



City of Friendswood Comprehensive Plan

July 1998

J. T. Dunkin & Associates
Urban Planners - Landscape Architects
Dallas, Texas

TABLE OF CONTENTS

		<u>Page</u>
Section 1	The Comprehensive Plan Executive Summary	1.1
Section 2	Goals & Objectives	2.1
Section 3	Baseline Studies	3.1
Section 4	Thoroughfare Plan	4.1
Section 5	Parks and Open Space Plan	5.1
Section 6	Community Facilities Plan	6.1
Section 7	Utility Systems	7.1
Section 8	Master Drainage Plan	8.1
Section 9	Comprehensive Plan	9.1
Section 10	Appendix A	10.1
	Appendix B	10.3
Figure #		
	Location	1
	Site Features	2
	Existing Land Use	3
	Corridor Land Use and Zoning	4
	Corridor Land Use and Zoning	5
	Corridor Land Use and Zoning	6
	Thoroughfare Plan	7
	Neighborhood Areas	8
	Existing Parks	9
	Proposed Parks	10
	Stevenson - Arena	11
	Neighborhood Park - School	12
	Trails System, N. Friendswood Drive	13
	Trails System, E. Parkwood	14
	Trail Alternatives	15
	Proposed Parks and Trails	16
	Municipal Building, Police and Library	17
	Existing Fire Station Location	18
	Proposed Fire Station Location	19A
	Proposed Fire Station Location	19B
	Existing and Proposed Schools	20
	Water Utilities	21
	Sanitary Sewer Collection System	22
	Master Drainage Plan	23
	Comprehensive Plan	24

THE COMPREHENSIVE PLAN EXECUTIVE SUMMARY

Friendswood's Comprehensive Plan represents a vision of the City's future, and many questions can be answered to express the Plan's importance.

- What is the Comprehensive Plan?
 - The Plan document contains elements which address the community's vision of its long range needs for physical growth and development.
- Why have a Comprehensive Plan?
 - A Plan is used in making consistent day-to-day and long-range development and financial decisions required by city personnel and their appointed and elected officials. The Plan is also useful as a tool for promoting the community's economic development.
- How is the Comprehensive Plan used?
 - The Plan sets the framework for more detailed processes and procedures to be implemented by the public and private sections in the development of the urban area. The Plan is used as a guide for implementing policies, and making decisions that will affect the physical environment and general welfare

of the community as it "grows" toward a fully developed state.

The above questions and statements indicate the importance of the Plan in the City's future development and redevelopment. The Plan is never static and it should be reviewed and amended every few years with approved changes addressing the various issues which are brought about by changing development patterns and community attitudes. The Plan is one of several tools the City has at its disposal to accomplish the quality of life desired by its citizens.

The Comprehensive Plan contains the following planning elements:

- Goals and Objectives
- Baseline Analysis of Existing Conditions
- Thoroughfare Plan
- Park Plan
- Community Facilities Plan
- Utility Systems
- Drainage Plan
- Comprehensive Land Use Plan

The centerpiece of this plan is the Comprehensive Land Use Plan Map (Figure 24), which is visioned to represent the most appropriate land use pattern for achieving a functional and harmonious community, consistent with the goals and objectives on pages 5 and 6. Decisions regarding future development and any rezoning should be consistent with this plan.

Of particular significance is the projected population of 45,000 to

50,000 at the time of a fully developed state of "build out." This projected population was derived by applying the current zoning ordinance unit densities to the Land Use Plan. It's important to note that if the future population is allowed to grow much beyond this number, significant capital expenditures would need to be made for additional infrastructure such as an additional water supply feed line. Thus, for economic reasons, and the desire to maintain some of the rural character of the community, current zoning densities should not be increased.

Some of the more significant findings and recommendations are:

- The approximately 500 acres currently zoned for retail and commercial services is adequate for serving the projected population of 45,000 to 50,000. Although no additional rezoning is needed, it may be beneficial to make some adjustments in locations that would result in the assemblage of multiple smaller parcels into single larger parcels or more optimum location.
- Consideration should be given to rezoning a large parcel of land in the souther section of the City adjacent to F.M. 528 to Business Park. This is a desirable location for future high technology users, possibly built in a campus setting. Once single-family development begins, the opportunity for rezoning will be diminished.
- There presently exists some inconsistencies in the Zoning

Ordinance permitted uses. In particular, the NC permitted uses should be revised to make them more compatible with adjoining neighborhoods.

- Consideration should be given to creating a "Main Street Corridor" that would revitalize what is essentially the current OBD.

- Consideration should be given to some means of "encouraging" developers to link together neighborhood areas with parks and hike and bike trails.

GOALS AND OBJECTIVES

GOALS & OBJECTIVES

The Comprehensive Plan for Friendswood pertains to the elements of the urban structure and its expansion with three goals:

- To guide the City in resolving current issues.
- To guide future growth toward a specific, desirable and economic pattern.
- To guide the use of land area and valuable resources to the betterment of everyone.

The first and most important consideration in the development of Friendswood is its people. Some of the objectives which fall under the three goals stated above are:

- To establish and maintain a physical environment that can be adequately serviced and that will promote the health, safety, and general welfare of the community.
- To provide adequate water supply, waste disposal and other infrastructure facilities.
- To guide the protection of developed land area from damaging flooding and hazardous living conditions.

- To guide the protection of residential areas from incompatible land uses.
- To provide and encourage greater safety and efficiency in vehicular movement.
- To provide adequate park and recreational areas.
- To preserve social traditions, historical heritage and the small-town rural character of the community while accommodating growth.
- To promote and encourage the development of commercial and light industrial businesses that the citizens of Friendswood perceive to be desirable and that strengthen the City's economic base.
- To maintain and, where appropriate, improve the community's appearance.

BASELINE STUDIES

BASELINE STUDIES

BASELINE ANALYSIS

There are several characteristics and features in the present urban area which can be helpful and be a source for input to the formulation of the Comprehensive Plan. Understanding the influence each of these items have had on the development of the City and their relative importance on future development will assist in making sound decisions for the Plan. Among these various characteristics and features are those related to population, the City's physical structure, and use of land. Each of these relates to the City's past, present and future identity and structure. A basic requirement in the Plan is to consider the positive aspects of this base data as input for making sound proposals for the future.

THE SITE

The City of Friendswood is located adjacent to Houston in the southern part of Harris County and the northern part of Galveston County. The City is approximately three miles west of Interstate Highway 45 and is linked to the Highway by two Farm-to-Market Roads, 2351 and 528 and 518. Farm-to-Market Road 518 serves as a north-south conduit tying the City to Pearland on its north and League City on its south. The location of the City to its surroundings is shown by Figure 1.

Municipal Boundaries - Friendswood's boundaries are defined as they now exist, unless there are future boundary adjustments made with adjacent cities. As shown by Figure 1, Friendswood has

common boundaries with League City, Pearland, Alvin, Houston and unincorporated areas of both Brazoria and Harris Counties. Present boundaries define the limits of the City's ultimate development and represent a line defining jurisdictional rule. It is to the advantage of Friendswood and any city it adjoins to jointly plan either side of the common line so there will exist compatible arrangements of land uses and access between communities.

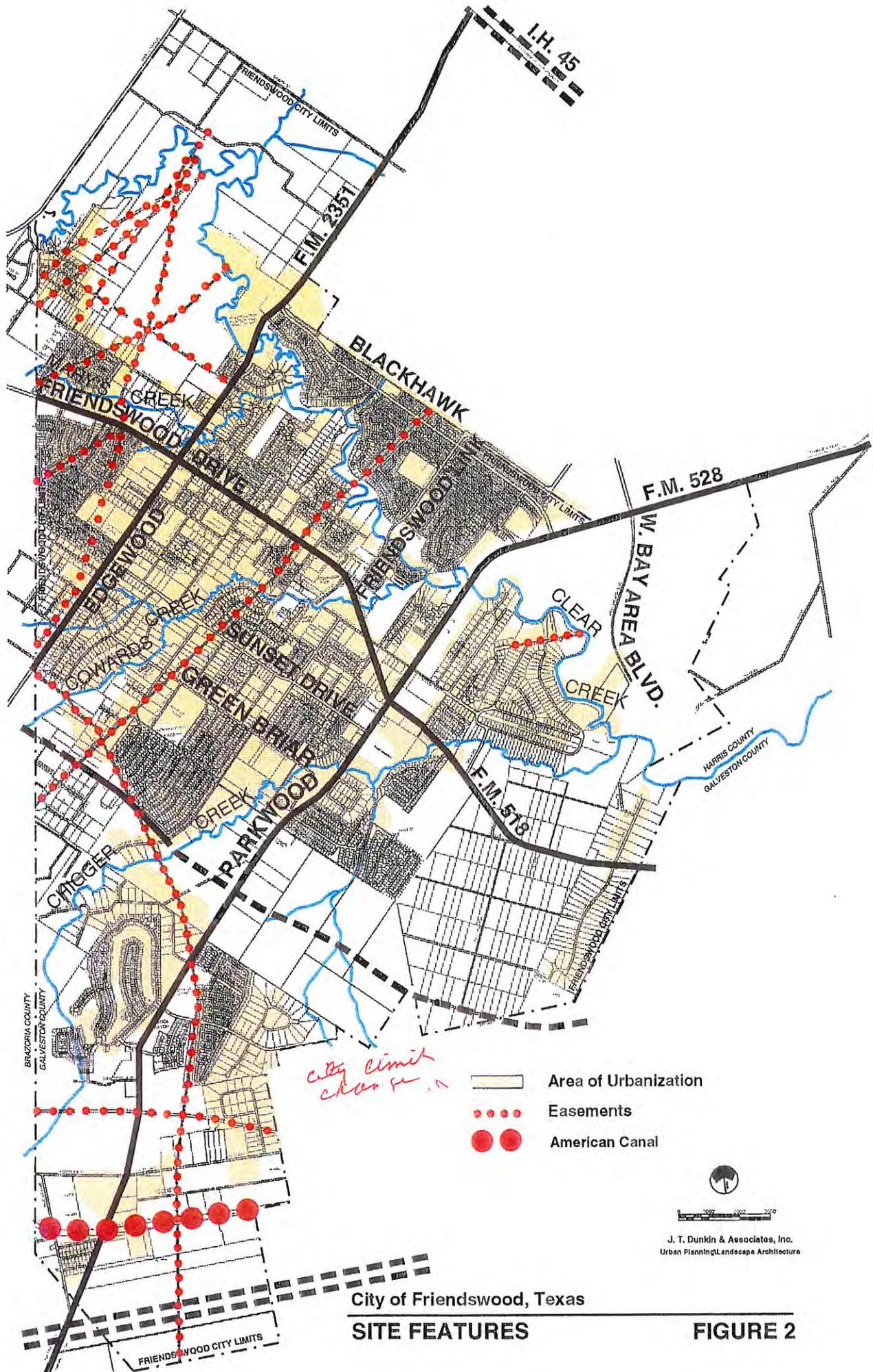
County Boundaries - As previously mentioned, Friendswood is situated in two counties -Harris and Galveston. Clear Creek forms the boundary between the two counties. The western city limit is the boundary between Galveston and Brazoria Counties. Being in two counties may involve dual planning at the local level on projects originated by one or both counties. Drainage, recreation and transportation are representative types of projects which could involve cooperative efforts and joint planning.

Highway System - The relationship of the three highways (F.M.s 2351, 528 and 518) is shown on Figure 2. Each is important vehicular access to and from the City and surrounding areas. The combination of these three arteries form the basic structure for the City's thoroughfare system. The growth of Friendswood and that which will occur in cities surrounding Friendswood will create additional traffic volumes to be handled by each of these arteries. Recent improvements have increased traffic capabilities for all three of these highways.

Vehicular access from Friendswood to other areas in the metropolitan area is convenient via Interstate Highway 45 and State Highway



FIGURE 1



*city limit
change*

- Area of Urbanization
- Easements
- American Canal



J. T. Dunkin & Associates, Inc.
Urban Planning/Landscape Architecture

City of Friendswood, Texas

SITE FEATURES

FIGURE 2

35. The City is fortunate to have appropriate locations relative to these arteries thereby avoiding the vehicular traffic normally associated with major highways.

Creek Systems - Most of the surface drainage in the City flows north and east to Clear Creek. This Creek's watershed begins in areas north and west of the City. Three minor creeks flow into Clear Creek from water sheds both within and outside the City's corporate boundaries. Mary's Creek, which enters the City along the western boundary immediately north of Friendswood Drive, has a watershed originating west of the City of Pearland. Both Cowards and Chigger Creeks are creek systems within Friendswood, but each has surface drainage from eastern sections of Pearland and Brazoria County.

Within the City, there are 226 defined drainage areas which rely on the system of creeks to collect storm water and to safely remove the water from the community. Drainage studies being performed on these creek systems are for the purpose of determining the requirements for handling run-off. Preliminary studies indicate the need for creek widening and development of detention systems, both of which will have an influence on existing and future development along the creek system.

Easements/Rights-of-Way - There are several easements or rights-of-way shown on Figure 2 which represent the routes through the City for either a pipeline or electrical transmission line. These routes sometimes can present impediments to orderly urban development. Many easements result in alignments which divide

property into odd shapes and therefore dictate the design of parcel subdivision. Several easements through a piece of property can increase development costs. This may be a factor in development of land north of Friendswood Drive and west of Edgewood Drive because of the frequency and arrangement of easements. Occasionally, facilities in easements can be abandoned or be consolidated with others. Either approach improves the subdivision opportunities or alternatives for development.

The routing of the American Canal is a right-of-way shown on Figure 2 in the southern section of the City which may influence development patterns. Crossing this feature with streets for access between areas on either side of the canal will require some type of structure at such points. The costs associated with this type of crossing will likely minimize traffic/pedestrian access.

Urbanization - The areas of the City which are presently developed, as well as those that are undeveloped are shown on Figure 2. A more detailed description is provided in the subsequent Existing Land Use section. The Plan addresses the prospective development of currently undeveloped land.

The above features, some of which are man-made while others are natural, are factors which have had influence on the City's present structure. These features are likely to continue to exercise this same importance as the City develops. When making short and long-range planning decisions which may involve one or more of these factors, their relative impact or influence should be recognized.

THE POPULATION

The scope of the recommendations coming from the comprehensive plan is dependent on the people who benefit from plan proposals. Therefore, a general understanding of the present population, and the population expected to reside within the community at certain times in the future, provides a means of measuring and determining needs for those who are of benefit.

The City's population growth between each of the previous census years is shown in Table 1. Population has generally doubled for each decade. Some of this increase is not a result of normal growth, but rather from annexation of population areas. This occurred in 1983 and 1985 when the area north of Clear Creek was incorporated into the City.

TABLE 1
PRESENT AND PAST POPULATION

<u>Year</u>	<u>Number</u>
1970	5,675
1980	10,719
1990	22,814
1995 City estimate	27,812

Census data provide a source for describing various characteristics of the 1990 population. These characteristics provide a general profile of the citizens residing in Friendswood which is helpful when developing proposals to meet perceived community needs. The census characteristics may also be important to a firm or person desiring to locate in Friendswood.

Housing Units - The 1990 Census recorded 8,048 housing units of which 7,756 were occupied. Based on the estimate of people occupying these housing units, the number of persons per unit ranged from 2.83 to 2.99. The relationship for the city data by counties is shown in Table 2.

TABLE 2
1980 AND 1990 POPULATION AND DWELLING UNITS

	1980	1990		
	Total City	Galveston	Harris	Total
Population	10,719	14,879	7,835	22,814
Dwelling units - total	3,507	5,163	2,885	8,048
Dwelling units - occupied	3,238	4,983	2,773	7,756
Persons per household	3.27	2.99	2.83	-
Persons in group quarters	115	90	-	90
Household 65 years and over	--	273	74	347

Age - A detailed understanding of population is vital to city planning because each age group has special needs. As indicated in Table 3, 7.5 percent of the population in 1990 were under five years of age (preschool). This is up from the 1980 percentage for this age cohort. Likewise, those 55 and older (pre-retirement and retirement) in 1990 represented a little over 12 percent of this population which is an increase from 1980. In 1990, the average median age between the City and the State was 32.9 and 30.8 years respectively. The population appears to be aging and is modestly older than the State as a whole. Both are important considerations in the planning process.

Table 3
AGE DISTRIBUTION

<u>Age Range</u>	<u>1980</u>		<u>1990</u>	
	<u>Persons</u>	<u>Percent Total</u>	<u>Persons</u>	<u>Percent Total</u>
Total Population	10,719	100.0	22,814	100.0
Under 5 years	686	6.4	1,720	7.5
5 to 15 years	2,223	20.7	4,324	19.0
16 and 17 years	584	5.4	793	3.5
18 to 20 years	360	3.4	937	4.1
21 to 24 years	878	8.2	857	3.8
25 to 44 years	3,644	34.0	8,064	35.3
45 to 54 years	1,294	12.1	3,153	13.8
55 to 64 years	602	5.6	1,664	7.3
65 years and above	448	4.2	1,302	5.7

Labor Force - Various types of occupations within the labor force and their composition to the total number of employed persons provides a comparative evaluation for the wage earning segment of the population. The 1990 Census reported 12,143 employed persons sixteen years and over or 75.9 percent of the total labor force. There were 9,525 private wage and salary workers in comparison to 1,671 government workers, 839 self employed workers and 108 unpaid family workers. There were 474 unemployed persons reported by the Census.

The distribution of the persons employed by occupation is shown in Table 4. As shown, the occupational categories for (1) executive, managerial, and administrative, (2) professional specialty, (3) sales, and (4) administrative support, account for approximately 70 percent of the total occupations. In each of these categories it could be assumed above average wages are earned for work performed.

TABLE 4
1980 AND 1990 COMPARISON - EMPLOYED PERSON BY OCCUPATION

<u>Occupation</u>	<u>1980</u>		<u>1990</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Executive, managerial & administrative	1,950	38.6	2,370	19.5
Professional specialty			2,631	21.7
Technical and support	989	19.6	723	6.0
Administrative support including clerical			1,917	15.8
Sales	795	15.7	1,500	12.4
Private household	99	2.0	43	.3
Protective services			162	1.3
Service	245	4.8	943	7.7
Precision, production, craft & repair	764	15.1	1,019	8.4
Machine operators, assemblers, inspectors			330	2.7
Transportation and moving	175	3.5	242	2.0
Others	35	.7	263	2.2
	5,052	100.0	12,143	100.0

Income - Capabilities of the population to receive higher levels of income often will reflect the quality of goods and services it can afford and expects to receive. This expectation can generally be applied to municipal services. In 1989, the Census reported a median household income of \$50,492 for the City. The value was considerable above the State median of \$27,016. A summary of median incomes is set forth in Table 5 to indicate a comparative position of Friendswood's median income to that found in 1989 in surrounding communities.

TABLE 5
COMPARISON OF MEDIAN HOUSEHOLD INCOME,
1979 AND 1989

<u>City</u>	<u>1979</u> <u>Median Income</u>	<u>1989</u> <u>Median Income</u>
Friendswood	\$ 31,918	\$ 50,492
Nassau Bay	---	50,574
League City	26,190	45,043
Pearland	27,123	42,565
Webster	---	32,377
Alvin	21,220	28,860

Education - The levels of education attained by residents in a community indicate to some degree the types of employment for which the population may be best qualified. In the 1990 Census it was found that for the age group of 25 years or older, 92.6 percent of them were graduates of high school or a higher level of education. Those who received a bachelor or higher degree accounted for 34.9 percent for this age group. The 92.6 and 34.9 percent were comparable to 72.1 and 20.3 percent for the State. These numbers would indicate the community as a whole is well educated and above most others.

HOUSING

Housing is not an element of population, but rather it is an item which identifies the quality and type of shelter the population receives. Characteristics which address these two factors are age, costs for shelter, and ownership.

Age and General Characteristics - In 1990 the Census data indicated approximately eighty percent (80%) of the housing units

had been built since 1970. About eighty-three percent (83%) of all units contained three or more bedrooms and all units were connected to a water system except 104 which were indicated to be on well water. Of the occupied units all were receiving sanitary sewer service except 200 using septic tank disposal.

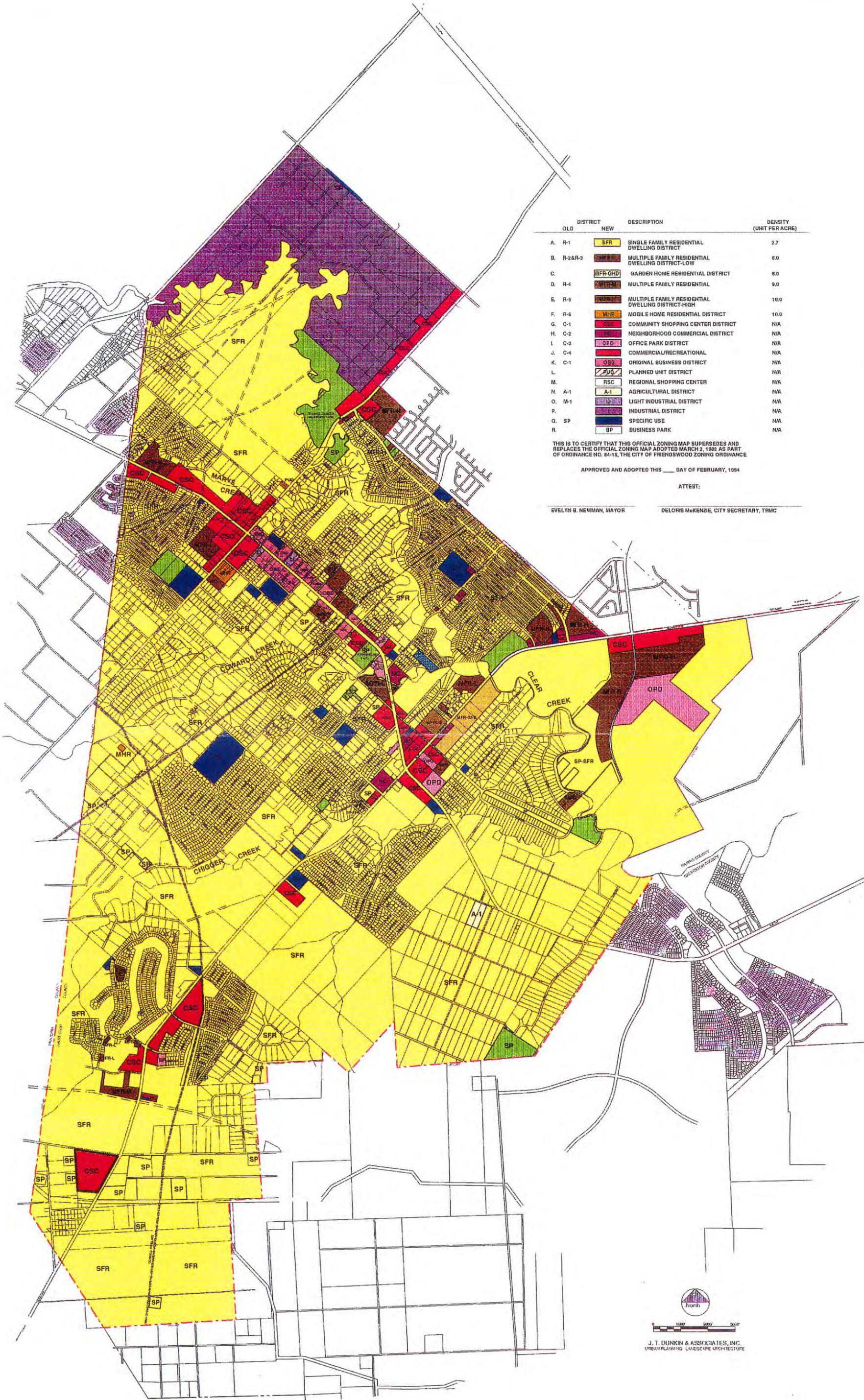
Housing Costs - Approximately seventy four percent (74%) of all occupied units were occupied by the property owner. The median monthly mortgage was \$896 with fourteen percent (14%) of the occupied units not mortgaged. Those owners having housing costs exceeding what is considered to be a general guideline of a maximum thirty percent (30%) of their 1989 monthly income accounted for 812 owners or about fifteen percent (15%) of all owners.

The median rental rate in 1990 was \$607. Rental housing units accounted for twenty-six percent (26%) of occupied units and 528 households were spending in excess of thirty percent (30%) of their 1989 income for rent.

The number of homeowners in Friendswood exceeds the sixty-one percent (61%) found for the State. Further, the City's median mortgage and rent costs exceed the State's respective values of \$712 and \$395. Housing in Friendswood has sound value and the overall age should be considered positive when various types of housing programs are needed in many other communities for upgrading the housing stock to a desirable and acceptable level for their citizens.

LAND USE

The physical composition of Friendswood is identified by its land use structure. The present location and relationship found between



DISTRICT	DESCRIPTION	DENSITY (UNIT PER ACRE)
A. R-1	SFR SINGLE FAMILY RESIDENTIAL DWELLING DISTRICT	2.7
B. R-2&R-3	MFR-MR MULTIPLE FAMILY RESIDENTIAL DWELLING DISTRICT-LOW	6.0
C.	MFR-GHD GARDEN HOME RESIDENTIAL DISTRICT	6.0
D. R-4	MFR-MR MULTIPLE FAMILY RESIDENTIAL	9.0
E. R-5	MFR-HR MULTIPLE FAMILY RESIDENTIAL DWELLING DISTRICT-HIGH	10.0
F. R-6	MHR MOBILE HOME RESIDENTIAL DISTRICT	10.0
G. C-1	CSC COMMUNITY SHOPPING CENTER DISTRICT	N/A
H. C-2	NC NEIGHBORHOOD COMMERCIAL DISTRICT	N/A
I. C-3	OPD OFFICE PARK DISTRICT	N/A
J. C-4	CR COMMERCIAL/RECREATIONAL	N/A
K. C-1	OB ORIGINAL BUSINESS DISTRICT	N/A
L.	PUD PLANNED UNIT DISTRICT	N/A
M.	RSC REGIONAL SHOPPING CENTER	N/A
N. A-1	A-1 AGRICULTURAL DISTRICT	N/A
O. M-1	LI LIGHT INDUSTRIAL DISTRICT	N/A
P.	IND INDUSTRIAL DISTRICT	N/A
Q. SP	SP SPECIFIC USE	N/A
R.	BP BUSINESS PARK	N/A

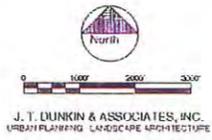
THIS IS TO CERTIFY THAT THIS OFFICIAL ZONING MAP SUPERSEDES AND REPLACES THE OFFICIAL ZONING MAP ADOPTED MARCH 2, 1992 AS PART OF ORDINANCE NO. 84-15, THE CITY OF FRIENDSWOOD ZONING ORDINANCE.

APPROVED AND ADOPTED THIS ____ DAY OF FEBRUARY, 1994

ATTEST:

EVELYN B. NEWMAN, MAYOR

DELORIS McKENZIE, CITY SECRETARY, THMC



CITY OF FRIENDSWOOD, TEXAS
EXISTING ZONING

land uses is a result of satisfying those activities that are normally associated with the residents' needs for carrying on their daily activities for a place to reside, a place to work, and a place to spend free time, all linked together by land designated to allow for a means of movement via streets to occur between these various activities. This may be a simple description of how the composition of the City's structure is formed, but it does point out the living environment can be shaped over time if sound relationships are established between various types of land use. How the land is used, the association between uses, quantities of use, and the resulting structure each have an individual and collective impact, either positive or negative, on the quality of life found where these uses exist. Therefore, one of the more important considerations when planning for the City's future is to understand the characteristics of the land use relationships and how they affect the community's quality of life. By recognizing and maximizing the positive aspect of the use of land and by applying these to new or redeveloping areas, the overall quality of the urban environment can be maintained at the level desired by the citizens of Friendswood.

A better understanding of the use of land in the City and the influence land use has on the City's physical environment is gained through an evaluation and analysis of the present types of land use, the land use pattern, and other physical or environmental characteristics found in the urban area which are influenced by the use of land. Using this data as a basis for formulating land use decisions and projections results in a sound and meaningful Future Land Use and Comprehensive Plan.

EXISTING LAND USE

A land use survey was conducted in the spring of 1994 to provide a basis for evaluating present land use and to develop the necessary data for formulating the Land Use Plan. The survey of all properties within the City and on the City's fringe consisted of a parcel-by-parcel inventory to determine the use of land for each parcel. Uses were placed into one of nine categories. Each category represented a grouping of land use having similar functions and compatible characteristics. The following further identifies the nature of these categories:

Residential Uses

- Single-family residences - one family dwellings and related accessory buildings
- Two-family residences - duplex dwellings and related accessory buildings
- Multi-family residences - apartments, rooming houses and related accessory buildings
- Mobile Homes - mobile homes used as a fixed dwelling

Public, Semi-Public and Related Uses

- Schools, churches, cemeteries and hospitals
- Parks, playgrounds and public buildings

Recreation

- Park and Open Space - municipal park areas
- Private Park - private recreational space generally within a residential neighborhood
- Private Recreation - golf course, racquet club, and the private baseball complex

Retail Uses

- Retail stores, shops and personal service establishments; eating establishments, service stations and any associated off-street parking facilities

Office Uses

- Single and multiple offices and financial institutions and off-street parking areas

Commercial Uses

- Commercial services, building material yards, automobile garages and sales lots, warehouses, wholesale establishments, sale of used merchandise, dancing schools, and open storage of materials

Industrial Uses

- Light Industry - light processing, storage, light fabrication, assembly and repairing
- Heavy Industry - manufacturing, repair or storage involving heavy processes, glare, dust or odor

Streets and Alleys

- Land dedicated to public use for local street and highway rights-of-way whether open or closed to use

Vacant and Agricultural Use

- Vacant land having either no apparent use or used for agricultural purposes

The land use survey provides information for developing a qualitative and quantitative analysis of existing land use. The general quality of the urban area, to a certain extent, can be determined when land use information is mapped.

Land Use Inventory - Land use data collected during the survey was mapped and quantities calculated by categories. A summary of land use by categories is set forth in Table 6. In this table, there is shown for each category, a total acreage and the percentage of that category's acreage of the total developed area and the percentage of the total area of the City. The summation of all developed and vacant land in the City totaled 13,574 acres or 21.2 square miles. These values are approximate, since they have been compiled from map data, but the computer tabulations are relatively accurate for identifying the land use composition of the City.

Land use data was aggregated and calculated for small areas generally the size of a neighborhood or smaller. Both the mapping of Neighborhood Areas and land use calculations by Areas are found in Appendix "A." Data in Table 6 has been summarized from the neighborhood data.

TABLE 6
EXISTING LAND USE - CORPORATE LIMITS
CITY OF FRIENDSWOOD, 1994

<u>Use</u>	<u>Acres Used</u>	<u>Percent of Developed</u>	<u>Percent of Total Area</u>
Single-Family	3,620.8	59.7	26.7
Two-Family	4.8	.1	.1
Multi-Family	86.4	1.4	.6
Mobile Home	7.0	.1	.1
Public and Semi-Public	254.3	4.2	1.9
Park	428.3	7.1	3.1
Retail	118.4	2.0	.9
Office	25.6	.4	.2
Commercial	128.9	2.1	.9
Industrial	11.0	.2	.1
Canal	24.5	.4	.2
Street Rights-of-Way	<u>1,353.6</u>	<u>22.3</u>	<u>9.9</u>
Sub-total	6,063.6	100.0	44.7
Vacant	<u>7,510.4</u>		<u>55.3</u>
	13,574.0		100.0

Land use relationships and characteristics applicable to Friendswood are identified by data in Table 6.

- **Right-of-Way** - The area and percentage of use for street rights-of-way are approximately 1,254 acres or 22.3 percent of the total developed land area. From data developed for other cities, this percentage can range upward to 30-35 percent. What this lower percentage indicates is an efficient use of land for this purpose. Excessive use has two major results: (1) extra land not actually needed for street purposes

is removed from other productive use, and (2) the greater space in this category which primarily results from extra width represents a higher maintenance responsibility to the City.

- **Residential** - As indicated, approximately 62 percent of the developed area is used for some type of residential use. There are no specific guidelines or standards for assessing this use; however, the values shown do indicate the prominence of residential use in the community.
- **Nonresidential** - The 4.7 percent of nonresidential uses of land for retail, office, commercial and industrial is a result of several factors. Retail and commercial services are generally dependent upon and closely related to a market or service area. The association of cities in Friendswood area collectively have the population to justify various types of retail uses such as those found in or near a shopping mall. The closeness of Baybrook Mall does impact the location of most retail uses in these smaller cities, except for those establishments whose services are required on a more frequent basis, such as: the food store, drug store, or personal service store. Commercial uses found in the City also are generally linked to serving the population in comparison to uses involving light assembly and fabrication, material storage or other similar types of uses found in a commercial business park.

It is important for the benefit of more complete range of

services, as well as for the tax base that the City work towards attracting sound retail, office and commercial uses. Limited locations within the community and available land are both factors to be evaluated based on site selection criteria commonly required for these types of uses. Job opportunities, as well as tax base can be a product from new commercial and office users.

- **Public and Semi-Public** - Among the types of land uses in this category are churches, schools, cemeteries and municipal facilities. Most of these uses are tax exempt. Approximately four percent of the developed land is in this category with most sites fully developed.
- **Park and Open Space** - The acreage in this category is comprised of 197.9 acres in municipal park space, 93 acres in County park space, and the remaining 188.2 acres in private recreational space primarily represented by the ball complex on Parkwood Avenue and the golf course and tennis club. These spaces account for 7.1 percent of the developed land. The addition of the City's community park south of F.M. 518 will boost this acreage an additional 75 acres upon its completion.

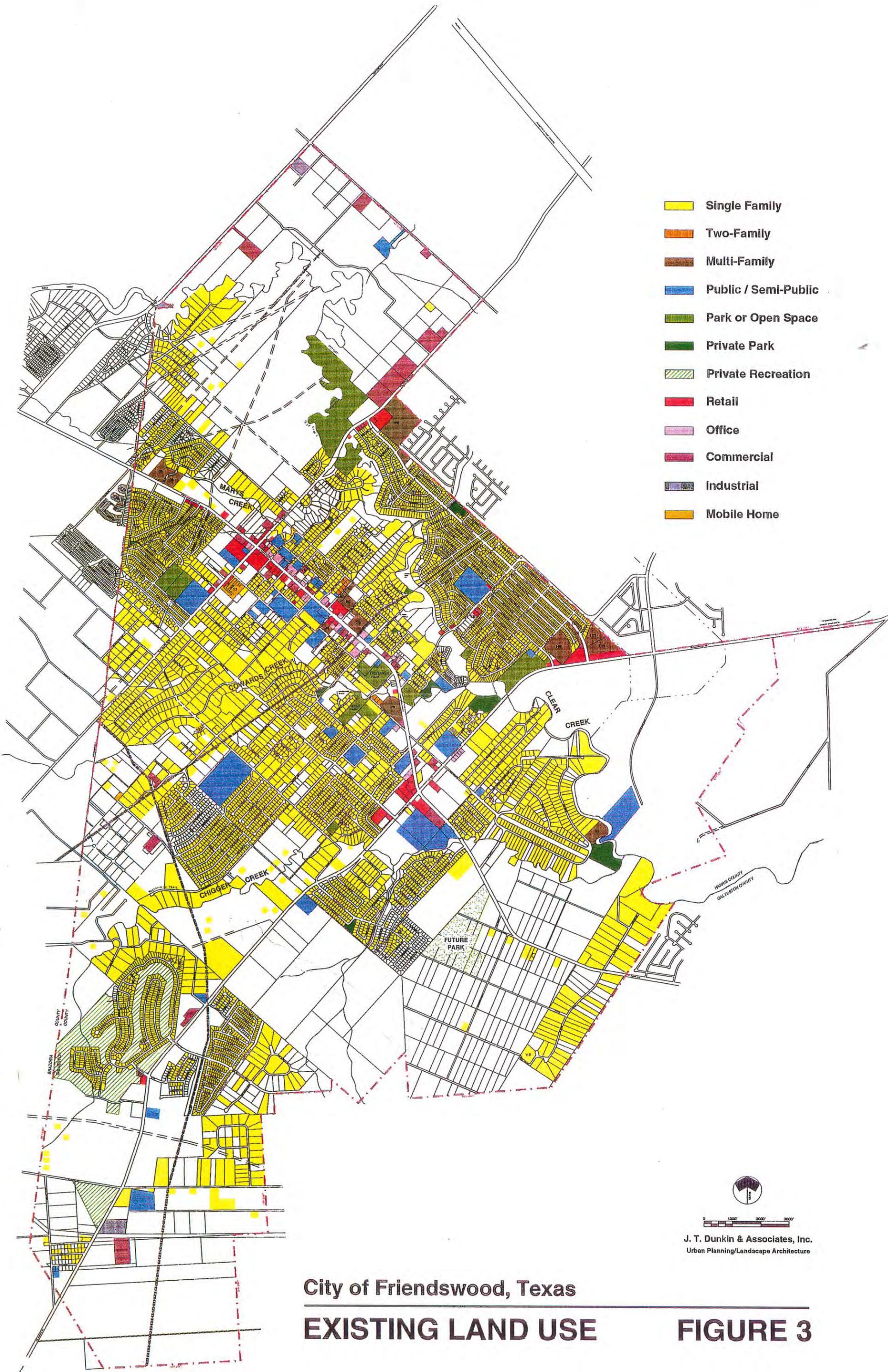
The land use inventory provides a guideline to long-range land use planning. Understanding of the respective quantities assists in assessing where emphasis is needed to strengthen the community structure. Acreage values and how these are distributed and assembled in the land use pattern helps to provide some basis for assessing and determining future land use needs.

LAND USE INVENTORY

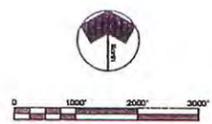
The pattern of the developed use of land is shown on Figure 3. The street system serves as the basic framework which supports this pattern. Principal usage can be seen by location of uses and the intensity of the color code system for these uses. The primary characteristics of the pattern is shown by the prominence of single family residential and the extension of nonresidential uses along Friendswood Drive between Edgewood Drive and Parkwood Avenue.

When referring to Figure 3 for the graphic explanation to the comments made below, it is important to observe that the City's boundaries are fixed; therefore, the ultimate boundary for the expansion in use of land will be these boundaries. The following paragraphs discuss various features found in evaluating the pattern and use of land.

- **Residential** - It is always desirable to have a compact single family land use pattern for the purpose of minimizing the cost of services to areas which are outlying or not contiguous to other developed sections of the City. From the various housing and development characteristics found in the residential areas, it appears the preponderance of early development was either side of an east-west axis formed by Friendswood Drive between Edgewood Drive and Parkwood Avenue. Newer residential subdivisions north and south of Friendswood Drive and the older section of the community have almost absorbed all the vacant land in their expansion of the corridor between Parkwood Avenue and Edgewood Drive.



- Single Family
- Two-Family
- Multi-Family
- Public / Semi-Public
- Park or Open Space
- Private Park
- Private Recreation
- Retail
- Office
- Commercial
- Industrial
- Mobile Home



J. T. Dunkin & Associates, Inc.
Urban Planning/Landscape Architecture

City of Friendswood, Texas

EXISTING LAND USE

FIGURE 3

The single-family development east of Parkwood Avenue in the eastern section of the City is somewhat dispersed with vacant areas available for residential expansion. A similar situation exists in the northwest section of the City, west of Edgewood Drive and north of Friendswood Drive. Because of the scarcity of land, a procedure may be found to be appropriate for larger blocks of vacant land having similar future development projected by the Land Use Plan to adopt a more detailed development plan than projected within this Plan. The advantage of this procedure is to bring together, over a period of time, smaller tracts into a larger homogeneous development than might be accomplished if done in incremental pieces.

- **Nonresidential** - Most all nonresidential uses are found along Friendswood Drive between Parkwood Avenue and Edgewood Drive, or along these streets for a short distance north and south from Friendswood Drive. All three of these streets are major thoroughfares and are attractive to retail, office and commercial uses because of adjoining property's accessibility and visibility to the traffic traveling on them. Other nonresidential uses are located on Parkwood Avenue and Edgewood Drive at their intersection with Blackhawk.

There is beginning to form a retail area on Parkwood Avenue near Sun Meadow. In this area of the City, there is likely to be an expansion of retail services brought about by further population growth. This location is approximately three

miles south of local retail services found at the intersection of Friendswood Drive and Parkwood Avenue and will be more convenient to nearby areas and will likely be capable of sustaining various types of retail services because of the residential growth.

There are two areas within the City which are either developed or vacant where opportunity exists for creating the framework for future nonresidential development. The frontage along the west side of Edgewood Drive is partially developed with various commercial types of land use, some of which need attention to their site to create a better image for attracting other uses. This area does have industrial and commercial zoning, and a commercial business park may be possible through economic development effort and working with the property owners in developing an appropriate business park plan. The other area of the City applicable for future nonresidential use is south of the canal on the east side of Parkwood Avenue. Precise land use planning should be done to explore development opportunities with the property owners. This area presently has good access which will be improved as thoroughfare systems are built. Some adjustment to city limit boundaries between Friendswood and Alvin to gain more Parkwood Avenue frontage is desirable regardless of the ultimate use of this section of the City.

**CORRIDOR LAND
USE**

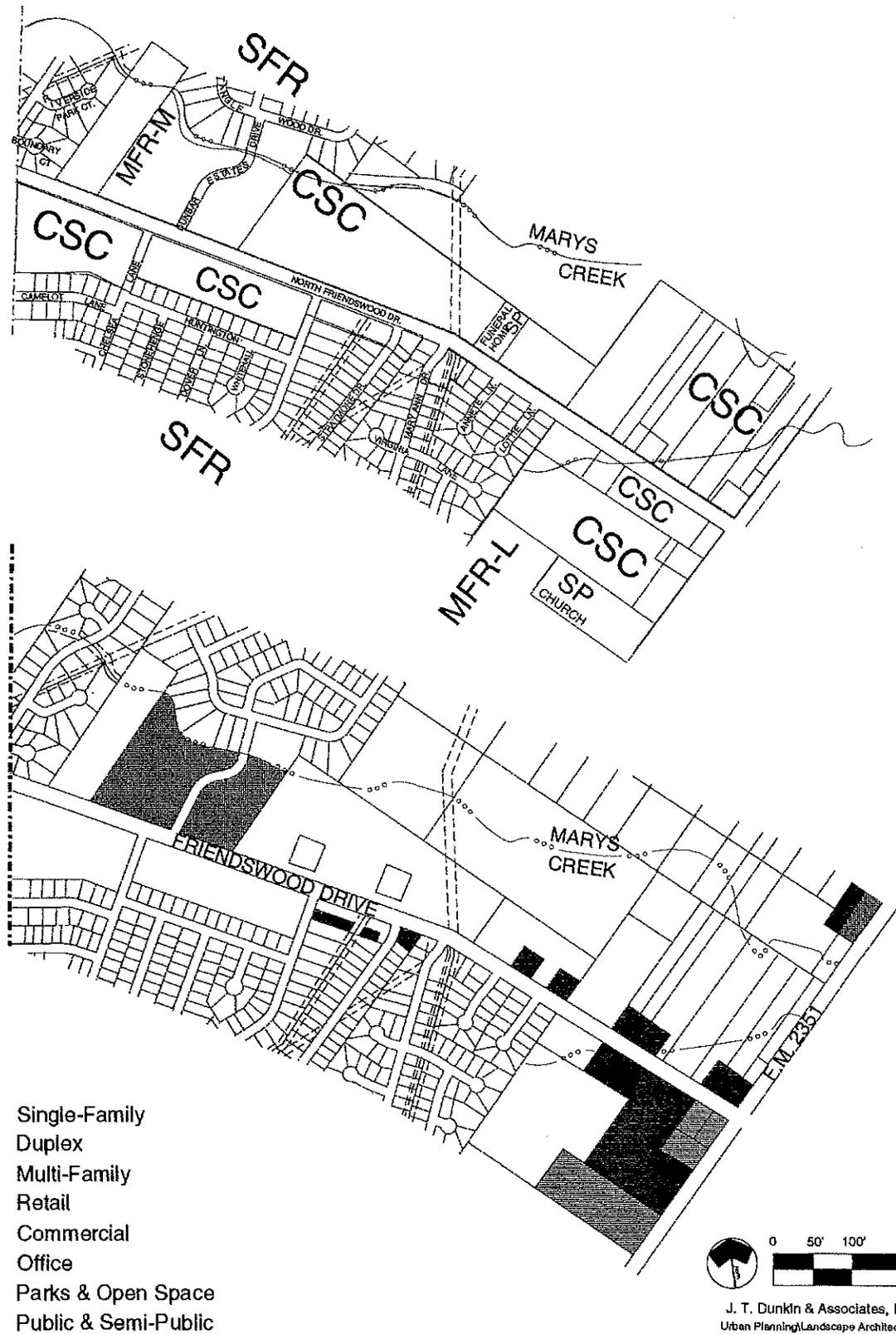
The prominent concentration of retail-office and light commercial uses are located on Friendswood Drive from just east of the westerly city limits to east of and including the intersection of

Friendswood Drive and Parkwood Avenue, F.M. 518. Because of this prominence and the association of uses in the corridor land use pattern, illustrations of land use mapping have been enlarged for this corridor and are shown by Figures 4, 5 and 6. In addition, the corresponding zoning districting is shown to indicate the type of district in which these uses are located.

The Friendswood Drive corridor is considered now and in the future to be the most important corridor for business use. Two factors are identified with this status: (1) the corridor generally has a nonresidential type of land use either side of Friendswood Drive, and (2) most of the frontage is developed and the tenure of these uses are of various lengths in time.

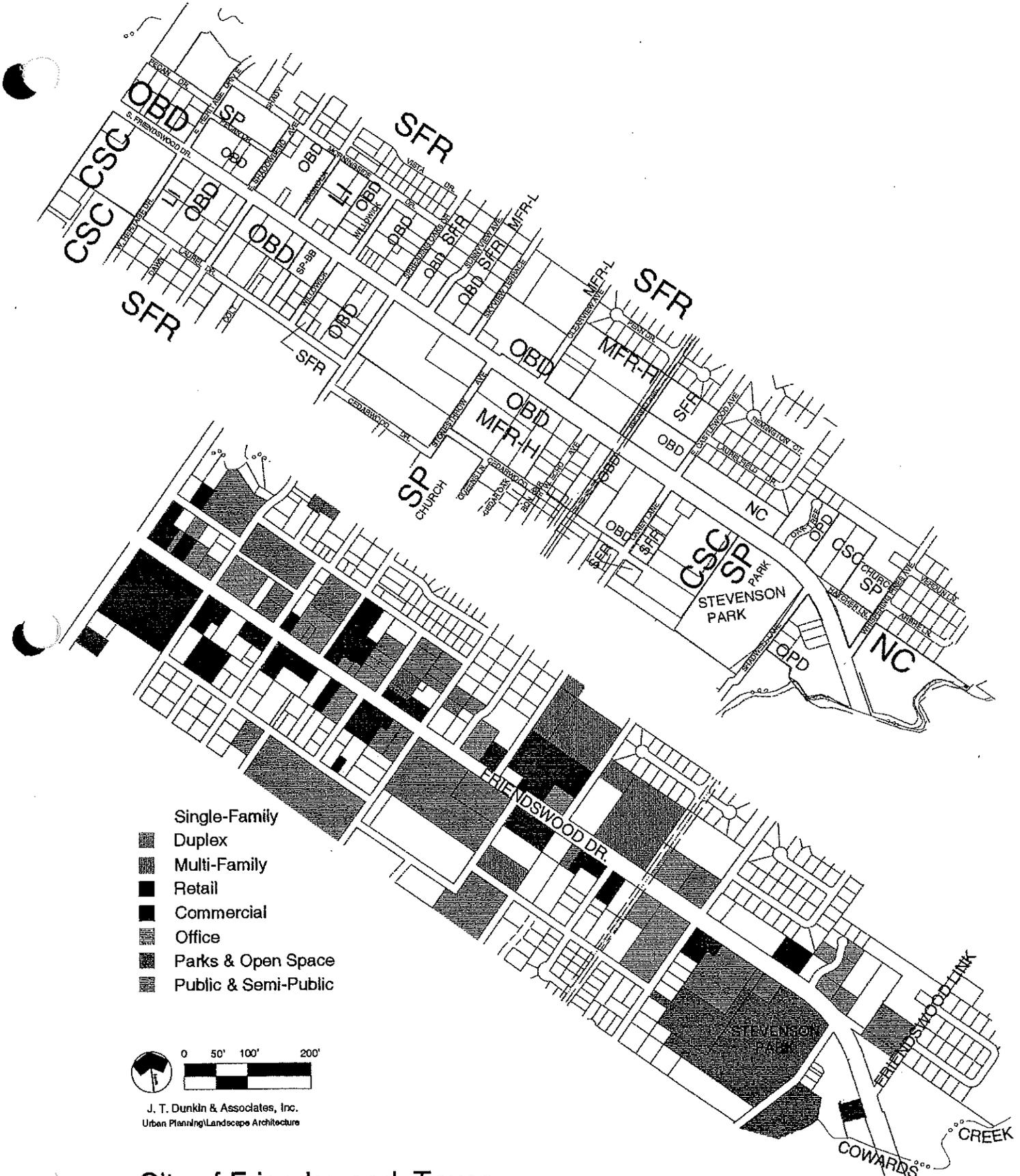
Various conditions will influence how the quality of the corridor evolves for business purposes and how the overall values are preserved and enhanced. The City can be instrumental in driving some of these conditions through land use and development standards, emphasis on aesthetics, traffic management and other approaches which relate to uniform criteria addressed by ordinances or policies. Coupled with this type of approach, there will likely be a need for assistance from the City to create economic development incentives and approaches to help establish and strengthen markets for uses along the corridor.

It is conceivable that through broad development goals and efforts, the corridor can become even more attractive than presently found and the general characteristic now identified with the corridor can be elevated to achieve more sound land use relationships and quality

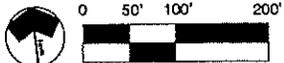


City of Friendswood, Texas

CORRIDOR LAND USE & ZONING FIGURE 4



- Single-Family
- Duplex
- Multi-Family
- Retail
- Commercial
- Office
- Parks & Open Space
- Public & Semi-Public



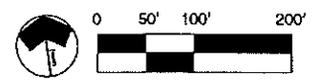
J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas

CORRIDOR LAND USE & ZONING FIGURE 5



- Single-Family
- Duplex
- Multi-Family
- Retail
- Commercial
- Office
- Parks & Open Space
- Public & Semi-Public



J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas

CORRIDOR LAND USE & ZONING FIGURE 6

in development.

The relationship which exists between some uses does not always appear to be compatible. The intrusion of some commercial types of land use in a predominant retail or office environment often tends to affect the attractiveness and quality of the area for these personal service types of use. Association of land uses having similarity in types, access, parking, and site development, are all factors associated with good compatibility.

It is recommended that the City create a Main Street District of its own to further the economic development of this area through regulation of permitted uses, compatibility of those uses, landscaping, architectural control, streetscape development, and other aesthetically pleasing policies to encourage relocation of businesses and expansion of, or strengthening of existing businesses through these design guidelines and a quality growth environment. Traditionally, if a City can create the proper environment, the market place will respond favorably.

THOROUGHFARE PLAN

Major Thoroughfare Plan

Updated March 2018

(Resolution 2018-05)

The Major Thoroughfare Plan serves as a guide for the designation of those streets within the street system, which are to serve as the primary arteries for vehicular traffic. The system of major thoroughfares also has other uses or relationships in the urban area, which include:

- Develops the structure or framework around which the community is developed. In land use planning, the system is commonly referred to as the structural framework on which the land use pattern is woven.
- The system provides traffic linkages between major areas in the community and linkages between the community and adjacent areas.
- Because the system is designed to carry high volumes of vehicular traffic, it is subject to attracting, along the corridors or at intersections between thoroughfares, business activities related to serving local and adjacent needs.
- The system generally identifies homogeneous areas of land use, which are often referred to as neighborhood areas.

Because of the importance of the above factors, and others which can be developed to address the system's relationship to the community, it is imperative that the community plan provides for a sound and reliable thoroughfare system.

Adopted Plan

The relationship and importance of the three highways – Edgewood Drive (FM 2351), Friendswood Drive (FM 518) and Parkwood Avenue (FM 528) – has been discussed in the Baseline Studies (Section 3 of the Comprehensive Plan). Early on, these highways provided a framework around which the City's initial urban development occurred. The spacing between these facilities has allowed logical and homogeneous areas of land use to develop within the framework.

The City of Friendswood adopted a Thoroughfare Plan in 1990. This Plan was built around the above highway system with each of the facilities functioning as a major street in the thoroughfare system. The Plan was modified in 1998, 2001 and 2004.

Plan Elements

There are three primary elements in the Thoroughfare Plan: the major thoroughfare, boulevards and collector streets. The function of the major thoroughfares and boulevards is to move large volumes of traffic, while the collector streets move traffic from local streets and along a continuous route to the major thoroughfares and boulevards.

In Friendswood, the more extensive collector street system is west of Friendswood Drive between Edgewood Drive and Parkwood Avenue. These streets are designed to have wider right-of-way and pavement width than a local street but less than the major thoroughfares. The design of a good residential area provides for the collector street system.

Often, there are several types of cross sections for rights-of-way and pavement width in a Thoroughfare Plan, which designates the thoroughfares. Each section reflects the thoroughfare's importance in the overall system. Usually, the thoroughfare's ability to handle traffic is indicated by the number of traffic lanes. The cross sectional standards used for the thoroughfares improved in the City (Friendswood Drive, Edgewood Drive, and Parkwood Avenue) have been set by the Texas Department of Transportation. Blackhawk was already built as a thoroughfare when it was annexed into the City.

Thoroughfare Plan

The adopted Major Thoroughfare Plan, with modifications, is shown by Figure 7. Street classifications are determined by their line width shown on the plan. Alignments which are existing and open for use are shown as a solid line while future facilities are shown by a dashed

line. In developing areas, the general locations of the major thoroughfares or minor thoroughfare are to be guided by this Plan with the final location being set by the development's street pattern.

The following are features shown on Figure 7:

- Thoroughfare Designation – The geographical area shown on the Plan extends beyond the corporate limits. Currently, the adopted plan graphics do not cross these boundaries. It is important for the City to establish on-going coordination with adjacent communities to develop continuity of the facilities between the local systems.
- Thoroughfare Routes – There are two routes to be determined as vacant land is placed into urban use: (1) Friendswood Lakes Boulevard (also known as Brittany Bay Boulevard) from FM 528 to the west city limits including coordination with Pearland for linkage to Pearland Parkway (2) Friendswood Lakes Boulevard (also known as Brittany Bay Boulevard) from FM528 to the east city limits including coordination with League City for linkage to League City Parkway.
- A future major highway facility shown on the adopted Major Thoroughfare Plan is the Grand Parkway in the southern section of the City. The ultimate construction of this type of highway would be significant to the growth and development within the City.

Thoroughfare Standards

Street design shall conform to the Subdivision Ordinance and all applicable planning tools, as well as specifications outlined in the Design Criteria Manual. Other considerations for design shall include street function, street capacity, service levels, traffic safety, pedestrian safety and utility locations.

To provide more flexibility for planning purposes, a range of right-of-way widths has been developed using the established widths from the ordinance. These ranges are shown on Figure 7.

Bicycle Lanes and Trails – Space should be provided on the major thoroughfares, boulevards, and collector streets for the bicyclist. The street sections for those streets indicated to function as links in the trail system shown on Figure 16 should be considered during review of construction plans. Alternatives for location of a trail within the right-of-way are shown on Figure 15.

FIGURE 7
CITY OF FRIENDSWOOD
Major Thoroughfare Plan



Updated: March 5, 2018

April 19, 2004 (R2004-07)
 July 2, 2001 (R2001-31)
 July 20, 1998 (R 1998-23)

Legend

- Major - Sufficient Width
- - - Major - To Be Acquired
- Boulevard - Sufficient Width
- - - Boulevard - To Be Acquired
- - - Boulevard - To Be Widened
- Collector - Sufficient Width
- - - Collector - To Be Acquired
- - - Collector - To Be Widened
- Downtown District Boundary

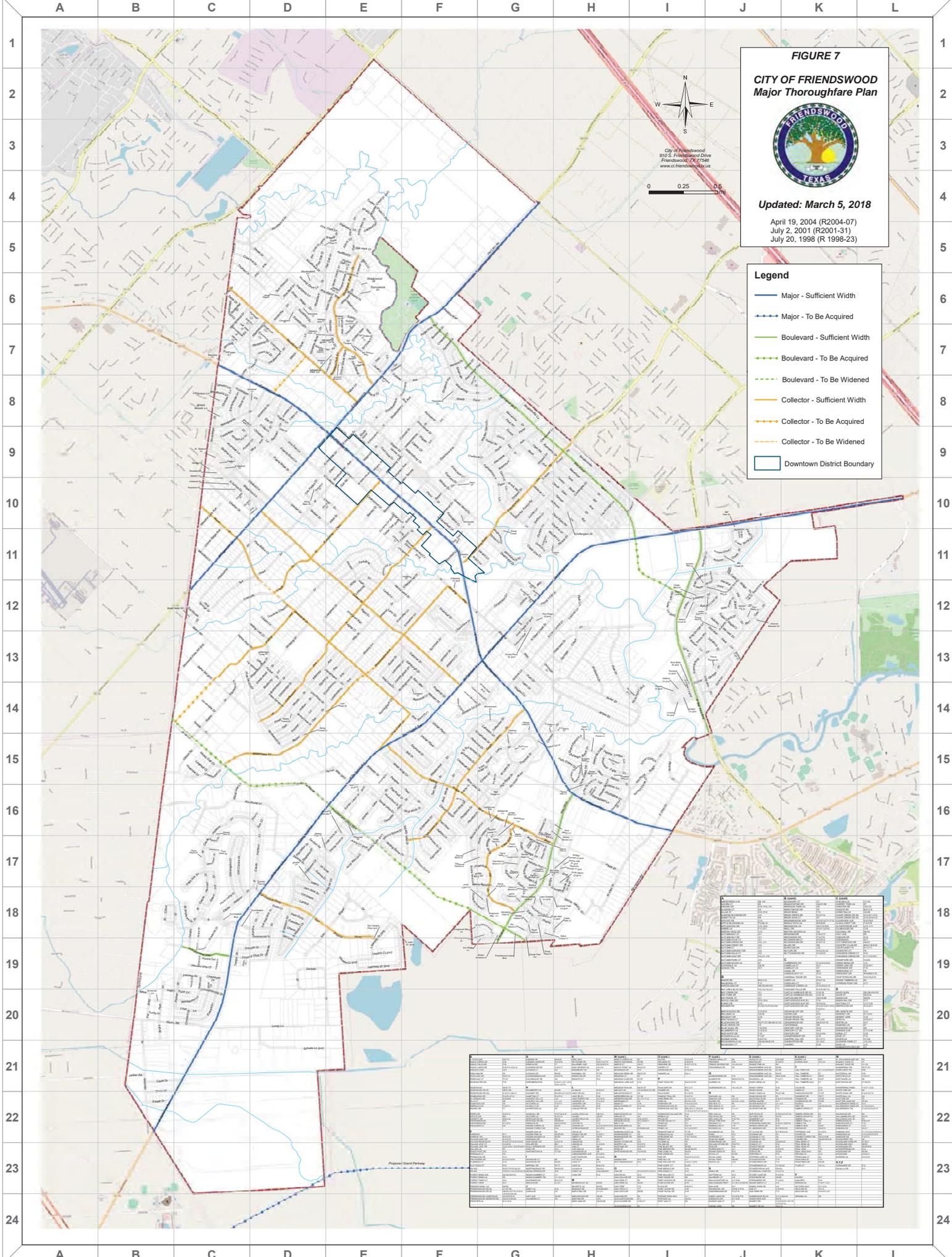


City of Friendswood
 912 S. Friendswood Drive
 Friendswood, TX 77546
 www.ci.friendswood.tx.us

0 0.25 0.5
 Miles

Street Name	Classification	Notes
Alford	Major	Sufficient Width
Alford	Major	To Be Acquired
Alford	Boulevard	Sufficient Width
Alford	Boulevard	To Be Acquired
Alford	Boulevard	To Be Widened
Alford	Collector	Sufficient Width
Alford	Collector	To Be Acquired
Alford	Collector	To Be Widened
Alford	Downtown District Boundary	

Street Name	Classification	Notes
Alford	Major	Sufficient Width
Alford	Major	To Be Acquired
Alford	Boulevard	Sufficient Width
Alford	Boulevard	To Be Acquired
Alford	Boulevard	To Be Widened
Alford	Collector	Sufficient Width
Alford	Collector	To Be Acquired
Alford	Collector	To Be Widened
Alford	Downtown District Boundary	



PARKS AND OPEN SPACE PLAN

PARKS AND OPEN SPACE PLAN

GENERAL

The Parks and Open Space Plan for the City was completed and subsequently adopted by the Parks Board and City Council in 1993. This section of the Comprehensive Plan updates this Park Element and discusses the Plan in a condensed format for the more detailed and descriptive material contained within the Parks and Open Space Plan document.

INTRODUCTION

Friendswood's urban area is rapidly developing and there is an evident need to plan for the development of both immediate and long-range recreational facilities to meet requirements being brought about by residential expansion. The Parks and Open Space Plan recognizes all the elements of the urban environment -the site, the people, the use of land and land use development opportunities both for existing and expected needs as discussed in the Baseline Analysis.

The Park and Open Space Plan is based on the expected growth to the "built-out" status of land within the City. Current and future recreational needs are identified based on population residing in the community. Neighborhood service areas are defined in the Plan and the population and general types of facilities are identified for each neighborhood for the "built-out" condition. Initial recreational requirements of the current population, and ranging upward to five years for space and facilities are specifically defined, with require-

ments beyond that time period remaining less specific to allow flexibility in implementation of the Plan.

The present and future citizens of Friendswood are those who will place demands for recreational space and opportunities on the park system; therefore, this Plan is designed to serve their expected needs.

**FACTORS
INFLUENCING
RECREATION
DEVELOPMENT**

Recreational spaces and facilities are considered to be one of the several types of municipal service needs generated by the urban dwellers. Similar to other types of service uses, the location of the recreational use within the urban area and the residents within its service area are both important to the recreational use's success and viability. Based on this premise, it is an important consideration that the planning for recreational space and facilities be closely related to where the people reside in the City's present and future urban area.

Some of the key factors in the Baseline Analysis pertinent to recreational planning and the future park system are discussed below.

The Site - The City's growth is bringing about change and new demands on its infrastructure and services, and as recreation planning occurs for new facilities, factors influencing their location, size and other features should be understood. As discussed in this element of the Plan, the location of the population, present and future, is basic and one of the more important factors to be understood and evaluated for guiding the Park Plan. Other site factors

which have influence on park and recreational use are recapped as follows:

- **Development Status** - The present developed areas of the City are shown on Figure 2 in the Baseline Analysis. Shaded areas are predominantly residential with the concentration of nonresidential use found along Friendswood Drive between Parkwood Avenue and Edgewood Drive.
- **Highway System** - Highways serving Friendswood, shown on Figure 2 form the basic framework for the City's thoroughfare system and tend to influence the development pattern by their location and service to adjacent land.
- **Creek Systems** - The creek system found in the City can have both a positive and a negative influence on urban development. The positive feature of the system is the open space created by the creek corridors and the ability to possibly use some of these spaces for locations of walking trails. The negative aspect is the flood prone area associated with each creek.

Creeks shown on Figure 2 include Clear Creek and the three tributaries: Mary's, Cowards, and Chigger.

- **Easements** - A number of easements are shown on Figure 2 to illustrate the various locations where these may be found. Many easements have been incorporated into existing developments and a similar practice is expected in future develop-

ments. However, when practical, some easements may serve as the location for a trail which link park areas traversed by these easements.

The Population - Friendswood's population has generally doubled in each of the last three Census. Growth places various demands on urban services, one of which is the ability to service the community with spaces and opportunities for various types of recreational activities. How these spaces and facilities are chosen have a very close relationship to the characteristics and location of the population in the present and future urban area.

- **Social and General** - Review of the social and general characteristics of the population identified in the Baseline Analysis allows for the opportunity to examine the current status of the population as related to overall features of persons residing in the City when the Census was taken for 1990. No specific population feature is directly linked to recreation; however, review of this data does permit user characteristics for input into the planning process which may give general direction or resolution to a question when the present population and its needs are being considered as related to recreational planning.

In summary of data in the Baseline Analysis, the population characteristics from the Census data would indicate the citizens of Friendswood are, as a whole, a younger and well educated population, with a preponderance being in the labor force and employed in jobs reimbursing them at incomes considerably above the State average of \$27,016.

Location of Population - The location of present and future recreational spaces and facilities needs to be in close proximity to the population they are serving. A survey similar to the land use survey was made to identify residential development to determine where the present population was residing. In addition, the 1990 Census' preliminary housing unit and population count was obtained for block level data. Between these two sources, the existing population by location was determined for specific areas of the City.

To identify the future residential land use pattern for undeveloped areas in the City, current mapping was reviewed for zoning districting. This review set forth areas designated by zoning for residential use and those areas were generally coupled with existing developed residential use to formulate the expected location for the future residential development.

From this data, an analysis was made to determine where the future population will likely reside. This analysis guided the decisions for determining the location for the various types of park and open space areas in the total park system.

Neighborhood areas were designated to assist in the analysis of the population as pertaining to evaluating existing facilities and plan to meet future needs. The city area was divided into eleven neighborhood areas. The purpose of forming these neighborhoods was to identify homogeneous areas where specific park and open space planning can be accomplished to meet the needs of each area.

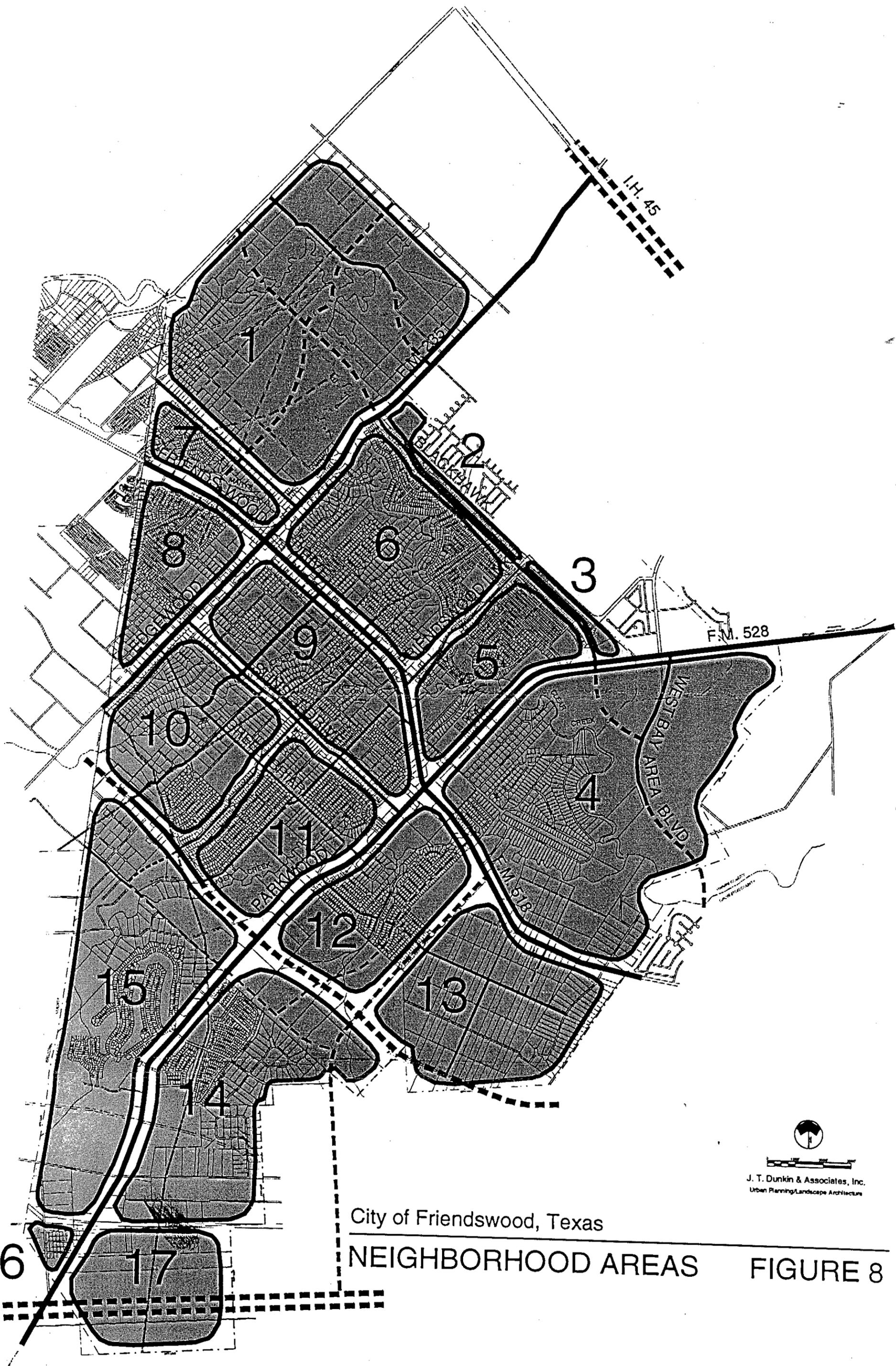
The boundaries for these areas, as shown on Figure 8, are generally delineated by existing or proposed thoroughfares, creek courses,

and municipal boundaries. Each area is of varying size and population; however, the development pattern within each of the areas is similar and the relationship between these eleven areas will allow a sound approach to be taken for planning recreational facilities, particularly those for the neighborhood level.

- **Population Distribution** - Understanding where the present and future population resides in the urban area is the primary factor in site selection for facilities.
- **Existing Population** - The information from the land use survey and data from the Census were both used in determining the location and number of residents for each Neighborhood Area. The neighborhood estimate in Table 7 is based on the number of dwelling units tabulated for each area in mid-1992 and the 1990 number for persons per household of 2.93 persons.

**TABLE 7
1992 EXISTING POPULATION - NEIGHBORHOOD AREA**

<u>Neighborhood</u>	<u>Dwelling Units</u>	<u>Population</u>
1	390	1,143
2	759	2,224
3	3,561	10,434
4	774	2,268
5	1,072	3,141
6	633	1,855
7	391	1,246
8	295	864
9	34	100
10	387	1,134
11	---	---
	8,296	24,309




 J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas

NEIGHBORHOOD AREAS

FIGURE 8

**TABLE 8
NEIGHBORHOOD AREA
HOLDING CAPACITY AND POPULATION
ESTIMATE**

Area	Existing Dwellings Units	Vacant Lots	Vacant Residential Acres	Dwellings Per Acre	Future Dwellings	Total Dwellings	Persons For Dwelling Unit	Total Population
1	390	41	732	2.7	2,030	2,461	2.8	6,890
2	759	45	-	-	-	804	2.8	2,251
3	3,341	29	70	2.7	189	3,779	2.8	10,581
4	774	42	-	-	-	836	2.8	2,340
5	1,072	243	101	2.7	372	1,609	2.8	4,505
6	432	43	700	2.7	1,890	2,366	2.8	7,184
7	391	184	1,024	2.7	2,770	3,347	2.8	9,371
8	293	224	406	2.7	1,094	1,615	2.8	4,522
9	34	113	804	2.7	2,170	2,317	2.8	6,487
10	317	70	619 79	2.7 9	1,822 711	2,840	2.8	7,952
11	-	-	376 37	2.7 9	1,015 313	1,328	2.8	4,271
Total	8,294	1,038			14,328	23,702		64,341

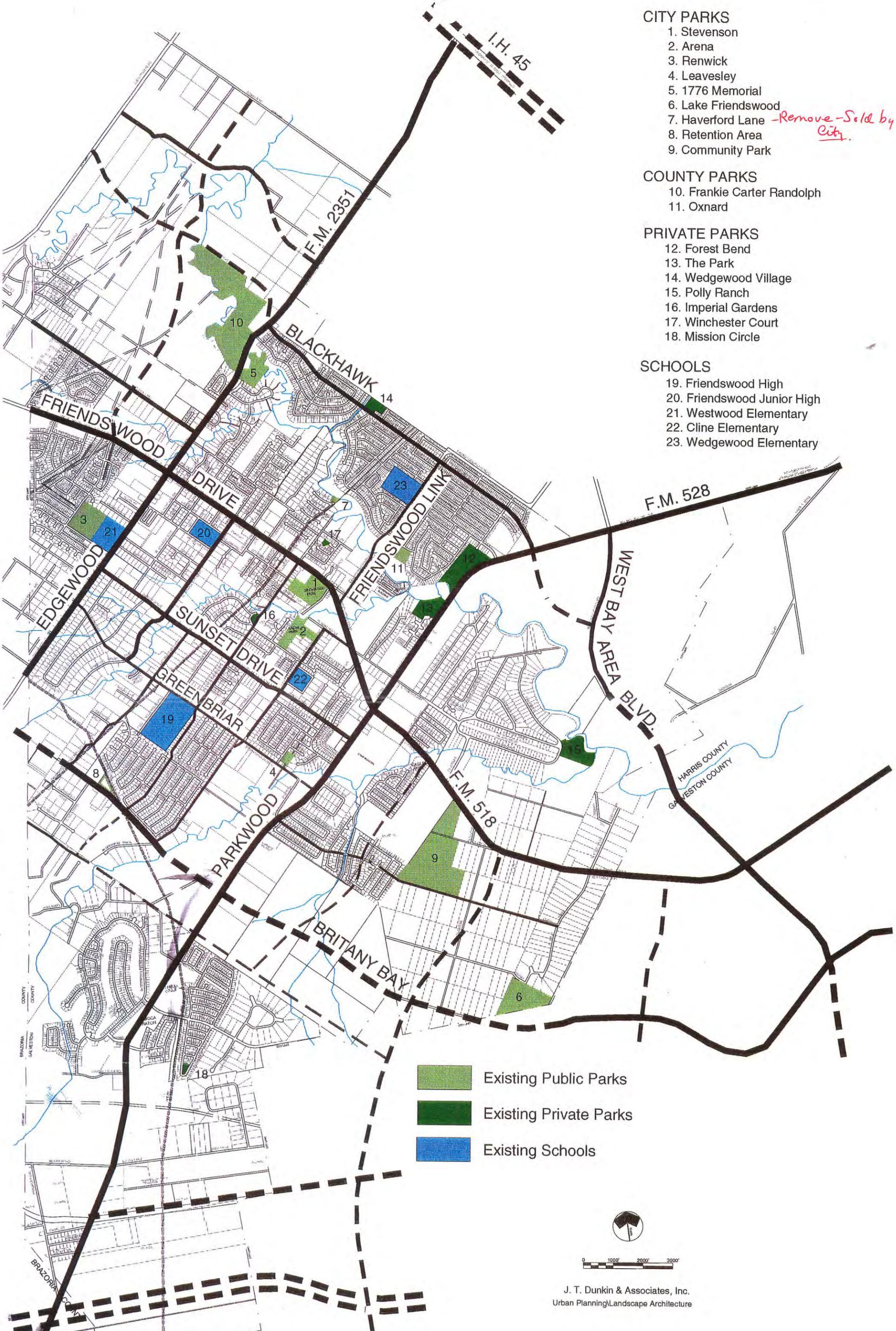
- Future Population** - An estimate was prepared for future population by Neighborhood Areas for the time when the City will be approaching total absorption of its residential land. This calculation recognized: (1) number of vacant residential lots; (2) vacant land residentially zoned and likely to be developed for this purpose; (3) the present single-family value of 2.7 lots per acre now used as the maximum single-family residential density and the value used for calculating lots to be developed from vacant residential land;

and (4) the number of existing developed and occupied lots. The sum of these provided the total number of lots, or a possible holding capacity of residential lots, for each Neighborhood. To the total number of lots in each Neighborhood was applied an estimate of 2.8 persons per dwelling for determining the Neighborhood's population holding capacity. This estimated population is the approximate number of persons which can be expected to reside within the Neighborhood and exerting some type of recreational demand on the park system. These values are shown in Table 8.

The above population estimate for a "build out" of 66,361 persons is considered to be a very optimistic value since all land may not be absorbed, and other factors influencing the projection may change. However, the value is considered valid at this time to use in long-range planning for recreational facilities. This value provides an estimate which can be altered from time-to-time as the Plan is reviewed. It also provides an estimate which is slightly greater than will be expected to be achieved, and therefore, facilities would not likely be under-planned.

**INVENTORY -
ACTIVITY -
FACILITY**

Park development in Friendswood has not kept pace with urban growth, but the status of the present residential development patterns will allow this course to be corrected if the opportunity is taken within the near future. The status of development influencing the park system is represented by the pattern of residential development. Some developed areas currently have recreational space



CITY PARKS

- 1. Stevenson
- 2. Arena
- 3. Renwick
- 4. Leavesley
- 5. 1776 Memorial
- 6. Lake Friendswood
- 7. Haverford Lane *-Remove - Sold by City.*
- 8. Retention Area
- 9. Community Park

COUNTY PARKS

- 10. Frankie Carter Randolph
- 11. Oxnard

PRIVATE PARKS

- 12. Forest Bend
- 13. The Park
- 14. Wedgewood Village
- 15. Polly Ranch
- 16. Imperial Gardens
- 17. Winchester Court
- 18. Mission Circle

SCHOOLS

- 19. Friendswood High
- 20. Friendswood Junior High
- 21. Westwood Elementary
- 22. Cline Elementary
- 23. Wedgewood Elementary

- Existing Public Parks
- Existing Private Parks
- Existing Schools



J. T. Dunkin & Associates, Inc.
Urban Planning/Landscape Architecture

City of Friendswood, Texas

EXISTING PARKS & OPEN SPACES **FIGURE 9**

available while in developing areas space can be made available for park purposes. Coordinating existing recreational spaces and facilities with the opportunities for future spaces is an important factor in developing the community's park system. In the following section, existing spaces and facilities, and recreational activities are discussed for both public and private ownerships.

Existing Municipal Parks - There are approximately 187.5 acres of park land in the City distributed in seven park sites. Four of the sites are developed for active use, one for passive use, and two sites are undeveloped; however, planning is now under way on the recently purchased site for use as a community park. The location in the community of each park is shown on Figure 9. A summary of recreational activities and facilities found in the parks is tabulated in Table 9. Descriptions in the following paragraphs explain the type of features found in each park, the park's present service area, and other similar items which identify the park's function.

- **Lake Friendswood** - This 33 acre undeveloped park is almost totally in water surface. Plans prepared for development include an area for swimming with a bath house, related shelter, and deck area. Construction has been placed on hold at this time.
- Another undeveloped site is a retention pond located south of Friendswood High School shown on Figure 9 as Site 8.

In summary, the active park and recreation features found in Friendswood generally occur on three sites: Stevenson, Renwick,

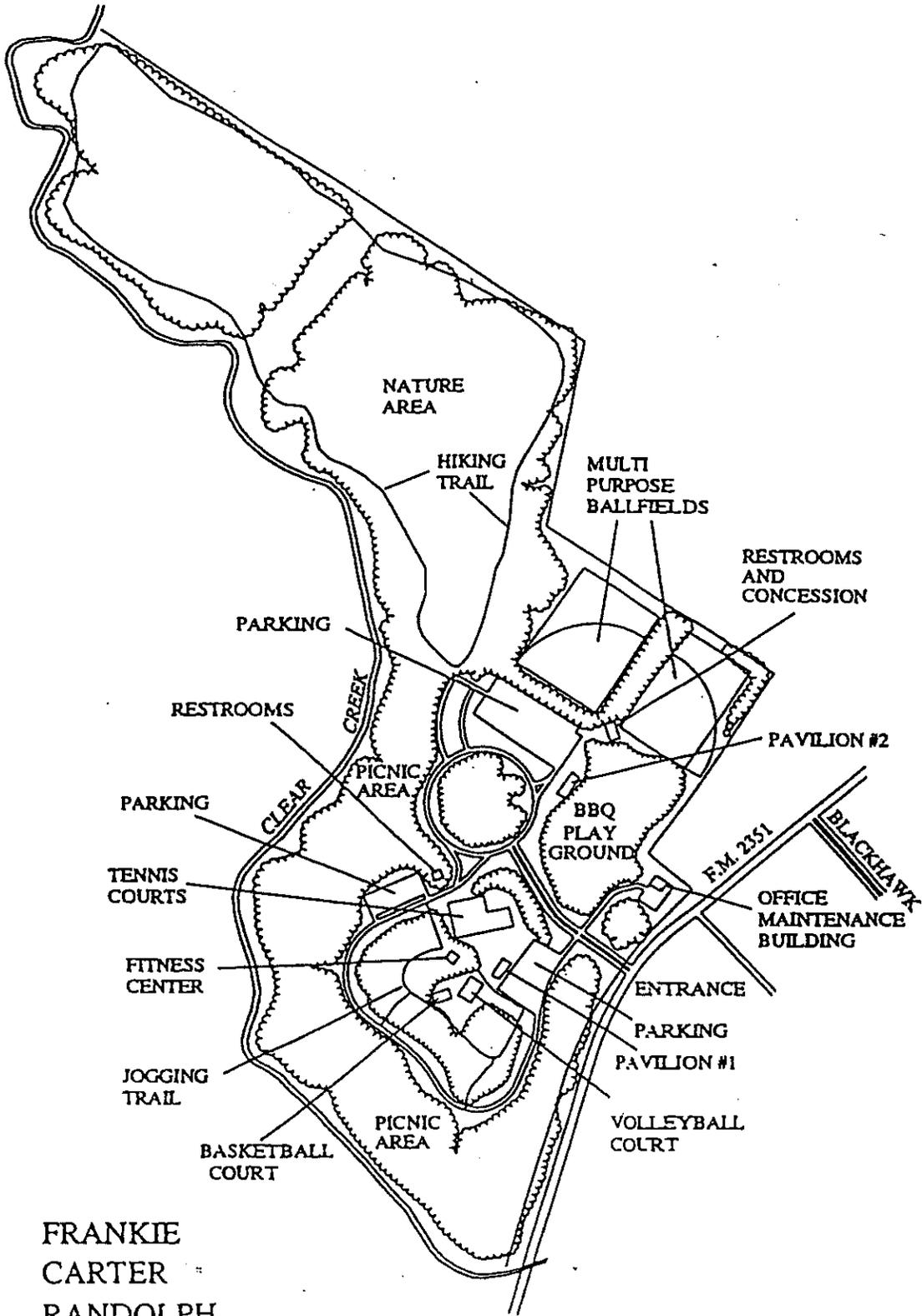
and Arena. The park system consists of approximately 199.5 acres and is considered to be below those desirable standards for land and facilities for a city in the population range of Friendswood.

County Parks - The city park system is one source offering the community space and facilities with recreational opportunities. In Friendswood, a number of homeowner-supported recreational spaces and County spaces offer recreational services, but on a more limited basis because of their respective sizes. There is one exception, and that is Harris County's Frankie Carter Randolph Park, which is approximately 93 acres.

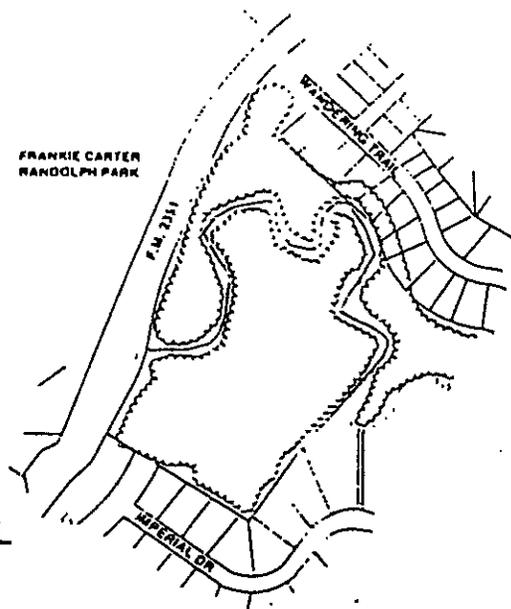
There are two County parks located in Friendswood – Frankie Carter Randolph and Oxnard Parks, both of which are in Harris County. Each of these facilities is shown on Figure 9.

- **Oxnard** - This 3.0 acre park is located on the north bank of Clear Creek and has a gazebo, play structure, open space and a parking area. The passive nature offers a neighborhood feature to the surrounding residents and allows access to the Creek.
- **Frankie Carter Randolph** - This 93 acre park is bounded on the south by Clear Creek and on the north by vacant land which is zoned for industrial use.

Private Recreational Spaces - There are eighteen private recre-



FRANKIE
 CARTER
 RANDOLPH
 PARK



1776 MEMORIAL PARK

- 1776 Memorial Park - This special type of park is located on Edgewood Drive and Clear Creek, and is in a natural wooded condition. The park contains approximately 12.6 acres and has a nature trail meandering through the wooded area. Parking is provided at the entrance.



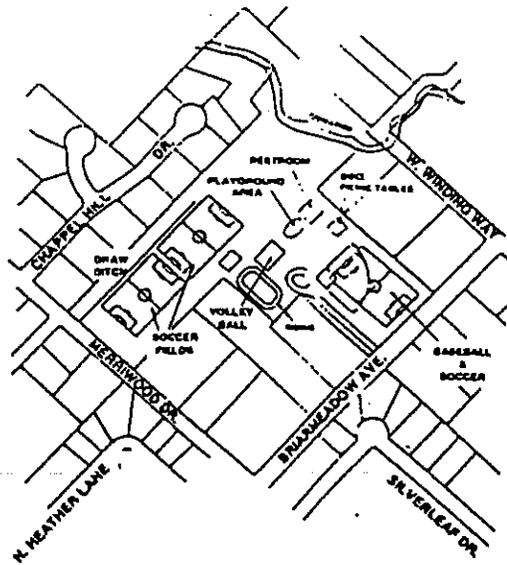
COMMUNITY PARK

80 acres

- Community Park - The sketch shows the location south of Friendswood Drive of this 80 acre site purchased for community park purposes. Planned facilities include ballfields and soccer fields. Completion of the initial construction is planned to allow use by the summer of 1996.

1999

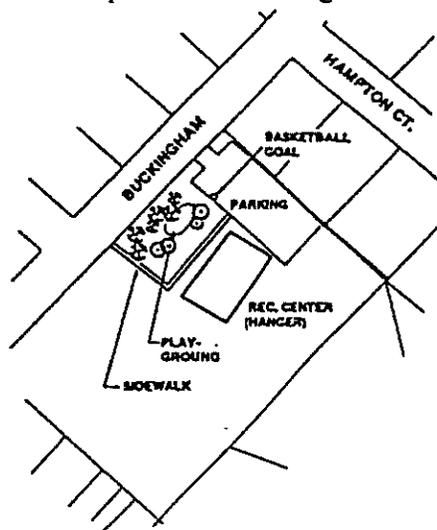
ARENA PARK



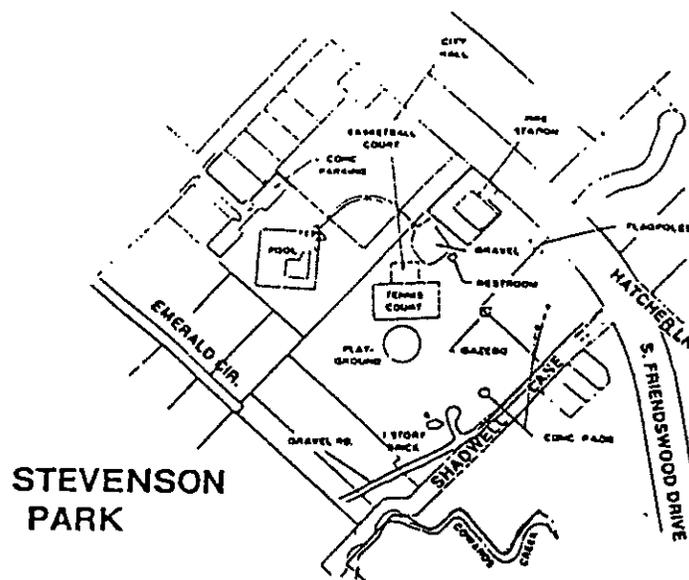
- Arena Park - Shown on the sketch of this 11.9 acre park are three practice soccer fields, one of which serves a dual use for a ballfield, sand volleyball, an older restroom building, a picnicking area and play apparatus.

Arena Park is a neighborhood park located across Cowards Creek from Stevenson Park. Opportunities exist for unifying the two spaces into a single recreational feature.

LEAVESLEY PARK

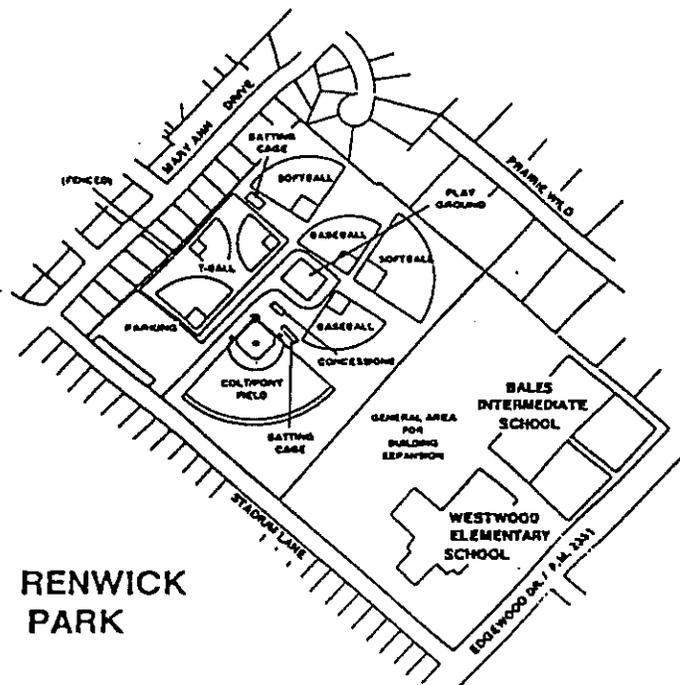


- Leavesley Park - This 3.0 acre park is principally used for the recreational activities furnished within the recreation building. Approximately one-half of the site is an open shaded area with play apparatus and seating located near the front of the building. This park is not considered to function as a neighborhood facility because of limited use restricted by its physical size, but rather as a special facility offering indoor recreational services.



STEVENSON PARK

- Stevenson Park - Among the more significant features of this 22.4 acre park are the swimming pool, four lighted tennis courts, a basketball court, and playground apparatus. Recent improvements are a walking/jogging path, memorial site and several park benches, all shaded by mature trees.



RENWICK PARK

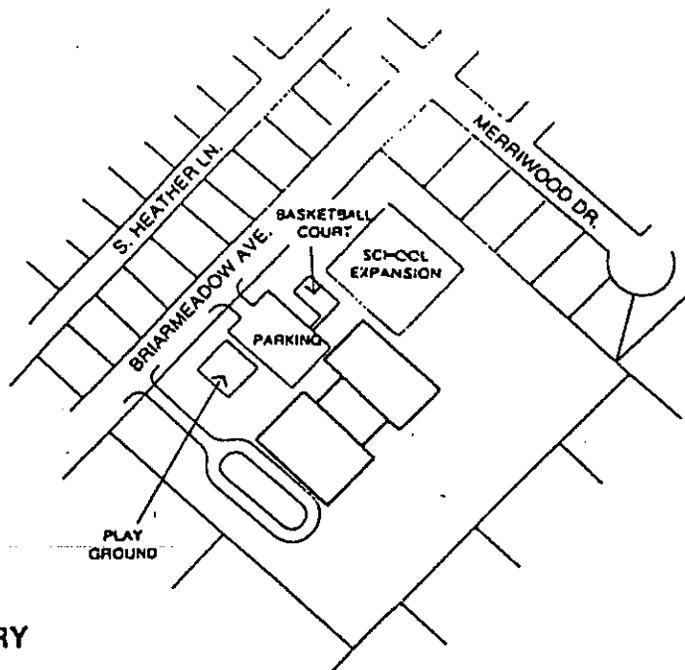
- Renwick Park - This 19.0 acre park, adjacent to the 20.0 acre Westwood Elementary School site, is completely utilized for ballfields. These lighted fields serve all age groups in the community who participate in youth baseball and softball. In the fall, the colt/pony league field is converted to use for football. Parking provides space for 168 vehicles.

ational facilities provided by entities associated with the area or users served by these facilities. These facilities are located throughout the community and fulfill some of the demands for recreational facilities being generated by persons residing in these developments. Commonly found in most private spaces is play apparatus, and occasionally sheltered space, swimming pools and tennis courts. Forest Bend is the most spacious of the private spaces and is considered to be capable of furnishing a variety of recreational opportunities to its users. The larger space and the arrangement of facilities and their size, such as the pool and civic building, are among the factors contributing to this private park's desirable features. The large open space provides an area for those who desire to practice field sports such as soccer or football. This is one feature lacking in the other private parks.

School Sites - School campuses often contribute to solving the need for recreational spaces, especially when there is a need for a field sports area. These spaces are sometimes developed as a feature on the school site, or just exist as an unorganized open space where these activities can occur.

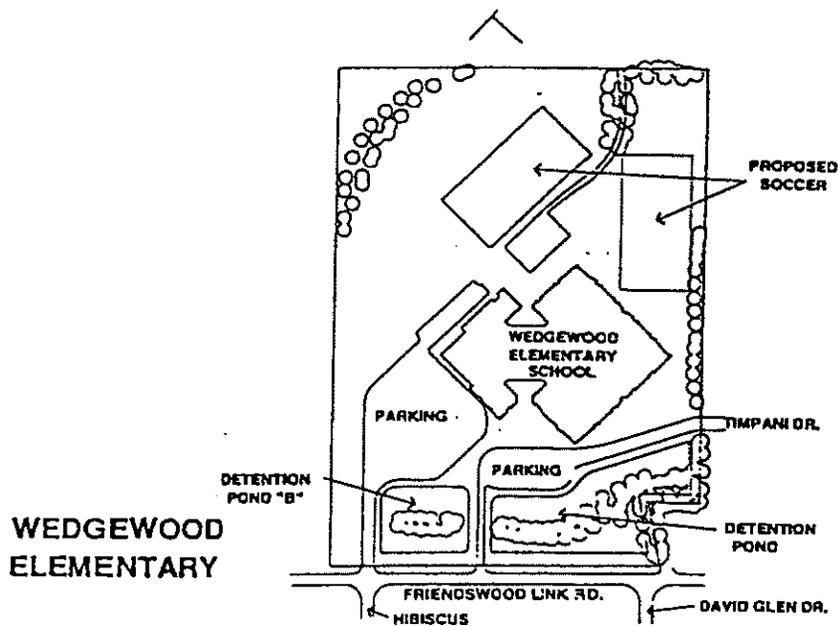
There are six school sites located in Friendswood: Friendswood High School, Friendswood Junior High, Bales Intermediate School, and three elementary schools (Cline, Westwood, and the new Wedgewood located on Friendswood Link). Sketches of these sites are shown to illustrate the recreational and sports facilities on each site, as well as to identify any other usable spaces.

- **Westwood Elementary School** - This school campus was



**C.W. CLINE
ELEMENTARY**

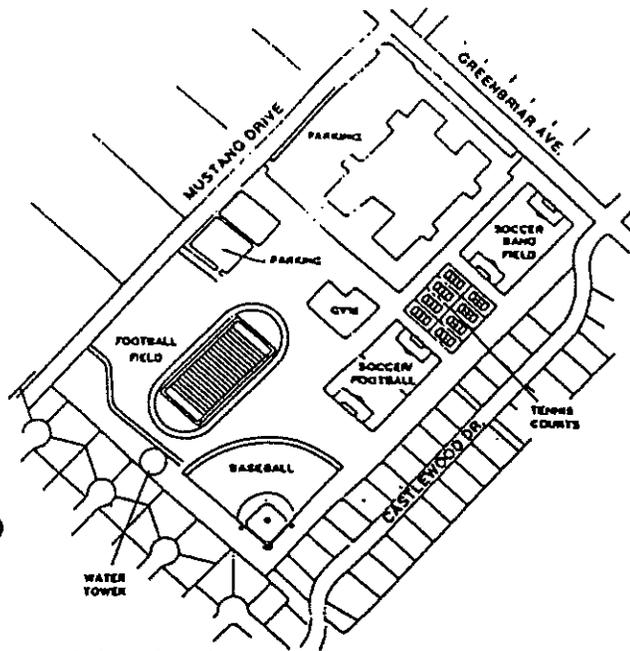
- C. W. Cline Elementary School - This seven acre campus is developed with permanent features being the building, parking, playground and basketball court.



**WEDGEWOOD
ELEMENTARY**

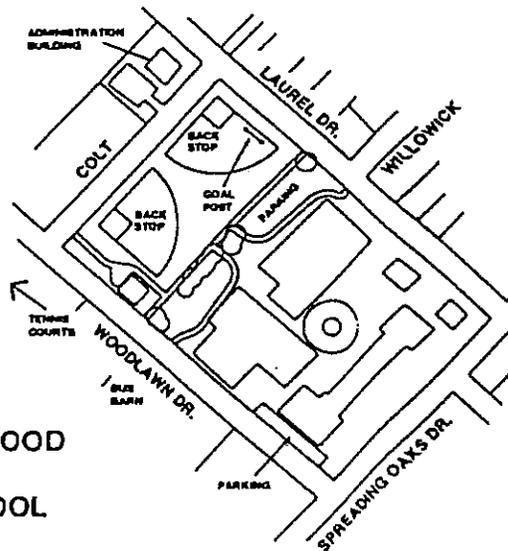
- Wedgewood Elementary School - Although this site has limited recreational space, it can be an important park-school facility for this section of the City which is deficient in public recreational space. The campus was completed in 1994.

**FRIENDSWOOD
HIGH SCHOOL**



- Friendswood High School - This is a 43 acre campus totally utilized for building and activity areas. The soccer fields and tennis courts provide the facilities for school related sports activities. Currently, there is not an agreement between the City and the District for the City to use these facilities for practice or play by organized sports.

**FRIENDSWOOD
JUNIOR
HIGH SCHOOL**



- Friendswood Junior High School - This is an older campus which has limited space for sport facilities. As shown on the sketch, there are four tennis courts associated with the campus and two ballfields. An open space south of the administration building appears to be used for football practice. These facilities are not used for practice or play by organized sports.

discussed with Renwick Park. A factor affecting soccer activities is the loss of fields when this school site is expanded this coming year to accommodate Bales Intermediate School. The adjacency of the park to the school campus is a definite asset for the school since some space will be available in the park for activity areas being removed by building expansion. This park/school site has long term value to both the City and the District.

Private-Commercial Recreational Areas - There are three private recreational facilities (golf, tennis and a softball complex) within the City which are available to serve the citizens' recreational needs. These are in close proximity to each other in the southern section of the City with access off Parkwood Avenue.

- The Sun Meadows golf course is an eighteen hole course developed as an integral part of the residential community built around its fairways. The course is available to public play and is the closest course in the area for use by local residents.
- Windsor Court Racquet Club, adjacent to the Sun Meadows development on Country Club Drive, has 13 courts, 7 of which are covered. The courts are operated as a club with access to local and area players. In addition to tennis, swimming is offered by the Club.
- The Friendswood softball complex has three lighted softball fields and one recently constructed unlighted field. The

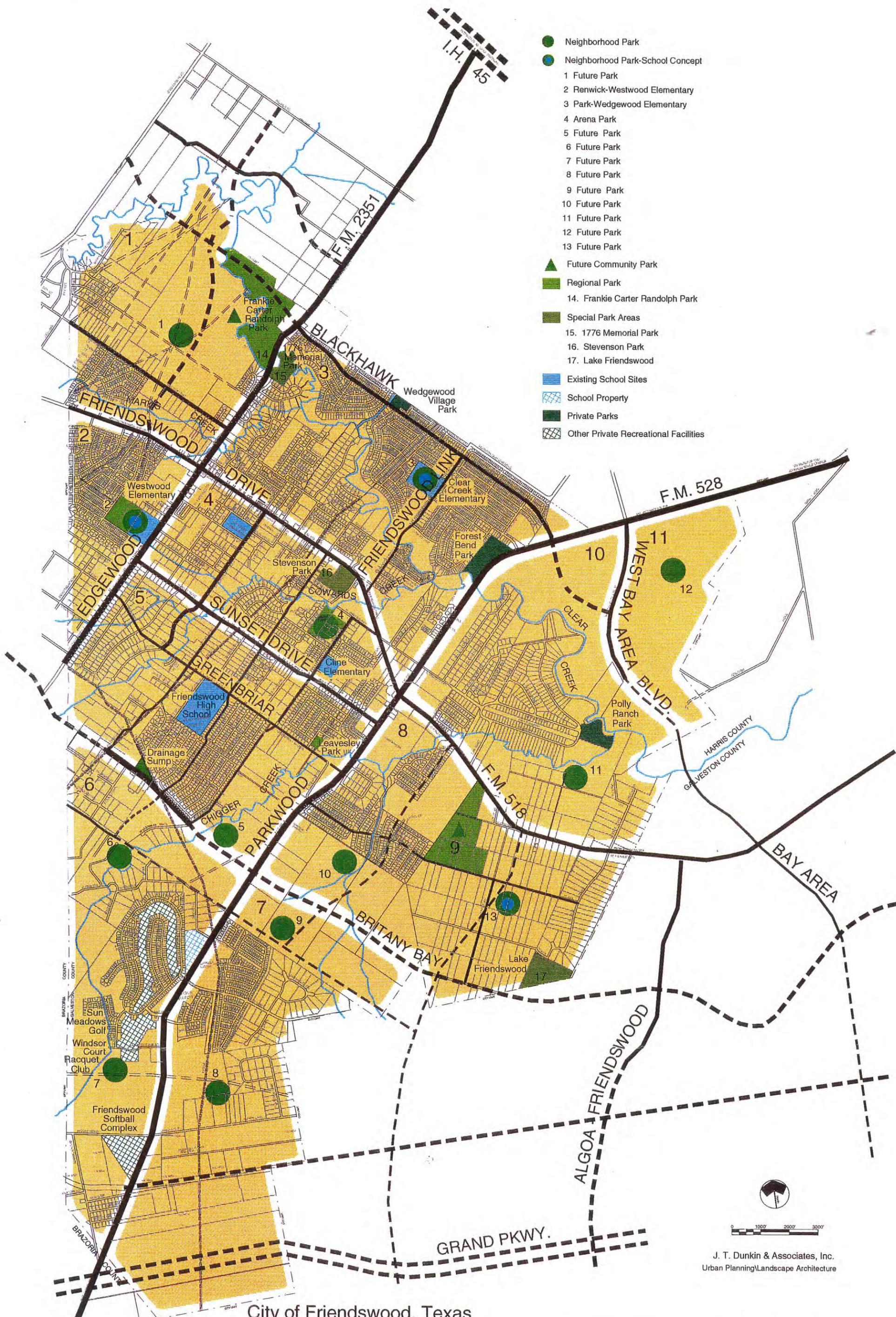
facilities and amenities are principally for adults. This facility, even though private, makes a contribution to the City's need for softball fields.

Existing Recreational Activity/Facility - In the discussion of recreational spaces, various types of activities and facilities were mentioned to be located in certain park or school spaces. These activities/facilities listed in Table 9 are either city, school or private. The list is not all inclusive of the recreational activities to be found in the park system, but does include those which are more commonly in demand. Other activities not listed generally do not require a large space and therefore can easily be integrated into a park design with the larger space users.

**TABLE 9
RECREATION ACTIVITIES-FACILITIES**

<u>Activity/Facility</u>	1997		
	<u>City</u>	<u>School</u>	<u>Private</u>
Basketball courts	4	6	-
Tennis courts	4	12	13
Baseball fields	4	2	1
Softball fields	6	-	-
Football fields	-	4	-
Soccer fields	6	10	-
Playground areas	4	3	3
Picnic tables	155	14	12
Swimming pools	1	-	3
Volleyball courts	3	-	-
Trails - miles	3.9	-	-

Activities/facilities are somewhat equally distributed between the



- Neighborhood Park
- Neighborhood Park-School Concept
- 1 Future Park
- 2 Renwick-Westwood Elementary
- 3 Park-Wedgewood Elementary
- 4 Arena Park
- 5 Future Park
- 6 Future Park
- 7 Future Park
- 8 Future Park
- 9 Future Park
- 10 Future Park
- 11 Future Park
- 12 Future Park
- 13 Future Park
- ▲ Future Community Park
- Regional Park
- 14. Frankie Carter Randolph Park
- Special Park Areas
- 15. 1776 Memorial Park
- 16. Stevenson Park
- 17. Lake Friendswood
- Existing School Sites
- School Property
- Private Parks
- Other Private Recreational Facilities

J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas
PROPOSED PARKS

FIGURE 10

City and the ISD with the contribution from the private sector close behind for tennis and softball. Although they are available to citizens of Friendswood, not all activities/facilities are always accessible for practice and competition. The City should not be responsible for furnishing in their park spaces all needed practice areas, but it should be the leader in providing the space for practice and competition. The planning for future facilities should incorporate into their design as many of the recognized recreational needs as is possible to be achieved with reasonable and planned capital investments.

**RECREATIONAL
ACTIVITY/
FACILITY NEEDS**

Often, a community does not know if it is providing its citizens the types and quality of recreational services they desire or would use, if these services were available. Normally, when there is a deficiency which affects a number of persons who may be organized to participate in a sporting activity, the desires of this group will be made known. But other needs which may not be related to organized sports can easily go undetected.

Needs Assessment - To assess recreational needs, three processes were used which are discussed in following paragraphs:

- Texas Outdoor Recreation Plan (TORP) - The 1990 TORP document is the State's sixth edition of a comprehensive outdoor recreation plan. The Plan divides the State into twenty-three regions having similar characteristics. Several counties comprise Region 16 in which Friendswood is located.
- The National Recreation and Park Association (NRPA) has functioned as a source for guidance in park standards for

determining park and open space needs. Their criteria is established from a nation-wide collection of data, and NRPA is very specific to point out that their data is to be used only as a guide to the development of local standards.

- Another method frequently used to determine recreational needs is to assess the local user groups' activities and any projections of their future memberships.

TABLE 10
ACTIVITY/FACILITY
RECOMMENDED FACILITIES

<u>Activity/Facility</u>	<u>TORP⁽¹⁾</u> <u>Standards</u>	<u>NRPA⁽²⁾</u> <u>Standards</u>	<u>Needed Game</u> <u>Facilities</u>
Basketball	6	12	15 to 17
Tennis Courts	26	30	20 ♦
Baseball	8	12	13 (baseball only)
Softball	7	12	6 to 8 (softball only)
Football	3	3	2
Soccer	3.3	6	20*
Playgrounds	28 Acres	-	17 to 19 play structures
Picnic Tables	61	-	70 to 80
Swimming Pools	3	3	2 public pools
Volleyball	N/A	12	6 to 8
Trails	6.2 miles	-	As many as possible

Legend

⁽¹⁾TORP - 1990 Texas Outdoor Recreation Plan

⁽²⁾NRPA - National Recreation and Park Association

◆ Tennis Center would accommodate tournament play, if desired

* Field dimension will vary

Facilities listed above do not include school facilities

A detailed analysis of the methods used to determine these results is found in the City's Park Plan. Also included in the Park plan is a detailed analysis of types of parks, proposed acquisitions, methods of obtaining the sites and funding alternatives. Figure 10 shows the proposed parks included in the Park Plan.

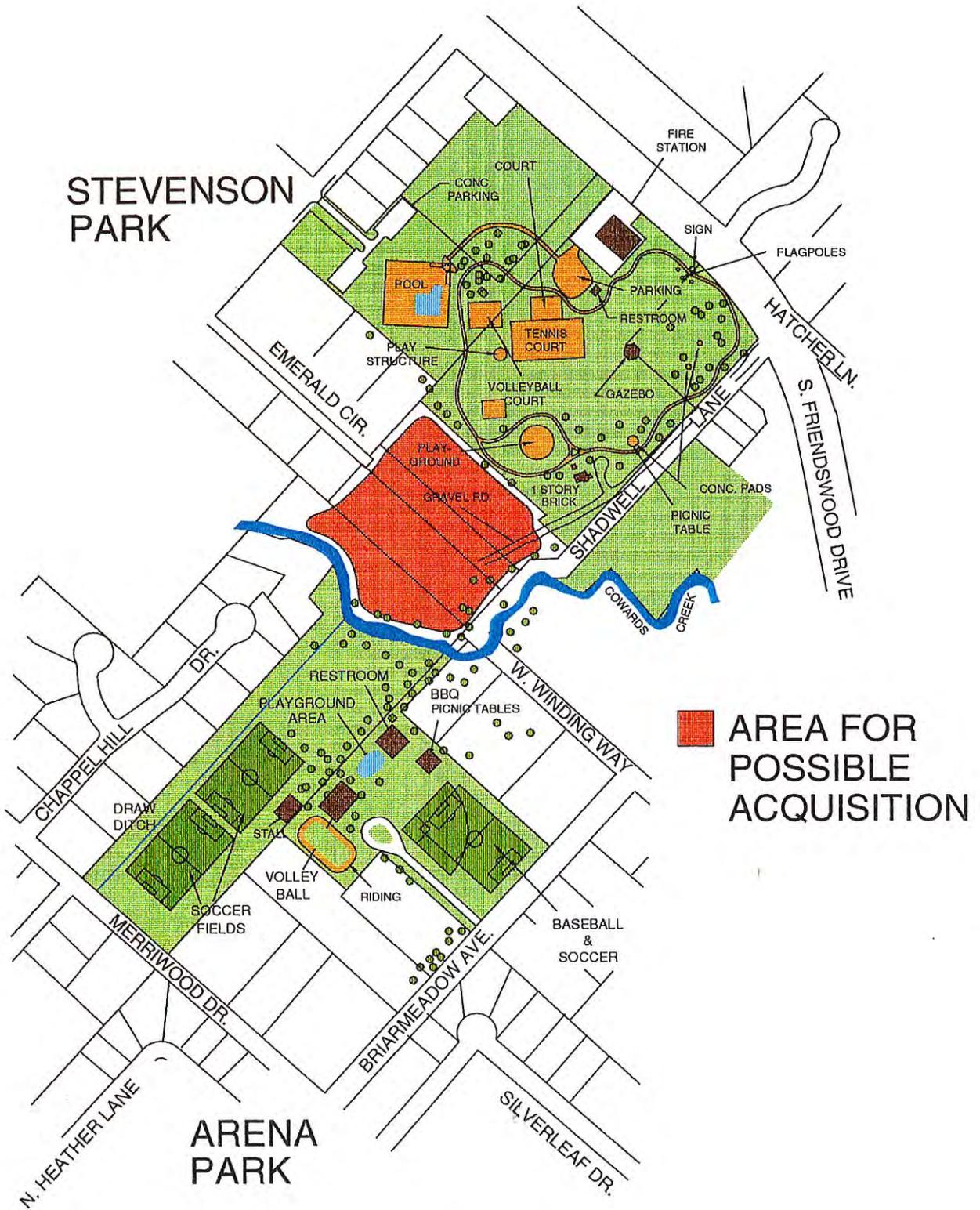


Figure 11



Figure 12
 NEIGHBORHOOD PARK / SCHOOL

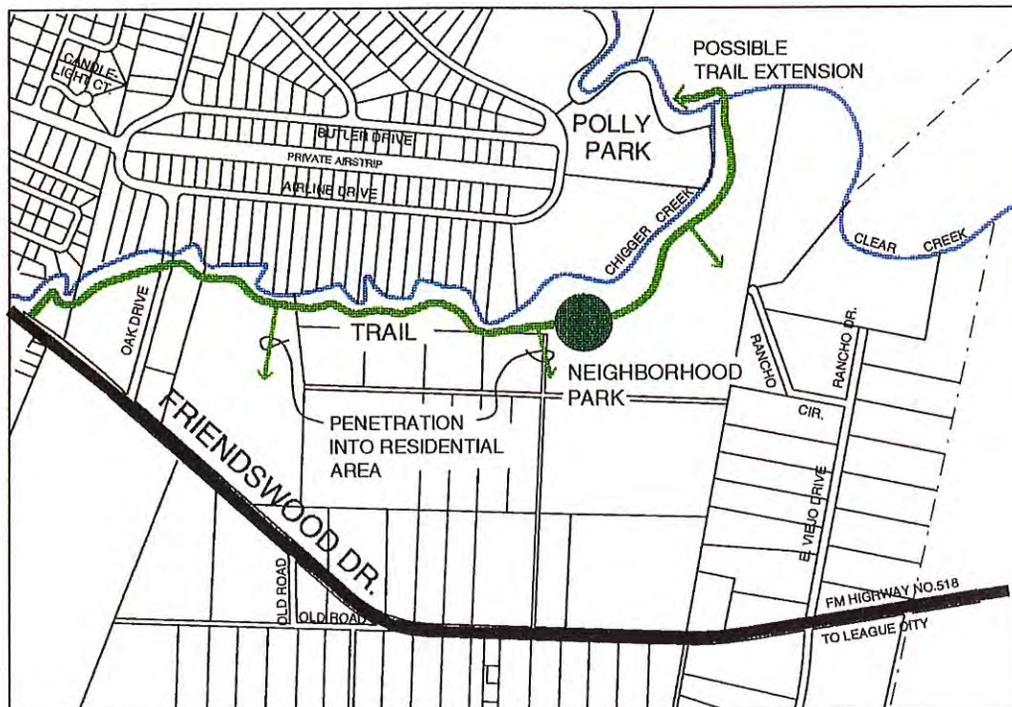


FIGURE 13

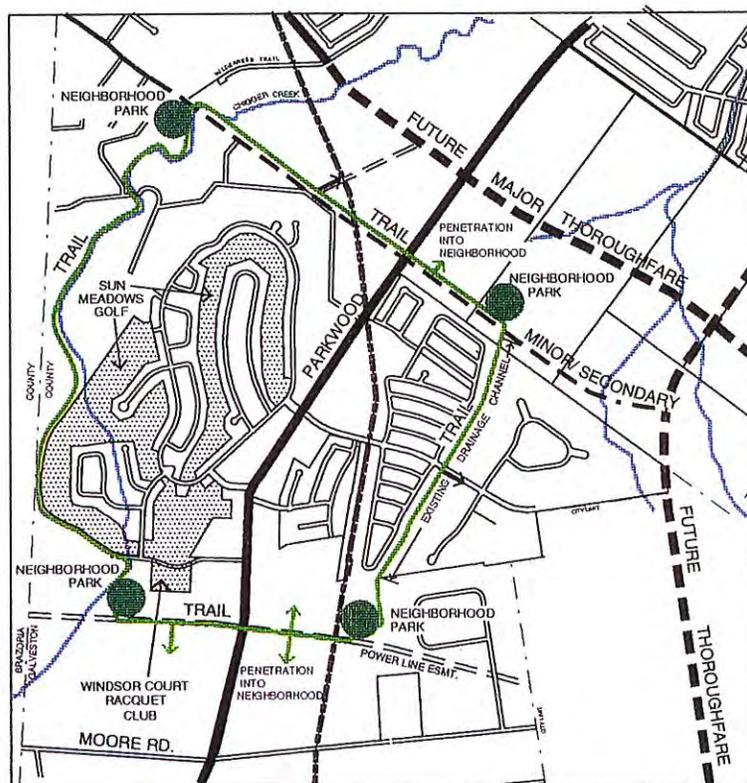
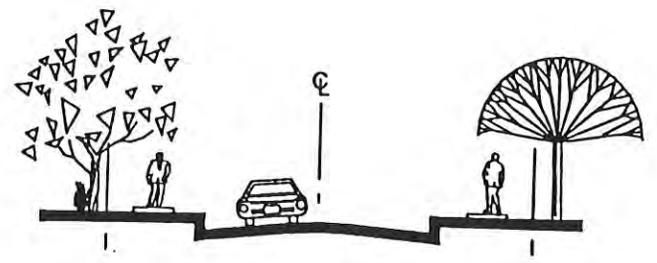
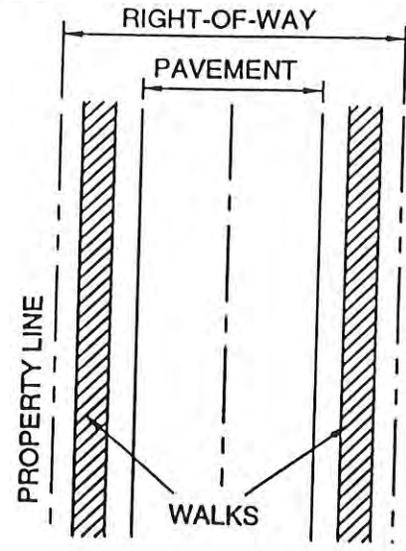


FIGURE 14

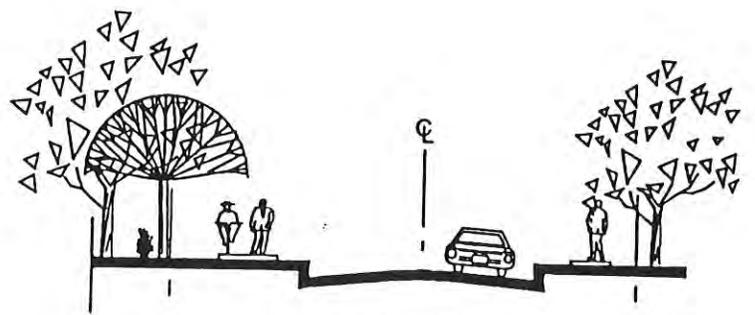
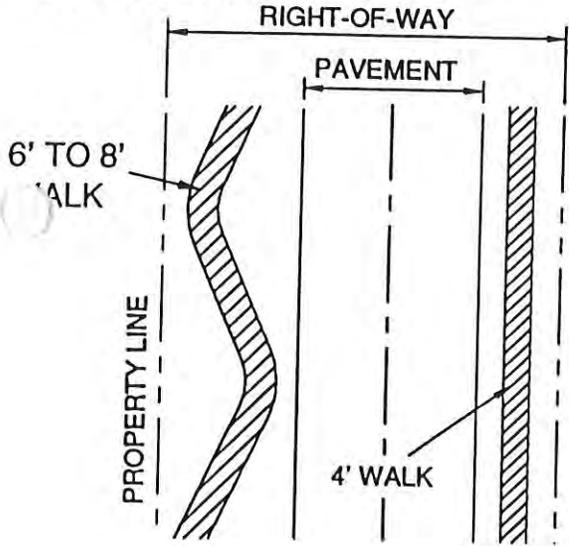
TRAIL ALTERNATIVES
IN STREET RIGHTS-OF-WAY

FIGURE 15A



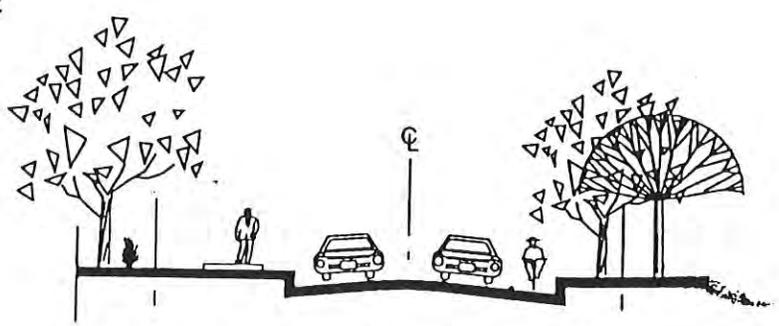
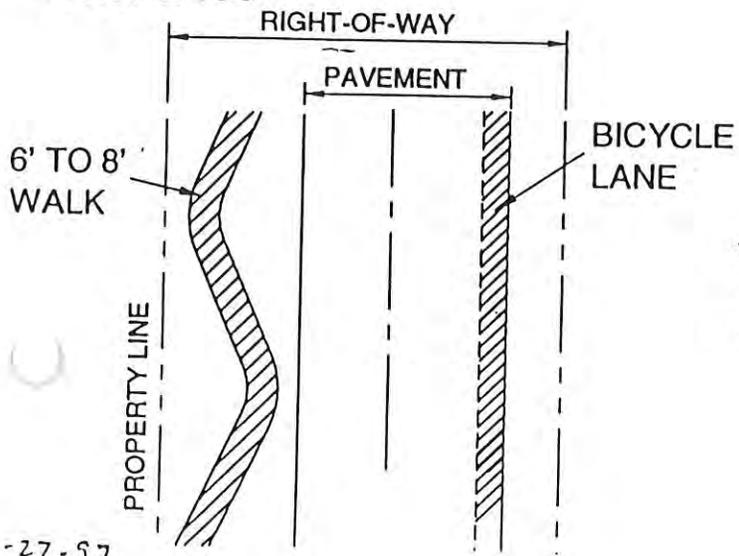
SECTION

FIGURE 15B

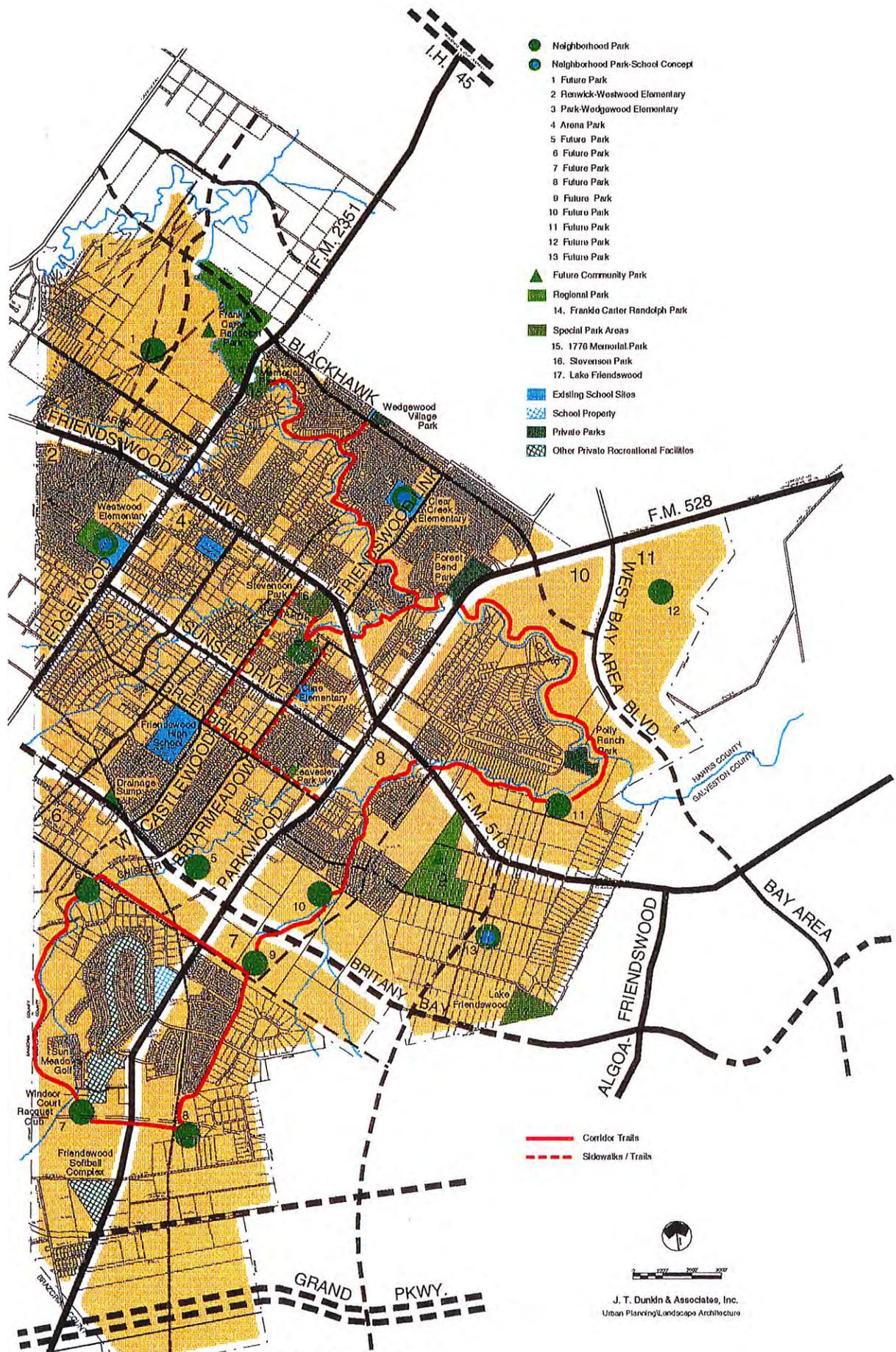


SECTION

FIGURE 15C



SECTION



- Neighborhood Park
- Neighborhood Park-School Concept
- 1 Futuro Park
- 2 Rawick-Westwood Elementary
- 3 Park-Wedgwood Elementary
- 4 Arena Park
- 5 Futuro Park
- 6 Futuro Park
- 7 Futuro Park
- 8 Futuro Park
- 9 Futuro Park
- 10 Futuro Park
- 11 Futuro Park
- 12 Futuro Park
- 13 Futuro Park
- ▲ Futuro Community Park
- Regional Park
- 14. Franko Carter Randolph Park
- Special Park Areas
- 15. 1778 Memorial Park
- 16. Stovenson Park
- 17. Lako Friendswood
- Existing School Sites
- School Property
- Private Parks
- Other Private Recreational Facilities

City of Friendswood, Texas

PROPOSED PARKS & TRAILS

FIGURE 16

S-27-97

COMMUNITY FACILITIES PLAN

COMMUNITY FACILITIES PLAN

MUNICIPAL FACILITIES

There are several operative functions involved in municipal government, some of which the average citizen is probably not aware, that are required to provide the services they enjoy and use. These functions are grouped together and given the collective title of Community Facilities. Included with the municipal functions are the school districts which also provide a community service but under a separate taxing and governmental operation.

MUNICIPAL FUNCTIONS

The municipal functions included in this section of the Plan are: the administrative offices, library, police, fire, public works, community development, and service center operations. Often, how these functions are housed and their location in the community will influence the efficiency and cost for their services. It is not the intent to analyze the operative characteristics of each function, but rather the status of space and location as related to the population. It is important to be aware of where space deficiencies exist or where change can be made to improve services, thus allowing recommendations to be placed in the capital improvement plan for the programming and funding of new facilities. The following discusses the existing features of each function and when applicable recommendations are set forth.

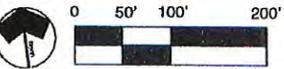
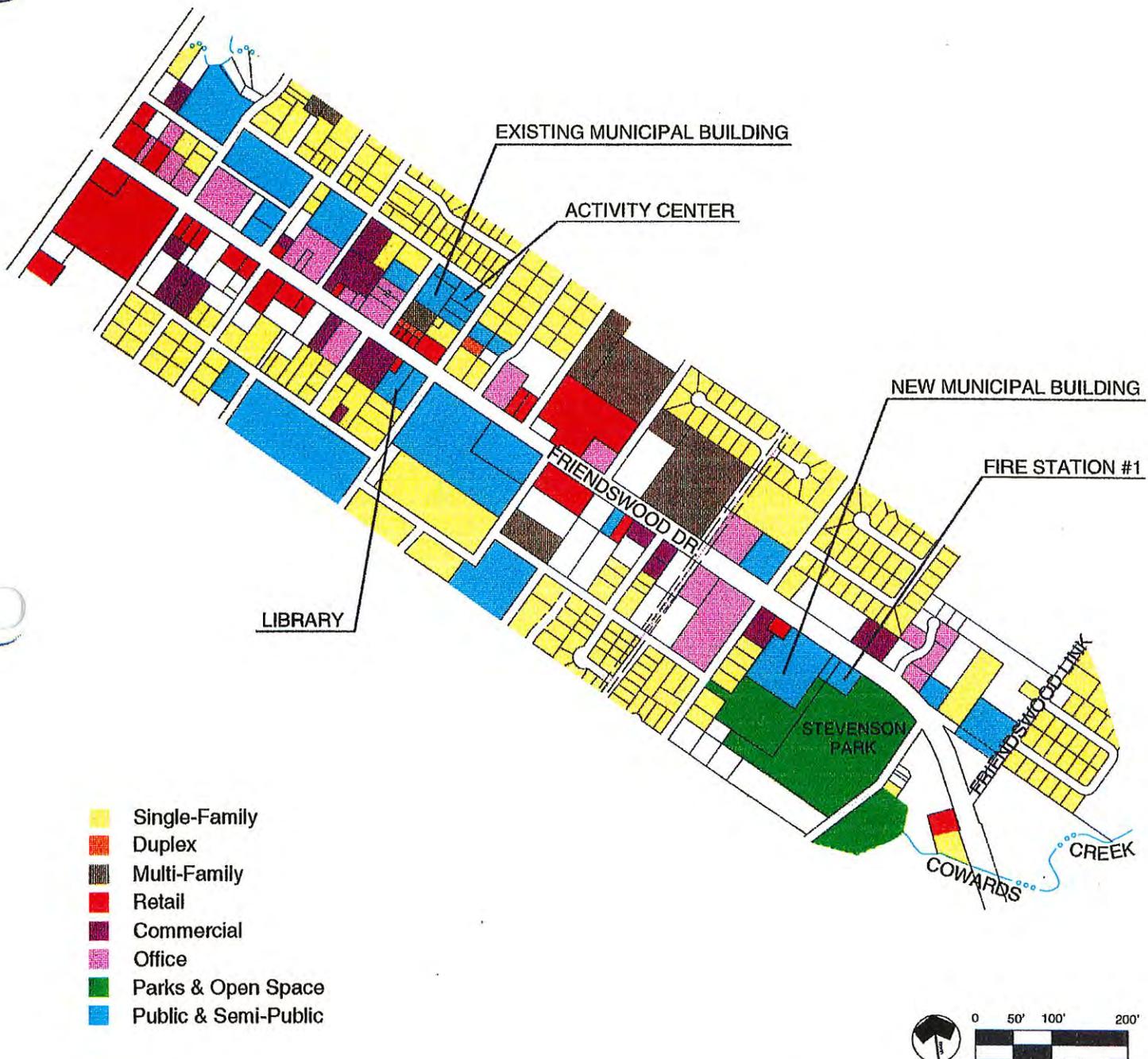
City Hall - The location of the new municipal building is at 910 South Friendswood Drive adjacent to Fire Station 1 and Stevenson Park. Offices at this new location are Administration, City Secre-

tary, Community Services (parks and recreation), Administrative Services (finance, human resources, utility billing, municipal court, MIS) and Community Development, which includes engineering, planning, zoning, and building inspection. There are approximately 22,100 square feet of space in the City Hall for administrative use and the Council Chamber. This space should be sufficient to accommodate personnel growth which will gradually occur with population growth.

Library - The city library recently moved into a single story building on Friendswood Drive from its previous location on Morningside. This newer building was formerly used as an office and has been refurbished for the library which will have expanded space for all library activities, as well as meeting room space. The current building includes approximately 15,600 square feet. The site has high visibility to the public and the building is positioned to allow space for landscape treatment along the thoroughfare with adequate parking area behind the building.

This facility is expected to serve the library needs for the City's ultimate population. The central relationship of the library within the community and the service area are both factors which minimize the need for any future branch facilities. The purchase of the small tract adjacent to the library on Friendswood Drive is planned and will complement this site.

Police - The police department had been sharing space with the administrative and parks offices in the 13,000 square-foot building located at 109 Willowick. The fire marshal's office will be the fire activity located in this building. Given the age of the building, and



J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas

MUNICIPAL BUILDING, POLICE & LIBRARY FIGURE 17

the ability of the building to provide functional space for police and other public safety activities are both factors to be evaluated in a pending study to determine the long range needs for housing public safety functions.

Fire - The present fire facilities consist of the following stations:

- Station Number 1 is located at 1000 South Friendswood Drive adjacent to the new City Hall and Stevenson Park. In past years the station was centrally located but growth has brought about change and other stations were required to provide adequate fire coverage and service.
- Station Number 3 is located at 4402 Laura Leigh Street in Forest Bend Park. A significant section of the station's service area is outside of the City. However, areas north of Clear Creek are served from this station which is a major factor should crossing the creek from the south become restricted. The important factor to be considered in spacing stations is to be assured the engine can reach the fire within a reasonable time from when reported.
- Station Number 2 is located at 2605 West F.M. 528 south of Sun Meadow Boulevard. Fire training facilities which are used to train personnel in fire fighting techniques are located on this site.

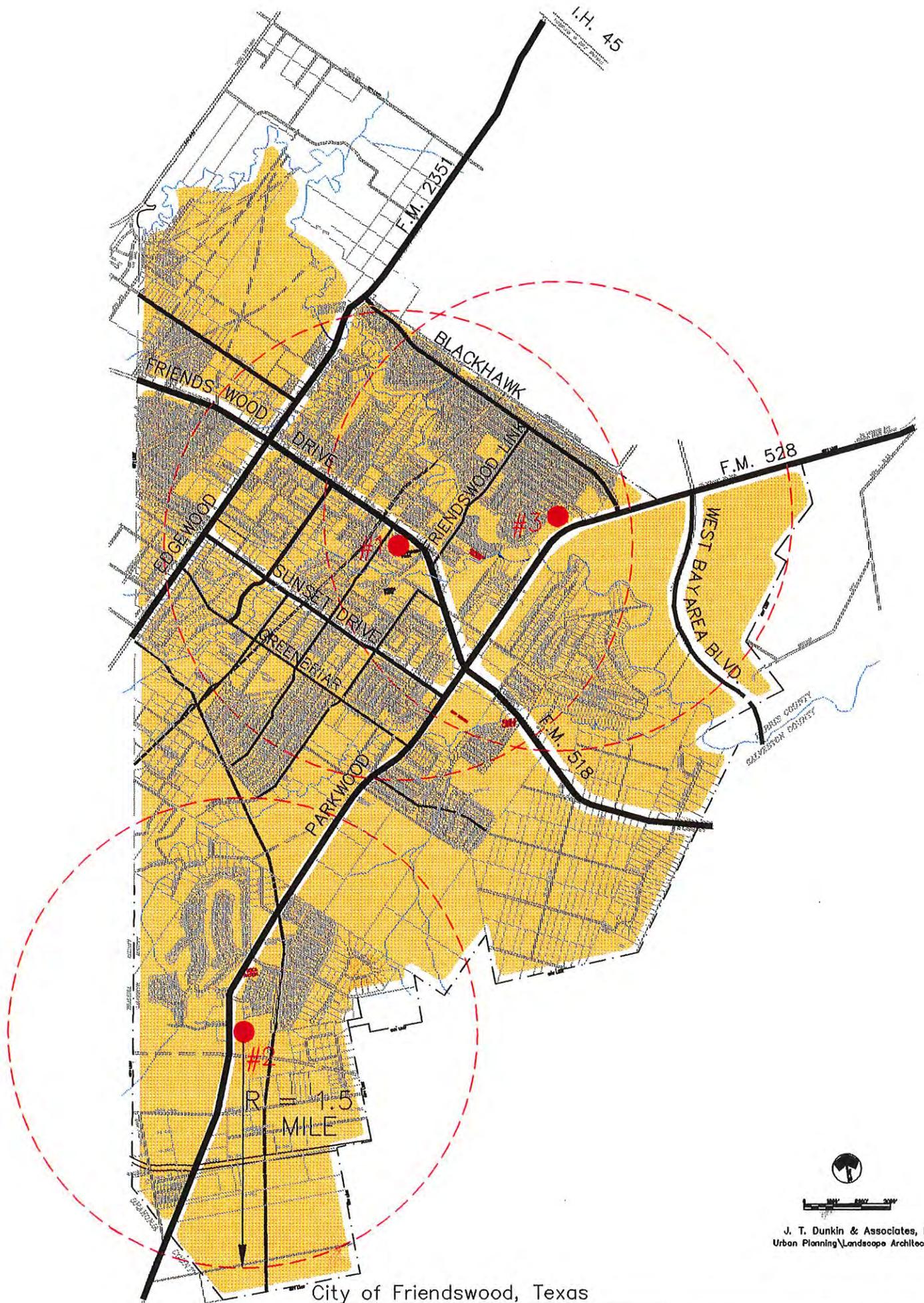
Each of the above sites is shown on Figure 18 with a one and one-half mile service area. As shown, there is a significant overlap in

service areas and not all of the City has coverage. The greater the overlap without added benefits, or protection, the more costly it is to provide the fire protection. When stations can be spaced where there is minimum overlap with adequate protection, the fewer the number of stations will be needed to provide coverage within the City, and likewise, the lesser cost for fire station capital investments and operational costs.

There are various methods for determining proper fire station spacing. One standard often used is to have a response time which does not exceed three minutes. Another standard is to use a one and one-half mile service radius from the station to define the service area as shown on Figure 18. This distance is based on the above response time. The location on or close to the thoroughfares for stations 1, 2, and 3 is ideal for travel when responding to a fire or providing emergency equipment.

Two proposals for the spacing of fire stations in the future are shown on Figures 19A and 19B, using the one and one-half mile service radius. The proposal shown on Figure 19A indicates the relocation of Number 1 to Edgewood Drive just north of Friendswood Drive. From this location there would be good coverage for the present and future development in the northwest quadrant of the City. Station 3 is not adjusted because of its strategic location north of Clear Creek. Also Station 2's location is shown to remain. As it is located nicely for coverage of the Southern part of the City.

The service configuration shown on Figure 19B indicates two new stations: (1) relocation of Central to Edgewood Drive and (2) a new



City of Friendswood, Texas

EXISTING FIRE STATIONS

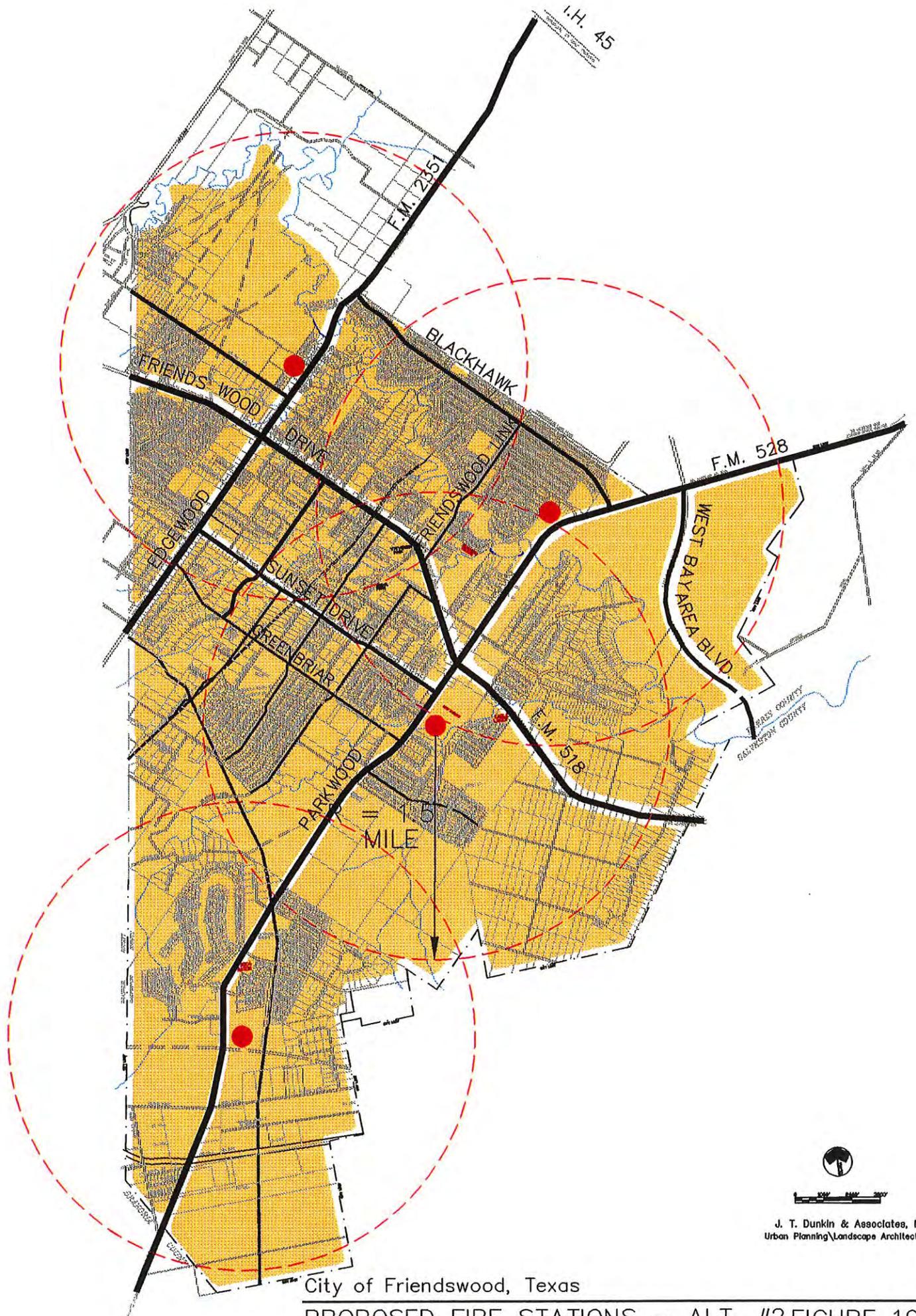

 J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

FIGURE 18



J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas
 PROPOSED FIRE STATIONS – ALT. #1 FIGURE 19A



J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architecture

City of Friendswood, Texas

PROPOSED FIRE STATIONS – ALT. #2 FIGURE 19B

station location of Parkwood Avenue south of Sunset Drive. Should this proposal be implemented, it would appear some type of inter-city cooperation could be undertaken to share costs for coverage in the adjoining cities of League City and Pearland.

From the above proposals, it is evident that some adjustment will be required to provide adequate fire protection to the City's future urban area. Both of these proposals would be costly. Therefore, it is recommended more detailed study be done before final decisions are made. Such study would involve actual response times from locations, the type of equipment that would be in use, man-power and other similar considerations influencing the station's operation and location.

Public Works - The Public Works building and surrounding grounds are located on approximately three acres at 1306 Deepwood Drive. This site also serves as the center for field operations for water, sewer and streets within the public works function and park maintenance. These field activities work out of a 2200 square-foot maintenance building. The present site area used for maintenance purposes is considered to be adequate in the future for the types of operations presently handled from this location.

Activity Building - This building did house the library function, but since has become an Activity Building. Currently, the building is used for senior activities with future plans to include arts and craft rooms, meeting rooms, and a larger assembly area.

Summary - The recent purchase of the building for the Library, the

construction of the new City Hall, and the redesignation of the spaces vacated by these two functions has created adequate spaces from which to operate for the administrative offices, police, engineering, public works and community development as the City nears build-out.

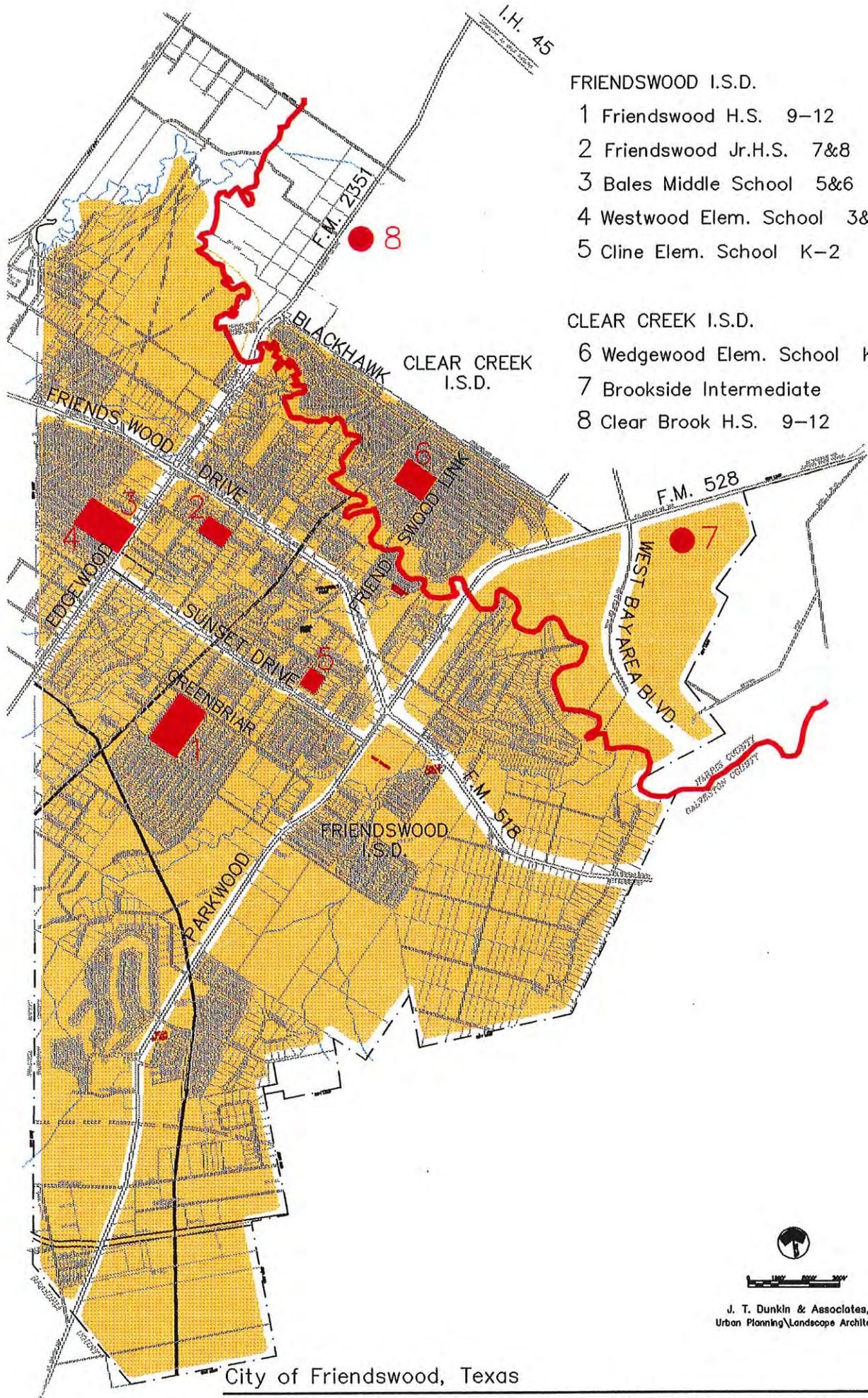
For capital improvement purposes, plans should reflect the eventual up-grading of the police facility and sites for new fire stations. Planning for these sites should be undertaken in the near future to determine their precise location. This is especially important in locating a site on Edgewood Drive north of Friendswood Drive where sites along the thoroughfare south of Clear Creek are developing for other purposes.

SCHOOL FACILITIES

Friendswood is served by two school districts which are separated within the City by Clear Creek. North of the creek and inside the city, the Clear Creek Independent School District operates Wedgewood Elementary and Brookside Intermediate. An elementary site has also been purchased adjacent to Brookside Intermediate. Both sites are on F.M. 528 and are shown on Figure 20. Although not in the City of Friendswood, the Clear Brook High School is nearby just north of Blackhawk on Edgewood Drive.

Friendswood Independent School District serves the area of the City south of Clear Creek using the five types of schools shown on Figure 20. The school district has vacant property at the intersection of Parkwood Avenue and Windsong.

School district facilities need to be factored into the Comprehensive



- FRIENDSWOOD I.S.D.
- 1 Friendswood H.S. 9-12
 - 2 Friendswood Jr.H.S. 7&8
 - 3 Bales Middle School 5&6
 - 4 Westwood Elem. School 3&4
 - 5 Cline Elem. School K-2

- CLEAR CREEK I.S.D.
- 6 Wedgewood Elem. School K-5
 - 7 Brookside Intermediate
 - 8 Clear Brook H.S. 9-12

City of Friendswood, Texas

EXISTING AND PROPOSED SCHOOLS FIGURE 20



Plan even though the City has no authority to designate specific locations for school facilities. However, when considering future school sites, the City and school can work in a cooperative manner to designate sites as land develops. By showing the intent of school sites in the Plan, the development community is made aware that such sites are needed and can plan their property appropriately to accommodate these facilities. Further, when elementary school sites are designated, the City can begin to direct the platting for development of the neighborhood around this site. Also, the City can consider joint use of a site for park-school purposes and purchase land with the District.

As mentioned, the Clear Creek District has purchased a middle and elementary site on Parkwood Avenue. Even though the City was not involved in the land acquisition, it still may desire to explore a neighborhood park for this area of the City.

Within the Friendswood District, there are two areas where vacant land will ultimately be developed principally for residential purposes. These areas are either side of South Friendswood Drive towards League City and East of Parkwood Avenue towards Alvin. To satisfy the elementary school, and possibly the middle school needs, the general location for future sites should be designated for these areas.

Friendswood ISD - To provide some direction to future school needs, very preliminary projections are set forth below to indicate the scope of these needs:

- In the 1990 Census which was taken around mid-1989, the number of occupied dwelling units in the City in Galveston County was 4,983 units.
- The total enrollment in the FISD for the 1989-90 school year was 3,232 students.
- The ratio between the above values is .65 students per dwelling unit.
- Examining this relationship between population/dwelling unit and student enrollment indicates the following for the grade levels shown:

K - 5 = .29 students per unit
 6 - 8 = .16 students per unit
 9 - 12 = .20 students per unit
 .65 students per unit

When applying a similar approach to the end of the 1994 year's housing units and the January, 1995 student enrollment the following comparison can be made.

- Assuming all, or the preponderance of all, new dwellings since 1989-90 have been built in the FISD portion of the City, the dwelling count is the 1990 count of 4,983 plus the 1,573 units built since 1989 for a total of 6,556 units.
- The January 1995 enrollment was 4,208 students.

- The ratio between dwelling units and student enrollment is .64.

Therefore, it should be valid to examine below the built-out dwelling units and a factor of .64 to provide a preliminary estimate for elementary enrollment which can be converted to classrooms and ultimately to school(s).

- A built-out population of 45,000 persons with 2.8 persons per dwelling is assumed. The number of dwellings for the total City would be approximately 16,000 units. Adjusting this value to the FISD would place approximately 12,000 units in the District.
- Applying the .64 factor to the dwelling count would generate a total enrollment of 7,680 students.
- Further division of the enrollment to the elementary level of K-5 would result in an enrollment of approximately 3,500 students. This value would require five schools each having a capacity of about 720 students.

From the above analysis, it is reasonable to assume the District will likely need two additional lower grade level schools to serve the City's future urban area. These sites are shown on Plate 10 as future schools with one location generally situated south of Friendswood Drive in an area where a neighborhood park is proposed on the Park Plan. The other location is further west in a general location where another neighborhood park is proposed on the Park

Plan.

The City and School District have an opportunity to make a significant contribution to the future residential areas in the southeastern section of the City by jointly undertaking site acquisition and development of the future neighborhood facilities. The school projections made herein make certain assumptions which may be varied in a more detailed analysis, but the conclusions reached for a minimum of two additional lower level grade schools should be valid.

UTILITY SYSTEMS

EXHIBIT "A"

UTILITY SYSTEMS

**UTILITY
SYSTEMS**

The City of Friendswood operates and maintains both a water system and a wastewater system. Future expansion to these systems required to meet the community's future growth will be implemented through the use of impact fees. These fees, charged against new development, will pay the cost for new facilities, but they cannot be used for replacement costs. Therefore, costs associated with upgrading the existing systems will require some other type of funding source. The following sections discuss the existing features of each system and proposed capital improvements as set forth in the 1997 study which updated the City's impact fees.

**WATER
SYSTEM**

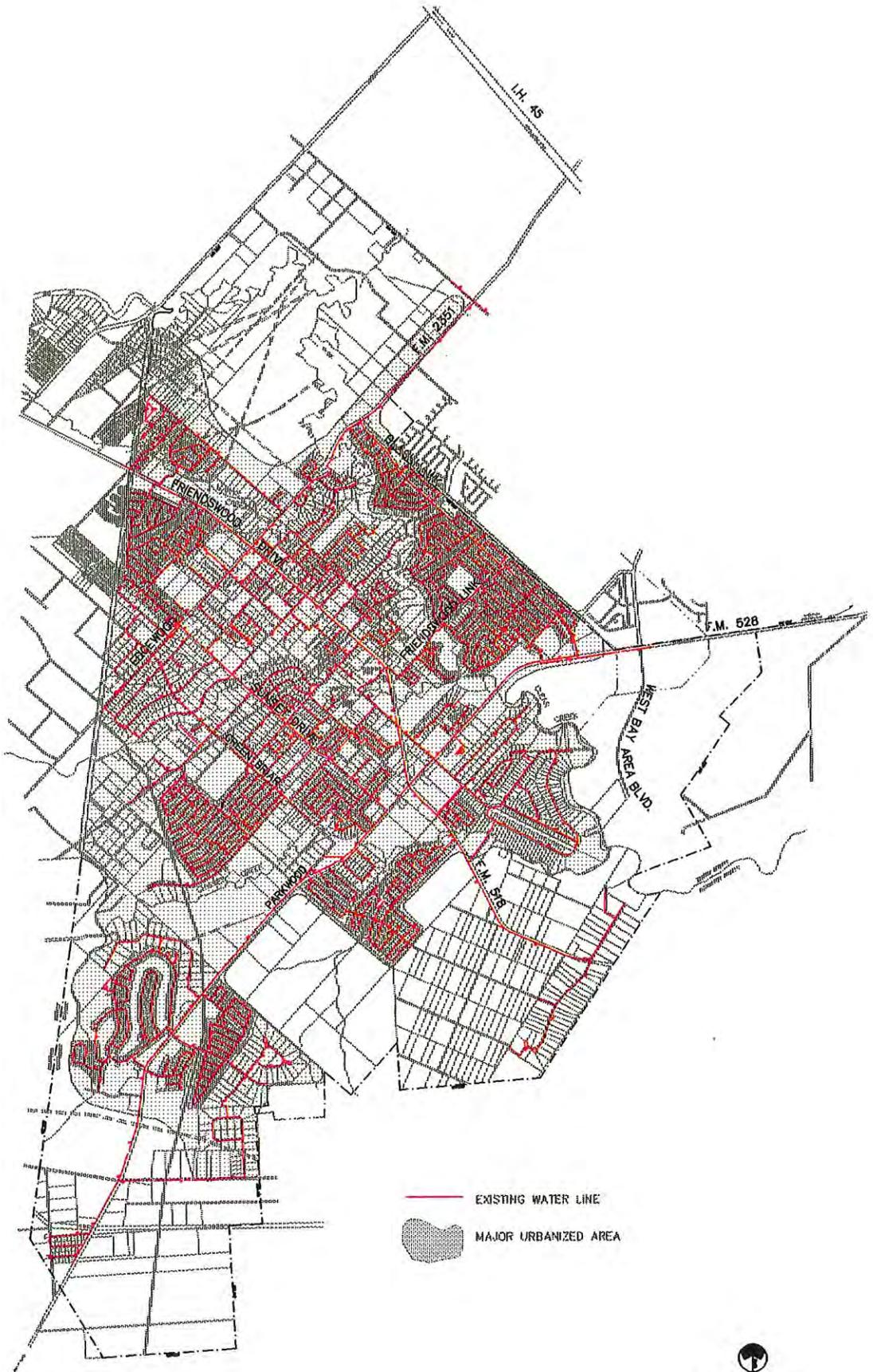
Water Source - The City has two sources for its water supply. These sources are from ground water wells and surface water which is purchased from the City of Houston. This water purchase is for 3.0 million gallons per day which is in excess of current needs. The purchase was in response to direction by the Harris-Galveston Coastal Subsidence District that the service area in which the City of Friendswood is located would convert to the surface water supply whereby 80 percent of the total demand would be served by surface water and that a maximum of 20 percent of the total demand would be served by the City's existing water wells. The City also has an agreement with the City of Houston to secure a second take point for surface water when additional capacity is required. Based upon current estimates, Friendswood will require an additional 2.3 MGD of surface water at build out.

Demand - In 1996, the City's average water consumption was approximately 3.58 million gallons per day. Of the 10,011 connections, the customer connections were divided between 8,189 single family and 1,463 multi-family units. The remaining 359 connections were split among commercial (193), sprinkler systems (119), and semi-public uses such as parks, schools and churches (47).

The system demand will exceed the available surface water capacity in the future and the City of Friendswood will be acquiring additional surface water from Houston. As of 1997, a study of the water distribution system and additional surface water take point(s) is underway but has not been completed. This study will determine what improvements are needed to the City's water system and at what point additional surface water will be required.

Distribution System - Figure 21 shows the present water distribution system. The system is primarily comprised of six and eight inch lines. Major lines in the system are the following:

- A ten inch line is in Friendswood Drive east of Parkwood Avenue to Viejo Drive near the eastern city limits.
- A twelve inch line is also in Parkwood Avenue south of Friendswood Drive to within approximately one thousand feet of the southern city limits.
- From the intersection of Friendswood Drive and Parkwood Avenue, a fourteen inch line in this right-of-way extends



J. T. Dunkin & Associates, Inc.
 Urban Planning/Landscape Architects

City of Friendswood, Texas
 WATER UTILITIES

FIGURE 21

easterly to the city limits.

- A ten inch line (with some 8-inch segments) is in Friendswood Drive between Parkwood Avenue and Edgewood Drive.
- A twelve inch line (with some 8-inch segments) is in Blackhawk Boulevard between Parkwood Avenue and Edgewood Drive.
- A twelve inch line from the ten inch line in Friendswood Drive to the twelve inch in Parkwood Avenue.

The location of the larger trunk lines described above which are located in the City's southeastern section will provide the opportunity to meet future growth and water demands in this area.

Completed projects associated with surface water are the transmission, pumping, and storage facilities which are expected to be adequate to serve the City's requirements to the time when approximately fifty percent of the City is built out. As the City approaches this level of development, a second transmission line in Beamer Road and Dixie Farm Road with associated pumping and storage facilities is envisioned by the City's engineers. Currently, an eight inch line is located in the rights-of-way of Beamer and Edgewood and tie to the twelve inch line in Blackhawk Boulevard.

Future Improvements - There are three growth areas in the City where future capital improvements are proposed for the water system: the Melody Lane system, Bay Area Boulevard Service Area and the South Friendswood system.

- The Melody Lane area extends service into a vacant area of approximately 400 acres between Melody Lane and Clear Creek. The proposed eight and twelve inch lines tie to an eight inch line in Melody Lane.
- Proposals for the South Friendswood System include the looping of minor distribution lines which are comprised of eight and twelve inch sizes within proposed residential developments. This line network would serve approximately 1,088 acres.
- Proposals for the Bay Area Boulevard Area include constructing of a 14-inch trunk line from Parkwood (along the Bay Area Boulevard right-of-way) to the 10-inch line in Friendswood Drive. This would enable a second take point for surface water to be located in the north portion of the city and the system could then push water to the south.

WASTEWATER SYSTEM

Treatment - The Blackhawk Regional Wastewater Treatment Plant is located in Friendswood on Clear Creek in the northeastern section of the City. Friendswood owns 4.875 million gallons per day of the plant total capacity. This capacity was purchased in two phases. Phase I provided 2.375 million gallons per day and this capacity is serving present development. An additional 2.5 million gallons per day was obtained by the City in the Phase II construction and is available to serve future development. This capacity will serve the City through the ten-year capital improvements set forth in the impact fee study, from 1997 - 2007.

• In 1996, the number of equivalent units was estimated to be 9,850

for wastewater treatment purposes. Using an average daily demand of 100 gallons per capita per unit and the 1990 census data of an average of 2.86 persons per unit, the 1996 estimate of capacity utilized at the Blackhawk Plant is 2.817 million gallons per day. Based upon same criteria, the capacity required of the plant at buildout, assuming 17,500 equivalent units, would be 5 million gallons per day. Assuming no adjustment to usage per capita or the number of persons per unit, the City would be required to purchase a small amount of additional capacity (estimated population is 48,600).

Collection System - This system is shown by Figure 22, Sewer Utility. Most collection lines in the system which service the adjoining properties are six and eight inches in size. Trunk lines range upward from twelve inches to thirty-six inches. Not all areas of the City are provided sanitary sewer service as shown by Figure 22. Approximately two hundred units were not served by the City's system as reported in the 1990 Census. An area of the City shown on Figure 22 receives sanitary sewer service from the City of Pearland. If the residentially developed properties north of this area were connected to a sanitary sewer system, it is likely they too would be served by Pearland.

The non-served areas are scattered over the community and most are close to existing lines, or could be reached by line extensions if the line gradient is feasible.

Future Improvements - There is one area proposed to receive sanitary sewer trunk lines through the impact fee capital improvement program. This area is the Bay Area Boulevard Area which

also coincides with capital projects for water.

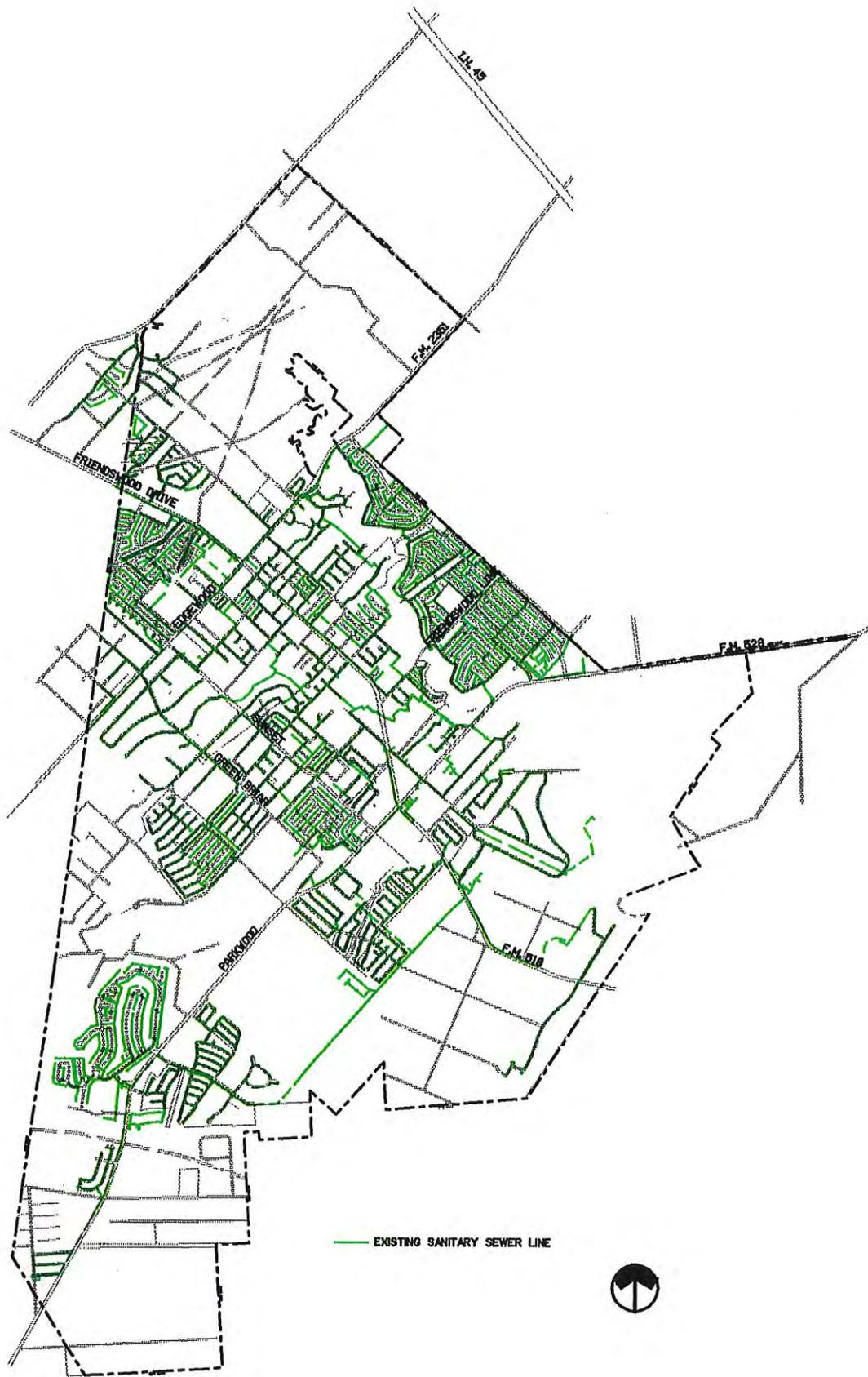
- The Bay Area Boulevard Service Area is proposed to be served by a sanitary trunk force main system. The single biggest factor influencing the selection of a force main over a gravity trunk line in the channel by-pass being proposed by Harris County Flood Control District. The details of the proposed improvements are identified in the study for that area due out in the Summer of 1998.

Other projects will be financed by funds from sources other than impact fees. These projects are designed to take service into previously unserved areas.

The utility planning performed for the City has been designed to match water and sewer services against growth in those areas not heretofore served. Through the collection of impact fees over a period of time as these areas develop, the capital costs and some associated costs will be recovered whereby new development will have paid for their lines. Other costs for improvement needed such as extension of sewer services to developed properties will require other funding sources to make these improvements.

SUMMARY

Recent improvements and future plans for improvements to the Blackhawk Wastewater Treatment Facility and current supplies of water will allow the City adequate utility infrastructure and availability through its expected built out capacity of a 48-50,000 total population. Any increase beyond that point would probably require increased capacity in wastewater treatment and increased purchases of water supplies to accommodate that increase in population.



City of Friendswood, Texas
 SANITARY SEWER UTILITIES FIGURE 22

MASTER DRAINAGE PLAN

DRAINAGE

GENERAL

The initial phase of a master drainage plan was undertaken in 1992 and completed in 1993. The purposes of this initial study was to create a planning tool to be used by the City and developers to provide guidance for the provision of adequate drainage for the continued growth of the city. This was to be accomplished by providing the City with a city-wide drainage map with the delineated drainage areas, determining run off flows from each drainage area and analyzing existing capacities of twenty designated outfalls.

This resultant study has become Phase I of the City of Friendswood's Master Drainage Plan. It is recommended that, as subsequent phases are completed, additional tasks be performed to supplement the City of Friendswood's Comprehensive Master Drainage Plan. These tasks can also be performed in phases over a period of years. These should include, but not necessarily be limited to:

- Update Flood Plain Information
- Erosion and Sediment Deposition
- Storm Water Management
- Flood Plain Ordinance and Drainage Criteria
- Miscellaneous - funding alternatives, flood alert system, monumentation, elevation certification, and implementation strategies and schedules

STUDY COMPONENTS

The following summarizes the major elements undertaken in Phase I:

- **Mapping** - The mapping for the drainage system was city-wide. Since the mapping was from original map data, there are expected to be some inconsistencies in the base map coming out of this first phase, as well as storm data. Based on City and Consultant data, all the drainage areas within the City were mapped. This mapping effort was not intended to search out and rectify all inconsistencies but to provide a map for "working" purposes that the City of Friendswood can utilize and improve upon as the system evolves and inconsistencies are discovered.
- **Analysis** - Completion of base mapping and definition of the drainage area allows the analysis phase to be completed. The purpose of this phase was to provide the City with the magnitude of the flows that could be expected from each drainage area for given frequency storms. This analysis was based on existing land use. These flows are to be used as a planning tool to provide guidance for the provision of adequate drainage as the City continues to grow.
- **Specific Problem Areas** - The third phase of the study was an analysis of twenty designated problem outfalls. It was determined that many of the problems stem from undersized storm sewer systems and/or a lack of drainage ditch capacity. This analysis does not examine any downstream impact from increased flows to the creeks.

DRAINAGE ANALYSIS

The purpose of this analysis was to determine the magnitude of run off flows that can be expected from the various drainage areas. The analysis is based on existing land use. The intent of this analysis is to give the City a planning tool to provide guidance for the provision of adequate drainage as the City continues to grow.

For each problem site, a proposed solution was determined. It is important to understand that the solutions presented in this planning study are only conceptual. The stated pipe sizes may vary based upon eventual detailed engineering and topographic surveying which will be performed during project design. The proposed solutions presented in this study provide the City a possible solution, magnitude of cost and basis for planning future engineering and construction. It is expected that after initiation of actual design engineering, acquisition of detailed survey data and analysis of alternatives, site specific parameters and city requirements, a more refined and cost effective solution can be obtained.

Of the 226 defined drainage areas within the City, 20 problem areas were identified by the City staff utilizing empirical information and citizen input. The problem areas are shown by Figure 23. The analysis for each of these areas has been condensed in this Plan to the identity of area, statement of problem and the proposed solution. A complete analysis can be gained from the Drainage Study.

- **#1 Woodlawn Storm Sewer**

Statement of Problem: Street flooding

Proposed Solution:

- A. Woodlawn at Shadowbend: Three possible solutions**

- 1. Construct a detention basin in the vicinity of Wood-**

lawn and Shadowbend to collect the flows which cannot enter the storm sewer system.

2. Replace the existing storm drains from Shadowbend with two 60 inch storm drains.
3. Convey the flows from the drainage areas north of Shadowbend down a ditch along the back property lines between Woodlawn and David St.

B. Laurel Drive Storm Drain:

This system requires complete reconstruction beginning at Woodlawn Drive by replacing the 24 inch storm drain with a 60 inch storm drain and ending with a 36 inch storm drain on Laurel Dr.

C. Spreading Oaks from Woodlawn to the tributary of Cowards Creek:

The double 36 inch storm drain pipes should be replaced with double 72 inch pipes to convey the flow to the tributary of Coward's Creek.

D. Tributary of Coward's Creek:

The Tributary should be cleaned out, widened, and grass lined in order to convey the greater discharge resulting from these upstream improvements.

• **#2 Briar Meadow Ditch**

Statement of Problem: Area flooding

Proposed Solution:

- A. Construct a storm drain from the intersection of Sunset Drive and Briar Meadow north to Winding Way and then west to Coward's Creek.
- B. Install an 84 inch storm drain at a slope of .00006 ft/ft along Briar Meadow toward the north. Connect it to the

existing 48 inch storm sewer, continuing north along Briar-meadow and then west along Winding Way to Coward's Creek, with an 84 inch storm drain. At northwest corner of Sunset and Briar-meadow intersection place a junction box with a 36 inch stub-out to pick up the flows from west in the north roadside ditch of Sunset. Cross Briar-meadow with a 60 inch RCP to pick up flows from the east of Briar-meadow. Cross Sunset Drive with 60 inch RCP and install a junction box with a 48 inch pipe to the west and a 42 inch pipe to the South. These pipes should be used in the future to extend the storm drain system along Briar-meadow and west along Sunset.

C. As roads are improved, extend storm drains south, east, and west.

• #3 Leslyn/Sterlingwood Outfall

Statement of Problem: Street flooding

Proposed Solution:

- A. Runoff from the Sterlingwood subdivision requires both the existing 48 inch storm pipe on the north side of Merriewood and the double 24 inch storm drain on the south side. The 24 inch storm pipes should be connected to the manhole on the north side of Merriewood and the pipes which drain the Briar-meadow ditch from the south should be blocked off .
- B. Leslyn Subdivision requires four additional inlets and a 36 inch storm drain to the north paralleling the existing system.
- C. When designed in the 5-year street replacement program, Merriewood and the crest in Deseret Drive should be

lowered to allow relief of 100-year flood flows down Deseret and across Merriewood to the detention pond north of Merriewood.

- **#4 Sunset Ditch**

Statement of Problem: Ditch flooding

Possible Solution:

Install a storm drain pipe on the south side of Sunset Drive from Mills to Cowards Creek. Outfall the storm drain at Coward's Creek on the north (downstream) side of Sunset.

- **#5 High School Outfall**

Statement of Problem: Street flooding

Proposed Solution:

- A. Remove and replace three 36 inch pipes under Falling Leaf Drive with four 60 inch RCP's, lower the flow line of the ditch to allow positive drainage.
- B. Install a 48 inch storm drain in Larkspur toward West Castlewood with inlets at the sag, and at the Outfall of the drainage easement behind the properties facing West Castlewood. Extend a 36 inch drain culvert to Castlewood Drive with a headwall in the Castlewood Ditch to collect the 5 year flows from Castlewood Dr.
- C. Construct a riprap overflow section from Larkspur to the ditch for flows exceeding the storm drain capacity.
- D. Perform a detail drainage analysis on the High School property and adjacent neighborhood.

- **#6 Greenbriar Ditch**

Statement of Problem: Area flooding

Proposed Solution:

- A. Install a storm drain from Chigger Creek to Briar Meadow.
- B. Install double 24 inch cross connections to the north at Briar Meadow, install 1 cross connector to the north ditch at the 10 foot easement north of Londonderry, stub out to the south at Wilderness Trail West ditch.
- C. Install 600 feet of 54 inch (36 inch for smaller line) storm drain west from the 60 inch. Install 24 inch cross connectors to the north ditch each side of Murphy Lane and install inlets in the south ditch at the same location.
- D. Install 400 feet of 48 inch (24 inch for smaller line) storm drain west from the 54 inch to midway between Murphy and Mills Drive and install a 24 inch cross connector.
- E. Install 400 feet of 42 inch (18 inch for smaller line) storm drain west from the 48 inch to Mills Drive and two 18 inch cross connectors to the north at Mills Drive and inlets on the south ditch at the same location.

- **#7 Wilderness Trails/GlenShannon Outfall**

Statement of Problem: Street flooding

Proposed Solution:

- A. Install a 72 inch RCP with headwall from the west side of Wilderness Trail at GlenShannon Subdivision to Chigger Creek along the back of the properties facing Greenbriar Avenue. Install ditch headwall and modify ditch to accommodate the 72 inch line. Tie existing 48 inch line to the 72 inch RCP.
- B. When and if Wilderness Trail is changed to curb and gutter, install parallel line in GlenShannon, add inlets at street intersections, tie parallel line to 72 inch and block of

headwall.

- **#8 Falcon Ridge I**

Statement of Problem: Street flooding

Proposed Solution:

- A. Remove the curb at southeast corner of White Wing Circle for a length of 243 feet. Install ballards to keep pedestrians and cars from entering the proposed swale.**
- B. Construct a grass lined swale from the southwest corner of White Wing Circle southeast to the utility easement line. This swale would have a minimum depth of 2.5 feet, a 5 foot bottom width with a 5:1 side slopes for ease of maintenance on a minimum slope of 0.0025 ft/ft slope.**

- **#9 Mission Estates Outfall**

Statement of Problem: Street flooding

Proposed Solution:

- A. Improve conveyance through the off site access road downstream from the 54 inch constriction structure.**
- B. Install one additional 54 inch culvert through the restriction berm resulting in a 1.5 foot freeboard during the 5-year flood and the ability to accommodate larger floods.**
- C. Insure adequate outfall ditches to convey the difference between the 5-year flow in the pipes and the 100-year flow through the streets allowing a maximum 1 foot depth of flooding in the streets.**

- **#10 Carmel Village**

Statement of Problem: Street flooding

- A. Insure adequate outfall ditches to convey the difference**

between the 5-year flow in the pipes and the 100-year flow through the streets allowing a maximum 1 foot depth of flooding in the streets.

- B. Install two (2) additional 66 inch RCP culverts under San Joaquin Parkway.
- C. Purchase at least two lots between South Mission and the ditch at sag locations and install overflow ditches capable of conveying the 100-year flow to the ditch without flooding the streets to a depth greater than one foot.

- #11 Sun Meadow Main Outfall

Statement of Problem: Street flooding

Proposed Solution:

- A. Purchase a drainage easement with the golf course area (approximately 7 acres). Excavate 61 acre feet for a detention pond below elevation 31.
- B. Disconnect existing pipes at detention pond crossing(s), and install headwalls at each outfall.
- C. Construct concrete overflow swales from East Castle Harbor Drive to the open area. average overflow width is 10 feet.
- D. Install a flap gate at end of 72 inch outfall so that Chigger Creek flows will not back up into the local detention facility.
- E. Connect the relief storm sewer which flows north to the detention pond.
- F. Evaluate the "Regional Flood Control Plan for the Clear Creek Watershed" for improvements to Chigger Creek to reduce flooding in this subdivision.

- **#12 Sun Meadow Relief Storm Sewer**
Statement of Problem: Street flooding
Proposed Solution: Connect the existing relief storm drain to the proposed detention facility.

- **#13 Garden Drive Ditch @ Spreading Oaks**
Statement of Problem: Area flooding
Proposed Solution:
 - A. Improve the swales along W. Shadow bend from Sedora Drive to the tributary draining this area.
 - B. Install a 48 inch culvert across Garden Drive on the west side of Shadow Bend to convey the ditch flow across the road.

- **#14 Garden Road Ditch @ FM 2351**
Statement of Problem: Area flooding
Proposed Solution:
 - A. Install a 48 inch culvert under W. Edgewood Drive next to the 42 inch storm drain to equalize the ditch flows and convey flows to the proposed swale in Sedora Drive.
 - B. Install a 36 inch storm drain from Brigadoon to the south side of W. Edgewood. Connect the 18 inch storm drain in Brigadoon to this pipe and install a ditch inlet south of Stadium Lane. Clean the ditches along W. Edgewood South of Stadium Lane.

- **#15 Block bounded by FM 528, FM 518, Winding Way and Leisure Lane**
Statement of Problem: Area flooding
Proposed Solution: Extend the Highway storm drain to

Winding Way via Leisure Lane and install inlets and ditch headwall to pick up ditch flows or improve ditches along Leisure Lane, and as the vacant areas develop include detention to maintain existing flows.

- **#16 Melody Lane**

Statement of Problem: Inadequate Drainage

Proposed Solution:

- A. Acquire a 30 foot drainage easement from Melody Lane to Mary's Creek east of the Dunbar Estates subdivision. Construct a 4 foot deep ditch in the easement at a slope of 0.004 ft/ft. with 3:1 side slopes.
- B. Install two double 24 inch culverts under Melody Lane east of Dunbar Estates at an equal distance from the proposed swale.
- C. Improve the ditches on both sides of Melody Lane to have a consistent slope toward the double 24 inch culverts.
- D. As development occurs, encourage detention to maintain the existing low flows from the area.

- **#17 FM 518 - Willowick to Mary's Creek Tributary**

Statement of Problem: Street flooding

Proposed Solution: Construct a parallel relief storm along Edgewood and South Friendswood.

- **#18 FM 518 - Willowick to Coward's Creek**

Statement of Problem: Street flooding

Proposed Solution: Construct a parallel relief storm sewer line along the southwest edge of FM 518.

- **#19 Annalea Outfall**

Statement of Problem: Area flooding

Proposed Solution:

- A. Replace recent 36 inch RCP at the outfall from Virginia toward drainage ditch with a 48 inch RCP. Extend this line to the pipe from Rachael. Connect the two inlets on the south side of Virginia at Rachael to this new line.
- B. Replace the existing 24 inch line from Amette and Lottie Lanes with a 33 inch line.
- C. Add an Inlet at Lottie Lane, add a manhole at Lottie Lane and replace 18 inch line with a 24 inch line.
- D. Extend the 48 inch line to Mary Ann Lane and connect south inlets at this intersection to the new line.
- E. Extend a 36 inch line south along Mary Anne to the inlets at Linda Lane.

- **#20 Whitehall Outfall**

Statement of Problem: Street flooding

Proposed Solution: Increase the inlet capacity by adding inlets or replacing with larger RCP and culverts.

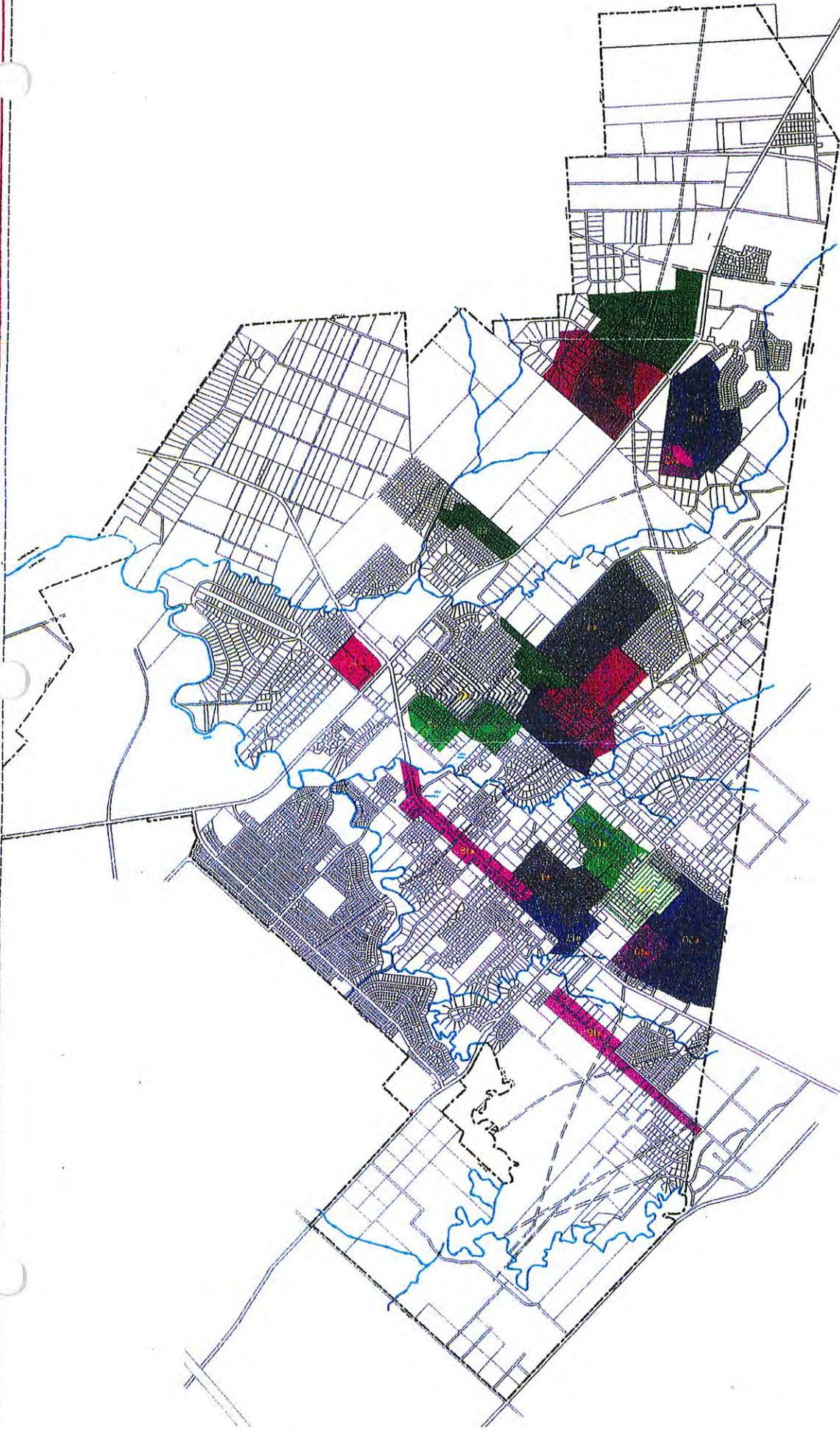


FIGURE 23

CITY OF FRIENDSWOOD
20 DETAIL PROBLEM AREAS

CITY OF FRIENDSWOOD
MASTER DRAINAGE PLAN

J. LAUNCH & MILLER, INC.
Engineering Consultants

BERT H. HALFF ASSOCIATES, INC.
ENGINEERS • SCIENTISTS • SURVEYORS



COMPREHENSIVE PLAN

COMPREHENSIVE PLAN

PLAN COMPONENT

The Comprehensive Land Use Plan brings together all the planning elements into a consolidated Plan. The graphic representation of the Plan, shown by Figure 24, is supplemented by appropriate descriptions, when necessary, to emphasize certain parts of the Plan. Each of the individual planning elements set forth in the Plan are shown with the exception of utilities and drainage elements.

The Plan represents, at this point in time, the most appropriate urban structure and land use pattern for achieving a functional and harmonious urban area as the City develops.

Implementation of the Plan for new areas will be driven by growth, and to some extent, planning efforts directed toward any change in the developed areas of the community will also likely be responsive to the present population and new population. The thrust of the Plan is to create an urban environment which has quality, value, and features which can be enjoyed by all age groups.

POPULATION

Population estimates of the City's future growth have been made for different purposes in recent years. These estimates are important because they are used to forecast the timing, and to what extent various improvements are to be planned and implemented for meeting the needs of the future population.

It is appropriate for the Plan to tie together these estimates and create a common base for the Plan.

- The studies performed in 1990 and the updating in 1993 of the City's Land Use Assumptions, Capital Improvements Plan and Impact Fees were mentioned in the Utility Element. These studies use the population estimate as an integral part of the calculations made for the impact fees. The population estimate from this study is shown in Table 12.
- The Houston-Galveston Area Council of Governments' (HGACOG) population projections for Friendswood is also the projection used in the 1993 updating of impact fees.
- Projections made for the Parks Master Plan prepared in 1993 prior to the Comprehensive Plan forecasted population based on building permit projections. This estimate is shown in Table 3 by population ranges.

TABLE 12
COMPARATIVE POPULATION PROJECTIONS

Year	City	Projection		
		Impact Fee	HGACOG	Parks Plan
1990		22,814	22,814	22,814
1995		30,850	30,850	29,400 - 29,800
2000		38,900	38,900	34,000 - 36,000
2003		43,724	--	--
2005		46,960	46,960	39,600 - 43,800

Projections beyond 2005 made by the above sources push the City's potential population beyond 50,000 persons. However, there are

factors which may limit the City's population below this value. A consideration not given to the projections made for the Park Plan is the amount of land which may be converted to the detention or retention of storm water. All of the projections would be influenced by any portion of the vacant 5,200 acres currently zoned for single family use being absorbed for the above purposes. Further, decreases in residentially zoned land which is converted to other uses or remains vacant would also influence these projections. Therefore, a population at the time the City approaches a built out condition of 45-50,000 persons is assumed reasonable for the Plan at this time. As various factors affecting land absorption become better defined and in future Plan updating, the long range projections can then be refined.

PLAN STRUCTURE

The Plan concept is structured using the various elements in the Plan with the thoroughfare arrangements providing the primary structuring element. This system of existing and proposed traffic arteries serve as corridors for safe and efficient traffic movement in and through the City which is one of the Plan objectives. Along these corridors and at intersection nodes, the visibility and access offered by the thoroughfares provide the opportunity for various types of land use to locate, which by nature, need these two features to remain viable. The thoroughfare system affords one other opportunity in directing the City's development pattern. This is the formation of areas having similar residential characteristics which can be capable of supporting a neighborhood park and possibly an elementary school. Both of these features are generally the core of a neighborhood area. Therefore, the neighborhood planning concept should be used as decisions are made for locating future

thoroughfares.

Another Plan objective is the provision of adequate park and recreational areas. The system of neighborhood parks is in consonance with the existing and future neighborhood areas. Not shown on Figure 24 in the detail set forth on Figure 16 are the opportunities to link neighborhood areas and recreational facilities with hike and bike trails, some of which would be along existing easements and rights-of-way. The provision for a community park facility to meet immediate recreational needs is proposed on the new site recently purchased south of F.M. 518. The location for a future facility shown on Figure 24 in the Melody Lane area north of Friendswood Drive will likely be needed as the City approaches a developed condition.

Educational facilities also have some structuring capabilities. The school arrangement shown on Figure 24 represents the existing facilities for the two Districts plus the proposal for two elementary grade level school infrastructure capabilities are also an important aspect of the plan in determining growth limits and patterns. Current and future plans have established a population cap of 48-50,000 persons. This limit could indeed be exceeded but it would necessitate increased expenditures of funds for infrastructures improvements and the dollar value per capita ratio would increase significantly for the Friendswood Independent School District in the southern section of the City. When possible, it is not only more economical, but it is also more functional to group recreational and educational facilities in neighborhood areas as is discussed in the Park Plan.

Each of the above elements has a significant part in creating the structure upon which the land use pattern for residential and nonresidential uses can be arranged to best serve the community's residents.

**LAND USE
ELEMENT**

Use of land has the broad characteristic of being either residential or nonresidential. This characteristic plus the quality and intensity of the developed use is, among others, a result of applicable zoning, subdivision and building code requirements and regulations. The Land Use Plan establishes the concept and broad criteria for those requirements which are found in these documents, and is a legislative requirement for the zoning ordinance.

Several proposed nonresidential land use relationships shown by Figure 24 follow closely the existing use of land. However, some proposals offer different concepts than those established by zoning. The following comments discuss the intent of the land use categories shown and some of the more important characteristics.

Residential Land Use Categories - There are three categories for residential use.

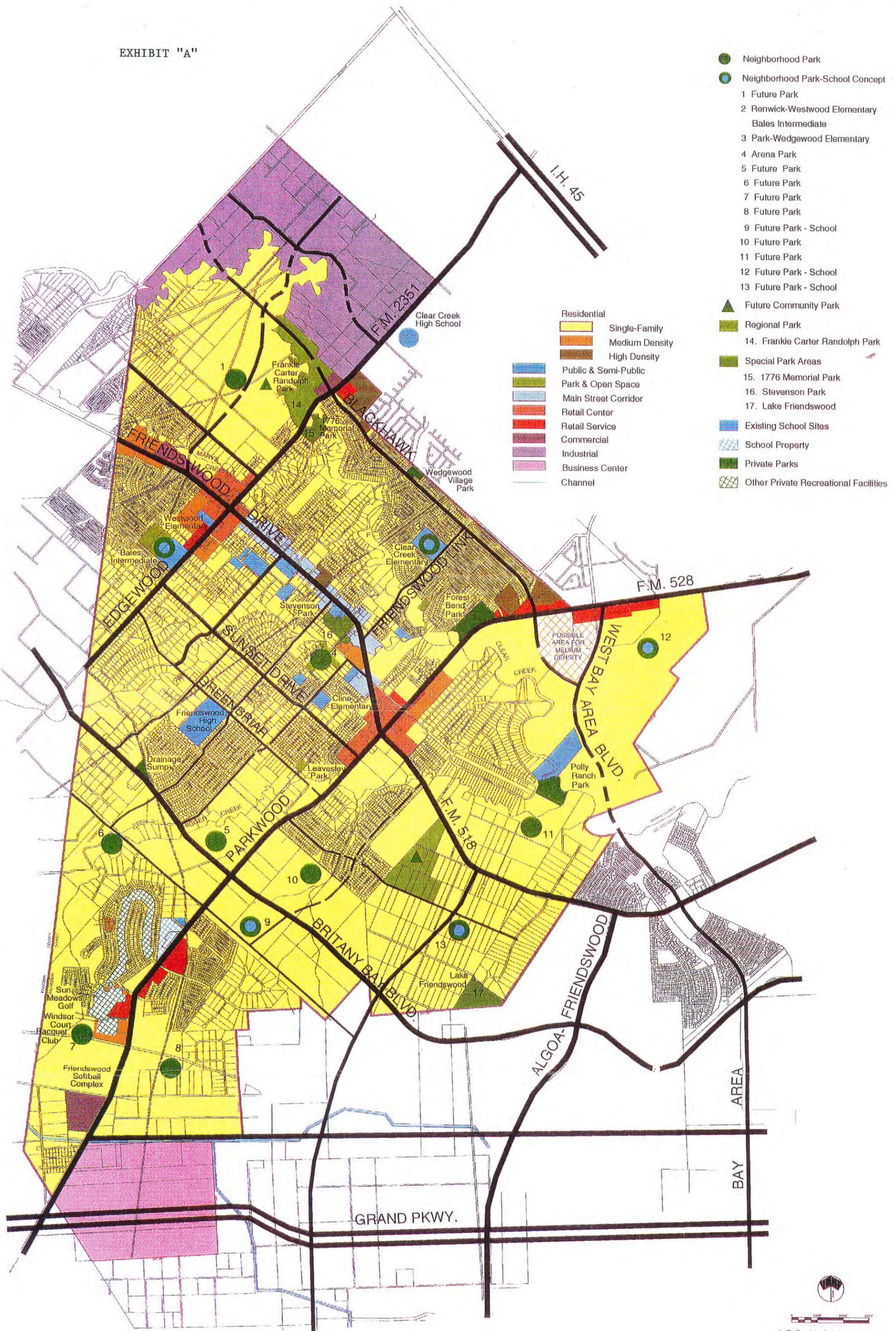
- **Single-family** - This type of land use is the predominant color on the Plan. It represents all areas, either existing or future, which are intended for single-family detached dwellings. The density of dwellings per acre of developed land for this category is 2.7.
- **Medium Density** - The medium density land use is intended to provide space for the smaller lot product, such as the garden home and multi-family or attached housing units of

low and medium densities. Density in this category can be as high as nine units per acre. Areas for medium density are generally located adjacent to the thoroughfare corridors.

- **High Density** - Areas shown on Figure 24 in this category are existing multi-family developments. The density set forth for this category is no greater than 18 units per acre for developments built before 1996 and no greater than 12 units per acre for developments built after 1996.

Nonresidential Land Use Categories - There are three land use categories shown on Figure 24 which have the intent to provide space for businesses related to retail and personal services. These are the Main Street Corridor, Retail Center and Retail Service.

- **The Main Street Corridor** land use proposal occurs between Parkwood Avenue and Edgewood Drive, either side of the Friendswood Drive. The intent of this land use category is to create, through zoning and development standards, a business corridor which would attract a variety of unique retail land uses. An inviting environment is suggested to be developed through the use of development standards for landscape and site treatment of private properties with emphasis on streetscape treatment of the Friendswood parkways and median. Uses perceived to be future users in this corridor range from retail shops for day-to-day needs to specialty shops for crafts, services and offices to a variety of restaurants and food establishments.
- There are two types of existing zoning categories which have



- Neighborhood Park
- Neighborhood Park-School Concept
- 1 Future Park
- 2 Renwick-Westwood Elementary Bales Intermediate
- 3 Park-Wedgewood Elementary
- 4 Arena Park
- 5 Future Park
- 6 Future Park
- 7 Future Park
- 8 Future Park
- 9 Future Park - School
- 10 Future Park
- 11 Future Park
- 12 Future Park - School
- 13 Future Park - School
- ▲ Future Community Park
- Regional Park
- 14. Frankie Carter Randolph Park
- Special Park Areas
- 15. 1776 Memorial Park
- 16. Stevenson Park
- 17. Lake Friendswood
- Existing School Sites
- School Property
- Private Parks
- Other Private Recreational Facilities

- Residential
 - Single-Family
 - Medium Density
 - High Density
- Public & Semi-Public
- Park & Open Space
- Main Street Corridor
- Retail Center
- Retail Service
- Commercial
- Industrial
- Business Center
- Channel

City of Friendswood, Texas

COMPREHENSIVE LAND USE PLAN

FIGURE 24

approximately 500 acres now zoned for retail and commercial services. For many cities in the State, a range of four to ten acres of retail use per 1,000 persons is an adequate inventory of property for these needs. At the present, the relationship between retail and commercial land and the population is approximately nine acres per 1,000 persons. Based upon the quantities zoned and a population projection in the range of 45,000 persons, there are adequate areas for new retail and commercial developments.

- **The Retail Center** land use category is influenced by the above comparisons. The two locations shown on Figure 24 for this category are both on Friendswood Drive at Parkwood Avenue and at Edgewood Drive. Each is a prominent location within the City and is partially developed for retail uses commonly found in retail centers.

The Plan implies these areas are to be homogeneously developed on each of the intersection's corners. It will require some assemblage of smaller parcels to larger tracts to achieve this objective and to create attractive shopping centers.

- **The Retail Service** land use category somewhat follows the intent of the present zoning category titled Neighborhood Commercial District. This proposed land use category is for retail sales of convenience goods and services to persons residing in adjacent residential areas.
- **The Commercial** land use category is proposed for business

uses which generally are of a non-retail characteristic, but may provide services such as an auto repair shop. This Commercial category is a more intense use of the land than those categories associated with retail land uses. Uses in this category possible would have associated out-of-doors, but screened, storage and could include fence contractors, building contractors, or the assembly of a product.

The Commercial land use areas are designed around locations which now have some uses which best fit in this category. The principal area for this land use development is on Friendswood Drive west of Edgewood Drive. The private softball complex on Parkwood Avenue is shown to be in this category.

- **A Business Center** land use category is delineated on Figure 24 in the southern section of the City. This area is located adjacent to Parkwood Avenue and would have the future Grand Parkway located within its boundaries. Approximately 500 acres are shown for this area perceived to be a location within Friendswood for future high technology users, possibly built in a campus setting. This is a long-range land use projection but the potential benefits from such a development for employment and tax base are worthy to be followed in the City's future economic development.
- **The Industrial** land use proposal shown on Figure 24 is located north of Clear Creek and west of Edgewood Drive. Current zoning for this area is in consonance with this proposal, with the exception of a strip of land approximately

four hundred feet deep adjacent to Edgewood Drive. Various types of uses are now located along this side of the corridor. An approach to examine the potential of this larger area for development would be the formation of a general plan. The plan could be prepared by the City as a concept for attracting potential industrial users.

OTHER PLAN ELEMENTS

The utility and drainage elements are not shown on the Comprehensive Land Use Plan but both are integral elements in addressing and guiding the City's future. When making land use or other decisions related to Figure 24, both Plans should become a part of the process used in arriving at such decisions.

ENTRYWAYS

Another feature of the City's future environment which becomes a part of the overall planning process is emphasis on the treatment of both private and public spaces along the City's entryways. This can become a major factor in the process of making land use decisions for private properties adjacent to the thoroughfare corridor entries and along their routes in the City.

The City's recent approval of an entryway overlay district for zoning purposes will address such features as signage, screening, utilities, landscape treatment, and architectural elements within a distance extending two hundred feet from the right-of-way or to the rear property line, whichever distance is less. This emphasis on each of the City's corridors over a period of time can bring significant change to the character of the City's environment.

SUMMARY

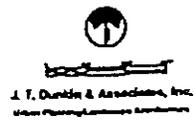
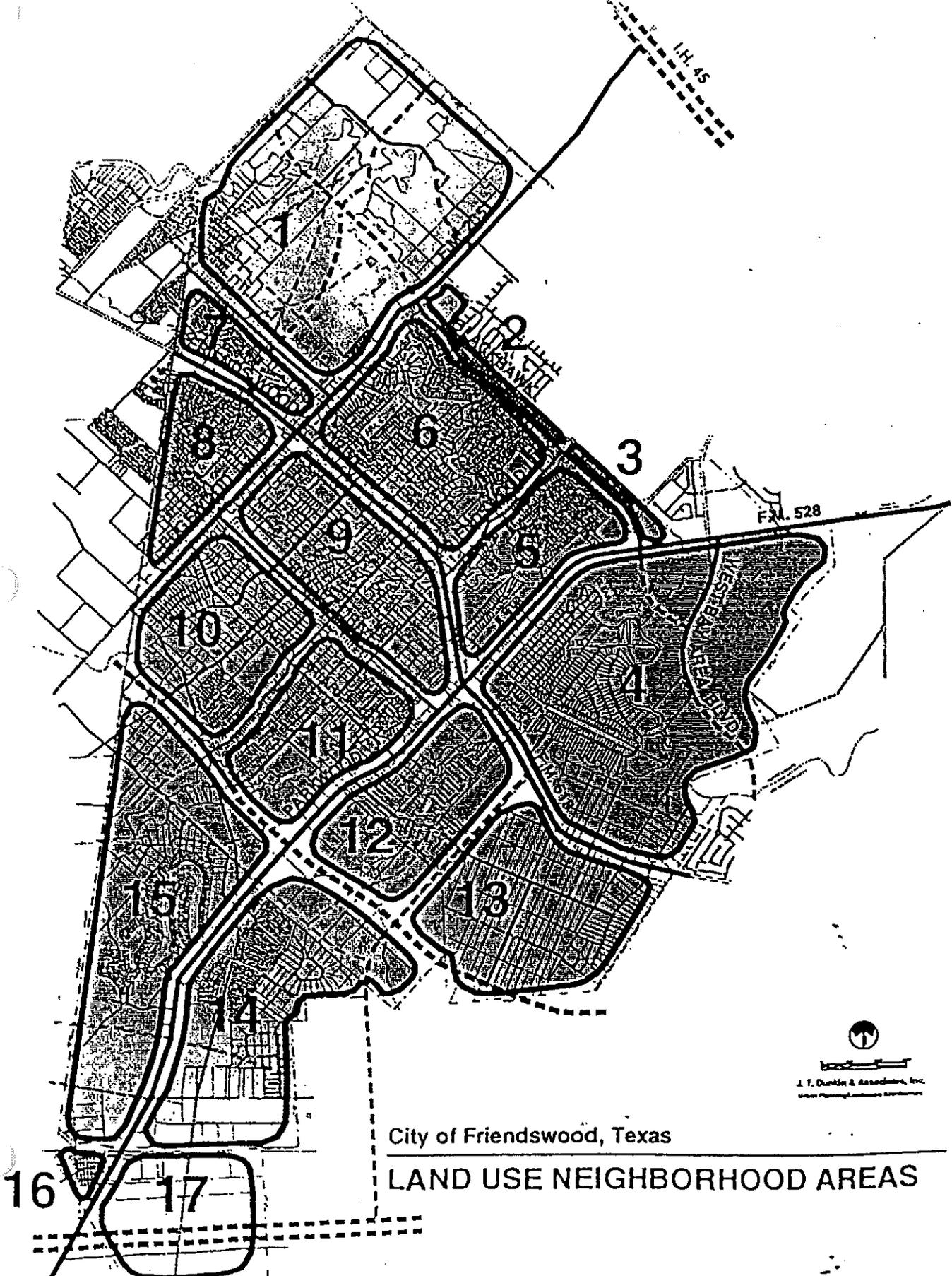
Statistics shown that the current breakdown of residential, commercial, and retail are adequate, in regards to percentages of land use, to accommodate a city of 50,000 persons. It is also clear from the land use maps, however, that some adjustments in locations are necessary to more effectively use the land and direct growth in the proper directions to afford the most compatibility among the various uses. The current industrial zoning on the north side of the City is sufficient for any type of industrial use that may locate within the City. It would be advisable to consider the area south of the American Canal as a possible Industrial Park to take advantage of the NAFTA agreement and subsequent expansions of I-35. It is also possible that a joint venture with the City of Alvin at this location could be accomplished.

Designation of the Industrial Park and adjusting the locations of some of the existing zoning sites will adequately address the proper percentages of land dedicated to the types of land use. Part of this process should include a redefining of the current zoning districts as well as a restructuring of the permitted uses contained within each of the districts. There presently exists many inconsistencies that have developed over the period of time since the city adopted its Zoning Ordinance. These have been created by amendments to the text, permitted use charts, and zoning map, and should be reviewed.

APPENDIX A

EXISTING LAND USE
CITY OF FRIENDSWOOD
1994

Areas	SF	2F	MF	MII	P&SP	Parks	Private Parks	Park/Comm	Retail	Comm.	Office	Ind.	Creast	Vacant	ROIW	Total
1	133.9	-	-	-	9.5	90.8	-	-	-	62.9	-	5.1	-	1,545.3	72.2	1,919.7
2	33.1	-	2.6	-	0.4	-	5.2	-	37.1	-	-	-	-	3.7	21.9	104.0
3	35.4	-	14.9	-	0.4	-	-	-	9.8	-	-	-	-	-	18.3	68.8
4	403.3	-	8.5	-	1.8	-	17.2	-	1.9	-	3.5	-	-	1,477.5	117.4	2,071.1
5	215.3	-	18.4	-	16.8	34.1	17.0	-	10.3	11.1	1.3	-	-	101.2	96.6	524.1
6	491.4	2.8	15.3	-	37.4	14.6	1.4	-	9.1	8.8	11.2	-	-	180.3	172.9	945.2
7	98.6	-	13.1	-	-	-	-	-	2.6	5.1	0.5	-	-	117.9	38.6	276.4
8	232.9	-	-	-	24.4	21.4	-	-	10.8	4.2	0.5	-	-	96.5	99.4	490.1
9	354.6	2.0	12.9	6.6	52.4	34.2	1.4	-	24.1	8.4	8.6	-	-	189.9	147.2	822.3
10	394.4	-	-	0.4	42.9	-	-	-	-	2.9	-	-	-	197.1	104.2	741.9
11	343.9	-	-	-	-	2.8	-	-	5.4	-	-	-	-	230.7	99.7	672.5
12	141.3	-	-	-	46.5	-	-	-	5.8	5.6	-	-	-	500.6	90.1	789.9
13	109.2	-	-	-	-	-	-	-	-	5.3	-	-	-	786.5	55.9	956.9
14	266.6	-	-	-	18.4	-	-	-	-	-	-	5.9	8.0	736.7	93.0	1,128.6
15	325.1	-	0.7	-	2.4	-	-	188.2	1.5	12.1	-	-	4.5	737.0	107.4	1,398.9
16	11.8	-	-	-	1.0	-	-	-	-	-	-	-	4.0	42.7	11.7	71.2
17	-	-	-	-	-	-	-	-	-	2.5	-	-	8.0	574.8	7.1	592.4
Totals	3,620.8	4.8	86.4	7.0	254.3	197.9	42.2	188.2	118.4	128.9	25.6	11.0	24.5	7,510.4	1,331.6	13,374.0



City of Friendswood, Texas

LAND USE NEIGHBORHOOD AREAS

16 17

APPENDIX B

**CITY OF FRIENDSWOOD
PRIVATE PARKS AND OPEN SPACE**

The park and open spaces listed below are developed for recreational use as a part of a residential subdivision. Acreages indicated for facilities have been calculated from map information and are only approximate in area. Facilities listed are those principal types of recreational features developed on each respective site. These facilities do contribute to satisfying the community's overall recreational needs but are considered to be for member use. Except for Forest Bend, either the physical size or the park layout limits the recreational opportunities that can occur on most of these sites.

<u>Facility</u>	<u>Approximate Acreage</u>	<u>General Facilities</u>
1. Eagle Lakes	2.0 Acres	Pool
2. Falcon Ridge	2.1 Acres	Pool
3. Field Creek Forest	1.0 Acres	Lawn
4. Forest Bend	26.0 Acres	Community building, pool, play apparatus, ballfields and backstops
5. Imperial Estates	2.0 Acres	Pool, lawn
6. Imperial Gardens	1.2 Acres	Play apparatus, pool
7. Kingspark/Whitehall	2.0 Acres	Pool, play apparatus and open space
8. Laurelfield	.6 Acres	Detention pond and park benches
9. Mission Circle	.3 Acres	Lawn
10. Polly Ranch	15.0 Acres	Play apparatus and open space
11. Renington Court	.8 Acres	Landscaping
12. San Joaquin	.3 Acres	Lawn
13. Sun Meadow	1.0 Acres	Lawn

<u>Facility</u>	<u>Approximate Acreage</u>	<u>General Facilities</u>
14. Sunset Meadows Estates	1.0 Acres	Pool, play apparatus and open space
15. The Park	16.0 Acres	Pool, tennis courts, lake and trails
16. Wedgewood Village	1.3 Acres	Pool, play apparatus and open space
17. Wedgewood Village	5.4 Acres	Trail, play apparatus and parking
18. Wilderness Trails	.8 Acres	Pool