

The 1986 Galveston Comprehensive Plan is a guide for future development and redevelopment in the City of Galveston. Comprehensive planning is a dynamic process which is influenced by many different factors that shape forces of change in the community. Although a Comprehensive Plan provides guidelines for long-range decision making, the plan must be flexible enough to reflect changes in City policies due to unforeseen events and trends. Comprehensive planning for Galveston is initiated with the 1965 City of Galveston Comprehensive Plan Report. This plan was updated in 1973. The 1986 Comprehensive Plan has been prepared to continue the community planning initiated in the 1973 Plan and to provide guidelines for current and future community growth.. The major emphasis in this Comprehensive Plan is on West Island since the 1973 Plan did not address this area.

This document is composed of six major sections: Section 1, History and Regional Setting; Section 2, Geographic Features and Definitions; Section 3, Social and Economic Characteristics; Section 4, Physical Features Influencing Development; Section 5, Holding Capacity Analysis; Section 6, Goals/Issues/Objectives/Policies; and Section 7, Implementation Process.

Section 1: History and Regional Setting

Section 1 describes the City's and Island's history as a major port on the Gulf Coast, and the major events that have shaped Galveston. The role that the Island's location and the Gulf Coast climate have played in the development of the City are also described.

This section is divided into the following subsections:

- History
- Location
- Climate

Section 2: Geographic Features and Definitions

This section identifies the major geographic features on Galveston Island, both natural and man-made and discusses the impact these features have had, and will have, on the City of Galveston. This section helps provide an understanding of the unique character of a barrier island, which is important in understanding the implications for future growth and planning. Section 2 includes definitions and descriptions of terms used in this document. Section 2 is broken down into the following subsections:

- Barrier Island Characteristics
- West Island Features
- East Island Features
- Definitions

Section 3: Social and Economic Characteristics

Section 3 is an analysis of the social and economic characteristics which influence development on Galveston Island. This section includes existing and historic population and land use patterns, economic characteristics and anticipated social and economic trends. This section is broken down into the following subsections:

- Population Characteristics and Trends
 - National Population Trends
 - Population History
 - Local Population Trends
 - Population Projections
- Land Use
 - Land Use Characteristics
 - Land Use Related to Population
 - Existing Land Use Patterns
 - Neighborhoods
 - Urban Trends (Indicates the general location of three major trends in the community; stable areas, rehabilitation/redevelopment areas, transitional/developing areas)
- Economy
 - Economic History
 - Economic Future (Galveston's economic future is dependent upon three major elements: people, other resources and philosophies; a unified force of all three elements will ensure a bright economic future for the city)

Section 4: Physical Features Influencing Development

This section is an analysis of the urban and natural features of Galveston which direct and influence development. The urban features include city services and community facilities. The description of natural features includes environmentally sensitive areas and potential hazardous areas of the island. This section is broken down into the following subsections:

- Urban Features
 - Thoroughfares and Highway Access (Summarizes the 1985 Galveston County Regional Mobility Plan with regards to roadway capacity and deficiencies and recommended roadway improvements)
 - Sanitary Sewer Service and Treatment (Summarizes sanitary services, treatment plant size, problems and future plans; recommends City prepare a master plan for West Island sanitary sewer service)
 - Water Distribution (Summarizes existing facilities, planned improvements for West Island)
 - Parks and Recreation (Summarizes existing facilities and park needs for West Island)

- Public Schools
- Fire Fighting Facilities (Summarizes existing facilities and problems; documents needed for new station on West Island near Sea Isle)
- Natural Features (Focuses on natural features of West Island; describes the character and unique aspects of the natural features)
 - Water Quality
 - Fish and Wildlife
 - Beaches
 - Erosion Rates and Control (Recommends continued use of the Beach and Dune Management Plan and its incorporation into the Subdivision Regulations)
 - Dunes
 - Washover Areas (Explains washover areas and hazards; identifies problems in mapping because of lack of substantive data to map specific areas and justify special development standards)
 - Wetlands (Explains importance of wetlands, both tidal and fresh water; map known wetlands areas)

Section 5: Holding Capacity Analysis

The future population and land use of the City of Galveston is dependent upon the capacity of each of the systems and facilities describe in Sections 3 and 4. This section summarizes the data presented in the two previous sections and analyzes the potential population and development which the urban and natural features of the City can support. The holding capacity analysis can cover a wide range of variables and can develop detailed development standards to regulate growth; or it can be a general examination of growth issues facing an area to determine land development policies which help shape the location and form of growth. Whether a holding capacity is general or specific in nature, there are four basic assumptions which underline this planning concept:

1. There are limits to the amount of growth and development a man-made environment can absorb without threatening public health, welfare and safety.
2. Critical population thresholds can be identified beyond which continuation of growth or development at greater densities will trigger the deterioration of natural resources and City infrastructure.
3. The natural capacity of a resource to absorb growth is not fixed, but can be altered by human intervention.
4. The determination of the limit of capacity of a given system is, finally, a judgmental act.

This section is broken down into the following subsections:

- West Island Holding Capacity Analysis
The objective of this analysis is to give an overview of existing and potential future conditions of the following: traffic, water distribution, sanitary sewer service, natural features, storm hazards. The analysis consists of two study areas: Study Area 1, which is

bounded by the proposed Sunbird Development to the west, West Bay to the north, the Village of Jamaica Beach to the east, and the Gulf of Mexico to the south; Study Area 2, which is bounded by the Pirates Cove Municipal Utility District to the west, West Bay to the north, the Galveston Airport to the east, and the Gulf of Mexico to the south.

Study Area 1 – Existing development in Study Area 1 is primarily composed of recreational vehicle parks, beach front homes and the Indian Beach Subdivision. Based on census data, approximately 15% of the units are occupied on a permanent basis, and it is assumed that the remaining units are second homes or vacant, unsold units. Since 1980, the City has granted development rights in Study Area 1 for construction of 2,707 single family (detached and attached), 3,745 condominiums and 100 multifamily dwellings. In Study Area 1, there are two vacant sub-areas that have not been included in planned development projects and are located outside the environmental sensitive wetlands and beach area along the Bay and Gulf Coast. The sub-areas are located west of Jamaica Beach and east of Sea Isle. An additional vacant sub-area west of the study area is located between Bay Harbor and White Sands developments. The two sub-areas in Study Area 1 contain approximately 1250-1350 developable acres.

1. Traffic – Termini Road is the only roadway connection linking Study Area 1 to the remainder of the City. A critical segment in the transportation network and Study Area 1 is the eastern most segment of Termini Road, where all of the traffic entering and leaving the study area from the remainder of the City passes. This section discusses the existing traffic counts and level of service on Termini Road, as well as providing estimated traffic generation in Study Area 1. These figures are based upon analysis of developments approved since 1980, and analysis of proposed roadway improvements as outline in the 1985 Regional Mobility Plan. This section also raises the key issue of how much additional development and resulting traffic can Termini Road handle. The study states that based on the analysis, an additional 700 single family or 1,200 multifamily dwelling units can be constructed, and that no additional residential development beyond these units should occur, unless additional traffic carrying capacity is provided to tie the study area to the City or the Mainland, or the actual traffic volume does not reach projected levels.
2. Water Distribution – Future water distribution to the far west end of the island will be dependent upon the planned installation of an additional transmission line sized to serve the proposed development. If planned improvements are installed in a timely manner, the supply and distribution of public water should not limit development.
3. Sanitary Sewer Service – Sanitary Sewer service in Study Area 1 is provided by the Terramar/Isla Del Sol and White Sands treatment plants. Only 470 acres of undeveloped and uncommitted land west of Indian Beach may be within the Terramar/Isla Del Sol plant service area. The study points out that the 570 acres of land between Indian Beach and Jamaica Beach cannot be economically served by the Terramar/Isla Del Sol plant and development of this area should not occur until a feasible sewer service plant is devised. The White Sands Treatment Plant has approximately 270 acres of undeveloped and uncommitted land in its service area.
4. Natural Features – The study points out that the environmental policies, as outlined in Section 6 of the document, influence a large portion of Study Area 1. Both tidal and

non-tidal marshes are addressed. The wetlands are located adjacent to the Bay and do not have a great potential for development. Although small portions may be utilized for Bay access, major development is not expected and is not calculated in the land area assumed to be available for development.

5. Storm Hazard – The report states that the storm hazard development factor cannot be calculated specifically into a formula or reduced to numbers for Study Area 1. The Regional Mobility Plan, however, has determined that construction of a new Bay crossing and improvements to 8 Mile Road, Stewart Road and Termini Road are necessary to provide improved evacuation opportunities for West Island residents.

Study Area 2 – There are two commercial sites located in this study area as designated by the West Island Commercial Land Use Policy. One is an approved plan development for 410 units directly east of Bermuda Beach on Termini Road known as Island Princess. The second one is located between 7 and 8 Mile Roads on Termini Road. The ability of the West Island roadways to serve Study Area 2 is of particular significance to future development in this area. The majority of the traffic will travel on Termini Road or Stewart Road to reach the Mainland and Galveston's urban center. Since 1980, the City has granted approval to construct 340 single family dwellings, 475 multifamily and 185 condominium units in Study Area 2. There are approximately 3600-3800 acres of vacant land suitable for development in Study Area 2. The areas generally fall into two east-west corridors. The first is parallel and adjacent to Termini Road and Stewart Road, and the second is located to the north and separated from Stewart Road by fresh water wetlands.

1. Traffic – Area 2 is connected to the urban area of Galveston by two roadways, Termini Road, a four lane divided highway, and Stewart Road, a two lane road. This section of the report analyzes the existing traffic generated on the road and the traffic proposed to be generated by additional development. The report points out that to achieve the traffic capacity on both Termini and Stewart Roads that has been reflected in the analysis, they must be operated and designed as efficient facilities with a minimum number of intersections. Since much of the traffic generated in Study Area 1 will pass through Study Area 2, any excess capacity in Area 2 that would be developed must be reduced by the additional trips that were assigned to Area 1. Therefore, the consultant states that the 700 single family, or 1,200 multifamily units noted in the discussion of study Area 1, should be considered as the limit for new development for all of the area west of 7 Mile Road, including both Study Area 1 and Study Area 2 until additional traffic capacity is added to the area roads, new access points to the Mainland are constructed that permit a redistribution of traffic, or the actual measured traffic volume does not reach the levels anticipated herein. The report goes on to state that the plan's new crossing of West Bay at 8 Mile Road could result in the reassignment of traffic on weekends that would substantially increase development ceilings in Study Area 2. Also, the widening of Termini Road from 4-to 6-lanes in Area 2 into the urban core of the City, may open development options in Area 2, if the new Bay crossing is not constructed.
2. Water Distribution – There are not any major problems anticipated in providing adequate water service to the area, provided timely improvements are made to the system.
3. Sanitary Sewer Service – The report indicates that it is unlikely that Study Area 2 will be completely developed for many years to come therefore, the sewage flow capacity built

into the proposed interceptor system should accommodate the needs of the area well into the 21st Century. The report states that as development occurs in Study Area 2, the Airport Treatment Plant's capacity must eventually be increased.

4. Natural Features – The environment policies outlined in Section 6 of the document will influence a large portion of the area between Pirates Cove and 7 Mile Road. Both tidal and non-tidal marshes are located here. The wetlands, which are located adjacent to the Bay, do not have a great potential for development. Although small portions of the wetlands may be utilized for Bay access, major development is not predicted and is not calculated to include the coastal wetlands. The wetlands located on the interior of the island are scattered throughout the center part of Study Area 2. It is possible that future development may utilize mitigation practices to displace some of these wetland areas.
5. Storm Hazards – The storm hazard development factor cannot be calculated specifically into a formula or reduced in numbers for Study Area 2. The Regional Mobility Plan, however, has determined that construction of a new Bay crossing at 8 Mile Road, and improvements to 8 Mile Road, Stewart Road and Termini Road, are necessary to provide improved evacuation opportunities for West Island residents.

Section 6: Goals/Issues/Objectives/Policies

The goals, objectives and policies for future development and redevelopment in the City of Galveston accompany the Land Use Policy and Thoroughfare Plan. Combined with the graphic plan, this section is a guide for residents, the City Council, the Planning Commission, and the City Staff of Galveston for future land use decisions on the Island. A description of how to use the goals, objectives and policies is included within this section.

The seven goals for future development of Galveston Island are identified as follows:

1. Economic Development

Goal: To direct the growth of the City toward a sound and diversified economic base.

Objectives:

1. Protect and enhance the operation of the four major contributors to the Island's economic well being. (The Port of Galveston, the University of Texas Medical Branch, financial services and tourism).
2. Make the most appropriate and productive long range use of limited land.
3. When appropriate, facilitate development of vacant land and revitalization of substandard structures through economic incentives.
4. Provide the opportunity for residents and visitors to enjoy a unique way of life, including the variety and quality of facilities, community and public services and the natural environment.
5. Fully evaluate the public cost and benefits of future development to ensure that the City of Galveston and its residents receive the maximum benefits and to ensure that the City is able to meet its obligation to new development.

2. Land Use

Goal: To direct the arrangement of land uses in an efficient and harmonious pattern to protect property values and prevent an uneconomic sprawl of development beyond the capabilities of the City of provide adequate services.

Objectives:

1. **Stable residential areas:** Continue to protect and preserve the existing stable residential areas of the City by utilizing existing planning policies and programs and applying policies as outlined in the section. Stable residential areas are located in the built-up part of the City, as well as in clusters scattered along West Island.
2. **Declining residential areas:** Strive to upgrade the tradition of those residential areas which are in disrepair through public and private efforts. Target those areas which are without specific planning policies and programs as priority neighborhood planning projects to be addressed by the residents and City Planning Staff. Declining residential areas are located in the built-up part of the City, as well as in clusters scattered along West Island.
3. **Developing residential areas:** Encourage development of a wide variety of residential dwelling types in undeveloped areas to meet the diverse needs of the current and future population of the City. Developing residential areas are located on West Island, west of the airport, on the San Jacinto disposal area and East End flats, east of Second Street. Developing residential areas do not include wetlands, beaches and dunes protected under this plan.
4. **Commercial areas:** Encourage commercial development which is property located in relation to major thoroughfares and serves the broad range needs of residents and visitors to the Island.
5. **Industrial areas:** Maintain the existing quality of industrial development on the Island, which encouraging the development of vacant land and the reuse of deteriorating property within the industrial land use area.
6. **Special districts:** Continue the various planning programs already in place for special districts in the City and encourage integration with future planning.
7. **Central Business District:** Continue support of the redevelopment efforts of the Downtown Revitalization Committee and planning for Tax Reinvestment Zone No. 10.

3. Special Districts, Projects and Planning Programs

Goals: To continue planning which addresses the detailed issues of unique aspects of the community, preserves the best of the City's past and strives to improve its future.

Objectives:

1. **Special Districts:** Continue the many planning programs already in place for special districts in the City and encourage integration of future planning.

2. Neighborhood Plan: Strive to enhance the quality of life and residential character of individual neighborhoods.
3. Historic Preservation: Continue to promote the preservation of Galveston's unique historical structures and districts, both residential and non-residential.

4. Natural Environment

Goals: To recognize the contribution of the natural environment to the health, safety and economic well being of Island residents and to strive to maintain the integrity of the Island's wetlands, dunes and water quality.

Objectives:

1. Wetlands: Protect the integrity of the Island's estuarine and freshwater wetland resources.
2. Beaches and Dunes: Protect the integrity of the Island's beaches and dunes and aggressively implement the adopted Beach and Dune Management Program.
3. Water Quality: Design future development activities on West Island to protect the water quality of West Bay.
4. Canal Development: Recognize the need to control the future design of canal developments to ensure protection of the Island's natural resources.
5. Preservation and Replanting of Vegetation: Use land in a manner that protects existing vegetation and replants natural areas.

5. Storm Hazard Protection

Goal: To inform citizens of the need to protect future development from potentially hazardous erosion destruction and poor evacuation conditions.

Objectives:

1. Flood Plain: Protect future development and uses in the 100-year flood plain from potentially hazardous erosion or excessive destruction of private and public property.
2. Evacuation: Inform citizens of hazardous conditions and take measures to provide the opportunity for evacuation in the event of a hurricane or a severe coastal storm.

6. Traffic

Goal: To develop a thoroughfare system which provides for the safe and efficient movement of goods and people.

Objectives:

1. Protect and improve the traffic handling capacity of the City's major and minor arterials.
2. Provide for the improvement and replacement of Termini Road.

3. Continue to plan for the provision of additional accesses to the Mainland, between 8 Mile Road and Virginia Point.

7. City Services and Community Facilities

Goals: To develop the wide range of City services and community facilities essential to the City and to locate these in a manner allowing efficient operations.

Objectives:

1. Sanitary Sewer Service Treatment: Plan for the provision of future city-wide sanitary sewer service and wastewater treatment facilities and the repair and maintenance of existing systems.
2. Water Supply and Distribution: Plan for the future supply and distribution of water essential to domestic consumption, fire protection, sanitation and industrial processing.
3. Parks and Recreation: Provide adequate parks and recreation facilities for the entire City.
4. Education Facilities: Ensure adequate education opportunities for all citizens.
5. Public Safety: Provide maximum public safety throughout the City.

Section 7: Implementation Processes

In accomplishing its' purpose, the plan will act as a framework to structure activities under three broad categories:

1. The adoption and administration of land use law;
2. Cooperation among public and quasi-public agencies in the private sector in improving the community;
3. Determination of the best course for local government to follow in assisting and stimulating growth in the community's private sector through application of selected redevelopment and incentive programs.

More specifically, the plan contains recommendations that will guide activities related to land use, transportation and community facilities. This final section on Implementation describes various implementation processes which will be one of the more important sections of the plan for the Staff, as well as Planning Commission and City Council. Some of the implementing tools described herein have been enacted and are the basis of much of the regular subdivision platting and zoning review and approval process. Other recommendations may not be a part of the regulative process but are implementation methodologies that can be adopted as urban planning policies that can be pursued in the City of Galveston's drive towards achieving a desirable balance of continual urbanization, protection of a unique environment and quality of life for its citizens.

I. HISTORY AND REGIONAL SETTING

INTRODUCTION

The city of Galveston, located on Pelican and Galveston Islands, is approximately 29 miles long and varies from one to three miles wide. Bounded on the south by the Gulf of Mexico and the north by the Intracoastal Waterway, Galveston lies approximately three miles of the Texas coast.

HISTORY

Galveston Island and the city of Galveston have rich and interesting history. The island's location on the Gulf Coast and its natural characteristics have presented unique opportunities for commerce and recreation. People have been drawn to the island by these opportunities for centuries.

There is evidence that prehistoric Indians inhabited the island during the winter season. The nomadic Karankawa Indians are also known to have hunted and fished on the island while on the mainland. The first people of European origin to visit the island were the Spanish. Originally explored by Cabeza de Vaca in the early 1500's, the island was named in 1782 for count Bernardo de Galvez. Jean Laffitte held the island as the base for smuggling and privateering operations from 1817 to 1820.

Galveston has long been a prime location on the Gulf of Mexico. Following the establishment of the Republic OF Texas, the city of Galveston was established in 1842. The community became the largest and most important cities in the Republic of Texas. By the turn of the 20th century, Galveston was known as "The Queen City Of the Gulf" and "The Wallstreet of the Southwest". It was the second richest city in the U.S., based on per capita income. The strategic location of the island also led to a long history of military significance from the Civil War to World War II.

The city lost its status as a financial center following the Galveston Storm of 1900. The storm physically and economically devastated the city and left 6,000 dead. In the ten years following the storm, a 17' high seawall was constructed, the city's elevation raised 10' and a permanent causeway built linking the island to mainland. Although the Wharves regained their significance as a major port, the opening of the Houston ship

channel in 1914 signaled the decline of Galveston domination of commercial port activities in Texas.

Two other storms have prompted major rebuilding on the island. Following Hurricane Carla in 1961, medical facilities at the University of Texas Medical Branch were expanded, development of Pelican Island was initiated, the Wharves facilities were expanded and a major historical renovation and revitalization effort began. Currently, in the aftermath of Hurricane Alicia in 1983, major development has dominated the city's construction activity since Hurricane Alicia.

It has only been in the past decade that most of the island has been incorporated into the City of Galveston. The original city of Galveston was established on the East End of the island in 1842. It was not until the annexation of the west end of the island in 1975 that all but approximately 800 acres of the island has been incorporated into city limits. Figure 1 illustrates the growth of the city from 1838 to 1985. All of Galveston and Pelican Island are now within the city limits except the Village of Jamaica Beach and the Pirates Cove Municipal Utility District.

LOCATION

Galveston is centrally located on the section of the Gulf Coastal Seaboard extending from the Rio Grande River at Brownsville, Texas, to the mouth of the Mississippi at New Orleans. Figure 2 illustrates the island's location on the Gulf for port related activities. The city is connected to the mainland by rail and highway transportation.

Galveston is connected to the mainland by two bridge connections. Interstate Highway 45 is the most important connection, providing access to Houston and areas to the north. From Houston, a series of major highways radiate to the west, north and east. Interstate Highway 10, a major east-west highway of national importance, runs through Houston. The Houston-Galveston area is illustrated in figure 3. The second bridge connection is across San Luis Pass on the West End of the island. This bridge provides access to Freeport and the industrial and manufacturing areas to the west. Access to the Bolivar Peninsula to the east is provided by a free ferry service.

CLIMATE

Galveston's climate is generally mild and semitropical. The island's location on the Gulf provides a moderate marine climate which contributes to its attraction as a major recreation and resort location. The average temperature fluctuates between a winter low of 43 degrees and a summer high temperatures in the summer and the cold air masses which normally move southeast across central and eastern Texas during the winter generally moderate before reaching Galveston. Snow, Sleet and temperatures below freezing are rare. The dominant winds in the area are from the southeast and are usually of moderate velocity.

The island receives between 40 and 50 inches of rainfall per year. Tropical storms and hurricanes usually strike the coast from the southeast and are usually accompanied by heavy rainfall and high tides. Hurricanes typically occur during August and September. At least 85 storms have affected the Texas coast since 1880. Of these, 16 storms of hurricane strength have struck Galveston County between 1920 and 1941 while the county was struck six hurricanes during the decade the 1940's. Since 1950, hurricanes have struck Galveston in varying degrees of force: 1959 (Debra) , 1961 (Carla), 1963 (Cindy), 1971 (Fern), 1980 (Allen), and 1983 (Alicia). At least five times in the last century as many as three storms have struck the Texas coast within a two-month span. At a minimum, tornadoes and flooding. At worst, hurricanes endanger the lives of thousands of people.

II. GEOGRAPHICAL FEATURES AND DEFINITIONS

INTRODUCTION

Section II identifies the major geographical features on Galveston Island. These features are natural and man-made and illustrate the influence that typical barrier island characteristics have on urban development. The definitions and illustrations included in this section are referred to throughout this document. An understanding of the dynamics of barrier island is important to the analysis and policies include in this comprehensive plan.

BARRIER ISLAND CHARACTERISTICS

Galveston Bay was formed when the Trinity and San Jacinto River Valleys were flooded by the rising sea level, 5,000 to 13,000 years ago. Galveston Island began as a small sand bar at the southwestern side of the entrance to Galveston Bay, about 4 miles offshore in the Gulf of Mexico in 5 to 8 feet of the water. This sand bar developed into an island and grew seaward, to the southwest, by beach and spit accretion. Bayward growth by tidal marsh accretion, eolian (wind blown) accretion, and hurricane washover also occurred.

The seaward accretion began to slow approximately 1,600 years ago, and for the past 600 years erosion has been the prevalent trend. Erosion has been experienced all along the Texas Coast, and is the result of a decrease in the sediment load of the littoral currents. This loss of sediment has been due primarily to natural processes and in part to recent mainland related activities such as flood controls and shoreline modifications.

The island is one of 295 barrier islands which line the U.S. coastlines of the Atlantic and Pacific Oceans and the Gulf of Mexico. The islands have ecological significance for the ecosystem found on the islands and for the protection they provide for adjacent lagoons and bays. In addition, barrier islands protect coastal and inland areas from the full force of coastal storms by acting as a barrier to ocean waves and winds – hence the name “barrier Island”.

The geographical features of the island’s east and West End areas vary. The West End of the island, commonly referred to as west island, down-the-island, or the West End, is composed of natural geographic features typical to barrier islands. The East End of the island was modified significantly from its original form by the construction of the Seawall. Figure 4 illustrates the boundaries of West Island and the East End.

WEST ISLAND FEATURES

The processes which led to the development and evolution of Galveston Island have created a typical barrier island profile on West Island, illustrates in figure 5. This profile consists of a fore beach which is the area of normal wave attack, and a back beach which is exposed to wave action during moderate to extreme storms. The dunes first began as a group of coppice mounds, which are dunes in the initial stages of formation and support either very little or no vegetation. Behind these mounds are the foredunes which support extensive to sparse vegetation. Foredunes can range in height from 2 to 12 feet. Further information on the dune system on the island can be found in Galveston Beach and Dune Management’s Plan adopted by the city of Galveston.

Galveston Island has a very poorly organized dune system. Most dunes on the island vary in height from 2 to 6 feet, with a few being as high as 12 feet.

The density of vegetation and diversity of species for many West Island foredunes are very low. Many of these dunes are sparsely vegetated with large bare areas and small breaches or washover located between dunes.

Behind the dune area lies the barrier flats. The majority of the barrier flat areas are low mounded grasslands. Beyond the barrier flats lie the wetland areas. The types of marshes which are found in these wetland areas varies with salinity of the water which inundates them, and range from freshwater and brackish marshes (non-tidal) to salt water (tidal) marshes. Tidal marshes are areas which are inundated by tides, and are the most productive type of wetland area. Tidal marsh areas are the major food source for the marine life of the Bay and Gulf.

EAST ISLAND FEATURES

Until 1902 the East End had many of the same natural geographic features as West island. Although the area had been urbanized, there was a long continuous stretch of beach and some wetland areas. Following the Storm of 1900, the seawall was constructed and the city's elevation was raised 10'. The 17 - foot - high seawall is probably one of the best built seawalls on any barrier island in the United States. The primary source of fill material for raising the city's elevation came from off-shore areas and Offal and English bayous.

At the time of the seawall's construction and until the 1960's there was a wide beach in front of the seawall for most of its length. However, this area has since eroded and the beach has largely disappeared. The Corps of Engineers indicates that the offshore sediment is largely mud and offers very little sand for beach replenishment.

There is a large beach on the very eastern tip of the island. This area has benefited from accretion and the jetty constructed to improve the harbor entrance. East Beach has grown from 200 to 7,000 feet in slightly less than 100 years.

DEFINITIONS

The following terms and definitions refer to geographic features located in the city of Galveston which may influence future development. Many of the features are illustrated

in Figure 5. Further discussion and analysis of specific natural features is included in section IV.

Accretion The increase of land area (widening of the island) by the action of natural forces. Also, accretion is the opposite of erosion, the seaward movement of the shoreline.

Backdune The dunes located landward of the foredunes, and (typically) extensive vegetated. See figure 5.

Barrier Island an elongated, narrow land form separated from the mainland by open water and/or wetlands. It is characterized by a dynamic system of offshore bars, a sandy beach, dune ridges, and wetlands.

Coppice mounds An emerging dune just beginning to rise above the beach, usually vegetated or sparsely vegetated, located immediately in front of foredunes. See figure 5.

Dune an emergent mound, hill, or ridge of sand, either bare or vegetated, which rises to summit, and of which one or more of the sides of the summit has an average slope greater than the slope of the shoreface of the beach between the summit of the dune and the Gulf of Mexico. See figure 5.

Dune Area Those areas which currently support dunes or emerging dunes and all of the areas in between.

Dune Management Area This is the same as the State's Dune Protection line (sec. 63.012), which is located within a line drawn parallel to and 1,000 feet landward of the line of mean high tide of the Gulf of Mexico.

Erosion The diminishing or deterioration of land area by the action of natural or man-made forces.

Foredune The first major row of dunes facing the beach, usually sparsely to extensive vegetated. See figure 5.

Groin Short walls built perpendicular to straight stretches of beach and designed to trap sand flowing in the longshore current. The groins along the Galveston seawall protect the toe of the seawall from erosion.

Hurricane Washover An area where sand from the dunes and/or interior uplands was washed either bayward or seaward leaving a very low cut across the island.

Jetty Long walls built perpendicular or nearly perpendicular to the shoreline to keep sand from flowing into a pass or ship channel.

Line of Vegetation The line that marks the extreme seaward boundary of natural vegetation which spreads continuously inland. (State Statute Sec. 61.001(2)). See figure 5.

Public Beach Any beach area, whether publicly or privately owned, extending inland from the line of mean low tide to the line of vegetation which the public has acquired the right of use or easement to or over the area by prescription, dedication, presumption, or has retained a right by virtue of continuous right in the public since time immemorial, as recognized in law and custom. (Section 61.001.(5)).

Replenishment Beach The process of replacing sand lost from a beach, the widening of beach. Replenishment and nourishment have the same meaning in the plan.

Seawall The Galveston seawall is a man-made barrier which extends from the east tip of the island to a point near 107th street. It protects the city from overwash damage and shoreline erosion. See figure 5.

Swale The depression between two dunes or two remnants of old backdune.

Wetlands Areas that support plant species that tolerate wet or saturated soils, and, therefore, fall within the regulatory jurisdiction of the Corps of Engineers Section 404 Permit program.

Wetlands, Estuarine The estuarine wetlands are defined as all wetlands that are subject to daily tidal action, or are located in the marine waters.

These wetlands are located throughout the north side of the island, from the airport on the east to San Luis Pass on the West. The U.S. Fish and Wildlife estimate for acreage 5,218. The estimate for 1956 was 8,306 acres.

Wetlands, Freshwater Non-tidal wetlands found on Galveston Island. These wetland are not subject to tidal influence though they may be flooded by storm-driven marine waters or develop saline characteristics because of evaporation or wind-blown salts.

The majority of these wetlands are located between sweetwater lake on the east and Jamaica Beach on the west. The U.S. Fish and Wildlife service estimate for freshwater wetlands was 1,088 acres in 1979. The estimate for acreage in 1956 was 1,359.

III. SOCIAL AND ECONOMIC CHARACTERISTICS AND TRENDS

INTRODUCTION

This section includes a discussion and analysis of the social and economic characteristics and trends in the in the City of Galveston. The population composition, the land use patterns and the economic strenght and weakness of the island all play an important role in the city's future. Existing and historical data are presented for each of these factors and potential future trends are identified in this section.

It is important, as with all portions of this document, that the social and economic factors influencing Galveston are viewed comprehensively. Each factor influences the others to play a role in the social and economic development of the island. Individually, each factor is important but does not give a complete picture of the island and its residents.

POPULATION CHARACTERISTICS AND TRENDS

National population trends

The United States has experienced three major population trends in the last thirty years which have had and will continue to have major implications on community development; the "baby boom", the "baby bust" and the growth of the elderly population. The number of annual births steadily increased until 1957. About 47 million children were born in a 12-year span, accounting for about 21 percent of the population in 1980. The baby boom's influence on communities can be traced through the flooding of the lower school systems in the 1950's and 1960's, of higher education institutions in the 1960's and 1970's and of job and housing markets in the 1970's and 1980's. The baby boom generation now in their child-bearing years and are exerting pressure on the job market and the housing industry to produce employment and housing opportunities.

Despite the declining average number of births per 1,000 women (birth rate) since 1960, the large number of females from the baby boom generation that are in their child-bearing years will cause an increase in the actual number of children during the 1980's.

The increase births will result in a second wave of children, but more moderate in rate of increase when compared to their parents in the baby boom generation. The second wave of children known as the “echo of the baby boom” may require a renewed inventory of facilities, such as schools during the 80’s and 90’s.

The subsequent declining birth rate in the 1960’s that marked the end of the baby boom has become known as the baby bust. The decline in the birth rate has left the nation with facilities and infrastructure designed for a large population of children. Currently, the abrupt decline in population between 15 and 24 years of age is impacting communities across the nation. The issue of whom will inherit and support the infrastructure built for the baby boom generation is significant. The impact of the baby bust will be softened slightly by the predicted echo of the baby boom.

These three population trends have resulted in a change in household composition. Nationwide, the average household size has been declining, particularly in the last decade. The decline in household size has been due to a declining birth rate and a change in family compositions. This trend has had a significant impact on the demand for housing. If the population of a community remains stable while the average household size decreases, a larger number of units will be required to accommodate the population. Nearly half of the total increase in occupied housing in the 1970’s was a reflection of decreased household size.

Population change

As indicated in table 1, the population of the City of Galveston steadily increased from 1910 to 1940. Despite various in the intervening decades, the population has remained relatively stable since 1940. The lack of growth is not consistent with the continued growth of Galveston County. The county has historically been one of the most populous counties in the Houston-Galveston area, second only to Harris County. Galveston County has benefited from the Port of Houston, Galveston, a strong industrial base and the suburban sprawl of Houston. In particular, the commuter oriented communities in the Clear Creek basin have substantially increased the county’s population. The city of Galveston has not attracted a significant portion of this regional growth.

Figure 6 and Table 2 illustrates the distribution of the city’s population, households and housing units by census tract. The shaded areas on Figure 6 indicate areas that have grown in population in the past decade. The white areas are tracts which have decreased in population. The island’s population has decreased substantially in the older neighborhoods while increasing on West Island.

It is important to note that the city's population as a whole stabilized between 1970 and 1980 while the land area incorporated within the Galveston city limits increased. The annexation of West Island in 1975 added approximately 30 square miles of land to the city, increasing the geographic area of the city by almost four times. Figure 1 (section 1) illustrates the annexation. The population on West Island at the time of annexation was in excess of 1,000. These new residents offset a decline of 3.3 percent in population in the pre-1975 city limits between 1970 and 1980.

Between 1970 and 1980 the East End of the island experienced growth in some census tracts and decline in others, despite the overall slight decline in population. Growth occurred in census tracts 123100 due to multi-family housing construction. Increased population in tracts 125001, 125002 and 125100 represents development of multi-and single-family units along the western edge of the city's urban nucleus.

Population growth on West Island resulted from construction of over 1,100 single family dwelling units in census tracts 12520 and 12530, the city's western suburbs.

Table 2, while depicting the shifting population patterns in the city, also reveals a substantial increase in multi-family dwelling units and a decline in single family units for the census tracts that compose the pre-1975 city boundary. For the prior to annexation of West Island, the 1970 total of 23,026 dwelling units was made up of 17,169 (75%) Single-family units and 5,857 (25%) multi-family units. By 1980 the total number of dwelling units for the same area increase to 25,939 which was composed of 16,954 (65%) single family and 8,986 (35%) multi-family units.

Local population trends

The effects of four nationwide trends - growth produced by the baby boom, decline resulting from the precipitous drop in the birth rate, and the 1973 City of Galveston Comprehensive Plan report as contributing to the lack of population growth in Galveston. These same factors have continued to influence the size and composition of the city's population in the past decade.

Source: U.S. Census

The bulge of the baby boom generation can be traced though Galveston's population age composition history in table 3. There was a substantial increase in the population between ages 0 and 14 from 1950 to 1960, between ages 15-24 from 1960 to 1970 and between ages 25-44 from 1970 to 1980. Each of these age groups grew by approximately 20 percent and increased their share of the decade's population by approximately 4 to 5 percent over the previous decade. The resulting effect on

Galveston's current population is growing labor force at a prime age 25 to 44 years of age. Galveston is currently facing the same pressures as the rest of the nation from the baby boom. In particular, the demand for moderately priced housing for this age group has been identified by several market studies. Historically the housing supply in Galveston has been limited and expensive. Housing demolitions have typically offset any increase in housing stock.. This trend continued in the development of single family homes on the entire island between 1970 and 1980, with only a modest increase in single family units.

A report, The economic Strengths of the city of Galveston, prepared in 1980 by Texas A&M University, identified the following specific concerns regarding the island's limited housing supply. Geographical space constraints, availability, price and financing have severely restricted housing for lower, middle and upper middle income persons.

At least partially in response to the lack of housing, one-third to one-half of the Galveston labor force commutes from residences on the mainland. The actual and potential consequences as result of this trend are great:

- The loss of interest, allegiance and service to community concerns and problems.

- The loss of potential community leadership.

- The loss of consumption dollars to the local economy.

- The loss of property tax revenues to the city.

The baby bust can also be traced through Table 2. The population between 0 to 14 years of age drastically decreased from 1960 to 1980, 19,658 to 11,841 persons. A 38 percent decrease in the younger population in the past two decades will continue to have an impact on the city as this group matures. The 1990 census should find a decline in the 15-24 year old age group in Galveston.

Due to the number of women in their childbearing years, 25-44, the number of children in the 0-14 age group should increase moderately by 1990. Over the long term, however, population in the 0-14 age group is not likely to recapture the level of significance it had in the 1960's. It is possible that force shortages in the population groups of 15-24 and 24 to 44 will accompany the maturing of the baby bust generation by the end of the century.

Galveston's elderly population has followed national trends and steadily increased from 1950 to 1980. This age group has grown from 6.6. percent of the population 1950 to 13.1 percent in 1980. Galveston's concentration of residents over 65 years of age is one of the highest in the state. However, it is located within the Houston - Galveston standard metropolitan Consolidated area which has the lowest elderly population in the state. Nationally, the issues of retirement, pensions, social security services to the elderly will become important. Locally, it can be anticipated that these issues will have special significance due to Galveston's potential attraction as retirement community.

The fourth national trend, the declining household size, has also prevailed in Galveston. Galveston has traditionally had average household sizes below the national levels. From 1950 to 1980 the average household in Galveston declined from 3.2 to 2.49 persons, compared to figures for national as a whole which showed a decline from 3.37 to 2.75 persons for the same period.

A fifth trend identified in the 1973 Comprehensive Plan Report was the shifting of the population composition to a larger percentage of minorities. This trend has continued with a decrease in percentage of whites residents from 69.6 percent to 63.5 percent between 1970 and 1980. The white population has decreased 21.6 percent from 1950 to 1980 while other races have increased 33 percent. If these trends continue, the population groups will achieve parity after 1990.

Population Projects

The Houston-Galveston Area Council (HGAC) is the regional planning agency responsible for area-wide transportation planning and other planning related duties in the Galveston area. Part of the transportation planning process requires the HGAC to maintain census data and periodically prepare population projections for its member governments. In September, 1983 the council published projections for the City of Galveston that anticipated an addition of 17,854 residents to the 1980 population of 61,902 by 2000 for a total population of 79,756. The twenty year increase growth of 14.5 percent (8,950) during the 1980's and 11.2 percent (8,904) during the 1990's. Table 6 presents a summary of HGAC's projections by census tract for total population, persons per household, number of households, the number of single and multi-family dwelling units and the percent of occupied dwelling units.

The HGAC's projections reflect both decline and growth in different parts of the city. The fully developed, mature neighborhoods generally reflect an anticipated decline in population as the persons-per-household rate continues to decline and dwelling units are removed from the housing inventory, for example census tracts 123300 and 124100 (for location of tracts, see figure 6, Galveston Island census tracts). The decline in household size is also expected to off-set a slight increase in dwelling units several census tracts resulting in decline in population, for example, census tracts 124200 to 124500. Growth is projected for four census tracts located East of 61st Street where construction of new dwelling units is expected; 123100, 123400, 124000, and 124400.

Census tracts 123100 and 123400 show the greatest rate of anticipated growth in the area East of 61st street are considered, HGAC anticipates a modest increase of 1,362 persons by 2000.

The major growth area in the city is projected for the tracts west of 61st street. A total of 16,492 persons are expected to be added in this area with census tracts 125001 and 125200 each to grow by about 5000 residents. This growth area extends from Jones Drive/Lockheed Street west to the Eckerd's Bayou area.

The West Island area- census tracts 125200 and 125300- represents the greatest amount of undeveloped land in the city. In 1980 the area contained 1961 persons (3.17 percent of the city's population) and 2999 dwelling units (10.36 percent of all dwelling units). By 2000, this area is projected to contain 9,483 persons (11.89 percent of the city's population) and 13,175 dwelling units (27.73 percent of all dwelling units). The projected growth continues past trends of dwelling unit occupancy. However, it does not reflect the potential rate of residential development that has been given construction rights in the area. Since 1980, the city has granted development rights for 3047 single family (detached and attached) units, 3930 condominiums units and 573 multi-family units for a total of 7552 units. At the rate of approving 7550 units in the first five years of the 20 year projection period, the rate of actual development may substantially exceed the projected growth.

If the primary market for the West Island development continues to be the non-permanent weekend tenants and the occupancy rate for dwelling units remains at the 1980 level of 24% (combined average rate for the two tracts), the additional permanent population for the city will be moderately increase over the city (84% or greater), the growth in population could substantially accelerate the city's actual increase in population. For example, using assumptions in the following computations, the potential range of population growth for the dwelling units approved since 1980 varies from 4,874 to 16,172 persons.

The potential increase in the quantity and type of development that has been approved for census tracts 125200 and 125300 over figures contained in the HGAC's projections raises several issues.

First, the HGAC projections for tracts 125200 and 125300 reflect a continuation of past housing trends; housing in tracts 125200 is expected to be a combination of permanent residences and second-homes for weekend use at an overall occupancy rate 59 percent. The assumption regarding occupancy by full-time residents in tract 125200 reflects that tract's distance from employment centers in Galveston, up to ten to fifteen miles and the availability of each beach and canal amenities for residences. Census tract 125300 is more distant from employment centers and is projected to have 15 to 16 percent of its units occupied by permanent residents. Planned development in tract 125300, however, calls for construction of hotels and commercial establishments which indicate a growing employment base and elements of a permanent residents is likely to increase and pressures to develop additional dwelling units will increase. Also emphasis on a year-round community may accelerate the growth rate of the island, by increasing permanent residents, as well as potentially attracting residents from the island's east end and thus redistributing the island's expected population increase.

Second, the HGAC projections indicate the addition of 5061 multi-family dwelling units throughout the city by the year 2000. The approval of 632 single family attached (townhouse), 3930 condominiums and 573 multi-family units for a total of 5135 units in census tract 125200 and 125300 since 1980 indicates the HGAC target will be too low if the approved units are built over five to ten years. The tendency toward construction of multi-family type units may result in a decrease in the rate of construction of single family detached units. It should be noted that HGAC anticipated construction of 9776 single family units and only 400 multi-family units in the two census tracts by year 2000.

Over the next few years, and as HGAC prepares estimates of exiting population by census tract for 1985, the rate and character of development actually constructed in tracts 125200 and 125300 should be monitored to determine the likely impact on the island's population. Issues related to approval of additional development on West Island are addressed in section V of this plan.

Land Use

Land Use Characteristics

Understanding the way land is used in Galveston is a necessary ingredient in preparing the Comprehensive Plan. To know the land is used - its utility for the land's owner and its contribution to the community's function - is a prerequisite to shaping plans that will influence future land use decisions.

Use of land in Galveston is constantly changing due to a variety of decisions by owners and government regulators. Land to be converted into urban uses from vacant or agricultural use requires a conscious decision by the owner or interest-holding developer and the concurrence of government regulators through the administration of zoning regulation and, perhaps, environmental rules. A successful venture results in an obvious and, at times, dramatic addition to the urbane elements of the community as new residents or places of commerce are built.

Other decisions in the Community also contribute to change, though not as obvious as first-time construction on vacant land. Property owners that decide to diligently keep-up their property through regular maintenance contribute to a stable community and retard physical change while owners that permit property to deteriorate through a lack of maintenance contribute to deterioration and decline in the community.

The examples cited above cover only two types of decision made by property owners, renters, developers, financiers, and government leaders and others that constantly shape the format the community. The purpose of the comprehensive plan is to identify what

the community wants to become and provide a framework to guide the major decisions and the numerous day-to-day actions that alter the city over time.

In 1973 the city prepared a comprehensive plan that cited significant land use characteristics that are summarized as follows:

1. The land use pattern in Galveston is a compact arrangement constricted by the airport and Offatts Bayou on the west, and by a government land reservation on the east. The Galveston Channel and bay restrict development to the north and the Gulf of Mexico to the south;
4. The preponderance of Pelican Island is vacant except for ship yards, Texas A&M University Marine College and other non-residential Uses;
5. Galveston's industrial land is located north of Broadway and closely related to water and rail transportation systems along the wharves and Galveston Channel;
6. Commercial land use is concentrated in downtown and in corridors along Broadway and Seawall Boulevard. The latter area serves the city's tourist guests;
7. A relatively small amount of vacant land suitable for development, exists in the city. The lack of land for residential use is evident throughout the city; and
8. The present constricted residential area should be expanded to the East and the West beyond the airport.

Since these observations in 1973, the city has resolved, at least temporarily, its shortage of developable land by stretching its limits to the Far West end the island. Some of the observations made in 1973 remain valid in 1985; the city east of 61st street remains compact, Pelican Island retains a large vacant section and industrial land is located north of Broadway. Other major features in the city have been altered; residential development has occurred between 61st street and the airport, additional commercial development for the tourist trade has been constructed along Seawall Boulevard west of 45th street, and development of West Island has continued with approval and partial construction of major land use projects.

As a result of the changes in land use since 1973, it was necessary to update information describing land usage in the city. For the purpose of this plan, a generalized land use surveys was conducted. Table 7 indicates the amount of land found in eight land use categories. The boundaries of each of the neighbors and other major areas listed in Table 7 are illustrated in figure 7. A 1" = 1000' scale Existing Land Use map is available for review in the city's Department of Urban Planning and Transportation. The location and quantity of land use by categories was determined by compiling land use data from land

use maps and other planning documents prepared by the city of Galveston. This data was generally verified by windshield surveys.

Existing Land Use Summary, City of Galveston

*Includes Tidal Wetlands and Freshwater Wetlands.

Table 8 is a summary of existing land use within the City of Galveston; public right-of-way are included in the various categories reported. The distribution of land use categories reflects Galveston's recreation orientation and the high amount of land which is publicly owned and tax exempt. Approximately 35% of Galveston is held by the City of Galveston, Galveston County, the State of Texas and the U.S. Government. An additional 10% is owned by private tax exempt organizations and the Galveston Wharves. The annexation of West Island brought the Galveston State Park into the city limits. This addition significantly distorts the percentage of land which is devoted to parks and recreation.

The annexation also brought additional single family land into the city limits. Although this adds to the city's inventory of residential land it should be noted that only a small percent of the West Island it should be noted that only small percent of the West Island Housing stock contributes to the city's need for additional single family homes. Current estimates from the Houston-Galveston Area Council and review of West Island homeowner's permanent address list reveal that only 20%-30% of these homes are used on a permanent basis by Galveston residents.

Land Use Related to Population

The 1973 Comprehensive Plan Report outlined the amount of land in each land use category utilized per 100 persons ration and other cities. At that time, the city's ratio of residential Land to people and parks and recreation land to people was found to be unusually low. The 1973 ratios indicate that development within the city needed to provide additional and less dense residential developments and provide additional parks and recreation space. Table 9 presents a comparison of the 1973 land use/population ratios and 1985 ratios and 1985 ratios and the target ratios recommended in the 1973 Comprehensive Plan Report.

This comparison appears to indicate that in general the basic land use changes that the City of Galveston adopted as their objectives in 1973 have been made. However, the changes in the land use quantities related to the city's population primarily reflect the annexation of West Island and the focus on seasonal and tourist facilities,

As predicted, the annexation of West Island provided the additional residential land. However, the majority of the additional residential land is not available for the average Galveston family. The increased in residential land reflects upper income single family developments and high density seasonal condominium construction .

The increase in the amount of retail and commercial land per 100 person is primarily due to a substantial amount of developments along 61st street and new tourist oriented developments on Seawall Boulevard. The retail/ commercial ratio has grown beyond the 1973 target. However, the significant increased in tourism appears to have absorbed the recent development.

Existing Land Use Patterns

Equally important to the amount of land available for specific uses is the arrangement of those land uses. The urban and natural features discussed in section V and the geographical constraints of the island create several prominent features in the city's land use pattern. The following is a description of the general characteristic of each land use category and the significant features of each:

Single and Two Family Residential There are two major types of single family land use in Galveston. The most predominant type is very dense older residential structures, Primarily constructed prior to 1960, the housing is typically arranged on 260' x 300' blocks at a density of 8.5 to 21.2 dwellings per net acre. The condition of the structures ranges from very good to extremely poor. The second type of single family residential development is located in residential subdivision constructed since 1960. These developments are typically at a density of 3.5. to 8 dwelling units per net acre.

The older residents are located on the East End of the island in dense neighborhoods. Some of the neighborhoods are susceptible to encroachment by incompatible higher density housing, commercial and industrial uses. The newer residences are usually located in subdivision with consistent land use and are protected from incompatible encroaching uses. However, the current interest in high-rise condominium developments may result in a growing amount of conflict when these two uses of contrasting density are placed in proximity to each other.

Multi-Family Residential Multi-family residential areas are generally well-located along major throughfares; they range from high rise structures to low rise public housing and modified structures marketed to wide range of affluent to low income families. There are site specific problems with scattered high density housing on the east end.

Public/ Semi-public Galveston's large amount of public and semi-public property is unique situation. Although they disrupt the overall land use pattern of the city, the responsible institutions and agencies generally strive to be a positive force in the surroundings community. The city has no intentions of acquiring additional large public land holdings and is striving to reduce the holdings where feasible and beneficial.

Parks and Recreation The east end of the island is served by a series of neighborhood parks which provide green space and community open space for the surrounding neighborhood. Due to the isolated development pattern of West Island, this same park concept has not continued. The provision of such facilities will be an important part of existing and future neighborhoods on west end.

Retail/Commercial The majority of Galveston's retail and commercial development is appropriately located on major throughfares. This land use category includes neighborhood and community shopping centers, professional office buildings and tourist oriented facilities.

A West Island commercial land use was adopted in March, 1985. The policy identifies appropriate commercial land use locations west of the Seawall in the Termini Road corridor.

Industrial Galveston's industrial development is primarily located between Broadway Boulevard and West Bay. The geographic limitations of these boundaries contain industrial development in a location central to highway, rail and port facilities. There are some problems with encroachment of industrial development into residential areas north of Broadway.

Neighborhoods

The City of Galveston implemented a neighborhood planning program in 1978 designed to supplement the city's Comprehensive Plan. A comprehensive plan consist of general guidelines for long range city planning and land use management. While the plan aids the city in long range decision making, it does not address issues specific to individual neighborhoods. The neighborhoods plans provide detailed assistance in determining the current and future needs of individual neighborhoods and recommend courses of action to meet those needs. Galveston is currently divided into eleven residential neighborhoods. The neighborhoods are delineated in Figure 8 and listed below in Table 10.

City of Galveston Neighborhood Plans

The neighborhood planning process allows for the study of detailed solutions to correct specific problems in each neighborhood. The neighborhood planning process developed by the city staff is much the same as the process development in preparing a comprehensive plan. It includes:

- Data collection
- Problem Identification
- Formulation of Goals and Objectives
- Development of Alternative Plans
- Final recommendations
- Adoption by the planning Commission
- Adoption by City Council
- Implementation and Use of the Adopted Plan

Adopted neighborhood plans are used as a guideline for decisions regarding land use regulation, construction of public facilities and provisions of government services. In addition to being more site specific than the Comprehensive Plan, neighborhood plans encourage active resident participation. Often the adopted plan will call for the implementation of plan elements by the residents. Following adoption of the plan, the city staff will provide technical support to residents of the neighborhood in reaching the goals and objectives of the plan. For example, the Kempner park neighborhood plan calls for a changing in zoning from a less restrictive category to on more restrictive. The change is intended to protected the residential character of the neighborhood. Residents have obtained the change in zoning through their own initiative and with thee assistance of the city staff.

As Table 10 indicates, the neighborhood planning program has completed five neighborhood plans. The success of this program depends upon the timely and efficient completion of all of the plans. In addition, the annexation of West Island necessitates preparation of plans for those emerging neighborhoods as well.

Urban Trends

The 1980's have brought a surge of interest in the reestablishment of Galveston as a year-round vacation site and convention site. Development and redevelopment has focused on hotels and condominiums and other facilities to accommodate the anticipated increasing number of visitors to the island. The majority of activity has been on the West Island and along Seawall Boulevard. In 1984 , 677 hotel-motel rooms and 543 condominiums units were completed. A 800-passenger paddlewheel boat has been launched and a four-mile trolley system is planned. Proposed projects include additional hotel and condominium units, a new golf course and waterfront tourist development at the Galveston Wharves. However, the entire city has not undergone such rapid development. In particular, many existing residential areas of the city are suffering from neglect and deterioration. Some older neighborhoods are in need of rehabilitation and development. Others suffer only from minor maintenance problems which should be corrected before they become serious.

Figure 9, an urban trends map, illustrates the general location of three major trends in the community. The mapped trends represent a collective judgement of properties and do not necessarily describe precisely the conditions of each property area. The trend categories are stable, rehabilitation/redevelopment and transitional/developing. Identification of these three trends will aid the city in prioritizing capital improvements projects and making land use management decisions. The map indicates general boundaries and is intended as an overview of the city's physical condition in 1985. The locations of the three trends were determined through review of the city Building Code Inspector's data, neighborhood plans and windshield surveys of the city.

Stable Areas These are areas which include housing, business and community facilities in sound condition. The ability of these areas to remain stable will depend upon continued maintenance of private property and city facilities and the prevention of construction of incompatible uses.

Rehabilitation/Redevelopment Areas These areas exhibit signs of decline and/or deterioration due to inadequate property maintenance and require attention by property owners and the city to upgrade the existing structures. The majority of these areas are located on the east end of the island and are composed of structures that predate 1945.

Transitional/Developing Areas Approximately 25 percent of the island is vacant land which may be appropriate for development. Guidance of future development in these areas will be important to the quality of life on the island and the city's ability to serve ability to serve its residents.

Although a seemingly large amount of land is available for development, due to the geographic and environmental constraints of the island, this vacant land represents all of the city's future land expansion.

A large amount of recent and proposed redevelopment can be attributed to the city's tax Reinvestment Zone program. The Texas Tax Increment Financing Act of 1981 allows incorporated cities to issue bonds or notes to finance public works or public improvements in a reinvestment zone. At the time an area is designated a reinvestment zone. At the time an area is designated a reinvestment zone so that tax increment financing tools can be used, the total appraised value of real property in zone is designated as the tax increment base, and the taxing units levying taxes in the zone during its life are limited to the resulting tax yield are the tax increment. The public improvements constructed or provided are paid for only out of the tax increment fund. Galveston leads the state with ten Tax Reinvestment Zones.

Figure 10 illustrates the Tax Reinvestment Zone locations and Table 11 outlines the finance projects. If the Tax Reinvestment Zone locations are compared to urban trends map, the impact of the zones are located in previously vacant areas which are currently being developed.

Economy

Economic History

Galveston's economy has historically been based upon based upon four components. Collectively, these components account for 90 percent or more of the total employment and income on the island.

- The Port Of Galveston
- Medical and Health Care Services
- Financial Services
- Tourism

The largest source of employment and income on the island is in waterborne commerce. "Approximately one out of every two persons employed on the island obtains work in port-related activities, either primary or secondary employment." Directly and indirectly, the Galveston Wharves contribute to approximately 50 percent of the city's revenues. The wharves contain 22 piers 32 berths, two grain elevators and a container port along the south side of Galveston channel. The Todd Shipyard and other port related business plus the maritime branch of Texas A&M University are located on Pelican Island on the north side of the channel. Planned port improvements include a 50-foot deep draft channel project which will significantly increase the opportunities for growth and development.

The second most important component of Galveston's economy is medical and health services. St. Mary's Hospital and the University of Texas Medical Branch (UTMB) compose a medical complex offering medical education, research and patient care. UTMB was established in 1891 and is Galveston's largest single employer. The facility has a very active building program and is continually expanding. Almost one-third of the practicing physical in Texas is either UTMB graduates or has served residents or internship there.

Financial services on the island include insurance, banking and real estate. American National Insurance Company, the largest stock insurance company in Texas, and American Indemnity are based in Galveston. There are seven banks and three savings and loan associations. Approximately one out of every six or seven persons employed in Galveston is engaged in financial services.⁵

Tourism is and ever increasing component of Galveston's economy. New development and aggressive revitalization in producing first-rate tourist and labor intensive, tourism plays a major role in the total amount of annual revenue received by the city. Galveston attracts and averages 1.5 million visitors each year.

Economic Future

The purpose of this element of the Comprehensive Plan is to indicate recent trends of several basic economic indications and to comment upon those trends as they implement certain portions of the plan (i. e., expenditure related) will depend to a major extent upon the island's general economic condition at a given point in time.

However, many of the basic growth management recommendations can be scheduled and initiated regardless of local economy and actually be preparatory to improved economic conditions. Other recommendations suggest in the Plan such as environmental issues, beautification, adoption of many of the basic land management policies and regulations can have a positive effect upon the island desirability as a place to live, conduct business and recreate thus having a positive effect upon the economy.

Bank deposits and loans trends provide an overview of the local economy. The following chart indicates a ten year history of the deposits and loans of the islands banks. The historic corresponding loan trend that indicates a confidence in local economy. The 1986 deposit and loan record showing a decline is representative of a general economic decline in the region and state of Texas.

Another indicator of the extend of retail sales activities is the City Sales Tax Rebates from the State of Texas Comptrollers office. The following chart indicates the city's return of their appropriate amount of locally collected sales tax on retail sales. The chart also indicates "real dollars" by using 1978 as the base year and reducing the tax rebate by the annual inflation rates as published by the U.S. Bureau of Commerce and Statistics. This adjustment better reflects the retail sales activities rather than the retail costs of goods. Sales tax rebates have increased by approximately 43% from 1979 though 1985 but after discounting inflation the "real dollars" increased has been 30% thus indicating a relatively flat trend of retail activity during this period.

While other cargo includes containerized cargo, bananas, plywood , cotton, sacked grain and flour and bulk sugar has remained fairly constant, bulk grain handled has fluctuated fairly significantly. This type of material is often affected by U.S. grain sales to other nations of which local authorities may not have directed control. Opportunities for a less fluctuating use of the port may exist though channel and modernized port facilities, expedites Customs inspections and processing and improved land transportation facilities.

Building construction activities on the island leaped both in numbers of building permits and valuation of construction during 1983 followed by a continuing decline to 1986. This phenomenon has been experienced throughout Texas and the Galveston region. The opinions of many participants in this industry expect that as the general economy is either rekindled or redirected for improvement, such as the attraction of increased industrial development in Texas, this sector of the economy will improve with a gradual increase in construction.

The single greatest impact upon arresting the decline in this sector is the expansion of the employment base of the island. Other coastal areas such as Carolinas coast and Florida which have historically depended upon tourism as a major economic base have activity pursued industrial and services industries to balance their growth. These efforts indicate that their economies are rapidly improving and general construction activities have increased significantly. Thus, the search, identification and attraction of major employment industries are important to Galveston's economic future. The ingredients of water transportation, Mainland highway systems. Air transportation facilities, customs and port facilities, and possible sites at Pelican Island coupled with the initiative of the business, civic and government leaders are in place. Industrial prospects, particularly foreign industrial prospects are yet available, coupled with the approved foreign trade zone and other industrial sites at Pelican Island a concentrated effort to successfully establish an industrial base within the city is highly recommended.

The city of Galveston is a major employer on the island and has had an annual general governmental expenditures budget ranging from 12.8 million dollars during the fiscal year of 1976-77 to over 24.4 million dollars during 1985-86. Examination of the general revenue expenditures by functions for the period of 1976 through 1986 indicate that public safety, planning and traffic and housing reprints greater increases of expenditures than other functions. Much of the increase of expenditures in the functions have been to make physical improvements to the municipal systems. While the total city employee count has remained basically the same, the growth of the general governmental expenditures has nearly doubled during the past 10 years indicating that the city is experiencing the effects of inflation and a greater propionate amount, being spent on "hardware goods" to serve the community.

The general revenues to the city during the fiscal years 1976-77 to 1986 do not reflect the same rate of growth as expenditures indicating a need to rely upon reserve funds to meet expenses.

The majority of general revenues to the city has been in the category of taxes (property, personal and retail rebates) which during the reporting period has grown correspondingly with the total income to the city. This growth has resulted in the majority from the increase Real property net assessed value from 401.8 million in 1976-77 to over 1,000 million in 1985-86. The property tax rates for the City has remained fairly constant during the same period indicating that new real property growth is required to continue providing growth in municipal services and rather than relying upon increased tax rates.

Economic Growth is obviously required to maintain the continued development and redevelopment goals of the community. The basic economic indicators indicate a very positive trend during the late 1970's and early 1980's. The mid 1980's trends have indicated an overall negative trend reflecting the general economic downturn in Texas and the Galveston region during this period.

A significant event has occurred during 1986 which can have a positive impact upon the local economy. The city was selected by the U.S. Navy as a "Homeport" base for five

U.S. Navy sea going craft. The base is creating approximately 667 military and 25 civilian new jobs beginning in 1990. During the construction of the base it is estimated that approximately 300 construction jobs will be created during 1988 through 1989. A report prepared by Turner, Collie & Braden, Inc. Strategic Planning Group in 1986 indicates not only the aforementioned growth in job activities but also a wage and salary income generated by the homeport of approximately 11.5 million dollars in 1988 growing to approximately 25.4 million dollars by 1995 for the Galveston region. These salaries are for off base employees.

It is aggressive actions thus exhibited that can improve the basic economic health of the community which when coupled with aggressive growth management policies a structured and organized process for a continually improving and growing community can result. Other activities which play a significant role in improving and growing community can result. Other activities which play a significant role in improving the economic stability and possible growth are those to be undertaken by the University of Texas Medical Branch, Texas A&M University, Other government institutional growth (U.S. customs, U.S. Army Corps Of Engineers, National Oceanic and Atmospheric Administration, Texas Parks and Wildlife Department, etc.). The University of Texas Medical Branch has both a national and international reputation and will be a major factor in Galveston's continuing economic growth.

Galveston's economic future is dependent upon three major elements: people, Other resources and philosophies. A unified force of all three elements will insure a bright economic future for the city.

IV. Physical Features Influencing Development

Introduction

Just as the social and economic characteristics of the city influence Galveston's development, the island's physical features which will affect Galveston's potential for growth and development. Urban features include the streets and city infrastructure such as water distribution and sanitary sewer systems. The natural features are the environmentally sensitive or potentially hazardous areas of the island. The following discussion outlines the characteristics of the island's physical features and the consideration which are important to future decision making.

Urban Features

Thoroughfares and Highway Access

Accessibility is a primary consideration in Galveston's location off the coastline of Texas. The ability to get on and off the island is important in both daily and emergency situations. Within the island, each of the major thoroughfares plays a critical role. The very narrow configuration of the island necessitates very long thoroughfares which are often the sole of access to a particular area. The 1985 Galveston County Regional Mobility Plan addresses both the highway access to the island general thoroughfares configurations. That document is the basis for the thoroughfares planning presented in this report.

There are four functional classifications of roadways on Galveston Island identified by the Houston-Galveston regional Transportation Study office:

Interstate Highways are roadways which are generally constructed to full freeway standards carrying large volumes of traffic.

Major Arterials are the primary transportation network connecting major urban and rural areas and carrying the bulk of urban traffic.

Minor Arterials accommodate trips of moderate length and distribute traffic from major arterials to collector streets.

Collectors are streets which provide access to land and traffic circulation within developed areas.

Galveston's Island highways and major and minor arterials are listed below and illustrated in Figure 12.

A measure of problems associated with a highway or arterial roadway is its ability to adequately carry the traffic that uses the roadway each day. When the volume of traffic approaches the road's capacity, congestion increases and the road's effectiveness declines. Traffic congestion is typically measured by level of Seville classification. There are six levels of service designated by the Texas State department of highway and Public Transportation, A through F. Level of service (LOS) A is totally free-flow condition with little or no interference from other vehicles and is typically found in rural to lightly developed areas. LOS F at the other end of the scale, describe stop-and-go (forced flow) conditions, or total breakdown of the facility that may be found along some urban routes during peak rush hours. The other levels of service, B through E, describe various stages on the level of service scale between A and F. Urban roadways are usually designed to operate at a LOS C or D in their design year.

The 1985 Regional Mobility Plan examined traffic-flow characteristics and identified major capacity deficiencies as determined by the level of Seville on three of Galveston's four major arterials. Table 12 indicates Key characteristics, level of service and capacity deficiencies of roadways for which traffic counts are available.

All of Galveston's major arterials, I-45 and some minor arterials carry a heavy traffic load during a typical weekday. This load is substantially increased by visitors on spring and summer weekends and holidays. On average Sunday in June, 1982, daily traffic on the I-45 causeway was 74,000 vehicles. This is compared to a count of average weekday traffic of 45,000.

In addition to investigating the roadway capacity deficiencies listed in Table 12, the 1985 Regional Mobility Plan analyzed the need for additional traffic capacity from Galveston Island to the mainland. This analysis indicated that additional capacity will be required for daily traffic service. Current and proposed development on the island will greatly increase the demand on I-45. Additional access in the form of tollway from Virginia Point on the mainland to 8 Mile Road on Galveston Island is proposed.

Recommended improvements are summarized in Table 13. The improvements have been prioritized by existing capacity deficiencies, projected future demands and existing roadway conditions.

Sanitary Sewer Service and Treatment

Approximately one-third of the land area of the city of Galveston has immediate access to city Santeria sewer service. Currently, the city does not have a definite master plan for providing additional service. The last sanitary sewer master plan was prepared in the 1960's and did not address annexation of West Island. For these reasons, future service within the city is currently an important issue. Because the issues facing the east end of the island and west island are very different, the two areas are covered separately in the following discussion.

The east end of the island (the area behind the seawall) is serviced by the city's two municipal treatment plants. The sewer lines in this area were constructed in the 1930's and later years and many of the lines suffer from hydrogen sulfide corrosion. Maintenance of the system is he primary consideration on the east end.

The two waste water treatment plants serving the east end are the main facility at 52nd street and Port Industrial Blvd. And the Airport Facility. Their respective capacities are:

- **Main Facility**
 - 10.00 mgd Permit capacity
 - 25.00 mgd Hydrologic capacity
 - 6-7.00 mgd Average use – 1985

- **Airport Facility**
 - 3.75 mgd Permit capacity
 - 8.0 mgd Hydrologic capacity
 - 8.60 mgd Average Use –1985

The city Utility Department anticipates that the capacity of the Airport facility can be increased to 4.00 mgd major plant modifications.

West Island has only recently received any service other than septic tanks. For example, the Sea Isle subdivision is primarily served by septic tanks. Ninety percent of the lots in this canal lot development have septic tanks which contribute to pollution problems. Specific problems, such as closure of bay areas to shell fishing, are addressed under the “water quality” discussion in this section. The Seville areas of treatment plants on west island are illustrated in Figure 13.

To date, West Island is served by two waste water treatment package plants. The two plant’s capacities are:

- **Pointe San Luis**

150,000 gd Initial capacity
500,000 gd Plant design capacity (proposed)
1.8 mgd Ultimate capacity

- **Terramar/Isla del sol plant**

250,000 gd Interim permit capacity
500,000 gd Final permit capacity
60,000 gd Average use –1985

Existing development and proposed projects which have received city approval will require all available capacity in these two plants. In order to provide the ultimate capacities, the city is implementing a Capital Recovery fee for use of the Isle del sol facility.

Additional Seville to West Island will be provided through the installation of an intercept sewer ranging in size from 24 to 27 inches and connecting existing service at 7 Mile Road to 10 Mile Road.

Serviced by the Airport waste treatment plant, this line will provide capacity for future development in the area west of the airport to the state park..

The new line, however, while providing sewer services to the developing areas west of 7 Mile Road cannot be used to its full capacity until a bottleneck in the existing system 81st street and 6 Mile Road is eliminated. The existing 12 inch line east of 6 Mile Road will be capable of accommodating approximately ten percent of the projected flows from new development west of 6 Mile Road. Removal of the bottleneck with construction of a gravity flow line (36 inches) or a lift station and

force main (18 inches) must be constructed before substantial development occurs in the area served by the new interceptor.

Additional relationships between potential development and sanitary sewer service are discussed in the following section V , Holding Capacity Analysis.

The four plants seeing the city, the main plant, the airport facility and plants at Pointe San Luis and Terramar/Isla del sol, represent a regional-plant system. Although not part of an adopted master sewer plan, the regional-plan system has evolved as the city's response to development scattered over the island. Under the city's current approach, the Pointe San Luis plant will serve the west end of the island west of Terramar beach. See Figure 13 for location of the plant and existing and future service area.

The Terramar/ Isla del sol plant will serve the generally west of Indian Beach and up to the limits of the Pointe San Luis service area. The Terramar/Isla del sol plant is currently a temporary metal plant that should be upgraded to a permanent concrete facility.

The area between Indian Beach and Jamaica Beach may not be cost-effectively served by the Terramar/Isla del sol plant. At least two other options exist for serving the area, develop a sewage treatment facility in conjunction with the Jamaica Beach community.

The airport plant is well located to eve the city's growing urban fringe from 61st street to the limits of the Pirates Cove Municipal Utility District boundary while the main plant will serve additional development in the east island.

The city should prepared a master sewer plan that provides at least the following information:

1. the size of each regional plant at the various stages of development, plus design guidelines for improving the plants:
2. the size and general location of interceptors and pump stations to be constructed to serve undeveloped areas:
3. the most cost-effective manner of serving the area between Jamaica Beach and Indian Beach:
4. an equitable manner of funding major capital improvements such as upgrading the Terrama/Isla del sol plant; one funding alternative to be evaluated would be adoption of a capital cost recovery fee to be paid by new customers that generate the need for sewage treatment facilities.

The city's sewer plan should strive to develop a system to service the entire island in an efficient and cost-effective manner.

Water Distribution

City water distribution is generally available to all of Galveston Island. There is not a specific master plan for the entire city service; however, improvements are continually being planned by the utility Department. The annexation and subsequent development of West Island has required that planning for future transmission lines be completed. Improvements to the water distribution system currently being considered include a 10"-20" diameter between 7 Mile Road to the new elevated tank at the Pointe San Luis development near San Luis Pass. The proposed to be phased over a 35-year period. The phased improvements plan for West Island includes the following elements:

<u>Year</u>	<u>Project</u>	<u>Cost Estimates</u>
1986	16" water line- 13 Mile Rd. to Jamaica Beach	\$ 452,000.00
1990	16" water line- 11 Mile Rd. to 13 Mile RD. 16" water line- Indian Beach to Sea Isle. Jamaica Beach Pump station Improvements.	1,485,300.00
2000	20" water line-10 ½ Mile Rd. to 11 Mile Rd. 20" water line-Jamaica Beach to Indian Beach 16 " water line- 7 Mile Rd. to 10 ½ Mile Rd.	2,349,600.00
2010	24" water line-Jamaica Beach Pump Station to Jamaica Beach Pump Station and Ground storage at 7 Mile Rd. Elevated Storage Tank at 10 ½ Mile Rd. (1 mil. gal.)	3,254,800.00
2020	12" water line-Sea Isle to Bay Harbor 10" water line-Bay Harbor to San Luis Point 16" water line-13 Mile Road to Jamaica Beach	801,000.00
	Total construction cost 1986 - 2020	\$8,342,700.00

Note: Above costs included contingencies, engineering, legal and administrative costs.

Source: west Galveston Island water plan, December, 1985, prepared by the Municipal Utility Department, City of Galveston.

The east end of the island is provided services by lines which were installed early in the 1900's. Monitoring the lines is needed to determine their condition and the amount

of leakage that is being experienced. Ground storage tanks are located at 59th Street, 30th street and the airport.

Through an agreement with the city of Houston for purchase of water, Galveston should have an adequate supply of water up to and beyond 2000. In order to even out the amount of water drawn from the Houston system, Galveston may use wells to help serve peak summer demand periods.

Parks and Recreation

The responsibility for providing open space for a community's recreation needs is an important element in the city's planning program. Galveston's park and recreation needs are twofold. Beachfront recreation sites are essential to the island's recreational industry and neighborhood and community parks are important to Galveston's residents. In response to these two different aspects of recreation, two basic types of parks have been developed by the city: commercial facilities located in beachfront areas and community facilities which serve the island's residents.

The Park Board of Trustees is responsible for operating tourist-oriented, ocean-related facilities. At present four principal facilities are operated; Stewart Beach Park (at the end of Broadway at Seawall Boulevard), Apffel Park (at the eastern end of the island), Seawolf Park (on Pelican Island) and Dellanara Park (at 7 Mile Road and FM 3005).

Stewart Beach has commercial amusement attractions and a boardwalk adjacent to the beachfront. Between March 4 and September 29, 1985 over 360,000 persons visited Stewart Beach. The highest individual weekly attendance figure was achieved during the week of May 20 to 26, approximately 32,500 visitors, and the highest monthly total of almost 130,000 visitors also set during May.

R.A. Apffel Park is located at the end of Boddeker Road and East Beach Road. The 655-acre park contains an extensive beach area, a jetty for fishing, and boat launching facilities plus support uses; Restaurants, recreational center and bath houses. During the March through September seasons in 1985, 840,000 plus visitors entered the park. The highest weekly attendance figure was achieved early during the season when 59,000 patrons entered the park during the week of April 1 through 7, 1985. The highest monthly attendance level was achieved during May, 1985 when over 175,000 visitors entered the park.

The third facility operated in 1985, Seawolf Park located at the end of Seawolf Parkway On Pelican Island, is a Sea-oriented passive-recreation park. A pavilion, fishing pier, playground and picnic area are provided. Attendance at Seawolf Park reached a peak during July when 31,500 plus visitors entered the park. The first week in July also set

the highest weekly total when 8,500 patrons visited the park. For the March through September season, the total number of patrons exceeded 148,000.

Dellanara Park, opened in May, 1986, near the end of the seawall at 107th street, provides space for 88 recreation vehicles and 300 day-use camp sites.

An additional recreation facility currently being planned by the Board of trustees is a golf course to be constructed at R.A. Apffel Park. The initial stage of construction will place 18 holes in use with an additional 18 holes to be added in eight to ten years.

In addition to entrance fees collected at its facilities, the Park Board of Trustees receives 7 cents of the city's 11 cent hotel room tax. Revenues are disbursed by the Board to beach patrol (operated by the city), the Moody convention center, the Tourism development committee, the Arts and historical foundation and for beach cleaning. Park facilities provide for year-round residents of Galveston are operated by the Parks and Recreation Department. Ten of the facilities are on property owned by the city, one site is leased from a business, four are operated on sites owned by the Galveston Independent School District and three are on property owned by the municipal Airport.

The Park's Department's facilities can be divided into the following types of park/recreation areas:

Playlots are usually a small area of one acre or less which provide facilities for preschool children and younger elementary school children. Playlots are usually located in high density urban areas. Ziegler Park and the playlot at 29th and church streets are the Department's two playlots.

Playgrounds (neighborhood parks) serve as play space for the children of a neighborhood area. Typically, playgrounds are five acres or more in size, are centrally located in the neighborhoods they serve and have a service radius of up to one-half mile. Galveston's existing playgrounds are generally well-located but several are smaller than five acres and all of the playgrounds generally have a service radius of less than one half mile. The parks and recreation department operates eleven playground facilities.

Playfields are recreational facilities which are designed for the entire community, children to adults. They usually serve several neighborhood areas and include community buildings, lighted playfields and other active facilities. The standard size is usually 10-20 acres. Galveston has two playfield facilities; Burnett park-school and Lindale Park.

Large parks are facilities of 25 to 100 acres which provide both passive and active recreation facilities for all age groups. Typically these parks are provided on basis of 2 to 5 acres of park area per 1,000 people. The beachfront recreation areas compensate for the reduction in size per population. Schreiber Park at 35 acres is the department's

largest park facility. An additional large park occupying approximately 200 acres of airport property, Lassie fields, is used only for ballfield sports.

Parkways and Ornamental Areas include scenic drives, the grounds of public buildings and plazas. Broadway Boulevard, 61st street, New Strand, Ferry Road and 25th street are examples of parkways which have business district, these parkways are important aesthetic elements of the city.

Special facilities include golf courses, beaches, community centers and other special interest facilities. The Parks and Recreation Department's facilities include Pirate's golf Course wets of the airport, Perry Park along the edge of Offatt's Bayou and a senior citizen center operated in the Gulf Breeze Apartments.

The Parks and Recreation Board is an advisory body, appointed by the city council. Unlike the Park Board of Trustees with independent funding sources, the park and recreational Board participates in the city's budgetary process to derive for acquisitions and maintenance of city parks. Due to limited funding sources, the board and the city have established a pattern of cooperation with other public bodies in providing facilities. Four of the playground/neighborhood park facilities are operated on school Board property and three facilities (Pirates Golf course, Schreiber Park and lassie fields) are operated on Municipal Airport property. The Ball High School baseball field at schreiber park was built through the cooperative efforts of the city and school board.

Several problems and deficiencies exist with facilities managed by the Park and Recreation Department. The following facility improvement needs were noted in preliminary assessment of park needs by the Park and Recreational Board and staff.

- water oriented park facilities on Offatt's Bayou;
- community social centers to fill the after work, after school, and evening hours for high school students and adults in various neighborhoods which would be within walking distance for the are residents;
- city beautification for parks and esplanades;
- golf course improvements;
- soccer and softball facilities;
- relocate present Lassie League facilities into Schreiber Park;
- gymnasium and swimming pools;
- tennis court lighting and resurfacing;
- modernization of park- school sites and neighborhood playgrounds;

Plans under consideration to improve the Parks and Recreation Department's facilities include development of a new Perry Park on Offtatt's Bayou in cooperation with the Moody Foundation and development of soccer, tract and practice football facilities at Lasker Park In cooperation with the school Board. The new Perry Park may contain picnic, sail boating and fishing facilities to enhance the public's use of Offatt's Bayou.

Tentative plans have also been considered for construction of new indoor pool facility that would serve both school students during school periods, and the public during evenings and weekends.

The Galveston County Parks Department operates three beach-oriented facilities at 7 ½ Mile Road, 9 ½ Mile Road and 11 Mile Road. The parks range in size from seven to approximately ten acres and contain parking, picnic, and concession-stand facilities plus a walk-over deck for access to the beach. The final operating county park facility is located on the West Side of 61st street at Offatt's Bayou. The facility provides a public boat ramp, picnic and restroom facilities, and a fishing pier. A concessionaire also provides boat rentals at the park. An additional county park will be constructed on an 80-acre tract of land that spans the island west of the Terramar Beach development. The new park will probably have more extensive facilities than the current county parks. However, the final construction program has not been determined.

The Galveston State Park occupies a 1944-acre site between Jamaica Beach and the Pirates Cove/Palm Beach developments. The park contains 170 camp sites for recreation vehicles with water and electric hookup lines and ten-camp sites. The 1 ½ miles of beach attracted 529,109 visitors between September 1, 1984 and August 31, 1985 with a peak period occurring in August when 17,480 overnight campers stayed at the park. The occupancy rate for camping facilities often reaches 100 percent during a typical summer week indicating a demand exists for additional overnight facilities.

There are additional proposed park facilities located on west island. The San Luis Point planned development includes dedication of six park sites. The sites are 2.00 acres, 7.35 acres, 3.30 acres, 1.80 acres, 2.5 acres and 2.7 acres in size. Only one of these sites, the 7.35 acre site, is located with potential for being a community open space, the remainder will provide sites for beach access. The long-term ownership and management responsibilities for these parks has not been determined; both public and private ownership remain as options.

The park facilities discussed in this section of the Comprehensive Plan are summarized in Table 14 and located in figure 14. Table 15 compares the land area per 1,000 people of various community park types with the standards adopted in the 1973 Comprehensive Plan Report. Because playgrounds often contain playlot type facilities, the standards for the two types of parks are combined for analysis purposes.

The East End of the island presently has 39.03 acres of playlot and playground facilities, 41 percent of the 94.35 acres indicated as the area's needed. The East End storage of 55.32 acres when added to the 3.08 acres needed by the West Island, indicates the total island need to be 58.40 acres. The island's required acreage for playfields, 48.71 acres, and results in shortage of 34.71 acres after subtracting the existing 14 acres contained in

the two playfield facilities. The city's two large parks operated by the Park Board have 54 acres or 86 percent of the island's East End needs.

When considering the apparent shortage of park acreage the following factors should be considered:

1. The East End of the island is densely developed with few options to substantially increased the current park land inventory. It is unlikely that the acreage standards can ever be fully achieved in the East End area.
2. While the acreage needed to meet the park standard may not be achieved in the East End, the park and recreation space made available at Appfel, and Seawolf Park and Stewart Beach will help fill the deficit. Also, indoor recreation facilities can help meet the community's needs without requiring relatively land-extensive parks sites.
3. The only park facilities on West Island are related to the beach and bay, and serve primarily the island's tourist. The park area to be added by the White Sands development also falls into the tourist-service category and will have limited utility for meeting balanced park and recreation of permanent residents.

Public Schools

The Galveston Independent School District (GISD) provides education services for a district which includes Galveston Island and the western end of Bolivar Peninsula. The average daily attendance in October, 1986, showed 4,820 elementary, 1,405 middle, 690 eighth grade and 2,402 high school students attending the district's twelve schools. The locations of Galveston Island schools are shown on Figure 14.

As a result of state-wide school reform legislation, the maximum number of students per classroom has been reduced, thus reducing the capacity of schools. Coupled with the change in standards has been an influx of students in primary grades resulting in overcrowding in the passage of House Bill 72 and average student enrollment in February, 1984 follows:

During the present school year, Parker Elementary School is the most overcrowded facility. Located as the most westerly elementary school, Parker receives students west of 61st street, the area of highest recent growth rate among elementary students. Several plans to reduce the crowded condition have been considered. At present it is the intent of the school Board to construct a new school for grades k through 4 on property adjacent to Schreiber Park and the addition of six temporary classrooms at Parker Elementary School. At this time, no additional facilities are planned west of Schools Field; approximately 400 students live west of 103rd street and 175 west of 9 Mile

Road. However, over the long term, if the east-end flats are developed and year-round residents on West Island increase, students from these areas may require new schools.

To accommodate the influx of young children into school system, the existing grade structure of the elementary schools will be adjusted from k through 5 grades to k through 4 grades. Under this arrangement, all fifth grade students will attend Austin or Weiss middle schools with sixth graders while all seventh graders students will be moved to Central to attend school with all eight grade students. Adjustment of the distribution of games accommodate seventh grade students.

Fire Fighting Facilities

At present, Galveston has six fire fighting stations. The stations and their major pieces of equipment are:

Station #1, City Hall	1, 1500 gpm pumper 1, 1000 gpm pumper 1, 135 foot aerial pumper (1700gpm) 1, 85 foot snorkel pumper (1500 gpm) 1, rescue truck
station #2, 5 th and Church streets	1, 1500 gpm pumper
station #3, 50 th and Q ½ streets	1, 1000 gpm pumper
station #4, Scholes field	1, crash truck (1000 gpm)
station #5, 56 th streets and Ave.k	1, 1,000 gpm pumper
station #6, 12 Mile and Stewart RD.	2, pumpers; place holding facility; and emergency medical service station used during summer weekends only.

The city has acquired a new 1250 gpm pumper that will be added to the truck fleet and result in the redistribution of some of the truck equipment among the stations.

Due to development of West Island, the city has identified the need for a new station on a site near the Sea Isle development, however, funds for capital construction could not be allocated in the current fiscal year budget. This station remains as the highest priority for construction of new fire stations.

Planning the optimum location of additional fire stations on Galveston Island is difficult due to the island's length, 29 miles, and relatively narrow width, 1 to 2 ½ miles. At present, five fire airport and 2nd street are spaced from ¾ to two miles apart. The city's other station, #6, on 12 Mile Road, is over seven miles west of the airport station.

Fire station location standards indicate the spacing of stations should be related to the density of development; in high density areas, spacing should provide a service radius can be up to one mile, in very low density areas the service radius can be up two four miles. The development pattern on West Island will not permit full advantage to be taken of station's full service radius due to the island's narrow width. Stations spaced to meet minimum low density service radius dimensions may result in an over building of facilities on per capita basis.

The potential character of development along the east-west axis of Galveston Island also creates planning problems. If high density service radius dimensions may result in an overbuilding of facilities on a per capita basis.

The potential character of development along the east-west axis Galveston Island also creates planning problems. If high density development, especially high-rise buildings, are permitted to develop in a linear manner adjacent to FM 3005 and the beach, a higher standard of fire service and a close spacing of stations will be required. It is likely that the density of development elsewhere in the FM 3005 corridor adjacent to the high density strip will be low to medium density justifying a wider spacing of stations to serve the linear high density development will also result in a n overbuilding of facilities on a per capita basis.

Due to the high cost of capital facilities and manpower for new fire fighting companies, the city may be required to select a large service radius for new stations on West Island and to restrict density development from areas with fire-station service appropriate for low density development.

The location proposed for station #7 near the Sea Isle development will result in a nine mile distance between stations #6 and #7, and a distance of 4 ½ miles from station #6 and #7, to the west end of the island. As development occurs in the area between stations #6 and #7, an additional station may be required if higher density development is permitted. Due to the extent of urban uses already approved in the White Sands Development- over 2000 hotel/condominium, 4000 dwelling units and 30 acres of commercial uses- an additional station will be required. If high-rise buildings are constructed, the new station may also require aerial or snorkel truck units.

The portion of the island between stations #6, at 12 Mile Road, and #5, at Schools Field, will experience additional development, especially after construction of a new trans-bay bridge linking 8 Mile Road to the mainland. Given the improved access to the area, its proximity to the higher density development of the east end and existing scattered higher density development already approved by the city, it is likely the new development will justify the need for an additional station in the vicinity of 8 Mile Road

and FM 3005. Pelican Island is presently provided initial fire-response service by station # 5 at 56th street and avenue k. Access to the island is provided only by the 51st street/ Seawolf Parkway bridge. With additional development of industrial and institutional uses on Pelican Island, it is likely that an additional station will be required. Also, if the east-end flats are developed extensively, an additional station may be required. Present service to any new uses on the flats would come first from station # 2 located at 5th street and church street. Station # 2 is approximately two miles from the East End of the flats area.

Natural Features

Galveston's unique and fragile environment is an important part of the city's attraction to residents and visitors. The natural features which contribute greatly to the city's economic and physical well-being include the fish and wildlife water quality, beaches and dunes and wetlands. The specific focus of the natural features descriptions and policies in this document are the natural features of West Island. The rapid development of this area threatens to endanger both the West Island natural habitats and the residents and visitors. The following text describes the character and unique aspects of the natural features.

Water Quality

The Galveston Bay system includes several small bays and inlets, East and West Bay, Trinity Bay, and the small Christmas and Drum Bays. In total, these shallow, submerged areas cover an area of 553 square miles within the Galveston-Houston area.

West Bay lies immediately north of Galveston Island. It is a relatively low-energy environment, protected from the gulf by the Island. Water exchange between through San Luis Pass and Bolivar Roads. The salt-wedge, the mass of marine water that is initial mixing zone with the fresh or estuarine waters, penetrates only to a point slightly inside San Luis Pass and slightly west of Pelican Island (see figure 15, Biological Feature /Consideration map at the end of the section). The mean daily tidal range is only one-foot, which provides for little actual water volume turnover in the bay. This indicates that the bay waters are not flushed out during the normal tidal cycle, leaving waters in the bay for extended periods of time resulting in nutrient build-up or other potential pollutant development.

The salinity of the bay is variable and depends on the amount of runoff into the bay. Following heavy rains, especially after hurricane storms, the saline waters become greatly diluted by the fresh waters flowing in from inland drainage, turning the bay waters brackish (low salinity). Conversely, during hot and dry summers, evaporation and lack of freshwater input increase the bay salinity substantially. Much of the bay adjacent to the island is very shallow, ranging from one to three feet deep. The deeper areas, four to

eight feet deep, are associated with navigation channels and other alterations of the substrate (bay floor).

Because of the slight tidal exchange in the bay, pollutant build-up can develop if pollution discharges are not controlled. Fecal coliform and total coliform, (bacterium from the intestinal tract of mammals) are being monitored on West Bay by the Texas department of Health. Coliform counts have exceeded health safety levels in the past. Pollution contributors are suspected to be faulty sewage disposal systems on the Inland and land runoff of fertilizers, pastureland, and other non-profit surfaces, as well as discharge from point sources from the mainland.

The “loading limits” of the bay are the amount of pollution that the West Bay area could be expected to successfully dilute without experiencing adverse water quality conditions. These limits have not been determined. The bay physical limitations placed on its ability to dilute pollutants because of the slight tidal exchange and poor water flushing. Site-specific sampling in the canal areas and inlets of the island indicate the pollution levels have exceeded state standard.

The Department of Health has closed the harvesting of shellfish in residential subdivision channels (canals) and harbor areas on the island in radius of 300 yards offshore from the mouth of the canal. The area is illustrated in figure 15.

Potential pollution sources on Galveston island are septic and sewage system failures, agricultural runoff, fertilizer and urban runoff, uncontrolled point sources (pipes discharging into the inlets and lagoons), and any restrictions on bay circulation and flushing.

Fish and Wildlife

The fish and wildlife resources of Galveston island are rich and diverse; bay sport fishery is significant . In 1984 Galveston County Issue 45,444 fishing permits and 7,746 combination fishing/hunting license. In Harris County 101,595 fishing permits were issued and 91,861 combination permits. In Brazoria county 21,816 fishing permits were issued and 10,170 combination permits. It is assumed that many of these permits were utilized in the Galveston area. The Texas Parks and Wildlife study of 1984 found that from 1974-1983 an average of 935,000 man-hours were annually spent on recreational fishing in Galveston Bay.

The commercial fishery for Galveston and Trinity Bays produced an average catch of 820,300 pounds per year of finfish, and the following shellfish harvest:

Pink/brown shrimp	4.1 million pounds
White shrimp	6.5 million pounds

Blue crabs	3.3. million pounds
Oysters	4.7 million pounds

An estimated 90-98 percent of the commercial catch of the Gulf is of estuarine dependent species. Some 80 percent of the Gulf fishery used Galveston Bay as a nursery. Specific estimates for the bay portion adjacent to the island are not available.

Most of the wetlands border the northern portion of the island demonstrate a rich and productive estuarine habitat. Nursery grounds for fisheries are commonly found, as well as areas of productive benthic (bottom) communities (polychaetes, crustaceans, pelecypods, and nermertines).

The bird population of Galveston Island is extensive. Waterfowl use the island during the fall, winter, and spring months. Shorebirds and wading birds use it year-round, and many species nest on the island. Seabirds use the island most of the year, and song birds depend on the island during their migration into the interior of the U.S. and Canada. During five winter bird surveys, Galveston recorded an average 162 species of birds and 90,400 individuals. This ranked number 30 of 1,363 study areas nationally. Twenty-one colonial nesting sites of birds are located on the Biological Features map, figure 15.

The oak mottes of Galveston Island and other Texas Gulf locations hold particular value to the migratory song birds. Birds crossing the Gulf are subject to severe weather conditions during the spring migrations. If rains are experienced over the gulf, the birds will often require perching areas on land to rest and take food and water. Wooded areas that provided the proper habitat are scarce in the north Texas coast; however, Galveston provides some critical wooded areas to serve this function. Substantial numbers of birds have been observed swarming the oak mottes of the island during a bird migration “fall-out”. There are three mottes located on West Island, see Figure 15:

- Moody Ranch, Adjacent to Sweetwater Lake (3 acres)
- Kite Woods, adjacent to Eckerd Bayou (3 acres)
- Pirates Coves 6, adjacent to Ekerd Bayou (20 acres)

Beaches

The beaches of Galveston Island are constantly moving, a result of the continuing process of wave action and sand movement. The sand particles of the beach are constantly shifted by wind forces or wave action in both seasonal and long-term cycles. The small waves move sand shoreward, toward the Gulf during the winter seasons causing erosion. Wind processes typically mavo the sand inland, and is known as the eolian process. The winter erosion of the beach usually results in the build-up of sand bars offshore.

The movement of sand parallel to the shoreline is called littoral drift, or transport. Galveston Island experiences a predominantly southwestern littoral sand movement. The overall Gulf sand budget is the total amount of sand available for movement along the coast line. The sand budget has diminished over the past 50 years because of flood control measures, drainage alterations, navigation structures such as jetties, channel construction and other factors that have reduced the movement of particulates from the shore into the Gulf.

Hurricanes have caused severe erosion on West Island. Hurricane Alicia caused an estimated 100 feet of erosion on West island, and up to 200 feet at the west end. Aerial photo review indicates that hurricane activity can cause significant losses to the beach and dune areas, with accretion restoring part or all of the losses given enough years of relative calm. The historical data available indicates that the beaches rotate through erosion cycles and accretion cycles which each last 10 or more years. The unknown factor at this time is whether the Gulf sand budget is sufficient to continue replenishing the beaches' sands after an erosion cycle. The long-term littoral sand budget is not known, raising fears that the sand eroded away now will not be replaced.

Erosion Rates and Control

Erosion rates have been estimated by several different agencies and individuals for Galveston Island. Rate estimates vary according to criteria and study methodology. The city is best suited to use the rate of erosion estimating method described in the beach and Dune Management plan and restated in the Comprehensive Plan (under performance standards). This uses the ten-year erosion rate criteria, based on aerial photo review. This method can be implemented by the city staff for the specific location of the planned development. The procedure is usable by the city and fair to the land owners/developer. The comprehensive plan policies recommended that this rate be reviewed annually; the city may find good reason to adjust the ten-year criteria in the future. Data is not available at this time to justify changing the erosion rate, or methodology, for city planning purposes.

Erosion control methods are extremely difficult to recommend within a planning framework, Galveston Island has tried numerous methods to arrest the erosion of its beaches and shoreline, with the only truly successful method being the Seawall. The groins along the Gulf shoreline have been found to slow down the erosion rates, but not arrest them. There are several control methods being studied and marketed around the world for ocean-front protection, and the larger develops on Galveston Island are studying several of them. However, to date there are no known methods directly applicable in a cost-effective manner to Galveston.. The comprehensive plan recommends in the policies (see Section VI) that the city continues to look for viable artificial or natural system that would arrest the erosion conditions on the island. The intent is to keep the door open to consider the right erosion control technique when it is presented.

The initial vegetation on the forming dune is the pioneer vegetation. They first appear in small clumps on the coppice mounds (see figure 5, Section II). As the plants grow and die , they develop soils more conducive to further plant growth, eventually developing more stable, productive soils. As the vegetation expands, the wind blown sands become trapped in the plant material, and the dunes begin to grow and expand. As this stabilization process is set in motion, the Island shoreline and foredunes become more stationary. Typical of most barrier islands, this provides the fundamental protection against winter erosion and storm surges. The adopted Beach and Dune Management Plan contains a more detailed description of the technical processes.

Galveston Island has experienced the most severe dune erosion and dune losses where vegetation has been removed by natural or man-made activities. The protection and enhancement of the dune system is the city's best structures such as groins, seawalls, and offshore reefs that are properly constructed to protect beaches.

Washover areas

During hurricane conditions, low-lying coastal barrier islands may be subject to being washed over by the tidal storm surge. If proper conditions exist in the structure of the island, washover channels may develop. Washover channels are calculated based on the existing topographic relief of the island compared to potential tidal flows during storms and hurricanes. Such channels may represent a particular hazard to future development and, therefore, warrant special development considerations. Washover hazards may include accelerated erosion, structural damage, loss of roads and utilities, human evacuation problems, and other hazards.

Washovers on Galveston Island have been identified in the following documents regarding Galveston Island:

- Fisher, et. Al. Environmental geologic Atlas of the Texas Coastal zone
- Galveston – Houston Area, Bureau of Economic Geology, University of Texas at Austin, 1972;
- Brown et. al. Natural Hazards of the Texas Coastal Zone, Bureau of Economic Geology, University of Texas at Austin, 1974

Citations referring back to these documents occur in other literature relative to Galveston as well.

There are three problems, however, in applying the information to the planning program.

1. The mapping of the washover channels is vague; the scale is so small that specific boundaries for the washovers cannot be determined;

2. Data supporting the location of the washovers on Galveston Island has not been found. FEMA and their technical consultants who developed the flood maps for the island could not provide additional information and neither party was able to substantiate the washover channels locations or their existence;

3. The washover concept has been discussed openly in Galveston the past several years - in news articles and court documents – showing growing public interest. The increased interest has not, however, added to knowledge of the washover channels actual location.

Washovers are of interest in local planning activities but substantive data that would allow the city to map the specific areas and justify special development standards does not appear to be available. The performance standards proposed for the 100-year floodplain areas will probably suffice for hazard protection purposes until better data becomes available to locate specific washover areas.

Wetlands

As discussed in the Fish and Wildlife description in this section, the wetlands are an integral part of the island environment. Wetlands provide critical habitat for the majority of the fish and wildlife species found in the Gulf and Galveston Bay. Wetlands also provide important functions in storm water retention, erosion control, pollutant polishing, recreational uses, and biological study. Pollutant polishing is the cleansing of pollution as it moves through the wetland environment. An estimated 90 – 98 percent of all Gulf fish depend upon the wetlands for some part of their life cycle.

The loss of wetlands has occurred throughout Galveston Bay for over 100 years. The losses on Galveston Island have been estimated at about 3,1000 acres of estuarine wetlands between 1956 and 1959, and about 300 acres of non-tidal wetlands for the same period. The long-term impacts of these losses cannot be estimated, nor can the net balance requirement of wetland needs be determined. It is generally agreed throughout the coastal U.S. that wetland losses must be minimized, if not stopped, before a critical imbalance is reached.

Galveston's wetlands provide important habitat for numerous species of birds and fish, as can be seen any time of the year. The wetlands protect the island's north side from erosion, and help to store the storm waters pushed into the bay from the Gulf. The wetlands reduce the water quality problems caused by sedimentation and help to filter and absorb the pollution coming from upland runoff and sewage discharge.

Based on the best available information, the location of the tidal and freshwater wetlands are shown on Figure 15, Biological Features/Considerations.

NOTES - SECTION IV

1. Barry Goodman & Associates, 1985 Galveston County Regional Mobility Plan, H-Gac, Houston, Texas, 1985.
2. Division of Shellfish Sanitation Control, Sampling Data From 1979 through 1984, Texas State Department of Health, Austin, Texas.
3. Order Number MR-65, Issued September 1, 1983.
4. McEachron, L.W., A.W. Green, Weekend Sport – Boat Fisherman FinFish Catch Statistics for Texas Bay Systems, May 1974 – May 1983, Management’s Data Series No. 59, Texas Parks and Wildlife Department, Austin, Texas, 1984.
5. Hamilton, C.L., G.E. Saul, Texas Commercial Harvest Statistics 1977 – 1983, Management Data Series No. 64, Texas Parks and Wildlife Department, Austin, Texas, 1984.
6. Gilmore and Trent, Abundance of Benthic Macroinvertebrates in Natural and Altered Estuarine Areas, National Marine Fisheries Service, April, 1974.
7. Hielbrun, L.H., “Christmas Bird Count,” American Birds, Annually.
8. Mueller, Allan J., An Inventory and Habitat Analysis of Upper Texas Coast Woodlots, U.S. Fish and Wildlife Service, Galveston, Texas, December 1981.
9. Ibid.
10. Benton, A.M. and J. Bolleter, Airphotos Analysis of the Impact of Hurricane Alicia on Galveston Island, Texas A&M University, Seer Grant Program, College Station, Texas, September 1984.
11. U.S. Fish and Wildlife Service unpublished data.

V. HOLDING CAPACITY ANALYSIS

INTRODUCTION

The number of houses and people that a city can support – and the effect the population will have on the city’s natural and man-made environment are of vital importance to contemporary cities such as Galveston. A holding capacity analysis (also known as carrying capacity analysis) is a planning process that studies the natural and man-made environment’s ability to absorb and support growth and development without being degraded. The process is complex and can be sued many different ways. A holding capacity analysis can cover a side range of variables and develop detailed development standards to regulate growth. Or it can be a general examination of growth issues facing an area to determine land development policies to help shape the location and form of growth. Whether a holding capacity is general or specific in nature, there are four basic assumptions which underlie this planning concept:

There are limits to the amount of growth and development the man-made environment can absorb without threatening public health, welfare and safety. For example, there is a limit to the amount of pollutants that West Bay can absorb without destroying the natural plant and animal life supported by the bay. Existing canal subdivisions on West Island currently exhibit real or potential problems with wastewater management which has resulted in closures of bay waters to all shellfish harvesting within radius of 300 yards offshore of the canal outlets by the State Department of Health. The water in the vicinity of the mouths of canals has been pushed beyond its capacity to absorb pollutants.

Critical population thresholds can be identified beyond which continuation of growth or development at greater densities will trigger the deterioration of natural resources and city infrastructure. On Galveston Island, this is especially apparent on major thoroughfares. The existing population and seasonal traffic population on West Island place heavy demands on the area’s two roadways, Termini Road and Stewart Road. As development continues, this demand will become increasingly critical.

The natural capacity of a resource to absorb growth is not fixed, but can be altered Human intervention. Many of the water quality problems on West Island are apparently the result of septic system failures. The holding capacity of the area may be greatly increased if different sewage systems are utilized.

The determination of the limit of capacity of a give system is, finally, a judgmental act. Although this type of planning process is grounded in scientific and engineering principles, the interpretation of the data is the responsibility of the local government. The value that the City of Galveston and its residents place on their chosen quality of life is the determining factor in the interpretation. For example, the level of traffic congestion the local residents are willing to tolerate on summer weekends on major streets and the desire to maintain wetlands as habitats for plant and animal life are standards set by the community based on the collectives value judgments.

Use of the following analysis must recognize the general level of information used as a basis for the study. As refined information becomes available and as decisions are made to alter the stated assumptions, the recommendations derived from this holding-capacity, analysis must be reexamined.

West Island's natural and man-made features are continually impacted by development in the area. To date, development has occurred in a random scattered pattern depending upon the availability of water, roads, and sanitary sewer service and financing for these facilities. In particular, sanitary sewer service has been a major determinant of proposed development. Figure 13, Section IV, illustrates existing development on West Island and the wastewater treatment facilities serving each development. This map also identifies two large portions of West Island which are not provided sanitary sewer service and do not contain major developments. These two areas, delineated below in Figure 17, are the focus of the following general holding capacity analysis.

WEST ISLAND HOLDING CAPACITY ANALYSIS

The basic principles of a holding capacity analysis have been used in the following analysis of potential future development on West Island. An analysis of each study area is presented. The objective of the analysis is to give an overview of existing and potential future conditions based upon information which is currently available.

Analysis of the two areas reviews the existing and potential future conditions of:

- **Traffic**
- **Water Distribution**
- **Sanitary Sewer Service**
- **Natural Features**
- **Storm Hazards**

This information is followed by a discussion of conclusions drawn as a summary of the holding capacity of the study area. Information is presented in the form of ranges and estimates reflecting the general nature of this analysis. In particular, the traffic estimates are an assimilation of general information.

STUDY AREA 1

Study Area 1 is delineated in Figure 18. The area is bounded by the proposed Sunbird Development to the west, West Bay to the north, the Village of Jamaica Beach to the east and the Gulf of Mexico to the south.

Existing development in Study Area 1 is primarily composed of recreational vehicle parks, beachfront homes, Indian Beach subdivision and the approved Pointe San Luis subdivision. The existing subdivision has a relatively low density reflecting the use of septic tanks in this area. There is one commercial location directly west of the Village of Jamaica Beach. This site is a designated commercial site in the West Island Commercial Land Use Policy. Study Area 1 also includes a large public beach parking area.

Although there are not any specific large traffic generating uses at the present time, there are a number of access points onto Termini Road due to the above listed uses. Within a 3.5 mile length on this 2-lane roadway there are approximately 9 access points.

Based on census data, approximately 15 % of the units were occupied on a permanent basis, and it is assumed, the remaining units were either second homes or were vacant unsold units.

Since 1980, the city has granted development rights in Study Area 1 through approval of planned development projects the largest of which is Pointe San Luis. The Development Plan for this subdivision indicates approximately 182 acres for single family detached housing, 38 acres of attached single family, 91 acres of condominium and single family mix and 28 acres of public open space for a total of approximately 600 acres.

In Study Area 1, there are two vacant sub-areas that have not been included in planned development projects and are located outside the environmentally sensitive wetlands and beach area along the bay and gulf coast. The sub-areas are located west of Jamaica Beach and east of Sea Isle. An additional vacant sub-area west of the study area is located between the Bay Harbor and Pointe San Luis developments. All of the sub-areas in Study Area 1 contain from 1250-1350 acres of uncommitted but developable land.

TRAFFIC

Termini Road is the only roadway connection linking Study Area 1 to the remainder of the city. The present road has two lanes and, according to level-of-service standards reported in the Regional Mobility Plan, has the following traffic capacity ranges. Level of service (LOS) A-B,

Accepted as a desirable standard for rural areas, ranges from 0 to 3700 vehicles a day; LOS C-D, usually accepted as a desirable standard for urban areas, ranges from 3701 to 6100 vehicles a day; LOS E, usually considered to be symptomatic of a street suffering from traffic congestion, ranges from 6101 to 10,000 vehicles a day; and LOS F, an unacceptable forced-flow condition occurs when traffic exceeds 10,000 vehicles a day.

Level of Service LOS	Average Daily Traffic	Road Service
A-B	0-3700	Rural Areas
C-D	3701-6100	Urban Areas
E	6101-10,000	Symptomatic of Traffic congestion

The official segment in the transportation network in Study Area 1 is the eastern most segment of Termini Road where all of the traffic entering and leaving the study area from the remainder of the city must pass. Several traffic counts were taken by the city at Termini Road and 16 mile Road during typical springtime week days and during the winter season weekdays which indicates differences in spring/summer traffic reflected in average daily traffic counts. The results of those counts are as follows:

<u>DATE</u>	<u>TRAFFIC COUNT</u>	<u>LEVEL OF SERVICE</u>
April 1984	4319 ADT	C
August 1984	5849 ADT	D
Spring 1985	5131 ADT	C-D
Labor Day 1985	8471 ADT	E
June/July 1986	4940	C-D
Oct/Jan 1986	2070	A-B

As indicated by the above table, the summer months experience a rather significant increase in traffic over the winter season as would be expected due to the beach and summer home use. The traffic count taken during Labor Day 1985 at Termini Road and 16 Mile Road of 8471 vehicles represents a significant increase over either the summer 1984 or summer 1985. Due to threatening weather conditions, the 1985 Labor Day traffic was not regarded to be as heavy as it would have been if ideal beach weather prevailed.

The general trend of summer traffic counts indicate a C-D LOS range which is representative of an urban use service of the roadway. Recognizing that Termini Road is experiencing a level of service of an urban roadway and there are between 1250 and 1350 acres of uncommitted but developable land, concerns becomes evident as to the future serviceability of Termini Road.

The concern becomes more apparent when the traffic estimated to be generated by the approved but yet to be developed land use plan of the White Sands development is added to the most recent actual traffic counts. The following traffic count estimates are based upon non-summer roadway use realizing that summer roadway use is variable depending upon weather conditions and the cyclical trends in vacationer beach visitations.

Table 17

**ESTIMATED TRAFFIC GENERATION – STUDY AREA 1 AT TERMINI ROAD
AND 16 MILE ROAD**

A.	<u>Non summer Weekday Actual Count</u>	2070
B.	<u>Approved Non – constructed Units Area 1 1980 – 1985</u>	
	Single Family Units/15 % Occupancy (1713 x 0.15)	257
	Trips Per Unit, Per Day	<u>10</u>
	Total Single Family Unit Trips	2570
	Multiple-Family Units/15% Occupancy (3250 x 0.15)	485
	Trips Per Unit, Per Day	<u>6.1</u>
	Total Multiple-Family Unit Trips	2959
	Total Residential Trips projected	5529
	Less 30% Trips Occurring Inside Study Area 1	(-) <u>1659</u>
	Total Residential Trips generated by Area 1 Termini Road at 16 Mile Road	3870
C.	Hotel Rooms at 60% Occupancy (2017 x 0.60)	1210
	Assume 2 Trips Per Day/per room	<u>2</u>
		2420
D.	Commercial Area -	30 Ac.
	Assume Floor Area Ratio of 0.3	390,000 sq.ft.
	Assume 20% of Trips attracted From east of 16 Mile Rd.	<u>3268</u>
	Total Actual and projected trips generated By approved non-built development – Termini Road at 16 Mile Road (A+B+C+D)	11,628
	Use ADT Range (10% +)	10,460-12,790

The total estimated 11,628 average daily traffic range generated by development that was counted in 1986 and that calculated to be generated by traffic counts and that calculated to be generated by approved non-constructed units traffic indicates the two lane section of Termini Road will experience a level of service F. With Termini Road so severely impacted, it is unlikely that all development presently approved by the city will be built until the road is

widened. Rather, the level of service on the two lane road will gradually deteriorate to a serious level of congestion which will make the area unattractive for additional construction.

If Termini Road is widened to four lanes as recommended by the Regional Mobility Plan, all of the development approved by the city may generate average daily, non-summer, weekday traffic of 10,466 to 12,790 vehicles on Termini Road resulting in a B-C LOS at 16 Mile Road. If the non-Summer weekday traffic is increased by 65 percent for a summer weekend day ($11,628 \times 1.65 = 14,186$), the following ADT ranges and level of service conditions will exist on (four lane) Termini Road.

Non-Summer weekday ADT 10,466 to 12,790; LOS B-C

Summer weekend ADT 17,268 to 21,104; LOS E (high end of t he E range)

The estimated future traffic volumes are considered to be conservative due to assumptions that the future permanent occupancy rate of dwellings will remain at a low 15 percent level; commercial property will attract 80 percent of its trips from within the study area; and hotel occupancy rates in the non-summer months will be relatively low at 60 percent occupancy. If these assumptions are too conservative, trips will increase and the level of service will deteriorate on Termini Road. Also, trips may increase on Termini Road due to construction of improvements in the 80 acre park owned by Galveston County and located west Terramar Beach.

The level of service based on estimated traffic volumes noted above indicates Termini Road with four lanes will probably provide an acceptable level of service for traffic during the non-summer months. During the summer, however, the level of service will likely deteriorate to the high E range on weekends, especially during peak traffic flow conditions over holiday periods. The E level of service is characterized by traffic conditions that are unstable, vehicles operating at speeds below the posted speed limit and stoppages of momentary duration.

The acceptable level of service on Termini Road is based on construction of a four lane divided roadway. If construction standards on the road are upgraded to restrict points of roadway access to grade separated intersections, the traffic carrying capacity of the road could be increased and the level of service would be improved.

While the above analysis addresses traffic generated by actual traffic counts during 1984 and 1985, and development presently approved in Area 1, a key issue remains; how much additional development and resulting traffic can Termini road handle?

Determination of the amount of additional development that can be supported by Termini Road depends on the worst level of service the public wants to tolerate and the time of year when the worst traffic will be experienced. It is recommended that the summer weekend period be used as the critical time period and that a mid-range of E level of service be

tolerated. If the maximum traffic range of 21,104 ADT (for existing and approved development) is allowed to increase to 26,250 ADT (the mid-point in the E LOS range) then an additional 5146 trips can be accommodated.

The additional traffic volume to use Termini Road at 16 Mile Road can be translated into the number of dwelling units using the assumed ITE traffic rate and a factor indicating 30 percent of the trips will occur within Study Area 1.

Based on this analysis, an additional 700 single family or 1200 multi-family dwelling units can be constructed. No additional residential development beyond these units should occur, therefore, unless additional traffic carrying capacity is provided to tie Study Area 1 to the city or the mainland, or the actual traffic volume does not reach the projected levels.

The additional traffic carrying options to expand the development potential include widening of Termini Road to six lanes, and/or construction of a West Bay crossing to the mainland from Study Area 1.

The addition of two more lanes to Termini Road for a total of six lanes may be difficult to build for the length of Termini Road between Study Area 1 and 8 Mile or 7 Mile roads.

The amount of land that can be absorbed by 700 single family or 1200 multi-family units depends on the density of construction. Recent single family subdivisions approved in Area 1 range from 2.8 to 4.6 dwelling units per acre which would require 250 to 152 acres for 700 units.

Multi-family developments have been approved at densities ranging 5.7 to 35 units per acre which would require 210 to 34 acres for the 1200 units.

If development other than residential units is proposed to use the additional trip carrying capacity (5146 trips) of Termini Road, a very careful analysis of the use and its likely impact on traffic should be made. Land uses devoted to providing local retail service that have their entire market area within Study Area 1 will have local traffic impacts but may not attract customer (trips) from beyond the study area. Such uses may help reduce the number of residential trips leaving the study area for local retail services by providing those services within the study area.

On the other hand, commercial uses oriented to the tourist will attract trips from outside the area. The magnitude of the attraction should be translated into trips to measure the impact.

Water Distribution

Future water distribution to the far west end of the island will be dependent upon the planned installation of an additional transmission line sized to serve the proposed development. The new line is part of an overall plan being considered to provide services to West Island. See Section IV, Physical Features Influencing Development. The line ranging in size from 12 to

20 inches will connect the existing system to the new elevated tank at the White Sands development. Future development in Study Area 1 must address provision of these additional lines. If planned improvements are installed in a timely manner, the supply and distribution of public water should not limit development.

Sanitary Sewer Service

Sanitary sewer service in Study Area 1 is provided by the Terramar/Isla del Sol and Point San Luis plants. The Terramar/Isla Del Sol plant is a metal package-type plant that must be upgraded and expanded to function as a permanent regional plant. Its service area which has not been absolutely defined may begin about at a point west of the Indian Beach and then run west to the east limit of the Pointe San Luis plan service area. Approximately 470 acres of undeveloped and uncommitted land west of Indian Beach may be in the plant's service area. The 570 acres (approximately) of land between Indian Beach and Jamaica Beach may not be economically served by the Terramar/Isla Del Sol plant; development of this area should not occur until a feasible sewer service plan is devised.

The Pointe San Luis treatment plant has approximately 270 acres of undeveloped and uncommitted land and its service area.

It is assumed the sewage treatment capacity provided by the city's regional plant system can be expanded as needed to serve additional development provided the following conditions are met: 1) the city can devise a financial arrangement to pay for treatment plan expansion; 2) all necessary governmental permits for discharge from the expanded plants are received; and 3) a sewer service plan is approved of the Indian Beach/Jamaica Beach area. Sewage treatment facilities may, therefore, not be a factor limiting development. A master sewer plan should be prepared to address the sewage treatment issues in Study Area 1, and if the above conditions cannot be met, the limitations placed on development by limited treatment facilities should be identified.

Using a factor of 100 gallons per capita, per day, the 700 single family and 1200 multiple-family units can generate the following flows that must be accommodated by adequately sized lines to the treatment plants.

Single family units:

$700 \text{ du} \times 3.00 \text{ person/du} \times 100 \text{ gal/day per/person} \times 2.5 \text{ (peaking factor)} = 693,000 \text{ gal. Per day}$

Natural Features

The environmental policies outlined in Section VI of this document will influence a large portion of Study Area 1; both tidal and non-tidal marshes are addressed. The wetlands are

located adjacent to the bay and do not have a great potential for development. Although small portions may be utilized for bay access, major development is not expected and is not calculated in the land area assumed to be available for development. The small area of wetlands located on the interior of the island have not been included in the estimate of land available for development.

Storm Hazards

The storm hazard development factor cannot be calculated specifically into a formula or reduced to numbers for Study Area 1. The Regional Mobility Plan, however, has determined that construction of a new bay crossing at 8 Mile Road and improvements to 8 Mile Road, Stewart Road and Termini Road are necessary to provide improved evacuation opportunities for West Island residents.

Study Area 2

Study Area 2 is delineated in Figure 19. The area is bounded by the Pirates Cove Municipal Utility district to the west, West Bay to the north, the Galveston Airport to the east and the Gulf of Mexico to the south. The 1985 bond election authorized construction of a sanitary sewer line which will serve this area. The proposed location of an additional mainland causeway access at 8 Mile Road will greatly enhance access to Study Area 2. Although the extension of city services will urbanize the area, this portion of the city is not protected by the seawall.

There are two commercial sites located in this area as designated by the West Island Commercial Land Use Policy. One is an approved Planned Development for 410 condominium units directly east of the Bermuda Beach subdivision on Termini Road known as the Island Princess. The second is located between 7 Mile and 8 Mile roads on Termini Road. Due to the proposed mainland access at 8 Mile Road it is recommended that this commercial site be located on or adjacent to 8 Mile Road at the intersections of Termini Road or Stewart Road.

There are two commercial sites located in this area as designated by the West Island Commercial Land Use Policy. One is an approved Planned Development for 410 condominium units directly east of the Bermuda Beach subdivision on Termini Road known as the Island Princess. The second is located between 7 Mile and 8 Mile roads on Termini Road. Due to the proposed mainland access at 8 Mile Road it is recommended that this commercial site be located on or adjacent to 8 Mile Road at the intersections of Termini Road or Stewart Road.

The ability of West Island roadways to serve Study Area 2 is of particular significance to future development in the area. Due to the linear configuration of the island, traffic from

points west of the study area will impact Area 2’s roadways. The following analysis reviews the potential traffic generated by development within the study area and to the west. The majority of this traffic will travel on Termini Road or Stewart Road to reach the mainland and Galveston’s urban center.

Census data indicates the portion of Study Area 2 in census tract 1252 had 59 percent of its units occupied by year-round residents, while the portion of the study areas in census tract 1253 had 15 percent of its units permanently occupied.

Since 1980 the city has granted approval to construct 340 single family, 475 multi-family and 185 condominium units in Study Area 2. For the purposes of analysis, multi-family and condominium units will be combined for a total of 660 multi-family units.

There are 3600 to 3800 acres of vacant land suitable for development in Area 2. The areas generally fall into two east-west corridors. The first is parallel and adjacent to Termini Road and Stewart Road, and the second is located to the north and separated from Stewart Road by freshwater wetlands.

Traffic

Study Area 2 is connected to the urban area of Galveston by two roadways, Termini Road, a four lane divided highway and Stewart Road, a two lane road. The Regional Mobility Plan lists the level of service for various classes of roads. While in Area 1 a rural level of service was used to measure the performance of Termini Road at 16 Mile Road, both rural and urban standards are reported for Area 2. At present the area is relatively sparsely developed and roads generally function as rural roads. However, as urban development increases, and urban level of service may become appropriate. The urban level of service assumes traffic will move at a slower posted speed limit, say 35 to 45 mph versus the 55 mph limit in rural areas.

	Rural LOS		
	A-B	C-D	E
Four lane divided road 35,000	0-12,000	12,001-17,500	17,501-
Two lane road 10,000	0-3,700	3,701-6,100	6,101-

	Urban LOS		
	A-B	C-D	E

Four Lane divided road 23,000	0-16,100	16,414-19,100	19,101-
Two lane Road 11,000	0-7,780	7,701-9,100	9,101-

The assumed critical segments in the transportation network serving Study Area 2 are on Termini and Stewart roads at their intersections with 7 Mile Road. Traffic counts taken by the city on Termini at 7 Mile Road during the spring of 1984 and 1985 indicate a three percent decline where as traffic counts taken at the same area during Labor Day weekend 1985 and the summer (non weekend) of 1986 indicate a dramatic increase of over one hundred percent.

Traffic counts taken at Stewart Road and 7 Mile Road during Labor Day weekend 1985 and summer weekend 1986 both indicate a fairly significant increase of one hundred to two hundred percent during each period respectively. As indicated by the following chart, the level of service for rural roads levels D and e are experienced on Termini Road during summer periods.

<u>Date</u>	<u>Traffic Count</u>	<u>Level of Service</u>
Termini Road 1984	8997 ADT	B
Termini Road 1985	8730	B
Termini Road Labor Day, 1985	18,750	E
Stewart Road Labor Day, 1985	1,9995	A-B
Termini Road Summer 1986	16,110 (June/July)	D (high end of D range)
Stewart Road Summer 1986	3340 (June/July)	B (high end of B range)

Termini Road Winter 1986	5500	A
Stewart Road Winter 1986	1230	A

Estimates of traffic that may be generated as a result of existing plus unbuilt, but approved, development are shown in Table 18 for a non-summer weekday. The projected traffic is added to the actual traffic counts of a non-summer weekday of 1986 for comparison to level of service C-D recommended as a reasonable LOS to determine excess capacities.

Table 18

ESTIMATED TRAFFIC GENERATION – STUDY AREA 2 ON TERMINI AND STEWART ROADS AT 7 MILE ROAD

A.	Non-summer Weekday Actual Count (Combined Termini Road and Stewart Road)	6730
B.	Approved – Non constructed Units – Study Area 2	
	Single Family Units/59% Occupancy (454 x 0.59)	267
	Trips Per Unit/Per Day	<u>10</u>
	Total Single Family Unit Trips	2,670
	Multiple-Family Units/59% Occupancy (452 x 0.59)	389
	Trips Per Unit/Per Day	<u>6.1</u>
	Total Multiple-Family Unit Trips	2,375
	Total Residential Trips Projected	5,045
	Less 15% Trips Occurring Inside Study Area 2	(-) <u>757</u>
	Total Residential Trips Projected on Termini And Stewart Roads	4,298
	Plus 90% of Trips from Study Area 1 passing through Study Area 2 from Study Area 1 (8845 x 0.90)	7,960
	Total projected trips (90% Area 1 + Area 2)	12,248
	Total projected plus 1986 actual	6,730
	Total Trips Actual Count and Approved Unbuilt Units Termini and Stewart Roads	<u>18,978</u>

Based upon actual traffic counts for winter and non summer weekday periods Termini Road historically receives eighty one percent of the total traffic and Stewart Road receives nineteen percent. Based upon these percentages Termini Road would have a weekday traffic count of approximately 15,372 vehicles and Stewart Road approximately 3606 vehicles based upon actual and projected traffic counts.

Applying a 10% factor the following ADT ranges may occur for nonuser weekdays on the two roads:

Termini Road (81%) 13,375 to 16,340; LOS C-D (Rural Road)
Stewart Road (19%) 3,137 to 3,833; LOS A-B (Rural Road)

Historical summer traffic counts indicate that both roads experience an approximate 100% increase in traffic counts during summer peak periods over winter counts. Based upon this trend, peak traffic counts for both roads using actual counts, approved non-built units and 90% of Area 1 traffic passing through Area 2 could reach the following levels for summer peak periods:

Termini Road (81%) 26,750 to 32,960; LOS E (Rural Road)
 Stewart Road (19%) 6,274 to 7,666; LOS E (Rural Road)

If Stewart Road is widened to a four lane undivided street as shown on the Regional Mobility Plan, its capacity will increase and the following traffic split and level of service for rural roads may occur.

Termini Road (65%) 21,465 to 26,231 LOS E (mid range)
 Stewart Road (35%) 11,588 to 14,124 LOS D-E (four lane undivided)

To achieve the traffic capacity on both Termini and Stewart roads that has been reflected in this analysis, they must be operated and designed as efficient facilities with a minimum number of intersections. If Stewart Road is allowed to develop as an urban arterial with frequent intersections, the speed of traffic movement will decline, while the impacts of urban operating characteristics on Termini Road will result in the level of service declining to the E-F range.

The above analysis indicates a high to mid range of E LOS will be experienced on the average by traffic entering and exiting Study Area 2 on summer weekends based on estimates of traffic generated by existing and approved development. In determining the amount of additional traffic that can be tolerated by the street system based on construction of new development, the same standard applied in Study Area 1 has been used – i.e. allow the maximum range to achieve a mid-point on the E LOS range. The analysis for area 2 does include the assumption that Stewart Road will be constructed as a four lane undivided roadway per the recommendations of the Regional Mobility Plan.

Termini Road – Rural Road, four lane divided

Mid LOS E Range	26,250 ADT
Summer period maximum	<u>26,231</u> ADT
Excess Capacity	19 ADT

Stewart Road – Urban Road, four lane undivided

Mid LOS E Range	19,000 ADT
Summer period maximum	<u>14,124</u> ADT
Excess Capacity	4,876
Rounded to	4,900 ADT

Total excess capacity Termini and Stewart Roads during summer periods based upon pass through of traffic from Area 1 during the same period, rural LOS E for Termini and four lane undivided LOS E for Stewart Road is estimated to be approximately 4900 ADT.

As a result of the test, the excess capacity of approximately 4900 trips generated by Study Area 1 can be interpolated into an additional 565 single family units or approximately 1000 multiple family units based upon summer period traffic generated by the two study areas with the construction of Stewart Road to urban road, four lane undivided standards.

Should additional development be considered that would indicate an increase over the above suggested new development, those approvals must be based upon several factors. First, will the calculations for traffic be based upon summer period traffic? The above average daily traffic generation is based upon summer periods at which time use of summer homes decrease the vacancy factor and increased activities at the public beaches and public parks. Obviously, winter period traffic on Termini and Stewart Roads will be less, resulting in greater excess roadway excess capacities thus allowing for a position to be taken for a greater extent of development.

Secondly, a mid level of service E has been selected as an optimum acceptable level of service on the two roadways. A question can be posed: should the City of Galveston accept a higher range of level of service such as high E LOS or low F LOS particularly during the summer months?

The recommended development accommodations contained herein are based upon:

- There does not appear an opportunity for additional east west major thoroughfares on West Island.
- As future development becomes more dense, the concern for emergency evacuation requirements becomes more acute.
- An additional mainland connection at a future date may alleviate some emergency evacuation concerns but will make the West Island more accessible thus adding to its urbanization and beach use pressures.
- Judiciously regulated development controls implemented now will better accommodate the above described concerns.

The land use quantities and traffic assessments described herein do contain levels of tolerances; however, the traffic carrying capacities of these West Island thoroughfares are only one unit of measure and when the tolerances are used, other units of measure – i.e., infrastructure systems, drainage systems, impacts upon the fragile environment, etc. must also be considered and balanced against the economic/cost benefits of development.

Water Distribution

There are no major anticipated problems in providing an adequate water service to this area provided timely improvements are made to the system. Improvements being considered are discussed in Section IV, Physical Features Influencing Development. At present a 16" line located along Stewart Road and an 8" line located along Termini road provide service to Study Area 2.

Sanitary Sewer Service

Funds to enable construction of a sanitary sewer line from 7 Mile Road to 10 Mile Road to serve the area were approved as part of a bond program by the Galveston voters in 1985. Construction of this line will provide a sanitary sewer interceptor to serve the area between the current municipal sewer service area in the vicinity of 7 Mile Road and Pirates Retreat/Pabst Road. The interceptor, designed with 24" and 27" gravity flow segments and pump stations and force mains can support major quantities of land development in Study Area 2. The 27" segment of the interceptor will be capable of carrying between 7.0 and 8.0 million gallons a day at capacity. If the 2600 to 2700 acres of developable land in the treatment plant service area were used as shown in the following example, the new sewer interceptor system can handle between 90 percent and up to 100 percent of the flow generated by the new development. Two alternative density ranges for development are shown in the example resulting in projected flows of 8.80 mgd and 6.26 mgd.

	<u>AC</u>	<u>DU/AC</u>	<u>Du</u>	<u>PER/DU</u>	<u>POPULATION</u>	<u>G/P</u>	<u>MGD</u>
<u>OPTION 1</u>							
Land North of Stewart Road	1900	x 4	=7,600	x 2.5	= 19,000	x 250	= 4.75
Land South of Stewart Road	800	x 9	= <u>7,200</u>	x 2.25	= <u>16,200</u>	x 250	= <u>4.05</u>
<u>OPTION 2</u>							
Land North of Stewart Road	1900	x 3	= 5,700	x 2.5	= 14,250	x 250	= 3.56
Land South of Stewart Road	800	x 6	= <u>4,800</u>	x 2.25	= <u>10,800</u>	x 250	= <u>2.70</u>
			10,500		25,050		6.26

While the total sewage flow is dependent on the density of development, the actual rate of increase in the flow from year to year will be dependent on the rate of construction of dwelling units. The Houston-Galveston Area Council has estimated that 1611 dwelling units will be added to census tract 1252 (from approximately 7 Mile to 11 Mile road) between 1988 and the year 2000. Even if the actual growth rate occurs at a much greater rate, it is unlikely that Study Area 2 will be completely developed for many decades to come. The sewage flow capacity built into the 24-27 inch interceptor system should, therefore, accommodate all of the needs of the area, at least, well into the twenty-first century.

Before the new line's full capacity can be used, a bottleneck in the existing sewer system which connects the 27-inch line with the Airport Treatment Plant must be eliminated. At present, a 12-inch line between 6 Mile Road and 81st Street can handle less than ten percent of the projected flows from the fully developed area. To relieve the bottleneck, a 36-inch gravity line or a lift station and an 18-inch force main must be constructed.

The Airport Treatment Plant will serve Study Area 2. The plant's current capacity is:

3.75 mgd	Permit Capacity
<u>1.60 mgd</u>	Currently being used
2.15 mgd	Capacity remaining
4.00 mgd	Anticipated permit capacity without improvements
<u>1.60 mgd</u>	Currently being used
2.40 mgd	Capacity remaining

As development occurs in Study Area 2, the unused capacity of the plant will be diminished. Eventually the plant's capacity must be increased.

The master sewer plan that has been recommended herein should address the capacity of the plant and its staged enlargement. The analysis of the plant should also take into account the potential use of undeveloped land east of 7 Mile Road that is also located in the service area of the airport plant.

Natural Features

The environmental policies outlined in Section VI of this document will influence a large portion of the area between Pirates Cove and 7 Mile Road. Both tidal and non-tidal marshes are located here. The wetlands which are located adjacent to the bay do not have a great potential for development. Although small portions may be utilized for bay access, major development is not predicted and is not calculated to include the coastal wetlands.

The wetlands located on the interior of the island are scattered throughout the center part of Study Area 2. It is possible that future development may utilize mitigation practices to displace some of these wetland areas, however, estimates contained in this analysis preclude their use, or assume they will be replaced by a like sized area.

Storm Hazards

The storm hazard development factor cannot be calculated specifically into a formula or reduced to numbers for Study Area 2. The Regional Mobility Plan, however, has determined that construction of a new bay crossing at 8 Mile Road and improvements to 8 Mile Road, Stewart Road and Termini Road are necessary to provide improved evacuation opportunities for West Island residents.

CONCLUSIONS

There are three principal factors that will shape potential development of West Island:

- **Natural features**
- **Traffic handling capacity of roadways**
- **Sanitary sewer service**

Natural Features

The studies carried out during preparation of the Comprehensive Plan have systematically identified sensitive natural areas. Recognition of the need to protect these areas is reflected in the holding capacity analysis. Consequently, fragile natural areas not suited for development have been excluded from the potential development area.

Traffic

Due to the unique traffic conditions that prevail on West Island – the relatively small number of full-time residents and the relatively large number of weekend/seasonal residents and beach visitors – the variations between weekday traffic and peak weekend traffic conditions are substantial. If roads are designed to provide acceptable levels of service for weekday traffic, then the roads will be overloaded on weekends. If, on the other hand, roads are designed to accommodate weekend traffic, there will be unused and costly capacity built into the system during weekdays. The analysis contained in this plan is based on the need to provide an acceptable though not a high level of service for weekend conditions. A mid-range E level of service has been selected as the target conditions to be achieved on principal roads during weekend conditions.

Based on projected traffic volumes that will result when all of the currently approved land development projects have been constructed, summer weekend traffic should generally fall into the E level of service on principal roadways. A marginal number of additional trips may be accommodated before the potential level of service dips into the low range of the E level. The additional trips will be generated by 875 single family or 1500 multiple-family units, based on the trip characteristics assumed in the analysis. The 875 single family or 1500 multiple-family units, therefore, become a ceiling on additional development until additional roadway capacity is built (over and above the presently planned improvements), new links to the mainland are constructed or the actual measured traffic falls below the projected levels.

The projected level of service for summer weekend traffic to fall into the mid-range of the E level is predicated on the construction of planned improvements to Termini and Stewart roads. Approval of the land development plans for the additional 875 single family or 1500 multiple-family units a definite construction program has been scheduled and funds have been committed for construction.

Sanitary Sewer Service

Sewer service issues for study Area 1 must be divided into three sub-areas; the area served by the Pointe San Luis plant, the area served by Terramar/Isla del Sol plant and the area immediately west of the Village of Jamaica Beach. It has been assumed that any development proposed in the service areas of the two plants can be served by the plants, even if it is necessary to expand their capacity. The area adjacent to Jamaica Beach, however, is probably outside the service area of the Terramar/Isla del Sol plant. Development of this area should, therefore, be discouraged until a permanent sewage treatment strategy has been determined. Development of any additional land in Study Area 1 should occur first in those areas most easily served by the two treatment plants; the area between the Pointe San Luis and Bay Harbor developments and to the east of the Sea Isle and Sea Bird developments.

During preparation of the master sewer plan for the city, staged improvements of the two plants in Study Area 1 should be planned along with design guidelines for converting the Terramar/Isla del sol plant into a permanent facility. Alternative financing strategies should be examined for funding the plants' improvements. Also, a strategy for serving the area west of Jamaica Beach should be devised in the master sewer plan.

Sewer service to Study Area 2 will be accomplished over the short term with construction of the proposed 24-27 inch interceptor system between 7 Mile and 10 Mile Road. Over the long term the existing bottleneck in the existing sewer system between 6 Mile road and 81st Street must be removed and the capacity of the Airport Treatment Plant must be increased. The orderly expansion of the Airport Treatment Plant and the Increased capacity of the transmission system should be addressed in the city's master sewer plan. Also, definite plans for providing service to the portion of the Study Area 2 located outside the Airport plant's service area should be developed.

1. Schneider, Devon M.; Godschalk, David R.; and Axler, Norman. The Carrying Capacity Concept as a Planning Tool, Planning Advisory Service Report No. 338, 1978, p.1.
2. Ibid., p. 1.
3. Ibid., p.1.
4. Ibid., p. 1.

VI. GOALS, ISSUES, OBJECTIVES AND POLICIES

WHAT IS THE COMPREHENSIVE PLAN?

The Comprehensive Plan for the City of Galveston – a plan based on coastal zone management principles – is a coordinated plan for the future of the city. The plan is an expression of goals, objectives and policies derived from the continuous planning program conducted by the city and the Planning Commission for the last two decades.

The Comprehensive Plan provides an overall framework for making decisions by public and private entities because:

- It is “long range” in that it projects physical development patterns to accommodate several decades of economic growth;
- It is “comprehensive” since it is based on an analysis of a wide variety of manmade and natural elements;
- It is “general” in that it forms a policy guide for future development by proposing general rather than specific locations and sizes of elements;
- It is a “framework plan” that sets general limits within which more detailed plans can be adopted for specific elements and special districts in the community; and
- It permits the City to relate specific projects, proposals for development, and zoning matters to a coordinated program of development.

The Comprehensive Plan is composed of six sections described herein. Sections I through V contain significant facts relative to the city’s history and regional setting, geography, social and economic characteristics, physical features, and the capacity of West Island to accommodate growth. Section VI, Goals, issues, Objectives and Policies, contains the expression of key recommendation in text and map form. The goals, objectives and policies are defined to provide guidance to the public and private decision makers in addressing the issues faced by the community. Map elements in Section VI describe the geographic distribution and location of key features in the plan, plus provide guidance in applying policies defined in the text.

Section VII, Implementation Programs, is not a part of the plan, rather, it is a series of recommendations to permit actions to be taken over the short term to begin accomplishing the plan’s goals. The implementation program can, therefore, be amended annually to address changing conditions and needs in the city without requiring an amendment of the Comprehensive Plan.

HOW TO USE THE GALVESTON COMPREHENSIVE PLAN

The planning process used in preparing this Comprehensive Plan was designed to provide the City of Galveston with a plan which assists in day-to-day decision making and also provide direction for the long range development of the island. Through input at city meetings, meetings with community leaders, and review by city staff member, seven major areas of concern were identified. Goals have been developed which reflect a common vision of the island's future. The goals are accompanied by objective and policies which define actions to be taken to achieve the city's goals. The goals, objectives and policies will provide direction to the community when considering:

- The adoption and administration of land use laws.
- The administration of public and semi-public agencies.
- Land use, transportation and community facilities activities and investment of public and private funds.

For example, when an application is made for a zoning change within the city, the comprehensive Plan should be consulted to determine the applicant's compliance with the city's long range goals, objectives and policies that effect the subject property. The applicant's property should be generally located on the Future Land Use Policy and Thoroughfare Plan map to determine the policies initially applicable in reviewing the request. Due to the nature of the request, other policies may also apply in making a decision on the requested zoning change. Application of the policies to a rezoning request must also examine the guidance provided by the supporting objectives and goals and their definition of the plan's intent. Individual policies, in general, should be interpreted generally and liberally rather than narrowly and specifically.

In addition to zoning decisions, coordination between city departments and other public and semi-public agencies can be facilitated through the use of the information in previous sections and reference to the goals and objectives can help prioritize public improvements. The need to continue the cooperative use of public school property to meet public park/recreation needs is an example of joint public/private investments.

STRUCTURE OF THE GOAL, OBJECTIVE AND POLICY FRAMEWORK

The following text defines goals, objectives and policies as a statement of what to be achieved by the plan and how it is to be accomplished. The statement of issues highlights some of the problems addressed by the plan.

GOALS are stated on the blue pages and followed by a discussion of the

ISSUES involved in consideration of that particular goal. The issues discussion is a summary of information presented in Sections I through V of this document.

OBJECTIVES and POLICIES for decision making are reported on pages following the goals and issues. The **OBJECTIVES** are specific statements about things the community hopes to achieve in the next decade. The **POLICIES** are actions which should be taken in order to achieve a particular objective.

The **FUTURE LAND USE POLICY AND THOROUGHFARE PLAN** graphically defines many of the policy areas. When considering use of a specific site, the **FUTURE LAND USE POLICY AND THOROUGHFARE PLAN** should be consulted to determine the city policies which will apply to the site and the surrounding area. The **PLAN** references specific physical features and development considerations, both natural and manmade.

THE GOAL, OBJECTIVE AND POLICY FRAMEWORK

Due to its location on the Gulf Coast, Galveston has a long history as a major port and seaside recreational area. In addition to these Gulf oriented features, the island is the site of many historical district and excellent educational facilities. These features, combined with the natural characteristics which are unique to a barrier island, are all a part of the island's attraction to residents and visitors and require special attention when considering the city's goals and objectives for planning. Although Galveston faces many of the same issues as other fast growing sunbelt cities, preservation of the historic and natural character of the island is a primary and special consideration of this Comprehensive Plan. The seven goals for the future development of Galveston Island are:

- 1. ECONOMICS DEVELOPMENT** To direct the growth of the city toward a sound and diversified economic base.
- 2. LAND USE AND CITY SERVICES** To direct the arrangement of land uses in an efficient and harmonious pattern to protect property values and prevent an uneconomic sprawl of development beyond the capabilities of the city to provide adequate services.
- 3. SPECIAL DISTRICTS, PROJECTS AND PLANNING PROGRAMS** To continue planning which addresses the detailed issues of unique aspects of the Community, preserves the best of the city's Past and strives to improves its future.
- 4. NATURAL ENVIRONMENT** To recognize the value of the natural environment to the health, safety and economic well being of the island's residents and to strive to maintain the

integrity of the Island's natural environment.

5. STORM HAZARDS

To inform residents and protect future development from potentially hazardous erosion and destruction and provide safe evacuation conditions.

6. TRANSPORTATION

To provide for the safe, convenient and efficient movement of goods and people.

**7. CITY SERVICES AND
services
COMMUNITY FACILITIES
city**

To develop the wide range of city and community facilities essential to the

And to locate these in a manner allowing Efficient operations.

1. ECONOMIC DEVELOPMENT

GOAL:

TO DIRECT THE GROWTH OF THE CITY TOWARD A SOUND AND DIVERSIFIED ECONOMIC BASE.

ISSUES:

There are four major contributors to Galveston's economic well-being: the Port of Galveston, The University of Texas Medical Branch, financial services and tourism. Approximately 50% of the city's revenues, indirectly and directly, are contributed by the Wharves. The University of Texas Medical Branch is the island's largest single employer, employing 7,500 people with an annual payroll of \$175 million. Insurance, banking and real estate activities have played an important role in Galveston's economy since the 1800's. And tourism is playing an increasingly important role in the economy; over a million people visit Galveston each year. Current redevelopment and new construction on the island is focused on accommodating these visitors and attracting others.

All four of these industries contribute to the economic vitality of the island and to some degree each is dependent upon the Gulf of Mexico and the unique way of life which the island offers. The Gulf provides opportunities for commerce and recreation. The island's natural environment offers opportunities for beachcombing, bird watching, boating, swimming and fishing. Historic districts, both commercial and residential, provide a pleasant atmosphere in which to live and work. Future economic development in Galveston will be dependent upon the preservation of this unique way of life while providing the facilities necessary for tourism and business.

The following Economic Development objectives and policies provide general direction for the future development of the island. Specific development objectives and policies to guide growth and change in the community are provided under the six goals for physical features beginning with land use.

OBJECTIVE:

Support Basic Activities

Protect and enhance the operation of the four major contributors to the island's economic well being.

POLICIES:

1. The City of Galveston will continue to support the Galveston Wharves in their ongoing development of port facilities.
2. The growth and development of Galveston's medical and health service facilities will be encouraged as an integral part of the community.
3. The importance of development of the island's insurance, banking and real estate activities will be recognized and supported by the City of Galveston.
4. The City of Galveston will strive to encourage high quality tourist oriented development which reflects the island's unique way of life.

OBJECTIVE:

Use Limited Land Resource Wisely

Make the most appropriate and productive long-range use of limited land.

POLICIES:

1. The City of Galveston will ensure that adequate land is made available for industrial and Port of Galveston related development. The development and redevelopment of existing industrial districts adjacent to Port Industrial Boulevard will be encouraged.
2. Planning for West Island which allows tourist oriented and primary (year-round) residential development in select locations will be an ongoing process for the City of Galveston. Planning will incorporate existing residences, private development plans and government agencies.
3. The release of the East End Flats and its subsequent development as residential property will continue to be pursued in the interest of providing middle income primary housing. Due to the environmentally sensitive nature of the Flats, carefully drafted development criteria for the development of the Flats will be drafted.
4. The release of additional airport property should continue for mixed use developments based on the highest and best use studies done by the City.

OBJECTIVE:

Coordinate Economic Incentives with Land Use Policies
When appropriate, facilitate development of vacant land and revitalization of
substandard structures through economic incentives.

POLICIES:

1. A sanitary sewer master plan should be prepared to address the feasibility of providing service to those areas which will be developed if service is provided. The plan should establish the city's policies regarding future waste treatment processing on West Island.
2. Support of the city's Grant Department in facilitating public assistance to private development will continue.
3. Consideration will be given to utilizing density bonuses in the redevelopment of deteriorating areas. Such redevelopment should comply with the objectives and policies listed under the goal "Land Use". The redevelopment plans should also be compatible with the purpose, intent, recommendations and specific requirements of the adopted neighborhood plans and Historic Overlay Districts, where appropriate.

OBJECTIVE:

Protect and Enhance Galveston's Unique Way of Life
Provide the opportunity for residents and visitors to enjoy a unique
Way of life including the variety and quality of facilities, community and public
Services and the natural environment.

POLICIES:

1. The City of Galveston will promote and enforce the policies already adopted for each of the Special Districts illustrated on the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN.
2. Planned Development Districts should be utilized to encourage creative development which enhances the natural environment and distributes higher densities away from sensitive natural features.
3. The performance and design standards pertaining to the natural environment listed under the goals "Natural Environment" and "Storm Hazards" will be enforced in recognition that the island's economic well being is inexorably bound to the island's unique natural environment.
4. New population growth, both permanent and seasonal, will be monitored to ensure that public service and facility needs are met and to ensure that residents and visitors are provided a high quality of life.

2. LAND USE

GOAL:

TO DIRECT THE ARRANGEMENT OF LAND USES IN AN EFFICIENT AND HARMONIOUS PATTERN TO PROTECT PROPERTY VALUES AND PREVENT AND UNECONOMIC SPRAWL OF DEVELOPMENT BEYOND THE CAPABILITIES OF THE CITY TO PROVIDE ADEQUATE SERVICES.

ISSUES:

Land use is one aspect of the city's growth which Galveston and its residents have the opportunity to control. Land use decisions have an impact on both the economic development and the quality of life of the island. Land use planning is generally based upon how a particular land use will affect both of these considerations.

Analysis of existing land use patterns, and urban and population trends on the island have provided the basis for the land use area designations which are defined on the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN (see Section III and IV). Specific issues which should be addressed in each of these land use areas are:

Residential Areas

A large part of the existing residential development on the island is composed of stable neighborhoods which exhibit a high level of maintenance and are composed of a compatible mixture of land uses. Some of these areas are protected by adopted neighborhood plans or historic overlay zoning districts. The policies established in the plans and districts should be strictly enforced, and those areas which are not currently covered by such specific planning documents should be included in future planning efforts.

Portions of Galveston's residential areas are in poor repair and suffer from varying degrees of neglect and lack of maintenance. These conditions exist in the older established neighborhoods and in relatively new subdivisions on the west end of the island as a result of hurricane damage. In many cases, the poor conditions of the city's infrastructure contribute to the overall deterioration of neighborhoods. Guidance from the city to neighborhoods and individual property owners in declining areas can help stabilize and revitalize the areas. Some of these areas are also protected by completed neighborhood plans or historic overlay zoning districts.

Developing Residential Area

In excess of 3000 acres of vacant land on the island is appropriate for residential development. The majority of this land is located west of the seawall on West Island in an area which has been developed in a scattered manner. As improvements are made to Termini Road, additional access linking the island to the mainland is provided and sanitary sewer service is provided, pressure to develop this area will increase. Additionally, there is a large portion (one mile square) of the east end of the island currently held by the U.S Federal Government as A spoil area. Should release of this property, known as the East End Flats, by the government allow development, a major opportunity for primary home residential development will be made available. Development of both of these areas should be carefully monitored to assure that the city is able to provide adequate services and facilities to future development. Special concern should be given to ensuring that an adequate level of access is provided for development on west Island to avoid additional deterioration of existing traffic conditions.

Commercial Areas

Commercial areas include retail, general business, professional and personal services, and tourist related activities. The commercial land use pattern for the island is generally well established for the built-up part of the island. Issues encountered in Galveston's commercial areas are similar to problems experienced in other communities. As succeeding generations have built homes and businesses in the community two problems have occurred. First, older commercial structures that have outlived one or more business occupants still remain in place waiting for a new tenant or to be redeveloped with adjoining properties. Some structures in the downtown and along Broadway exhibit this type of economic obsolescence. Second, as commercial enterprises prosper they may look for space to expand and the most economical options are often to find space in adjoining older residential areas. Nuisances created by parking and commercial related service activities can detract from the use of adjoining residential properties. The neighborhoods paralleling Broadway, and Seawall Boulevard, and around the downtown have experienced problems with commercial encroachment.

Another commercial problem experienced elsewhere is the commercial strip. Aligned along major thoroughfares such areas grow due to exposure to high volumes of traffic. Commercial strips develop bringing additional traffic to the thoroughfare, contributing to the traffic congestion with frequent access drives and adding an element of visual blight to the community with large paved parking areas, unattractive and oversized signs and bright night-time lighting. The 61st Street corridor is an example of a strip commercial area that has developed in Galveston over the past few decades. Without special care and review, portions of FM 3005 may also develop into strip commercial areas. The City has adopted a commercial land use policy for commercial areas west of 103rd Street. This policy identifies potential locations for commercial development with respect to street intersections.

Industrial Area

The majority of the existing industrial land on the island is concentrated in the northeast portion for the city. It provides support to and receives support from the wharves. Port Industrial Boulevard provides access throughout the industrial area to I-45 and the wharves. Continued development of this area will provide important economic benefits to the benefits to the city and should be encouraged.

Special Districts

As described under the goal “Special District s and Planning Program’s”, there are eight special districts in Galveston. The special considerations and issues pertaining to each of these districts are addressed in the objectives and policies for “Special Districts and Planning Programs”.

Central Business District

Current redevelopment of the Central Business District through Tax Reinvestment Zone No. 10 and the Downtown Revitalization Committee will provide Galveston with a plan for the CBD’s future. Integration of Special District plans such as the Strand and the Festival Marketplace will give the city and other public and private interests a unified direction for redevelopment.

OBJECTIVE:

Stable Residential Areas

Continue to protect and preserve the existing stable residential areas of the city by utilizing existing planning policies and programs and applying the following policies. Stable residential areas are located in the built-up part of the city as well as in clusters scattered along West Island.

POLICIES:

1. Stable residential areas will be protected from disruptive uses such as incompatible higher density residential structures, and encroaching industrial and commercial uses.
2. Routine maintenance by private property owners is encouraged and the overall condition of the property should be upgraded where necessary to preserve stable development.
3. Vacant land adjoining stable areas or occupied land to be reused should be utilized for residential, public or semi-public development.

4. Densities of new residential development will be compatible with surrounding residential areas and a buffer will be provided when there is a significant difference in densities.
Reuse of existing residential structures will be designed to occur at a density compatible with surrounding structures.
5. Proposed residential development which has a significantly different size, height or mass from adjacent existing development will be discouraged if the differences detract from the use and privacy of the adjacent development.
6. Existing commercial uses and other uses incompatible with the residential character of stable areas will be encouraged to:
 - a) Protect adjoining residential properties by construction and maintenance of planting screens, attractive walls, earthen mounds and/or other appropriate buffering devices.
 - b) Provide safe, attractive, pedestrian walks and entrances to business uses.
 - c) Avoid the construction of parking lots that will result in the removal of residential structures that contribute to the scale and character of the area; if parking lots are built, adequate screening will be provided to protect adjoining residential uses.
 - d) Expand building space for commercial or other incompatible uses only if the additional space does not detract from the established residential character.
 - e) Control outdoor lighting, sound and signs to avoid disrupting the use of adjacent residential properties.
7. Special care should be taken to protect existing historical districts and promote the preservation of Galveston's unique historical assets.
8. Maintenance and improvements to the public infrastructure should receive attention necessary to help maintain the stable areas.

OBJECTIVE:

Declining Residential Areas

Strive to upgrade the condition of those residential areas which are in disrepair through public and private efforts. Target those areas which are without specific planning policies and programs as priority neighborhood planning projects to be addressed by the residents and city planning department staff. Declining residential areas are located in the built-up part of the city as well as in clusters scattered along West Island.

POLICIES:

1. Declining residential areas will be protected from disruptive uses such as encroaching industrial and commercial uses.
2. Improvement of property through reconstruction and/or an extensive maintenance program by individual owners is encouraged. The city's planning programs and code enforcement activities will assist in property improvement activities.
3. Strong resident participation in neighborhood planning programs is encouraged.
4. Vacant land adjoining declining areas or occupied land to be reused should be utilized for residential, public or semi-public development unless specific revitalization plans, adopted by the Planning Commission and city dictate otherwise. Revitalization plans may consist of a neighborhood plan, historic overlay district, an economic redevelopment plan or an area-wide zoning study, precipitated by a rezoning application that comprehensively examines the relation of the property's use to the broad-scale upgrading of the declining area.
5. Density bonuses may be considered to encourage redevelopment in those areas of the city which are declining. Such bonuses should be carefully implemented in a manner which ensures that:
 - A) The density of development will be compatible with adjacent housing and a smooth transition will be provided between different densities.
 - B) Residential development which has a significantly different size, height or mass from adjacent development will be avoided if the differences detract from the use and privacy of the adjacent development.
 - C) The development is compatible with the purpose, intent, recommendations, and specific requirements of the adopted neighborhood plans and historic overlay districts, where appropriate.

6. Existing commercial uses and the other uses incompatible with the residential character of declining areas will be encouraged to:
 - A) Protect adjoining residential properties by construction and maintenance of planting screens and/or attractive walls.
 - B) Provide safe, attractive, pedestrian walks and entrances to business uses.
 - C) Avoid the construction of parking lots that will result in the removal of residential structures that contribute to the scale and character of the area; if parking lots are built, adequate screening will be provided to protect adjoining residential uses.
 - D) Expand building space for commercial or other incompatible uses only if the additional space does not detract from the established residential character.
 - E) Control outdoor lighting, sound and signs to avoid disrupting the use of the adjacent residential properties.
7. Special care should be taken to protect existing historical districts and promote the preservation of Galveston's unique historical assets.
8. Maintenance and improvements to the public infrastructure should receive attention necessary to help improve conditions in declining areas.

OBJECTIVE:

Developing Residential Areas

Encourage development of a wide variety of residential dwelling types on undeveloped areas to meet the diverse needs of the current and future population of the city. Developing residential areas are located on West Island, west of the airport, and on the San Jacinto disposal area and east end flats, east of 2nd Street. Developing residential areas do not include wetlands, beaches and dunes protected under this plan.

POLICIES:

1. Property owners proposing to change the zoning classification of their property, or secure approval of a planned development plan or subdivision plat will have their proposed plans reviewed by the Planning Commission and the city. The city staff will work closely with applicants of proposed developments to review the extent of impacts of their plan's elements. The evaluation of individual elements will be prepared by the appropriate city departments and will reflect goals, objectives, policies and map elements contained in the Comprehensive Plan and other data, criteria and information then available to the departments. The seven broad impact categories to be examined are listed below:

IMPACTS:

- A) Land use compatibility.
 - B) Transportation and Traffic impacts
 - C) Sanitary sewer and water demands.
 - D) Encroachment on the natural environment.
 - E) Potential storm hazards.
 - F) Impacts on community facilities.
 - G) Potential and implied responsibility of the city regarding the above elements and the anticipated public cost.
2. The orderly development of West Island west of 7 Mile Road is encouraged by the Comprehensive Plan. However, due to the restricted capacity of existing and planned streets and highways and other limitation, the following additional policies also apply to the area west of 7 Mile Road.
 - a) In order to accommodate the travel needs of permanent residents and weekend visitors to West Island, the level of service on the principal roadways, Termini road (FM 3005) and Stewart Road, should not deteriorate below a mid-range E level on the average summer weekend day from May through mid-September. Based on information available to the analysis contributing to this policy, the level of service will be determined by comparing the average daily traffic (ADT) using a roadway segment to the level of service standards for roadway facilities contained in the Regional Mobility Plan 1985. Whenever more detailed traffic flow information is available and more detailed traffic

flow information is available and more detailed capacity analysis of the West Island roadway corridors has been conducted, the method for determining the level of service rating of roadway segments should be reexamined. Based on the additional refined analysis, the minimum standard of a mid-range E level of service should also be re-examined to see if it adequately reflects the quality of service to be provided by principal roadways.

- b) No additional residential development will be approved that results in a net increase over the number of existing dwelling units and those unbuilt units already permitted under the zoning regulations, until the presently planned improvements of Stewart Road or Termini Road are placed in service, or until the presently planned improvements have been scheduled and funds have been committed for construction. The “presently planned” improvements are the widening of Stewart Road to four lanes to the State Park, and widening of Termini Road from the State Park to the west end of the island. Also, if development rights are rescinded for dwelling units already granted approval under the zoning regulations and /or subdivision regulations no more than the same number of dwelling units may be approved at another appropriate location on West Island. Under this policy, subdivision plats may be approved for property already granted development rights under the zoning regulations.
- c) When planned improvements to Stewart Road or Termini Road have been completed or definitely scheduled and a commitment of funds have been made, approval for construction of up to 1400 single family or 2500 multiple-family dwelling units may be given on West Island. The mixture of dwelling unit types may be varied so long as the total average daily traffic (ADT) estimated for the units can be accommodated by the street system and does not exceed the ADT generated by 2500 multiple-family units using trip generation rates contained in the Institute of Transportation Engineers, Trip Generation manual.
- d) When transportation improvements in addition to those presently planned are constructed for West Island that will increase the traffic carrying capacity of the principal roadways or redistribute traffic to relieve congestion, then additional development will be permitted. The number of dwelling units will be commensurate with the increased traffic absorbing capacity of the new transportation system. The types of additional improvements may include, for example, installing left-turn lanes and utilizing other transportation system management techniques, designing the four – lane improvements on Termini Road as a controlled / limited access highway, providing a new West Bay crossing (s) to the mainland, and widening Termini and / or Stewart roads to six lanes. During the planning and construction of improvements to the two roads close coordination of design activities should be undertaken with the appropriate environmental regulating bodies to minimize in so far as possible effects upon existing wetlands.

- e) No additional development, and in particular residential units, may be approved for the area adjoining the west boundary of the Village of Jamaica Beach and then west to the service area of the Terramar/Isla del sol sewage treatment plant until a plan for handling permanently the sewage treatment waste load for the area has been approved.
 - f) All residential developments to be constructed on West Island, including dwelling units already granted approval under the zoning regulations or new units to be approved in the future, must be designed in a manner to minimize traffic impacts on Termini and Stewart Roads. To accomplish this policy the following techniques may be required: utilizing a single access intersection with the principal roads, installing left-turn and right-turn lanes on the principal road, combining access for neighboring properties to principal roads into a single access point, and utilizing an interior collector road system to reduce the number of access points to the principal road and to distribute the internal traffic in the development.
 - g) Residential development east of the State Park and north of Stewart Road should be designed, to the extent practical, as neighborhood units at average densities of four dwelling units, or less, per acre. The design and organization of the neighborhood units should provide amenities for permanent residents including park/recreation facilities. The corridors of land located between Termini Road and Stewart Road and the beach can be developed at higher localized densities due to the increased level of accessibility provided by the two principal streets, however, the average density should not exceed nine units per acre. Design of residential developments in the corridor should provide amenities for permanent residents including park/recreation facilities.
 - h) Residential development west of the State Park should be designed to average densities of four dwelling units, or less per acre. Development of higher densities may be permitted adjacent to commercial centers so long as compensating lower density developments maintain the area-wide average.
3. The developing residential area located between 89th Street and 7 Mile Road is subject to the following:
- a) Residential development should be designed, to the extent practical, as neighborhood units at average densities of twelve dwelling units, or less, per acre. The design and organization of the neighborhood units should provide amenities for permanent residents including park/recreation facilities.
3. The San Jacinto disposal area and east end flats are subject to the following:
- a) The San Jacinto disposal area, if released for development, should be used primarily for mixed uses with an emphasis on residential uses to be occupied

by permanent year round residents. If sufficient land is released for development, the area should be designed to function as a neighborhood containing park/recreation facilities. A variety of housing types should be provided from single family detached to multiple family units. An emphasis of the approved development plan must be to encourage owner and renter occupancy by full-time residents. The density of dwelling units and the mixture of dwelling unit types must be planned to be compatible with the traffic carrying capacity of streets serving the area and the residential neighborhood concept.

- b) The east end flats should be used primarily for high density residential development. The design of the development and the quantity of units should be consistent with criteria developed in policy #1 (above) to ensure compatibility with manmade and natural factors such as access (traffic), sensitive natural areas and the threats to safety from storms.
5. Developing residential areas will be protected from disruptive uses such as incompatible residential structures, encroaching industrial uses or scattered and strip retail uses.
 6. Routine maintenance by private property owners is encouraged and the overall condition of property should be upgraded where necessary to preserve sound areas.
 7. Land which has not been otherwise designated on the West Island Commercial Land Use Policy or the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN will be utilized for residential, public or semi-public development.
 8. Densities of new residential development will be compatible with existing adjoining residential areas and a buffer will be provided when there is a significant difference in densities.
 9. New development which has a significantly different size, height or mass from adjacent existing development will be avoided if the differences detract from the use and privacy of the existing adjoining development.
 10. The design of new developments will make appropriate provisions, depending on the unique setting of each site, for the following:
 - a) Safe, convenient pedestrian walks/paths
 - b) A safe, convenient vehicular street system that discourages the passage of through-traffic over local streets.
 - c) Outdoor active and passive recreation facilities.

11. High rise (over three floors) residential structures will not be permitted at locations that are determined to be too far from fire stations or where fire fighting equipment at the responding station(s) cannot provide adequate protection. Application of this policy will be based on standards established by the Fire Department.

OBJECTIVE:

Commercial Areas

Encourage commercial development which is property located in relation to major thoroughfares and serves the broad range of needs of residents and visitors to the island.

POLICIES:

1. The function of commercial areas in the city should be directed at providing required goods and services to customers at convenient locations and in an organized manner that avoids uneconomical duplication of services. The primary function of five classes of commercial areas in the city that are encouraged by the Comprehensive Plan are reported in the following table.

The commercial functions are:

Retail, convenience – consumable goods purchased on a frequent basis primarily by the resident population; food, drugs, hardware, etc.

Retail, shopping goods – durable goods purchased on an infrequent basis and typically after comparison shopping; clothing, appliances, automobiles, etc.

Services, professional – primarily office and financial institutional space for the provision of financial, medical, legal service, and the like.

Service, personal – office and retail space for barber, beauty shops, repair services and the like.

General business – office and retail space for business services, distribution, building materials and the like.

Tourist commercial – lodging, retail and personal services for tourists including hotels, gift shops and travel agent, etc.

The downtown area is the traditional center of mercantile, financial and professional service activities in the city. Due to revitalization efforts the downtown has also become a center of tourist related services. All of these commercial functions will be encouraged to grow and prosper in the downtown.

A wide variety of commercial establishments have located along the Broadway, 61st Street and Stewart Road corridors due to their accessible locations for local traffic as well as traffic entering and leaving the island. The variety of functions – servicing residents in adjoining neighborhoods, residents from across the city and out-of-town tourists – should continue for these existing corridors.

The primary function of Seawall Boulevard should be to continue to serve the island's tourists because of its location on the coast and the existing major investments in hotel, restaurant and entertainment facilities. When combined with the public's tourists oriented recreation facilities at Apffel Park and Stewart Beach, the tourist area extends from the east tip of the island to beyond 61st Street. Future major tourist facilities should be located in the Seawall Boulevard/Termini Road corridor between 89th Street and 8 Mile Road. Primary access to the sites will be provided by Seawall Boulevard/Termini Road, however, secondary access should be provided to Stewart Road whenever feasible. Access to the 89th Street and 8 Mile Road corridor will be provided for tourists via the two bay crossings, the existing West Bay Crossing, I-45 and the new crossing at 8 Mile Road.

Community or major commercial centers provide a variety of retail facilities for their service areas. Shopping goods and convenience goods are the two principal activities. Due to the distance from the community center to other commercial centers in the downtown and along Broadway and 61st Street, community centers should respond to other market needs for service uses and general business establishments. The community center should occupy 10 to 20 acres and serve a trade area population of 20,000 or more.

Future community centers will be located as designated on the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN and at the following locations west of 61st Street:

- a) At or in the vicinity of the intersection of 8 Mile Road and Termini Road.
- b) The approval 30,29 acre combined sites located within the Pointe San Luis Planned Development.

Neighborhood or minor centers are designated to meet the convenience shopping and personal service needs of their market areas. The market area should contain at least 5,000 people and the center's site should be four to eight acres in size.

Neighborhood centers will be located as designated on adopted neighborhood plans and at the following locations west of 61st Street.

- a) The approved 7.89 acre combined sites located within the San Luis Pointe Planned Development.
 - b) The approved site located adjacent to the Sea Isle subdivision on Termini Road.
 - c) On Termini Road to the west of The Village of Jamaica Beach.
 - d) At or in the vicinity of the intersection of Termini Road and Stewart Road.
 - e) The approved site location directly east of the Bermuda Beach subdivision on Termini Road.
2. Commercial centers, both neighborhood and community, will be located at intersections of major thoroughfares and collectors and along high access corridors.
 3. Development of commercial property on scattered sites or as the continuation of a strip commercial area will be strongly discouraged. Commercial uses should be consolidated and separated from other incompatible uses.
 4. The design of new commercial sites and the reuse of existing commercial property will make provisions for:
 - a) separation of pedestrian and vehicular circulation;
 - b) separation of circulation and storage of delivery and service trucks and vehicles from pedestrians and private vehicles;
 - c) protection of noncommercial uses on adjacent property through the use of screens and buffers; and
 - d) only one main, well defined entrance/exit whenever possible. Secondary access drives should be used only when they lessen the traffic impact on adjoining public streets or when dictated by the volume of vehicles entering and leaving the site.
 5. The construction of additional community and neighborhood shopping centers on West Island should be allowed only if it is demonstrated by a thorough market analysis that:
 - a) Existing commercial center sites recognized by this plan, whether developed or undeveloped, are incapable of meeting the needs or the identified market now or in the future; and
 - b) The proposed commercial center will meet the specific needs of an identified market segment that is otherwise inadequately served without damaging the economic vitality of centers recognized by this plan.

OBJECTIVE:

Industrial Areas

Maintain the existing quality of industrial development on the island while encouraging the development of vacant land and the reuse of deteriorating property within the Industrial Land Use Area.

POLICIES:

1. The continuing growth and prosperity of the Port of Galveston is supported by the Comprehensive Plan. (See Economic Development goal and industrial growth related policies).
2. Industrial uses should be located only in the industrial land use area shown on the Future Land Use Policy and Thoroughfare Plan.
3. Industrial uses should not be located adjacent to residential property. When industrial and residential use proximity cannot be avoided, light industrial uses should adjoin residential properties. Light industrial uses are operations that are fully contained within a structure and do not have outdoor storage or processing activities visible beyond the perimeter of the property.
4. Adequate off-street parking and space for maneuvering and storage of trucks and equipment will be provided.
5. The impacts of noise, vibration, glare, dust, smoke and the use of hazardous materials or procedures will be mitigated.
6. Industrial uses should be served by Port Industrial Boulevard as the principal means of access. The design of new industrial sites and the reuse of existing industrial

property will make provisions for a minimum of entrances and exits and a minimum impact on traffic on adjoining streets.

7. Non industrial and incompatible uses on adjacent property will be protected through the use of screens and buffers.

OBJECTIVE:

Special Districts

Continue the various planning programs already in place for Special Districts in the city and encourage integration with future planning.

POLICIES:

1. Refer to the policies for Special Districts listed under the goal “Special Districts and Planning Programs.”

OBJECTIVE:

Central Business District

Continue support of the redevelopment efforts of the Downtown Revitalization Committee and planning for Tax Reinvestment Zone No. 10.

POLICIES:

1. Downtown Galveston is, and will remain, the heart of the city. The commercial function of the downtown – see Land Use Goal, Commercial Areas, Policy #1- will continue as a vital element in the downtown along with cultural, and governmental activities.
2. Public and private development of physical amenities such as the Festival Marketplace and the redevelopment of Post Office Street will be encouraged.
3. Private reinvestment and building rehabilitation in the downtown, residential uses in particular, will be particularly encouraged.
4. A strong sense of identity for the downtown and a unified marketing program directed at investors, businesses, tourists and residents will be developed.
5. A management program which addresses alley maintenance, on-street parking policies and security will be developed.
6. Plans would be made for long range financial support of downtown improvements to be continued after the life of the Tax Reinvestment Zone.

3. SPECIAL DISTRICTS, PROJECTS AND PLANNING PROGRAMS

GOAL:

TO CONTINUE PLANNING WHICH ADDRESSES THE DETAILED ISSUES OF UNIQUE ASPECTS OF THE COMMUNITY, PRESERVES THE BEST OF THE CITY'S PAST AND STRIVES TO IMPROVE ITS FUTURE.

ISSUES:

There are numerous subareas which comprise Special Districts on Galveston Island. Many are historical districts which are unique to the city. Others are individual structures and features which are related to semi-public facilities such as the airport and state educational facilities which also constitute Special Districts. These features contribute greatly to the image of Galveston as a resort and academic community, attracting visitors and residents. Many are features which contribute to the island's employment and tax base.

Galveston has been the site of continuous planning over the past ten years. These efforts have included the preservation of historic residential areas, the preparation of a beautification plan for Seawall Boulevard and the master planning for major institutions such as the University of Texas Medical Branch. An important function of this Comprehensive Plan is to provide a framework for the implementation of these planning programs and to encourage their continuation.

OBJECTIVE:

Special Districts

Continue the many planning programs already in place for Special Districts in the city and encourage integration with future planning. Special Districts are graphically defined on the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN.

POLICIES:

1. Seawall Boulevard:

- a) Implementation of the Seawall Beautification Plan as property is developed or reused is encouraged.
- b) The Seawall Boulevard Zoning District Ordinance, which will address land use, building setbacks and heights, should be completed.
- c) Provisions should be made for safe pedestrian access across the Boulevard.
- d) Provisions should be made through public and/or private development for adequate parking along the Boulevard.

2. Festival Marketplace:

- a) Participation in planning and support of the proposed Festival Marketplace will be an ongoing project for the City of Galveston.
- b) Development of the Marketplace which will accommodate the traffic and parking requirements of the residential and nonresidential development without encroaching on surrounding areas is encouraged.

3. The Strand:

- a) The city will continue to promote development of The Strand consistent with the quality of existing development and the Action Plan for the Strand.
- b) Provisions will be made through public and/or private development for adequate parking.

4. As master plans for the following Special Districts are prepared and revised and development policies are adopted by the appropriate agencies and organizations, they should be incorporated into this document:

- a) Galveston Airport
- b) Galveston Wharves

- c) University of Texas Medical Branch
- d) Texas A&M University

5. Broadway Beautification Committee:

- a) The development of a plan and conceptual guide for the development, improvement, preservation and beautification of the Broadway Study Area should be adopted.
 - c) Urban Design Standards and elements for landscaping, street lighting and traffic signals, signs (including public and private), architectural design, building heights, zoning classification and uses and other related uses should be developed.
- 6.** As plans are prepared for additional Special Districts, they should be incorporated into the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN.

OBJECTIVE:

Neighborhood Plans

Strive to enhance the quality of life and residential character of individual neighborhoods.

POLICIES:

Plans adopted for neighborhoods are incorporated herein:

- 1. The goals, objectives, policies and elements will be enforced as adopted in the Neighborhood Plans for:

East End

Old Central

Kempner Park

San Jacinto

Carver Park

Goals for the adopted plans are:

East End

a) Goal One

To ensure a clean and safe neighborhood through vigorous enforcement of existing laws and by encouraging neighborhood residents to become more concerned about their neighborhood.

b) Goal Two

To develop a transportation and parking system to facilitate the convenient, safe and effective movement of the neighborhoods working and living populace.

c) Goal Three

To enhance the quality of life of a pedestrian oriented neighborhood and surrounding community by providing diversified and convenient non-residential neighborhood facilities while minimizing adverse impacts to residential areas.

d) Goal Four

To ensure the single and two family duplex character of the neighborhood through efficient zoning and code enforcement to prevent adverse impacts from multi-family, institutional, and commercial uses.

OLD CENTRAL

a) Goal One

Enhancement of the quality of life and overall character of the neighborhood by improving the living conditions to provide a cleaner and safer environment.

b) Goal Two

Revitalization of the residential areas and promotion of commercial and industrial development in non-residential areas.

c) Goal Three

A transportation system that ensures safe and convenient passage through the neighborhood as well as to other parts of the city.

Kempner Park

a) Goal One

To ensure the low-medium density residential and historic character of the neighborhood through effective zoning and City Code enforcement to prevent adverse impacts from new commercial and high density residential uses.

b) Goal Two

Develop transportation and parking plan that facilitates safe and effective traffic flow that satisfactorily serves neighborhood residents.

c) Goal Three

Improve living conditions and promote a clean and safe neighborhood by enforcing existing ordinances and involvement of its residents.

San Jacinto

a) Goal One

Ensure the low-medium density single and two-family duplex character of the neighborhood through proper zoning and City Code enforcement, in order to prevent adverse impacts from multi-family, commercial and institutional uses.

b) Goal Two

Develop a transportation and parking plan to facilitate safe and convenient movement of traffic through the neighborhood.

c) Goal Three

Enhancement of the quality of life and overall character of the neighborhood by improving living conditions in order to provide a cleaner and safer environment.

2. A standard format for the neighborhood planning program should be established. The existing plans should be reviewed for consistency and serve as prototypes for the standard format.

3. The neighborhood planning program will be continued with the preparation of plans for:

Lasker Park	Weiss	Fort Crockett
Lindale Park	Bayou Shores	

- The plan should be prepared on a schedule of at least one per year with a goal of obtaining additional funding which will allow a faster work schedule. The plan should be prepared in the prioritized list shown above. This order should be reevaluated in view of prevailing issues and demands prior to commencing each plan.
4. The Neighborhood Planning Program should be extended to the west and east ends of the island with the designation of neighborhoods and the preparation of plans for existing and future development.
 5. The 1982 Standard Housing Code will be strictly enforced.
 6. A comprehensive alley plan which outlines necessary improvements and presents a master plan for more efficient alley design citywide will be prepared. Site analysis completed in the neighborhood planning program should be used as a basis for the master plan.

OBJECTIVE:

Historic Preservation

Continue to promote the preservation of Galveston's unique historical structures and districts, both residential and nonresidential.

POLICIES:

1. The City of Galveston will strive to uphold the architectural integrity of those areas included in the historic zoning ordinance and governed by The Historical District Review Board:
 - a) Silk Stocking District
 - b) East End Historical District
2. Recognizing the community- wide social, economic and physical value of the special qualities to the city's older neighborhoods and buildings, the city specifically encourages the preservation and restoration of such features.

4. NATURAL ENVIRONMENT

Goal:

TO RECOGNIZE THE CONTRIBUTION OF THE NATURAL ENVIRONMENT TO THE HEALTH, SAFETY AND ECONOMIC WELL- BEING OF ISLAND RESIDENTS AND TO STRIVE TO MAINTAIN THE INTEGRITY OF THE ISLAND'S WETLANDS, DUNES AND WATER QUALITY.

ISSUES:

Freshwater and Estuarine Wetlands

Galveston Island has both estuarine and freshwater wetlands throughout the West Island area. The estuarine wetlands re important for: 1) fish production, 2) fish harvesting, 3) pollutant polishing, 4) floodwater storage and local flood control, 5) maintenance of the fresh water table, 6) protection against storm washovers, 7) migratory bird habitat, 8) recreational uses, and, 9) other natural and social values. The freshwater wetlands are limited on the island and are limited to the portion of the Gulf Coast of Texas. The freshwater wetlands support a wide range of migratory birds crossing the Gulf of Mexico. The freshwater habitat provides important stopping, resting, breeding, and nesting habitat for several birds. The city has found that both the estuarine and freshwater wetlands are valuable resources to the city, the state, and the nation.

Beaches and Dunes

The Gulf dunes on Galveston Island are dynamic physical system. The dunes are essential for the long-range protection of Galveston Island. Because of the barrier island character, the dunes and general shoreline of the island are in a continual state of flux. Most of the Gulf shoreline of West Island from the seawall to San Luis Pass is in an erosion process. The rates of erosion vary from a few feet per year to in excess of ten feet per year (short term erosion). The erosion processes occurring on the Gulf shoreline are not entirely preventable. The natural stabilization of the dune area should be encouraged and erosion rates should be recognized in development management. Development should be managed in such a way as to minimize human acceleration of the erosion process. Ultimately, a total stabilization and/or nourishment program of the beach and dunes area by artificial or natural protection means should be implemented with close coordination with the various state and federal natural resource agencies.

Water Quality

The entire West Bay system is an important natural resource to Galveston, Houston, and surrounding communities. The portion of West Bay north of Galveston Island is the last major remaining open oyster harvest area in West Bay. The City of Galveston should contribute to the maintenance of the water quality for future harvesting of oysters, other

shellfish, and finfish, and to further the use of the West Bay and adjacent wetlands and tideflats by wildlife.

Canal Development

Canal developments have played a significant role in the development of West Island in the past. There are several concerns regarding environmental impacts raised by canal developments, both for Galveston Island and through out the Gulf Coast. Because canal systems are often designed as dead-end systems, water circulation is usually poor and flushing occurs on an infrequent basis. Due in part to the poor circulation, the quality of water may deteriorate impacting fish habitats in and near the canals and resulting in potential public health problems for people that come in contact with the water.

OBJECTIVE:

Wetlands

Protect the integrity of the island's estuarine and freshwater wetland resources.

POLICIES:

1. Wetlands Determination

All future developments (new and reuse) proposed for West Island must be checked against the FUTURE LAND USE POLICY AND THOROUGHFARE PLAN. The plan's map will indicate if the proposed development is located within an area that may be "wetlands". The wetlands area shown on the plan's map represents the general location of wetlands based on the best island-wide information available during the preparation of the plan. The wetlands area includes known or suspected wetlands plus perimeter buffer areas. The city will not be responsible for determining if the subject area is, in fact, located in the wetlands. The city will advise the proponent to consult with the Corps of Engineers if the location could be wetland. The Corps will then review the development site and make a formal determination as to whether the site does fall within the Federal Section 404 Wetlands boundary.

If the development site is determined to be "wetlands" by the Corps, then the following Performance Standards will be applied to the proposed development.

2. Performance Standards

If the site does involve wetland, as determined by the Corps, then the following performance standards must be met:

- a) Formal application must be submitted to the Corps if the land development plans require permit approval by the Corps. A copy of the completed permit application must be included as part of the zoning application or development plan application (this includes plats, General Land Use Plans, Site Plans, etc.) submitted to the city.
 - b) The city and/or Planning Commission will provide comments to the Corps on all wetland dredge and/or fill permit applications during the review comment period of the Corps. The comments will reflect policies concerning resource use and protection.
 - c) The approval of zoning, subdivision, development site plan (including General Land Use Plan) or building permit applications will not be considered for final action until the Section 10 and/or Section 404 permit has been approved for issuance by the Corps.
 - d) For sites requiring application to the Corps, the city will wait for formal comments from the state agencies, federal agencies, and the public submitted to the Corps, to determine what potential impacts may occur to fish, wildlife, and water quality prior to the City taking final action on a proposed project.
 - e) If specific fish and wildlife losses are identified, the city will recommend that reasonable mitigation for those resource losses be required by the Corps through the permit process.
 - f) The city will notify the Corps that any in-water disposal of dredged materials is opposed, except for filling purposes that are reviewed and approved by the City.
 - g) The city will notify the Corps that it: 1. Encourages the preservation of wetlands; 2. Encourages the restriction of land development; 3. Is opposed to the loss of any freshwater wetlands, and in particular, those that have value for migratory birds. If the loss of some wetlands is determined to be the most prudent action considering the site and its setting, the freshwater wetland areas proposed for filling that are five acres or more in size (or any part thereof) will be mitigated either by replacement of like-acreage or by enhancement of another area where a net balance in habitat value can be demonstrated.
3. Design Standards

The following design standards will apply for wetland areas and areas immediately adjacent to wetlands:

- a) Wetlands that are important for quantifiable reasons such as known locations for fish rearing or breeding, or bird nesting or fallouts, will be buffered sufficiently to protect the specific resource value at issue.
- b) The design of the wetland perimeters must reflect the objective of saving the particular wetland. Bird nesting areas must be buffered sufficiently to eliminate or

minimize disturbance to the nesting birds. Buffers may be required to restrict human or pet animal access to resource areas.

- c) Where feasible and environmentally sound, wetlands should be utilized for drainage control purposes and pollutant polishing. The city encourages the design of wetlands that will enhance drainage conditions, will protect water quality (particularly surface water run-off that may be polluted), and will result in the protection and/or creation of wetland areas. Plans submitted to the city that propose these design features must include narratives that discuss engineering and scientific conclusions and assumptions and any other considerations used as a basis for the proposed design.
- d) In or near freshwater wetland areas, the city encourages the incorporation of live oak trees and other appropriate trees into the design of planned developments for the benefit of migratory birds.
- e) The design of surface drainage in and around wetlands must minimize erosion in the wetlands.
- f) If the potential for aquifer recharge exists, the city encourages the design of land use to promote recharge opportunities by restricting the quantity of land covered by impervious surfaces and structures.

OBJECTIVE:

Beaches and Dunes

Protect the integrity of the island's beaches and dunes and aggressively implement the adopted Beach and Dune Management Program.

POLICIES:

1. Identification of Beaches and Dunes

The city recognizes that the state's beach easement extends from the mean low tide to the "line of vegetation". The line of vegetation is defined as the extreme seaward boundary of natural vegetation which spreads continuously inland (Section 61.001 (2)).

The Beach and Dune Management Area will be identified as that general area lying between the line of mean high tide and landward to a line 1,000 feet inland. The Beach and Dune Management Area is illustrated on the FUTURE LAND USE POLICY and THOROUGHFARE PLAN. The city intends to monitor any development in this area in recognition that the foredune and backdune areas are vulnerable to destruction and that it is in the public interest to ensure that the vegetation communities be properly maintained to protect the dune system.

2. Performance Standards

Any development proposed for the Beach and Dune Management Area described above will be subject to the provisions of the Beach and dune Management Plan and the performance standards presented here:

- a) Beach access point for pedestrians will be limited in number and location, to protect the coppice mounds and foredune areas from breach potential, due to uncontrolled foot traffic, and uncontrolled vehicular traffic. Vehicular access to other beach areas should comply with the Beach and dune Management Plan. All planned development and subdivision proposals must demonstrate beach access design that will protect the foredune and backdune areas. Design guidelines can be found in the Beach and Dune Management Plan, as updated in 1981, located in the Department of Urban Planning and Transportation.
- b) There will be no direct drainage in the general direction of the beach. All surface drainage will be directed to areas behind (landward of) the foredune, see Section II, Figure 5.
- c) There will be no building of structures within the ten year erosion line, except for properly designed dune walkways and walkovers as described in the Beach and Dune Management Plan document.

- d) The dune erosion line is determined by calculating the annual erosion rate at the site of the proposed land development project. This is calculated by examining aerial photographs (using photos at least ten years old) to determine how many feet, on the average, the line of vegetation has moved each year. The average erosion rate is multiplied by ten to determine the ten year erosion rate. If the dune vegetation line is not discernible, a straight line should be drawn from points on either side of the subject site (area) where the vegetation line is first discernible, following the line of constant elevation that would connect those two points of vegetation. This method of defining the line of vegetation is the same method used by the state.

- e) In recognition that the erosion rate on Galveston Island is dynamic, and the city may need to adjust the setback limit in specific areas or adjust the erosion rate time frame, the ten-year erosion rate/building setback will be reviewed annually.

OBJECTIVE:

Water Quality

Design future development activities on West Island to protect the water quality of West Bay.

POLICIES:

1. A citywide sanitary sewer master plan should be prepared which will establish the future waste treatment system for the parts of West Island that are located outside of one of the existing or planned regional plants.
2. All sanitary waste treatment systems should be designed to eventually hook into an area-wide treatment facility pursuant to Section 208 of the Federal Clean Water Act.
3. Performance Standards

The following performance standards will apply to development on West Island:

- a) All proposals for planned developments on West Island must address their long-range plan for sewage disposal. This will include:
 1. The life-cycle (life expectancy) of the sewage disposal system proposed for the development.
 2. The plan for disposal facilities beyond that time.
 3. Provisions for present and future easements and access for municipal sewer and water services.
 4. The method to be used to inform property owners regarding future sewerage requirements regarding easements, rights-of-way, etc.
 5. Proof of review by the city Utility Department of the planned development sewer plans.
- b) Developments that will have a stormwater discharge into the bay must address the following:
 1. The estimate discharge volume for a 25-year storm.
 2. An evaluation of pollution potential from urban runoff and, if appropriate, any mitigate measures.
 3. Easements or other means for stormwater retention and /or pollutant polishing.

4. If erosion appears possible due to flood flows or soil conditions, mitigate measures to reduce anticipated erosion from the 25-year storm discharge will be outlined.
- c) Developments along the bay shoreline within ten feet of the high tide mark must provide plans for the following:
1. Provisions for shoreline protection from erosion, either through revegetation or riprap or by other appropriate means.
 2. Designs for any cuts into the shoreline to minimize impacts on water circulation.
 3. “Hard edge” designs, such as straight bulkheads that project out into the bay, will be discouraged unless erosion and circulation impacts can be proven to be insignificant. Sloping bulkheads, bulkheads with soil and vegetation fronts and other design which assist circulation and water quality will be encouraged.
- d) In water disposal of dredged materials will be prohibited unless the filling of bay waters for land development purposes meets the standards and conditions set forth in the “Wetlands” objectives and policies of this document.
4. The quality of water discharged from West Galveston Island into West Bay is critical to the continued productivity of that marine ecosystem. The city, the Galveston County Health District and state and federal agencies, should examine the feasibility of expanding the District’s current water quality monitoring program to include tests for the following characteristics:
 - Fecal coliform
 - Lead
 - Cadmium
 - Copper
 - Petroleum hydrocarbons
 - Biological oxygen demand
 - Total suspended solids
 - Herbicides

Points of discharge of stormwater runoff into West Bay should be monitored along with established points in West Bay.

OBJECTIVE:

Canal Development

Recognize the need to control the future design of canal developments to ensure protection of the island's natural resources.

POLICIES:

1. Performance Standards

The following performance standards will apply to canal development on West Island:

- a) Canal developments on Galveston Island will require approval of a Section 10 Permit by the Corps of Engineers for dredging the canal, and for constructing any structures that will be placed in the waterway. Approval of a Section 404 Permit by the Corps will be required for any filling in wetland or aquatic areas. The city will require the project proposer to apply for these permits prior to submittal of subdivision, development site plan or zoning documents. A copy of the completed permit application shall be submitted with the subdivision, development site plan or zoning application to the city.
- b) The city and/or Planning Commission will provide comments to the Corps of all wetland dredge and/or fill permit applications during the review comment period of the Corps. The comments will reflect policies concerning resource use and protection.
- c) The approval of zoning, development plan, subdivision or building permit applications will not be considered for final action until the Section 10 and/or Section 404 permit has been approved for issuance by the Corps.
- d) As per the "Wetlands" policies in this document, the city will wait for the public's and agencies' reviews and comments on permit applications to determine the potential for environmental impacts. If quantifiable impacts are identified by the reviewing agencies, and /or the public then the city will request appropriate mitigation to minimize impacts on fish, wildlife, or water quality.
- e) The city will strongly encourage the minimization of impacts to wetland resources by alternative locations for improvements or by project design.
- f) Developments proposed for areas near potential aquifers will require hydrologic evaluations to determine if the proposed development would be compatible with the long term objective of the city to restore aquifer resources.

2. Design Standards

The following design standards shall apply to canal development on West Island:

- a) Canals will be designed to maximize water exchange rates in the canal areas. Canals should generally be at least 100 feet wide, and no deeper than the body of water; avoid narrow entrances in large bodies of water.
- b) Canals will be oriented to maximize aeration opportunities using the prevailing winds.
- c) The route of access canals from developments to the parent body of water should occur by the shortest and least environmentally damaging route possible, i.e., avoid intertidal marshes, submerged grass beds, and oyster reefs. Alignment of the canals should take advantage of existing natural or manmade channels.
- d) Control turbidity and sediment dispersion as much as possible during construction. Complete all construction of canals before connecting them with the access canals, and excavate access canals using the best dredging techniques available, i.e., use turbidity control screens and dispose the excess spoil in diked non-wetland areas.
- e) Canal depths shall be minimized to maintain the euphotic zone wherever possible. The euphotic zone is that part of the water column that receives sufficient light penetration to promote photosynthetic processes. In the Galveston area this is estimated to be between 4 and 6 feet deep. Canal depths should be sloped with the shallowest water the farthest from the entrance of the canal.
- f) Stormwater discharges into canals shall be designed to minimize potential pollutant discharges caused by urban runoff. The total surface area planned for paving or other nonpermeable construction must be evaluated to determine if there is a potential for urban runoff pollution in excess of what the receiving water body can properly dilute without being adversely impacted.
- g) Point-source discharges into canals should be prohibited whenever possible. If point-source discharges are permitted, discharges must be free of pollutants. Point-source refers to a discharge out of a pipe or other specific point of discharge.
- h) Canal development plans must include a 20-year dredged material disposal plan. This must include the estimated timing and quantity requirements for dredging determined by an evaluation of sedimentation estimates and long-term navigation requirements. The disposal plan must provide for sufficient upland disposal sites to meet the estimated disposal needs. Upland disposal sites should be large enough to accept material dredged from channel entrances extending into West Bay during future dredging operations.

OBJECTIVE:

Preservation and Replanting of Vegetation

Use land in a manner that protects existing vegetation and replants natural areas.

POLICIES:

1. Existing native vegetation plays a vital role in a stable ecosystem. The contributions of dune grasses, wetland plants and oak mottes in soil stabilization and provision of food and shelter for native fauna is an essential link in the island's natural processes. Existing native plants found in natural conditions should be preserved and protected from infringement by development and expanded whenever practical by replanting or creating conditions to permit native plants to expand their territory.
2. The preservation of existing trees whether found in a natural setting or planted by man is specifically encouraged. Trees with a caliper of six inches or greater should be preserved and protected whenever practical and additional trees suited to the site and climatic condition should be planted to increase the island's tree inventory. When trees with a caliper of six inches or greater are removed, replanting of trees in a location compatible with the new land use should follow the schedule shown below:

For removal of:

1. each 6" up to 12" caliper tree
2. each tree of 12" or greater caliper

Plant at least:

One replacement tree of same variety approved by city; minimum size new tree to be 6" caliper.

One replacement tree for each full 6" of caliper; replacement tree to be of same variety or variety approved by city; minimum size of new trees to be 6" caliper

5. STORM HAZARD PROTECTION

GOAL:

TO INFORM CITIZENS OF, AND PROTECT FUTURE DEVELOPMENT FROM, POTENTIALLY HAZARDOUS EROSION, DESTRUCTION AND POOR EVACUATION CONDITIONS.

ISSUES:

Floodplain

The majority of West Island has been mapped as being within the 100 year floodplain boundary determined by the Federal emergency Management Administration (FEMA). Based upon historical evidence, the Island experiences significant flooding on a regular basis. Flood velocities can significantly damage public and private investment as well as cause hazardous conditions during storm surges. The city intends to manage development in these areas to protect the public interest.

OBJECTIVE:

Floodplain

Protect future development and uses in the 100-year floodplain from potentially hazardous erosion or excessive destruction of private and public property.

POLICIES:

1. Performance Standards

The majority of West Island has been mapped as being within the 100 year floodplain boundary as determined by the Federal Emergency Management Administration (FEMA).

Any development proposed for areas that fall within the 100 year floodplain must meet the following performance standards:

- a) The city should develop a design standard for flood velocity engineering. Until a velocity standard is developed, project sponsor for Planned Developments will be required to recommend an appropriate flood velocity to which their project will be designed.
- b) All grading plans and ground structures will be designed to an appropriate flood velocity to minimize potential hydrologic impacts.
- c) Developments will consider potential off-site impacts to structures and utilities when any surface changes or structures are planned that could alter flood velocity conditions.
- d) The city will minimize public investment or long-term responsibility in utilities and services that may be impacted by hydrologic alterations.

OBJECTIVE:

Evacuation

Inform citizens of hazardous conditions and take measures to provide the opportunity for evacuation in the event of a hurricane or severe coastal storm.

POLICIES:

1. Future major development proposals will be evaluated with regard to the impact they will have on citywide evacuation abilities. Applicants for approval of future development will include an evacuation analysis as a part of the traffic impact analysis required under the goal “Transportation” in this document. The evacuation analysis will be prepared as required by the City Emergency Management Coordinator.
2. Future residents on the island will be informed of the varying degrees of hazard on the island due to hurricanes and severe coastal storms.

6. TRANSPORTATION

GOAL:

TO DEVELOP A THOROUGHFARE SYSTEM WHICH PROVIDES FOR THE SAFE AND EFFICIENT MOVEMENT OF GOODS AND PEOPLE.

ISSUES:

The 1985 Galveston County Regional Mobility Plan provides general guidelines for the development of the Galveston County transportation network. The plan gives special attention to Galveston Island and its particular concerns and should be referred to for specific information regarding traffic and thoroughfare planning on the island.

The plan identified major capacity deficiencies on Galveston’s major and minor arterial and recommends an implementation strategy for local, county, state and private financing of the necessary improvements. The implementation of the Regional Mobility Plan is particularly important due to the critical function of the Galveston Island thoroughfare system. The system serves both daily and seasonal traffic on a routine and emergency basis. Available traffic counts indicate that portions of three of the island’s four major arterials (Seawall Blvd., 61st Street and Broadway Blvd.) are functioning at a level of Service F, the worst level of service rating. This rating does not take into account the impact of seasonal traffic on the thoroughfares.

Future development on the island must reflect an awareness of existing traffic congestion and illustrate its ability to mitigate the impact it will have on the thoroughfare system.

OBJECTIVE:

Transportation System Actions

Protect and improve the traffic handling capacity of the city's major and minor arterials.

POLICIES:

1. The following Immediate Projects (1985-1990) will be implemented as recommended in the 1985 Regional Mobility Plan:
 - a) Construction of a new 6-lane arterial extending Broadway Blvd. from 6th Street to Apffel Park Road.
 - b) Upgrading of Port Industrial Blvd./M.H. 49 to a 4-lane arterial between 28th Street and 12th Street.
 - c) Construction of a new 4-lane causeway from Virginia Point (mainland) to Eight Mile Road.
 - d) Construction of a new continuous ramp connection from 61st Street to I-45 (from the south to the northwest)
 - e) Reconstruction of 8 Mile Road to a 4-lane arterial with improved intersection from the new bay crossing to Termini Road (FM 3005).
 - f) Construction of a new 4-lane divided arterial between San Luis Pass and the State Park (to upgrade the existing 2-lane section of Termini Road/ F.M. 3005). The long range needs for the road should be examined, as recommended in the following objective.
2. The following Short-Term Project (1995-2000) will be implemented as recommended in the 1985 Regional Mobility Plan:
 - a) Widening and realignment of Stewart Road from 75th Street to the State Park.
 - b) Construction of additional lanes and interchange structures on I-45 between S.H. 6/S.H. 146 and Port Industrial Boulevard.
3. The following Long-Term Project (1995-2000) will be implemented as recommended in the 1985 Regional Mobility Plan:
 - a) Extend Heards Lane from Saladia Street to 57th Street and to transition to the one way pair of streets, Avenues O and P.
 - b) Widening of the Pelican Island Causeway from U.S. 75 to the east end of Pelican Island.

- c) Widening of Seawall Blvd. to 6-lanes from 61st Street to 2nd Street by removal of on-street parking.
- 4. Site plans for future developments will strive to minimize the impact of the site's traffic on adjoining public thoroughfares. The least number of entrances/exits consistent with needs of the land use should be constructed and they should be located to direct traffic to the point of least impact.
- 5. The Planning Commission reserves the right to require a traffic impact analysis of any proposed new development. When required by the Planning Commission, such analyses shall be prepared by the applicant for such development using base data and guidelines developed by the City Department of Traffic and Transportation.

OBJECTIVE:

Termini Road

Provide for the improvement and replacement of Termini Road.

POLICIES:

1. A supplemental study to the 1985 Regional Mobility Plan should be completed which addresses:
 - a) The permanent and seasonal population which depends upon Termini Road for daily access to West Island and for evacuation during hurricanes and coastal storms.
 - b) The design of Termini Road and a system of secondary streets to accommodate this population. Restrictions on access to Termini Road from abutting property should be included in the design. See the Land Use Goal and supporting objectives and policies for developing residential areas.
 - c) The appropriate design standards for major and minor arterials located west of the seawall including:
 1. Appropriate elevation of the road to allow evacuation.
 2. Appropriate construction methods to provide the desired storm hazard tolerance.
 - d) Right-of-way acquisition considerations and strategy.
 - e) Funding methods and the city's level of investment.
2. In the interim, future development dependent upon Termini Road should:
 - a) Minimize access points directly on to Termini Road. Also, see the Land Use Goal and supporting objectives and policies for developing residential areas.
 - b) Provide secondary streets (s) to accommodate short trips and relieve congestion on Termini Road.
 - c) As appropriate, relocate the alignment of Termini Road as indicated on the 1985 Regional Mobility Plan.

OBJECTIVE:

Mainland Access

Continue to plan for the provision of additional access to the mainland between Eight Mile Road and Virginia Point.

POLICIES:

1. A supplemental study to the 1985 Regional Mobility Plan should be completed which addresses:
 - a) The detailed design of the causeway/bridge and 8 Mile Road including the appropriate construction methods to provide the desired storm hazard tolerance and to minimize negative impact on wetlands.
 - b) Right-of-way acquisition considerations and strategy.
 - c) Funding methods and the city's level of investment.
2. In the interim, any future development in the general location of the proposed improvement should indicate provision of right-of-way for the new bridge and associated roadways.

7. CITY SERVICE AND COMMUNITY FACILITIES

GOAL:

TO DEVELOP THE WIDE RANGE OF CITY SERVICES AND COMMUNITY FACILITIES ESSENTIAL TO THE CITY AND TO LOCATE THESE IN A MANNER ALLOWING EFFICIENT OPERATIONS.

ISSUES:

The City of Galveston is facing two diverse issues regarding the provision of city services and community facilities. The east end of the island is suffering from a lack of maintenance and the inherent problems of systems which were installed over fifty years ago. In direct contrast to this situation, the west end of the island is faced with demands for city services to a rapidly developing area of the city. The city's ability to keep pace with both of these situations is critical to its emerging role as a major vacation and convention site.

An important part of providing basic city services and facilities to residents and visitors is planning for future needs. Each development application must be reviewed in terms of its long and short range benefits and costs to the City of Galveston. In addition, approved developments should be carefully monitored to ensure that the city can meet its obligations to current and future residents.

OBJECTIVE:

Sanitary Sewer Service and Treatment

Plan for the provision of future citywide sanitary sewer service and wastewater treatment facilities and the repair and maintenance of existing systems.

POLICIES:

1. A citywide sanitary sewer master plan should be prepared which addresses the location of future service lines and treatment facilities and the maintenance of existing lines and facilities and establishes the future waste treatment system for West Island. The plan should provide:
 - a) The size of each regional plant at the various stages of development, plus design guidelines for improving the plants.
 - b) The size and general location of interceptors and pump stations to be constructed to serve undeveloped areas.
 - c) The most cost-effective manner of serving the area between Jamaica Beach and Indian Beach.
 - d) An equitable manner of funding major capital improvements such as upgrading the Terramar / Isla del Sol plant; one funding alternative to be evaluated would be adoption of a capital cost recovery fee to be paid by new customers that generate need for sewage treatment facilities.

2. All future proposals for land development on West Island must address their short and long-range plan for sewage disposal. If the proposed disposal system includes any elements other than extension of municipal sewer lines connected to the city's treatment plant with adequate capacity to accept the added waste load, then the following items that apply to the proposed system should be addressed.
 - a) The life-cycle (life-expectancy) of the sewage disposal system for the development.
 - b) The plan for disposal facilities beyond that time.
 - c) Provisions for present and future easements that permit current operations and expansion of the municipal sewer system.
 - d) The method to be used to inform property owners regarding future sewerage requirements regarding easements, right-of-way, etc.
 - e) A projection of the timing and magnitude of anticipated public costs.

3. Consideration of combining the Pirates Cove Municipal Utility District and the Village of Jamaica Beach into the Galveston city limits at some future date should be included in any sewer master planning program.

OBJECTIVE:

Water Supply and Distribution

Plan for the future supply and distribution of water essential to domestic consumption, fire protection, sanitation and industrial processing.

POLICIES:

1. A citywide water distribution master plan should be prepared which addresses the location of future service lines, water storage and water supply sources, and maintenance of the existing system.
2. All future proposals for land development within the city must address the provision of water distribution to the development.
3. The City of Galveston will plan to ensure a long range supply of water for the city.

OBJECTIVE:

Parks and Recreation

Provide adequate parks and recreation facilities for the entire city.

POLICIES:

1. All future proposals for major residential developments in excess of 400 dwelling units should address the provision of parks and recreation facilities for the future population of the development according to the following standard:

Playlots/playgrounds (neighborhood parks)	1.50 acres per 1,000 people
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2. The preparation of neighborhood plans should include a review of existing park facilities in each neighborhood and address any additional recreational needs of the residents.
3. Future park development should be reviewed by the Parks and Recreation Department according to the following design criteria:
 - a) Playlots/playground (neighborhood parks)
 1. Between three and four acres in size in the older dense neighborhoods; six acres or more in less dense newer residential areas. A standard of 1.50 per 1,000 people should be attained.

2. Locate in conjunction with a public school site, if possible.
 3. A service area of approximately one-half mile in radius with a population of between 4,000 to 8,000 residents.
 4. Site design should include:
 - a) A general purpose play area for elementary age children.
 - b) A surfaced multi-purpose play area for basketball and volleyball.
 - c) Play equipment for preschool and elementary age children.
 - d) Safe and convenient pedestrian access separate from vehicular traffic.
 - e) Attractive landscaping and screening.
- b) Playfields
1. Between 10 to 20 acres in size in newly developing areas. Six to eight acres in existing dense neighborhoods. A standard of 0.75 acres per 1,000 people should be attained.
 2. Locate in an area convenient to several neighborhoods and in conjunction with the site of a middle or high school, if possible.
 3. A service area of approximately one mile in radius.
 4. Site design should include:
 - a) Lighted ball diamonds and tennis courts.
 - b) A community building.
 - c) Off-street parking facilities.
 - d) Attractive landscaping and screening.
- c) Large Parks:
1. Between 25 to 100 acres in size. A standard of 1.00 acre per 1,000 people should be attained.
 2. Locate in an area convenient to a large portion of the populations.
 3. Site design should include:
 - a) Facilities for picnicking, fishing, boating, hiking or bicycling.

b) Off-street parking facilities

d) Special Facilities:

Special facilities such as community centers and indoor active recreation centers will be considered as options in meeting recreation needs of the islands' permanent residents. Other special facilities such as golf courses, arboretums and amusement parks will require specific analysis to determine the appropriate location, size, facilities and market for the intended use.

4. When the opportunity occurs to acquire additional parkland through acquisition, dedication or other devices, the parcels should be carefully screened to determine their satisfaction of anticipated needs and location/access criteria.
5. While little or no additional land may be available in the east end, existing park facilities should be vigorously protected over time from actions that would reduce their size. Any proposed reduction should be considered only if it is offset by replacement facilities of equal or greater size and/or utility to the community.
6. The City Parks and Recreation Board and the Parks and Recreation Department will continue to cooperate with the Galveston Independent School District to develop and manage joint recreation facilities on city or School Board property.

OBJECTIVE:

Education Facilities

Ensure adequate educational opportunities for all citizens.

POLICIES:

1. Assistance will be given to the Galveston Independent School District in planning facilities to serve future residents of West Island, the east end and the San Jacinto/East End flats area.
2. City growth monitoring will be conducted in conjunction with the GISD and information will be exchanged regularly.

OBJECTIVE:

Public Safety

Provide maximum public safety throughout the city.

POLICIES:

1. All future developments must address the ability of the city to provide adequate fire and police service.
2. Access for emergency vehicles to West Island during congested traffic conditions will be a consideration during evaluation of future development applications in that area.
3. The city's next fire station will be constructed on a designated site near the Sea Isle development. Thereafter, additional stations will be constructed as needed and as capital funds are appropriated to provide adequate fire protection based on standards established by the Fire Department. Areas that may need protection by a new station include the San Jacinto/East End flats, Pelican Island, the vicinity of the 8 Mile Road and Termini Road intersection, the area west of Jamaica Beach along Termini Road, and the Pointe San Luis development at the west end of the island.
4. At the location of each new fire station the city will determine whether additional facilities should be developed including police holding quarters, an emergency medical service station, a community center and a branch library.

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VII. IMPLEMENTATION

INTRODUCTION

The City of Galveston is a complex social, physical and economic organization held together by laws and commonly accepted social norms and community values. The city's private and public sectors function within a broader regional, state, national and worldwide framework. The parts of the complex structure are interrelated and forces changing one element will alter other elements.

The Comprehensive Plan is a public document composed of words and maps that set out guidelines to be used for the construction and reconstruction of the city's existing and future parts. The Plan is not a law, in that it defines precise restrictions, rather, it is a document that influences public and private decisions because its recommendations are supported by both sectors. The Plan contains recommendations that strengthen some of the city's assets and move toward solution of some of its problems.

IMPLEMENTATION ACTIVITIES

In accomplishing its purpose, the plan will act as a framework to structure activities under three broad action categories: (1) the adoption and administration of land use laws, (zoning ordinance and subdivision regulations); (2) cooperation among public and quasi-public agencies and the private sector in improving the community; and (3) determination of the best course for local government to follow in assisting and stimulation growth in the community's private sector through application of selective redevelopment and incentive programs.

More specifically, the Plan contains recommendations that will guide activities related to land use, transportation and community facilities. Most of the city's land is owned and used by private parties as residences, places of commerce or as vacant land. The use and division of land is controlled by zoning and subdivision laws that limit the individual owner's land rights in order to accrue benefits for adjoining private owners and the community as a whole. The structure of the land use laws have a direct relation to the manner in which the city grows and changes from actions by the private sector. Some private owners react spontaneously to economic and social force in changing the use of their property particularly in areas where active land development is under way. Protection of the island's fragile natural environment and shaping of new development into a quality living environment is a principal goal of land use regulations. Other owners, often with small holdings in the built-up part of the city, may require assistance of local government in overcoming obstacles to making land use improvements. Such assistance can assume the form of rehabilitation, redevelopment and economic incentive programs. The Comprehensive Plan's land use recommendations provide guidance for private land use whether initiated by the owner or in response to local government programs.

Transportation recommendations are intended to help guide the investment of public and private funds in transportation system improvements to achieve a higher level of service.

Public funds will be spent on upgrading existing and constructing new transportation system elements for the movement of vehicles, people and goods. Private investment will be primarily in the form of new subdivision streets, on-site circulation, and off-street parking.

Recommendations for community facilities will help guide the use of existing and the expansion of new facilities for education, recreation, public services, health care, and utility services. The coordination of program efforts to maximize the level of service with the least expenditure of public funds is emphasized.

Because the Comprehensive Plan is intended to influence a wide range of public and private decisions, some of its components may relate selectively to certain decisions while other components may relate to all decisions. Use of the Plan is, therefore, influenced by the type of issue being considered and the decision to be made. The following list recognizes major categories of decisions likely to be faced by the community.

Decision Areas:

1. **Zoning** – the structure of the ordinance and its administration including consideration of applications to change the zoning district classifications of private property and approval of planned development plans and application of environmental policies, especially on West Island;
2. **Subdivision** – the structure of the regulation and its administration including review and approval of new public streets, drainage ways and placement of utilities;
3. **Coordination of Public and Quasi-Public Agencies** – the opportunities that exist from time to time to improve the quality and/or quantity of service provided by independent and semi-independent boards and agencies, state agencies and federal government bodies through the coordination of programs and the use of facilities;
4. **Capital Expenditures** – the process used by the City and other government units to determine when and where to spend limited revenues on construction of capital items such as roads, utilities, drainage systems and public buildings;
5. **Land Development Cost Analysis/Generation of Revenues** – the determination of the range of off-site public improvements generated by private land development ventures and the allocation of their cost to the public or private sector and the generation of revenues required to construct the full range of public services required to support a high-quality urban life;
6. **Redevelopment** – the process usually carried out by the cooperation of private land owners and public agencies or under urban redevelopment legislation to accomplish reuse of existing urban areas;
7. **Rehabilitation/Conservation** – a wide variety of private and public activities aimed at improving and protecting conditions in developed areas that merit long-term use including housing rehabilitation and historic preservation programs;

- 8. Economic Development** – a variety of public activities developed in partnership with the private sector to serve as incentives for creation and preservation of jobs, income, taxes and investment opportunities;

To begin implementation of the Comprehensive Plan there are several activities to be considered under each of the three action categories and to help determine answers in the eight decision areas. The activities are listed below in relation to the action categories and decision areas. The list of activities should be expected to change over time as additional refinements in the evolving land use control program of the city become necessary and as new issues arise in the priority list of problems to be addressed by the community.

Action Category: Adoption and administration of land use laws

Decision Areas: Zoning regulations

Subdivision regulations

Activities:

1. Examine the zoning ordinance controls and administrative procedures that may carry out the Plan's policies concerned with protecting the island's fragile natural environment.
 - a. Initially, the city should examine ways to amend the zoning ordinance to require applicants seeking approval of a general land use plan (the first formal action leading to approval of a planned development plan) or a change in the zoning classification of property to submit information to demonstrate how the proposed project will satisfy policies relating to wetlands, beaches and dunes, water quality, canal development, floodplains and washover areas. As the city gains experience with the review of environmentally sensitive land development projects, a body of data describing the extent of impacts and ways of avoiding negative effects will be collected. Also, in the event an environmental study of the island's natural systems is conducted as a result of current litigation involving the Corps of Engineers and the Sierra Club, the city should attempt to ensure that the island's sensitive environmental features are thoroughly examined. The city should then assemble available information and define to as exact an extent as possible, conditions or performance criteria that determine the threshold environmental impacts of development that can be tolerated by the city. As appropriate, the conditions should be amended into the zoning ordinance to formalize the review process.
 - b. Conditions (performance criteria) defined to carry out the environmental policies should be prepared with a clear understanding of how evaluation of plans prepared to meet the condition will be handled; the conditions should recognize when and by whom discretionary judgments based on professional experience will be made. The role of other agencies (federal and state) and the assistance they will provide should be recognized.

2. Examine the zoning ordinance controls and administration procedures that may carry out the plan's policies concerned with urban impacts of planned development plans and proposed changes in zoning districts.
 - a. Consider requiring applicants to submit development plans to demonstrate the compatibility of proposed uses to the character of the adjoining area and to satisfy the plan's policies for the following areas: stable, rehabilitation, developing historic, special, commercial and industrial neighborhoods.
 - b. Define procedures to evaluate the impact of land development on public streets. Part of the procedures should include identification of an acceptable level of service for traffic to experience on streets after the proposed development is occupied, and guidelines to be used by the applicant in determining traffic impacts. The city should maintain existing traffic count data (or require the applicant to establish current traffic levels) and provide the applicant with information to describe future background traffic that will be generated by land development already approved by the city but not yet constructed.
 - c. The applicant should be required to demonstrate satisfaction of policies relating to sewage disposal and water supply and the plan's relation to the city's strategy for providing these services.
 - d. The applicant should define, to the extent practical at this preliminary stage, the major components of the proposed drainage system and its compliance with the plan's policies that address drainage.
 - e. Procedures should be prepared by the city to measure the potential impact of the proposed development on the city's current ability to accommodate evacuation during life-threatening storms.
3. The administration of subdivision regulations should strive to achieve the following.
 - a. Review of proposed subdivision plans in the Termini Road corridor of West Island should encourage provision of a continuous east-west minor arterial street system parallel to Termini road to permit vehicular trips within the subdivision to use streets other than Termini Road. To the extent practical, the minor arterial should connect with street stubs in adjoining subdivisions.
 - b. Procedures for review of proposed subdivision plans for property presently zoned to permit the type and density of anticipated development, should require the applicant to demonstrate compliance with policies for the protection of wetlands, beaches and dunes, water quality, canal development, floodplains and washover areas. The conditions defined to review environmental impacts of planned development plans in item (1,a) above, should also be applicable to review of subdivision plans.

ACTION CATEGORY: Cooperation among public and quasi-public agencies and the private sector.

DECISION AREAS: Coordination of agency actions

Capital budget plan

Cost responsibility/capital expenditure revenues

ACTIVITIES:

1. Examine opportunities for use of public property to meet a variety of public needs.
 - a. As development of West Island occurs and additional school, fire station, library and, especially, park sites are required, examine and feasibility of combining uses on the same tract. Joint site development of schools, libraries and parks with field and court sport facilities are compatible with meeting the needs of younger population groups, while parks with court sports and passive recreation, libraries and community centers are compatible with meeting the needs of mature/elderly groups.
 - b. As the planned Interstate 45 causeway improvements are completed and more definitive planning is conducted for a West Bay Freeway, close coordination will be required between the City of Galveston and the Texas Department of Highways and Public Transportation. Activities for the acquisition of adequate rights-of-way dedication or purchase and the protection of areas planned for major interchanges should be investigated. Continued development of the island coupled with the need to facilitate emergency island evacuation actions will result in a continuing increase of demands for improved access from Galveston Island to the mainland. Preparatory planning for the supportive thoroughfare approaches and an internal island thoroughfare system necessitates the need to regularly monitor traffic demands and the corresponding State Highway plans development process.
2. Long range capital plan and an annual capital budget.
 - a. As with most developing communities the City of Galveston should make its long range plans to manage its development. Once the plans and policies are in place for land use, transportation and community facilities, the planning process continues on to the more specific plans of phasing the implementation processes and preparing long range capital plans. In order that long range capital plans be formulated, municipal departments having the responsibilities for transportation and streets, water, sewer and drainage facilities should each contribute to the long range capital plan through the preparation of their individual, but coordinated, facilities plans. Each municipal department should initiate their long range facilities plans using the Comprehensive Plan as an approved guide for the islands future development as soon as practicable. As the department capital plans are completed, the plans should be formatted into a system of priorities, general cost estimates and other implementation requirements. Coupled with a fiscal resource analysis and program the long range capital plan can become a major tool for the Comprehensive Plan implementation.
 - b. The annual budget process provides the department heads the City Council an opportunity to review the long range capital plan, it priorities and potential fiscal

resources in the preparation of the recommended annual budget as it relates to the Comprehensive Plan implementation process. The Comprehensive Plan, its goals and supportive long range capital plans should be simultaneously consulted in the annual budget to reverify the long range plans with shorter range priorities and objectives.

3. Recognizing local governments shortfall of revenue for capital projects versus the much greater existing and future needs for improvements, the local governments responsibility for financing improvements for new development should be examined. More specifically, the allocation of costs for public infrastructure improvements to serve new development between the private and public sector should be reviewed. The cost allocation formula must be equitable, that is, acceptable to the land development industry, the community's leadership and the electorate as a whole.
 - a. The recent decision by the Texas Supreme Court to uphold the right of the City of College Station to mandate land developers to dedicate land or make cash payments in lieu of land dedication for neighborhood parks for future residents should be examined for its application to Galveston. Mandatory participation by developers in the provision of public facilities previously provided by the community as a whole must meet three tests; the regulation must accomplish a legitimate goal related to the health, safety or general welfare, it must be reasonable and not arbitrary, and it must lead to the provision of facilities specifically for future residents of the subject development.
 - b. During the 1987 session, the Texas Legislature passed Senate Bill 336 which provide municipalities the legal authority to set capital recovery fees and describes the basis for establishing the fees. Examination of the advantages and disadvantages of requiring payment of development fees at a time building permits are issued should be investigated. Such fees are typically set at a rate to help compensate the city for the added costs of public infrastructure generated by new development. Advantages of this method of raising capital funds are primarily due to the relatively painless manner of applying the charges of future but currently non-existent home owners, renters and business people. The primary disadvantage of the process is directly related to the same fact; the allocation of charges for additional improvements drives up the cost of development thus limiting the potential market and under some circumstances dampening the rate of development.

ACTION CATEGORY: Assist private sector through planning and incentives

DECISION AREAS: Redevelopment

Rehabilitation/Conservation

Economic Development

ACTIVITIES:

1. Determine a standard format for presentation of neighborhood plans.

- a. Initiate neighborhood plans for the West Island area, integration existing and proposed development and defining a structure for major vacant areas.
 - b. A continuation of preparation of neighborhood plans is recommended recognizing special characteristics and opportunities of each neighborhood. Neighborhoods recommended for neighborhood plans are Lasker Park, Lindale Park, Weiss, Bayou Shores, and Fort Crockett.
2. Promote rehabilitation in areas suited for rehabilitation/redevelopment in a manner consistent with existing neighborhood plans and historic preservation districts.
- a. Existing codes and ordinances should be examined to determine if a) they are totally pertinent to rehabilitation and redevelopment activities and b) they are cost prohibitive to encourage rehabilitation and/or redevelopment. Often development codes and ordinances are formulated on the basis of new development and may overlook opportunities to encourage rehabilitation of older areas. The attention to the public's health, safety and general welfare must be maintained; however, if the public's safety can be maintained various codes and/or ordinances may be relaxed to meet certain well defined conditions relative to redevelopment.
 - b. Historic and special districts within the City often are those areas that set the City of Galveston apart from other cities and are the areas that one remembers as "unique". As neighborhood plans are completed the historic and special districts should receive attention. Assistance both in funding and participation can often be found through special interest groups within the downtown, Stand area, Texas University Medical Branch area and residential historic neighborhoods. These groups should be identified, met with the assessed for their ability to participate in the special district plans.
3. Encourage private investment in new land development and redevelopment projects and coordinate planning and construction of major public institutions and independent agencies which have demonstrable positive economic impacts on the community.
- a. Examination of the City's participation agreements with private development should be carefully reviewed and where necessary assume in contractual agreement the municipal responsibilities for certain development and/or redevelopment activities. Such a City-Developer contract for community facilities should describe specifically the developers responsibilities for installation and cost assumption for those facilities to serve the planned project. The agreement should also clearly define these costs of facilities installation that have been required but are excess in size to serve the broader interest or needs of the community. An example may be that the developer may be required to plat, dedicate and be responsible for the construction of a major or minor arterial which would border or cross the project. The agreement would specify the number of lanes, or width of street that would be necessary to serve the project and thus the developers responsibility to construct. The cost of that street width would be absorbed by the developer whereas any additional street width construction cost resulting from City requirements will be

assumed by the City. A clear identification of responsibilities through contractual form clearly assigns responsibilities and encourages private investment through full understanding of city participation.

Older areas that may be identified by the City desirable to encourage redevelopment should be identified in the long range capital plans and corresponding budget. A commitment will be required of the City, according to the plan's priorities, to maintain a progressive program for budgeting and implementation. Examples may include water or sanitary facilities replacement or upgrading, street or drainage improvements, sidewalks improvements, zoning district changes initiated by the City, etc.

- b. Scheduled and regular liaison and information exchange meetings should be conducted possibly on a quarterly basis and would include municipal staff members and representatives of the major institutions having positive impacts on the community. The purpose of the meetings would be to exchange information, short and long range plans, immediate activities and cooperative needs identification between major institutions and the city. Through such meetings impacts upon municipal services can be identified early and facilitated in a more planned and efficient manner.

SAMPLING OF TOOLS FOR IMPLEMENTATION

The City Council and City Planning Commission have at present a series of ordinances available to them for the management of growth and the implementation of the goals of the community. The following is a description of a variety of ordinances and policies that the City of Galveston may have adopted and is enforcing, or others that the City may wish to adopt. The purpose of the following descriptions is for those wishing to become familiar with the Galveston Comprehensive Plan and the tools for its implementation that are either presently available or that are generally accepted by most communities as basic growth management techniques.

The descriptions are categorized by:

Land Use	Environment
Transportation	Rehabilitation/Redevelopment
Community Facilities	Economic Development
	Beautification

Under each of these categories are possible legal tools typically adopted for growth management and policies that may be established by the elected leaders who represent the community. As stated earlier, many of the described tools are presently in effect and being enforced by the City.

Action Category

Implementation Technique

1. Land Use

City Council adoption by resolution of a Comprehensive Plan as the city's basic statement of growth goals and growth management policies.

Ordinances Zoning

Zoning ordinances are the basic elementary tool available to the city in achieving the land use plan goals. The Planning Commission is charged with the responsibilities of preparing long range plans and assisting in the implementation/monitoring of those plans. The Planning Commission is a recommending body to the City Council in zoning matters; thus, this body monitors existing ordinances and makes recommendations to the City Council relative to the need of the land use ordinance revisions and requested changes of existing zoning as they relate to the Land Use Plan.

Types of zoning used to implement long range goals as well as for special area concerns are:

Cumulative Zoning – The basic zoning methodology first recommended and tested during the early 1920's. The City of Galveston's existing zoning ordinance is basically a cumulative zoning ordinance with modifications or additions. This type of zoning ordinance offers very little recognition for special area concerns or requirements. To provide flexibility will often cause many amendments or awkward enforcement procedures.

Planned Unit Development – This type of zoning offers more flexibility in achieving basic land use arrangement goals and the height, bulk and set-back requirements but it must be based upon a set of predetermined design criteria. The design criteria must be included in the basic ordinance in detail to protect the community health, safety, traffic, and general welfare concerns but flexible enough to allow for achievement of private development design goals.

This type of zoning is most often desired for new residential areas, areas using new housing technology or in mixed use developments.

Performance Standards – This type of zoning is most often based upon specific design criteria relative to special and often environmental affecting use areas.

Examples include the management of noise, dust, vibration, sanitary and storm drainage discharge often associated with industrial areas.

Special District Zoning – This zoning technique is often used as an “overlay district” to a conventionally zoned area. Design criteria and performance standards should be specifically written for such districts to achieve the desired land use goals. Examples of such districts include floodplain areas, historic districts, redevelopment areas, tourist/entertainment districts, environmentally sensitive areas, etc.

Recognition of Other Legal Mandates – There are various state and federal bodies that do have an influence upon the island’s land use regulations due to their missions of environmental protection and flood hazard protection. Regulations presently administered by these bodies may be incorporated into local ordinances, or may influence the extent and enforcement of municipal ordinances. Examples of these local ordinance influences may include state and federal regulations concerning beach development, wetlands use, discharge from ships into the gulf waters, air and water pollution, flood insurance programs and other land use development controls. These standards and/or controls are most often written in design standards or special district controls.

Subdivision

This ordinance regulates the division or platting of land into two or more parcels. The ordinance may include specific platting information that will assist in implementing the land use policies of the city. This ordinance can also describe the platting process prior to the final plat approval by the Planning Commission. Processes can consist of:

General Land Use Plan usually consists of an early concept of a larger scale development. The minimum land area required for concept plan approval can be set by the Planning Commission. The concept plan can describe general arrangements and quantities of land use, suggested zoning classifications, thoroughfare extensions or improvements (in conformance with the city’s thoroughfare plan) methodologies for treatment of environmentally sensitive areas, major utility requirements, parks and open space recommendations

etc. It is at this point that negotiations for city/developer agreements can be initiated and established.

Preliminary Plan (Plat) most often establishes more detail than the Concept Plan and will include phasing plans, preliminary lotting plan, rights-of-way widths, set-back lines, easements, general dimensions, preliminary engineering plans, more detailed design addressing environmental regulations, reserve areas for beautification, etc. More specific agreements can be made at this point for city/developer agreements.

Final Plats are the documents filed with appropriate public bodies and consist of accurate lotting arrangements with specific control dimensions, easements and rights-of-way dedications, final engineering documents and signed city/developer contracts of agreements. Such agreements may be relative to parks land ordinances, cost sharing of community facilities, homeowner association charter/by laws, etc. Under certain conditions, the final plat requirements can include provisions for “short form” plats which would not necessarily require all of the informational data to be submitted as for plats containing multi-lot layouts.

Policies

The adoption of a series of land use management policies are instrumental to implementing any set of development goals. The City Council may adopt by resolution policies which are then carried out by appointed commissions and municipal staff. Examples of such policies are:

Preparation of infrastructure resource and distribution plans by various municipal departments. These more specific plans of water resource and distribution plans, sanitary sewer collection and treatment plans, in conjunction with the cities land use plans play a major role in planning long range resource and treatment requirements, how to finance needed facilities, staging of improvements, and locational criteria for the facilities.

Developer/City Agreements for cost sharing of infrastructure or thoroughfare construction can be established to reflect the responsibilities of both parties

and can result in a set of uniform criteria that can be incorporated into both parties development phasing. Often these agreements can be put into contract form which can describe the specific agreements for both parties such as costs sharing, how and when costs will be collected, phasing of development, responsibilities for construction, etc.

Capital Improvements Program can establish budgets for short/long range community facilities improvements. These improvements often have a direct bearing upon a developer, or redeveloper, initiated plans and their timing. The City Council's budgetary policy will often reflect its attitude towards land use development or redevelopment.

Coordination with other governmental bodies to insure compatibility and coordination of policies and regulations with those of the City is a continuing process. The sizing, location and timing of school construction (or closing) necessitates coordination with the Galveston Independent School District with the city's approval of development plans. Similarly, Texas Parks and Wildlife activities at its facilities will have an impact upon traffic/thoroughfare planning, associated private development activities, infrastructural needs, etc. Other governmental bodies include H.G.A.C., Texas Department of Highways and Public Transportation, U.S. Corps of Engineers, private utility companies and the various public and private Universities, medical institutions and associations.

2. Transportation

Ordinances

Master Thoroughfare Plan Typically the Master Thoroughfare Plan is adopted by resolution by the City Council in conjunction with the other elements of a Comprehensive Plan. In situations that the City Council has mandated that traffic movement and thoroughfare route protection is critical to the functioning of its operation, this element can be adopted by ordinance. As with any ordinance, any changes to the plan requires a recommendation from City staff(s) and the public hearing process.

Zoning

Rights-of-way protection can be provided through criteria established for performance zoning ordinances

such as Planned Unit Development or Performance Standards.

Subdivision

Right-of-way platting can be required of either preliminary or final plat approvals.

Policies

Traffic Impact Analysis and traffic general studies can be required of concept or preliminary plan phases of the platting (subdivision) ordinance. The significance of this policy is particularly important to plans submitted for approval in the West Island area wherein traffic carrying capacities of Termini Road and Stewart Road are critical to continued urbanization of the area.

Design Standards relative to the classification of thoroughfares by traffic types and volume can include right-of-way width, roadway width, spacing of driveways and intersections, numbers of travel lanes and parking lanes, and engineering design criteria for construction.

Developer Participation for certain thoroughfares can result from municipal policy relating to classification of the thoroughfare and its design standard. An example may be that the developer pay for a certain number travel lanes and/or storm drainage and the City pay the balance of construction costs.

Capital Improvements Programs and Bond Programs planned and approved often express the city's policies for thoroughfare improvements and extension activities.

Coordination with other governmental bodies on a regular basis can include Texas Department of Highways and Public Transportation, adjoining municipalities, and Department of Emergency Preparedness.

3. Community Facilities

Ordinances

Impact Fees placed upon new development to be used for specific purposes and within specific service areas is a relatively new form of leveeing fees for certain city services that will be impacted by the new development. Certain and specific legal requirements must be met by the City in leveeing these fees and must be clearly defined in the ordinance. During 1987 the Texas

legislature passed SB 336 which provides cities the authority to adopt capital recovery fees under specific conditions. The city should investigate such an ordinance adoption.

Park Land Dedication ordinances are relatively new in the State of Texas but have been upheld in courts of law providing the ordinance meets certain tests. Existing city codes and ordinances should be reviewed to determine if the City presently has such authority. If not, the city may wish to adopt the appropriate ordinances.

Beach and Dune Ordinances which regulate the use and development of the beaches and associated dunes are significant to preserve a major recreation area of the island. Such ordinances should regulate the measures of conserving the beaches, use of beaches, cleanliness and safety of their use, accessibility (public and private) and design criteria of adjacent private developments for beach protection.

Policies

Design standards for the location, purpose and design of parks is initiated by the Parks Board and the municipal staff.

Water and sewer extension policies are initiated by the Municipal Utilities Department under the guidance and approval by the City Council. The policies, based upon long range utilities plans, can include city/developer participation discussed earlier.

Fire protection policies, or design standards such as location, placement of specific equipment, etc. should be coordinated with the zoning and land development plans to assure compatibility of station requirements and timing of need with land development activities.

Public Buildings such as libraries, public works maintenance buildings, storage yards, etc. often have special design requirements such as service areas that should be incorporated into growth policies. Regular needs monitoring and longer range planning will assist in developing long range Capital Improvements Programming and Bond Program planning.

Schools/Park land policies can greatly reduce expenses while very often improving utilization of similar playground and athletic facilities. Joint use of land, or both entities (G.I.S.D. and City of Galveston) adopting a policy of locating schools and park sites adjacent to each other in newly developing areas will provide the school with playground facilities, shared athletic facilities with a shared cost of installation and maintenance with the City Parks Department. Such facilities provide for year round use and very often become the focal point of a residential community.

4. Environment

Ordinances

Design Standards prepared in conjunction with the Comprehensive Plan, zoning and platting ordinances can be adopted to strike a balance of urbanization with protection of the fragile environment of the island. Design standards that should be initiated are:

Floodplain regulations

Wet lands preservation

Landscape controls

Sanitary Sewer regulations

Storm Drainage design criteria

Density controls

Most of these regulatory procedures are described in other implementation actions in that they are basic to managing growth – growth which is not subjected to being in conflict with the use of land and environment.

Policies

Adoption, as policy, the regulations set forth by other governmental agencies concerning the use of areas designated to be environmentally sensitive.

Identification of the designated environmentally sensitive areas are found within the Comprehensive Plan. These areas should be officially identified by appropriate City Council action and establish mediation measures in conformance with those adopted by state and federal bodies.

Establish design policies pertaining to canal and bulk head design in the appropriate engineering plans approvals by the city.

5. Redevelopment/Rehabilitation

Ordinances

Zoning

Special Districts inclusion in the zoning ordinance can be assigned to specific areas of the city that have been officially targeted as districts appropriate for neighborhood conservation, rehabilitation, historic preservation or special use areas such as the Central Business District. Specific performance standards can be developed and included in the special district zoning classifications that are appropriate to the purpose of that district. Examples of special districts may include:

Medical Areas(s)

Historic areas

Central Business District

Neighborhoods exhibiting potential for

Rehabilitation and/or redevelopment

Subdivision

Replatting, street and alley closures, informational requirements as specified in subdivision regulations that would be appropriate for newly platted areas may not be appropriate for older redeveloping areas of the city. As plans are prepared for special districts there may be a requirement for provisions in the subdivision ordinance and policies to facilitate the desired redevelopment goals, while meeting the legal requirements of the basic platting ordinance.

Building Codes

Redevelopment/rehabilitation building standards which meet the basic fire protection, health, housing and safety codes may be included in the basic codes as they apply to special districts.

Policies

Capital Improvements Program planning for community facilities as they apply to rehabilitation/redevelopment areas often provide the needed impetus to initiate private activities/investment in the areas.

Use of other fiscal resources through state and federal programs can reduce the fiscal requirements of the locality. Encouragement of private investments particularly in historic preservation/restoration through local incentive programs as a city policy can encourage this resource.

Encouragement and guidance of neighborhood preservation/redevelopment activities can be provided through the preparation of neighborhood plans such as those presently being prepared by the Planning Department staff. Such planning assistance by municipal staff, when appropriate, is a valuable resource to the City in expressing its policies and guidance for rehabilitation and redevelopment. The participation by neighborhood citizens in the planning process is beneficial to encouraging self help and self improvement activities which collectively will help in halting further neighborhood deterioration.

Maintain a scheduled building inspection program and strict enforcement of building/safety/health/fire codes including a program of standard building clearance will assist in curbing the rate of deterioration of neighborhood.

Adopt an aggressive economic development program that will provide an enhanced tax base, increase family incomes and attract new employment. The basic reason for housing and commercial deterioration is the lack of adequate income for the purchase of housing and/or for the expenditures necessary for structure (home) maintenance.

An economic development program involves both the municipal elected leaders, appointed leaders and civic leaders such as the Chamber of Commerce. Often an economic development position is created within the municipal staff organization. That individual is charged with the responsibility of being familiar with fiscal resource identification (governmental and/or private fiscal resources), methodologies of seeking and successfully bringing those economic generators or improvements to the community, organizing and managing economic improvement programs,

maintaining close liaison with the business community and organizations and solicitation of a community wide support.

6. Economic Development

Ordinances

The entire spectrum of economic development is influenced by the constant review of the Municipal ordinances which collectively have effects upon the economic stability of a community.

Ordinance modification reflecting economic enhancements may include ordinances that the city may have already adopted and need review or research applicability:

- Increment Financing Districts
- Investment Zones
- Tax Incentive Districts
- Zoning Special Districts
- Municipal Image Ordinances including those described in Rehabilitation/Redevelopment and Beautification Ordinances

Policies

Similar to the discussion relative to ordinances, the expressed policies of the city government collectively influence continued economic growth and health. These policies when working with those of other governmental bodies (Galveston Independent School District, H.G.A.C., state and federal government) and the quasi public bodies (Chamber of Commerce, Texas University System, Medical Institutions, etc.) should mold a strong network system to continually review similar goals to develop economic growth and strengths.

7. Beautification

Ordinances

Galveston Island is a place of unique beauty which has been a major influence upon its popularity for tourist and resident alike. However, the beauty can be lost through neglect and over use. The types of ordinances and policies listed below when used in conjunction with those listed with the discussion "Environment" are

suggested implementing methods for the protection of the islands beauty.

Sign Ordinances which described the criteria by signage may be permitted within the city have been successfully adopted and administered in many Texas cities.

Landscape Ordinances regulating the removal and/or replacement of landscape material – such as trees and native vegetation – further encourage protection and enhancement of beautification, programs and developer responsibilities.

Weed Control Ordinances stipulating the requirements for the regular mowing of privately owned land provides for both beautification as well as for health and sanitary purposes.

Beach Litter Ordinances are already in affect along public beaches.

Street and Highway Litter Ordinances similar the beach litter control ordinances improve appearance and reduce municipal clean-up expenses.

Enforcement of Structural Demolition Ordinances remove unsightly, hazardous and often unsanitary structures which if left unattended add to the unattractive image of the City.

Policies

Landscaping and other beautification improvements can be incorporated into zoning performance standards as a developer responsibility. The standards should also require the provisions and methodologies for the long term maintenance responsibilities.

Capital Improvement Programs include budget line items for beautification for municipal construction or reconstruction projects.

Encouragement of special districts (i.e. Central Business District, Historic Districts, Medical Districts, Educational Institutions/Campuses, etc.) for inclusion of beautification efforts within their areas of jurisdiction.

Other fiscal resources for municipal improvements are available through various public and philanthropic groups. Examples of such resources are matching grants programs available through the State of Texas such as Texas Department of Highways and Public Transportation for highway beautification, Texas Department of Parks and Wildlife for parks and recreation projects and the Land Conservation Commission. Private or quasi-public foundation grants for beautification can also be available through such groups as the Ford Foundation for Urban Beautification.

As stated earlier, the above list of Comprehensive Plan implementation tools may include many, or most, of those ordinances and policies already administered or adopted by the City. However, the list is provided herein for those desiring information to better understand the legal basis for certain implementation recommendations contained in this Plan and to possibly gain a greater insight to the broad range administrative tools that if used properly can lead to achievement of the Plan's – i.e. the city's – growth tools.