the village proper would involve the removal of structures on the seashore side of the main



road. This area would become part of an open-space Seashore Reserve. Houses on the landward side remain in a residential use classification. A central area on the landward side is reserved in a commercial land use for village and potential tourist needs. Some residents expressed a desire for an expanded commercial strip, however, a limited amount of land, within the village proper, restricts this type of expansion. The historic San Dionicio Church is delineated as a public-use area. The main objective of this part of the design plan is to enhance the appearance and quality of life within the village proper. This and other areas within Umatac have a tremendous recreational potential and an increase in tourism potential could enhance the village economy. A desire for increased tourist revenues was expressed by many residents at public meetings. This desire is compatible with a major objective of the Seashore Park Plan proposed by the Department of Parks and Recreation.

The scenic vistas in Umatac are a valuable asset for the entire island. Due to the area topography, there are many vantage points from which to view the village, ocean and surrounding landscape. The beauty and tropical flavor of Umatac have promoted various attempts to include the area in seashore parks plans. The land uses and areas of particular concern, depicted on the design plan have been coordinated with the Department of Parks and Recreation's land-use planning aspects of a new proposed Seashore Park Plan which encompasses Umatac, Merizo and much of the interior of Southern Guam. The proposed Seashore Park area is delineated as a conservation-park use on the community design map. Also depicted as conservation uses are a proposed watershed on the Umatac River and a portion of Conservation Area No. 5. The Government conservation area is delineated as a wildlife refuge. There is an overlap of areas of the proposed Seashore Park, watershed and wildlife refuge, however, these are all compatible uses. Management of this area would involve close coordination between the Division of Aquatic and Wildlife Resources, Department of Parks and Recreation and the agency responsible for the development of water resources in the watershed area.

Since many area residents depend upon agriculture, prime agricultural land where soil conditions, drainage patterns and slope permits this type of land use, is delineated on the plan.

4. Merizo Community Design

The Merizo community area extends from the Toguan River to Ajayan River along the southern tip of Guam. Its perimeters include Cocos Island and the lagoon on the seaward boundary and inland to a point where hilly terrain or slopes in excess of 15% occur. The emphasis in Merizo commumity design is on preservation of the entire shoreline and the Cocos Lagoon area as this is seen as a very important resource and will be a high use area because of marina facilities. These areas are designated for conservation, low-density and open-space use. A watershed area for a proposed reservoir site is also delineated as a conservation area as well as the wildlife refuge or Government Conservation Area No. 5, in the Geus River Valley.

The natural beauty of Merizo has made it a favorite com
munity of not only village residents, but other island citi
zens and visitors who wish to temporarily escape from
the pressures of urban living. Geographically, Merizo is
located at the southern end of the island and is the fur
thest community from major trade centers. This has con
sistently kept the area's growth rate slower than othe
rapidly expanding urban centers.

Merizo is characterized by minimal urban subdivision
and commercial enterprise as well as large expanses o
rural lifestyle. The open space, betweens homes and gar
dens, naturally blends with surrounding terrain. As
coastal village, there is a strong identification with th
sea. Inland terrain is mountainous and offers scenic vis
tas with hiking trails; however, most recreational an
economic activity is centered along the shore.

The existing Pigua government subdivision retains
low-density, urban residential delineation and limited ex
pansion of other existing single-family residential areas i
projected. The 3,000 person capacity of the governmen
subdivision is adequate for long-range population expar
sion residential needs. Existing multiple-family residentia
and commercial areas retain their present delineation
The rural area, between the Geus River and Quinene Rd
may eventually change to urban in compliance with
proposed extension of sewer facilities.

In the Merizo area, there is little prime agricultural lanc
Agricultural areas with relatively flat terrain and adequat
topsoil are delineated as increased population densit
and infrastructure in these areas would further limit th
amount of potential agricultural land. Limited farmlan
has caused backyard horticulture to be more popular c
adaptive than large-scale efforts.

Historically, Merizo is known as a fishing village. Lucra
tive employment opportunities, changing values and ty
phoon damage facilitated a decline in fishing, howeve
renewed interest and a demand for fresh fish are causin
a gradual return to this mode of subsistence. Improve
docking facilities and cold storage could greatly assi
the utilization of this resource base. Charter fishing coul
also bring more tourists to the area and increase local re
venues. Presently, a majority of Guam's tourist clientel
enjoy the scenic and recreational benefits of the are
Tourism growth is a highly recommended activity as
compliments resource preservation. The establishmer
of service facilities for tourists, however, should be car
fully planned so that they are environmentally sensitiv

Historical sites such as the conbento rectory dating bac
to 1856, and the Shrine of Our Lady of Sorrows, whic
is maintained by the women of Merizo, and Bell Towe
are preserved as links to the past. They comprise an in
portant part of Merizo's overall scenic attraction.

The greatest attraction and one of the area's most valu
ble resources is the Cocos Island and lagoon area. Visito
can view myriad of coral growth, fish and other reef li
within the barrier reef habitat. Cocos Island offers a
idyllic beach strand where swimming and picnicking con
pliment nature observation. The unique ecological cor
position of this atoll-like area necessitates its preservatio

A host of juvenile fish species find haven in the lagoon area and comprise a resource base for the island's fishing industry potential. Along the Seashore Reserve, on the shoreside of the lagoon, mangrove wetlands fringe the seashore and offer the only expanse of this type of habitat that is not federally owned. The mangrove strand and river estuaries are delineated as open space Seashore Reserve in contrast to the low-density delineation along the populated areas of shoreline. The entire Cocos Island, lagoon and shoreline area could optimally be a marine sanctuary developed and managed with multiple uses.

Public and semi-public uses include the Merizo Elementary School, San Dimas Church, cemetery and a school site in the Pigua government subdivision.

When different facets of Merizo are viewed as a whole, the rural lifestyle, reefs, mountains and wetlands all blend into a community that has valued tranquility as its focal point.

5./6. Inarajan Malojloj Community Design

The Inarajan-Malojloj community area extends from Ajayan Bay through Inarajan Village Proper and includes the major rural area known as Malojloj. Socially, politically and geographically, Malojloj is aligned with Inarajan. The large land area, however, necessitates the use of two separate maps to depict land use within the single community area.

At the focal point of community design for Inarajan is the village proper which represents a concentration of a traditional architectural style. A unique blend of styles, some of prewar Spanish influence, has necessitated its distinction as a historic architectural district by the Department of Parks and Recreation. The Inarajan Historic District, developed by the Department of Parks and Recreation, overlaps the historical land-use delineation on the community design plan. Performance standards have been outlined to facilitate development that preserves the existing flavor of the village center. Both residents and visitors appreciate the scenic beauty and historical significance of the area. Public input into plans of both the Bureau of Planning and the Department of Parks and Recreation has expressed an overwhelming desire to delineate the village proper as a historical area.

The Inarajan Historic Architectural District is comprised of sixty-six significant structures. Of these, eighteen date from 1901 to 1925. Another thirteen are pre-WWII. Another thirty-five are sympathetic in character and were built shortly after the end of the war. The village as a whole represents the urban and architectural style that was once common on the island. The type of architecture is residential in scale and character. The building style is a blend of the elevated older tropical structures of the 18th and 19th century with the everchanging building methods and materials available on the island. The focal point of the village is St. Joseph's Church. The Church, badly damaged in WWII, was immediately restored and has not been appreciably altered since. The town hall is prewar construction and in scale and character with the residences. The repetitive materials, colors and spaces between the houses and church tend to draw the village together and creates an identifiable urban and architectural character unique to Guam. Inarajan's historic district is the last remaining concentration of this character

and building style. Hopefully, the historic designation will alleviate some of the problems of substandard housing. New standards for lot sizes would alleviate clustering of small lots and crowded conditions associated with the interpretation of the area as a substandard residential area.

It has only been since 1952 that the around-the-island road was connected and tour buses could pass through the area. The relative isolation has preserved traditional lifestyle in several ways. Inland from the village proper and adjacent to massive expanses of rural lifestyle in Malojloj are major expanses of prime agricultural land that is being utilized for farm production or lies idle as potential agricultural land for future use. The proliferation of rural frame houses, beyond urban and commercial centers, gives an aesthetic appearance of a slow-paced residential growth to meet the population increase. Modern architectural styles and subdivisions are conspicuously absent throughout the entire area. The entire Malojloj area is designated in a rural use classification. The only other rural areas in the entire Inarajan-Malojloj area are small sites on the southern side of Inarajan Village Proper. Typhoon wave action in the area between Agfayan and Inarajan Bay also restricts urban expansion and denotes Malojloj as the major rural area for the logical direction of residential growth. An urban residential area is in the location of Belen Road. The only commercial area is designated at the junction of Belen Road and Route 4.

The entire coastline is designated as an open-space conservation area. The extent of the conservation area includes the Seashore Reserve and inland to include cliff-lines in excess of 15% slope. It is recommended that the present housing activity along the Seashore Reserve retain its present density to preserve the open-space and aesthetic appearance of conservation areas. The designated rural areas are expansive enough to facilitate any long-range urban expansion during the time span and population projections utilized in community design planning.

Other conservation areas include the Inarajan saltwater pool that has been a favorite recreational attraction of the area. Also, the little-known wetland areas of the Inarajan and Agfayan River estuaries are preserved for their ecological importance. The presence of wetland areas of particular concern suggests that urban expansion in these areas would not be ecologically or economically feasible due to both the presence of unique aquatic life and flood prone conditions. An existing eel farm aquaculture development is located at Agfayan Bay, as well as prawn farming aquaculture ponds in the Inarajan River Valley.

Some of the largest agricultural areas are designated within the interior basin of the Inarajan area. Also inland of coastal residential areas are the adjoining watersheds for proposed reservoirs on the Inarajan and Ugum Rivers. The U.S. Army Corps of Engineers has completed a hydrological study of the Ugum site and projected that the capacity will supplement existing supplies for domestic and agricultural water requirements of southern communities. Of all the proposed reservoir sites, the Ugum River area will probably be the first to be developed.

Public and semi-public land-use in the Inarajan-Malojloj area includes Inarajan Elementary, Inarajan Jr. High, the Public Health Center and San Isidro Church in Malojloj. San Jose Church is included within the historic conservation delineation of Inarajan Village Proper.

7. Talofofo Community Design

The Talofofo community area extends along the southeast coast from the Talofofo River to the Ylig River or Togcha area and inland to include savannah, slopes, the southern interior basin and central developed areas along the Cross-Island Road. The Cross-Island Road, or Route 7 area includes Baza Gardens and Windward Hills.

A unique variety of terrain features and land uses characterizes the Talofofo area. The village proper retains a traditional island atmosphere, but houses are rather equally subdivided as the community evolved from a Japanese wartime civilian encampment to a postwar settlement. Today, the village proper is a slow-growth urban community. The basic process of rapid urban community development, not a result of terrain restrictions, is responsible for Baza Gardens in this community design area. Land development enterprise of lot subdivision has initiated the emergence of a new neighborhood and now expansion has arrived at a pace that is comparable to a slowly increasing demand for an urban lifestyle.

In the plan, Talofofo Village Proper is designated as low-density urban with a commercial block in the center of the village. Baza Gardens residential area and adjacent land is also an urban land-use area. A projected commercial use is also depicted in the Baza Gardens area. Expansive rural areas include Windward Hills or lands adjacent to Route 7 and extends along the landward side of the entire length of Route 4 through the community area.

Both Talofofo Village Proper and Baza Gardens are off the main route of traffic and retain a cohesive pattern of urban living as coastal areas are the areas for the natural spread of rural growth. The shoreline areas and cliffline of the coast area are a resource of aesthetic and ecological importance. When preserved, they economically enhance the tourist potential of the entire island as visitors come to experience scenic vistas. The value of natural communities at the shore and in forested clifflines should be preserved for wildlife and nature observation. For this reason, the present low-density land use of the rural areas between these areas is kept at its present state.

The entire seaward side of Route 4 is designated as conservation open space area to include the Seashore Reserve with Talofofo Bay and Ipan Beach designated as recreational parks.

Talofofo Bay is a favorite surfing location and has a shoreline park for picnicking and relaxation. Hiking over savannah terrain into the ravine forest and Tarzan Fall is a favorite recreational pastime in the area. The tourist potential of the cave of Japanese straggler, Shoichi Yokoi has yet to be realized. Especially, Japanese tourists, are

fascinated by the life of a man who hid in the jungles for 28 years. Perhaps the greatest potential economic base, on an area level, is the large expanse of fertile farmland that exists at the village's backdoor into the interior basin between the southern hills. With good topsoil and relatively flat terrain, agricultural development is possible if deemed economically feasible, and as self-sufficiency in produce becomes an islandwide objective. Large expanses of prime agricultural land are outlined within the interior basin between sloping terrain.

A more intensified agricultural use with performance standards could exist within the community without an adverse affect upon a wetland area of particular concern. The lower Talofofo River Valley forms a floodplain and aquatic plant and animal life form a natural community near the river's opening into the sea. Aquaculture development, however, has proven compatible with the ecosystem. If environmentally sensitive performance standards are met, a future potential for increased aquaculture development could add to the agricultural growth within the Talofofo area.

The surface drainage area within the interior hills, west of the agricultural lands, could provide the vital ingrediant to farming endeavors. Water from a proposed reservoir site on the Talofofo River could supply adjacent prime agricultural land. This area is delineated as watershed conservation on the design plan. The Government Conservation Area No. 3, dissected by Cross-Island Rd., is delineated as a wildlife refuge. This pristine beauty of the Tarzan Falls area, its ecological complexity, and presence of endangered plant species suggest that this area be preserved for scientific study and nature observation by present and future generations.

Within the Talofofo community design, the Talofofo Elementary, Notre Dame Academy, village churches, a proposed school site for Baza Gardens, a sewage treatment plant adjacent to Baza Gardens and the Seventh-Day Adventist Academy on Route 7 are all designated as public and semi-public use areas.

8. Yona Community Design

The Yona community area extends from Ylig Bay or Turtle Cove to the Pago River. With long expanses of rocky coastline, the area is not a typical coastal village community. Likewise, the village is not inland far enough to have a close association with interior agricultural land. The main characteristic of Yona has been concentrated urban expansion. Random urban growth necessitated a large-scale urban renewal program that has dramatically changed the appearance and lifestyle within the village proper. Concrete-based structures, sidewalks, uniform roads and tailored lawns have replaced much of the traditional frame house and backyard garden appearance. However, the traditional appearance is still prevalent in the immense rural area that is adjacent to the urban development subdivision. There is a distinction between the old village and the new village, but cohesive social ties still bind residents to a common community identification.

Within the residential areas, Yona Village Proper is given a low-density urban use classification that is consistent with the housing and urban renewal projects. Large expanses of adjacent residential land are designated as rural and are adequate for long-range urban expansion needs. A rural area also exists inland from the Pago Bay coastal area. A currently zoned, multiple-family area, adjacent to the village proper, is designated for medium to high density use although it has not been developed for such use. Commercial areas, within the village proper, south of the main village and within a rural area, are designated. These areas should be adequate to meet the needs of area residents in the future population growth projected for the Yona area.

Due to a limited access within the interior land areas, the greatest resource potential within the community design area are the varied land uses along the seashore. The rocky clifflines provide scenic wildlife habitats that are natural components of resort development. The Turtle Cove or Ylig Bay area has exhibited a natural inclination towards tourist growth within the area. It has been given a resort use classification on the design map.

The rocky coastline and limited beach areas have varied conservation use classification. The majority of the coastline is open space Seashore Reserve with the exception of Tagachan Beach which is delineated as a recreation use area. The beaches at Turtle Cove and Tagachan are the only accessible sandy beach areas along the coastline within the area. The recreational potential of Tagachan or Marine Beach is a prevalent interest of many community residents. It is the only public beach area for favored activities such as picnicking and swimming.

A limited amount of prime agricultural land and conservation open space of savannah and ravine forest terrain are the two distinct uses within the interior land area of Yona. The areas of agricultural land are currently not in use primarily due to limited access and water supplies.

Beneath the raised coral terraces that comprise the southeast cliffline is a para-basal lens area. Existing wells and current research suggest that pockets of developable water lie on the volcanic basement that underlies the coral cliffs. Open-space conservation of steep slopes will assist in the preservation of unseen groundwater resources. A wetland estuary at the mouth of the Pago River is also designated in a conservation classification.

Public and semi-public uses, depicted on the design plan, are the M.U. Lujan Elementary School, St. Francis Church and School, and the Yona Community Center comprised of the Village Health Center, Commissioner's Office and Fire Station.

9. Central Guam Community Design

The Central Guam area is geologically characterized as a transitional zone between the northern limestone plateau and southern volcanic formations. Despite its limited land area, geologic characteristics and unique ecology, this community area is the location of the major concentration of urban development on the island. Approximately 30% of the islands population resides here. Commercial, industrial and residential development has ex-

panded from Agana, the major trade center and seat of both governmental and religious power structures. Included within the Central Guam community are major areas of Agana, Agana Hts., Maina, Sinajana, Chalan Pago-Ordot, Mangilao, Barrigada and Mongmong-Toto-Maite.

Historically, Agana has been the major governmental and commercial trade center since the Spanish colonists consolidated the remaining conquered Chamorros into the central village location of Agana. The residential barrios have since been replaced with a multiplicity of commercial enterprises and governmental activities. Only a few single-family and multiple family residences exist in the downtown area. The majority of these are located in Anigua – the southern sector of Agana.

The downtown area of Agana was completely destroyed during World War II. The rubble was pushed into the sea to form the Paseo de Susanna recreational center. The Paseo has become a center for recreational spectator sports. In addition, the shoreline is the scene of seasonal fishing for atulai (mackerel). Though Agana Bay is fringed by minimal Seashore Reserve, along Marine Drive, it is a favorite location for net fishing for tiao (goatfish) and manahak (rabbitfish). The nearby boat basin has expanded to meet projected needs for increased boating activity. A sewage treatment facility is also located in this area for the discharge of treated effluent over the reef front.

As an additional relief from the commercial and governmental land uses that typify Agana, are the remains of the Plaza de Espana built in 1836. For 230 years, this was the seat of the Government of Guam and the other Mariana Islands. The Spanish Bridge marks the past course of the Agana River and Skinner Plaza and Latte Stone Park offer recreational space and historical beauty to enhance the surrounding environment and reflect the character of the growth of Agana. At the center of Agana stands the Agana Cathedral or Dulce Nobre de Maria, Guam's largest church and the seat of the Diocese of Agana. Ft. Santa Agueda offers a historical site and scenic vista of the entire Agana area.

Marine Drive is the main artery between the capital city and the rest of the island. The heaviest traffic circulation is between Agana and the extensive industrial, resort, commercial and residential land-use activity in adjacent Tamuning. Terrain restrictions have resulted in linear development of commercial enterprise along Marine Drive between Agana and Tamuning. This transitional area is a major location for commercial growth.

Basically, postwar development in Agana was in response to irregular-shaped lot parceling. It is projected that the future will show an increase in the concentration of both commercial and governmental land-use activity with a further decline in the construction of residential dwellings. Bounded by the sea and a high cliffline between

Agana and the Agana Heights residential area, with extensive development existing on coastal lands, north and south of Agana, capital expansion has few directions to take.

Commercial encroachment into the Agana Swamp wetland is increasingly evident. The conservation-wetland designation of this area of particular concern seeks to promote land-use activity that would enhance the existing character of this ecological habitat. Of particular beauty and value is Agana Spring where freshwater is discharged from the central underground aquifer and disperses over the wetland floodplain. The water converges into the Agana River which also absorbs the city's stormwater and then flows through a channel across the reef flat and into the sea. The Agana Swamp wetland is not only a wildlife habitat, but assists in aquifer recharge and constitutes the source of a flood hazard zone that encompasses part of the downtown area. The U.S. Army Corps of Engineers has outlined the hazard zone and the ecological importance of the wetland habitat in separate studies. The nature of the area suggests an open-space land-use adjacent to the wetland. Some residences already exist within the fingerlike land projections that pierce the wetland. Further residential growth is not recommended for this area.

The historical character of Sinajana does not affect current land-use delineations as housing and urban renewal planning and implementation have formed an area of single-family residential growth surrounding St. Jude Church and the community center. Commercial areas meet the needs of a growing community. Across Route 8 from the village proper, the Afami area was not included in the renewal efforts of 1972. However, they still retain an identification with the Sinajana municipality. Afami has resulted from random developmental growth which has not facilitated a planned infrastructure system. Its boundaries of slopes and wetlands restricts further expansion of the present low-density urban land-use.

Adjacent to Sinajana, with urban renewal blending into a more random pattern of development, Agana Heights is characterized by a relatively rapid growth of multiple-family dwellings. It is projected that the increasing number of people working in Agana will create an even greater demand for apartments. A higher density of residential growth is a compatible land-use activity in relation to the surrounding area.

The small residential area of Maina is politically affiliated with Asan, however, its geographic proximity places it adjacent to Agana Heights. The present urban density is restricted and contained by steep topography. It is recommended that it maintain its present character which compliments the surrounding open-space. The Maina River Valley is one of the most beautiful areas of the tropical ravine forest plant community. It is also considered to be a most powerful abode of the taotaomona spirits of the island's ancient inhabitants. Open-space conservation is compatible with beliefs that the area should not be disturbed.

In the Chalan Pago-Ordot area, extensive urban single-family residential land-use surrounds separate public-use centers of the Our Lady of Peace and San Juan Bautista churches and Ordot Elementary School. Rural residential use exists adjacent to urban density with the most expansive area delineated along Santa Cruz St. in Chalan Pago. However, topographic features suggest that this area be given an open-space conservation delineation to discourage further growth towards urban density. Throughout the area are low-lying basins which are also designated as a conservation land-use. The interior savannah and scattered ravine valleys are delineated as open-space conservation areas.

The coastline of Mangilao has few access roads. It is characterized by undeveloped, high rocky clifflines with bench terraces at the water's edge. The limestone forest in this area is an important habitat for many valuable plants and animals. In particular, it has been determined to be a critical habitat, by the Division of Aquatic and Wildlife Resources for many species of endangered birds. Because of terrain features, scenic beauty and ecological value, the Seashore Reserve is designated as open-space conservation. Development within the Seashore Reserve has taken place at Pago Bay Estates at the southern extreme of the Mangilao area. It is recommended that further residential density be discouraged along the entire coastline.

Along Route 15, commonly referred to as the back road to Andersen Air Force Base, rural residential growth is delineated as an area for the logical expansion of urban density and lifestyle. Open-space conservation area provides a necessary buffer zone between residential growth and coral quarry activities along the northeast coast.

Despite a prevalence of existing rural use along Dairy Rd., between Mangilao and Chalan Pago-Ordot, the incidence of interior basins necessitates a consistent open-space conservation land-use surrounding low-lying areas. It has been demonstrated, that existing houses in these areas are subject to periodic flooding and must be of raised construction. Thus, they are not only subject to flooding but also typhoon damage. It is recommended that further proliferation of development in basin areas and on surrounding slopes be discouraged. The community area has other more developable terrain for urban growth.

Within the Barrigada area, land-use is characterized by single-family urban dwellings. A rural land-use area is depicted as a region for urban growth and a logical transition use between existing urban density and interior open-space areas that are important watershed areas for aquifer recharge. Within the Barrigada area, one very large interior basin is depicted along with several smaller low-lying areas. An 80 acre agricultural subdivision in the Radio Barrigada area is delineated for agricultural use. An expansive linear commercial area is also present in the area of the junction of Routes 8 and 10 in Central Barrigada.

Residential development in the Mangilao, Chalan Pago-Ordot and Barrigada areas has been a very rapid and random postwar development. Urban growth has located along traffic routes that were originally established to serve military facilities that have long since disappeared. For this reason, uniquely identifying focal points of acti-

vity do not reflect traditional island lifestyle or planned urban activity. Without an intense concentration of economic activity or ecological features, the emergence of urban residential areas with a proliferation of multiple-family dwellings around public-use institutions is the identifying characteristic of this part of Central Guam.

The University of Guam is the major center for academic studies which serve the interest of the entire island. Established in 1952, it has steadily grown into a major accredited college of learning and research. It has a complex of 18 buildings. The Marine Laboratory has initiated many valuable studies concerning the fragile reefs and other marine areas surrounding the island. Adjacent to the University of Guam, George Washington Sr. High and the Vocational Technical School are large multiple-family residential land-use areas where apartments and condominiums support the growing population in this area. Adjacent areas are also the location of commercial growth of university-related enterprises and services for community residents. Future expansion of commercial land-use is envisioned as a compatible use with the residential and public-use in the university area.

Another center for public-use in the Mangilao area, is the Public Health and Social Services facility which serves a large portion of the island's population. Major public and parochial schools as well as the facilities of the Department of Agriculture and the Department of Corrections add to Magilao's distinction as a center for public-use institutions and adjacent urban residences.

Barrigada and Chalan Pago-Ordot resemble Mangilao's random pattern of developmental change except that they are comprised of mostly single-family dwellings surrounding smaller public-use facilities such as churches and primary schools. There is still considerable open-space in Chalan Pago, however, urban areas are steadily encroaching on developable terrain and existing rural areas are approaching an urban density. The most isolated rural area lies between Chalan Pago-Ordot and Mangilao.

Intersecting Maimai and Chalan Pago-Ordot are small, low-lying interior basins that are periodically flooded during the rainy season. These expanses of grass flats, between gently sloping terrain, are important drainage areas in the geological transition zone between the northern limestone plateau and the southern volcanic uplands. Chalan Pago-Ordot lies atop this transition zone. A major underground aquifer is supplied by these drainage areas and lies beneath the Central Barrigada area. Being a major water resource area, as much open-space and responsible, pollutant-free development is recommended over the water lens and in the area of the interior drainage basins.

In Mongmong-Toto-Maite, much of the land is in airport sound and accident potential hazard zones due to the adjacent air installation. The hazard areas have been outlined in a study by the Naval Air Installations compatible use zone program. These conditions have disrupted area cohesiveness. Major housing tracts in the Mongmong area have little association with each other and commercial and public-use facilities are not in central locations. San Miguel Elementary School borders Agana Swamp. Traffic circulation is also restricted by adverse conditions. The residents of Mongmong-Toto-Maite are aware of the many land-use conflicts and have expressed an interest in more effective comprehensive planning. At public meetings, it was evident that residents wish land-use activity be planned in response to the areas of particular concern or that the operations of the Naval Air Station and Guam International Airport be modified in response to existing urban density in Mongmong-Toto-Maite.

An increase in industrial activity in the area of existing commercial activity along Route 8, is projected as a compatible use with the sound and crash zones in Mongmong-Toto-Maite. It is recommended that further expansion of residential dwellings not be permitted as long as air installation activities are increasingly expanded.

Public-use areas throughout the entire scope of the community design include:

Adelup Elementary School
Incinerator Facility
General Baptist Church
Our Lady of the Blessed Sacrament Church
Bishop Baumgartner Jr. High
Sinajana Fire Station
Guam Housing and Urban Renewal Office
Bishop's House & Chancellory Office

Immaculate Heart of Mary Church
San Miguel Elementary
Bayview Baptist Church
Vehicle Inspection Station
Administration Buildings
U.S. Post Office
Academy of Our Lady
First Church of God
San Vicente Parochial School and Convent
Barrigada Commissioners Office and Fire Station
San Juan Bautista Church
Marine Laboratory
George Washington Jr. High
Learning Resources Center
Price Elementary School
Our Lady of Purification Church
Department of Correction
Public Health & Social Services
Mangilao Commissioner's Office and Youth Center
Pigo Cemetery
Christian Science Society Church
Seventh Day Adventist Chapel
Agana Heights Elementary
C.L. Taitano Elementary
St. Jude Church
Sinajana Community Center
Friary (Agana Heights)
Governor's House
Harvest Baptist Church, Toto
Agueda Johnston Library
Nuestra Senor De Las Aquas Church
District Court
Dept. of Public Safety Headquarters
Agana Cathedral
Cathedral Grade School
Carbullido Elementary School
San Vicente Church
P.C. Lujan Elementary
Barrigada Library & Community Center
Ordot Elementary School
University of Guam (dormitories & teacher housing included)
Vocational Technical High School
KGTF Studio
Santa Teresita Church & Social Hall
Department of Agriculture
Animal Control Branch
Father Duenas School

10. Tamuning Community Design

Two major growth policies of the Government of Guam involve the enhancement of resort development and light industry on Guam. The land-use areas where both of these activities are currently centralized, are within the Tamuning area. This area includes Harmon, Tumon and the Tamuning residential and commercial areas.

Tourist revenue is considered by many to be the greatest economic potential of the island. Resources such as clean

air, scenic vistas and human hospitality are the benefits the tourist seeks on Guam. Tourist development requires a scenic location that is free of adverse conditions and centralized so that services can be adequately met. Centralization of a resort area not only enhances convenience, but also prevents random development of areas of natural beauty. When the quality of life is improved for the tourist, the quality of life is also enhanced for the resident. Tourist revenues benefit the population through increased employment, commercial activity and government expenditure of tourist-induced revenue for improvement programs.

For these reasons, the Tumon area has been delineated in the community design plan as a resort area. In this area priority performance guidelines will seek to insure its responsible development.

Within the Harmon area, an industrial park has arisen from the stark base of an abandoned airfield. This area centralizes an important economic activity as industrial products and services provide for a wide range of the island's needs. As population increase will expand developmental needs, industrial services will become increasingly important. The Harmon area is delineated in a light industry use classification on the design plan.

Though the Harmon Industrial Park is centralized, its unplanned insular development did not provide a basic infrastructure for traffic circulation needs. As a result, throughways are not marked or maintained and often cross privately-owned properties. The community design of this area has emphasized the improvement of traffic circulation in the industral area. The plans are coordinated with the specialized efforts of the Department of Public Works, Planning Section. Because development in Harmon has occured as a result of random private enterprise, rather than comprehensive area planning, many roads can not be relocated due to existing development. However, in areas of potential expansion, new routes are planned and where possible, existing traffic flow is modified by connecting links.

Adjacent to the Harmon Industrial Park is Guam International Airport. The terminal and related facilities are delineated in an airport use classification on the design map. Included are the extension of Airport Road to Route 16 and the fuel farm site in the same area. It is projected that the Guam International Airport will assume an increasingly important role in transportation services. As the number of aircraft utilizing expanding facilities increase, accompanying increase in noise levels and accident potential hazard zones further necessitates adjacent areas as being more conducive to industrial growth or open-space rather than increasing residential density.

Tamuning has historically been a growing trade center since the first Carolinians came to trade for iron with the Spanish colonists and settled the area. As lucrative employment opportunities and the convenience of an increasingly sought after Western lifestyle have occured, the Tamuning area has become the location for high-density human settlement. Residential and commercial activity has concentrated in this part of the island. People will continue to settle near the resort and industrial areas as they continue to develop. Multiple and single-family residential use are both prevalent in Tamuning. Much of the residential growth has developed in a residential subdivision in the Oka-Tamuning area.

Little land in Tamuning is available for open-space or other conservation uses as nearly all the land area is utilized for urban development. A few parks and the unfortunate existence of a mineral extraction site provide the only break in the continuum of houses, commercial enterprises, and public institutions. For this reason, urban and commercial use classifications reflect the necessity for the continuance of the present land uses within the entire community area.

The only exceptions to the high-density use are the thin cliffline areas that border portions of the seaward and landward boundaries of the community. Ypao Public Beach is delineated in a recreational use classification. The coastline Seashore Reserve and clifflines in excess of 15% slope are designated as open-space as their existing aesthetic appeal are vital to the tourist industry within this area. Other clifflines along the eastern boundary of Tamuning and Alupang Island are also delineated as conservation areas. There are no other undeveloped areas in Tamuning.

Two major hospitals, fire stations, schools, churches, and public utility facilities are considered public-use areas. They include:

St. Anthony Church and School
Tamuning Elementary School
L.B.J. Elementary School
Brodie Memorial School
J.F.K. Senior High School
St. John Episcopal Church and School
Guam Rehabilitation Workshop Center
Department of Public Works and PUAG Center
Tamuning Commissioner's Office, Fire Station and Community Center
Medical Center of the Marianas
Guam Memorial Hospital
St. William's Catholic Church
Tamuning General Baptist Church
Palauan Evangelical Church

11. Dededo Community Design

The Dededo community design area is bounded by the Naval Communications Station, Yigo and Andersen Air Force Base. The major land area, known as the Dededo Loop, is delineated as open-space and sinkholes in compatibility with the Dededo aquifer and Andersen Air Force Base sound zones as areas of particular concern.

Dededo is one of the most rapidly developing communities on Guam and encompasses one of the largest land areas. Residential lots and traffic circulation in the village proper were originally planned in the design of a Cross around the village center and Santa Barbara Church. The last decade, however, has seen the expansion of the village proper into the surrounding Kaiser-Dededo subdivision. Liguan Terrace and Ypapao Estates are additional,

planned and relatively isolated subdivisions that have emerged in response to housing demands. A more random spread of low-density urban residences has occured in the Astumbo area. An increasing number of higher density apartment complexes are developing along major traffic routes. In addition to existing and projected urban settlements, the Guam Housing and Urban Renewal Authority has planned and initiated construction of five residential subdivisions, four of which are in the Dededo area, with the remaining subdivision in adjacent Yigo. Increased commercial and public institution land use will inevitably accompany the growth of these areas.

Urban use classifications are generally along main traffic routes with projected expansion delineated in areas surrounding the aquifer. Single family dwellings include the village proper, Kaiser-Dededo, Liguan Terrace, and Ypapao Estates. Four GHURA 500 Low-cost Housing Project sites are also delineated as low-density residential areas. Projected low-density urban expansion is shown in the Finegayan area and adjacent to Liguan Terrace and Kaiser-Dededo.

Medium-high density urban use is depicted along Marine Drive in the village proper, between strips of commercial and recreational land-use. Expansion of existing areas of apartment use is also shown in a strip along Route 16 and projected as a land use in the Astumbo area.

A large commercial area lies at the junction of Route 16 and Marine Drive. The major commercial trade center is depicted along Marine Drive in the village proper with other small areas situated within the village residential area. An area of projected commercial use is depicted in the Astumbo area to meet the demands of the growing density in this area.

Existing public institutions include churches, existing and proposed school sites and the community center within the village proper. The community center includes Santa Barbara Church, the Social Hall, Commissioner's Office and Fire Station within Iglesia Circle.

The rapid urban growth in Dededo optimally meets a gradual demand for housing in response to a growing population, however, this and other land uses must be planned in compatibility with freshwater resources as an area of particular concern. Open space must be maintained over aquifer areas to assist in the recharge of underground water supplies. The Dededo area lies atop the northern limestone plateau. Rainwater soaks through permeable coral rock and floats upon a layer of salt water to form a lens system. The aquifer area, centered within the Dededo Loop provides the bulk of the island's supply of fresh water. As water rapidly soaks through coral, so can pesticides, solid waste leachates and sewage. Thus, agriculture, industry, solid fill and sewage disposal systems are discouraged as land uses over the aquifer. Small-scale gardening is an acceptable use. The soil layer, however, is too thin to support large-scale agricultural efforts.

Ponding basins within urban subdivisions already attest to the need for responsible land use in Dededo. Most of the open-space land consists of old fields and waste places where original forests never recovered from wartime damage and land grading, however, the land is kept in a conservation use.

12. Yigo Community Design

As the northernmost community and being geographically consolidated, the perimeters of Yigo generally follow municipality lines. The community is bounded by Dededo, Andersen Air Force Base, the ocean and the northern edge of the Pagat community along the northeast coast.

Yigo is primarily characterized by residential development in relation to being the northernmost community, the existence of the Dededo-Yigo aquifer and the Mt. Santa Rosa volcanic features. The residential areas are outward reflections of a period of technological transition. Within the rural and urban areas of the village proper, houses are in a random arrangement. Frame houses with tin roofs and concrete-based structures are side by side. Every conceivable combination of building materials between these two extremes can also be seen. Thus, Yigo is typical of many areas of urban growth that are outside the precisely designed subdivisions. Marianas Terrace, Perez Acres and the GHURA Low-Cost Housing are examples of a trend toward planned, insular neighborhoods in Yigo.

A portion of the Dededo-Yigo Loop, which roughly encircles the Dededo-Yigo Aquifer, dictates many land-use patterns. Random urban sprawl is discouraged in this area to protect the water lens, and in compliance with the aircraft sound zones for flight approaches to Andersen Air Force Base. Despite these areas of particular concern, random urban sprawl is clearly evident.

Planned growth is needed in areas of Yigo for better design, traffic circulation, infrastructure, public institutions and parks that have more functional utility or usefulness to area residents. Improvements in these areas will lead to a more aesthetic overall appearance of the community area.

Along the northernmost sections of Marine Drive and the northernmost land at the base of Mt. Santa Rosa, rural areas are designated as a land-use area for urban expansion. Existing and proposed low-density urban use is depicted in the village proper, Marianas Terrace, Perez Acres, GHURA Low-Cost Housing, all in a consolidated sector of urban development. The only isolated subdivision is Machanano, Formerly called Agafo-Gumas, near the Dededo-Yigo border of the Loop.

A commercial center is located in the center of urban development at the junction of Marine Drive and Gayinero Drive. It conforms to existing commercial zoning and does not project expanding commercial use as Dededo is the major trade center for the northern communities.

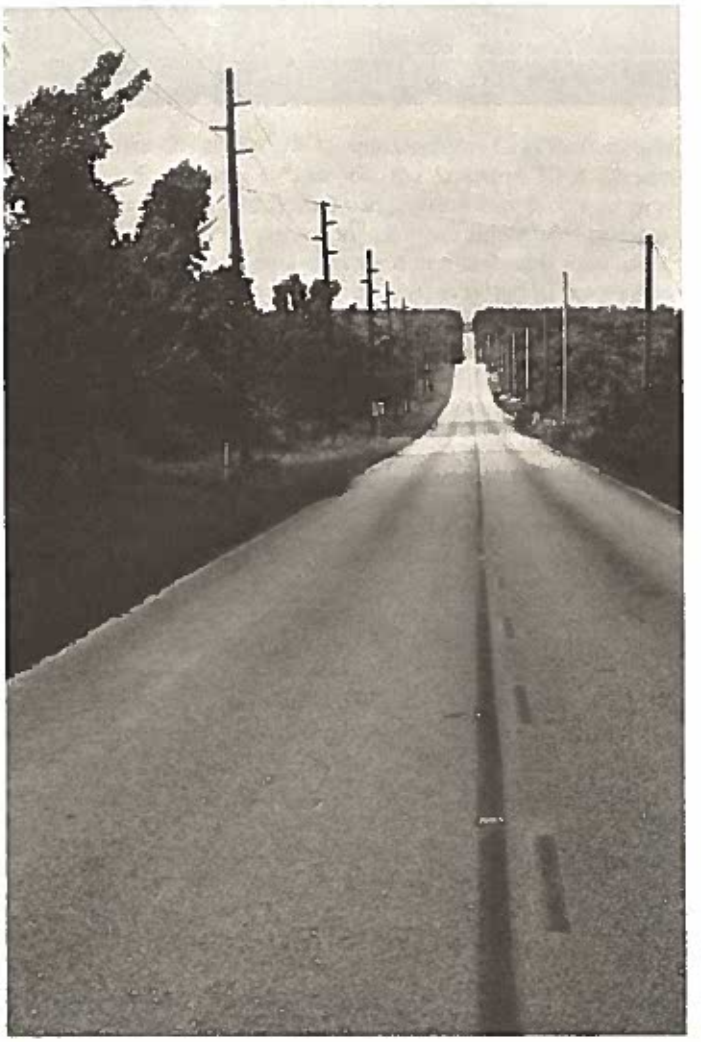
Within Yigo, areas of ecological and historic significance add to the assets of the community area. Conservation Areas 1 and 2 include portions of limestone forest on the central limestone plateau and terraces along the northeast coast. A multitude of threatened plant and animal species rely upon the specific requirements found in these critical habitat areas. Of historic significance, Yigo is the

location of a battle on August 4, 1944 and the South Pacific War Memorial stands as a reminder of past events.

In the center of the community, northeast of the village proper, is a large tract of government-owned land that is proposed as a park. Remaining conservation uses include a small ballpark within the village proper, recreational space within subdivision, the South Pacific War Memorial Park and numerous sinkholes and basins that are scattered throughout the entire community.

The majority of land in Yigo is characterized by northern limestone plateau. The surrounding coastal terraces are the uplifted remains of a barrier reef that encircled an inner lagoon. Thus, the interior limestone is soft and sedimentary — promoting rapid infiltration of water into the aquifer. The coastal limestone is hard and thus, a valuable resource for construction purposes. Two quarry locations, at Mt. Santa Rosa and on the northeast coast, in Yigo attest to a growing reliance on coral extraction to meet the demand for rock, gravel and sand. Mineral extraction sites are purposely confined within rural areas.

The major geologic interruption in Yigo is Mt. Santa Rosa, a volcanic hill that has penetrated the limestone plateau. The volcanic material has eroded from the slopes over time and drainage patterns have deposited it into a low-lying inland area. The soil build-up of lateritic red clay represents the only major area of agricultural land in northern Guam.



Many of the residents of Yigo engage in subsistence farm ing and maintain livestock. Fortunately, the agricultura land lies outside the main concentration of undergroun water resources. Nevertheless, control of pesticides an fertilizers are necessarily enforced until their effect o groundwater resources has been determined through lon range study. Many subsistence farmers, at public meeting assisted in the delineation of the agricultural use area b tween Lupog and Mataguac.

Public institutions, outlined on the community desig plan include:

Animal Quarantine Kennels
Commissioner's Office
Andersen Elementary
Yigo Elementary
F.M. Leon Guerrero Elementary
Simon Sanchez Jr. High
Our Lady of Lourdes Church
Yigo General Baptist Church
Yigo Assembly of God
Church of God

13. Pagat Community Design

The Pagat design plan is geographically located on th northeast coast of Guam between Pagat Point at th northern extreme and Mocham at the southern end. extends inland to include subdivisions known as Lat Heights and Barrigada Heights. Barrigada Heights, situ ted atop Barrigada Hill, is a low-density urban subdiv sion built on a volcanic area that has risen above the lim stone plateau that geologically characterizes the desig area. Barrigada Hill centers an aquifer area that has r quired Barrigada Heights and Latte Heights to utili ponding basins for aquifer recharge. The majority land over the aquifer is delineated in an open-space co servation use.

Isolating the two urban subdivisions from the major rur areas of Pagat and Sasajyan are expanses of federal lar area known as Andersen Air Force Base South (Marb Annex) and Naval Communication Station Radio Barrig da. Pagat Village Proper, formerly called As-Beco, is th focal point of the design plan. The existing rural densit of human settlement along Rt. 15 offers a holding are for future urban growth. A proposed recreational pa and school site depicted on the plan, could adequate serve future expansion toward an urban density. The a jacent rock quarry and labor camps at Mochom will r main rural for an indefinate time period. The long-ter mineral extraction site is being terraced such that th area may eventually be used for urban developmer however, the island's past experience with mineral e traction suggests that, once abandoned, mineral extra tion sites are ill-suited for all types of functional land us

The major rural holding area within the design plan Sasajyan, sometimes called the Marbo Cave area. Th government planning staff of the Territorial Planni Commission prepared a subdivision plan of the area 1974. The proposed subdivision parcels, recreation

parks, school sites and traffic system are incorporated into the community design plan.

North of Sasajyan, a large historical park is situated in the Pagat Point area. The precontact village site has a latte complex, rock shelters and other prehistoric features. The Guam Historic Preservation Plan, developed by the Department of Parks and Recreation, contains a site plan for the possible future development of the Pagat site as a recreational/educational/historical park. The entire site is delineated in a conservation-historical site use classification on the design map.

The Pagat historical site and most of the Seashore Reserve, delineated as open-space conservation, are characterized by relatively pristine limestone forest vegetation. The entire coastline between the sea and Route 15, with the exception of highly altered land in Sasajyan and the Hawaiian Rock Quarry, is considered to be a critical habitat for endangered and threatened species of wildlife. Presently, only a few ranches on private lands and leased Government of Guam land are land uses affecting the ecosystem. Major developments that would pressure this area's resources are discouraged with a conservation open-space delineation.

With a rural density, virtually no major trade centers are planned for the area. Small neighborhood stores are adequate for immediate needs. Public use areas are all proposed with the exception of the existing Church of World Messianity within the Pagat Village Proper or As-Beco.

APPENDIX

APPENDIX NO. 1

In 1974 an intensive investigation and evaluation of the grid system and mapping system on Guam was begun. Due to the inadequacies of existing maps and dissatisfaction with such maps, various agencies began their own individual grid and mapping system. A policy such as this would have led to more confusion and duplication of mapping efforts. To avoid further problems, the Bureau of Planning consulted all the major map users in the Government of Guam and, with the help of their input, developed and proposed one uniform system for all to use.

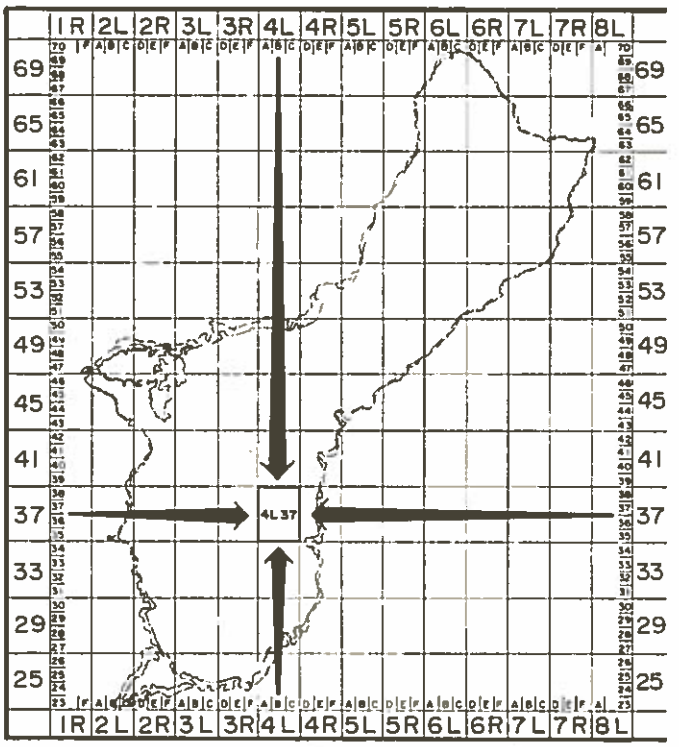
The only foundation for a grid and mapping system is the survey data of an area. For Guam, the survey data was established in 1913 which was ideal for grid identification and a map base. This coordinate system, which has negligible distortion for the island of Guam, is the legal basis for all surveying on the island. There have been technical difficulties due to poor survey procedures and war damage, but its basic concepts are as good as the most modern system anywhere in the world.

The Guam coordinate system has always been defined in metric units with direct conversion to foot system units often superimposed. Since there is currently a growing, irreversible trend toward use of the metric system, this quality of the Guam Coordinate system is most fortunate. In early 1976, Public Law 13-102 was signed by the Governor which provides for a commission on the Metric System and requires that dual dimensioning begin by February, 1977. Considering these factors, the basis grid for Guam is based on the metric system.

By Executive Order No. 75-16 the Uniform Grid System was established for Guam. In essence, the Uniform Grid System updates the Guam Geodetic Triangulation Net technical procedures common to surveyors, into a more convenient and usable form for planners, engineers, and non-technical map users. The Guam Geodetic Triangulation Net, as noted in the Executive Order, is the technical base for the Uniform Grid System. On the other hand, the Land Square System, as developed in 1913, was good for the state-of-the-art of 1913. The running numbering of squares, the quadrant numbering sections, and the row numbering of units was copied from the American Sectional System common at the time. Such a system is not readily adaptable to computerization but rather dependent on using an individual's working knowledge and memory. Therefore, the simple basis concept of Cartesian coordinates is used in the Uniform Grid System. This provides for divisions in units of ten and is fully described in the specifications provided for the system in Executive Order No. 75-37.

Evolving naturally from the Uniform Grid System was the Uniform Mapping System, and this was effected by Executive Order No. 75-37. The Uniform Mapping System provides guidelines so that all mapping on Guam fits into a systematic pattern based on the Uniform Grid System. This means that, in the case of a series of maps being designed for area coverage of a project, and where regular squares or rectangles constitute each map sheet, then the lines of the Uniform Grid System shall regulate the individual sheet match lines.

Some map series, which are standard, give total island coverage, with some sheets provided to show larger scales. This is regulated to be consistent for all users. Where only limited projec areas are to be mapped the flexibility of the grid allows the us of any grid line, providing it has an even metric value and nc a foot system value. In mapping irregular-shaped areas, no gri lines are used for the sheet lines; but the metric grid lines mus be shown to allow integration with other maps of the system Survey maps, engineering site maps, and strip maps are als flexible, with the only requirement that metric grid lines b superimposed and properly labeled.



EXPLANATION OF LOCATION SYSTEM

THE ISLAND OF GUAM IS DIVIDED INTO SQUARE "GRIDS" EACH 1000 METERS BY 1000 METERS. GENERAL LOCATION OF ANY FEATURE IS DEFINED BY THE GRID IN WHICH THE FEATURE IS LOCATED. LOCATION OF A GRID IS DEFINED BY THE "COLUMN" AND "ROW" IT IS IN.

COLUMNS ARE DEFINED BY A NUMBER-LETTER COMBINATION. THERE ARE EIGHT COLUMNS (1 THRU 8) EACH DIVIDED INTO SIX (A THRU F) 1000 METER COLUMNS. FOR MAPPING PURPOSES, COLUMNS A, B, & C ARE COMBINED TO FORM A "LEFT" HALF. (EXAMPLE 4L) AND COLUMNS D, E, & F FORM A "RIGHT" HALF (EXAMPLE 4R). THE NUMBER-LETTER COMBINATION IS A CODE SYSTEM RELATED DIRECTLY TO THE GUAM GEODETIC TRIANGULATION NET METRIC COORDINATE SYSTEM.

ROWS ARE DEFINED BY TWO NUMBERS (23 THRU 70) DEFINING THE 1000 METER INCREMENTS OF THE GUAM GEODETIC TRIANGULATION NET METRIC COORDINATE SYSTEM. FOR MAPPING PURPOSES, FOUR 1000 METER ROWS ARE COMBINED AND IDENTIFIED BY THE COORDINATE NUMBER OF THE MIDPOINT. FOUR ROWS SUCH AS 35, 36, 37, & 38 ARE INCLUDED IN MAPPING ROW 37 (EXAMPLE 37).

TO DEFINE THE LOCATION OF A MAP WHICH COVERS THREE COLUMNS (4A, 4B, & 4C) AND FOUR ROWS (35, 36, 37, & 38) THE MAP LOCATION IS 4L37. TOTAL ISLAND COVERAGE IS PROVIDED ON 70 SUCH MAPS WHICH INCLUDES 4 SMALL "INSET" AREAS. THESE MAPS ARE NUMBERED 1 THRU 70

APPENDIX

APPENDIX NO. 2 – COMMUNITY POPULATION PROJECTIONS FOR THE YEAR 2000

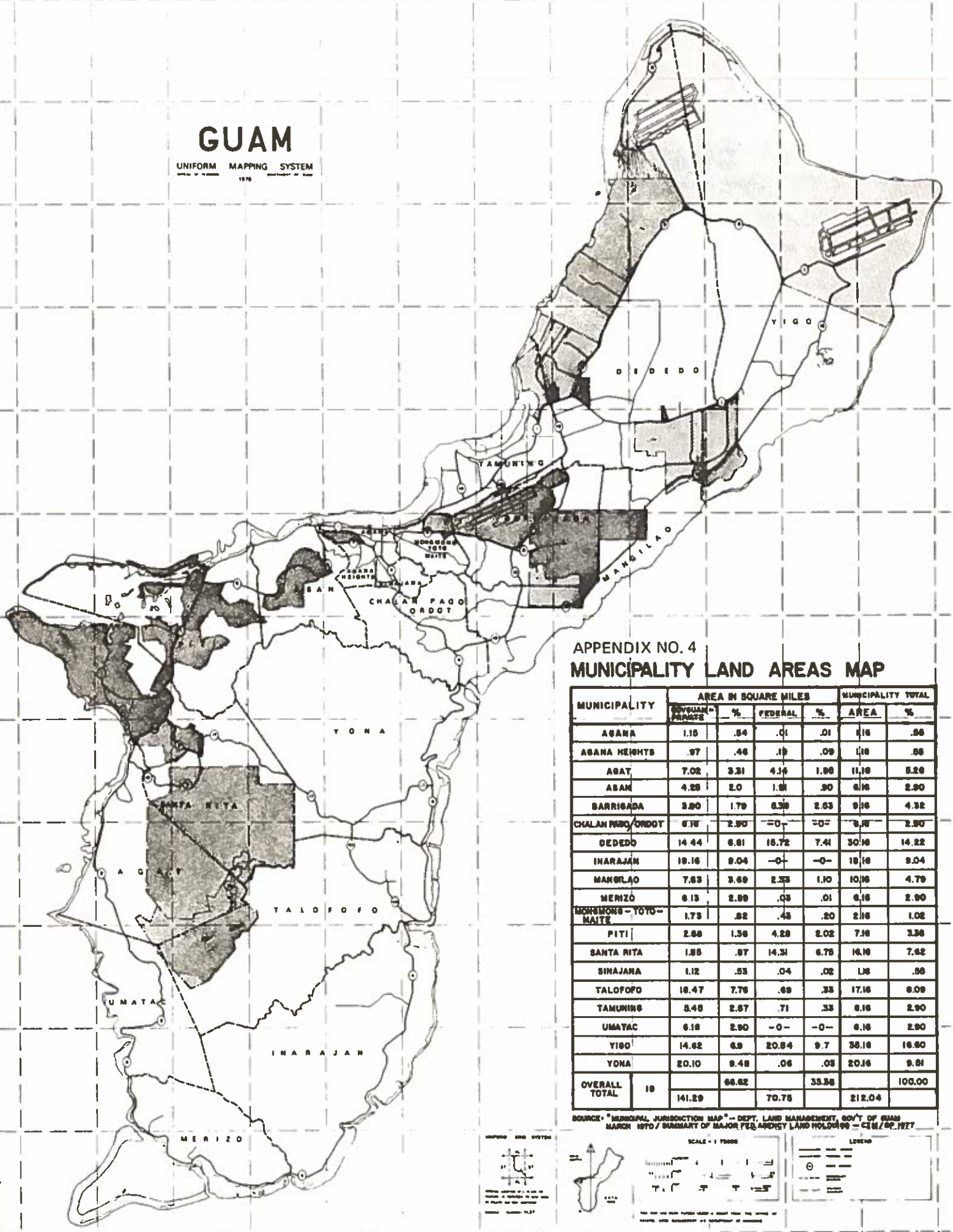
		Uniform Grid Reference	Estimated No. of Existing Dwelling Units (1977)	Estimation of Existing Population (1977)	Population Projection Year 2000	Location	Municipality
Asan - Piti Community	1.	3E-49	200	1,000	2,000	Asan Village	Asan
		3C-49	157	785	1,400	Piti Village	Piti
		3B-48	50	250	275	Piti Kaiser	Piti
		3D-48	127	75	150	Nimitz Hill	Piti
		3C-48	112	460	560	Nimitz Hill Estates	Piti
		3C-48	0	0	260	Nimitz Towers	Piti
		TOTALS	646	2,570	4,645		
Agat - Santa Rita Community	2.	3B-42	94	470	1,000	Apra Hts. North	Santa Rita
		3A-41	84	420	850	Apra Hts. South	Santa Rita
		2F-41	210	840	1,050	Hyundai Santa Rita	Santa Rita
		2F-40	294	1,470	2,150	Santa Rita	Santa Rita
		2E-40	219	1,095	2,650	Old Agat	Agat
		2E-39	443	2,215	4,500	Agat Village Proper	Agat
		2D-39	51	255	350	Agat South	Agat
		2D-38	72	360	500	Agat South to Pagachao	Agat
		2D-38	0	0	1,000	Pagachao	Agat
		2D-37	61	305	450	Taleyfac	Agat
		TOTALS	1,528	7,430	14,500		
Umatac Community	3.	2E-31	20	100	350	Salagna	Umatac
		2E-30	120	600	900	Umatac Village	Umatac
		2E-29	0	0	350	Machanage-As-Paile	Umatac
		TOTALS	140	700	1,600		
Merizo Community	4.	2E-28	26	130	280	Bile Bay	Merizo
		2F-27	183	915	1,500	Merizo Village & Pigua	Merizo
		3A-25	118	590	800	Sagualao	Merizo
		TOTALS	327	1,635	2,580		
Inarajan (Malojloj) Community	5. & 6.	4A-26	39	195	365	Agfayan Bay	Inarajan
		4B-27	104	520	600	Inarajan Village	Inarajan
		4C-28	90	450	800	Ghagamin-Lago	Inarajan
		4D-32	125	625	1,000	Malojloj	Inarajan
		TOTALS	358	1,790	2,765		
Talofofo Community	7.	4C-36	324	1,620	1,975	Talofofo	Talofofo
		4D-37	107	535	700	Ipan	Talofofo
		4B-39	145	573	1,000	Windward Hills	Yona
		4B-39	150	750	1,400	Baza Gardens	Yona
		4B-38	42		200	Casa De Sirena	Yona
		4C-39	50	250	500	Sabana Maleyuc	Yona
		4E-41	16	80	100	Togcha	Yona
		TOTALS	834	3,808	5,875		
Yona Community	8.	4E-41	0	0	100	Ylig Bay	Yona
		4E-41	87	435	800	As-Misen	Yona
		4E-42	298	1,500	2,820	Yona	Yona
		4E-43	46	230	500	North Yona	Yona
		4D-42	56	280	1,040	Pulantat	Yona
		TOTALS	487	2,445	5,260		

	Uniform Grid Reference		Estimated No. of Existing Dwelling Units (1977)	Estimation of Existing Population (1977)	Population Projection Year 2000	Location	Municipality
	9.	5A-45	336	1,572	5,000	Mangilao West	Chalan Pago-Ordot-Mangilao
		5B-46	576	1,392	4,080	Mangilao	Mangilao
		5B-48	955	4,691	10,000	Barrigada Village	Barrigada-Mangilao
		4E-49	1,401	5,644	8,000	Mongmong-Toto-Maite	Mongmong-Toto-Maite
Central Guam Community		4C-50	166	639	2,550	Agana	Agana
		4A-49	88	440	700	Maina	Asan
		4B-48	905	4,525	8,000	Agana Hts.-Sinajana	Agana Hts.-Sinajana
		4A-48	90	450	750	Afami	Sinajana
		4D-46	446	2,212	4,000	Chalan Pago-Ordot	Chalan Pago-Ordot
		4F-47	85	425	600	Mai-Mai	Chalan Pago-Ordot-Mangilao
		TOTALS	5,048	21,990	43,680		
	10.	5C-54	537	1,491	4,000	Tumon Village	Tamuning
		5B-53	625	1,559	5,000	Tumon	Tamuning
Tamuning Community		4E-52	2,853	8,799	18,500	Tamuning Village	Tamuning
		TOTALS	4,051	11,849	27,500		
	11.	5E-53	406	1,811	3,000	Gugagon	Dededo
		5D-53	1,155	5,775	8,000	Liguan Terrace	Dededo
		5E-55	141	705	750	North Liguan Terrace	Dededo
		5E-56	0	0	5,000	Dededo West	Dededo
		5F-54	473	2,365	2,600	Dededo Village	Dededo
		5F-55	280	1,400	1,500	Wettengel	Dededo
		6B-55	1,034	5,170	5,200	Kaiser Dededo	Dededo
		6B-55	0	0	500	GHURA 500 site 1	Dededo
		6B-55	87	435	800	Ypa-Pao	Dededo
		6B-55	94	376	2,400	Ypa-Pao Estates	Dededo
Dededo Community		6C-56	0	0	500	GHURA 500 site 5	Dededo
		6B-57	253	1,265	1,500	Yseng-song	Dededo
		5F-58	100	500	500	GHURA 500 site 2	Dededo
		6A-59	337	1,685	3,000	South Areas	Dededo
		6A-60	0	0	500	GHURA 500 site 3	Dededo
		6C-60	78	390	500	Yseng-song North	Dededo
		TOTALS	4,438	21,877	36,250		
	12.	6E-56	695	3,361	9,000	Yigo Village	Yigo
		6D-56	0	0	500	GHURA 500 site 6	Yigo
		6E-55	200	336	600	Perez Acres	Yigo
		7A-55	35	175	500	Mt. Santa Rosa	Yigo
		6F-58	253	1,265	1,500	Yseng-song West	Yigo
		6F-59	78	390	500	Chaguian	Yigo
Yigo Community		6D-62	102	520	1,000	Agafa-Gumas	Yigo
		TOTAL	1,363	6,097	13,600		
	13.	5D-52	54	270	540	Barrigada Hill	Barrigada
		5D-52	256	800	1,050	Barrigada Hts.	Barrigada
		5F-52	326	815	1,244	Latte Hts.	Mangilao
		6B-50	0	0	5,000	Sasajyan	Mangilao
Pagat Community		5F-49	125	625	1,500	Pagat Village	Mangilao
		TOTALS	761	2,510	9,334		
		GRAND TOTALS	19,945	84,701	167,589		

APPENDIX NO. 3 – Public Meeting and Map Review Schedule

Community	Public Meeting Dates	Map Review Dates
Asan-Piti	March 29, 1977	August 17 - 31, 1977
Agat-Santa Rita	March 22, 1977	August 17 - September 8, 1977
Umatac	February 2, 1977	June 6 - 20, 1977
Merizo	February 22, 1977	May 27 - June 10, 1977
Inarajan-Malojloj	March 1, 1977	July 12 - 26, 1977
Talofofo	March 8, 1977	August 17 - 31, 1977
Yona	March 15, 1977	August 17 - 31, 1977
Central Guam	April 12, 1977	August 24 - September 20, 1977
	April 19, 1977	
	April 26, 1977	
Tamuning	February 15, 1977	March 23 - June 2, 1977
Dededo	May 3, 1977	August 19 - September 2, 1977
Yigo	May 31, 1977	June 3 - 17, 1977
Pagat	May 10, 1977	August 24 - 31, 1977

Note: Minutes of the public meetings can be viewed in the Office of Bureau of Planning, Coastal Management Section.

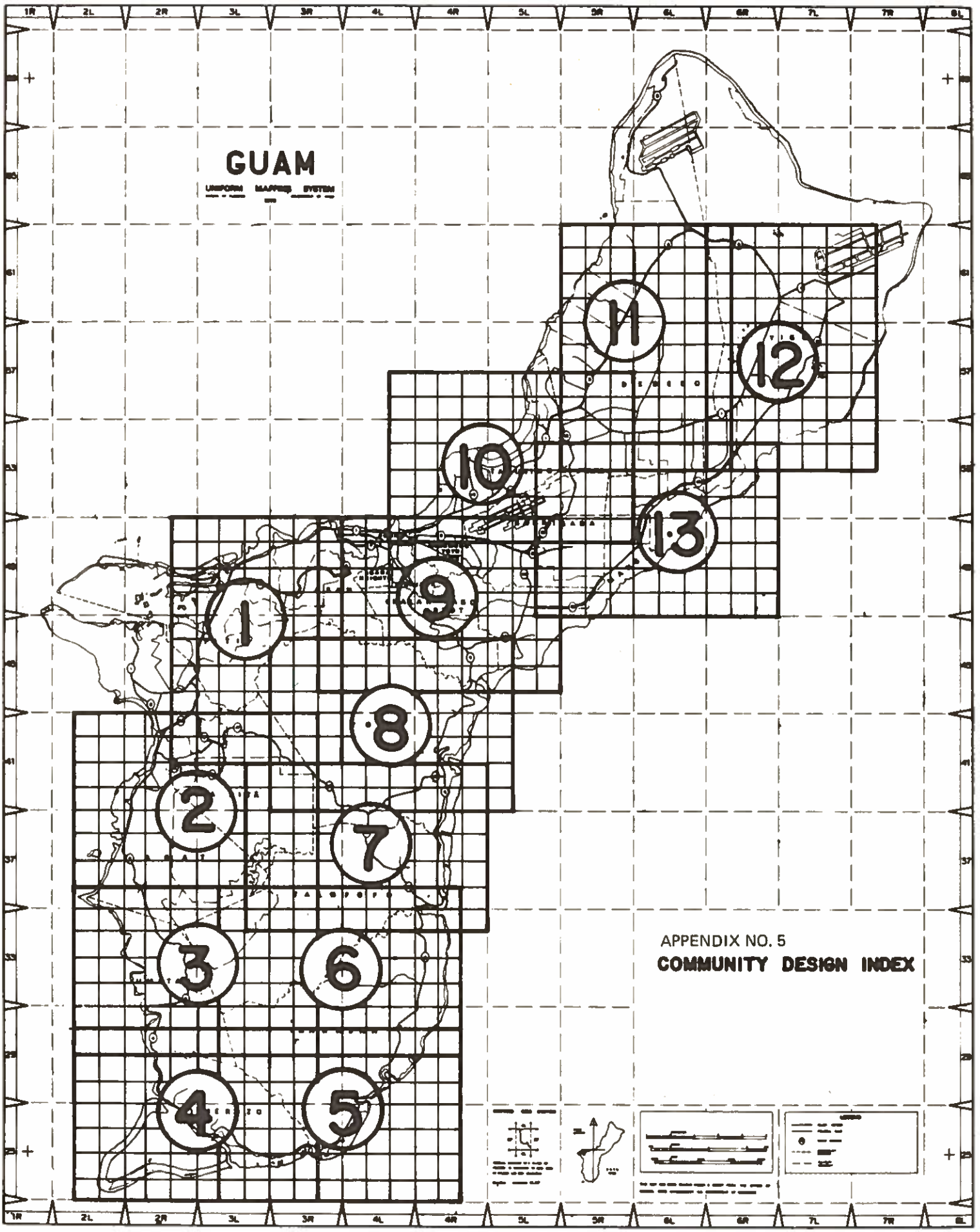


APPENDIX NO. 4

MUNICIPALITY LAND AREAS MAP

MUNICIPALITY	AREA IN SQUARE MILES				MUNICIPALITY TOTAL	
	GOVERNMENT OF GUAM	%	FEDERAL	%	AREA	%
AGANA	1.15	.54	.01	.01	1.16	.55
AGANA HEIGHTS	.97	.46	.19	.09	1.16	.55
AGAT	7.02	3.31	4.16	1.96	11.18	5.26
ASAN	4.25	2.0	1.91	.90	6.16	2.90
BARRIGADA	3.80	1.79	6.38	2.63	9.16	4.32
CHALAN PAGO/ORDOT	6.16	2.90	-0-	-0-	6.16	2.90
DEDEDO	14.44	6.81	15.72	7.41	30.16	14.22
INARAJAN	19.16	9.04	-0-	-0-	19.16	9.04
MANGILAO	7.63	3.59	2.53	1.19	10.16	4.78
MERIZO	6.13	2.89	.03	.01	6.16	2.90
MONGMONG-TOTO-MAITE	1.73	.82	.43	.20	2.16	1.02
PITI	2.68	1.36	4.28	2.02	7.16	3.38
SANTA RITA	1.85	.87	14.31	6.75	16.16	7.62
SINAJANA	1.12	.53	.04	.02	1.16	.55
TALOFOFO	16.47	7.76	.69	.33	17.16	8.09
TAMUNING	3.45	2.87	.71	.33	6.16	2.90
UMATAC	6.16	2.90	-0-	-0-	6.16	2.90
YIGO	14.62	6.9	20.54	9.7	35.16	16.60
YONA	20.10	9.48	.06	.03	20.16	9.51
OVERALL TOTAL 18		66.62		33.38		100.00
	141.29		70.75		212.04	

SOURCE: "MUNICIPAL JURISDICTION MAP" – DEPT. LAND MANAGEMENT, GOV'T OF GUAM MARCH 1970 / SUMMARY OF MAJOR FED. AGENCY LAND HOLDINGS – CEM/GP 1977



APPENDIX NO. 5

COMMUNITY DESIGN INDEX

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