SECTION 4

COST ESTIMATES AND SCHEDULE

COST ESTIMATE SUMMARY

This section presents cost estimates and scheduling information for the full facility as presented herein. As an alternative, estimates are also presented for a core facility that could be constructed with the deletion of the Open Sea Exhibit, the Restless Sea Exhibit, and the Lowlands Strand. The core facility is presented as an option to consider when seeking funding. It is our view that the core facility represents an adequate first stage that will not reduce revenues in the initial five years of operation from those of a full facility. This is discussed in Section 5.

A summary of the cost for these two options (Detailed in Tables 4-1 and 4-2 in Appendix C) is presented below:

Construction Costs	Full Facility Total Capital Costs	Core Facility Total Capital Costs
Exhibit buildings & outdoor exhibits with life support system and acrylics	$21,941,543	$15,159,852
Nursery	808,621	808,621
Site Work/Infrastructure	4,319,105	4,319,105
Theater/Ticket	498,467	498,467
Gift	311,542	311,542
Administration	685,392	685,392
Service Building	453,152	453,152
Total Construction Costs	$29,017,823	$22,236,132
Project Overhead	10,982,177	9,763,868
Project Total	$40,000,000	$32,000,000

The above estimate has a relatively higher percentage project overhead value for the core facility. This reflects the fact that the design was developed for the full facility and not detailed to include the elimination of individual exhibits. For this reason higher contingencies are included.

Basis for Cost Estimates

In general terms, the cost estimates are based on the price of construction in Seattle for 1992, escalated by approximately 42% to account for the higher construction cost of Guam and some escalation to the bid date. Taken in other terms the estimates represent the cost of construction in Hawaii according to the Means Handbook plus 10-20%. The construction market on Guam has been exceedingly volatile over the last few years ranging from highly inflated to depressed depending on the state of the market. In some instances the derivation of prices is based on actual recent bids adjusted to Guam. In the case of acrylics, the estimates are based on recent quotations in Taiwan for U.S. made acrylic windows.

The costs of life support systems is derived from Montgomery Watson cost curves for similar mechanical systems in other aquariums constructed in the last ten years. The cost of exhibits within the buildings are based on recent detailed estimates of exhibit costs in another major aquarium project adjusted to Guam.

Project overhead costs are based on the values indicated in the accompanying tables (Tables 4-1 and 4-2, Appendix C) which are representative of other recent projects. Included in overhead costs is a managing consultant, operating contractor, design services, construction supervision, some miscellaneous contracting, and the client's administrative cost.

Financing costs included specifically are for (1) financial/institutional consulting during the pre-design stage; and (2) an amount equal to about 2.8%[1] of the construction cost for interest during construction.

Operating Cost Estimates

The estimated cost for electricity in this facility for the process water system is on the order of $94,000 a year. Air conditioning energy costs would be on the order of $30,000 a year. The cost of water and sewer utilities are nominally estimated at $2,000 a month. The maintenance supplies and miscellaneous outside service contracts are estimated to be half a percent of the construction costs or approximately $161,000. Thus the total estimate of annual utilities and O&M cost is $309,000. Other annual costs are defined in Section 5.

PROJECT SCHEDULE

Project Stages

The project schedule is defined in three major stages: **Predesign Stage**, **Design Stage**, and **Construction Stage**. Figure 16 is an illustration of a project schedule that incorporates these three stages as further detailed as a series of separate tasks. The cost of the tasks are shown on Tables 4-1 and 4-2. Certain scheduling assumptions are made, the most of important of which are discussed below.

Schedule Assumptions - Immediate

- The schedule assumes final report submittal on July 1, 1993.
- GEDA then has two months to review the report and make recommendations to the legislature for approval.
- The legislative approval is assumed to require one month. The legislative approval basically says two things: 1) "we choose to proceed further with this project," and 2) "we will appropriate the necessary funds to take us through the predesign stage. For the full project this would be approximately $750,000".

Schedule Assumptions - Predesign Stage

- The Predesign Stage begins with legislative approval.

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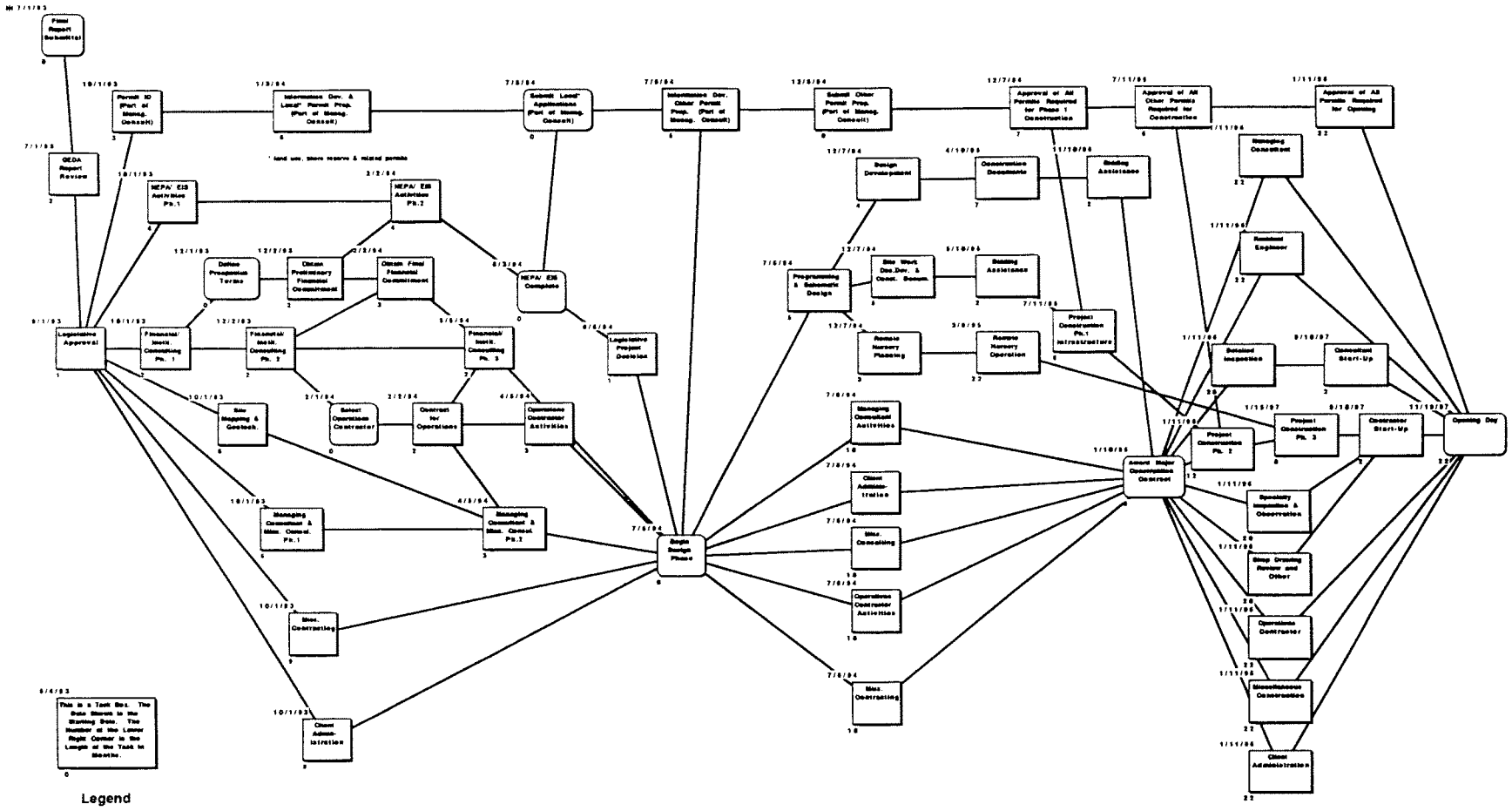
[1] This assumes that half the project costs will be subject to interest payments at 7.5% and that this interest will accrue during the last half of the project expenditure.



Guam Territorial Aquarium
Program Schedule

FIGURE 16

- The Predesign Stage includes a number of separate tasks. These would include the preparation of the environmental documents required for final approval to the project. This activity in total could take approximately eight months.

- The permitting task is closely related to preparation of the environmental documents. All required permits would first be identified. During the information development phase, pre-application conferences would be held with local and federal agencies that would review or issue permits for the project. Following completion of the Final EIS, applications for local permits or approvals (especially Land Use and Seashore Reserve permits) would be submitted to the respective agencies. This is done in order to allow adequate time for review and approval. This would allow approximately 12 months for approval of these permits prior to the initial infrastructure construction phase.

- In general, permit applications that require specific design information (such as construction permits) would not be submitted at this stage.

- Another major task during the predesign stage is the financial and institutional consulting work that would seek out and receive commitment for funding. Also during the predesign stage the site would be mapped and the geotechnical work done, a certain amount of management consulting would take place to advance the project program and design. A special operations contractor would be selected and put in place in order that he can interact with the design team in the development of the design of the project. These activities could take approximately eight months and be done at the same time as the environmental studies.

Schedule Assumptions - Design Stage

- The Design Stage begins when major financing is assured and the legislature commits to the project.

- Information required for all remaining permits, including most federal and construction related permits would be developed during the design phase. At this time, specific animals proposed for exhibits would be identified and permits required for their importation and holding would be discussed and negotiated with the appropriate agencies (eg., Department of Agriculture, Division of Aquatic and Wildlife Resources; U.S. Fish and Wildlife Service).

  This would allow approximately five months for approval of permits related to specific Phase 1 infrastructure construction activities. The remaining permit approvals would need to be acquired either by the start of Phase 2 construction (13 months following second permit submittal) or Phase 3 construction (25 months following second permit submittal).

- The Design Stage will include conventional design activities as well as work by the client, the operations contractor, and the managing consultant. During this stage two elements of work could be authorized in order to keep the remainder of the schedule on track. One of them would be the beginning of site construction and the second would be the development of operations of the remote nursery. These are indicated in Figure 16.

Schedule Assumptions - Construction Stage

- The third phase of the work is the Construction Stage during which the major project construction task would take place overseen by the managing consultant, the resident engineers, and the operations contractor.

SECTION 5

MARKET EVALUATION

INTRODUCTION

This section provides the results of the market evaluation for the proposed Guam Territorial Aquarium. It includes a review of the tourist and resident markets for the aquarium, a forecast of the size of these markets in the future, a review of existing visitor attractions on Guam and of existing aquariums elsewhere, the preliminary estimate of the range of projected attendance during the first five years of operation, the recommended level of admission pricing, planning parameters for design-day attendance, and the recommended operating season for the proposed aquarium.

PRELIMINARY CONCEPT

The concept for the aquarium consists of six inside exhibit areas and support space totaling 46,000 square feet and 4.75 acres of outside exhibit area. See Section 2 for a more detailed discussion of the exhibit and facility concepts. In general, 15 to 22 acres of buildable space are required at a site. Preliminary estimates suggest this will produce a two to three hour length of stay; somewhat more than most aquariums. The facility is specifically focused on providing a unique experience for all visitors. This concept responds well to the following preliminary market guidelines.

Attendance:	500,000 ± to 350,000 ±
Maximum Capacity:	1,000 ± to 600 ±
Theme:	"The Deep"

The unique feature to draw visitors is Marianas Trench/Deep Sea Exploration & Sealife. This can be unique in the world. Interpretation can be via live animals (where possible), models, pressure demonstrations, video, film and advanced techniques (holography; virtual reality).

The main theme will be supported by proven draws including interpretation of:

Coastal Zone: (mangrove, crocodile),
Reef: (walk through, conservation message),
Open Ocean: (sharks, rays and pelagic fish) and
Special Attractions: (predators, octopus, poisonous fish, giant clams, seasnakes/eels, shells; sea turtles; endangered species; jellyfish.

Support themes and keys to integrating the exhibits with area geography include:

Peoples of Guam, Marianas & Relationship to Sea: (fishing, navigation)
Natural Phenomena: (volcanoes, typhoon, tsunami)
Local Legends/Traditions
Bio-Geographic Portrayal of Represented Attractions

Size

40,000 square feet ± public space plus life support and administrative facilities.

Peripheral Development

Purpose: To develop source of capital and operations revenue for aquarium, and create a well-rounded development program for tourists and residents. Future uses may include:

- Accommodations: Low rise, modest scale (100 rooms ±) to serve:
  - School and education programs for Micronesian school children (week-long, dormitory style)
  - Research visitors (extended stay - 2 weeks to 3 months)
  - New tourist markets for Guam (eco-tourism, adventure tourism)

  Space required ~ 10 acres.

- Support Recreation: Concession recreation opportunities (e.g. cultural/entertainment center, sports facilities, and children's play area with games.)

- Support Commercial: view restaurant - operated as an independent facility open to aquarium visitors and other guests. The restaurant would be from 150 to 250 seats, open for lunch and dinner. In addition to serving visitors, it would cater group functions at the aquarium.

  These support facilities would augment the aquarium program by creating a greater critical mass of facilities, extending length of stay, and serving as an outreach/gateway to dive/education and ecology programs throughout the region.

  Peripheral Land Opportunities could be offered for tender (probable land lease with initial payment and percentage of revenue earmarked for ongoing aquarium support).

Management and Operations

GEDA as Master Lessee from government with subleases to qualified private sector or non-profit operators selected by competitive tender.

SITE ANALYSIS

The Tagachang Bay site is particularly attractive for aquarium development and appropriately situated. The property itself has very pleasant views in all directions and a beautiful natural setting. The resulting oceanfront location of the aquarium enhances the visitor experience and the outdoor areas and paths are an important relief valve on peak days. Food and beverage outlets and public decks should orient to this view.

As is true of any visitor attraction, the selected site will have a significant influence on its achieving two important objectives: first, garnering recognition as a unique institution; and second, generating strong public appreciation and visitation. Clearly, there are several site characteristics that are conducive to achieving the first objective. The site is very attractive and offers project designers a rare opportunity to create a facility truly in harmony with its setting. It will provide its visitors beautiful vistas and shoreline access. Equally important, the site's setting and topography permit the aquarium to be developed as a truly encapsulated environment virtually free of any external intrusive influences and activities. Further, the existing rock formations and tidal pools along the site's waterfront offer wonderful opportunities to create interesting and educational nature walks where school groups can view and learn about the many species of marine life inhabiting the Guam coast.

In terms of the site's impact on visitation, the site possesses both advantages and constraints. There are virtually no competing man-made attractions in the surrounding region, and the site location will permit the aquarium to capitalize on the local recreational traffic currently being drawn to Tagachang Beach Park. Tourist visitation to Tagachang is not yet significant. Fortunately, the

site is located very near the primary highway carrying the great majority of visitors who tour Guam. Thus, providing visitors convenient access from that highway into the aquarium site should not be difficult.

In terms of attendance, the site's only real disadvantage is its lack of proximity to the hotel zone. Since market penetration invariably declines over increasing distance from attractions, the site location is seen as an impediment to maximizing attendance. This situation, however, can be partially mitigated by working with tour operators and establishing a convenient and economical transportation system to serve the aquarium. If the aquarium can negotiate guaranteed contracts with the tour industry, an independent system would not be desirable or necessary. These contracts would also be a significant credit enhancement mechanism for financing the facility.

TOURIST MARKET

Volume of Visitor Arrivals

Historic trends in Guam visitor arrivals since 1975 are shown in Table 5-1. Starting with a small annual base, visitation tripled during the period, standing at 737,260 in 1991. These arrivals include visits for business and pleasure trips, although pleasure trips greatly predominate. Ninety-nine percent of the visitors arrive by air; the remainder by ship.

TABLE 5-1
SUMMARY OF GUAM VISITOR ARRIVALS BY YEAR, 1975-1991

Year	Air Arrivals	Ship Arrivals	Total
1975	239,682	2,555	242,237
1976	201,347	3,752	205,099
1977	240,567	5,361	245,828
1978	231,975	6,873	238,848
1979	264,326	8,355	272,681
1980	291,333	9,434	300,767
1981	312,862	8,904	321,766
1982	316,794	9,595	326,389
1983	345,805	4,735	350,640
1964	361,423	7,242	368,665
1985	364,938	13,208	378,146
1986	397,575	9,495	407,070
1987	477,495	6,459	483,954
1988	576,170	9,629	585,799
1989	658,893	9,865	668,748
1990	769,876	10,528	780,404
1991	728,722	8,538	737,260

Source: Guam Visitors Bureau; Guam Department of Commerce, Summary of General Tourism Statistical Information, July 1992; and Economics Research Associates.

The decline in visitor arrivals from 1990 to 1991 is attributable in large part to the outbreak of the Persian Gulf War, which caused many tourists to cancel their vacation plans. A recovery has taken place in 1992. The volume of visitor arrivals during the first six months of 1992 indicate that totals for the entire year will exceed the 1990 level of visitor arrivals.

Table 5-2 shows visitor arrivals to the Marianas region as a whole since 1987, with separate figures for Guam and for the Northern Marianas. Saipan is the major destination in the Northern Marianas, but a further breakdown was not available. Visitation to Guam increased by 253,306 during the period. Visitation to the Northern Marianas increased by 235,502. Guam's share of total visitation decreased from 71 percent to 63 percent during the period. The Northern Marianas' share increased from 29 percent to 37 percent. Guam thus has significant competition within the Marianas region.

TABLE 5-2
MARIANAS REGIONAL VISITOR ARRIVALS 1987-1991

	Guam		CNMI		Total	
Year	Number	%	Number	%	Number	%
1987	483,954	71	194,242	29	678,196	100
1988	585,799	70	245,545	30	831,344	100
1989	668,748	66	345,531	34	1,014,279	100
1990	780,404	63	466,913	37	1,247,317	100
1991	737,260	63	429,744	37	1,167,004	100

Source: Guam Visitors Bureau. Research Department, 1991 Visitor Industry Summary (Brochure); and Economics Research Associates.

Origin of Visitors

Table 5-3 shows the number of Guam's visitors by country of origin. Table 5-4 shows the percentage distribution by country of origin. Japan has typically generated 80 percent or more of Guam's visitors. The United States generates almost seven percent and the neighboring islands in the Northern Marianas generate almost four percent. The remainder of Guam's visitors originate in a wide range of countries.

The increase in the number of visitors during the period 1986-1991 from various countries which constitute growing markets are shown below:

Japan	249,953
United States	21,856
Korea	18,169
Taiwan	7,456
Australia	5,255

Japan is a key strategic market for Guam due to its relative proximity, its large population (124 million) and its high per capita income which facilitates the ability to travel. In addition, the hospitality industry on Guam is already extensively oriented to serving the Japanese market through the necessary language skills, the presence of Japanese tour companies on Guam, and the extensive air service linkages to Japan.

Table 5-5 shows data available from 1982 onwards on visitor arrivals from Japan as a percentage of all visitors to Guam. The percentages differ slightly from those shown in Table 5-4 because they cover only arrivals by air. As indicated, Japanese visitors accounted for at least four-fifths of travelers to Guam throughout the period.

TABLE 5-3
GUAM VISITOR ARRIVALS, BY COUNTRY OF ORIGIN, 1986-1991

Year	Japan	US	CNMI	Australia	Korea	Philip-pines	Europe	Taiwan	Hong Kong	Canada	Other	Total
1986	332,317	28,398	16,109	785	839	2,771	1,052	1,111	1,533	290	21,865	407,070
1987	412,537	31,161	14,877	477	12.47	2,873	1,491	641	1,239	352	16,959	483,964
1988	493,543	37,092	19,322	820	2,044	3,761	2,125	732	1,440	593	24,327	585,799
1989	555,748	42,678	22,990	5,194	4,514	3,960	2,793	966	1,990	715	27,200	668,748
1990	537,569	51,544	30,489	7,794	7,645	4,424	2,943	2,189	2,161	655	33,321	780,404
1981	582,270	58,254	27,860	6,040	19,008	5,484	1,998	8,574	3,019	539	32,110	737,256

Source: Guam Visitors Bureau, Research Department; and Economics Research Associates.

TABLE 5-4
PERCENTAGE DISTRIBUTION OF GUAM VISITOR ARRIVALS, BY COUNTRY OF ORIGIN, 1986-1991

Year	Japan	US	CNMI	Australia	Korea	Philip-pines	Europe	Taiwan	Hong Kong	Canada	Other	Total
1986	81.60%	7.00%	4.00%	0.20%	0.20%	0.70%	0.30%	0.30%	0.40%	0.10%	5.40%	100.00%
1987	85.30%	6.40%	3.10%	0.10%	0.30%	0.60%	0.30%	0.10%	0.30%	0.10%	3.50%	100.00%
1998	84.30%	6.30%	3.30%	0.10%	0.30%	0.60%	0.40%	0.10%	2.00%	0.10%	4.20%	100.00%
1989	83.10%	6.40%	3.40%	0.80%	0.70%	0.60%	0.40%	0.10%	0.30%	0.10%	4.10%	100.00%
1990	81.70%	6.60%	3.90%	1.00%	1.00%	0.60%	0.30%	0.30%	0.30%	0.10%	4.30%	100.00%
1981	79.00%	6.80%	3.80%	0.80%	2.60%	0.70%	0.30%	1.20%	0.40%	0.10%	4.40%	100.00%

Source: Guam Visitors Bureau, Research Department; and Economics Research Associates.

TABLE 5-5
VISITORS FROM JAPAN, AS A PERCENTAGE OF
GUAM VISITOR ARRIVALS BY AIR, 1982-1991

Year	%
1982	83.5
1983	85.1
1984	83.4
1985	82.7
1986	83.6
1987	86.4
1988	85.7
1989	84.3
1990	82.9
1991	80.0

Source: Guam Visitors Bureau; Guam Department of Commerce; and Economics Research Associates.

International Travel by the Japanese

Guam is one of many travel destinations available to the Japanese. Data available for the period 1986 to 1990 are shown in Table 5-6 and indicate that Guam has been the destination of approximately six percent of the Japanese outbound travel market throughout the period, a strong showing. However, it should also be noted that Guam experienced a slight loss in market share during the period.

TABLE 5-6
GUAM'S SHARE OF JAPAN'S INTERNATIONAL'
OUTBOUND TOURIST TRAFFIC, 1986-1990

YEAR	SHARE
1986	6.0%
1987	6.0%
1988	5.9%
1989	5.8%
1990	5.9%

Source: Research Department. Guam Visitors Bureau; and Economics Research Associates.

Table 5-7 compares market shares for several markets in the Asia-Pacific area and also shows shifts in market share over time. Two destinations for Japanese travelers, Australia and the Northern Marianas, showed major increases in market share, but started with a small base of visitors. They can be characterized as young markets. Korea, Japan's immediate neighbor, and Singapore are established markets which also demonstrated significant increases in market share during the period. Hawaii and Taiwan are previously established major markets which lost significant market share during the period. They can be characterized as mature markets.

TABLE 5-7
MARKET POSITION BY DESTINATION, JAPANESE OVERSEAS TRAVELERS TO SELECTED MARKETS RANKED BY GROWTH IN MARKET SHARE, 1985-1989

Destination	Market Share 1989	Shift in Market Share 1985-1989 (1)
Australia	3.6%	166%
Northern Marianas	2.7%	119%
Singapore	8.8%	113%
Korea	14.4%	112%
Macao	3.2%	107%
New Zealand	1.0%	99%
Hong Kong	12.3%	95%
Guam	5.8%	94%
Taiwan	10.0%	81%
Hawaii	13.6%	79%
Thailand	2.8%	61%
Philippines	1.6%	51%
China	3.7%	40%

(1) A figure higher than 100% indicates that market share increased during the period.
Source: Japan Travel Bureau, "JTB Report '90", derived from date provided by the Japanese Ministry of Justice, "Immigration Office Statistics"; and Economics Research Associates.

Survey data cited by the Japanese Travel Bureau indicate that there are a variety of purposes for overseas travel by the Japanese. When asked what they planned to do on their trips, most people answered that they intended to enjoy nature and scenery. This was a trip purpose cited by 72 percent of the people. The number two answer (56 percent) was to "see famous historical sites and works of architecture," a primary reason for going to urbanized areas. The next most prevalent answers were "to taste the food and delicacies of the country" (48 percent), "to enjoy shopping" (43 percent), "to rest and relax" (38 percent), "to experience a different culture" (36 percent) and "to visit museums" (31 percent.) Guam's ocean setting already serves the purposes of "enjoying nature and scenery" and of "rest and relaxation." The creation of a distinctive and unique aquarium on Guam would help to strengthen its appeal in the categories related to man-made attractions. The desire to experience nature and scenery also indicates that it would also be helpful if the aquarium were sited in a scenic, natural setting.

Within the destinations available to the Japanese overseas travel market, Guam enjoys a special advantage in that it (along with Saipan) is the least expensive destination among the major alternatives, as shown in Table 5-8. Korea and Taiwan, due to their proximity to Japan, are only slightly more expensive. However, among the overseas year-round ocean resort alternatives, Guam and Saipan are clearly the least expensive trips for the Japanese market.

TABLE 5-8
JAPANESE TRAVEL EXPENDITURES BY DESTINATION, 1990

Destination	Expenditures (Yen x 1,000) (1)
Guam and Saipan	140
Southeast Asia	190
China	200
Korea and Taiwan	150
Hawaii	220
Southern Pacific Islands	290
West Coast of the U.S.	310
East Coast of the U.S.	370
Middle East and Africa	440
Oceania	440
Central and South America	530
Europe and Soviet union	470
Overall Average	270

(1) Includes fare, hotel charges, food expenses, but excludes shopping and other expenditures.
Source: Japan Travel Bureau, JTB Report '90

The importance of cost as a factor in choosing Guam has been borne out by visitor surveys. A 1989 survey found that the most frequently cited reason for selecting Guam (mentioned by 52 percent) was the price of tours available to Guam. The second most important reason for selecting Guam was the "beautiful seas" environment (34 percent). A 1991 survey also found that these two reasons were the most frequently mentioned, with 50 percent citing the "beautiful seas" motivation and 44 percent citing reasonable travel prices.

Tourism Infrastructure on Guam

The number of hotel rooms on Guam approximately doubled from 1985 to 1991, as shown on Table 5-9. The increase in the number of rooms has been particularly large from 1989 onwards. The majority of hotel rooms are located along the Tumon Bay beach resort area.

Hotels on Guam have been able to maintain high occupancy rates on an annual basis due to the relatively even distribution of visitor arrivals throughout the months of the year. A decline in occupancy rates occurred in 1991, reflecting the decline in visitor arrivals combined with the growth in the number of rooms.

Hotel occupancy taxes collected from 1992 through 1991 are shown in Table 5-10. The increase reflects the growth in the number of hotel rooms and visitor arrivals, combined with increases in hotel room rates over time. Occupancy taxes are assessed at 13 percent of the room rate, and the proceeds are deposited in the Tourist Attraction Fund.

TABLE 5-9
NUMBER OF AVAILABLE HOTEL ROOMS ON GUAM, AND ANNUAL HOTEL OCCUPANCY RATES, 1982-1991

Year	Room Availability	Occupancy Rate
1982	241	DNA
1983	281 9	87%
1984	2964	84%
1985	2991	82%
1986	3248	87%
1987	3864	86%
1988	3939	84%
1989	4133	90%
1990	4955	89%
1991	5894	79%

Source: Guam Visitors Bureau; Economic Development and Planning, Guam Department of Commerce; Guam Hotel/Motel and Restaurant Association; and Economics Research Associates.

TABLE 5-10
OCCUPANCY TAXES COLLECTED (UNADJUSTED FOR INFLATION)

Year	Taxes Collected (000s)
1982	2,357
1983	3,028
1984	3,502
1985	4,051
1986	4,534
1987	5,730
1988	8,826
1989	11,774
1990	14,601
1991	(1)15,984

(1) At 13% of revenue.
Source: Guam Visitors Bureau, Economic Development and Planning, Guam Department of Commerce, and Economic Research Associates

Additional hotel rooms have been constructed during 1992, and others are under construction. The Guam Visitors Bureau (GVB) reported that 2,373 hotel rooms were under construction as of its '91 Visitor Industry Summary. In addition there were a very large number of additional hotel projects planned or proposed. However, the recent contractions in the Japanese financial markets, which have been a major source of financing in the past, has resulted in the cancellation or deferral of a number of the planned projects. However, the ongoing projects should permit Guam to accommodate continued growth in visitation over at least the near term. New hotels or additions due to open in 1993/94 include the Hyatt (448 rooms), Hilton Tower (240), Royal Palm (100 condos/120 hotel rooms), and the Leo Palace.

Airline service from Guam's overseas tourism markets has increased significantly, and interviews indicate further expansions are scheduled or planned. The Guam Department of Commerce,

Division of Economic Development and Planning, reported that as of February 1991 there were 182 flights per week, providing 41,021 available passenger seats per week. Based on preliminary figures for July 1992, these totals had increased to 205 flights and 48,824 available passenger seats per week, an increase of 19 percent. There were 28,087 available seats per week from Japan, and 20,737 seats per week from other areas. This contrasts with the 80%/20% split of Japanese/all other visitor arrivals in Guam. The situation reflects the shortage of available slots at Tokyo's Narita International Airport, Japan's busiest, and the competition for these slots. The number of available seats from Narita airport to Guam actually decreased during this period. However, seats were added from other Japanese airports, so that total available seats from Japan increased from 25,245 to 28,087 during the period, or 11 percent. On an annual basis, there are 1,460,524 available seats from Japan and 1,078,324 available seats from all other markets.

There are six existing golf courses on Guam and three new golf courses (Leo Palace, Talofofo, and Guam Municipal) are on line. Others are planned.

Tourist Characteristics

Length of Stay. Average visitor length of stay on Guam is 3.6 nights, according to the GVB's '91 Visitor Industry Summary.

Origin of Visitors. As indicated previously, approximately 80 percent of visitors are Japanese. Within Japan, the single most important market is the Kanto region (Tokyo and neighboring prefectures), followed by the Kansai region (Osaka, Kobe, Kyoto and environs) and the Chubu region (Nagoya and other areas lying between the Kanto and Kansai regions.) A 1989 survey of Guam's Japanese visitors indicated that 52 percent came from the Kanto region, 16 percent from the Kansai region, and 12 percent from the Chubu region, with the remaining 20 percent from other areas of Japan. However, This mix may have changed somewhat during the past year due to the changes in air service referred to above.

Type of Traveler. Japanese visitors to Guam fall into three principal types according to how their travel arrangements are made. These categories are visitors on package tours (the most prevalent), visitors on group tours, and individual travelers who have purchased their own air fares and booked their own hotel accommodations. A 1989 survey by Merrill & Associates found that approximately 70 percent of Guam's Japanese visitors were on package tours, approximately 25 percent were on group tours, and approximately five percent were individual travelers. Only the visitors on group tours have their itineraries on Guam set in advance. Group tours are all expense paid tours organized for selected groups such as companies or clubs.

Visitors on package tours have discretion over how they will spend their time once they have arrived on Guam. Generally, their package covers air fares, hotel accommodations, and ground transportation to and from the airport. The packaged tour generally does not include visits to attractions or other activities on Guam, with the exception of a sightseeing tour, generally on the first morning of their visit. After that, the visitor decides what he or she wants to do during the remainder of the stay. The tour company offers various optional tours and other activities (such as a visit to a gun club) to the tourist, but these are not included in the packaged price of the tour. Hence, approximately 75 percent of the Japanese visitors (the package tourists plus the individual tourists) establish their own itineraries regarding what attractions they will visit on Guam.

Demographic Characteristics. A December 1991 survey of Guam visitors indicated that 58 percent of the visitors were male and 42 percent were female. Median income was in the range of $24,000 to $32,000. In this survey, the majority of the visitors were young adults, with 56 percent being under age 31 and 34 percent being under age 25.

A 1989 survey found that gender was more evenly split, with 48 percent male and 52 percent

female. (Sampling variability is to be expected.) Sixty-two percent of the visitors were between 20 and 30 years old. Women predominated in the 20-25 age group. Men predominated in the 25-30 age group. As could be expected from the age structure, the majority of the visitors were single.

Honeymooners accounted for 6 to 8 percent of visitors, based on the two surveys.

Seasonality of Visitation. Visitor arrivals in Guam are shown by month in Table 5-11. Table 5-12 shows the percentage distribution by month and indicates that Guam has a very even distribution of visitor arrivals compared to many other vacation destinations. In a 48-month period, only one month showed a level in excess of ten percent.

Table 5-13 compares visitation for the first six months of the year to totals for the entire year and indicates that the first half of the year typically accounts for approximately 49 percent of total visitation for the year. The lower figure during the first six months of 1991 is atypical and reflects the impact on travel of the Persian Gulf War, which occurred during the first part of that year.

TABLE 5-13
RATIO OF FIRST SIX MONTHS TO TOTAL YEAR VISITATION ON GUAM, 1988-1991

YEAR	JAN - JUNE	ENTIRE YEAR	PERCENT
1988	284,744	576,170	49%
1989	314,244	658,883	48%
1990	377,362	769,876	49%
1991	330,747	728,722	45%
1992 (part)	481,352	876,742	55%

Source: Previous tables, and Economics Research Associates

Estimate of Future Visitation. Since visitor arrivals for the first six months of 1992 are already known, a reasonable forecast of the total for 1992 could ordinarily be made. However, the disruption caused by the occurrence of Typhoon Omar during the second half of 1992 had a disruptive effect on visitation. Table 5-14 shows an estimate of what the level of visitor arrivals might have been for 1992 in the absence of the typhoon. Under normal conditions, the total for 1992 could be forecast at approximately 982,000 visitor arrivals.

TABLE 5-14
FORECAST OF POTENTIAL TOTAL VISITATIONTO GUAM IN 1992 IF TYPHOON OMAR HAD NOT OCCURRED

First six months	481,352
Assumed percent of full year	49%
Forecast for entire year	982,351

Source: Previous tables, and Economics Research Associates.

Table 5-15 provides a rough forecast for 1992 taking into account the occurrence of Typhoon Omar, assuming that the visitation during the second half of the year will be four percent lower than normal and the first half being four percent higher than normal (53 percent). This led to an adjusted forecast of 908,000. There is no way of knowing what the actual totals will be until the end of the year. Actual visitation was 877,000 arrivals for 1992. This greater than expected drop reflects the effects of several additional storms that hit later in the year. In spite of storms, however, visitation to Guam was up 19% in 1992.

TABLE 5-11
VISITOR ARRIVALS IN GUAM BY MONTH, FOR SELECTED YEARS

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1988	50,510	51,073	52,400	38,400	40,831	51,530	60,806	48,587	54,763	40,151	43,957	43,162	576,170
1909	56,247	55,165	53,599	42,700	47,109	59,424	63,108	65,455	60,126	49,781	49,708	56,451	658,873
1990	64,388	70,745	64,140	53,875	58,223	65,991	66,000	72,000	70,231	61,115	60,577	62,591	769,876
1991	63,627	45,277	45,383	50,998	58,797	66,665	64,951	68,417	70,032	62,100	62,703	69,772	728,722
1992 (plat)	80,960	87,208	88,675	74,208	71,966	78,277	DNA	DNA	DNA	DNA	DNA	DNA	DNA

Source: Guam Visitors Bureau; Economic Research Center, Guam Department of Commerce; and Economics Research Associates

TABLE 5-12
PERCENTAGE DISTRIBUTION OF VISITOR ARRIVALS IN GUAM, BY MONTH, FOR SELECTED YEARS

Year	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1988	8.8%	8.9%	9.1%	6.7%	7.1%	8.9%	10.6%	8.4%	9.5%	7.0%	7.6%	7.5%	100.0%
1909	8.5%	8.4%	8.1%	6.5%	7.1%	9.0%	9.6%	9.9%	9.1%	7.6%	7.5%	8.6%	100.0%
1990	8.4%	8.2%	8.3%	7.0%	7.6%	8.6%	8.6%	9.4%	9.1%	7.9%	7.9%	8.1%	100.0%
1991	8.7%	6.2%	6.2%	7.0%	8.1%	9.1%	8.9%	9.4%	9.6%	8.5%	8.6%	9.6%	100.0%

Source: Guam Visitors Bureau; Economic Research Center, Guam Department of Commerce; and Economics Research Associates

TABLE 5-15
ROUGH FORECAST OF TOTAL VISITATION TO GUAM DURING 1992 (1)

First six months	481,352
Assumed percent of full year	53%
Forecast for entire year	907,000 (2)

Source: Previous tables, and Economics Research Associates
(1) Based on experience during the first six months of 1992 and taking into account the negative impact of Typhoon Omar.
(2) Actual 1992 visitation was 877,000

Table 5-16 shows annual changes in visitor arrivals on Guam since 1975. The substantial increases in recent years reflect in part the easing of visa requirements for visitors from Guam's major markets in the latter part of the 1980's, the rapid growth in the hotel stock, particularly in the Tumon Bay beach resort area, and the rapid increase in travel spurred by a buoyant Japanese economy.

TABLE 5-16
TOTAL VISITATION TO GUAM ANNUALLY, AND PERCENT CHANGE OVER PREVIOUS YEAR

Year	Total	Percent Change
1975	242,237	DNA
1976	205,099	-15
1977	245,828	20
1978	238,848	-3
1979	272,681	14
1980	300,767	10
1981	321,766	7
1982	326,389	1
1983	350,540	7
1984	368 665	5
1985	378 146	1
1986	407 070	8
1987	483 954	19
1988	585 799	21
1989	668 748	14
1990	780 404	17
1991	737 260	-6
1992	877 000	19

Source: Guam Visitors Bureau; Guam Dept. of Commerce, Summary of General Tourism Statistical Information, July 1992; and Economics Research Associates.

Table 5-17 shows the compound annual growth rate for visitor arrivals for various periods since 1975. For the entire period 1975-1991, the compound growth rate was 7.2 percent. For the ten years ending in 1991, the compound growth rate was 8.5 percent. Growth was considerably slower in the period prior to 1982 (4.4 percent annually.)

TABLE 5-17
COMPOUND ANNUAL GROWTH RATE (CAGR) IN GUAM VISITATION FOR SELECTED PERIODS

Period	CAGR
1975-1991	7.2%
1975-1992(Fcst.)	7.8%
1975-1982	4.4%
1982-1991	8.5%
1983-1992(Fsct.)	10.0%

Source: Previous tables. and Economics Research Associates.

Table 5-18 shows the assumptions made by Economics Research Associates (ERA) regarding future growth in visitor arrivals. The forecast of 1,081,000 in 1993 was derived by assuming a ten percent increase over the level which could have been expected to occur in 1992 in the absence of Typhoon Omar. Since the actual figure for 1992 will probably be somewhat less, the actual increase should be in excess of 10 percent, hence the 19 percent increase shown for 1993 in Table 5-16.

TABLE 5-18
GROWTH ASSUMPTIONS AND PROJECTED VISITATION TO GUAM IN FUTURE YEARS

Year	Visitation (000's)	Growth Rate
1991	737	-6%
1992	908	23%
1993	1,081	19%
1994	1,178	9%
1995	1,272	8%
1996	1,361	7%
1997	1,443	6%
1998	1,530	6%
1999	1,621	6%
2000	1,702	5%

Source: Economics Research Associates.

In projecting visitor arrivals after 1993, ERA has assumed that the annual percentage increase in visitor arrivals will gradually decline in future years as Guam becomes a more mature destination market. As indicated earlier, two existing mature Japanese tourist markets, Hawaii and Taiwan, have lost market share in recent years.

Over the decade of the 1990's as a whole, the ERA forecast compares generally with a forecast made by the International Air Transport Association in 1991, which projected that air passenger travel to Guam would grow at an average annual rate of approximately 8 percent from 1990 to 2000.

RECESSION IMPACTS

In 1993, there are short term concerns about the recent drop off in the Japanese market. Arrivals from Japan were down 6% in January and 21% in February, leading to a total decrease of 12%

year to date. Japanese travel to Hawaii is also down (16% through February). This is somewhat comforting to Guam in that it indicates an overall source market weakness rather than a shift in competitive advantage. In other markets, visitation to Guam from Korea remains very strong (+69% year to date). The Taiwan market is reduced and holding until the visa waiver situation is resolved in Washington, D.C. Upon resolution, this market should resume its strong growth. On an overall basis, the GVB supports ERA's visitor projection of 1.35 million visitors by 1996. This, of course, requires a turnaround in travel from Japan, but our interviews with industry sources in Japan expect this to start this summer.

The airline industry is in a bit of turmoil as travel decreases were unexpected. Japan Airlines is cutting a flight from Osaka; ANA has cut from 1900 seats a week to 550; Northwest has cut back on its Manila and Fukuoka flights; Thai will pull out this summer. Continental, however, is now on a solid financial footing and their future looks promising. Korean Airlines is increasing their seat capacity from 660 to 800 to reflect this market growth. Also, there is a strong possibility that United will be starting a Guam/Saipan/Osaka route. The airport expansion will accommodate up to 1.5 million visitors so capacity will not be a constraint.

MARKET REQUIREMENTS

A market driven aquarium program must meet the needs of existing visitors, attract desired markets, and meet competitive challenges. The latest quarterly exit survey of Japanese visitors provides some significant direction in this area including:

- Compared to overall outbound travel from Japan, Guam is not attracting its share of family groups. There is a shortage of family attractions.
- Guam's image as a low income vacation destination will not change unless it attracts more executives and business owners.
- Approximately one in four Japanese visitors are repeat guests (36% in Hawaii).
- Beautiful seas are the most important reason for coming to Guam.
- Few of Guam's mature visitors stay longer than four days. There is a lack of attractions for these visitors.
- Four out of five visitors purchase an optional tour.
- Three out of five visitors purchase two or more optional tours,
- The most popular tours for 1992 were shopping (53%), sightseeing (48%), gun shooting (39%), and dinner show (30%). However, sightseeing and shopping tours reported a dramatic drop (over 50% decline) in the fourth quarter of 1992. Retailers report that duty free shopping is way down and that there is a shift away from branded goods towards experimental things (activities, handicrafts, etc.). Overall, visitors are becoming more price conscious.
- Water related tours were popular including: dinner cruise (22%); jet ski tour (16%); Atlantis submarine (14%); PIC day tour (13%); diving tour (12%); and fishing tour (4%). We understand that the Atlantis submarine often runs at capacity (48 persons) and that they are bringing in another submarine.
- The highest rated tours are diving and gun shooting (4.1 on 5 point scale); Atlantis submarine (4.0); PIC day tour; dog racing; and Sand Castle (3.9).

- The lowest rated tours are sightseeing and fishing (3.3); night tour (3.4); shopping and golf (3.5).

- There is a strong trend toward increased exploration and sightseeing on an individual basis. Participation in this type of activity increased from 67% (December 1991) to 69% (February 1992), to 70% (June, 1992), to 83% (October 1992).

- In terms of enjoyment, water activities received the highest satisfaction (6.0), followed by car rental (5.8), and beaches (5.6) on a 7 point scale.

These visitor characteristics, participation levels, and satisfaction levels are all positive factors for aquarium attendance and market acceptance.

There is also useful information on the breakdown of travel within the group market. Package tourists are described as Group, Company or Agent. The Agent package means that a visitor is "packaged" along with other visitors to achieve economies of scale. This represents just over half the market and ninety percent of the Agent package group are under thirty years of age. The group tour has a common bond among members, while the Company tours are packaged by the company. Company packages represent about a third of the visitors and Group tours about 12%. Only about 10% of the Guam visitors from Japan are not on some kind of tour.

The company arranged travel group is an especially important market for the aquarium. ERA's experience shows that aquariums have done very well in attracting this segment for both general admissions and private functions. They also have significantly higher income than the agent package visitor.

A relevant statistical relationship was uncovered between tourism to Guam and the CNMI in that about 10% of the Japanese visitors travel to Saipan as a side trip. When they return, they are again counted as a visitor arrival. The GVB needs to adjust for this double counting in the size of the tourist market.

Visitor industry representatives universally agree with the visitors that Guam needs more attractions, particularly indoor or weather protected. They speak highly of the Atlantis submarine, but it is too expensive (~$94/person) for many of the visitors and for families. Several see strong growth in the family market and that Guam needs something to interest the kids. They agree that an aquarium is the right kind of attraction for visitors and residents. The win-win aspects of serving both constituents was a key element in many of the interviews. They are less sure about cultural shows both in terms of popularity and possible competition to what is already offered at the hotels. They also note though that many Japanese travellers are looking for a cultural experience and that the "Man and the Sea" concept for the aquarium is a good tie-in.

Some of the hotel and tour operator representatives feel that the aquarium should be immediately accessible (within walking distance) to the hotels. To some extent, this reduces the market risk of being dependent on tour operators. The response of Atlantis to this condition has been to provide its own transportation pickup and delivery. The aquarium may have to have a similar system. If, however, the GTA can negotiate guaranteed contracts with tour operators, an independent system would not be necessary. Most tour operators are less concerned about immediate location as long as the aquarium is a quality experience. ERA feels that the Tagachang site is an appropriate compromise. We agree that there may be some short term loss in attendance because of the distance from hotels. However, this is outweighed by the longer term impact on satisfaction of having the aquarium in a quality natural environment with supporting land uses. The views from Tagachang should be emphasized and are a market plus.

GUAM'S RESIDENT MARKET

The growth in Guam's resident population from 1960 through 1990 is shown in Table 5-19. Guam experienced a comparatively rapid population growth over the four decades. Between 1980 and 1990, the population grew from 106,000 to 133,200, representing a compound annual growth rate of 2.3 percent. ERA has assumed that the population will continue to grow at this rate through the 1990's, resulting in a resident population of approximately 167,000 by the year 2000.

TABLE 5-19
POPULATION TRENDS AND PROJECTIONS IN GUAM (1)

Year	Population
1960	67,000
1970	85,000
1980	106,000
1990	133,200
1990 (Projected)	133,200
1991 (Projected)	136,300
1992 (Projected)	139,400
1993 (Projected)	142,600
1994 (Projected)	145,900
1995 (Projected)	149,300
1996 (Projected)	152,700
1997 (Projected)	158,200
1998 (Projected)	159,800
1999 (Projected)	163,500
2000 (Projected)	167,300

Source: U.S. Bureau of the Census; projection by Economics Research Associates.
(1) Compound Annual Growth Rate, 1980-1990: 2.3%

The 1990 Census reported that Guam's population had a median age of 25. There were 70,945 males and 62,207 females. Median household income in 1989 was $30,755, and median family income was $31,178. Per capita income was $9,928.

Local sources report that Guam's student population (kindergarten through high school was within the range of 30,400 to 31,500 throughout the period 1982 to 1990, increasing to 35,139 in the 1991-1992 school year. The number of students in the various age brackets is as follows:

- Kindergarten through fifth grade 18,395
- Grades 6 through 8 7,920
- Grades 9 through 12 8,824

Approximately 79 percent of the students attended public schools and approximately 21 percent attended private schools.

EXISTING VISITOR ATTRACTIONS ON GUAM

Guam does not presently have a major cultural attraction such as a major museum or aquarium. There is a very small zoo which is privately operated.

Individual attractions include a one-hour tour of the underwater marine environment by the passenger submarine Atlantis at Apra Harbor; the Pacific Islands Club at Tumon Bay, offering

water sports activities; and a dog racing track near Hospital Point. A major visitor attraction in the past has been Cocos Island Resort off the southeastern coast of Guam, offering visitors a tropical lagoon environment and promoted as Guam's Island Fantasy. This attraction had been closed due to storm damage but has now been reopened for day-use activities.

There are a variety of cruise operations, watersports operations, dinner shows, golf courses and gun shooting establishments. The latter have a particular appeal to the Japanese tourist because private use of firearms is prohibited in Japan. Shopping is also a major activity engaged in by visitors.

Access to many of the above activities is also offered as optional tours by the tour companies on Guam. Table 5-20 shows reported visitor participation in various types of activities based on 1989 and 1992 surveys of visitors. The table indicates that Cocos Island resort was the leading individual attraction. Visitation to other types of establishments such as the shooting establishments have increased since 1989 due to growth in the number of establishments.

TABLE 5-20
REPORTED VISITOR PARTICIPATION IN OPTIONAL TOURS ON GUAM

	Participation Rate	
Optional Tour	**1989**	**1992**
Dinner Shows*	38.5%	30.0%
Windjammer	10.2%	N.A.
Night tour	8.8%	10.0%
Scuba Diving	8.8%	12.0%
Pineapple tour	5.2%	N.A.
Atlantis	13.3%	14.0%
Golf*	15.2%	16.0%
Umidori	6.9%	N.A.
Shopping Tour*	25.9%	53.0%
Stars & Stripes	2.9%	N.A.
Gun Shooting*	21.8%	39.0%
Cocos Island	32.3%	N.A.
Sight Seeing*	29.8%	48.0%
Sunset Cruises*	11.1%	N.A.
Pacific Islands Club	8.0%	13.0%
Flea Market	5.0%	N.A.
Dog Track	9.8%	21.0%
Dinner Cruise	N.A.	22.0%
Sand Castle	N.A.	10.0%
Jet Ski	N.A.	16.0%
Deluxe Dinner	N.A.	7.0%
Jungle	N.A.	7.0%
Fishing	N.A.	4.0%
Southern Island	N.A.	5.0%

* The participation rate reflects total activity at several establishments of this type.
Source: Guam Visitors Bureau and Economics Research Associates

Guam also has a variety of buildings and historic sites from the Spanish era. A national park distributed over several locations commemorates World War II but is of limited appeal to Japanese visitors.

CHARACTERISTICS OF OTHER EXISTING AQUARIUMS

A review of aquariums outside Guam is contained in Appendix A

ATTENDANCE PROJECTION

The projection of attendance at the proposed Guam Territorial Aquarium during the first five years of operation is shown in Table 5-21. A range is given from low to high, as well as a mid-range estimate. The projection is based on estimated penetration rates for the resident market and the tourist market applied to the projected size of each market. The assumed first year of operation is 1996.

TABLE 5-21
PROJECTION OF ANNUAL ATTENDANCE RANGE AT THE PROPOSED GUAM TERRITORIAL AQUARIUM, 1996-2000, ASSUMING ADEQUATE ATTRACTION CONTENT
(In Thousands of Persons)

	1996	1997	1998	1999	2000
Travelers to Guam					
Market Size	1,361	1,443	1,530	1,621	1,702
Penetration Rates					
Low	16%	15%	15%	15%	15%
Mid	26%	25%	25%	25%	25%
High	37%	35%	35%	35%	35%
Projected Attendance					
Low	218	216	229	243	255
Mid	354	361	382	405	426
High	504	505	535	567	596
Guam Residents					
Assumed Market Size	153	156	160	164	167
Penetration Rates					
Low	12.0%	10.0%	10.0%	10.0%	10.0%
Mid	30.0%	12.5%	30.0%	12.5%	30.0%
High	18.0%	15.0%	15.0%	15.0%	15.0%
Projected Attendance					
Low	18	16	16	16	17
Mid	45	20	48	21	48
High	28	23	24	25	25
Total Projected Attendance					
Low	236	232	245	260	272
Mid	377	380	402	426	446
High	531	528	559	592	621

Source: Economics Research Associates

Penetration rates for the resident market after the first year of operation are estimated to range from 25 percent to 35 percent, based on experience of aquariums in North America and Asia-Pacific with regard to their local markets. Penetration during the initial year of operation is estimated to be

approximately 20 percent higher than the "stabilized" rate in subsequent years.

The estimated penetration rates for the tourist market range from a low of 15 percent to a high of 35 percent The lower end of the range reflects experience at comparable attractions in North America for which authoritative information is available on both the number of tourists to the area and the number of visitors to the aquarium who are tourists. Examples of aquariums in two beach resort communities include the Virginia Marine Science Museum, an aquarium and marine science museum in Virginia Beach, Virginia, and the North Carolina Aquarium on Roanoke Island in the Nags Head coastal resort area of North Carolina. The Virginia Marine Science Museum captures approximately seven percent of the overnight visitors to Virginia Beach. The North Carolina Aquarium captures approximately 15 percent of the tourists to that resort area.

The higher penetration rate of 35 percent reflects experience at a New Zealand Aquarium, Kelly Tarleton's Underwater World in Auckland, as well as the experience of Guam's number one individual visitor attraction, Cocos Island Resort. In its first year of operation, the New Zealand aquarium captured approximately 39 percent of the foreign visitors to New Zealand. (Information for subsequent years was not available.) As shown in Table 5-20, Cocos Island Resort had a penetration rate of approximately 32 percent. The strong appeal of Cocos Island Resort reflects the "beautiful seas" environment that many Japanese visitors give as an important reason for selecting Guam as a destination.

Penetration rates among the tourist market in the first year of the proposed Guam aquarium are assumed to be only slightly higher than in a stabilized year. This reflects the fact that most tourists are infrequent visitors to Guam.

The above projections reflect a range of "free market" responses. That is how the visitor may be expected to respond to the proposed facility based on the competition from other attractions.

It may be possible to increase attendance projections in several ways:

- Greatly increasing the size and cost of the facility.
- By special promotions.
- By insuring special commitment from the various tour groups to maximize the number of visitors who chose this option.

We do not believe the first way is cost effective. The second may have merit, but the net result should not be large. The last way deserves discussion between GEDA and the hotel and tour groups. Until that happens and definitive results are achieved, we cannot assume effectiveness.

ADMISSION PRICING

Because the Japanese tourist will be able to compare admission prices at the Guam aquarium with aquariums in Japan, it is recommended that the admission price be set not higher than the admission price at Osaka Aquarium, Japan's largest and most prestigious aquarium. The adult admission at the Osaka aquarium is 1,950 yen, equivalent to approximately $16 at current exchange rates. Rates charged the Guam resident market will need to be significantly lower for purposes of affordability.

In discussions with visitor industry representatives, it was generally agreed that a $15 admission price for the aquarium is achievable and that a 1.5 to 2 hour (2 or 3 walks around) length of stay should be programmed. Admission prices for locals, however, should be much less. There was also agreement that complementary recreation and entertainment facilities make sense to extend the

length of stay and market draw. Suggestions included some small rides, particularly for children - again, an appeal to the growing family market. It was expressed that the aquarium be operated as a "commercial" business and not get too serious. Operating hours from 10:00 a.m. to 6:00 p.m. were suggested. Evenings would be available for private groups and functions. It was noted that most Japanese travelers return to hotels by 6:00 p.m. and only go out at night if it is an organized tour.

The visitor industry emphasizes that the aquarium must be professionally managed and have strong entertainment values. They are skeptical about government or university operation being able to meet those criteria. As discussed later, the recommended management structure for the GTA is for private sector contract management with oversight by an independent non-profit foundation.

The overall packaging of the aquarium is an interesting exercise in tour pricing. The operators are looking for a moderate priced (approximately $50) package that gives them broader appeal than Atlantis (at $94). By comparison, Atlantis is a 3 hour tour with about 40 minutes actually in the submarine. There is separate bus access to somewhat mask the difference between the tour prices and the general admission price. This was also suggested as a consideration for the aquarium. The breakdown of pricing for an aquarium tour would be something like:

• Admission	$15
• Round Trip Transfer	10
• Tour Operator Fee	15
• Other Benefit	10
• TOTAL	$50

The "Other Benefit" could be a meal, souvenir brochure, special guide, or other activity at the aquarium site or on route. There is discussion now in Guam about applying a 10% admission tax to optional tours. This was an old law for movie theaters that is now being expanded. Live performances are exempt and the aquarium should fall in that category.

PLANNING PARAMETERS

Table 5-22 provides an estimate of design-day attendance at the proposed Guam Territorial Aquarium, representing a typical day of high attendance. The table also calculates the estimated peak crowd present during the design-day. These parameters provide a minimum for design of the aquarium, since it must have sufficient attraction content to provide a major draw.

TABLE 5-22
PRELIMINARY ESTIMATE OF DESIGN-DAY ATTENDANCE AT THE PROPOSED GUAM TERRITORIAL AQUARIUM, 1996

Range	Total Attendance	Design-Day Factor	Design-Day Attendance	% In-grounds at Peak Hrs	Peak In-grounds Crowd
Low	236000	0.4%	944	50%	472
Mid	377000	0.4%	1,508	50%	754
High	531000	0.4%	2,124	50%	1,062
Use	425000	0.4%	1,700	50%	850

Source: Economics Research Associates

Attraction Capacity Requirements

Capacity requirements for individual facilities within the GTA have been determined based on site constraints, conceptual programming, and the attendance flow model. The attendance flow simulation model provides a depiction of the performance of the provided capacity during the peak days.

The distribution of attendance flow is based on the likely utilization of individual attractions and facilities at any given moment.

Table 5-23 represents the attendance flow simulation for the GTA. Following is a description of the factors used in the model.

The first column, Visitation Probability, represents the probability that guests will visit a given component during his or her stay at the complex.

Each component is assigned an Element Length of Stay (L.O.S.) representing the time (in minutes) required to experience a specific attraction. The Probable Length of Stay is then calculated by multiplying Element L.O.S. by Visitation Probability.

The Instantaneous Probability, based on the probable L.O.S. of each attraction, represents the likelihood at any given time that a guest will be visiting a given attraction. The Instantaneous Probability multiplied by the in-facility attendance gives the necessary Holding Capacity of a given element and, depending on the Element L.O.S., the Hourly Capacity of each attraction.

The Tolerable Density, expressed in terms of square meters per person, represents the acceptable level of crowding within each component. This Tolerable Density multiplied by the required Holding Capacity gives the Attraction Sizing Requirements in terms of square meters for the given attraction component. This sizing requirement represents total required visitor floor area for the attraction or facility.

The total average length of stay for visitors in the program components is indicated by the Total Probable Length of Stay. As shown, this is estimated at 151 minutes (2 hours 30 minutes). This is a reasonably good balance with the length of stay recommended by tour operators, but some elements (e.g. Open Sea and Restless Sea) could be reduced or delayed to save costs.

Phasing

ERA recommends that the GTA open with a Core facility which does not include the Open Sea and Restless Sea exhibits. These exhibits will then be added over the next five or so years to create the Full facility. This phasing and reinvestment strategy reduces initial capital requirements and provides for new future attractions to stimulate market draw after the initial years and encourage repeat visitation. The Core facility still has enough entertainment content to meet visitor needs and attendance projections.

ORGANIZATION & MANAGEMENT

The management and organization of the GTA must be designed to meet a clear set of functional objectives. These objectives are consistent with the goals established in Section 2.

TABLE 5-23
GUAM TERRITORIAL AQUARIUM ATTENDANCE SIMULATION BY PROGRAM ELEMENT

Areas	Visitation Prob.	Element LOS (min.)	Fill/ Spill (min.)	Total LOS (min.)	Prob. LOS (min.)	Instantaneous Probability	Hourly Capacity (pers./hr.)	Holding Capacity (persons)	Tolerable Density (a.f./pers.)	Attraction Visitor Space Size Reqr. Sq. Ft.
Non-Exhibit Public Spaces										
Main Lobby / Circulation	100.0%	10	0	10	10	6.62%	338	56	25	1,408
Restroom (men) 1/	30.0%	3	0	3	1	0.60%	101	5	20	101
Restroom (women) 1/	30.0%	6	0	6	2	1.19%	101	10	25	253
Giftshop	60.0%	10	0	10	6	3.97%	203	34	20	676
Cafeteria	20.0%	30	0	30	6	3.97%	68	34	15	507
Fast Food	25.0%	15	0	15	4	2.48%	84	21	15	317
Subtotal		74	0	74	28	18.85%	865	160		3,262
Public Exhibit Spaces										
Theater / Auditorium	50.5%	25	5	30	15	9.94%	169	84	15	1,267
Floral / Coral Gardens	90.0%	15	0	15	14	8.94%	304	76	20	1,520
Predators of the Pass	90.0%	20	0	20	18	11.92%	304	101	20	2,027
Challenger Deep	100.0%	30	0	30	30	19.87%	338	169	20	3,379
Open Sea	90.0%	10	0	10	9	5.96%	304	51	20	1,014
Restless Sea	90.0%	10	0	10	9	5.96%	304	51	20	1,014
Subtotal		110	5	115	95	62.60%	1,723	532		10,220
TOTAL FACILITY		184	5	189	123	81.45%	2,618	692		13,482
Outdoor Areas										
Pacific Shore	70.0%	10	0	10	7	4.64%	237	39	35	1,380
Mangrove	70.0%	10	0	10	7	4.64%	237	39	35	1,380
Lowland Strand	70.0%	10	0	10	7	4.64%	237	39	35	1,380
Highland Forest	70.0%	10	0	10	7	4.64%	237	39	35	1,380
Subtotal		40	0	40	28	18.55%	946	158		5,518
GRAND TOTAL		224	5	229	151	100.0%	3,564	850		19,000

1/ Assumes attendance mix of 50% male and 50% female at 60% visitation probability respectively.

Source: Economics Research Associates

Objectives of the GTA

Education

- To improve the level of public knowledge and understanding of ocean and water environments.
- To inspire public interest, concern, and involvement in marine and fresh water life.
- To display achievements in marine research, aquaculture, fisheries, and other related marine endeavors to the public.
- To provide a teaching resource for schools.

Research

- To cooperate with research organizations that perform basic research studies in marine biology and other sea-related sciences.
- To cooperate with training programs for colleges and other research centers.

Entertainment

- To provide attractive and entertaining exhibits for the public and thereby stimulate maximum visitation, learning, and economic support.
- To improve the tourism experience on Guam.

International

- To attain international recognition for regional and deep water marine biological research and museum/aquarium design, exhibits, and management.
- To join international organizations and communicate and cooperate with other aquariums.

Local

- To improve the local cultural, educational, and economic environment.
- To achieve a design that harmonizes with the natural surroundings and local culture.

Strategies

Strategies to achieve these objectives include:

Education

- Provide advanced and attractive exhibit design that would give the visitors a sense of involvement and participation in the marine environment.
- Assist the elementary schools and high schools in Guam and the region in developing special programs and facilities for use in their environmental education.
- Provide college students and graduates practical training programs.
- Provide education programs to the public through university extension and Guam government.
- Show the results of research and technological achievements by special exhibits to the public.

Research

- Cooperate in research programs with the University of Guam and other universities, foundations, or government agencies.
- Hold international or regional conferences periodically.

Entertainment

- Integrate exhibitry with natural surroundings.
- Integrate exhibitry with man's relationship to the sea and local culture.
- Provide interesting, regionally-oriented, and technologically advanced exhibits.
- Provide natural habitats to encourage personal identification with nature.
- Provide high-quality bookstore services.
- Offer visitors participatory experiences with high entertainment content.

Internationalization

- Provide an environmentally sensitive plan in this unique site as an example for other aquariums.
- Run the aquarium with a sound business management approach to achieve a respected image.
- Hold international conferences and work with international research and education organizations.

Localization

- Encourage research personnel to participate in local teaching programs.
- Assist Guam government, the Chamorro Heritage Foundation, and others to set up a regional culture activity center and programs.

Philosophy and Purpose of Management

To implement these strategies:

- The GTA shall build up a corporate management system which shall have the following purposes:
  - Maintain the maximum level of operational efficiency and effectiveness with minimal staff.
  - Encourage commercial participation.
  - Obtain capital and operational funding consistent with visitor needs and financial responsibility.
- To these ends, management shall:
  - Determine of the mission of the GTA.
  - Develop a culture at the GTA of beliefs, attitudes, values, and unwritten guidelines.
  - Strategize concepts, ideas, and plans for achieving the mission.
  - Set identifiable objectives or goals for the organization.
  - Develop a management structure which supports the objectives, strategies, and culture.
  - Establish policies for carrying out strategy in accordance with GTA's basic objectives.
  - Establish short-term targets in operational plans for carrying out strategy.
  - Set standards of performance to achieve objectives successfully.
  - Sustain operational excellence through the recruitment, selection, and development of qualified and motivated people.
  - Provide required facilities and equipment for efficient operation.
  - Develop control systems to measure personal and organizational performance against plans and standards.

Organizational Culture

The general tenets underlying organizational culture at GTA are:

Values

- Host/Guest Philosophy
- Quality of Service
- Safety
- Teamwork
- Training
- Orderly, Disciplined, and Supportive Management
- Open and Honest Communication
- Prompt Decision-making
- Regular, Brief, and Informative Meetings

Attitudes

- Cleanliness of Facilities
- Courtesy
- Assistance and Sensitivity
- Attractive Presentation of Employees
- Desire to Educate and Inform Visitors

By individual area, they are:

Research

- The GTA is to prioritize marine preservation, document and understand marine resources, and insure protection of species habitat and the general biodiversity.

Employment and Employees

- The GTA is to provide permanent employment, training, superior working conditions and industry competitive compensation packages for a core staff of persons with the ability to manage the operations of the GTA with minimum staff. The GTA will utilize services from local Guam contractors and private sector operators to the maximum extent possible.

Financial Resources

- The GTA is to establish funding arrangements from both Public and Private sources sufficient to maintain the quality of facilities and meet expectations for the on-going management, operations, and expansion of the GTA in a cost effective and efficient manner.

Patrons and Guests

- The GTA is to ensure patrons receive courteous, efficient service and prompt and effective attention so as to increase their knowledge of the marine world, maximize their enjoyment and satisfaction, enhance the quality of experience gained and promote the desire to revisit the GTA.

Accountability

- The GTA is to manage operations in an efficient and effective manner and to fully account for the actions of management on a regular basis.

Social/Community

- The GTA is to implement processes, procedures, and initiatives which ensure no section of society will be disadvantaged in gaining equal enjoyment from use of the GTA and to play an active role in involving local community leaders and their constituents in the GTA.

Environment

- The GTA is to promote the preservation of the marine ecology of the region utilizing practices which minimize damage to the environment and comply with the best practices for species collection, presentation, and preservation.

ORGANIZATION CONTROL

Economics Research Associates examined a range of alternative organization forms for the GTA. These ranged from totally public sector development and operation through an independent private sector project. Each of these formats was evaluated according to operational criteria, market orientation, the aforementioned goals and objectives, qualitative factors, availability of qualified personnel, financial investment requirements, risk, and probability of successful implementation. The conclusion is to encourage maximum private sector involvement consistent with protecting public sector interests. As will be shown later, the economics of the project are favorable, but the returns are not sufficient to support a completely private project. Rather, we recommend a public-private partnership using both public and private capital sources to build the facility and the private sector to manage it under an operating contract.

Economics Research Associates recommends that the ownership and policy direction of the GTA be vested in an independent entity, the Guam Territorial Aquarium Foundation (GTAF). The GTAF will select a private sector operating contractor whose express purpose is the operation of the aquarium as a successful visitor attraction. Such an arrangement will permit the GTA to:

- Utilize all operating revenues (admission revenues, etc.) to pay for the cost of aquarium operations (as opposed to being applied to other functions of a parent organization).
- Make proper expenditures for marketing.
- Ensure complete control over facility maintenance and a high standard of visitor services.
- Permit staffing practices (including part-time and seasonal staff) and pay scales that are realistic in the marketplace.
- Allow for timely decision-making by the board of trustees and the operating contractor.
- Permit purchasing procedures and accessioning and deaccessioning policies to be tailored to the specific needs of the GTA.

These standards would be more difficult to achieve if the aquarium was operated as a unit of Guam government or as a branch of a parent cultural organization, as opposed to being an independent organization.

Type of Organization

The consultants recommend that the GTAF be structured as a non-profit corporation, specifically one qualifying under Section 501(c)(3) of Internal Revenue Code. This is a type of corporation widely used by museums, aquariums and zoos. For example, both the National Aquarium in

Baltimore and the Baltimore Zoo are owned by the City of Baltimore, but they are operated by separate 501(c)(3) organizations, respectively the National Aquarium in Baltimore, Inc., and the Baltimore Zoological Society, Inc. Advantages of a Section 501(c)(3) corporation include the following:

- Tax exempt status confers several benefits.
  - The GTAF is exempt from federal and state income taxes on any potential operating surplus resulting from admission fees and other income.
  - Donors to the GTAF can receive personal federal income tax deductions for donations made to the 501(c)(3) tax-exempt organization. Also, for persons with large estates, a complete federal estate tax exemptions is available for bequests made to a 501(c)(3) organization.
  - Generally, tax-exempt government foundations (such as the National Endowments for the Arts and the Humanities) as well as private foundations are required by their own operating rules and IRS regulations to donate their funds to 501(c)(3) tax-exempt organizations.
- As a corporation, the GTAF can enter into contracts as a separate entity.
- The formality and structure provided by the articles of incorporation, the bylaws, board resolutions, etc. will furnish structure and procedures for decision-making and dispute resolution.
- Miscellaneous advantages of a 501(c)(3) nonprofit corporation include lower postal rates on bulk mailings and eligibility for public service announcements (PSA's). Nonprofits are the exclusive beneficiaries of free radio and television PSA's provided by local media outlets.

Governing Body

The board of directors of the nonprofit corporation will constitute the GTA's board of trustees. Board of trustee membership can include ex-officio representatives of supporting organizations. However, the board members should also include private citizens since board membership is an important means of recognizing fund-raising and other work on behalf of the GTA as well as taking advantage of the business and scientific expertise of board members. A recommended Board constituency is presented at the end of this Section.

In addition to the board of trustees, the GTA should have an advisory council which provides technical expertise and other support to the GTA. Such an advisory council would be a means of incorporating advice and assistance from the many research, education, visitor industry, cultural and environmental organizations that have a stake in the GTA.

Special Relationships

While the GTA is recommended to be an independent entity, it is appropriate for it to establish special relationships with existing organizations. One of these is the Chamorro Heritage Foundation. Cooperative programs between the Foundation and the aquarium should be developed.

ORGANIZATION STRUCTURE

The line organization for managing the aquarium will be the responsibility of the operating contractor. However, certain organizational objectives should be considered in evaluating the

OC's proposed management plan. These are discussed below:

A functional organizational structure provides each manager or supervisor with clear-cut lines of authority and responsibility, allows for his participation in policy making, provides him with the right to be heard, and gives him the opportunity to develop his individual capabilities.

Division of Work

One of the first steps in organizing the GTA's structure is to group the work into the separate entities on the basis of similarity of functions. The functions to be carried out in fulfilling the objectives of the GTA must be defined so that 1) duties are clearly stated and 2) each person in a managerial or supervisorial position has direct responsibility.

Channels of Contact

The establishment of functional channels of contact is another important organizational objective. The plan of organization should permit and require personnel at all level to exercise common sense and good judgment in determining the best channels of contact to expedite the work. These channels should not be limited to the lines of responsibility and authority of the organization structure as shown on the organization chart (Figure 17).

When contacts are made outside of the lines of authority and responsibility shown on the chart, it should be the duty of each member of the organization to keep his senior informed on:

- Any matters in which his senior may be held accountable by those senior to him.
- Any matters involving disagreement or likely to cause controversy within or between
- Any policy matters requiting advice by the senior or coordination among departments.
- Any matters relating to changes in, or variances from, established policies.

Balance

To accomplish this objective, it is important that no one department or section have a disproportionate amount of authority in the organization. Second, accountability, authority, and responsibility should be centralized in a few key department heads to provide leadership, direction, and control. However, there should also be a decentralization of accountability, authority, and responsibility in those areas where this is practicable. Thus, major policies and decisions should be centralized, but responsibility for carrying out daily operations should be delegated to as many subordinates as is practicable. Along with this responsibility should go the authority to make decisions at variance with basic policies as long as these decisions are not detrimental or injurious.

Control

If the organization is to function in the optimum manner, it is necessary to formulate a system of control at the earliest possible date. In principle, control has five aspects:

- Comparison: standards of performance should be established, and all reports should follow these standards.
- Information: all information used for control should be objective.

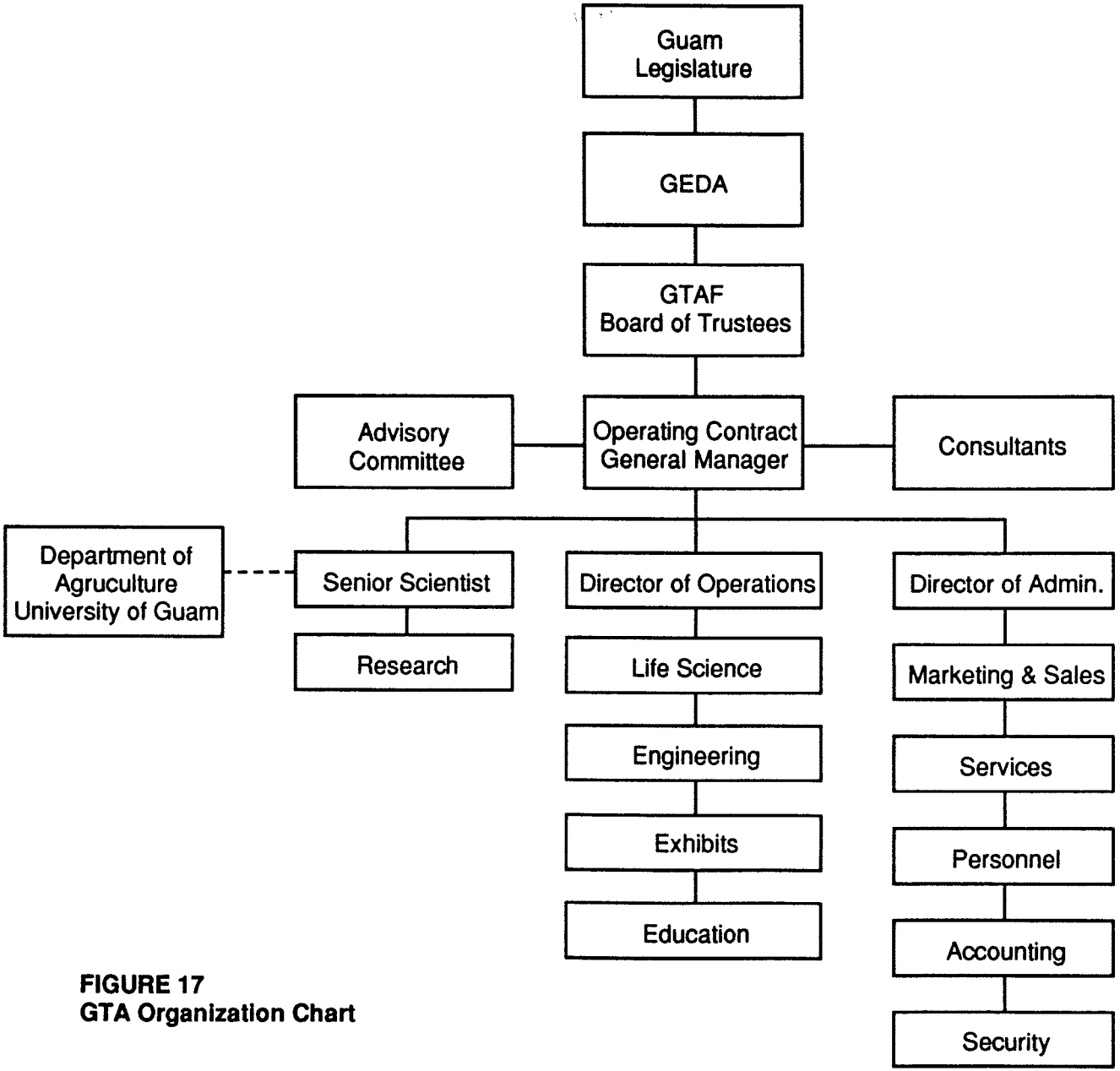


FIGURE 17
GTA Organization Chart

- Uniformity: no individual should be made responsible for actions which are outside his span of control or capability.
- Utility: figures and reports used for control purposes should be designed to assist in making decisions in the present and to avoid waste or errors in the future. Second, they should serve as a historical reference on which to base long-range planning.
- Avoidance of "red tape:" in an effective operation, such conditions as over-regulation, paper-mongering, and bureaucratic formulation cannot be allowed to exist.

Perpetuation

The final objective, though by no means the least important, is perpetuation of qualified personnel to run the GTA. The organizational plan should ensure that a "ladder" of positions is created and that personnel are being trained on a continuing basis to fill each higher position on the "ladder."

RECOMMENDED ORGANIZATION PLAN

Basic Plan of the Organization

The GTA shall operate under the supervision and policies of the Guam Government but day to day management will be contracted to an experienced private sector operator. Policy input from the Guam Government shall be represented through the Chairman of the Guam Economic Development Administration (GEDA), the single highest authority or policy maker actually within the GTA organization. He will Chair the Board of Trustees of the GTAF. Assistance in policy making will come from GEDA staff. These policies are passed on to the GTA General Manager who in turn supervises the managers of the principal Divisions of the GTA. GEDA and the GTAF Board works almost exclusively at the policy level, rarely dealing with day-to-day operational issues. These issues are handled entirely by the General Manager and the managers or curators responsible to him. The General Manager is an employee of operating contractor.

Office of the General Manager

The Office of the General Manager consists of the General Manager, an Advisory Committee, and special Consultants. The General Manager maintains policy-making relationships with the Advisory Committee and Consultants to assist in the formation of policies and creating long-range plans. His liaison to the day-to-day operations of the GTA is through the Deputy Directors, who also assist in policy formation. The General manager proposed by the Operating Contractor will be experienced in managing large scale visitor facilities that have been proven to be successful in meeting visitation, education, research, and financial goals.

Deputy Director and Department Managers

All day-to-day operations of the GTA are performed under the supervision of the Department Managers, who are overseen by the Deputy Directors (or Senior Scientist in the case of the Research Division). The Deputy Directors approve all major operational decisions, guided by policies made in the Office of the Director. The Deputy Directors also coordinate working relationships between departments.

The Departments of the GTA's Administrative Division, each with at least one manager, include:

- Security, which is responsible for the continuous oversight of GTA facilities to protect visitors, employees, and property from crime and physical harm, and is the primary coordinator of

emergency responses.

- Accounting, responsible for maintaining financial records and gathering and appropriating funds.
- Personnel, responsible for hiring and management of human resources.
- General Services, which runs many of the non-technical aspects of GTA operations such as information flow and the library.
- Marketing and Sales, responsible for marketing the GTA to the public and travel industry and interacting with the media.

The Departments of the GTA's Technical Division, again each with at least one manager or curator, include:

- Education, which is responsible for creating and presenting marine education programs to the general public.
- Exhibits, responsible for designing and building the physical exhibits at the Aquarium.
- Engineering, which maintains control of life support and comfort systems for both animals and humans and maintains the overall physical plant.
- Life Science, which is responsible for all animal husbandry for Aquarium animals.

The Research Division, which will run all experiments, laboratories, and publications associated with research projects.

Manpower Estimates

ERA examined the manpower requirements of other leading aquariums, mass attraction facilities, and museums and estimated the manpower requirements for the GTA. The estimates exclude personnel employed in off-site functions, parking, groundskeeping, emergency services, communications, and concessioned operations, the advisory committee, and consultants. ERA's estimates of manpower and payroll are presented in Table 5-24.

The total estimated direct employment at the GTA will be 90 for the full facility with an estimated payroll of about 2.7 million dollars. It is assumed that research staff will be separately funded by specific public or private sector programs. Excluding research, employment is 80 and payroll is $2.35 million for the full facility. Employment will be slightly less for the Core facility.

FINANCIAL PLANNING

Financial planning for the GTA entails estimating the net operating income or shortfall resulting from the revenues and expenses associated with the operation of the GTA. All of the figures expressed in the financial planning analysis reflect constant 1993 values. Revenues include admissions and concessions. Expenses include administrative and operating expenses, but exclude research expenses.

TABLE 5-24
DIVISIONAL BREAKDOWN OF PAYROLL BY POSITION AT GTA
PRELIMINARY ESTIMATES FOR 1997 (in 1993 dollars)

	Employees	Salary	Payroll
OFFICE OF THE GENERAL MANAGER			
Director	1	$75,000	$75,000
Executive Assistant/Secretary	1	25,000	25,000
Director of Administration	1	60,000	60,000
Director of Operations	1	60,000	60,000
TOTAL	4		$220,000
ADMINISTRATIVE DIVISION			
Security			
Manager of Security	1	$40,000	$40,000
Security Patrol Officer	3	18,000	54,000
TOTAL	4		$94,000
Accounting			
Controller	1	$55,000	$55,000
Admissions Officer	1	35,000	35,000
Ticket Vendor/Collector	3	18,000	54,000
Accounting Assistant/Procurement Officer	1	35,000	35,000
Accounting Clerk	2	20,000	40,000
Business Services/Concessions Manager	1	45,000	45,000
Bookstore/Giftshop Manager	1	35,000	35,000
Head Cashier	1	20,000	20,000
Cashier	2	18,000	36,000
Stock Supervisor/Buyer	1	30,000	30,000
Stock Clerk	1	20,000	20,000
TOTAL	15		$405,000
Personnel			
Manager of Personnel	1	$45,000	$45,000
Personnel Assistant	1	25,000	25,000
TOTAL	2		$70,000
Marketing and Sales			
Manager of Marketing	1	$45,000	$45,000
Membership Officer	1	35,000	35,000
Corporate Liaison	1	35,000	35,000
Director of Group Sales	1	35,000	35,000
Marketing Coordinator	2	35,000	70,000
TOTAL	6		$220,000
General Services			
Manager of General Services	1	$45,000	$45,000
Librarian	1	25,000	25,000
Computer Systems Operator	1	40,000	40,000
Receptionist/Tel Operator/Word Processor	3	15,000	45,000
TOTAL	6		$155,000
TECHNICAL DIVISION			
Life Sciences			
Curator of Fishes	1	$50,000	$50,000
Aquarist/Diver-Fishes	5	30,000	150,000

TABLE 5-24 (continued)

	Employees	Salary	Payroll
Life Sciences (continued)			
Bio-Tech-Fishes	2	20,000	40,000
Curator of Birds and Marine Mammals	1	50,000	50,000
Biologist/Vet - Birds and Marine Mammals	1	35,000	35,000
Animal Specialist-Birds and Marine Mammals	1	30,000	30,000
TOTAL	11		$355,000
Exhibits			
Curator of Exhibits	1	$50,000	$50,000
Exhibit Designer	1	30,000	30,000
Programmer-Analy/Audio-Visual Technician	2	25,000	50,000
Electrical Technician	2	20,000	40,000
Exhibit Preparer	1	20,000	20,000
Graphic Artist	1	20,000	20,000
TOTAL	8		$210,000
Education			
Curator of Education	1	$50,000	$50,000
Secretary	1	20,000	20,000
School Services Coordinator	1	35,000	35,000
Assistant School Programming Coordinator	1	25,000	25,000
Instructor	2	25,000	50,000
Volunteer Services Coordinator	1	25,000	25,000
Visitor Services manager	1	30,000	30,000
TOTAL	8		$235,000
Engineering			
Manager of Facilities and Engineering	1	$55,000	$55,000
Maintenance Crew Chief	1	25,000	25,000
Maintenance Laborer	2	18,000	36,000
Custodian/Matron	3	18,000	54,000
Groundskeepers	3	18,000	54,000
Carpenter/Painter	1	20,000	20,000
Plumber	1	20,000	20,000
Head Engineer	1	50,000	50,000
Engineering Assistant	3	25,000	75,000
TOTAL	16		$389,000
SUBTOTAL	80		$2,353,000
RESEARCH DIVISION (Separately Funded)			
Senior Scientist	1	$55,000	$55,000
Scientist	1	50,000	50,000
Associate Scientist	2	40,000	80,000
Bio-Tech	2	20,000	40,000
Laboratory Manager	1	40,000	40,000
Laboratory Technician	1	20,000	20,000
Science Editor	1	40,000	40,000
Production Assistant	1	15,000	15,000
TOTAL	10		$340,000
GTA TOTAL	90		$2,693,000

Excludes: parking, concessioned operations (restaurant), first aid and emergency services, communications, off-site housing, advisory committee, and consultants. Source: Economics Research Associates