



# CITY OF LUCAS COMPREHENSIVE PLAN

Updated 2022



Silver Certified City for the Keep Lucas Beautiful Program through the Scenic Texas Organization



Governor's Community Achievement Award from TxDOT and Keep Texas Beautiful



ISO Class 1 Rating  
Highest Public Protection  
Classification Rating Achievable



Lucas Farmers Market  
International City/County  
Management Association's 2022  
Community Partnership Award



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# CHAPTER 1 INTRODUCTION

## PURPOSE

The Comprehensive Plan is a long-range planning tool that defines the overall vision for future growth and development in the city. This, in turn, serves as a basis for decision making by staff, elected and appointed officials, and the general public. 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, and will assist in 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 cities 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 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,
- Maintain a high quality of life for its citizens, 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 identifying 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 Dallas 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, Parker to the southwest, Wylie to the south, St. Paul to the southeast, Lake Lavon to the east, and Fairview to the northwest as shown in Figure 1.1.

The population is estimated at 8,631 in 2021 and contains a total land area of 10,323 acres within the city limits.

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

- Appealing rural atmosphere

# CHAPTER 1 INTRODUCTION

## LOCATION *(continued)*

- Animal friendly neighborhoods
- Exceptional educational systems
- Proximity to services and shopping
- Low crime rate
- High quality housing
- Large lot sizes
- Nearby recreational facilities

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 Lucas a stable and attractive community.

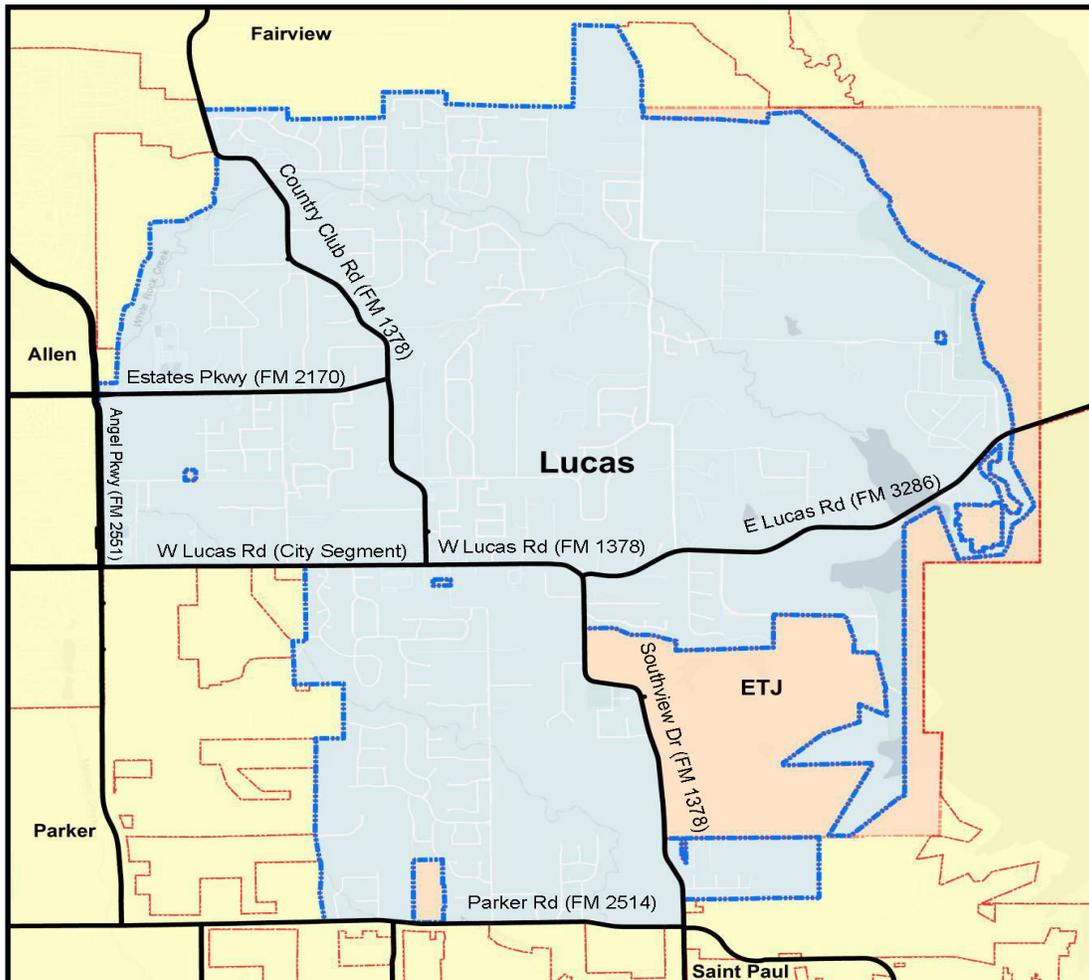


Figure 1.1—City of Lucas, Texas

## CHAPTER 2 POPULATION

One of the most important elements 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 that will be 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 (NCTCOG) Databases on Demographics, and other state agencies. Over the next 25 years the North Central Texas population is expected to grow by five 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 a 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 8,631 in 2021. This represents an annual growth rate of 9.2% and reflects 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 future 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 2035. Based upon all the foregoing assumptions, future population projections for both Lucas and the area within its extra-territorial jurisdiction (ETJ) are shown in Figure 2.1 and illustrated in Figure 2.2.

# CHAPTER 2 POPULATION

## POPULATION PROJECTIONS *(continued)*

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.

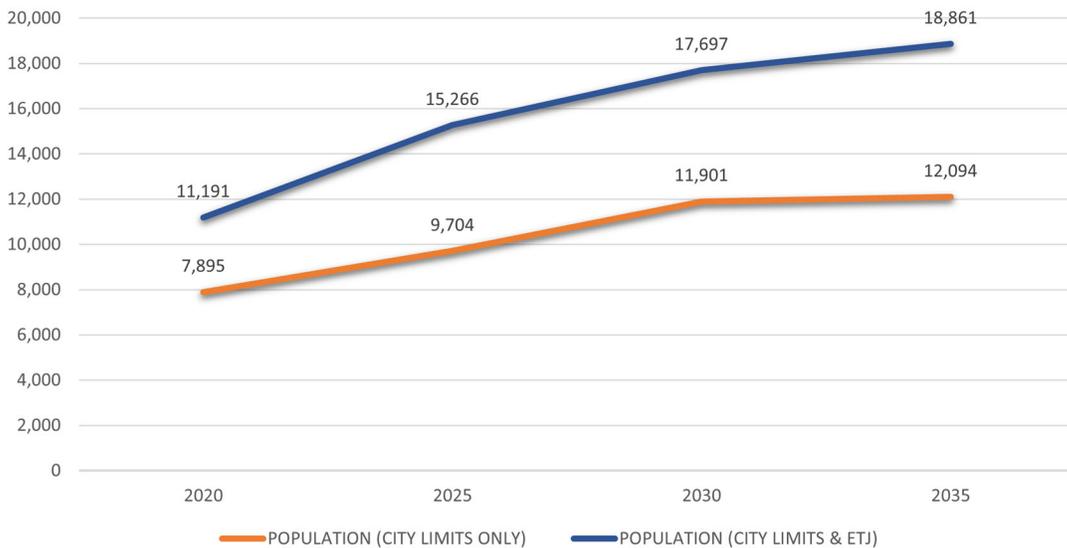
The anticipated population growth will place additional demands on the City’s infrastructure and resources:

- Streets and bridges
- Water and wastewater system (wastewater serves non-residential uses only)
- Stormwater management
- 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.

YEAR	POPULATION (CITY LIMITS ONLY)	PERCENT GROWTH	ANNUAL GROWTH RATE	POPULATION (ETJ)	POPULATION (CITY LIMITS & ETJ)	PERCENT GROWTH	ANNUAL GROWTH RATE
2020	7,895	14.8%	3.5%	3,296	11,191	22.7%	5.2%
2025	9,704	11.1%	2.22%	4,862	15,266	18%	4.5%
2030	11,901	18.5%	3.7%	5,796	17,697	16.2%	3.24%
2035	12,094	1.6%	1.6%	5,951	18,861	6.2%	1.24%

*Figure 2.1 - City of Lucas Population Projections*



*Figure 2.2 - Lucas Population Projections*

# CHAPTER 3 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 and 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 adequate housing of the appropriate types is available to the residents of Lucas.

## EXISTING HOUSING ANALYSIS

As of January 1, 2021, housing inventory in Lucas is:

- 2,680 Single family housing units
- 24 Semi or non-permanent housing units (e.g. Assisted Living Facilities)
- 1,210 ETJ single family housing units
- 3,914 Total housing units

## HOUSING GOALS AND OBJECTIVES

Although Lucas will add dwelling units through new construction, existing units must be adequately maintained 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 their useful service life. To enable the city to direct its efforts in developing 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 utilities.

#### 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 city ordinances and adopted building codes.
- Alleviate maintenance and service issues by upgrading existing infrastructure (water service, streets and drainage) to meet or exceed minimum standards.

# CHAPTER 3 HOUSING

## HOUSING GOALS AND OBJECTIVES *(continued)*

### 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 this 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 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.

## 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, 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 enforcement of the City's ordinances and building codes.
  - Establish or coordinate with existing community groups such as Habitat for Humanity to help those lacking the means to rehabilitate their property.
2. Review zoning ordinance for compliance of development within the city.

# CHAPTER 3 HOUSING

## HOUSING ACTIONS *(continued)*

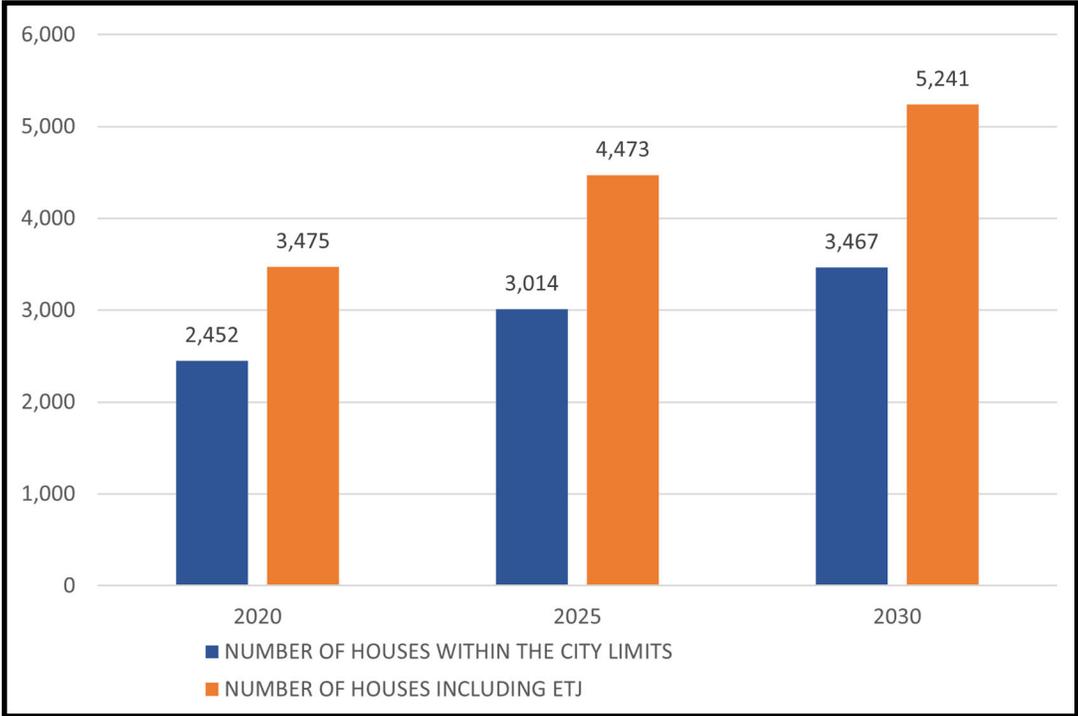


Figure 3.1 – Projected number of housing unit needs for City of Lucas and extra territorial jurisdiction.

# CHAPTER 4 LAND USE

## INTRODUCTION

The land use analysis provides 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 10,323 acres of land while the actual developed area of the city covers 9,008 acres. ETJs cover an additional 1,315 acres. Lucas has annexed all of the pockets of ETJ previously surrounded by corporate limits and the remaining ETJ tracts, excluding those located in the Seis Lagos Utility District for which there are no plans for future annexation, have a development agreement in place providing a timeframe for annexation.

## ANALYSIS OF EXISTING LAND USE

### Residential Land Use

Residential land use consists of 6,045 acres of single-family land use and 43 acres of manufactured homes land use, or 58.98 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. Manufactured homes account for 0.55 percent of total developed land area.

### Commercial Land Use

Commercial land use covers 505 acres or 4.89 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.

Lucas families are served by six independent school districts. The majority and central portion of Lucas are served by Lovejoy ISD with significant portions of the perimeter of the city split between the other districts but no other district having campuses within city limits. Lovejoy ISD has 3 campuses within Lucas. These are Hart Elementary School, Willow Springs Middle School, and Lovejoy High School. Lucas Christian Academy serving grades K-12 is also based in Lucas and serves area families. The public-school districts partially located in Lucas are as follows:

- Allen ISD
- Lovejoy ISD
- McKinney ISD
- Plano ISD

## CHAPTER 4 LAND USE

### ANALYSIS OF EXISTING LAND USE *(continued)*

- Princeton 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 and adjacent land uses.

#### **Industrial Land Use - (These parcels are zoned Light Industrial)**

Industrial land use covers seven acres or 0.07 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 971 acres, or 9.41 percent of the gross land area of Lucas. Streets do not pose any conflicts with other land uses in Lucas.

#### **Public/Semi-Public Land Use**

Public and semi-public land use within Lucas covers 29 acres, or 0.28 percent of the gross land area. Most of this land is utilized for city facilities, cemeteries, and public utilities such as water towers.

#### **Parks Land Use**

Parks land use covers 153 acres, or 1.48 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 at various locations throughout the city. Agricultural and open spaces cover 2,570 acres or 24.9 percent of the gross land in the City of Lucas. 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. This also includes land located in flood plains.

## CHAPTER 4 LAND USE

### **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**

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 ETJ of Lucas includes:

- Land adjacent to Lake Lavon
- A municipal utility district in the southeast corner of the city
- Several pieces of land adjacent to the city

# CHAPTER 4 LAND USE

## ETJ AND FUTURE ANNEXATIONS (continued)

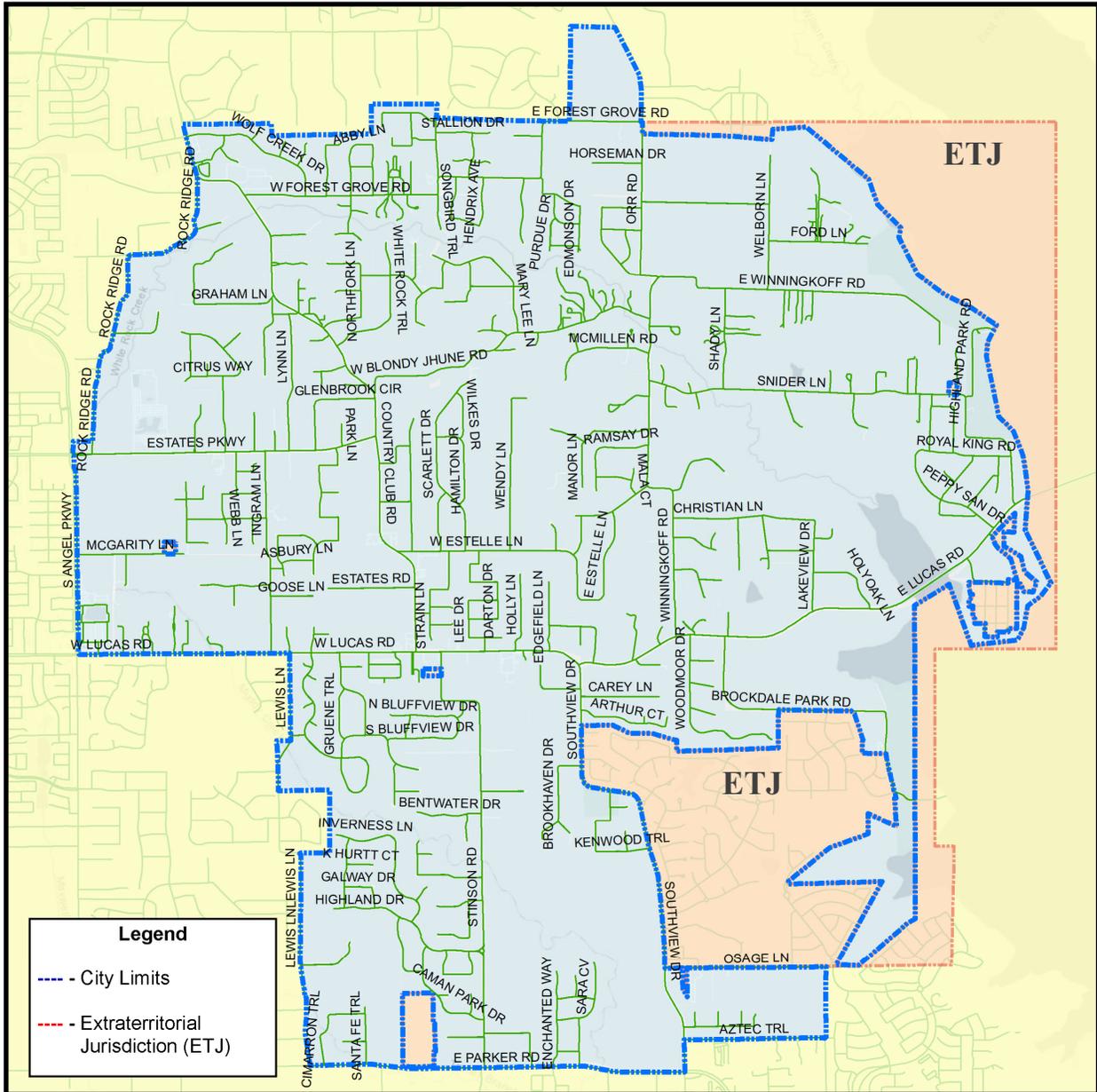


Figure 4.1- City Limits and Extraterritorial jurisdictions (ETJ)

# CHAPTER 4 LAND USE

## ETJ AND FUTURE ANNEXATIONS *(continued)*

The composition of the ETJ area is presented in table 4.3 and figure 4.4. 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 and that some areas of the ETJ are currently located in Municipal Utility Districts that cannot be partially annexed and are not entirely within the Lucas ETJ, thereby preventing them from being annexed. The only available area for annexation at this time, excluding those with a development agreement or Municipal Utility District (MUD), is Trinity Park.

LAND USE	ACRES	% OF GROSS
SINGLE FAMILY — MANUFACTURED HOUSING	1,100.02	83.65
COMMERCIAL	37.44	2.85
INDUSTRIAL	0	0
PARKS	32.39	2.46
PUBLIC/ SEMI-PUBLIC	2.15	0.16
STREETS	103	7.83
AGRICULTURAL AND OPEN SPACE	40	3.04
TOTAL	1,315.00	100

Figure 4.2 - Allocation of Existing ETJ Land Use

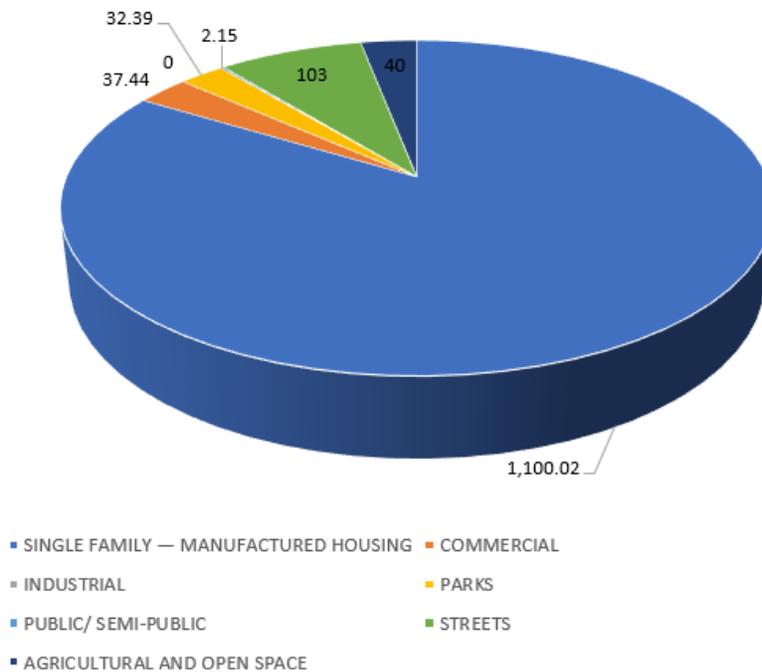


Figure 4.3- Allocation of Existing ETJ Land Use

# CHAPTER 4 LAND USE

## ZONING AND SUBDIVISION REGULATIONS

Lucas has previously adopted zoning and subdivision ordinances. Subdivision Ordinances provide the city with control over development practices within both the city and to a far more limited extent, the ETJ. Zoning ordinances are 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 overall goal of Lucas' land use policy is to optimize land use in order to improve the quality of life of Lucas residents. To achieve this, Lucas needs 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.

To achieve this overall goal, the City of Lucas has carried forward the same goals and objectives established in the past Comprehensive Plan.

## 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 quality commercial 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.

## CHAPTER 4 LAND USE

### **LOCAL GOALS AND OBJECTIVES AFFECTING DEVELOPMENT** *(continued)*

- 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 community residents.

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 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 uses include:

- Must be located to maximize the use of major neighborhood connectors while minimizing excessive traffic impacts on residential roads and neighborhoods.
- Should be limited and compact.
- Must allow for safe automobile/pedestrian access and circulation.
- 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 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.

## CHAPTER 4 LAND USE

### **FUTURE LAND USE** *(continued)*

- 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.

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. analysis of existing land use characteristics
2. effects of existing infrastructure
3. location of existing neighborhood connectors
4. 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.

### **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. Establishing this hierarchy of

## CHAPTER 4 LAND USE

### **RECOMMENDED ASSIGNMENT OF LAND USES** *(continued)*

development density will result in a more cohesive distribution of land uses 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. These locations 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 apparent benefits to the city in preserving areas for 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. Refer to Chapter 6 for detailed information on Parks and Open Spaces.

### **RECOMMENDED LAND USE PLAN**

The Future Land Use Map must be continually updated to reflect changes in the Future Land Use Plan as they take place. 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 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.

# CHAPTER 5

## 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 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 regarding 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 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;
- 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 8,631 persons in 2021, contains a total land area of approximately 10,323 acres. An additional 1,922 acres is located within the ETJs. 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 development is served by on-site sewerage facilities (OSSF), which requires a minimum of one acre for

## CHAPTER 5 ECONOMIC DEVELOPMENT

### **DEVELOPMENT CHARACTERISTICS AND POLICIES** *(continued)*

a residential home site. Most commercial development is served as defined by the Wastewater 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 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 2016-2020, the median household income in City of Lucas is \$174,500, which is almost three times the \$63,826 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 (NTMWD). 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, zoning restrictions, 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

# CHAPTER 5 ECONOMIC DEVELOPMENT

## **DEVELOPMENT CHARACTERISTICS AND POLICIES** *(continued)*

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 among the lowest in cities in Collin County and for cities in the DFW region. (\$0.268016 in 2022)
2. The city has had a fiscally conservative City Council that places an emphasis on providing 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 (FM 1378 and Parker Road).
5. Vacant land for additional housing.
6. Available sewer service in commercially zoned areas as defined by the Wastewater Master Plan.
7. Land prices are higher than regional or state averages.

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. Lucas needs a healthy mix of ad valorem and sales tax revenue. Ad valorem taxes should be used generally for day-to-day

# CHAPTER 5 ECONOMIC DEVELOPMENT

## **DEVELOPMENT CHARACTERISTICS AND POLICIES** *(continued)*

Decisions regarding business location will come from the business owner and their 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 community. Commercial development has benefitted the city with increased tax 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 public meetings 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 community values are maintained, and the city continues as a 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 the 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 its citizens. 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 good sales tax revenues. It is anticipated that planning for the development of similar businesses in the western and southern part of the city in commercial zoning areas will continue.

# CHAPTER 5 ECONOMIC DEVELOPMENT

## **ECONOMIC DEVELOPMENT GOALS AND OBJECTIVES**

Based on input from Lucas citizens, boards, 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 unique 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.

# CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

## INTRODUCTION OF PARKS, OPEN SPACE, AND TRAILS

Lucas is a distinctive community with unique features in design and surrounding natural environments. The city contains a total land area of 10,323 acres and 75 percent (or 7,742 acres) of the land has been developed. The remaining acres of land are vacant or being used for agricultural related purposes. Lucas is primarily comprised of low-density housing, large residential lots, and natural open spaces. Lucas is a hidden gem community with estate style living in the DFW Metroplex that is easily accessible to public parks, trails, recreational activities, and Lavon Lake. The city's entire eastern boundary borders along Lavon Lake and the Trinity Trail, which is a 25-mile trail designated for equestrian and pedestrian use only. There are three public parks, one private park, and three public trailheads located in Lucas; however, there is no planned or designated open space system.

The City Council appoints a Parks and Open Space Board (POSB) that serves in an advisory capacity to the City Council in all matters relating to parks and open space. The POSB makes recommendations on the implementation of beautification programs and projects to enhance the natural beauty of Lucas. During this update of the Comprehensive Plan, the city worked with POSB on making necessary revisions to help provide guidance on future planning for parks, open space, and trails. This collaboration has also led to an update of the Trails Master Plan (TMP) where new trail sections have been added to show the connectivity between neighborhoods, public parks, facilities, and the Trinity Trail. The updated Parks, Open Space, and Trails Master Plan (POSTMP) continue to place an emphasis on providing public access to recreational opportunities while preserving the natural environment of Lucas.

## PREVIOUS PARKS AND OPEN SPACE MASTER PLANS

**1988** – The first Comprehensive Plan for Lucas was adopted in 1988 and included a section on parks which indicated there were no recreation areas within the city. The plan revealed there was a lack of open space and recreation areas that needed to be addressed as the city continued to be developed.

**2003** – The City Council adopted Ordinance No. 2003-11-00490 entitled Park Land Dedication to provide requirements for park land dedication in new residential and mixed-use subdivisions and to provide for necessary planning for open space preservation and park development. The Ordinance states the following requirements for park land dedication:

- The city shall create and maintain a master park plan.
- The master park plan shall designate the size of the parks and the park zones that are to be supportive of these parks.
- Dedication of park land shall be in accordance with the master park plan.
- The city will determine the park location based on land suitability.
- This master park plan may be, from time to time, updated and amended at the discretion of the city.

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### PREVIOUS PARKS AND OPEN SPACE MASTER PLANS *(continued)*

**2004** – The city completed an update to the Comprehensive Plan which included a section on parks and open space. A community survey was conducted to determine interest regarding parks, open space, and recreational amenities.

**2005** – Lucas moved forward with developing the POSTMP. The city conducted another citizen survey to verify the accuracy of past survey results. The survey findings suggested that citizens were most interested in multi-purpose trails (walking, hiking, and biking), undeveloped open space, picnicking/pavilions, fishing piers, and equestrian trails/arena. These top preferences can be attributed to the rural character of Lucas and its proximity to Lake Lavon.

Public workshops and meetings were held to obtain additional public input where the citizen concerns were also found to be consistent with the citizen survey results. The citizen group agreed that Lake Lavon was a major resource for Lucas. This led to recommendations to preserve park land along the lake and that the trail system should also link residential neighborhoods to the lake.

**2006** – The POSMP was adopted by the City Council and serves as the master plan for the physical development of the city to provide recommendations for its growth, development, and beautification.

**2015** – The City began efforts to update the Comprehensive Plan and the POSMP. These efforts included town hall meetings and workshops to receive citizen feedback about local parks, recreation, and open space priorities. POSB took on an active role in recommending updates including developing the TMP.

**2017** – The City Council approved the Comprehensive Plan which included the TMP and updated POSMP. The Trails Master Plan designates all trails east of FM 1378 (Country Club Road) to be equestrian and hiking trails. All trails west and south of FM 1378 are designated as multi-purpose trails.

**2021** – In this newly updated Comprehensive Plan, POSB recommends new changes to the TMP located in the southern trail section (Willow Springs Middle School to Southview Drive) and northern trail section (Trinity Trail Connect). POSB has prioritized sections of the TMP based on connectivity to schools, public facilities, and access points to the Trinity Trail. The POSB has also expressed an interest in the expansion of existing parks to accommodate more visitors as the population grows.

### EXISTING PARKS AND OPEN SPACE

The City of Lucas operates three public parks in addition to having preserved considerable open space and accessibility through the development process. The City's public parks are the Lucas Community Park, Kenneth R. Lewis Park, and Forest Creek Park. There is a private park which is located in the Stonegate subdivision. Brockdale Park and Highland Park are also located in Lucas; however, the parks are located on land owned by the U.S. Army Corps of Engineers (USACE). Lucas has three accessible trailheads available to the public: East Winningkoff Trailhead, Brockdale

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### EXISTING PARKS AND OPEN SPACE *(continued)*

Park Trailhead, and Highland Park Trailhead. The city owns and maintains the East Winningkoff Trailhead which provides trail access in the northern area of Lucas. The USACE owns and maintains the Highland Park and Brockdale Park Trailheads which provide trail access on the eastern areas of Lucas.



#### **LUCAS COMMUNITY PARK**

665 Country Club Road

The city established the Lucas Community Park in 2009 and is located south of City Hall. The park is three acres and offers a five-foot-wide concrete sidewalk that circulates around two adjacent walking loops. The park also includes a pavilion, picnic tables, benches, barbecue grills, fire pit, and a large playground. Lucas residents and non-

residents have the option to reserve the pavilion for a fee. There is also the Community Center located on the west area next to a gravel parking lot. The Community Center is only available to Lucas residents to reserve at no cost. The facility provides an opportunity for residents to utilize the event space and rooms for special occasions. There is a public parking lot located between City Hall and the park. Improvements were made to the gravel parking lot to expand parking capacity during special events. Drainage improvements were made to the western park loop to prevent any flooding from that area of the park.

#### **KENNETH R. LEWIS PARK**

820 Southview Drive

Kenneth R. Lewis dedicated park land to the city in 1989. The park became known as Kenneth R. Lewis Park and is situated on five acres. Two-thirds of the park is open space and undeveloped for use with recreational activities. The park includes a baseball/softball field with a dugout, soccer fields, pavilion, restroom facilities, and public parking. There is also a concrete pathway surrounding the park that is available for walking.



#### **FOREST CREEK PARK**

985 Orchard Gap Lane

Forest Creek Park is a neighborhood park located near the subdivisions of Forest Creek Estates, White Rock Creek Estates and Northfork Ranch in the northern section of Lucas. The public can access the park from Country Club Road via Orchard Gap Lane off Norfolk Lane or White Rock

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### EXISTING PARKS AND OPEN SPACE *(continued)*

Trail. The park is two-acres consisting of a parking area, pavilion, two playgrounds, open space, sport court, and soccer field with goals. The city made park improvements to remove dilapidated structures which accumulated within the vicinity of the park. As part of the park renovations, the city also added a sport court, soccer goals, pavilion, and picnic tables.



#### **STONEGATE PARK**

St. James Drive

Stonegate Park is a private park located within the gated neighborhood of Stonegate in the northern section of Lucas. The park does not have a property address, but it is situated between 150 and 250 St. James Drive. Stonegate Park is only accessible to residents within the Stonegate neighborhood. This is a very small neighborhood park

occupying less than one acre adjacent to one of the tributaries of White Rock Creek. The park offers a traditional multiuse playground, small gazebo, picnic tables, and two-foot-wide concrete sidewalk that passes through the park. The sidewalk connects to a concrete trail that continues alongside the tributary of White Rock Creek.

#### **EAST WINNINGKOFF TRAILHEAD**

745 East Winningkoff Road

In 2017, the city developed the East Winningkoff Trailhead located in the northeast section of the city. The trailhead sits on three acres of land with equestrian and pedestrian access to the Trinity Trail. The trail access point connects to an unimproved trail along East Winningkoff Road to Welborn Lane that connects to the Trinity Trail. The trailhead offers a large gravel parking lot for loading and unloading of horses. Additional facilities include a corral, pavilion, restroom, and access to water.



#### **BROCKDALE PARK TRAILHEAD**

1625 Brockdale Park Road

Brockdale Park was established in 2005 and is located on the eastern edge of Lucas next to Lavon Lake. This park is situated on land owned by the USACE. Brockdale Park is 127 acres which includes the Brockdale Park Trailhead, boat ramp, and the Blackland Prairie Raptor Center. The Brockdale Park Trailhead provides recreational trail access to the Trinity Trail along

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### EXISTING PARKS AND OPEN SPACE *(continued)*

Lake Lavon. The trailhead includes parking, equestrian loading/unloading area, riding arena, restroom facility, pavilion, corral, and access to water. The Brockdale Park boat ramp is located east of the trailhead which allows access to Lake Lavon. The boat ramp has public parking available for vehicles, trailers, and boats. This provides access to recreational activities on the lake for those who enjoy boating and fishing activities. The Blackland Prairie Raptor Center is a non-profit organization that is located on the land area of Brockdale Park. The Blackland Prairie Raptor Center is dedicated to environmental preservation through public education and the conservation of birds of prey and wildlife in their natural habitat.



### HIGHLAND PARK TRAILHEAD

1955 Snider Lane

Similar to Brockdale Park, the USACE owns and maintains Highland Park. Highland Park is located at the northeast edge of Lucas and is approximately 59 acres. The park has a parking area and restrooms with relatively minimal services onsite. Highland Park provides a boat ramp at the north end of the park for boating and fishing activities on

Lavon Lake. The entrance to the boat ramp is through Highland Park Road which is located north of Snider Lane. The boat ramp is concrete with ample parking for trailers and vehicles. Trinity Trail passes through Highland Park and provides access points to the trail. A section of the Trinity Trail continues north past the limit of Highland Park to the northern section of Lucas near the NTMWD Treatment Plant. The Highland Park Trailhead is located south of Highland Park where the public can load and unload their horses to utilize the trail system. The trailhead includes facilities such as a loading/unloading area, ADA compliant restrooms, one pavilion, and a watering place for horses.

### OPEN SPACES AND NATURAL FEATURES

Open space is defined by the U.S. Environmental Protection Agency (EPA) as any open piece of land that is undeveloped and is accessible to the public. There are no buildings or other structures located on land designated as open space. Open space can include school yards, playgrounds, public seating areas, public plazas, vacant lots, and green space. Green space is land that is partly or completely covered with grass, trees, shrubs, or other vegetation including parks, community gardens, and cemeteries. The city's desire to preserve open space is outlined in the Park Land Dedication Ordinance which includes different options for the handling of park land dedication and the preservation of open space in Lucas. Lucas also has other forms of open space such as trail easements and federal land surrounding Lake Lavon. The most important natural feature in Lucas is Lake Lavon and its tributary creeks. Lake Lavon was constructed in 1954 and is owned and controlled by the USACE. There are 20 acres along the lake designated for park use (Brockdale Park and Highland Park) located within the City's boundaries. The public has access to these parks, the trail system, and the lake for recreational activities.

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### EXISTING TRAILS

The Trinity Trail and the connecting trail from the East Winningkoff Trailhead is currently the only public trail in-use that exists in Lucas. The trail is only open for recreational use to equestrians and hikers. The Trinity Trail is situated along Lake Lavon with scenic views of the lake and surrounding natural landscape. The trail is unpaved and 25.5 miles long located on federal land owned by the U.S. Army COE. The trail extends from the south at the East Fork Trailhead in Wylie to the north at the Giant Sycamore Loop in Fairview. There is approximately 11 miles of the Trinity Trail that passes through Lucas. This trail enters the city from the south at Collin Park in St. Paul and stretches north along the edge of the lake passing through Brockdale Park and Highland Park.

The Trinity Trail is operated and maintained by the Trinity Trail Preservation Association, a non-profit organization dedicated to the preservation and maintenance of the Trinity Equestrian and Hiking Trail. The city partners with the Trinity Trail Preservation Association and the USACE for a Public Lands Trail Cleanup where volunteers pick up trash and debris on sections of the Trinity Trail. The city also entered into a Memorandum of Understanding between Collin County and the USACE to work together in coordinating and supporting the development and operation of a multi-use trail for equestrian and pedestrian use at Lake Lavon. This partnership helps determine goals related to the planning, development, maintenance, and operation of the Trinity Trail, Brockdale Park Trailhead and Highland Park Trailhead.

### PROPOSED FUTURE TRAILS

During development of the POSMP, the city conducted a community survey and held public meetings to collect feedback from residents related to parks and open space. Residents ranked trails as the number one interest for parks and open space in the community survey. When the city began updating its Comprehensive Plan, POSB worked towards developing the TMP which focuses on three primary trail sections within Lucas: 1) Central Loop, 2) Northern Trail (Trinity Trail Connect), and 3) Southern Trail (Willow Springs Middle School to Southview Drive). In order to ensure the safety of all users along the trail system, the TMP designates all trails east of FM 1378 (Country Club Road) as equestrian and hiking trails. The trails west and south of FM 1378 are designated as multi-purpose trails to prevent potential safety risks between horse riders, bicyclists, walkers, and hikers.

#### Central Trail Loop

POSB has prioritized the Central Loop in the TMP as the number one trail priority. The Central Loop is a multi-purpose trail focused on connectivity to schools, public facilities, churches, and businesses. There are three major schools located along the Central Loop: Hart Elementary School, Willow Springs Middle School, and Lovejoy High School. The loop also connects to City Hall, the Fire Station, and the Lucas Community Park. The trail loop would begin at West Lucas Road/Allison Lane, extend east to and north on Country Club Road, west onto Estates Parkway, and south on Allison Lane returning to West Lucas Road. There would also be a trail connection through Ingram Lane to connect West Lucas Road and Estates Parkway. As the Texas Department of Transportation (TxDOT) works on the roadway expansion along Angel Parkway, the city may

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### **PROPOSED FUTURE TRAILS** *(continued)*

want to consider a potential trail connection from the Central Loop. This would allow residents to connect to retail and dining establishments in the main commercial area of Lucas.

#### **Northern Trail (Trinity Trail Connect)**

The Northern Trail (also known as Trinity Trail Connect) is considered second priority on the TMP. The Trinity Trail Connect is an equestrian and pedestrian trail that connects to the East Winningkoff Trailhead and has access points to the Trinity Trail. This trail consists of two loops which are centrally connected to the East Winningkoff Trailhead. These two loops would allow recreational access for residents who live in the northern area of the city. Public parking is available at the East Winningkoff Trailhead where users could walk or ride horses on the trail and connect to the Trinity Trail through access points.

The first trail loop extends west from Welborn Lane, south on Orr Road, east on Winningkoff Road, and returns north onto Welborn Lane. The second trail loop creates a connecting southern section that extends south from East Winningkoff Road onto Shady Lane, west on Snider Lane, and north on Winningkoff Road.

#### **Southern Trail (Willow Springs Middle School to Southview Drive)**

The Southern Trail (also known as Willow Springs Middle School to Southview Drive) is considered third priority in the TMP. This trail would connect the southern neighborhoods to Willow Springs Middle School and Kenneth R. Lewis Park. The trail would begin on the eastern side of Willow Springs Middle School on West Lucas Road and continue south to the back of the school connecting to North Bluffview Drive. The trail would extend south through Hidden Pass Lane, west on South Bluffview Drive, south and east on Bastrop Road connecting to Stinson Road. The trail would continue south along Stinson Road, passing Highland Drive, extend east to Southview Drive, and continues north connecting to Kenneth R. Lewis Park. It is desirable to develop a small trailhead in the southern trail section but due to undefined development, the location has not yet been identified.

### **GOALS AND OBJECTIVES**

The City continues to make improvements and pursue special projects to achieve the goals established in the Comprehensive Plan. The goals and objectives were developed in coordination with previous comprehensive and community planning. The POSTMP help outline a prioritized plan for the development of parks, open space, and trails in Lucas. Since 2017, the city has taken major efforts to achieve these goals such as the development of the East Winningkoff Trailhead, renovation at Forest Creek Park, maintenance at Kenneth R. Lewis Park, and improvements at Lucas Community Park. The city has submitted trail grant applications to be considered for TxDOT Safe Routes to Schools Project, Texas Parks and Wildlife Department Recreational Trails Grant, and Collin County Parks and Open Space Project Funding Assistance Program. The city continues to monitor for new grant application opportunities and identify potential special projects

## CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

### **GOALS AND OBJECTIVES** *(continued)*

that would be deemed eligible. Lucas supports the following goals and objectives when considering new projects for parks, open space, and trails.

#### **GOAL 1**

Preserve natural environment and native ecosystems.

##### **Objectives:**

- Conserve and protect ecologically sensitive and naturally beautiful areas (e.g., floodplains along creeks, wetlands, high points with scenic views toward Lake Lavon, etc.).
- Establish and/or enhance green space and natural areas along flood plains, and promote public access to green belt areas with trail systems, equestrian/hiking trails, etc.
- Encourage and promote water conservation using native plant materials, Smartscape 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 TMP to include green belt and open space that is compatible with the environment and compatible with residential neighborhoods.

##### **Objectives:**

- Continue to update Chapter 6, Parks, Recreation and Open Space of the Comprehensive Plan to meets current preferences and reflection of changing environment in the region.
- 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 parks 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 connect schools, parks, and residential areas locally and regionally.
- 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 TMP” approved by the Collin County Commissioners Court on May 7, 2012.
- Coordinate planning efforts and trail connection points with adjacent cities.

# CHAPTER 6 PARKS, RECREATION AND OPEN SPACE

## GOALS AND OBJECTIVES *(continued)*

### 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 as well as the expansion and redevelopment of existing park facilities
- 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 local, state, and federal grant opportunities.

## PLAN AND RECOMMENDATIONS

The purpose of this plan and recommendations are to provide community direction in a constantly changing environment. The city collaborates with community stakeholders when considering new projects related to public parks, open space, and trails. As the Lucas population continues to increase, the POSB recommends focusing on the expansion of existing parks to accommodate visitors and additional space. Lucas Community Park is a popular park used by the city for large-scale special events and it has become evident that public parking is limited. Special events at the park have become large community gatherings where the city may want to consider expansion in the future. In addition to parks and open space, the City has updated its TMP by examining practical trail locations that would not impede on a resident's property.

POSB has developed an adopt-a-park program where each board member visits a city park on a rotational basis to help recommend park improvements to the city. To further help achieve the goals in this plan, the city's Keep Lucas Beautiful program continues to promote the beautification and natural preservation of Lucas. As the city considers future planning and decision making related to parks, open space, and trails, the following recommendations are intended as a guide for the POSTMP.

- Trails (equestrian, hiking and biking), greenbelts, parkways or paths should connect to large recreational areas and provides access to recreational opportunities and scenic views.
- Prioritization of the TMP beginning with the Central Loop, Northern Trail (Trinity Trail Connect), and Southern Trail (Willow Springs Middle School to Southview Drive).
- Expansion of existing parks to accommodate additional space and public parking during special events.
- Municipal recreational facilities should be used to serve the community and prevent the construction of redundant facilities.
- School recreational facilities are encouraged to make their facilities available to the public when practical. If possible, school recreational areas should include parking, drinking fountains, restrooms, and remain open on weekends and during the summer months.

# CHAPTER 7

## 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, 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. 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, dedicate additional right-of-way, install improved drainage facilities, and use appropriate road construction materials.

### DRAINAGE

To protect property from flooding, it is imperative to facilitate drainage through natural and designed drainage systems. 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 properly designed, sized, constructed, and maintained. Storm drainage facilities include inlets, culverts, bridges, concrete lined channels, natural drainage channels, swales, creeks, 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 can erode the road base, cause sections of roadway to fail, and lead to loss of traction on the road. Currently roadway drainage is primarily handled via open channels and culverts. Maintenance in these channels is needed to avoid overgrowth of trees and other vegetation. Overgrowth can make roads difficult to drain and roots can undermine the structural stability of the pavements. As a result, the drainage

# CHAPTER 7

## STREETS AND DRAINAGE

### **DRAINAGE** *(continued)*

system is discussed in conjunction with the streets system in this chapter.

### **BRIDGES/CULVERTS**

Bridges and culverts are important parts of the infrastructure in the city. Both provide passage for transportation, usually over running water. While there are technical differences between bridges and culverts, for the purpose of thoroughfare planning, the road segment is the object of analysis independent of the engineering design characteristics of crossings, insofar as the decision to maintain such connections determines major traffic routes regardless of how the crossing is ultimately achieved. The City of Lucas has the following bridges/culverts over waterways along city-maintained thoroughfares:

- West Blondy Jhune Bridge
- East Blondy Jhune Bridge
- Snider Lane Bridge
- Stinson Culvert
- Winningkoff Bridge

By maintaining these bridges/culverts, Lucas maintains connection across the locations where these segments span. The decision to define these segments as thoroughfares necessitates the maintenance of these drainage/roadway assets. Additional roadways exist over waterways along local streets. These are not included in the thoroughfare plan because they do not carry through traffic and may be added, removed or modified by individual developments at a smaller scale.

The Texas Department of Transportation (TxDOT) maintains additional crossings over watercourses at the state's discretion so, while the same principle concerning the street segments does apply, the city has no direct ownership or control over these crossings.

### **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. TxDOT controls the traffic signals at these intersections:

- West 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 are classified as arterials (Type A and B), neighborhood connectors (Type C), and local streets (Type D). All of these roadways provide different levels of access and serve

# CHAPTER 7 STREETS AND DRAINAGE

## STREET CONFIGURATION AND FUNCTIONAL CLASSIFICATION *(continued)*

varying levels of traffic volume.

The highest level of roadway in Lucas is the arterial, which carries larger volumes of traffic based upon the number of lanes, with limited access connections. Most of these arterial roads are classified as Farm to Market (FMs) roads. Established in Texas through legislation in 1949, Farm to Market Roads exist as secondary state highway transportation systems connecting rural or agricultural areas to towns and city centers. The FMs have become an integral part of many Texans' daily commute. TxDOT maintains the state's FMs within the City of Lucas which consist of the following:

- FM 1378 Country Club Road and Southview
- FM 2514 Parker Road
- FM 3286 East Lucas Road
- FM 2551 Estates Parkway

The City of Lucas maintains one portion of Class B arterial street, the segment of West Lucas Road connecting Angel Parkway to Country Club Road. Lucas assumed maintenance of this road from Collin County in the 1990's. It was previously a gravel road.

The neighborhood connector carries less traffic utilized for mostly local trips and has a higher level of access. These neighborhood connector streets are owned and maintained by the city and consist of the following:

- Blondy Jhune Road
- Forest Grove Road
- Ingram Lane
- Lewis Lane (the City manages 600 feet of the northern section that is within the City of Lucas)
- Orr Road
- Rock Ridge Road (the City manages 300 feet of the southern section within the City of Lucas)
- Stinson Road
- Snider Road
- Winningkoff Road

Additional neighborhood connectors for consideration to serve future development and public safety consist of:

- The construction of Allison Lane from West Lucas Road to Estates Parkway

Additional residential/local streets (Type D) may include:

- Highland Drive from Stinson Road to Southview Drive.
- Completion of northern loop from Orr Road to the east, heading south to East Winningkoff Road.

# CHAPTER 7 STREETS AND DRAINAGE

## **STREET CONFIGURATION AND FUNCTIONAL CLASSIFICATION** *(continued)*

The remaining streets in the city function as local streets. Local streets have direct access to every parcel and carry a more limited volume of traffic. The 2022 Master Thoroughfare Plan representing the street network in the City of Lucas is located in the Appendix.

## **STREET SYSTEM EVALUATION**

Like other elements of public infrastructure, a street system should be understood as a portfolio of capital assets and must be managed accordingly. Therefore, it is essential that the city have a street condition assessment and management system in place before beginning major improvements to roadways. This system helps 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 infrastructure. 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 in detail 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 would be performed. This evaluation includes collecting data on the existing roadway conditions and rating evaluated elements for adequacy.

The criteria for the condition assessment are based on criteria which was adapted to the city needs. This condition assessment assists in identifying roadways that are candidates for maintenance, repair or total reconstruction.

## **EXISTING STREET CONDITIONS**

In 2022, the city conducted a pavement condition assessment to gather data to better prepare maintenance and rehabilitation planning. This initial assessment gathered data from approximately 75 miles of city-maintained roadways and assigned ratings using a 5-tier rating model based on the Pavement Surface Evaluation and Rating (PASER) system, a system developed to evaluate the condition of road segments. The city will update this data collection annually for initiative-taking maintenance planning, preservation activities towards maintaining an acceptable rating, and use resources effectively by identifying segments most in need of repair to help extend the life cycle of the city's roadways. See Figure 7.1 Pavement Condition Rating and Percentage.

# CHAPTER 7 STREETS AND DRAINAGE

## EXISTING STREET CONDITIONS *(continued)*

Future road project are ranked according to priority as follows:

### 1) Street Paving

A large number of streets in the city are paved, have acceptable pavement width and are in fair to good condition. A number of asphalt streets are demonstrating signs of potential failure due to inadequate road bases, poor soil condition, heavy traffic volumes, age, and drainage issues.

Pavement Condition Rating		Maintenance Methods
1	Excellent	New Pavement
2	Very Good	Crack has been sealed
3	Good	Crack Seal/Chip Seal/Routine Maintenance
4	Fair	Minor Rehabilitation
5	Poor	Major Rehabilitation

### 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 open channels along some roadways as well as the silted or undersized culverts. These channels and culverts allow water to flow across and under roadways causing premature damage. Potholes, cracks, and slumped pavement are examples of what can happen when the road base is allowed to erode.

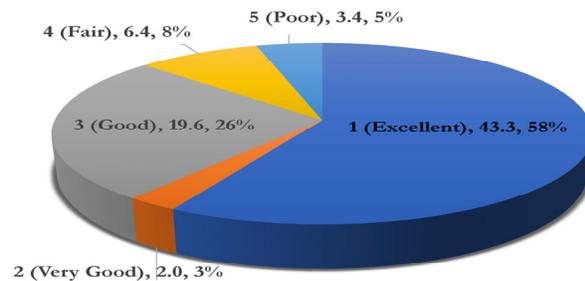


Figure 7.1 - Pavement Condition Rating and Percentage

### 3) Street Right-of-Way

Many of the roadways appear to need additional right-of-way to address drainage issues. Existing channels are too close to the road base, allowing water to impact road conditions. These narrow rights-of-way allow trees to grow too close to the roadways. When the right-of-way is not cleared or maintained, tree roots have been found to burrow under the roadway causing damage to the pavement.

### 4) Surface Conditions

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

# CHAPTER 7 STREETS AND DRAINAGE

## **EXISTING STREET CONDITIONS** *(continued)*

### 5) Street Width

Undersized roadways in the city can hamper vehicular circulation. Design consideration should include proper street widths for new and newly reconstructed roadways.

## **TYPES OF STREET IMPROVEMENTS**

There are several different methods of maintaining streets within a city. The appropriate choice depends 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 sealcoating 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 remove the existing pavement and new asphalt, or reinforced concrete pavement is installed. The goal is to construct pavement that has a minimum 20 year life span.

## **DRAINAGE SYSTEM ANALYSIS**

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

Annual precipitation in Lucas is approximately 42 inches per year. Rains are heaviest in spring and fall. City streets are crowned to promote open channel drainage on each side of the street.

# CHAPTER 7

## STREETS AND DRAINAGE

### **DRAINAGE SYSTEM ANALYSIS** *(continued)*

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 floodway defines the area where buildings are not eligible for flood insurance, while those located in the flood fringe may be eligible once floodproofing is implemented, but development should still be avoided in these locations in favor of alternatives. The goal of this program is to curtail development in floodplain areas, thereby reducing damage to structures and minimizing the danger to people during flooding events. Lucas is a participating city in the National Flood Insurance Program (NFIP).

Collin County, TxDOT, and USACE 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**

Creeks are the natural drainage courses that stormwater will follow and will generally flood during storms. Most large channels have their flood carrying capacity indicated by FEMA 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. In theory, any property has some chance of flooding given enough rainfall. Flood ways fill first followed by each level of floodplain, then non-floodplain areas.

#### **Water Channels**

A significant portion of the flooding that occurs in the city is associated with open channels 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 channels, it is possible for it to take several days for stormwater to fully drain or dry out in some locations. These channels are designed to convey surface water. Certain facilities, such as detention or retention ponds, are intentionally built to slow down water flowing through them so that downstream channels do not overflow. Impervious surfaces and changes to drainage patterns can cause issues, so these facilities must be actively maintained.

#### **Culverts**

Some structures in the street system do not lend themselves to adequate drainage when the facilities exist perpendicular to the natural flow lines. It is necessary to construct culvert pipes under roadways to allow a path for drainage under those roadway segments. In cases where culvert passage is silted, undersized or not provided, stormwater can cause premature damage to roadways and major safety problems.

# CHAPTER 7 STREETS AND DRAINAGE

## 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.

## 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 is not recommended.

The city has adopted specific street section designs based on roadway classification. 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. Increased traffic due to growth, new commercial development, and changes in city maintenance practices can revise 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.

Proposed improvements should be based on the street analysis, focusing on improvements that impact safety, are the most cost effective in the long term, 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. 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.

## POSSIBLE FINANCIAL SOURCES FOR IMPROVEMENTS

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 (e.g., Collin County, TxDOT, NCTCOG)
- Development Fees

# CHAPTER 8 WATER SYSTEMS

## INTRODUCTION

One of the most essential services provided by the City of Lucas is delivering safe drinking water to the community. The City of Lucas owns and operates its water system that consists of elevated storage tanks, ground storage tanks, pumps, water lines, hydrants, valves, etc. A Certificate of Convenience and Necessity (CCN No. 10193 amended on April 5, 2019) was issued by the State of Texas Public Utility Commission (PUC) to the City of Lucas to define its water service area and grant exclusive retail service rights. Because the CCN does not follow city boundaries, there are areas that are not in the city limits of Lucas but receive water from Lucas such as the area west of Rock Ridge Road that is located in the City of Allen’s extraterritorial jurisdiction (ETJ) and Trinity Park that is located in unincorporated Collin County. The Seis Lagos Utility District (SLUD), the Wylie Northeast Special Utility District (WNSUD), and the City of Allen supply water to a portion of residents inside the Lucas city limits and ETJ.

The city’s water system is a vital part of the city-owned infrastructure. The purpose of this section is to provide a description of the current water system, identifying criteria for determining future improvements to the water system, and providing a description of the water system capital improvements needed to meet future demand.

## EXISTING WATER SYSTEM

### Water Supply

The City of Lucas purchases water from the North Texas Municipal Water District (NTMWD). Water is delivered to the city at two delivery points. One delivery point 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 site located on McGarity Lane just east of Angel Parkway. The delivery point at the McGarity site is the newer of the two delivery sites, established in fiscal year 2004/2005.

### Existing System Facilities

The following information describes the location and description of the city’s water infrastructure:

#### Ground Storage:

McGarity Site	200,000-gallon tank 350,000-gallon tank
North Pump Station	500,000-gallon tank 750,000-gallon tank

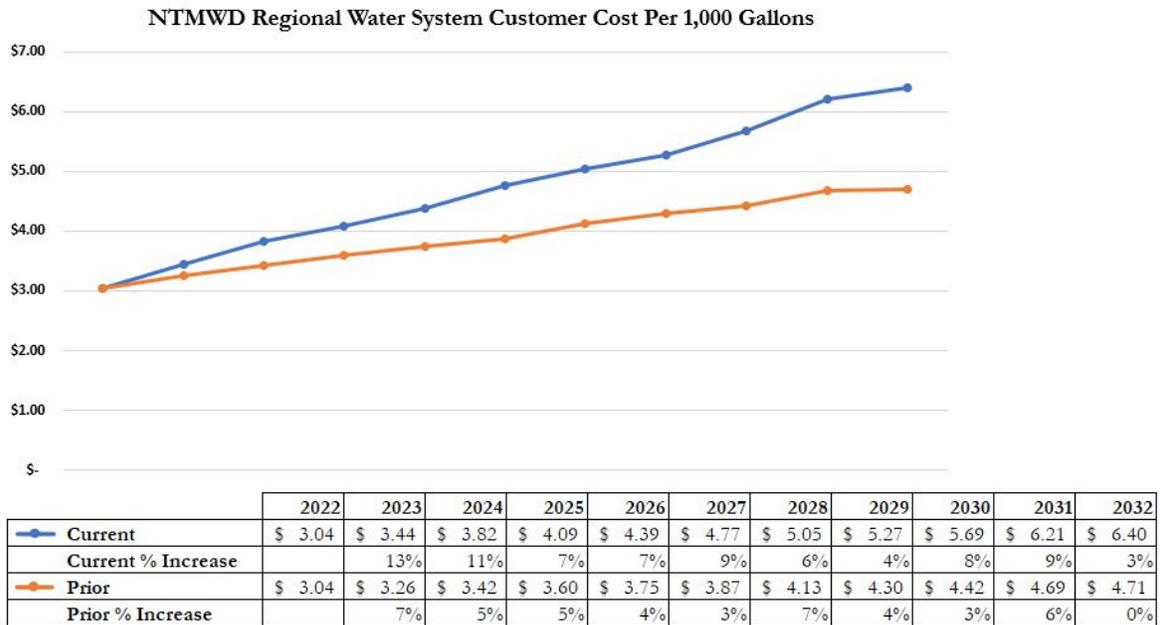
**Total: 1,800,000 gallons**



# CHAPTER 8 WATER SYSTEMS

## FINANCIAL *(continued)*

The graph below illustrates the projected wholesale water rate over a ten-year period. The City must include the cost of its water infrastructure and operational cost to determine the retail water rate for its water customers.



## 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, other factors will also have an impact on the future water system facilities. These factors are 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. The population to be served by the water system will include the build-out population of 13,274, plus an estimated population of 250 people currently being served by the water system that live outside the city limits. Accordingly, an estimated population of 13,442 located within the proposed service area will be utilized for determining the water demand, size and capacity of future system facilities that will eventually need to be met by the water system.

Since water demand in the water system service area is based on the population and their water usage, historical water usage is used to determine per capita per day usage. Based on this historical data, the water usage is approximately 250 gallons per capita per day, the maximum day to average

## CHAPTER 8 WATER SYSTEMS

### **PARAMETERS FOR FUTURE FACILITIES** *(continued)*

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 3.75 million gallons per day (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 and pumping facilities are provided by the Texas Commission on Environmental Quality (TCEQ). Per the 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 have been utilized, per previous analysis, for the present water system. This design criteria are based on providing elevated storage to meet peak hour demands in the system. Based on these 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 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 McGarity pump station pumps water to the McGarity tower. The McGarity tower has an elevation of 792 feet which is the upper pressure plane. The North Pump Station pumps water to the Winningkoff tower. The Winningkoff tower has an elevation of 723 feet which is the lower pressure plane.

#### **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 reduce the number of dead-end water lines 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, improve the dependability of the system in the area, and enhancing fire protection.

# CHAPTER 8 WATER SYSTEMS

## PROPOSED WATER SYSTEM

In 2021, the City acquired the services of an engineering firm, Birkhoff, Hendricks & Carter, LLP (BHC), to prepare an existing water distribution system hydraulic computer model and evaluation.

To conduct the existing waters system demand analysis, the following was evaluated:

- Hourly Pumping, Elevated and Ground Storage Levels
- NTMWD Supply Meter Data
- Customer Retail Billing Records

The findings of the demand analysis illustrated the following:

- Residential Maximum Day Unit Demand:  
495 gallons per capita per day (gpcd)
- Residential Maximum Hour Unit Demand:  
891 gpcd
  - Maximum Day Demand (4.3 MGD)
  - Maximum Hour Demand (7.7 MGD)
  - Minimum Hour Demand (0.98 MGD)

The existing water system hydraulic model included the following information:

- Base Map: Collin Central Appraisal District Lots
  - All known water lines in the system create network
  - Junction Nodes (Elevations and System Demands)
  - Existing System Pressure Plans (or Service Areas)
    - 792 Service Area (High Zone – McGarity Pump Station and EST)
    - 723 Service Area (Low Zone- North Pump Station and EST)
  - Pump Stations and Ground Storage Reservoirs
  - McGarity Pump Station: 5 Pumps = 4.82 MGD
  - North Pump Station: 5 Pumps = 5.20 MGD
- Total = 10.02 MGD**

<b>Existing System Pumping Recommendations</b>					
Service Area	Population Served	Estimated Number of Connections	TCEQ Min. Pumping (0.6 gpm/Conn.)	BHC Pumping Requirements	Total Existing Pumping
723 Service Area	5356	1706	1.47 MGD	2.72 MGD	5.20 MGD
792 Service Area	2711	863	0.75 MGD	1.58 MGD	4.82 MGD
<b>System Totals</b>	<b>8067</b>	<b>2569</b>	<b>2.22 MGD</b>	<b>4.30 MGD</b>	<b>10.02 MGD</b>

# CHAPTER 8 WATER SYSTEMS

## PROPOSED WATER SYSTEM *(continued)*

<b>Existing System Storage Recommendations</b>							
Service Area	Population Served	Estimated Number of Connections	TCEQ Minimum Volume Elev. Storage	BHC Elevated Storage Requirements	Total Existing Elevated Storage	BHC Ground Storage Recommendation	Total Existing Ground Storage
723 Service Area	5356	1706	0.34 MG	0.54 MG	0.30 MG	0.68 MG	1.25 MG
792 Service Area	2711	863	0.17 MG	0.32 MG	0.30 MG	0.40 MG	0.55 MG
<b>System Totals</b>	<b>8067</b>	<b>2569</b>	<b>0.51 MG</b>	<b>0.86 MG</b>	<b>0.60 MG</b>	<b>1.08 MG</b>	<b>1.80 MG</b>

The general conclusions identified the strengths of the water system to include:

1. The Water Distribution System has adequate and modern ground storage and high service pumping capacity.
2. The Distribution System layout and sizing is generally adequate and meets the needs of the current system demands, even under a severe test.

The improvements recommended:

1. Additional Elevated Storage Capacity is recommended in the 723 System.
2. The pressure boundary divide could be shifted to provide better and more stable pressures for some customers in the system.
3. Maintenance on the EST at McGarity is difficult (but not impossible) without a second EST in the 792 Service Area.
4. Carefully monitor the operational condition of the new pumps at both the McGarity Pump Station and North Pump Station.

The long-term recommendations include:

1. Develop a Water Distribution Master Plan.
2. Coordinate with NTMWD on long-term water supply needs.
3. Consider a second elevated storage tank for the 792-service area.

### **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.

As indicated in the long-term recommendations, the City of Lucas has engaged the engineering firm of Birkhoff, Hendricks & Carter, LLP (BHC) to create a Water Distribution Master Plan which will include the following:

# CHAPTER 8 WATER SYSTEMS

## PROPOSED WATER SYSTEM *(continued)*

Project Component	Total Capital Cost (\$)*
<b>Proposed 0.5 MG EST &amp; Parallel 12-Inch Water Line</b>	
Proposed 0.75 MG EST (723 SA)	\$5,500,000
Parallel 10-in. Water Line	\$2,000,000
<b>TOTAL:</b>	<b>\$7,500,000</b>

1. Review the water capital improvement projects included in the last impact fee report.
2. Review, update, and add where necessary capital projects eligible for recovery in the impact fee program.
3. Update the impact fee models for the years 2022 and 2032 based on population and land use absorption provided by the City. Water models will be 72-hour extended period simulation models for maximum hourly demand conditions. Impact fee models will be compared to the Master Plan buildout models to determine excess capacity in impact fee water lines and facilities.
4. Update the 10-year capital improvement program, including opinions of probable costs and implementation schedule. The 10-year Capital Improvement Program will be based on land use and growth assumptions provided by the City of Lucas.
5. Inventory new and existing water and wastewater projects eligible for the impact fee program.
6. For each project identified, analyze the capacity currently utilized, total capacity available, and the capacity utilized over the impact fee period.

The principal facilities needed for build-out conditions within the water system service area include the following:

Opinion of Cost Include:

- Construction
- Engineering
- Easements
- 20% Contingency

# APPENDIX

**Maps included in the Comprehensive Plan are as follows:**

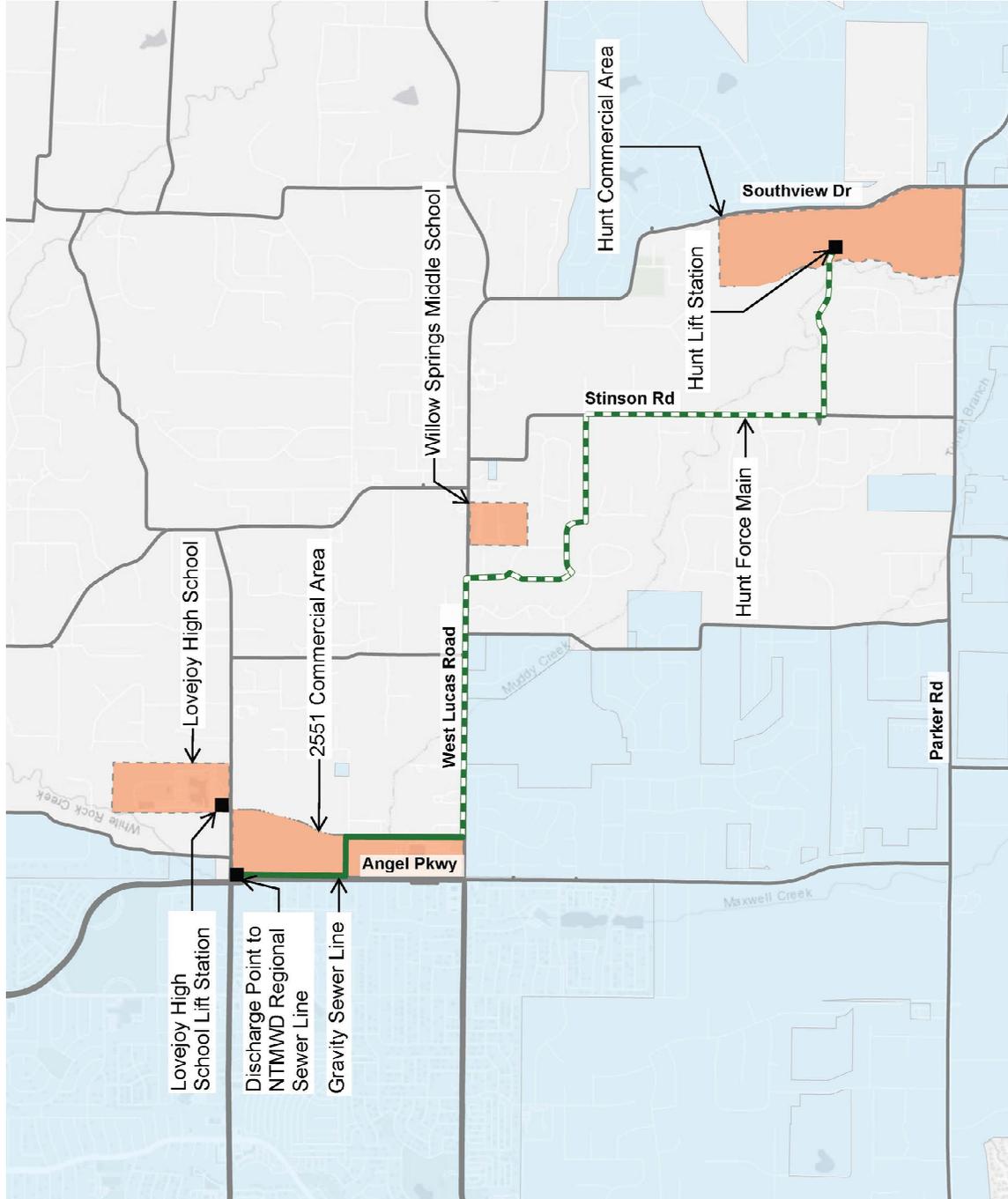
- Wastewater System Master Plan Map
- Water System Map
- Thoroughfare Plan Map
- Land Use Map
- Zoning Map
- Trails Master Plan

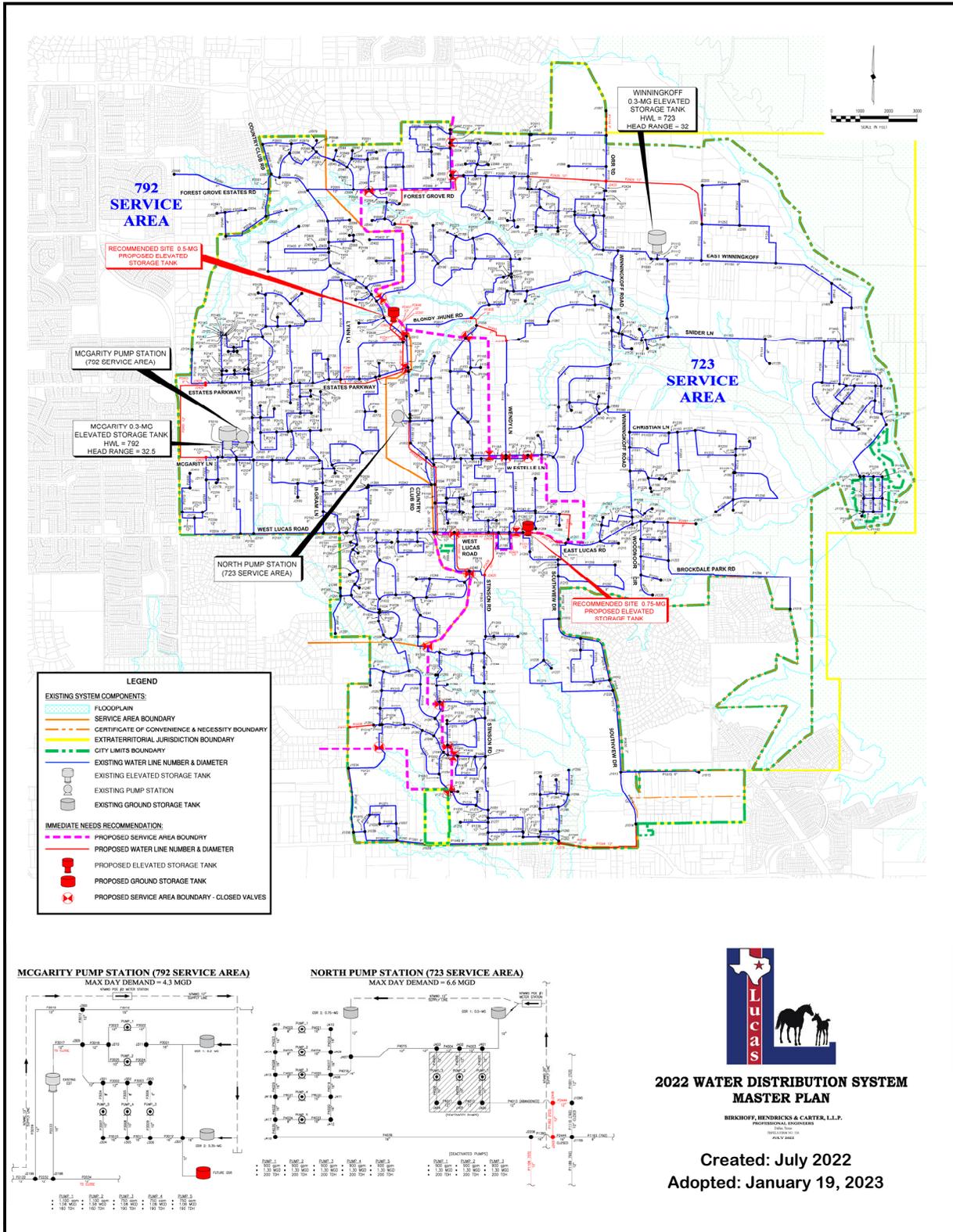
**Notes:**

1. Gravity Sewer Line is presently in service.
2. Hunt Force Main is constructed and out of service pending future development.
3. Lovejoy ISD sewer lines are not maintained by City of Lucas.
4. Willow Springs Middle School is served by City of Parker.
5. The blue shaded area is outside of Lucas City Limits.

# Wastewater Plan City of Lucas 2022

Revised: December 1, 2022  
Adopted: January 19, 2023







LEGEND		Proposed	Right-of-Way
Type	Color	# of Lanes	Divided
A	Grey	6	Yes
B	Yellow	4	Varies
C	Red	2	No
D	Green	2	No
Proposed	Blue	As Labeled	As Labeled

Right-of-Way	Median	Width (ft)
Yes	Median	78 + 6ft
No	Median	52-54
No	Median	24-28
No	Median	24
No	Median	50

**Proposed Intersection Improvement**

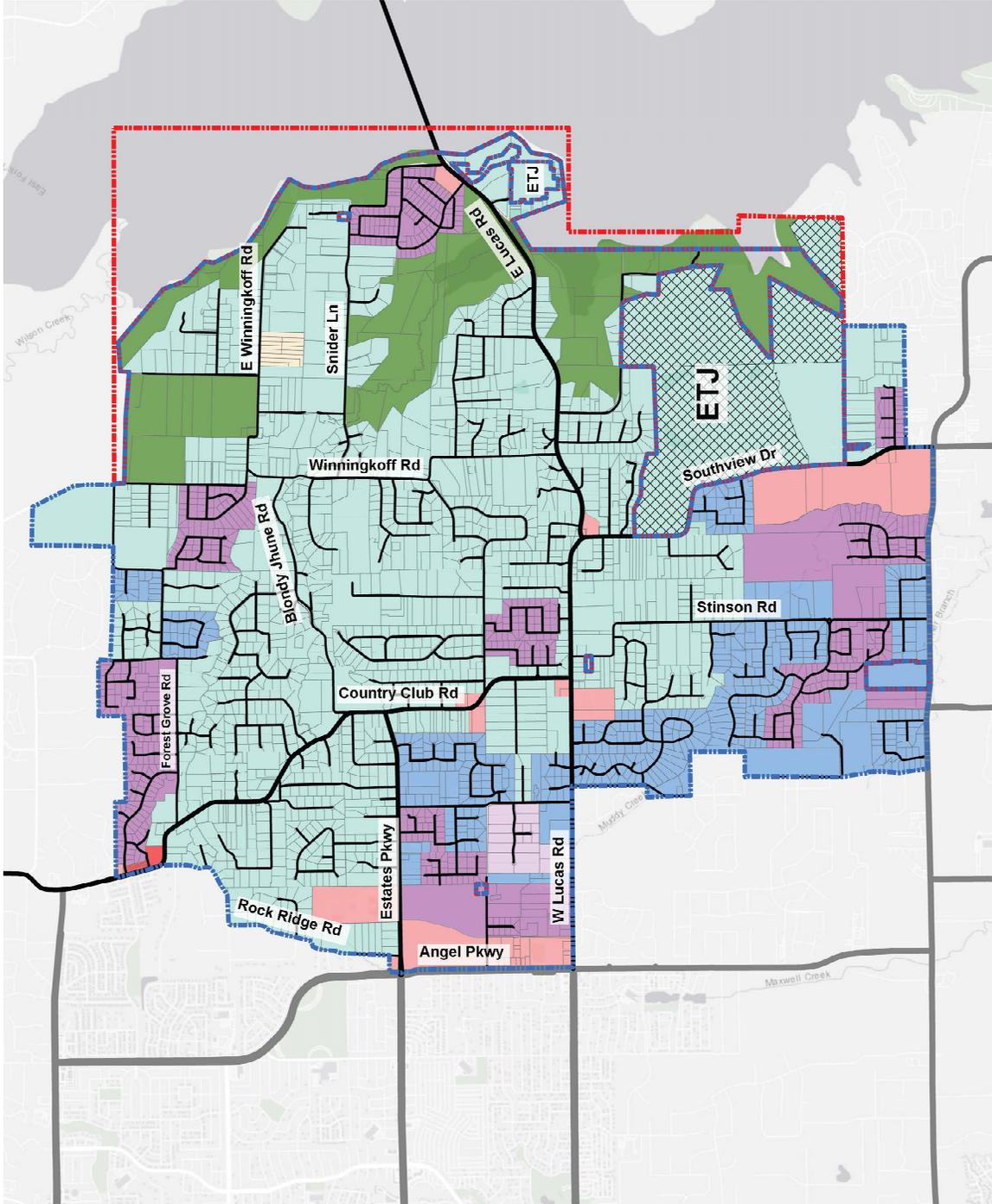
**Notes:**

1. Type D roads are shown for reference only and are not modified by this plan.
2. Private roads and driveways generally are not shown except where valuable for readability.
3. The blue shaded area is outside of City Limits.
4. Only the Northern 2,300 ft (approx) of Lewis Lane is Lucas maintained.
5. Only the Southern 300 ft (approx) of Rock Ridge Rd is Lucas maintained.

# Thoroughfare Plan City of Lucas 2022

Revised: March 31, 2023  
Adopted: January 19, 2023

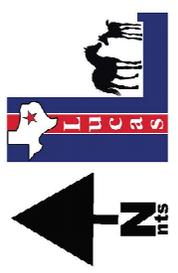




LEGEND	
<b>Land Use</b>	
	R2 (Single Family Residential 2 Acre Lots)
	R1.5 (Single Family Residential 1.5 Acre Lots)
	R1 (Single Family Residential 1 Acre Lots)
	ED (Estate Development District)
	MHD (Manufactured Housing)
	Commercial
	Village Center
	Open Space
<b>Boundaries</b>	
	Corporate Boundary (City Limit)
	ETJ Boundary (Extrajurisdictional Jurisdiction)
<b>Overlays</b>	
	Areas Managed by Municipal Utility District

# Future Land Use Plan City of Lucas 2022

Revised: January 13, 2023  
Adopted: January 19, 2023



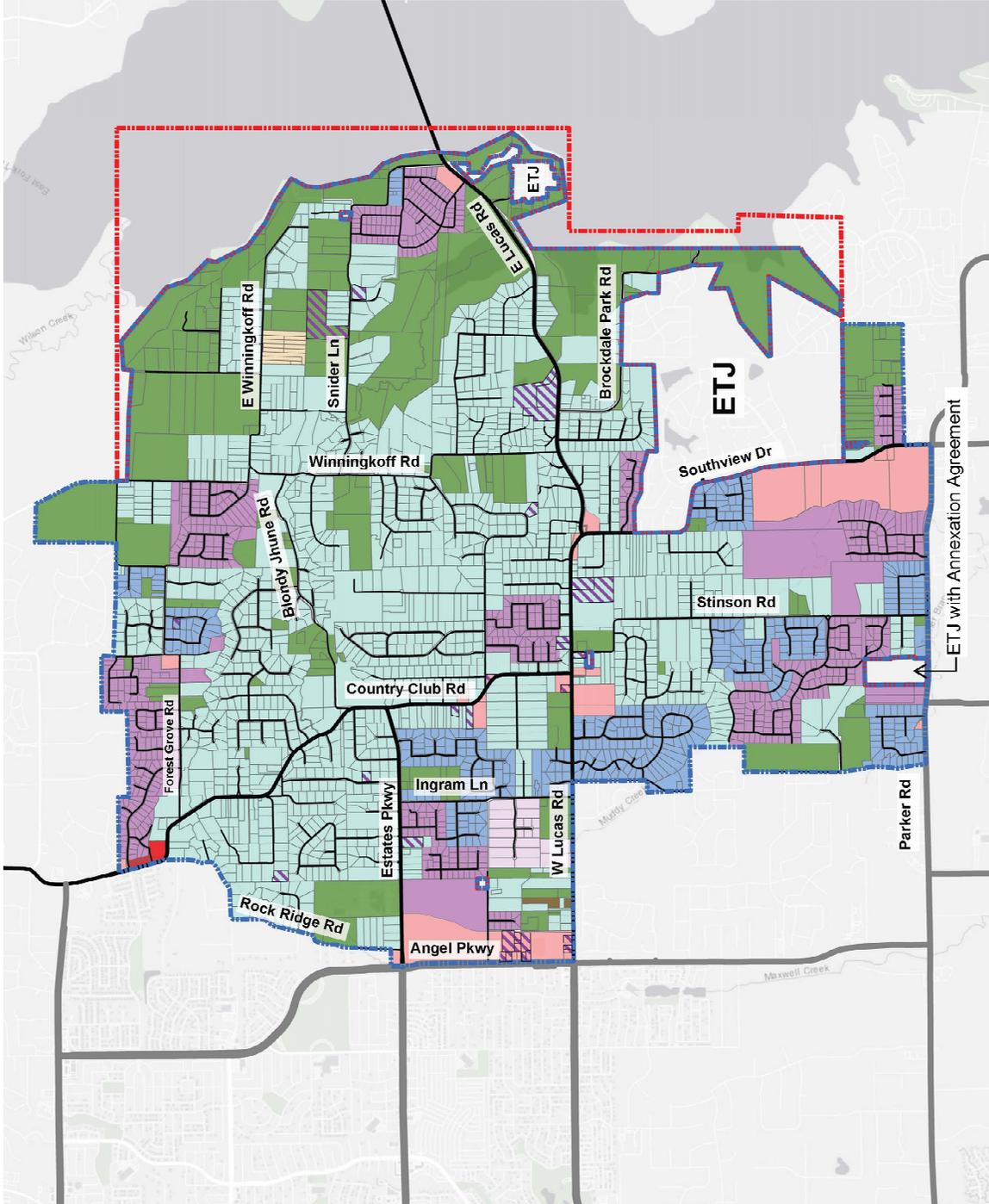
As required by Texas Local Government Code, Title 7, Subtitle A, Chapter 213, Sec. 213.005, "A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries."

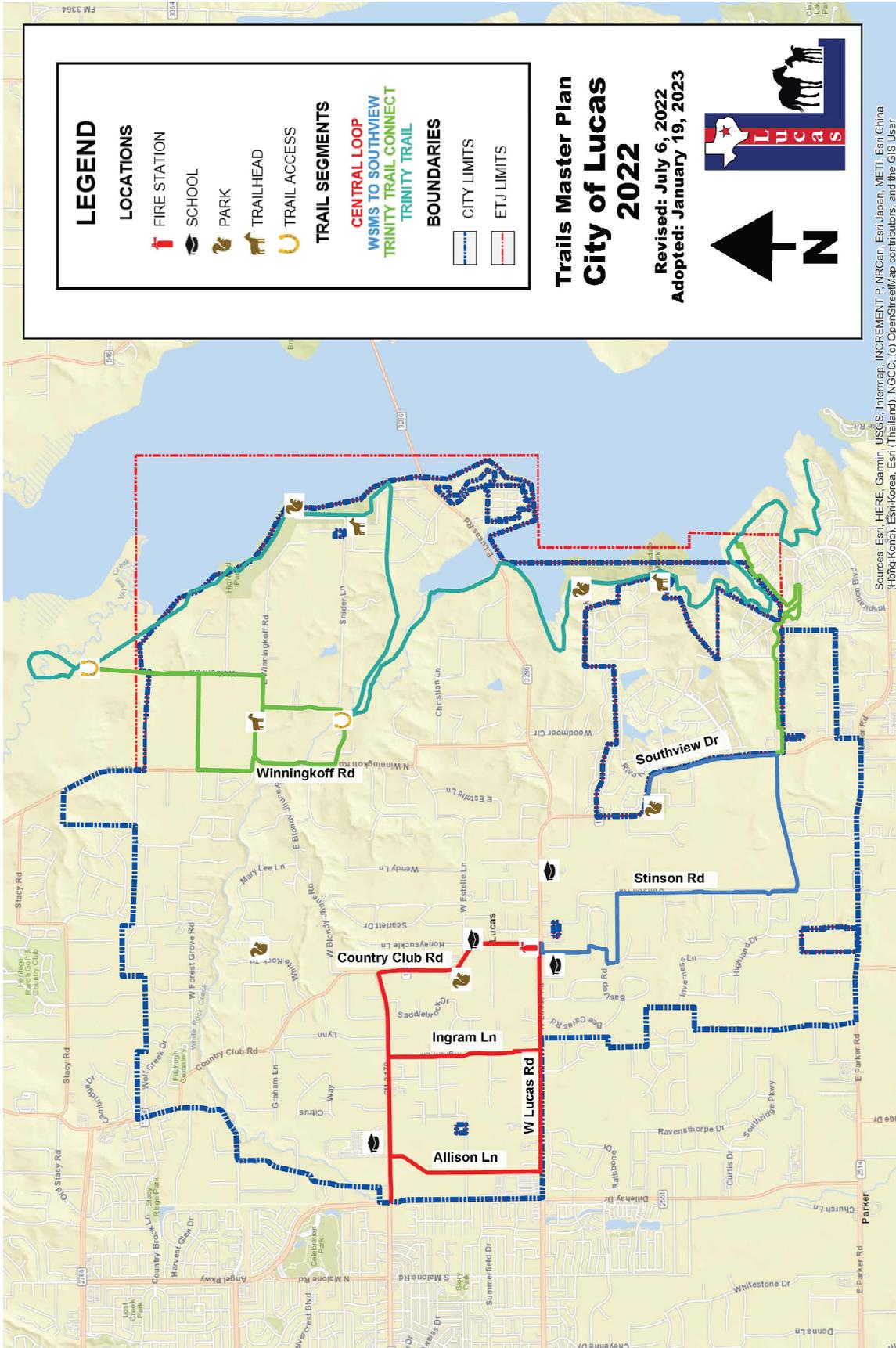
LEGEND	
<b>Zoning</b>	
	RZ (Single Family Residential 2 Acre Lots)
	R1.5 (Single Family Residential 1.5 Acre Lots)
	R1 (Single Family Residential 1 Acre Lots)
	ED (Estate Development District)
	MHD (Manufactured Housing District)
	CB (Commercial Business)
	VC (Village Center)
	AO (Agriculture)
	OS (Open Space)
	LI (Light Industrial)
<b>Boundaries</b>	
	Corporate Boundary (City Limit)
	ETJ Boundary (Extrajurisdictional)
<b>Overlays</b>	
	SUP (Specific Use Permit)

# Zoning Map City of Lucas 2022

Revised: January 13, 2022  
Adopted: January 19, 2023

Notes: For detailed boundary and annexation information, please see City of Lucas Boundary Map





**LEGEND**

**LOCATIONS**

- FIRE STATION
- SCHOOL
- PARK
- TRAILHEAD
- TRAIL ACCESS

**TRAIL SEGMENTS**

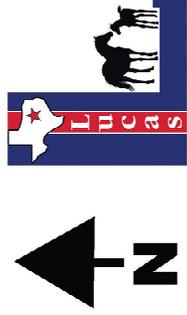
- CENTRAL LOOP
- WSMs TO SOUTHVIEW
- TRINITY TRAIL CONNECT
- TRINITY TRAIL

**BOUNDARIES**

- CITY LIMITS
- ETJ LIMITS

**Trails Master Plan  
City of Lucas  
2022**

Revised: July 6, 2022  
Adopted: January 19, 2023



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong-Kong), Esri-Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User