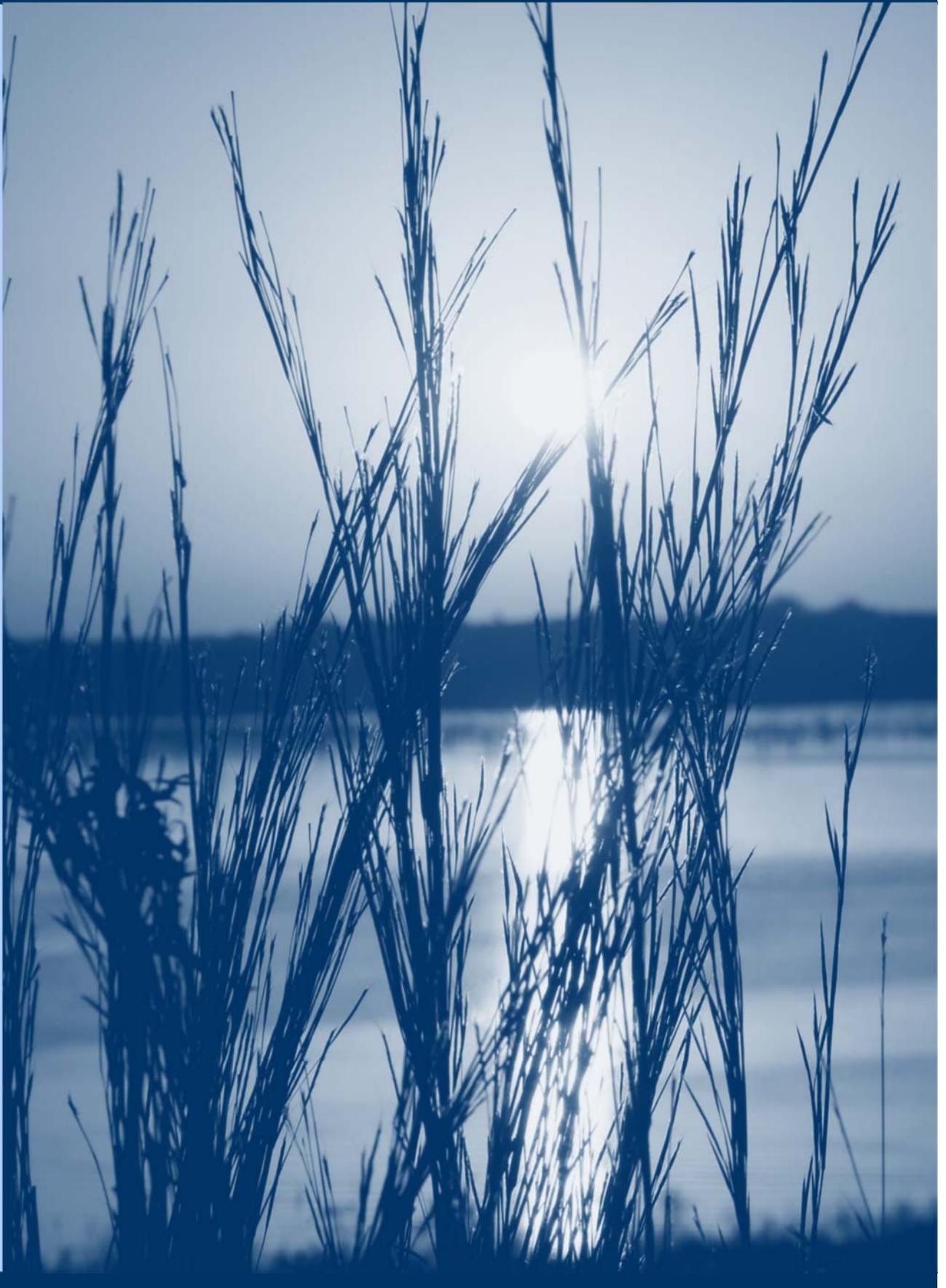


CITY OF LUCAS



COMPREHENSIVE PLAN

MARCH 2017



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INTRODUCTION

PURPOSE

The comprehensive plan can be defined as a long-range planning tool that is intended to be used by city staff, decision-makers and citizens to guide the growth and physical development of a community for its future growth. The original plan adopted in the late 1980's initiated the framework for the City of Lucas. Over the years it has been reviewed and updated as growth dictated. Having this comprehensive framework will assist in evaluating proposed actions, decisions concerning changes in local economic and demographic conditions, and resources, as well as guiding future planning scenarios for Lucas.

The State of Texas has established laws that specifically regulate the way incorporated cities such as Lucas can ensure the health, safety, and welfare of their citizens. It gives them the power to regulate the use of land, but only if such regulations are based on a comprehensive plan. Lucas strives to guide future development to accommodate new development without sacrificing the unique character of the city.

In basic terms, the primary objectives of a comprehensive plan are to:

- Manage growth in an orderly manner,
- Minimize potential conflicts between land uses,
- Provide for efficient and cost-effective delivery of public services, and
- Establish a rational and reasonable basis for making decisions about the community.

This updated version of the comprehensive plan will address the preservation of the country atmosphere of Lucas by addressing the growth and future needs relating to population, housing, land use, economic development, parks, streets, drainage, water, thoroughfares, and capital improvements.

LOCATION

Lucas is located in Collin County just northeast of the Dallas-Fort Worth Metroplex, 30 miles north of downtown Dallas. The City is positioned 10 miles east of the DART Parker Road Station, 30 miles north of the Love Field Airport, and 40 miles east of the Dallas-Fort Worth International Airport. Lucas is bordered by the City of Allen to the west, the City of Parker to the southwest, the City of Wylie to the south, the City of St. Paul to the southeast, Lake Lavon to the east, and the City of Fairview to the northwest as shown in figures 1.1 and 1.2.

The population is estimated at 6,875 in 2016 and contains a total land area of 9.85 acres.



The City has experienced significant growth in recent years as a result of its unique features including:

- Appealing rural atmosphere
- Animal friendly neighborhoods
- Exceptional educational systems
- Proximity to services and shopping
- Low crime rate
- High quality housing
- Large lot sizes
- Proximity to Lake Lavon

The City of Lucas' location, outside the pressures and restrictions of intense urban life, combined with its convenient position relative to local and regional economic and recreational centers, makes the City a stable and attractive community.



Figure 1.1—City of Lucas and Dallas/Fort Worth Metroplex



Figure 1.2—City of Lucas, Texas



POPULATION



One of the most important parameters of the planning process is the analysis and projection of the population. The purpose of projecting population is to provide a general scale for future development which is compatible with the prospects and the potentials of the city.

Population growth is primarily driven by construction of new housing and the annexation of land.

The population estimates reported in this plan are based on the US Census Bureau, the North Central Texas Council of Governments Databases on Demographics, and other State agencies. Over the next 25 years the North Central Texas population is expected to grow by 5 million people. It is assumed the City of Lucas will also experience significant growth if the local and regional economies remain stable.

After estimating the size and density of the future population, it becomes possible to determine the future level of demand for facilities, and to develop indices for issues which typically confront those persons who are actively involved in making decisions related to the planning process.

Projected population demand is the rational basis for projecting infrastructure needs, and establishing the timing of capital expenditures.

POPULATION TRENDS

The population of Lucas has increased dramatically from 540 in 1970 to 6,875 in 2016. This represents an annual growth rate of 5.69%. This is a reflection of the desire of many people to live in a rural or "small town" environment while keeping close to major urban centers. Continued population growth in Lucas is supported by forecast data for Collin County. The population of Collin County is expected to increase by almost 54 percent by 2035. The age composition of the Lucas population provides a profile, illustrating when and where the greatest need for various types of public expenditures will be required in order to meet citizen demand.

POPULATION PROJECTIONS

Population projections provide the most basic planning assumptions required for strategically meeting future public needs. Six significant assumptions specific to Lucas help form the basis from which to project the populations, and are listed below:

1. The density and character of development in Lucas will not change appreciably.
2. Lucas will experience in-migration from larger urban areas causing the local population to increase.



3. The average household size will remain 3.22 persons per household.
4. Population can be estimated based on the number of existing houses; the calculation of potential number of houses that can be built on developable land based on projected future land use, and subdivision of land tracts.
5. The City of Lucas is estimated to be built out in 2030. Based upon all the foregoing assumptions, future population projections for both Lucas and the area within the extra-territorial jurisdiction (ETJ) are shown in table 2.1 and illustrated in figure 2.2.
6. Whether the projected population occurs five years early or five years later, the city will require the same number of facilities for the projected number of people.

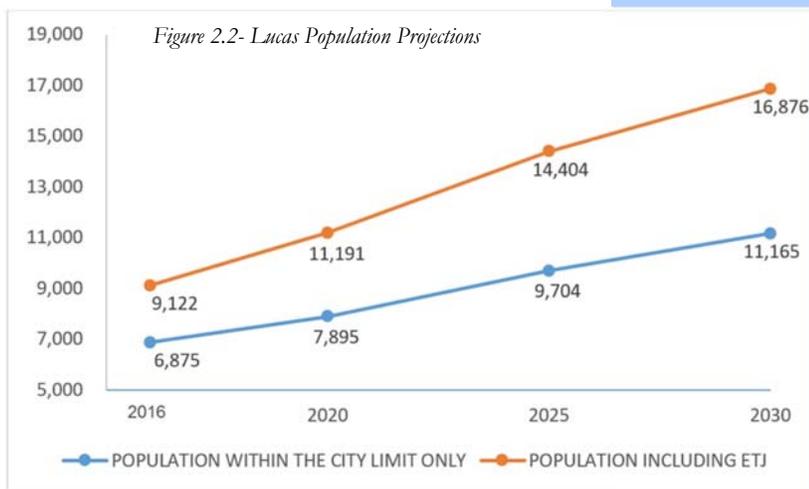
YEAR	POPULATION (CITY LIMITS ONLY)	PERCENT GROWTH	ANNUAL GROWTH RATE	POPULATION (ETJ)	POPULATION (CITY LIMITS & ETJ)	PERCENT GROWTH	ANNUAL GROWTH RATE
2016	6,875	N/A	N/A	2,247	9,122	N/A	N/A
2020	7,895	14.8%	3.5%	3,296	11,191	22.7%	5.2%
2025	9,704	22.9%	4.2%	4,700	14,404	28.7%	5.2%
2030	11,165	15.1%	2.8%	5,711	16,876	17.2%	3.2%

Table 2.1- City of Lucas Population Projections

The anticipated population growth will place additional demands on the City’s infrastructure and resources:

- Streets
- Water and wastewater system (waste water serves non-residential uses only)
- Parks and recreational facilities
- Environmental, educational, safety and health services
- Public Safety

Lucas should set goals for both the desired population levels and facilities necessary to accommodate the resulting demands. Most of these topics will be discussed in the following chapters of this Comprehensive Plan.



HOUSING

INTRODUCTION

There are four generally recognized determinants of the level of effective demand for housing units as follow:

1. The physical sources of housing demand which includes the number of type of family units in an area and the need for replacing existing units.
2. The level of wealth in an area and the distribution of that income.
3. Mortgage rates.
4. The supply price of housing which is the cost of providing the residents of an area with appropriate housing facilities.

The complex interaction of these four considerations works to determine whether or not adequate housing of the appropriate types is available to the residents of Lucas.

EXISTING HOUSING ANALYSIS

As of June 1, 2016 there were 2111 single family housing units in Lucas. There are an additional 24 other forms of housing units in Lucas which could be classified as housing in a non- or semi-permanent structure. Within the Lucas extra territorial jurisdiction there are 697 units, bringing the total housing in Lucas and the ETJ to 2,832 units.

- Single family 2111 units
- Semi or non-permanent housing 24 units
- Single family 697 units
- Total 2,832 units

HOUSING GOALS AND OBJECTIVES

Although Lucas will add new dwelling units through new construction, existing units must be adequately maintained in order to meet the local housing demand and foster a stable housing environment. It should be assumed that all housing and properties within the community are maintained in a reasonable (or sound), safe and sanitary condition for its useful life. To enable the city to direct its efforts in develop housing with the highest and best use, the following specific goals and objectives should be followed:

GOAL 1.

Encourage suitable development of land with adequate lot sizes, paved streets and utility lines.

Objectives:

- Establish and maintain subdivision ordinances to ensure that new infrastructure meets or exceeds minimum city requirements.
- Encourage high-quality construction through the continued enforcement of recognized building codes.



- Alleviate maintenance and service issues by upgrading existing infrastructure (water, streets and drainage) to meet or exceed minimum acceptable standards.

GOAL 2.

A sufficient choice of adequate housing should be provided to meet the needs of individuals.

Objectives:

- Zone land to promote long-term neighborhood stability.
- Maintain moderate density housing in suitable locations on the periphery of the city.

FUTURE HOUSING REQUIREMENTS

To provide an indication of the future demand for housing in Lucas, it is necessary to project the number of housing units which will be needed. These projections are based upon the assumption that the average household size would remain at 3.22 persons during the planning period. Allowing for a five percent vacancy rate, and reflecting anticipated future population levels, the future total housing needs for Lucas are estimated and illustrated in Figure 3.1. Lucas should encourage the maintenance of, and/or rehabilitation of older homes so they remain habitable over the planning period and beyond. As the population ages, provision must be considered for proper accessibility for an increasing elderly and disabled population. Attention to building design and adaptability can achieve a solution to this challenge.

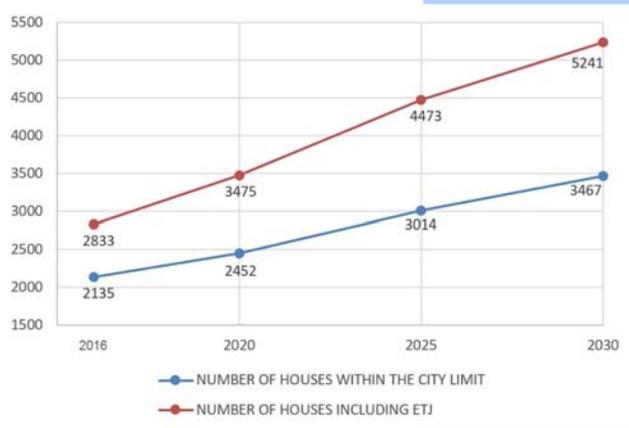


Figure 3.1– Projected number of housing unit needs for City of Lucas

HOUSING ACTIONS

Housing needs and some of the potential housing issues within the City have been identified above. The prevention of housing issues in Lucas will require the development and implementation of an effective housing program. Although this will be an ongoing process, specific actions for the next five years have been developed. These actions, all of which will be of negligible cost to the city, are listed below.

Action Items:

1. Beginning with those units in worst condition, complete the rehabilitation of housing units in the City by using one or a combination of the following methods:
 - Strict Code Enforcement of the City’s adopted ordinances.
 - Establish or coordinate with existing benevolent groups such as Habitat for Humanity to help those unable to help themselves.
2. Review current zoning ordinance for compliance with development issues within the city.



LAND USE

INTRODUCTION

The purpose of the land use analysis is to provide both statistical and graphical information concerning the various types, amount and intensity of land use within Lucas and identify problems which have arisen as a result of conflicting land use patterns or inappropriate land uses. An updated future land use plan can then be produced enabling Lucas to better guide land development in a manner which reflects local goals and objectives.

The total corporate limits of Lucas comprise 9,855 acres of land while the actual developed area of the City covers 7,285 acres. The extraterritorial jurisdiction (ETJ) covers an additional 1922 acres. Figure 4.1 at the end of this chapter displays an aerial illustration of the City of Lucas and the extraterritorial (ETJ) pockets within the city.



ANALYSIS OF EXISTING LAND USE

Residential Land Use

Residential land use consists of 5,582 acres of single family land use and 43 acres of manufactured homes land use, or 56 percent of the gross land area of Lucas. This is the most important land use classification in Lucas. Most single-family development lies in the central portions of

Lucas, taking advantage of gentle topography which is out of floodplain areas. Although there are some scattered commercial uses intermingled with single-family uses, most neighborhoods contend only with vacant lots as the only other use present. Manufactured homes account for 0.6 percent of total developed land area.

Commercial Land Use

Commercial land use covers 505 acres or 5 percent of the gross land area of Lucas. Access to public sewer facilities is allowed only in areas designated by metes and bounds that have been zoned for commercial use. There are six independent school districts in City of Lucas and one private school:

- McKinney ISD
- Princeton ISD
- Allen ISD
- Lovejoy ISD
- Plano ISD
- Wylie ISD



Most of the remaining commercial land uses within the city are in close proximity to the major roadway system. At present, there appears to be minimal conflict between commercial land uses and adjacent land uses.

Industrial Land Use - (These parcels are zoned LI light industrial)

Industrial land use covers 7 acres or 0.08 percent gross land area of the City and consists of light industrial uses along the north side of West Lucas Road. These light industrial uses have potential for conflict with adjacent future residential uses.

Streets and Rights-of-Way

Land utilized for streets and utilities comprises 965 acres, or 9.79 percent of the gross land area of Lucas. Streets do not pose any conflicts with other land uses in Lucas as these uses tend to be compatible.

Public/Semi-Public Land Use

Public and semi-public land use within Lucas covers 29 acres, or 0.30 percent of the gross land area. Most of this is utilized for City facilities, cemeteries and public utilities such as water towers.

Parks Land Use

Parks land use covers 153 acres, or 1.55 percent of the gross land area of the City. This includes three neighborhood parks, the Lucas Community Park and two parks located adjacent to Lake Lavon. In general, parks are compatible with their surrounding land uses.

Agricultural and Open Space Land Use

The remaining land use types, including agricultural and open spaces, are located randomly throughout the City. Agricultural and Open Spaces cover 2,570 acres or 26.08 percent of the gross land in the City of Lucas. In addition to land located in flood plain areas, this also includes those areas which are usually subdivided into lots with access to potable water facilities and paved streets or where surrounding development densities make agriculture or ranching less practical.



SOCIO-ECONOMIC AND MAN-MADE INFLUENCES AFFECTING LAND USE

An analysis of the existing development activity in Lucas should examine the following basic influences: population growth, housing availability, public utilities and facilities, transportation, and development constraints posed by both the



natural and man-made environment. This can then be used to better determine the influences which will define future land development in the City.

Housing

Lucas is comprised of primarily single-family housing units. With a steady growth in population, it is anticipated that the demand for well-constructed and well-maintained housing will continue to increase. Therefore, more units will need to be built to provide adequate and safe housing for the growing population. As the City's development approaches a "built out" condition, the increase in tax revenue due to new housing should be expected to diminish.

Infrastructure

Future growth and appropriate levels of service depends upon the City's water supply and distribution system, street system, and drainage system at suitable capacities and operational levels to meet demands. Various elements of Lucas' water, streets, and drainage systems will need improvement in the coming years.

Public/Semi-Public Facilities

Public facilities in Lucas include a City Hall, community center, parks, cemeteries, fire station and utility sites. As the future population increases, there will be a corresponding increase in the demand for these public facilities.

OTHER SERVICES

As the population increases, there will be an increase in the local demand for retail and/or consumer services. The City of Lucas has approximately 5.85 acres of commercial land use per 100 inhabitants (excluding the schools). To avoid conflict with adjacent residential uses and minimize negative traffic impacts, future commercial uses should generally continue to be confined to peripheral areas of the city.

ETJ AND FUTURE ANNEXATIONS

The extraterritorial jurisdiction of Lucas includes:

- Land adjacent to Lake Lavon.
- A municipal utility district in the southeast corner of the City
- Several pockets of land scattered throughout the City as well as adjacent to it

Figure 4.3 depicts the current ETJ. Additional development is anticipated to occur in the ETJ.



The composition of the ETJ area is presented in table 4.3 and figure 4.4. Any future large-scale residential development in the ETJ area will most probably occur to the southeast adjacent to Lake Lavon. As opportunities arise, the city should favorably consider annexing those "out areas" currently within the city limits as they become available for annexation. It should be noted that development agreements are in place which preclude some of the ETJ areas from annexation at the time of preparation of this Comprehensive Plan. The available areas for annexation at this time include:

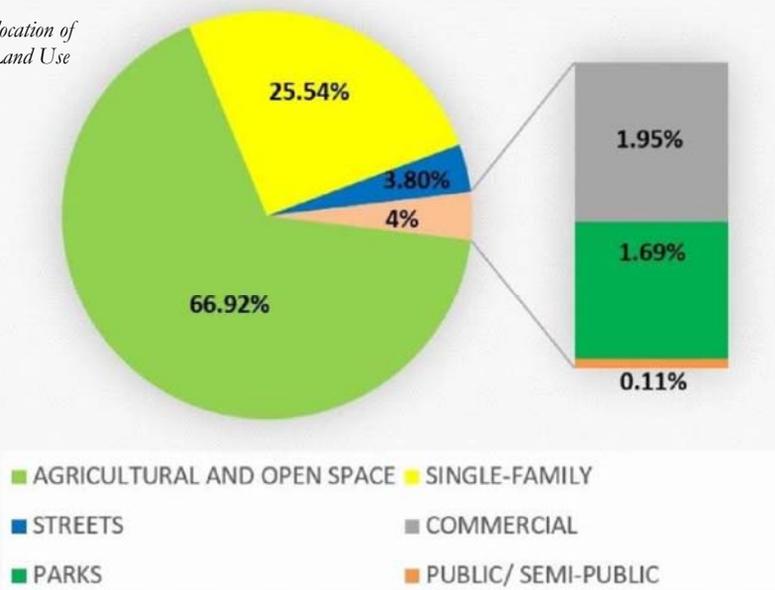
- Claremont Springs Phase 1
- Cimarron
- Edgewood Estates
- Trinity Park

Table 4.3 - Allocation of Existing ETJ Land Use

LAND USE	ACRES	% OF GROSS
SINGLE-FAMILY	490.88	25.54
COMMERCIAL	37.44	1.95
INDUSTRIAL	0.00	0.00
PARKS	32.39	1.69
PUBLIC/ SEMI-PUBLIC	2.15	0.11
STREETS	73.00	3.80
AGRICULTURAL AND OPEN	1286.43	66.92
TOTAL	1922.29	100.0

Source: August 2015 land use survey using aerial photography

Figure 4.4 - Allocation of Existing ETJ Land Use



ZONING AND SUBDIVISION REGULATIONS

Lucas has previously adopted zoning and subdivision ordinances. The subdivision ordinance provides the City with control over development practices within both the City and the ETJ. The zoning ordinance is used to regulate land uses that can occur within the city limits. The continued monitoring of these ordinances is important to ensure future development activities are consistent with the City's development objectives.

LAND USE GOALS AND OBJECTIVES

The goal of Lucas is to optimize land use in order to improve the quality of life of the residents. Lucas' land use goals are to avoid traffic congestion, inadequate or obsolete utilities or services and the location of incompatible land uses adjacent to one another. The proper planning and use of land will result in well-ordered land uses and development patterns as the City progresses.

LOCAL GOALS AND OBJECTIVES AFFECTING DEVELOPMENT

GOAL 1.

Develop the community in a manner which preserves and maintains property values and is consistent with the City's ability to serve existing and future development.

Objectives:

- Plan for reasonable demand with regard to water, street circulation and neighborhood connectors.
- Maintain the present rural atmosphere with a majority of large-lot residential development.

GOAL 2.

Preserve the residential and rural small-town atmosphere of the community while encouraging some quality small-scale economic development.

Objectives:

Utilize the "Survey of selected business" as a guideline for attracting business to the community.

- Ensure that commercial and other "high activity" uses are adjacent to designated neighborhood connectors to maintain acceptable fire/emergency response times.
- Preserve peripheral areas to the south and west for future limited commercial and moderate density residential development.
- Regularly review, update (if necessary) and enforce the zoning and subdivision ordinances to minimize the intrusion of incompatible land uses.
- Promote the general health and safety of the residents of the community.



It is important to understand that the Land Use Plan for Lucas is intended to serve as a general guide for the future development of the city. It should be considered flexible in nature, rather than a rigid blueprint for future land use. The population, housing, infrastructure and land use data contained in sections of this Comprehensive Plan serve to establish the determinants for land use projections.

FUTURE LAND USE

Land Use Planning Principles and Process

The following principles are considered applicable to the proper designation of land for residential use:

- Residential land should be well drained and free from danger of floods.
- Residential land should be readily accessible from, but not necessarily facing, arterial or collector streets.
- Residential land should be free from the danger of encroaching incompatible land uses.
- Residences should be able to access community facilities such as parks, schools, playgrounds and commercial facilities serving everyday needs.

Factors relating to the designation of land for commercial land uses include:

- Commercial areas must be located to maximize the use of major neighborhood connectors while minimizing excessive traffic impacts on residential roads and neighborhoods.
- Commercial areas should be limited and compact.
- Commercial areas must allow for safe automobile/pedestrian access and circulation. (Commercial areas require sidewalks per our adopted regulations)
- Commercial areas must be designed to avoid blighting effects on adjacent residential land and must be kept from encroaching on other sensitive land uses.

The proposed locations for commercial activities on the periphery of the community is acceptable both in terms of decreasing traffic stresses on central area roadways while providing accessibility to area customers. Commercial areas, if properly developed with landscaping programs and a developed access route to remove consumer traffic from through traffic, can be an asset to a community. It is with these factors in mind that the following principles were established for the planning of commercial areas:

- Commercial land uses should be formed into compact developments, avoiding "strip commercial" growth.
- Avoid the occurrence of scattered commercial development along major highways. Commercial activities should be consolidated into a few well organized areas to take maximum advantage of utilities and services and



to promote the economic well-being of the total business community.

- Adequate off-street parking and access should be utilized for commercial areas to decrease potential congestion and safety hazards.
- Avoid commercial growth on both sides of heavily traveled highways.

As the City of Lucas grows, future fire stations and emergency sites should be located to minimize the response time in accordance with national standards.

In order to formulate, adopt and implement a plan that accomplishes the foregoing overall goals and objectives, it is important to incorporate certain basic planning principles and processes into the local future land use planning effort. The Future Land Use Plan expresses projections that are based on sound planning principles, recognizing and supporting existing land uses, community facilities and physical features.

The plan for Lucas suggests that certain areas be reserved and developed for various land uses. Selecting the pattern and distribution of future land use is best accomplished through:

1. The analysis of existing land use characteristics
2. The effects of existing infrastructure
3. The location of existing neighborhood connectors
4. The application of recognized planning principles

These characteristics and principles establish a process by which to judge the most optimum and best land use based on local and community-wide standards. There are two advantages of going through such a process. First, it results in a land use plan for the City as represented by the Future Land Use Map. The Future Land Use Map can be used to assure that individual decisions follow a comprehensive pattern. It also helps in the sensitive but necessary evaluation of change with respect to public and private benefits. Second, the establishment of this planning process provides the City with a method of logically making subsequent land use decisions. It is important to reiterate that the Future Land Use Plan does not attempt to set the specific use for each and every parcel in the planning area.

RECOMMENDED ASSIGNMENT OF LAND USES

Residential Land Use Requirements

The assignment of land uses is then based upon the goals, objectives and planning principles previously stated. It is anticipated that new residential uses will be built as (1) new subdivisions close to or within current city limits, as (2) larger lot development in sparsely populated areas adjacent to Lake Lavon and the ETJs, and as (3) in-fill development/redevelopment. As one moves further west and south, residential densities transition from larger lots of two or more acres, to lots of one and one-half acres, and one



acre. By establishing this hierarchy of development density, will result in a more cohesive land use throughout the City.

Commercial Land Use Requirements

Future commercial land use allocations in Lucas should focus on peripheral locations to minimize traffic impacts on residential areas, reduce the potential for incompatible land uses, and minimize subsequent potential adverse effects. Drive will serve local needs with limited impacts to commuter and passerby highway traffic.

Industrial Land Use Requirements

No provision is made for future industrial development in Lucas. There are no perceived benefits to the City in preserving areas for future industrial development.

Parks Requirements

With respect to parks and open space, local opportunities for residents exist in Lucas. Expanded recreation options can be a benefit if operating and maintenance costs are held to manageable levels. Because of its limited tax base, Lucas should only expand park and open space facilities where and to the extent they are deemed needed.

RECOMMENDED LAND USE PLAN

A current delineation of existing conditions in both graphic and tabular form will not only allow for an up-to-date analysis of needs but will also allow for a measurement of success in achieving the Plan. Further, the Future Land Use Map should be used as a guide to keep incremental changes of the community in perspective. The individual decisions which actually shape the community, however, should be evaluated with respect to the characteristics and principles discussed throughout this document. Exceptions to this plan can be made and can be acceptable on a case by case basis where the greater good of the community is enhanced.



ECONOMIC DEVELOPMENT

INTRODUCTION

Economic Development can be defined as the basis by which a community maximizes or preserves the quality of life for its citizens. Economic development is a complex process vital to a community's pursuit of greater prosperity. Successful community development is a result of a well-executed economic development process that is given high priority by local leadership, and supported by residents. Moreover, economic development provides local employment and investment opportunities that generate these revenues. These revenues pay for public improvements, services, and facilities, as well as offset the increases in property taxes. However, for the City of Lucas, it is important to understand that economic development is only supported when it sustains the overall livability of Lucas. What does the term livability mean with regard to city planning? Many intangibles make a city livable, such as a sense of community, a strong sense of place in particular areas, city pride, and the friendliness of neighbors. However, there are also tangible aspects which can nurture livability. Therefore, the aspects of livability that this chapter will embrace include:

- Creation of a trail network that connects neighborhoods;
- Creation of neighborhood identity, and areas with a strong “sense of place”;
- Aesthetic quality of the neighborhoods and community;
- Proximity to open space and recreational opportunities;
- Proximity and availability of other community services such as high quality schools;
- Ease of access to and quality of retail and restaurants;
- Traffic flow and managing the impact of development and the associated increase in traffic on neighborhoods;
- Sustainability in buildings and development pattern; and
- Accessibility to natural areas

DEVELOPMENT CHARACTERISTICS AND POLICIES

Regional Context

Many aspects of regional development and demographic trends have a significant influence on economic potential. State, national, and international economics influence the regional and local economic potential, as well as contribute to the underlying assumptions for conducting regional and local economic analysis.

Lucas, with a current population estimate of 6,875 persons in 2016, contains a total land area of approximately 9,855 acres. An additional 1,922 acres is located within



the extra-territorial jurisdiction. The city's location in Collin County places it on the northeastern edge of the Dallas/Fort Worth Metroplex, convenient to most major employment centers.

Physical Growth Patterns



The Future Land Use Plan (Figure 4.5) depicts future land development characteristics for Lucas. Lucas is a traditional bedroom community with primarily large single-family lots and open spaces located through the core of the city with commercial located on the periphery. Residential is served by on-site sewerage facilities (OSSF), which requires a minimum of one acre for a residential home site. Most commercial is served as defined by the Waste Water Master Plan. Commercial development is planned in two primary areas of the City. Both of these areas have been planned and have all necessary services installed for development.

Unlike residential development, most of these areas for commercial development have access to sanitary sewer infrastructure installed with capacity available to meet future demand for these services.

In the past, the majority of commercial establishments consisted of small retail providers catering generally to local trade. In recent years major commercial growth has occurred along the western city limit boundary near the City of Allen, between West Lucas Road and Estates Parkway. In addition to development of commercial establishments near the western city limit, future commercial growth is anticipated near the southern city limit boundary in an area west of Southview Drive. Since Lucas foresees itself in the future as a community of primarily low density residential uses, the City will focus on appropriate, smaller scale commercial development, which will generate an acceptable level of sales tax revenues while effectively serving the needs of the local population base.

Local Regulations and Development Policies

The local regulations are reflected in the City's subdivision and zoning ordinances. Both ordinances must effectively direct development activities in a manner which both reflects local goals and objectives while recognizing realistic development standards. These regulations are not intended to discourage growth but rather to ensure that any new development provides for quality facilities and services.

Economic Base Study

The majority of all workers living in Lucas tend to be employed in occupations which require a higher or higher/moderate skill level. According to the US Census Bureau estimates for 2009-2013, the median household income in City of Lucas is \$101,636, which is almost twice the \$51,900 median household for the State of Texas.



Utility Services

The City of Lucas is the retail provider of water for its residents and businesses and its water wholesaler is the North Texas Municipal Water District. Details regarding the water system are described in Chapter 8 (Water) of this planning document. TXU and Grayson/Collin Electric provide electrical distribution. Natural gas, supplied by CoServe, is available in limited areas of the city.

Industrial Sites

Presently, there is no industrial development in Lucas. The high land costs in the area, compared to the Dallas/Fort Worth Metroplex, the zoning, the limited sanitary sewer system and the emphasis on Lucas remaining a low density residential community, are factors which make future industrial development in Lucas unlikely. The proximity of Lucas to major employment centers makes the issue of local job creation less important. Residential development is and will continue to be the most dominant land use along with minor ancillary development.

Commercial Sites

Lucas has a total of 505 acres of commercial development. By excluding land reserved for schools, 375 acres are directly reserved for commercial land uses. Future commercial sites will be located on the periphery of the city to minimize intrusive traffic volumes on interior neighborhoods. Details are provided in the Land Use Section of this planning document.

Community Assessment

It is important to note there is a critical link between economic development and comprehensive planning. Economic development is impacted by:

- Land use;
- Zoning;
- Accessibility to utilities;
- Access via transportation systems and infrastructure; and
- Demographics..

Characteristics of the City of Lucas include:

1. A property tax rate lower than the average for cities in Collin County and for the cities in DFW region. (\$0.320661 in 2015)
2. The city has traditionally had a conservative City Council that places an emphasis on providing a balance between necessary services with low taxes.
3. Skilled labor represents a high percentage of the Lucas work force.
4. Commercial land availability along FM 2551 and the southeast quadrant of the City (FM1378 and Parker Road).
5. Vacant land for additional housing.



6. Sewer service is available in commercially zoned areas as defined by the Waste Water Master Plan.
7. Land prices are higher than region or state average.

It is important for Lucas to realize its potentials and liabilities in terms of future economic development. Because of its location, Lucas has more potential for developing as a quality residential area than it does in becoming a significant economic center. However, it is important for Lucas to develop some commercial areas to meet the needs of residents.

While it is possible to operate primarily upon property taxes, doing so may require undesirable constraints on future spending. It is important Lucas not become dependent solely upon property taxes as the only revenue source for local government operations. The City of Lucas needs a healthy mix of ad valorem and sales tax revenue. Ad valorem taxes should be used generally for day-to-day operations while sales tax revenue should be used for capital projects.

Decision regarding business location will come from the business owner and his or her willingness to invest in a particular site; however, the city's development environment as conveyed through its development codes will have a major impact on where and what type of business activity takes place.

ECONOMIC DEVELOPMENT PLAN

Economic development in Lucas should have two major thrusts: (1) maintain appropriate housing development and (2) attract businesses that are appropriate for the City. Commercial development has benefitted the City with increased revenue. Balancing the financial well-being of the City and its ability to provide essential services with the citizens' desire to maintain the features and attributes of the City is paramount. Therefore, it is important to emphasize citizen feedback during the public meeting regarding economic development.

HOUSING SUPPLY

The demand for quality, upscale housing in Lucas is expected to continue. Lucas should focus on quality housing to ensure that values are maintained and the city continues as desirable place to live.

ATTRACTING NEW BUSINESSES

Attracting appropriate new businesses to Lucas will increase tax revenues and fund city-provided services. There is attractive land available for new businesses in western and southern city limit boundaries with infrastructure in place or in the planning stages. The western area is accessible through three arterial roadways including West Lucas Road, Estates Parkway and Angel Parkway. The area in southern part of city is similarly accessible through two major arterial roadways East Parker Road and Southview Drive.



The citizen's preferable commercial businesses survey conducted by the City in 2015 should be utilized to attract businesses desired by citizens of Lucas. The top five responses from the survey include:

- Sit Down Family Restaurant
- Farmers Market
- Garden/Nursery
- Grocery Store
- Feed Store

These types of retail establishments typically generate sales tax revenues. It is anticipated that planning for the continued development of similar businesses in the western and southern part of the city in commercial zoning areas will continue.

ECONOMIC DEVELOPMENT GOALS AND OBJECTIVES

Based on input from Lucas citizens, Boards and Commissions, City Council and staff, the following economic development goals and implementation strategies are recommended:

GOAL 1:

Support business endeavors that are in harmony with the rural characteristics and distinctive environment.

GOAL 2:

Improve and maintain the infrastructure to support growth in the tax base and sustain a sound financial future through the adoption and implementation of a capital improvement program.

GOAL 3:

Attract businesses to Lucas that serve the local population and promote the livability and a high quality of life for our citizens.



PARKS, RECREATION AND OPEN SPACE

INTRODUCTION PARKS, OPEN SPACE, AND TRAILS



The amount and quality of parks and open space within a community are often cited as important elements of local quality of life. Lucas has recognized this fact through an adopted Park Plan and a park dedication ordinance. Lucas is a unique community with large lots and open spaces naturally throughout the city. The city's entire eastern boundary is located on the shores of Lake Lavon, with natural waterways through the city for storm water run-off.

Due to the unique features of Lucas and the large lots and natural open spaces, parks are not as important to the city as they are to surrounding communities. With input from the community, Boards, council, and staff it was decided that existing parks with the exception of the future potential to expand existing facilities especially at the community park located next to city hall, that we have adequate parks facilities. The city should concentrate on expanding existing equestrian and hiking trails adjacent to the city on US Army Corps of Engineering property and throughout the city.

COMMUNITY COMPOSITION

The City of Lucas contains a total land area of approximately 9,856 acres. Approximately 74 percent (about 7,285 acres) of the land within the existing City is developed, while the remaining acreage is vacant or being used for some agricultural related purpose. Lucas currently has six parks (153 acres) utilized as parkland and has no planned or designated open space system. In addition the City of Lucas is located immediately adjacent to Lake Lavon, which provides opportunities for water based recreational activities, trails and open spaces.

PREVIOUS PARKS AND OPEN SPACE STUDIES

The City of Lucas historically has had common visions for development of Parks & Open Space. Previous studies performed date back to 2001 when community planning involved City officials interacting with the citizens in the form of Town Hall meetings and questionnaires intended to gather preferences and opinions about parks and open space in the City. Preferences and opinions came from a sample of the population voicing a variety of choices. A 2001 study entitled "Lucas Parks and Open Space Master Plan" presented a detailed analysis of the park system, open spaces, possible programs and recreational opportunities available, and the detailed history of lands in the City. The study also painted an overall picture of the City's situation regarding these issues,



described a strategy in which to develop a parks and open space master plan, and established goals and objectives outlining means to implement the proposed plan. Additional study was performed as a part of the 2004 City of Lucas Comprehensive plan which included an evaluation of the parks and recreational opportunities in the City and the current opportunities available and existing facilities available.

In 2015, the City hosted several Town Hall meetings to provide forum to receive feedback from citizens and to address the parks, recreation, and open space needs. The town hall meetings, previous study, and ongoing changes to parks and recreation in the region will serve as a backdrop in describing the current opportunities as they exist today.

EXISTING PARKS AND OPEN SPACE

Over the years, the City of Lucas has developed 4 parks and preserved open space in accordance with community planning efforts. The existing parks and open space include Brockdale and Highland Park currently operated by the Army Corps of engineers, and one private park located in the Stonegate sub-division making a total of 6 parks in the city and they are described and evaluated as follows.

BROCKDALE PARK

Brockdale Park was established in 2005 and is located at east edge of City of Lucas immediately next to Lake Lavon. Brockdale Park is 127 acres and has several amenities that have been developed and includes The Blackland Prairie Raptor Center that is located in the middle section of the park. This center is a nonprofit, rehabilitation and conservation education organization. The mission of this organization is to preserve the environment through public education and conservation of birds of prey and wildlife in their natural habitat.

KENNETH R. LEWIS PARK

Kenneth R. Lewis Park is located adjacent to FM 1378 (Southview Dr.), near the southern side of the City. The park is approximately 5 acres and offers baseball/softball field and soccer field. About two thirds of the park is open space and undeveloped for use with other activities.

LUCAS COMMUNITY PARK AT CITY HALL

The Lucas Community Park at City Hall is directly adjacent to the southern side of City Hall Parking Lot. The park is approximately 3 acres and offers a 5-foot wide concrete sidewalk that circulates the park and a pavilion for picnics and barbeques for the City residents of Lucas, and a large playground including multiple slides and climbing areas. The park also boasts a community center with rooms available to



residents at no cost. The parking area provided for the City Hall can be also utilized for the community park.

HIGHLAND PARK

Highland Park is located at Northeast edge of the city just off Snider Lane. This park is approximately 59 acres and has minimal services. Highland Park provides a boat ramp at the north end of the park for boating and fishing activities on Lake Lavon. The ramp is concrete with ample parking for trailers and vehicles. Entrance to the boat ramp area is via Highland Park Road. Available facilities at this park include the following: a parking area, boat ramp, and restrooms.

As with Brockdale Park, the Trinity Trail passes through the Highland Park. There is a trailhead existing at this park that serves as a point for riders to unload and load their horses with an entrance area on Highland Park Road. The Trinity trail continues north past the limit of Highland Park to the north end of City of Lucas limit near the North Texas Municipal Water District Treatment Plant as previously discussed. Available facilities at the trailhead in Highland Park include the followings: loading/unloading area, restroom facility with ADA considerations, one pavilion, and a watering place for horses.

FOREST CREEK NEIGHBORHOOD PARK

Forest Creek Neighborhood Park is located north of the City of Lucas next to Orchard Gap Lane. The Forest Creek Neighborhood Park is a small 2 acre park with several playgrounds and a soccer field. Access to the park is from Country Club Road via Orchard Gap Lane off Norfolk Lane. Facilities available at this park includes a traditional neighborhood playground and open space.

STONE GATE PARK

Stone Gate Park is a private park located on north side of the city in the Stone Gate Neighborhood and is only accessible to residents of that neighborhood. This park is a very small neighborhood park occupying less than 1 acre next to one of the tributaries of White Rock Creek. This park offers a traditional multiuse playground, a small gazebo, picnic tables and a 2-foot wide concrete sidewalk that passes through the park. The sidewalk connects to a concrete trail that continues alongside the tributary of the White Rock Creek.

OPEN SPACES AND NATURAL FEATURES

Open space represents the natural and agricultural through fields, pastures, prairies and woodlands. Public and private objectives may differ in regard to preservation of open spaces. The City's desire to preserve open spaces will depend on achieving common goals with private land owners and the public. The goal of



maintaining open space should be continued with interaction between the City and land owners to determine common means to achieve these goals.

Other open spaces in Lucas are in the form of:

- Lake Lavon existing flood plain areas
- Creeks and waterways;
- Vacant lands, farm lands, pastures and rights-of-way

All these open spaces can potentially allow for trails and trail connections. The most important natural feature in Lucas is Lake Lavon and its tributary creeks. Constructed in 1954, the lake is owned and controlled by the U.S. Army Corp of Engineers. There are twenty areas along the lake designated for park use, including Highland Park and Brockdale Park which reside in Lucas. These parks provide water-based recreational opportunities that would otherwise not generally be available in the county.

EXISTING TRAILS

Currently Trinity Trail is the only trail in-use that exists in City of Lucas. The Trinity Trail is situated along Lake Lavon with scenic views of the lake and surrounding landscape. The trail extends to the southeastern city limit of Lucas, and north to the City limit we share with North Texas Municipal Water District. This unpaved trail is 25.5 miles long and placed on the US Army Corps of Engineers land along Lake Lavon from East Fork Trail Head in Wylie in the south to the Giant Sycamore Loop to the north. Approximately 11 miles of the Trinity Trail passes through the City of Lucas. This trail enters the City of Lucas in the south from Collin Park in St. Paul, and stretches north along the edge of the lake passing through Brockdale Park and Highland Park. This trail is only open to horseback riders and hikers, and is maintained and operated by a group of volunteers named Trinity Trail Preservation Association (TTPA).



PROPOSED FUTURE TRAILS

Based on input from the citizens, boards, city council, and staff, the future needs of the city are to add additional equestrian/hiking trails. Specifically a trail system linking the Trinity Trails on the north side of the city with a trail through the city to reconnect with the Trinity Trails on the southern end of the city. The proposed trail and trailheads would start at E. Winningkoff Road and end at the Hunt property on the southern end of the city at a future trail head location. The trail should utilize wet lands and natural tree lines whenever possible to create a secluded and shaded trail area.



GOALS AND OBJECTIVES

The City has continued to work toward achieving the goals and objectives established with previous comprehensive and community planning. By setting the goals and objectives, some results are evident and progress has been made. Recognizing the current achievements, changed environment and surroundings, a revised set of goals have been outlined that share common themes that resonate with Collin County Open Space Strategic Plan:

GOAL 1.

Preserve natural environment and native ecosystems.

Objectives:

- Conserve and protect ecologically sensitive and naturally beautiful areas, e.g. flood plains along creeks, high points with scenic views toward Lavon Lake, etc.
- Establish and/or enhance green space and natural areas along flood plains, and promote public access to green belt areas with trail systems, e.g. equestrian/hiking trails, etc.
- Encourage and promote water conservation through the use of native plant materials, xeriscape techniques, and other methods.
- Maintain high standards for groundwater quality due to the proximity of Lake Lavon.
- Encourage development types, which minimize impacts upon the community's natural resources and visual appeal.

GOAL 2.

Provide a comprehensive Trail System Plan to include green belt and open space that is compatible with the environment and compatible with residential neighborhoods.

Objectives:

- Continue to revise and adopt comprehensive Parks and Open Space Plan that meets current preferences and reflection of changing environment in the region in 2016.
- Promote trail connections, and ensure greenbelt and open space dedication during the development review process.
- Create pedestrian and equestrian trails between residential neighborhoods, linear greenbelts, schools, public administrative facilities, and other activity centers, whenever physically and financially possible.
- Continue to adopt and finalize a detailed plan for necessary open space/trail easements to connect existing and future parks, schools, and neighborhoods into an integrated, low maintenance park and recreation system.
- Formulate and adopt policies and ordinances that protect the acquired/donated park land and open space easements.



- Utilize trails, wherever possible, to locally and regionally connect schools, parks and residential areas.
- Design a parks and open space system that is interconnected and multifunctional, which protects important natural, cultural and visual resources while providing appropriate opportunities for recreation.
- Integrate locally planned trails with the "Collin County Regional Master Trail Plan".
- Coordinate planning efforts with those of adjacent cities.

GOAL 3.

Develop and maintain the new Lucas parks and open space system.

Objectives:

- Determine actual maintenance cost currently needed to maintain existing parks.
- Undertake the necessary effort to determine maintenance costs and capital investment costs associated with acquiring and/or developing new parks and open space.
- Allocate sufficient funding to maintain existing parks, open space and trails.
- Formulate and adopt policies and ordinances that protect existing park facilities, open spaces, and trails.
- Explore cost sharing options such as Federal, TxDOT grants, or "Keep Lucas Beautiful" for fund raising.

PLAN AND RECOMMENDATIONS

The purpose of the plan and recommendations is to provide community direction in a constantly changing environment. Under existing and currently projected conditions and circumstances, the City of Lucas parks, open space and recreational needs will be well satisfied. Few things have so positive an effect on the quality of life in a community as a well-executed plan for a community's parks, open space, trails, and recreational facilities. These recommendations should be helpful to future decision-making as each plan component is gradually considered for implementation or revision.

- Equestrian, hike, and bike trails, greenbelts, parkways or paths should be provided to connect large recreational areas, providing access, scenic views and recreational opportunities.
- Combined municipal and school recreational facilities should be used to serve the community and prevent the construction of redundant facilities. If possible, school recreational areas should include parking, drinking fountains and restrooms and should remain open on weekends and during the summer months.



STREETS AND DRAINAGE

STREETS



The livelihood of a community is, to a very large extent, dependent upon convenient and efficient access to nearby major trade centers outside the city, major national travel routes and transportation terminals of national importance outside of the city. It is likewise dependent upon efficient circulation of people within the city. Local streets should provide safe, reliable access to work, schools, shopping, and homes. A street network, therefore, is of vital importance as it ties a community together and links it to the outside world.

The primary function of a street network is the safe and efficient movement of vehicles and people. The street network of any city operates, in effect, as the skeleton of that city, providing access in varying degrees to all properties abutting the network. Roadways and other rights-of-ways occupy more than 13% of the total developed area and allow for circulation between all areas within the City. In addition to moving traffic, streets provide: access to and drainage for abutting properties; open space between buildings; and right-of-way for various utilities. In this way, the street network is a primary factor in the determination of appropriate land use locations.

When adequate streets and drainage facilities are constructed, they can represent the largest single required expenditure of a city. As roads age they are affected by many factors: the quality of the soil under the road base, the type of pavement surface; type of preventative maintenance; and drainage conditions in the area (related to topography).

Repairing the roads to proper standards for long term durability can require roads to be raised or lowered to improve drainage, have additional right-of-way dedicated, have improved drainage facilities installed, and have appropriate road materials used in construction.

DRAINAGE

The topography of Lucas consists of both level and rolling terrain. As a result, localized flooding can occur, especially where culvert and drainage ditches are obstructed with vegetation or debris.

Many factors directly affect the surface storm drainage, to minimize property damage from flooding during periods of intense rainfall, the drainage system for a



community should be designed, sized, and properly maintained. Storm drainage facilities include inlets, culverts, bridges, concrete lined channels, natural drainage channels, swales, creeks, rivers, retention and detention ponds, and lakes.

Drainage can have significant effects on structural durability of streets and travel safety. Level ground and poor drainage allows water to collect in some areas, which erodes the road base and causes sections of road to fail, and can also lead to loss of traction on the road. Currently roadway drainage is primarily handled via open ditches and culverts. Maintenance in these ditches is needed to avoid over growth of trees and other vegetation. Over growth can make roads difficult to drain, and roots can undermine the structural stability of the pavements. As a result, the drainage system is discussed in conjunction with the streets system in this chapter.

STREET SYSTEM ANALYSIS

General Street Statistics

Within the City, traffic control is achieved primarily with signage. The City does not own, operate, or monitor any traffic signals to control traffic flow. However, the Texas Department of Transportation (TxDOT) controls several traffic signals at these intersections:

- Lucas Road and Southview Drive
- West Lucas Road and Country Club Road
- Country Club Road and Estates Parkway

STREET CONFIGURATION AND FUNCTIONAL CLASSIFICATION

The roadways in Lucas, which are classified as arterials including (Type A and B), neighborhood connectors (Type C), and local streets (Type D). All of these roadways provide different levels of access and serve varying levels of the traffic volumes.

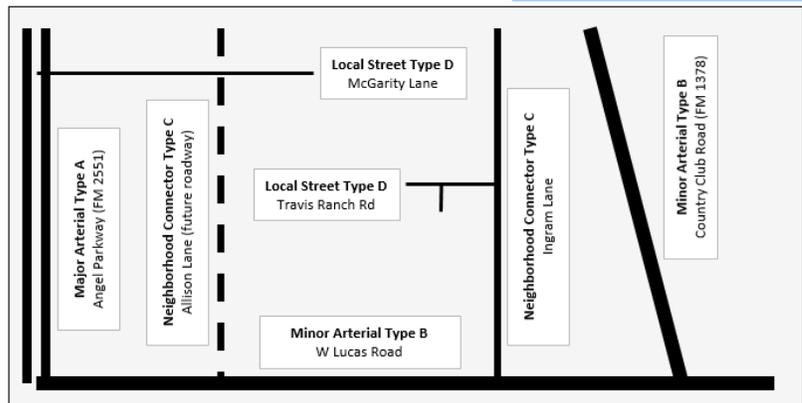


Figure 7.1– Roadway Classification

The highest level of roadway in the City of Lucas is the arterial, which carries varying amounts of traffic based upon the number of lanes, with limited access connections. Most of these are owned and maintained by the County or State.

The neighborhood connector carries less traffic for mostly local trips and has a higher level of access. Whereas, local streets have direct access to every parcel and carries a more limited volume of traffic. These are owned and maintained by the City. Figure 7.1 shows the relation between different levels of roadways.



Presently, Angel Parkway, Country Club Road, Estates Parkway, Lucas Road, Parker Road, and Southview Drive function as arterial streets in the City allowing traffic movement to cities such as Allen, Fairview, McKinney, Parker, Plano, and Wylie.

The neighborhood connectors in the City are Blondy Jhune Road, Brockdale Park Road, East Winningkoff Road, Forest Grove Road, Highland Drive, Ingram Lane, Lewis Lane, Orr Road, Snider Lane, Stinson Road, Winningkoff Road, Snider Lane, and Stinson Road. The remaining streets in the City function as local streets. Figure 7.2 represents the street network in City of Lucas located in the Appendix.

The geometric configuration of the street system in Lucas is adequate to meet current vehicle circulation demands.

STREET SYSTEM EVALUATION

Before beginning major improvements to roadways, it is essential that the City have a street condition assessment and management system in place. This system will help to ensure that streets in the existing developed areas of Lucas are improved in a uniform and orderly manner. It is through such a system that completed City projects will provide maximum benefits and will become an integral part of the future City. This should assist in the elimination of duplicate expenditures and assure that possible early obsolescence of improvements can be avoided.

A system inventory, as part of a street management system helps to identify different segments of the roadway system. Condition evaluation of the roadway segments is the first step in planning improvement. Such a system will provide a continuous evaluation of the street system inventory. It will also help to detect developing problems and determine the proper, corrective action needed. If a road is found to be adequate for its present service, it should be re-evaluated every five to 10 years to determine the trend of changes affecting its future adequacy. A complete evaluation of the roadway system would include all arterials, neighborhood connectors, and local streets in the city. As part of the condition assessment, an extensive visual evaluation of the pavement surface conditions, drainage, traffic control devices, and environmental conditions was performed. This evaluation included collecting data on the existing conditions and rating evaluated elements for adequacy.

The criteria for the condition assessment are based on criteria which was adapted to the City needs. Table 7.1 describes the ratings used in the assessment of the neighborhood connectors. Figure 7.3 summarizes the present ratings of the neighborhood connectors in Lucas.

This condition assessment assists in identifying roadways that are in need of repair or where a total reconstruction is needed.



EXISTING STREET CONDITIONS

Table 7.1 Rating Description

The results of the data from the streets observation and the assessments of the neighborhood connectors combined with data obtained from the City of Lucas were utilized to identify areas in need of remedial action. These are ranked according to priority as follows:

1) Street Paving

A large number of streets in the City that are paved, have acceptable pavement width and are in fair to good condition, and most of the concrete sections of roadway are in good condition as well. A number of the asphalt streets are demonstrating signs of failure due to inadequate road bases and poor soil condition and drainage issues.

2) Street Drainage

Some of the street system has been affected by poor drainage flow. The key areas that need to be addressed are silted and improperly sloped bar ditches along some roadways, as well as the silted or undersized culverts. These ditches and culverts allow water to sheet across roadways causing premature damage. Potholes, cracks, and slumped pavement are examples of what can happen when the road base is allowed to erode.

3) Street Right-of-Way

Many of the roadways appear to need further additional right-of-way to address drainage issues. Existing bar ditches are too close to the road base, allowing water to impact road conditions. These narrow rights-of-way also allow trees to grow too close to the road ways, when the right-of-way is not cleaned or maintained, roots from these trees have been found to burrow under the roadway causing damage to the pavement.

4) Surface Conditions

Surface distresses may appear on City streets. The asphalt pavement related-distresses that are most common included: longitudinal and transverse cracking, potholes and patch deterioration, rutting, shoving and corrugation, alligator cracking, and shoulder/pavement edge drop-offs, and deterioration.

Rating	Description
A Good	Good riding surface with no noticeable wear or obvious defects.
B Acceptable	Good riding surface, but has some minor surface defects and wear indications. Some minor cracking or patch repairs may exist.
C Fair	Slightly rough riding surface, edges beginning to break down, some moderate cracking, small areas of spalling, pavement, shoulder drop-offs, and cut repairs beginning to require attention.
D Poor	Uncomfortable and/or badly worn riding surface, extensive spalling, cracks, paving failures, poor patches and/or cut repairs, edge breakdown, and severe shoulder drop-offs.
E Unacceptable	Very rough and/or uneven riding surface, drainage problems, large surface in bad condition, many unsatisfactory patches and cut repairs, and safety hazards.

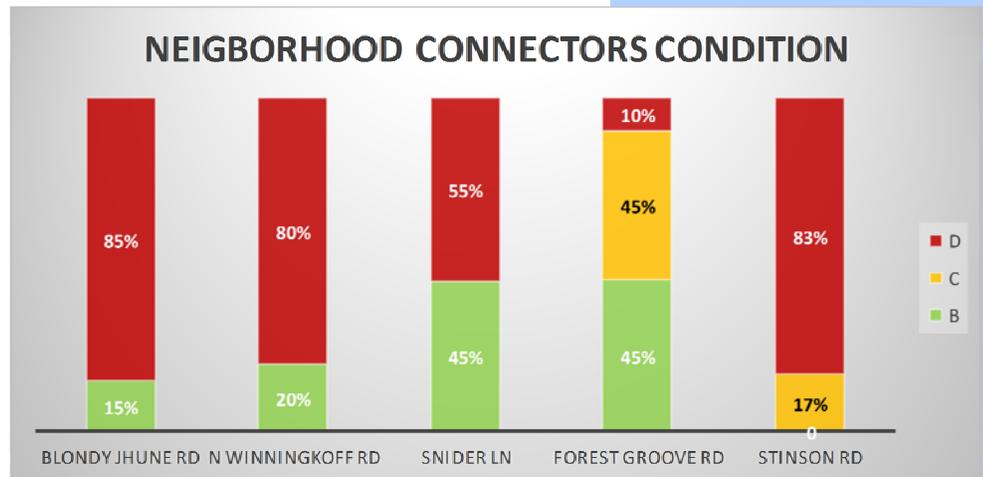


Figure 7.3 Neighborhood Connector Condition



5) Street Width

Undersized roadways in the City can hamper vehicular circulation. Design consideration should be given for new and newly reconstructed roadways.

TYPES OF STREET IMPROVEMENTS

There are several different methods of maintaining streets within a City. The appropriate choice depend upon the condition of roadway, the anticipated traffic load, and available funds.

Recommended street maintenance alternatives can include the following.

- Point Repairs -- Excavation of failed pavement sections and repair pavement surfaces (pothole repair).
- Level-Up -- Leveling of depressions in pavement with hot/cold mix asphalt concrete. This is used to even out roadway surface.
- Seal-Coat -- Application of asphaltic cement covered with uniform size of aggregate and rolling the aggregates after application. Ideally used once every three to five years to maintain streets and forestall more costly repairs. It should be noted that seal-coating does not address the structural deficiencies and it is only effective when the roadway base is in relatively good structural condition.
- Overlay -- Depending on the severity of wear, approximately one inch of surface is milled off the existing roadway. The remaining surface material is then overlaid with hot mix asphaltic concrete, followed by a surface treatment. This is used to completely replace the surface material of a street to address pavement deterioration and extend street life.
- Reclaim -- Scarifying existing pavement and base material, while adding cement to create a recycled asphalt-enhanced roadway base. The base is then compacted and overlaid with a new asphaltic concrete pavement. Streets receiving this treatment might last five years, depending on the traffic load and environmental conditions.
- Reconstruction -- Roadway reconstruction options removes the existing pavement, and new asphalt pavement is installed. The existing road pavement can also be replaced with a new reinforced concrete pavement. The goal is to construct pavement that lasts at least 20 years.

DRAINAGE SYSTEM ANALYSIS

The entire City relies on storm water drainage to be carried on the surface. The storm drainage system of Lucas currently consists of a system of bar ditches, channels, and culverts. These facilities carry storm water run-off within Lucas to the eventual terminus outside the city limits in Lavon Lake or Lake Ray Hubbard.



Annual precipitation is approximately 42 inches per year. The rains are heaviest in spring and fall. The streets in the City are crowned to promote open ditch drainage on each side.

The Federal Emergency Management Agency (FEMA) provides flood insurance rate maps that depict the 100-year and 500-year flood plains. These flood plains cover those areas that would most likely be inundated with storm water during the heaviest rains. The 100-year floodway defines the area where buildings are not eligible for flood insurance, while those located in the 100-year floodway fringe are eligible once flood proofing is implemented. The goal of this program is to curtail development in flood plains, thereby reducing damage to structures and minimizing the danger to people during flooding. The City of Lucas is a participating city in the National Flood Insurance Program (NFIP).

Collin County, TxDOT, and US Army Corps of Engineers control some of those facilities in the extraterritorial jurisdiction and some of the roadways in and around the City. Most of the necessary seasonal maintenance is the responsibility of the adjacent individual property owners. Initial design along with poor maintenance can cause negative drainage issues and impact road quality.

GENERAL DRAINAGE PROBLEMS

Creeks

All creeks are subject to flooding at some point. However, most large channels have had their flood carrying capacity as indicated by FEMA, as shown on their respective floodway maps. It is important to note that creeks that have not been mapped by FEMA are still subject to high water flows.

Bar Ditches and Water Channels

A significant portion of the flooding that occurs in the City is associated with bar ditches and culverts being inundated with rainwater flowing off adjacent properties while following the natural topographical lay of the City. Despite the proper construction and operation of the majority of these ditches, some are not able to deal with the intense storm water flows brought on by heavy rains. As a result, water is often left standing in intersections and yards of homes after rain has subsided.

Street System

Some structures in the street system do not lend themselves to adequate drainage since the facilities exist perpendicular to the natural flow lines. In cases where culvert passage is silted, undersized or not provided, the storm water can cause premature damage to roadways and major safety problems.



PLAN AND RECOMMENDATIONS

Purpose

The purpose of the Streets and Drainage section of the Comprehensive Plan is to assist the City in appropriating public funds in a manner which maximizes benefit. The plan identifies those street and drainage improvements, which are needed in order to provide an efficient transportation system, as well as minimizing property damage from flooding during periods of intense rainfall in the City.

STREET RECOMMENDATIONS

The most important consideration when developing a plan for street rehabilitation is to ensure that all plans for roadway construction also include plans for drainage improvements. All plans for road reconstruction must consider the size and slope needs for drainage. Any program for street improvements without drainage improvements would be futile.

The City has adopted specific street section designs based on the classification of the roadway. Different rights-of-way widths, pavement widths, and base thicknesses, are required for roadways that are expected to serve differing levels of traffic. This is especially useful when enforcing street quality standards and minimums for residential subdivision developments.

If several years lapse before projects are undertaken, a new assessment may be necessary to ensure that data is current. Whether increased traffic due to growth, new commercial, and changes in City; maintenance practices can change the recommendations made in this report. Street maintenance and repair plans should be reviewed annually to adjust for cost and changes in the road conditions.

Street Name	Type of Repair
Blondy Jhune Road	Reconstruction
Forest Grove Road	Reconstruction
Snider Lane and Bridge	Reconstruction
Stinson Road and Culvert	Reconstruction
Winningkoff Road	Reconstruction

Table 7.2 - Recommended Roads for Reconstruction, City of Lucas, Texas

Proposed improvements should be based on the street analysis, focusing on the improvements that impact safety, are most in need or will benefit the most people. High priority projects including highly traveled roadways in poor condition or first-time paving should be considered as soon as the City is able to finance the repairs. This excludes the state roads since they are maintained by TxDOT. For this plan, improvements should be phased. Phasing of improvements is designed to help minimize the financial impact on the community, while still realizing the need to make necessary improvements.

PROPOSED IMPROVEMENTS

As part of the Street Plan, recommended roads for reconstruction are presented in Table 7.2. Possible funding sources has been developed and is presented below.



POSSIBLE FINANCIAL SOURCES FOR STREETS

The City should pursue funding sources that will make fiscal sense to assist in providing necessary street improvements, including, but not limited to:

- The General Fund
- General Obligation Bonds
- Certificates of Obligation
- City Sales Tax
- Special Fees/User Fees
- Grants
- Cost Sharing

POSSIBLE FINANCIAL SOURCES FOR DRAINAGE IMPROVEMENTS

The following is a listing of sources which may be utilized to assist with future drainage projects:

- The General Fund
- General Obligation Bonds
- Certificates of Obligation
- Grants through the Office of Rural Community Affairs
- Special Fees/User Fees

ADDITIONAL FINANCIAL SOURCES

- Grants through the Office of Rural Community Affairs/Texas Community Development Program can be used to re-pave and repair streets. However, while streets are eligible, it is unlikely that a street project alone would be funded. Therefore, it might be possible to incorporate some street work into another, more fundable activity such as water line construction where streets must be torn up to bury line.
- The Texas Department of Transportation (TxDOT) has a program designed to maintain and improve on- and off-system roadways.
- The Texas Department of Transportation (TxDOT) also has a landscaping cost sharing program through which the department will provide landscaping materials up to 50% of the project cost. The city's contribution may be in-kind in the form of installation of materials. The city must provide the design plan for approval by the department over and above the city's in-kind contribution. Finally, the city must commit to maintaining the landscaping improvements
- Loans from the Texas Department of Agriculture. These low interest loans can be utilized in place of bank loans and the issuing of bonds.
- In an Assessment Paving Program, the City may follow carefully prescribed procedures of notices, public hearings and bidding, begins making the street improvements, assessing a portion of the costs against the adjacent property owners. The City may have to advance the cost of the projects, but eventually, the property owners will pay their fair share of the costs. This procedure is governed by the Texas Civil Statutes.



WATER SYSTEM

INTRODUCTION

The City of Lucas owns and operates Lucas Waterworks that serves the residents inside and outside its current Certificate of Convenience and Necessity (CCN) site map. The Lucas Waterworks serves residents outside the city limits and outside the Lucas extraterritorial jurisdiction (ETJ), but the City does not supply water to all residents within the Lucas ETJ. The Seis Lagos Utility District, the Wylie Northeast Special Utility District and the City of Allen supply water to a portion of residents inside the Lucas city limits and within the Lucas ETJ.

The City’s water system is a vital part of the City owned infrastructure. The purpose of this section on the water system is to update the Comprehensive Plan by providing a description of the current water system, identifying the criteria for determining future additions to the water system, and providing a description of the capital improvements needed for the future water system.

EXISTING WATER SYSTEM

Water Supply

The City purchases water from the North Texas Municipal Water District (NTMWD). Water is delivered to the City at two delivery points. One of the delivery points is at the North Pump Station site located on Country Club Road between West Lucas Road and Estates Parkway. The other delivery site is at the McGarity Pump Station site located on McGarity Lane just east of Angel Parkway. The delivery point at the McGarity Pump Station site is the newer of the two delivery sites. It was established when the first facilities were constructed at that site in 2004/2005.

Existing System Facilities

The principal facilities in the existing water system include ground storage tanks, elevated storage tanks, and pump stations. The storage tanks and pump stations are all located at the McGarity Pump Station, the North Pump Station and the Winningkoff elevated tank site. Following is a summary of the principal facilities in the existing water system:

Ground Storage:

McGarity Pump Station	200,000 gallon tank
	350,000 gallon tank
North Pump Station	500,000 gallon tank
	750,000 gallon tank
Total	1,800,000 gallons



Elevated Storage:

McGarity Pump Station	300,000 gallon tank
Winningkoff Site	300,000 gallon tank
Total	600,000 gallons

Pumping Facilities:

- McGarity Pump Station:
- Pump No. 3 – 750 gpm
- Pump No. 4 – 750 gpm
- Pump No. 5 – 750 gpm

North Pump Station:

- Pump No. 1 – 1,100 gpm
- Pump No. 2 – 1,000 gpm
- Pump No. 3 – 1,000 gpm
- Total 5,250 gpm**

New Facilities

A number of facilities have been added to the existing water system since the last comprehensive plan was prepared in 2004. These facilities include the initial McGarity Pump Station facilities which were under construction at the time of the preparation of the last comprehensive plan. Those facilities include the 300,000 gallon elevated storage tank, the 200,000 gallon ground storage tank, and the pump station with the first two 750 gpm pumps. Other facilities that have been added to the water system include the following:

Ground Storage:

- 750,000 gallon ground storage tank at the North Pump Station
- 350,000 gallon ground storage tank at the McGarity Pump Station

Pumping Facilities:

- Replacement of 900 gpm pump with 1,100 gpm pump at the North Pump Station
- New pump station at the McGarity Pump Station with two 750 gpm pumps
- Additional 750 gpm pump at the McGarity Pump Station

Water Lines:

- Country Club Road Water Line, including 9,200 feet of sixteen inch- and twelve-inch water lines
- Forest Grove Road Water Line, including 1,000 feet of eight-inch water line
- Shady Lane Water Line including 2,200 feet of eight-inch water line
- Southview Drive Water Line, including 12,000 feet of twelve inch water line
- Brockdale Park Road Water Line, including 7,000 feet of eight-inch water line
- Brookhaven Drive Water Line, including 6,300 feet of eight-inch water line
- Stinson Road Water Line, including 11,700 feet of twelve inch water line



- Water line to the fire station, including 320 feet of 12-inch water line
- Rock Ridge Road Water Line Phase I, including 3,500 feet of twelve inch water line
- Osage Lane Water Line, including 2,700 feet of six-inch water line

PARAMETERS FOR FUTURE FACILITIES

Typically, the two principal factors that determine the size and capacity of future water system facilities are the anticipated water demand in the water system and certain facilities design criteria. In the case of the Lucas water system, four other factors will also have an impact on the future water system facilities. These factors are the pending conversion of the water system from two pressure planes to one pressure plane, staging the additions to the water system to account for development, the need to reduce the number of dead end water lines in the system, and the ability of the NTMWD to supply water.

Water Demand

Water demand is a function of the number of people living in the service area and their water usage habits. The population to be served by the water system will include the build out population of 13,274, plus an estimated population of 168 people in the Allen ETJ currently being served by the water system. Accordingly, a total population of 13,442 located within the proposed Certificate of Convenience and Necessity (CCN) will be utilized for determining the water demand that will eventually need to be met by the water system. The size and capacity of future system facilities will be based on this population of 13,442.

Since water demand in the water system service area is based on the population and their water usage habits, historical water usage habits need to be determined in order to establish the projected demands. Based on established water usage habits, the water usage is approximately 250 gallons per capita per day, the maximum day to average day ratio is 2.5, and the peak hour to maximum day ratio is 1.8. With a build out population of 13,442 in the service area, this water usage will result in an average daily demand of 3.36 mgd, a maximum day demand of 8.4 mgd, and a peak hour demand of 15.12 mgd for the water system at build out.

Design Criteria

Different design criteria can be used to determine the size and capacity needed for future system facilities. Minimum requirements for determining the size of storage facilities and pumping facilities are provided by the Texas Commission on Environmental Quality (TCEQ). Per the Texas Commission on Environmental Quality (TCEQ), the water system needs to have at least 200 gallons of ground storage and 100 gallons of elevated storage per connection. More stringent design criteria has been utilized, per previous analysis, for the present water system. This design criteria is based on providing elevated storage to meet peak hour demands in the system. Based on this criteria, the elevated storage needs to have enough capacity to provide for peak hour demand with a reserve of one-third of the total



elevated storage capacity for fire flow. The ground storage requires sufficient capacity to meet a specified portion of the maximum day demand. The pumping capacity in the system needs to be sufficient to meet a specified portion of the maximum day demand. It is recommended that the more stringent design criteria, which has been used in the past for the existing water system, continue to be utilized for system facilities.

Pressure Planes

The existing water system presently operates on two pressure planes. The upper pressure plane is located primarily in the northwest part of the service area. The lower pressure plane serves the rest of the service area. The facilities that provide water to the upper pressure plane are located at the McGarity Pump Station site. The facilities that provide water to the lower pressure plane are located at the North Pump Station site and the Winningkoff Elevated Tank site.

Prior to the establishment of the two pressure planes, the water system was operating on a single pressure plane. One of the goals is to reestablish one pressure plane in order to simplify operation of the water system and improve efficiency. Due to the difference in elevations of the elevated storage tanks serving the existing water system, one strategy is an altitude valve installed at the Winningkoff elevated storage tank. This will allow the two elevated storage tanks to work together in the water system when it is converted to one pressure plane. Additionally limiting connections between the planes and the installation of residential pressure regulating valves (RPRVs) are other strategies for balancing the planes.

ETJ Annexation

The areas within the Lucas ETJ with the highest potential for annexation are already being served by the Lucas waterworks. However, the large ETJ area in the southeast part of the City is not. If this ETJ area is added to the City by annexation, the area would not be added to the water system service area. These areas are currently located within the CCN held by the Wylie Northeast Special Utility District (WNSUD) and the Seis Lagos Utility District (SLUD). In general terms, the WNSUD supplies water to the southeast corner of the city as well as the Inspiration neighborhood within the Lucas ETJ and the SLUD supplies the Seis Lagos and Brockdale Park neighborhoods.

Projected population in this area at build out is 3,892 people. This added population would not increase the projected population in the water system service area at build out. The only potential impact to the Lucas waterworks would be the operation of the SLUD water infrastructure. The WNSUD would most likely not relinquish its system to the City of Lucas.



Dead End Water Lines

There are a large number of dead end water lines in the existing water system. Dead end water lines have to be periodically flushed per TCEQ requirements in order to keep sufficient disinfection levels in the water lines. The City has to devote resources and funds to accomplish this purpose. It is the City's goal to address this situation by reducing the number of dead end water lines in the City thru the addition of water lines that will provide loops to eliminate the longer dead end water lines. Looping lines will eliminate the need to flush the lines, will improve the dependability of the system in the area, and enhancing fire protection. Included in the Appendix is a water system map showing the existing dead end water lines.

PROPOSED WATER SYSTEM

Proposed System Facilities

A number of system improvements will need to be made for the future water system based on water demand, the design criteria for improvements, and the other criteria mentioned in the previous section. The principal facilities needed for build out conditions when the water system service area (without the large ETJ area in the southeast part of the City included in the service area) include the following:

McGarity P.S. Site:

- 1,000,000 gallon ground storage tank
- Pump station with two 1,250 gpm pumps (replaces old pump station)
- 300,000 gallon elevated storage tank

North P.S. Site:

- Replace existing 8" delivery line (from NTMWD) with 12" delivery line
- Pump station with two 800 gpm pumps

Winningkoff Elevated Tank Site:

- Altitude valve with valve vault and piping

The additional facilities needed for build out conditions when the water system service area with the large ETJ area in the southeast part of the City included in the service area.

McGarity P.S. Site:

- Add a third 1,250 gpm pump in the new pump station
- 200,000 gallon elevated storage tank



North P.S. Site:

- 800,000 gallon ground storage tank
- Add a third 800 gpm pump in the new pump station

McGarity P.S. Site:

- Add a third 1,250 gpm pump in the new pump station
- 200,000 gallon elevated storage tank

Water Lines:

- 12" water line along Country Club Road and East Lucas Road
- 12" water line between Brockdale Park Road and Southview Drive

The additions to the water system listed above for both sets of conditions (i.e., with and without the large ETJ area in the southeast part of the City included in the service area) provide the facilities that will be needed in the water system under build out conditions and provide a balanced water system with similar capacity facilities at the two pump station sites.



APPENDIX

Maps included in the Comprehensive Plan are as follows:

- Wastewater System Master Plan Map
- Water System Map
- Thoroughfare Plan Map
- Land Use Map



APPENDIX



DISCHARGE POINT TO THE NTMWD REGIONAL SEWER LINE

2551 COMMERCIAL AREA

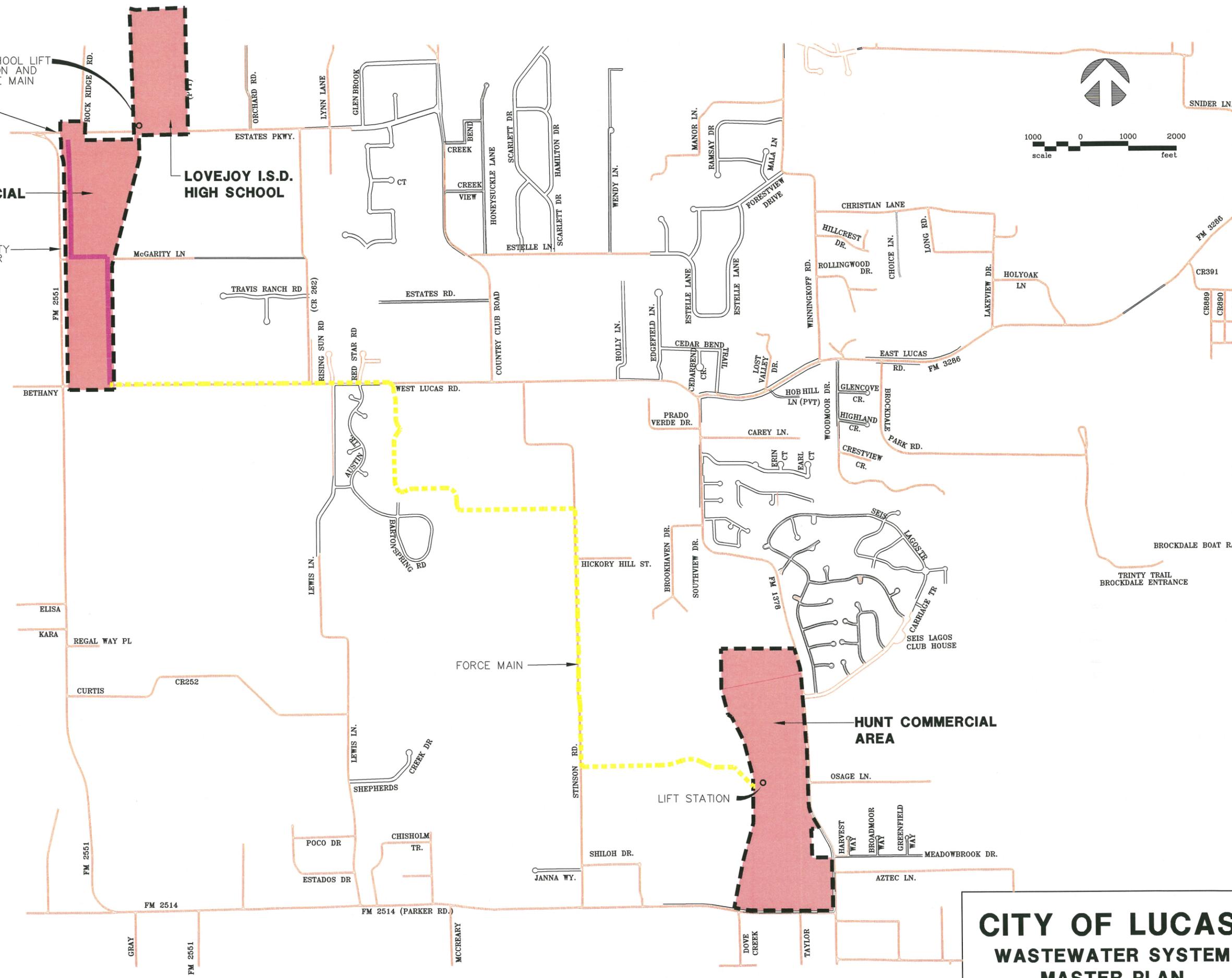
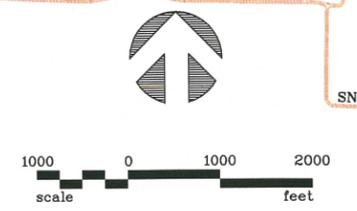
PROPOSED GRAVITY SANITARY SEWER

HIGH SCHOOL LIFT STATION AND FORCE MAIN

LOVEJOY I.S.D. HIGH SCHOOL

HUNT COMMERCIAL AREA

CITY OF LUCAS WASTEWATER SYSTEM MASTER PLAN

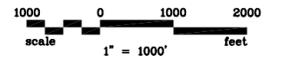


FORCE MAIN

LIFT STATION

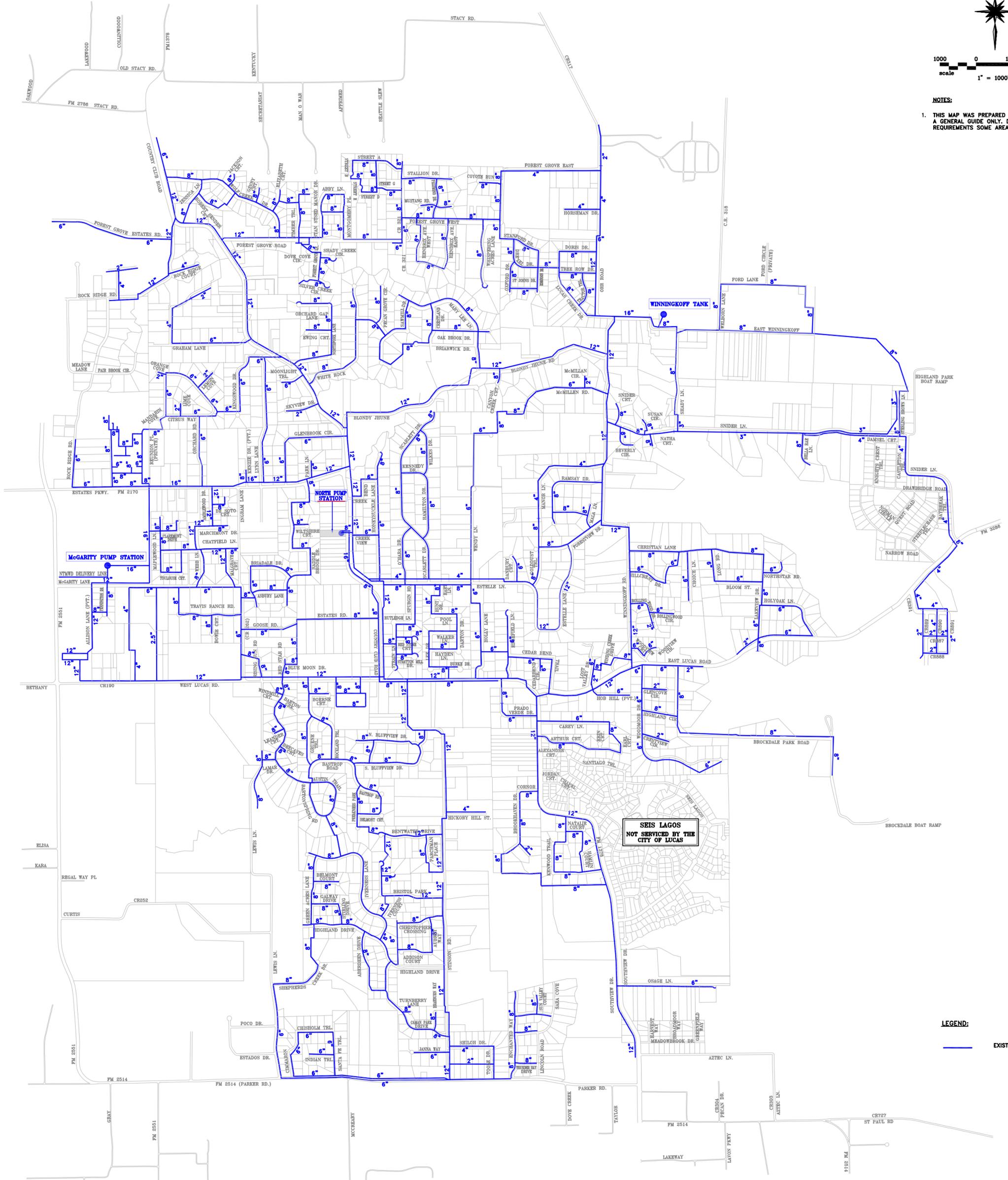
BROCKDALE BOAT RAMP
TRINITY TRAIL
BROCKDALE ENTRANCE

Water System Map



NOTES:

1. THIS MAP WAS PREPARED FOR AND INTENDED TO BE A GENERAL GUIDE ONLY. DUE TO GRAPHIC REQUIREMENTS SOME AREAS ARE NOT TO SCALE.

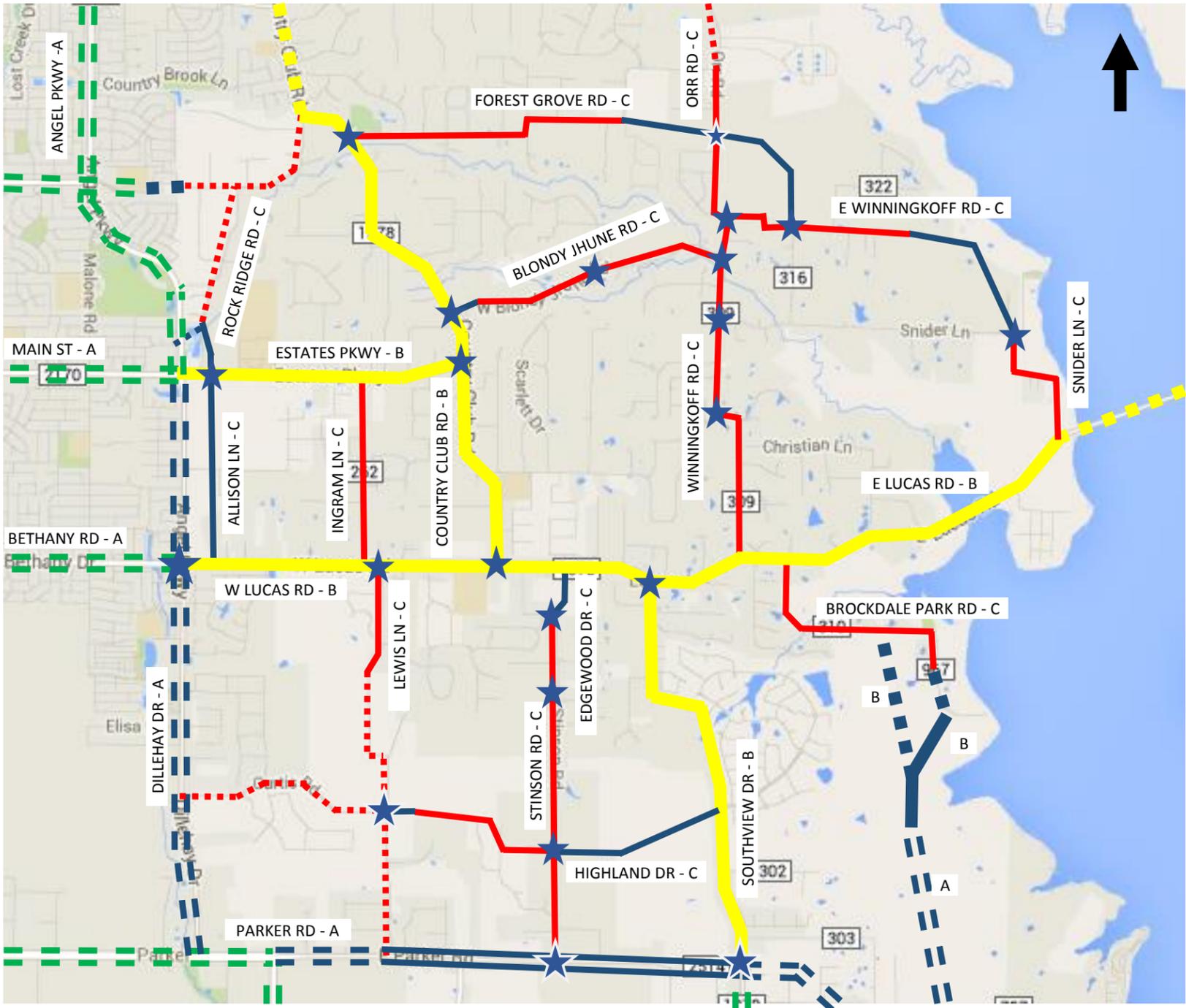


LEGEND:

— EXISTING WATER LINE



2017 Master Thoroughfare Plan



Legend

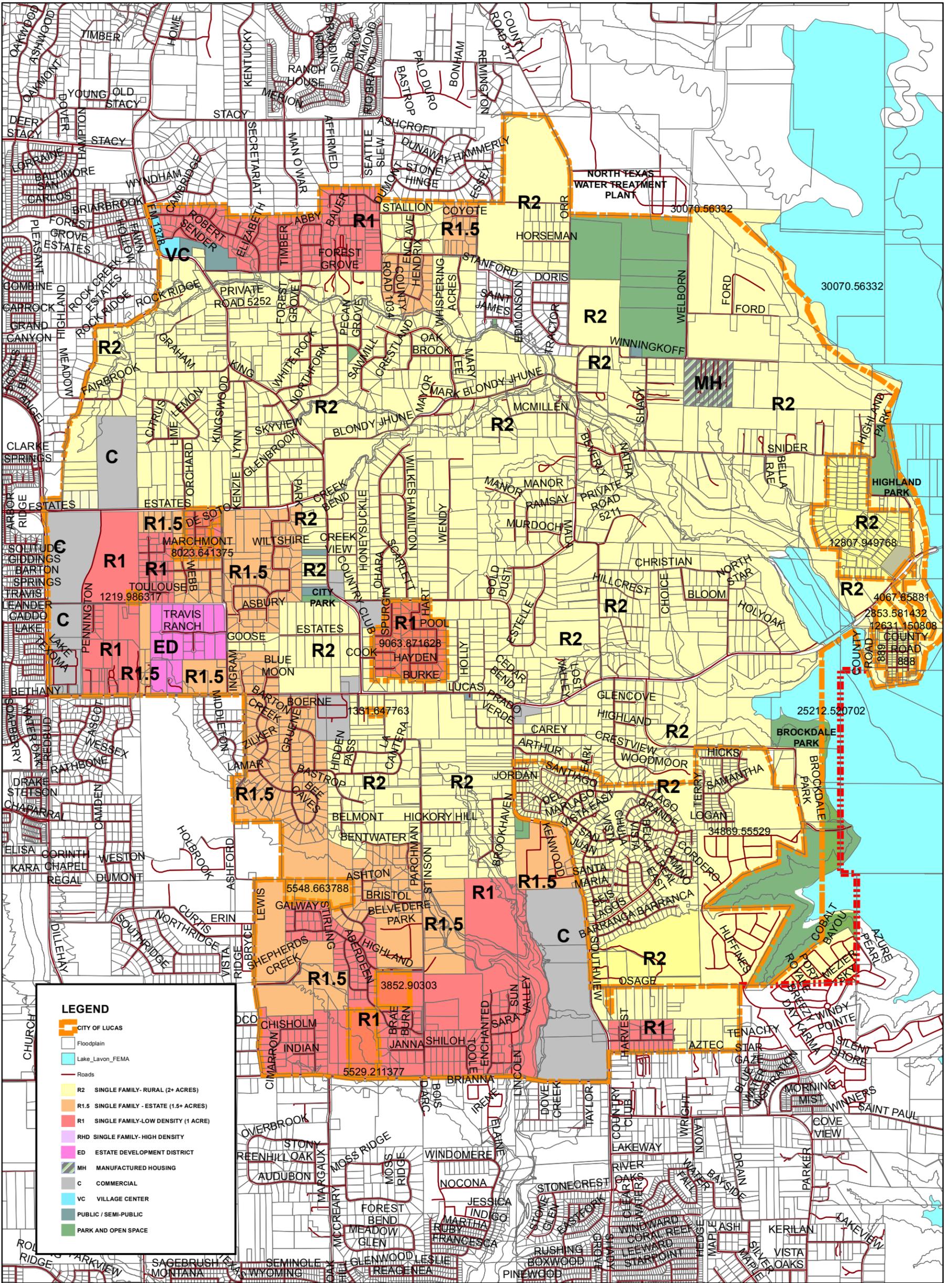
Solid lines are thoroughfares within the city.

Dashed lines are thoroughfares outside the city.

Blue lines are proposed thoroughfares.

★ Blue stars are proposed intersection improvements locations.
Thoroughfare name is followed by thoroughfare type.

Thoroughfare Type	No. of Lanes	Divided Roadway	Pavement Width (Feet)	Right-of-Way or Easement Width (Feet)
A 	Six	Yes	78 Plus a 16-Foot Median	120
B 	Four	No	52 to 54	60
C  Neighborhood Connector	Two	No	24 to 28	50
D (Not Shown)	Two	No	24	50



March 16, 2017



LAND USE MAP

CITY OF LUCAS



0 1,250 2,500 Feet