RESILIENCY

HAZARDS & RISKS ASSESSMENT

Community resiliency in Smithville refers to the ability of the community to anticipate, prepare for, respond to, and recover from significant adverse events, particularly natural hazards. This concept encompasses not only the physical and infrastructural aspects but also the social and economic systems that support the community's ability to bounce back and even thrive after disruptive incidents.

Primary Hazards Impacting Smithville's Resiliency

Smithville is in Bastrop County which developed the 2022 Hazard Mitigation Plan (HMP) Update titled "Bastrop County Hazard Mitigation Plan Update 2022: Maintaining a Safe, Secure, and Sustainable Community." The HMP is a multi-jurisdictional plan encompassing Bastrop County and its municipalities, several school districts, and water control and improvement districts.

The HMP focuses on evaluating and mitigating risks from "high" and "moderate" severity hazards to enhance community resilience. The Plan aims to safeguard lives and structures while reducing the costs associated with disaster response and recovery. By prioritizing mitigation efforts based on the most significant risks, the Plan seeks to reduce or eliminate the long-term dangers posed by known hazards to both people and property. The overarching mission is to secure a sustainable future for Bastrop County by revising and developing targeted mitigation strategies to protect the community, emphasizing the collective effort of local authorities, stakeholders, and the public in fostering a safer, more resilient Smithville.

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Hazard Ranking Result

The Hazard Risk Ranking chart categorizes various hazards based on their frequency of occurrence, potential severity, and overall ranking as follows:

1. **High-Risk Hazards**:
    - **Flood**: Highly likely to occur and has substantial severity.

HAZARD	FREQUENCY OF OCCURENCE	POTENTIAL SEVERITY
Flood	Highly Likely	Substantial
Wildfire	Highly Likely	Minor
Extreme Heat	Highly Likely	Limited
Tornado	Likely	Limited
Drought	Likely	Limited
Hurricane Wind	Unlikely	Limited
Lightning	Highly Likely	Limited
Hail	Highly Likely	Limited
Thunderstorm Wind	Highly Likely	Limited
Winter Storm	Highly Likely	Limited
Dam/Levee Failure	Unlikely	Limited
Earthquake	Unlikely	Limited
Expansive Soils	Highly Likely	Limited
Infectious Disease	Unlikely	Substantial
Cyber Attack	Highly Likely	Major
Hazardous Material Release	Likely	Limited
Pipeline Failure	Unlikely	Minor

- **Cyber Attack**: Highly likely to occur with major severity.
- These two hazards require immediate mitigation strategies due to their high frequency and severe consequences.

2. **Moderate-Risk Hazards**:

- **Wildfire**: Highly likely but only minor severity.
- **Extreme Heat, Lightning, Hail, Thunderstorm Wind, and Winter Storm**: All are highly likely but have limited severity.
- **Tornado** and **Drought**: Likely to occur but with limited impact.
- Although frequent, these hazards have moderate potential consequences, requiring monitoring and proactive preparedness.

3. **Low-Risk Hazards**:
    - **Hurricane Wind, Dam/Levee Failure, Earthquake, and Expansive Soils**: Unlikely to occur but with limited severity.
    - **Pipeline Failure**: Unlikely with minor severity.
    - These hazards pose a lower threat and are less likely to require immediate action.
4. **Outlier Hazard**:
    - **Infectious Disease**: While unlikely, its substantial severity warrants contingency planning for rare but high-impact events.

Recommendations:

- **Prioritize hazards with high severity and frequency**, such as Floods and Cyber Attacks.
- Develop mitigation and preparedness plans for moderate-risk hazards (e.g., weather-related events).

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- Ensure contingency plans are in place for low-frequency, high-severity hazards like Infectious Diseases.

This ranking highlights the need for preparedness against frequent hazards, especially those with high impacts, like lightning and floods.

The Risk Assessment for Bastrop County used historical data and statistical methods to estimate potential impacts from various hazards, drawing from records by the National Centers for Environmental Information (NCEI) and the National Oceanic and Atmospheric Administration (NOAA). Geographic Information System (GIS) technology helped identify risks and assess the vulnerability of community assets.

Key parameters evaluated for each hazard included the frequency of occurrence, expected losses, vulnerability, and overall impact, with details on the frequency of return and potential severity of impacts provided in specific tables. The Hazard Ranking, informed by the Risk Assessment Workshop and local insights, categorized hazards like floods, hail, and extreme heat as high risk, while tornadoes and winter storms were considered lower risks. This approach allows Bastrop County to prioritize mitigation efforts based on the severity and likelihood of each hazard, enhancing the community's resilience to potential disasters.

Elements of Community Resiliency

- **Infrastructure**: Developing and maintaining infrastructure that can withstand hazard events, such as elevated buildings to prevent flood damage and fire-resistant materials to protect against wildfires.
- **Preparedness and Education**: Continuous community education and preparedness activities that help residents know how to protect themselves and their properties from natural hazards.
- **Response and Recovery Plans**: Well-defined emergency response and recovery plans ensure quick and effective actions post-disaster to minimize human and economic losses.
- **Community Cohesion and Social Networks**: Strong social networks and community cohesion provide critical support during and after disasters, facilitating faster recovery.

By focusing on these areas, Hallettsville aims to bolster its resilience, ensuring it can withstand and recover from the natural hazards it faces. This integrated approach is vital for sustaining the community's safety, economic stability, and quality of life in the face of environmental challenges.

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Building Resiliency Measures into Plan

The Resilient Communities Program aims to integrate hazard mitigation plans into the comprehensive plan of a community, thereby enhancing its resilience to various hazards. The primary objective of the RCP is to develop a comprehensive approach to hazard mitigation by incorporating mitigation strategies into the community's long-term planning framework. By integrating hazard mitigation plans into the comprehensive plan, the program seeks to minimize the impacts of natural and human-caused hazards on communities, infrastructure, and the environment. Hazard mitigation and community resilience are related concepts aimed at reducing the impacts of disasters and building stronger, more adaptable communities. The table describes the difference between hazard mitigation and community resilience.

Hazard Mitigation Plan Integration

This section captures ways that the Risk Assessment, Goals and Actions developed in the HMP can be integrated into other City of Smithville documents, programs, and regulations. These are used to develop some of the goals and objectives for this Resilient Community Plan.

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DRAFT HAZARD RESILIENCY GOALS & OBJECTIVES

The mitigation strategy outlined for Smithville involves a combination of structural and non-structural measures aimed at reducing risks and enhancing community resilience.

Flood Resiliency



Goal Statement: Enhance flood resilience and safety within the community through targeted infrastructure improvements, regulatory enhancements, and public awareness initiatives.

Objectives

- Improve Infrastructure to Reduce Flood Risk
- Enhance Early Warning Systems
- Promote Flood Insurance and Risk Awareness
- Mitigate High-Risk Properties
- Strengthen Regulatory Framework
- Enhance Floodplain Management Expertise

Cyber Threats



Goal Statement: Heighten cybersecurity resilience by safeguarding critical infrastructure, protecting sensitive data, ensuring the continuity of essential public services, fostering a culture of cyber awareness, and maintaining trust in digital technologies across all municipal operations.

Objectives

- Strengthen Infrastructure: Continuously update and fortify systems to protect against evolving cyber threats.
- Protect Data Privacy: Enforce rigorous policies and encryption measures to ensure confidentiality and integrity of sensitive information.
- Ensure Service Continuity: Develop and routinely test response plans to minimize disruptions during cyber incidents.
- Promote Awareness: Offer comprehensive training and resources to all stakeholders to cultivate a security-focused culture.
- Foster Collaboration: Partner with various organizations to share intelligence, best practices, and innovative technologies.

Windstorms, including severe thunderstorms and tornadoes



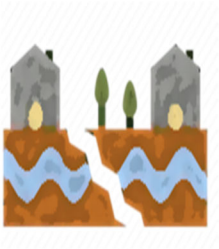
Goal Statement: Enhance community resilience and safety against windstorms, including severe thunderstorms and tornadoes, through improved infrastructure, early warning systems, education, and robust emergency response plans.

Objectives

- Wind strap Requirement on Temporary Structures
- Improve Emergency Communication & Warning Systems
- Storm Ready Designation
- Increase Public Awareness of Windstorms, Severe Thunderstorms, and Tornadoes

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Drought, Land Subsidence and Expansive Soils



Goal Statement: Enhance community resilience to drought and land subsidence by implementing drought monitoring, recommending soil compaction practices, strengthening water conservation ordinances, and launching a public awareness campaign on water conservation.

Objectives

- Drought Monitoring Program
- Soil Compaction
- Enhance Water Conservation Ordinance
- Public Awareness Campaign for Water Use

Severe Winter Weather and All Hazards



Goal Statement: Strengthen community resilience to severe weather by creating a de-icing plan, improving emergency communication, achieving Storm Ready designation, and increasing public awareness.

Objectives

- De-icing Contract Research/Plan Development
- Improve Emergency Communication & Warning Systems
- Storm Ready Designation
- Increase Public Awareness of Hazards

Wildfire Resiliency Goal



Goal Statement: Increase community resilience to wildfires through strategic planning, public awareness, and targeted mitigation efforts.

Objectives

- Integrate Wildfire Risk Management into Planning and Development
- Enhance Community Awareness and Participation in Wildfire Mitigation

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RISK ASSESSMENT

[Community Report - Census tract 48021950700, Bastrop County, Texas | National Risk Index]

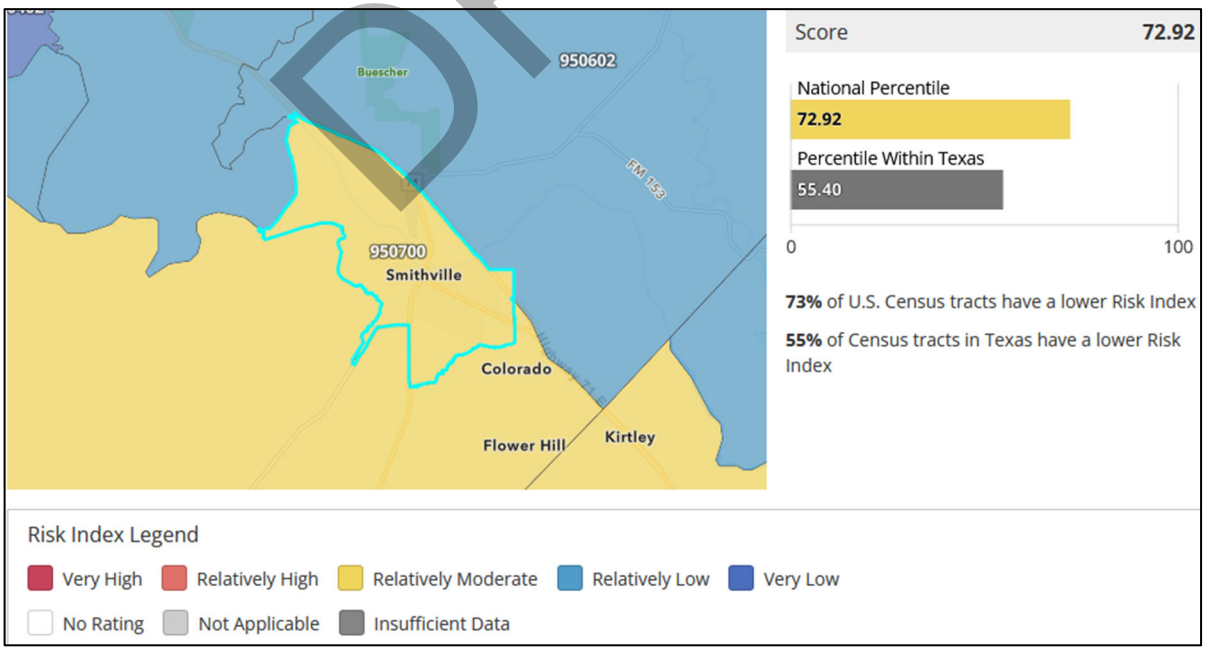
Determining Risk in Community Planning

The FEMA National Risk Index defines risk as the potential for adverse impacts from natural hazards, quantifying it through three main components:

- **Expected Annual Loss (EAL)**: Represents the average financial loss due to natural hazards annually.
- **Social Vulnerability**: Enhances the risk by indicating the sensitivity of certain social groups to natural hazards.
- **Community Resilience**: Reduces risk by representing a community's capacity to prepare, adapt, and recover from natural disruptions.

Expected Annual Loss
x Social Vulnerability
÷ Community Resilience
= Risk Index

These elements combine to form the Risk Index, calculating both composite and specific hazard type Risk Index values for communities, standardized in 2022 U.S. dollars. Census Tract 48209010810 (shown below) is the most representative for Hallettsville. The *Risk Index rating 72.9 is Relatively Moderate* for the census tract when compared to the rest of the U.S.



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The community is scored and rated based on:

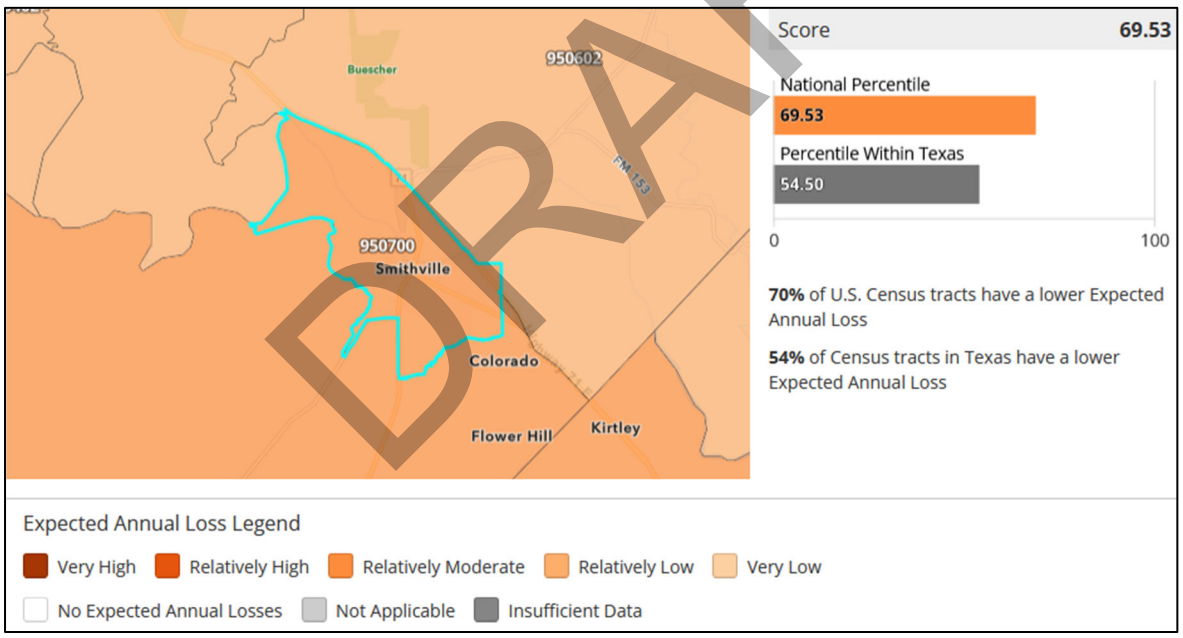
- **Composite Risk Index**: Reflects overall community risk from all 18 studied natural hazards.
- **Hazard-Specific Risk Index**: Indicates the community's risk level for specific hazards like tornadoes.

Risk Adjustments and Measurements

The EAL is adjusted based on the community's social vulnerability (increasing risk) and resilience (decreasing risk). This adjustment is crucial in generating accurate Risk Index values and percentiles across communities, highlighting areas with higher vulnerability and those better equipped to handle disasters.

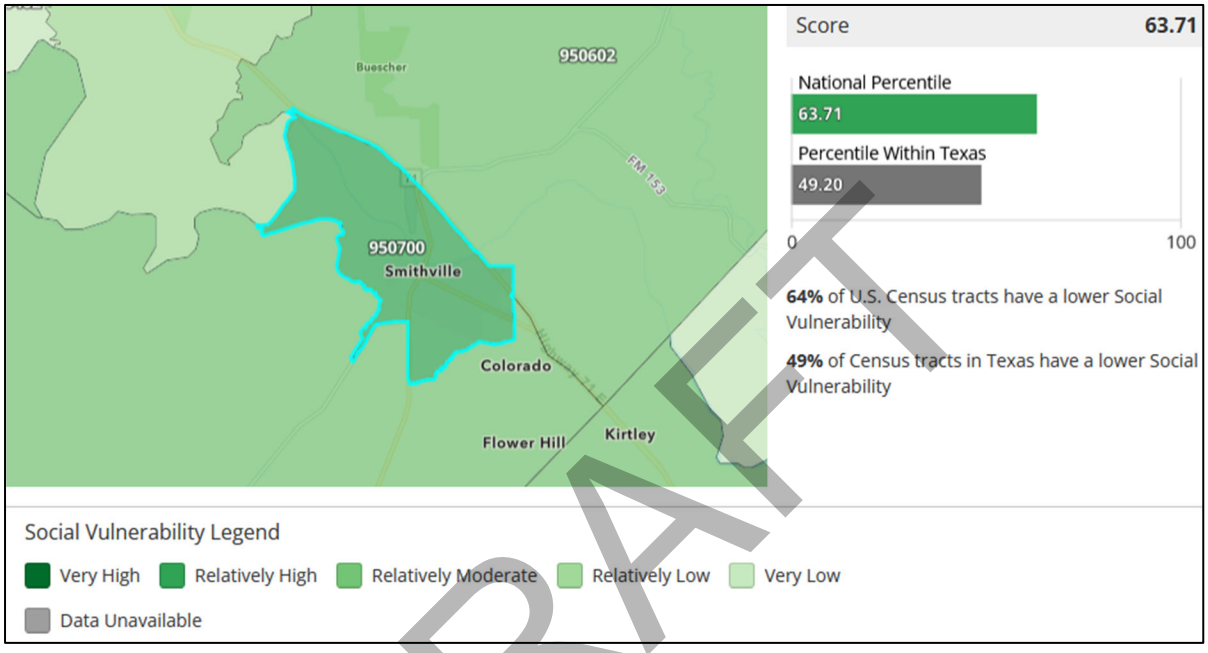
This framework informs the community's comprehensive resiliency plan, ensuring that development and emergency preparedness strategies are informed by concrete, quantifiable risk assessments. In this tract, expected loss each year due to natural hazards is Relatively Moderate when compared to the rest of U.S.

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Social Vulnerability

In the National Risk Index, a community's Social Vulnerability score indicates its susceptibility to the impacts of natural hazards, with a higher score increasing the community's overall Risk Index score. This census tract is rated as having a *Relatively High susceptibility* compared to the national average, suggesting a higher risk level from natural hazards.



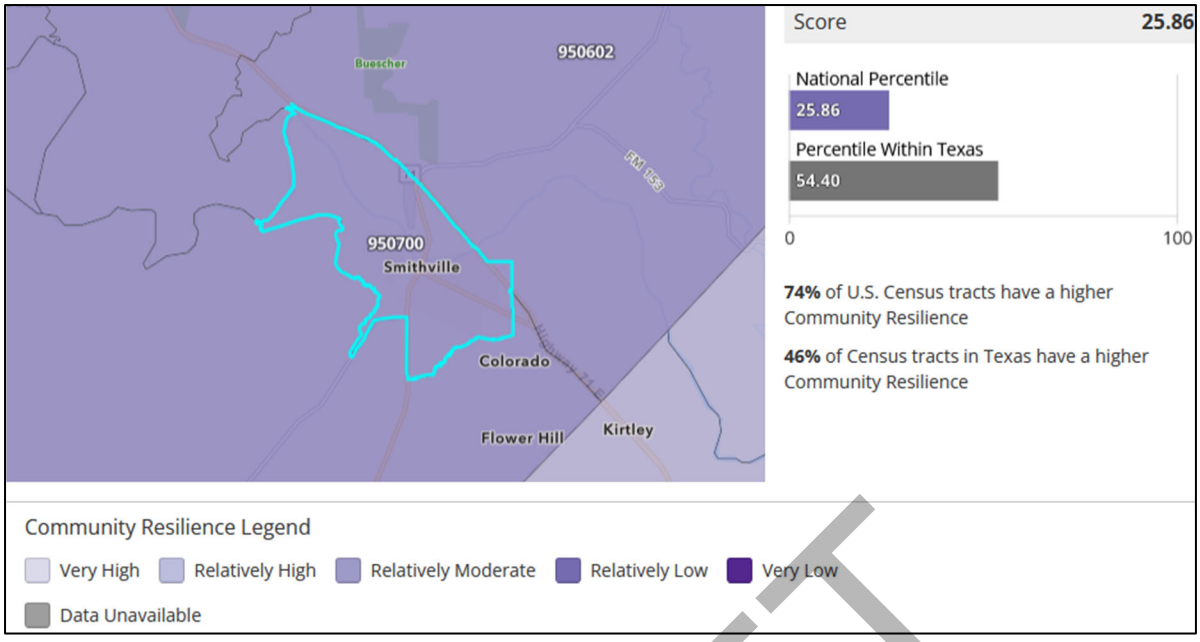
Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

Community Resilience

Community resilience is the ability of a community to prepare for anticipated hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. Consequently, the reduction risk component of the National Risk Index, a Community Resilience score and rating represent the relative level of a community's resilience compared to all other communities at the same level. A community's Community Resilience score measures its national rank and is inversely proportional to a community's risk. A higher Community Resilience score results in a lower Risk Index score.

This census tract has a *Relatively low ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions* when compared to the rest of the U.S.

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In community planning, the FEMA National Risk Index is essential for analyzing risk and preparing for emergencies by evaluating three key elements:

1. **Expected Annual Loss (EAL)**
2. **Social Vulnerability**
3. **Community Resilience**

The Risk Index calculates both overall and specific risk scores for communities, using this data to inform and tailor local resiliency plans. This strategic approach ensures that community planning is both responsive to current risks and proactive in enhancing long-term sustainability and resilience.

Smithville Population Study

Key Points

- **Smithville's Aging Population Requires Increased Investment in Senior Services**
- **Smithville Saw Steady Growth Until 1980, Then Renewed Expansion in the 1990s**
- **Smithville's Projected 2030 Population is 4,350, With Minimal Annual Growth**
- **Growth Projections (2025-2045) Show Scenarios of 0.5% and 1%**
- **Increases TDC Projects Texas Population Growth Through 2060 Based on Key Demographic Trends**
- **Rising Senior Population by 2045 Will Drive Demand for Healthcare and Housing**
- **Attracting Younger Families is Vital for Smithville's Long-Term Economic Stability**

Community Profile

Sources: U.S. Census Bureau (2022). American) Community Survey 5-year estimates.; Census Reporter (2022)

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Populations and People
Total Population
3,922
P1 | 2020 Decennial Census

Income and Poverty
Median Household Income
$56,627
S1901 | 2022 American Community Survey

Education
Bachelor's Degree or Higher
22.3%
S1501 | 2022 American Community Survey

Employment
Employment Rate
66.5%
DP03 | 2022 American Community Survey

Housing
Total Housing Units
1,869
H1 | 2020 Decennial Census

Health
Without Health Care Coverage
13.2%
S2701 | 2022 American Community Survey

Families and Living Arrangements
Total Households
1,666
DP02 | 2022 American Community Survey

Race and Ethnicity
Hispanic or Latino (of any race)
840
P9 | 2020 Decennial Census

Historic Population Growth Estimates

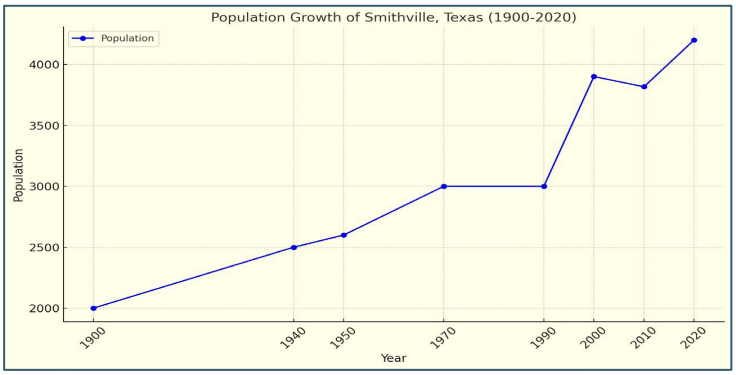
Population Growth Estimates

1900 - 1970: Early Growth Smithville grew steadily from 2000 residents, driven by the railroad.

1940: Reached about 2,500 residents.

1970 - 1990: Stability
Population growth slowed, with little change from approximately 3,000 residents.

1990 - 2000: Growth Resumes Proximity to Austin spurred growth.



2000: Population grew to about 3,900.
2000 - 2020: Continued Growth Smithville's population continued rising, despite a slight drop influenced by Austin's expansion.
2020: Approximately 4,200 residents.

Recent Growth Trends

From 2000 to 2020, Smithville's population grew to 4,200, an increase of approximately 299 people over 20 years, or an average of about 15 people per year. Recent Growth Rate Projection Steps follow:

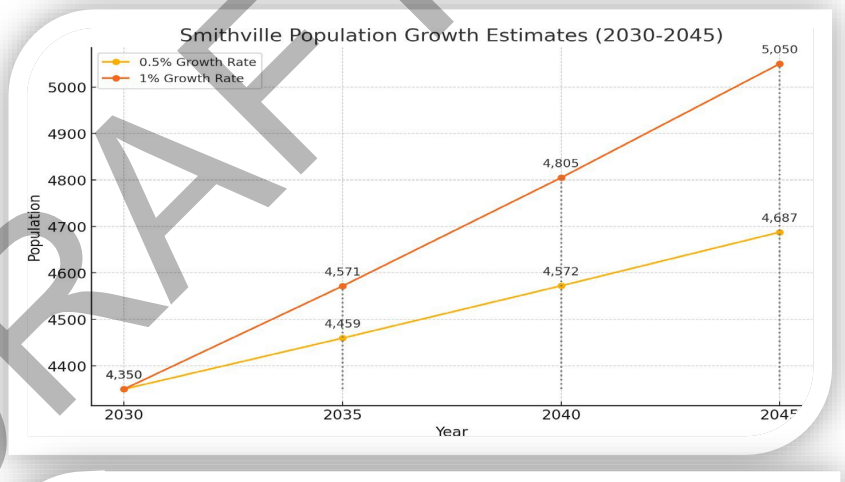
1. **Annual growth rate:** From 2000 to 2020, the average annual growth rate is about 15 people per year.
2. **Projecting to 2030:** If this trend continues, we can project the population in 2030 by adding 25 years of growth to the 2020 population.

Year	Estimate
2020	4,200
2025	4,275
2030	4,350

The projected population in 2045 is approximately 4,575 residents, assuming the current growth trend of about 15 people per year continues. This analysis represents a minimum growth scenario. Given Smithville's proximity to Austin, the growth rate is anticipated to increase over the planning period.

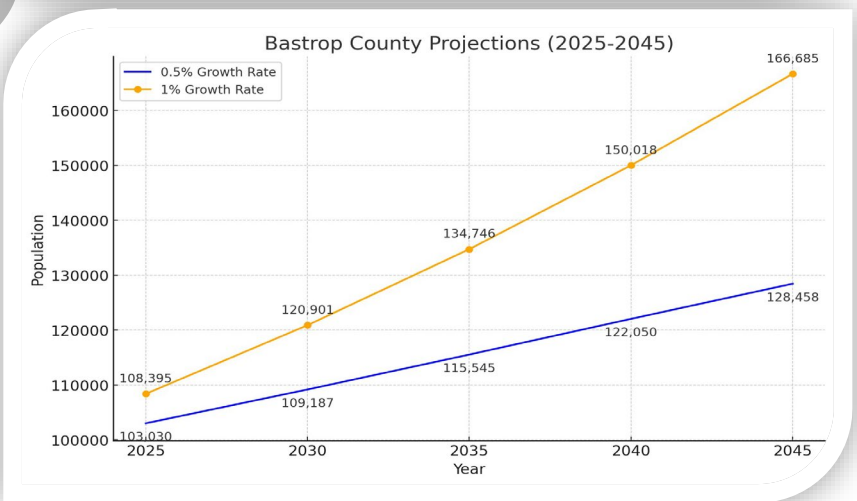
Future Projections

The graph illustrates Smithville's population growth projections from 2025 to 2045, using two growth scenarios: a 0.5% and a 1% annual rate.



Similarly, the Texas Demographic Center (TDC) has projected population growth for Texas from 2020 to 2060 using migration, fertility, and mortality rates. The TDC's projections, based on 1.0% and 0.5% migration scenarios, account for urban and rural differences but exclude special populations like students and prisoners.

Though widely used, this method has limitations, especially in rapidly changing or smaller areas, and projections may need updates if trends shift.

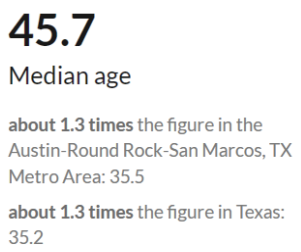


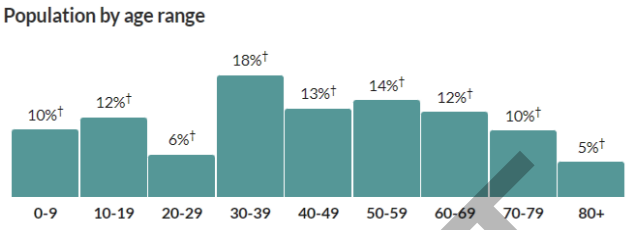
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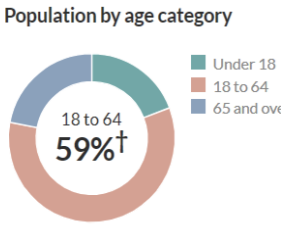
Distribution of population by Age, Generation & Ethnicity

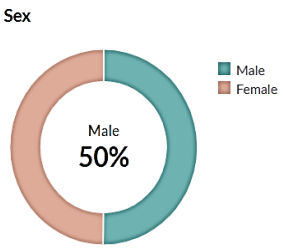
Key Observations:

- Middle-Aged Dominance: The largest age groups are 50-54 and 35-39, particularly for males.
- Lower Youth Population: Fewer children and young adults suggest a smaller younger population.
- Senior Population: A significant number of residents are 65+, with more women due to longer female life expectancy.
- Balanced Gender Distribution: Even split between males and females, with more males in working-age and more females in the older age groups.









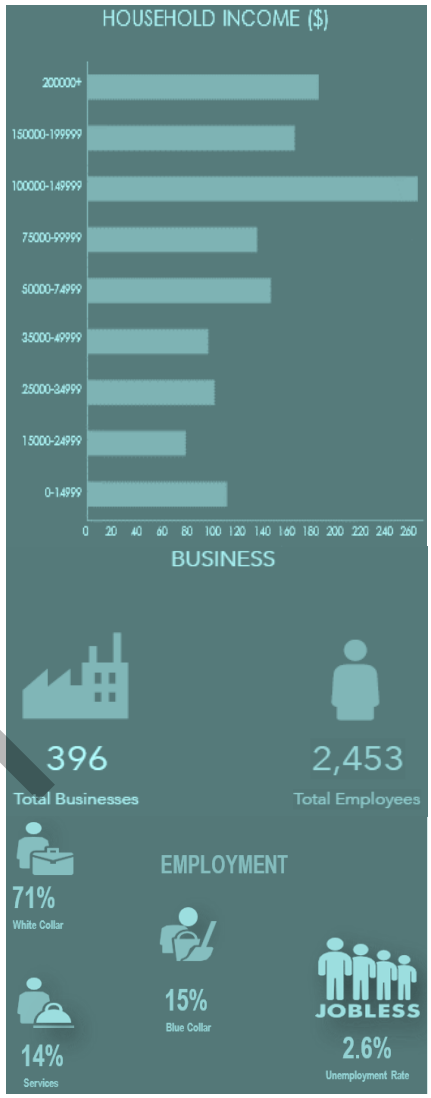


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Implications for Smithville (2045):

- Aging Population: Many middle-aged residents will retire by 2045, increasing demand for senior services, healthcare, and assisted living.
- Economic Considerations: The working-age population will sustain economic stability for two decades, but future workforce shortages may arise without more young people. Attracting younger families will be crucial.
- Education and Youth Services: Lower demand for schools and youth services now, but this could change if younger populations grow.
- Urban Development: Investment in age-friendly infrastructure and retirement housing will be needed as the population ages.
- Future Growth: Without more young residents, growth may slow. Attracting younger workers through affordable housing and jobs could balance the population.

Economic Insights



Key Points

- $93,580 Median Household Income
- The 100,000-149,999 income bracket has the highest frequency of households, reaching close to 260.
- The 200,000+ income bracket follows as the second most frequent category.
- Lower income brackets like 0-14,999 and 15,000-24,999 have relatively fewer households compared to the middle and higher income brackets.
- Income brackets between 50,000-99,999 and 25,000-49,999 show moderate household counts.
- Workforce Composition: Smithville City has a workforce that is 71.2% white-collar, 15.1% blue-collar, & 13.7% in
- services.
- Home Ownership: A significant majority of homes (84.5%) are owner-occupied, with only 15.4% being renter- occupied.
- Educational Attainment: The community is highly educated, with 26.8% holding a Bachelor's degree & 29.0% having a graduate or professional degree.
- Commute & Transportation: A large majority (81%) of residents drive alone to work, with minimal use of public transportation (0.0%) &
- carpooling (2.8%).
- Income Stats:
- $56,784 Per Capita Income
- $451,139 Median Net Worth

Implications:
Smithville City has a strong upper-middle-income presence and a notable share of high-income households. A smaller share of low-income households indicates economic stability but may also point to a lack of affordable housing options for lower-income residents. The combination of strong incomes and substantial net worth indicates long-term financial stability for households. Policies to enhance wealth equity and opportunities for lower-income groups may be needed.

The dominance of white-collar jobs aligns with higher incomes and educational attainment. Opportunities for blue-collar and service workers may be limited, affecting economic diversity. High home ownership reflects financial stability but may signal challenges for new or lower-income residents seeking affordable housing.

A highly educated population supports a white-collar workforce and higher income levels. It may attract businesses requiring skilled labor but could widen the gap for those with lower education levels. Heavy reliance on personal vehicles suggests a lack of public transportation infrastructure. Encouraging alternative commuting methods may reduce traffic congestion and environmental impacts.

Smithville is a prosperous, highly-educated community with a strong white-collar workforce, high home ownership, and solid incomes. However, limited transportation alternatives and lower affordability for housing or jobs could create barriers for economic inclusivity.

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SMITHVILLE HOUSING STUDY

Summary

Focus is on affordability, renovations, and new construction to sustain Smithville's housing market.

- **Median Property Value in Smithville (2022) is $222,200, $60K Below National Average**
- **Property Values Increased by 23% from 2021 to 2022, Rising from $180,200**
- **Smithville's Homeownership Rate is 68%, Slightly Higher Than the National Average of 65%**
- **Median Per Capita Income in Smithville is $56,627 with 1.67K Households**
- **Smithville's Property Market Experiences Significant Growth Despite lower than regional average values.**

Current Characteristics

Citations: *U.S. Census Bureau (2022). American Community Survey 5-year estimates.* *http://censusreporter.org/profiles/16000US4879624-Smithville-tx*

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Households

1,666
Number of households

the Austin-Round Rock-Georgetown, TX Metro Area: 905,689

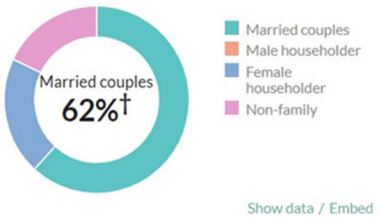
Texas: 10,490,553

2.4
Persons per household

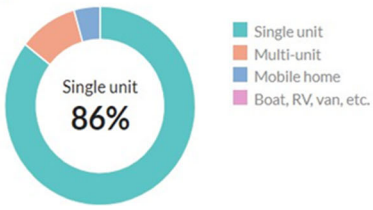
a little less than the figure in the Austin-Round Rock-Georgetown, TX Metro Area: 2.5

about 90 percent of the figure in Texas: 2.7

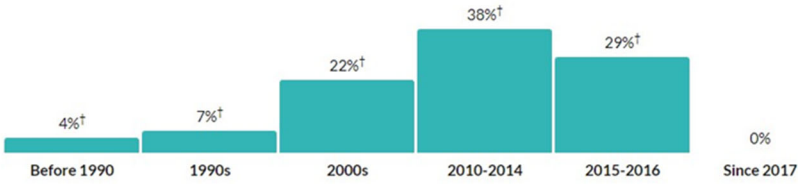
Population by household type



Types of structure



Year moved in, by percentage of population



Value

$222,200 ±$20,731
Median value of owner-occupied housing units

about three-fifths of the amount in the Austin-Round Rock-Georgetown, TX Metro Area: $390,500 ±$2,684

Value of owner-occupied housing units



Composition of Existing Housing Stock

Total Housing Units: Smithville has approximately 2,046 housing units.

Occupancy Status:

- Occupied Units: Approximately 81% of the housing units are occupied.
- Vacant Units: About 19% are vacant.

Ownership Structure:

- Owner-Occupied Units: Approximately 68% of occupied units are owner-occupied.
- Renter-Occupied Units: About 32% are renter-occupied.

Types of Structures:

- Single-Unit Structures: Approximately 86% of the housing units are single-unit structures.
- Multi-Unit Structures and Others: The remaining 14% comprise multi-unit structures, mobile homes, and other types.

Current Housing Market Trends

Smithville has experienced notable shifts in its housing market over the past year. Here's an overview of the current trends:

Home Values
Median Home Value: As of October 2024, the average home value in Smithville is approximately $328,685, reflecting a 1.7% decrease over the past year. Zillow

Market Activity

- **Active Listings:** There are currently 181 active home listings in Smithville, with 7 new homes listed for sale. Movoto
- **Median List Price:** In June 2024, the median listing price was $393,300, marking a 7.9% increase compared to the same period last year. Realtor
- **Median Sale Price:** In October 2024, homes sold for a median price of $395,000, representing a 21.2% increase year-over-year. Redfin

Market Competitiveness:

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- **Market Score:** Smithville's housing market is considered not very competitive, with a Redfin Compete Score™ of 13 out of 100. Redfin
- **Sale-to-List Price Ratio:** Homes are selling for about 4% below the list price. Redfin
- **Days on Market:** Properties typically go pending in around 124 days, indicating a slower market pace. Redfin

Inventory and Sales:

- **Homes Sold:** In December 2023, 61 homes were sold in Smithville, up from 41 in the same month the previous year, indicating increased buyer activity. Movoto
- **Days on Market:** On average, homes sold after 85 days on the market in December 2023, compared to 64 days in December 2022, suggesting a lengthening sales cycle. Movoto

Conclusion:

Smithville's housing market is experiencing mixed trends, with rising median sale prices and increased sales activity, yet a decrease in average home values and longer listing durations. These dynamics suggest a market in transition, with potential opportunities for both buyers and sellers.

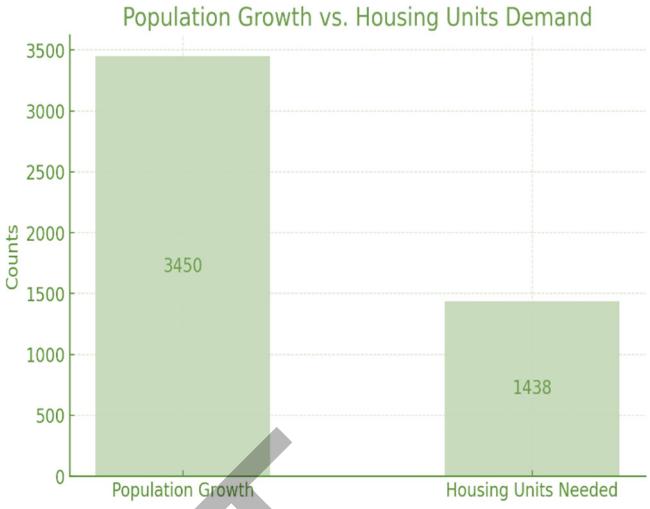
Future Housing Needs for Next 10 Years

Projection for Future Housing Units Needed (Next 10 Years):

Smithville's 2030 Comprehensive Plan anticipates significant population growth, estimating an increase of approximately 2,700 to 4,200 new residents over the next decade.

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To estimate the number of additional housing units required:



1. **Population Growth Estimate:** Assuming an average increase of 3,450 residents over 10 years
2. **Average Household Size:** With an average household size of 2.4 persons per household.
3. **Housing Units Needed:** Approximately **1,438 additional housing units** would be required to accommodate the projected population growth.
4. **Replacement of Aging Housing Stock:** Considering the age of existing structures, some units may require replacement or significant renovation.
5. **Market Demand and Economic Factors:** Factors such as housing affordability, economic development, and market trends will influence the actual number of units needed.

Based on projected population growth and current housing data, Smithville may need to develop approximately 1,400 to 1,500 new housing units over the next decade to accommodate new residents and replace aging structures. This estimate should be refined through ongoing assessments of demographic trends, economic conditions, and housing market dynamics.

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Housing Challenges

Over the next decade, Smithville will face several housing challenges that need to be addressed to support the community's growth and sustainability:

Affordable Housing: There is a significant need for affordable housing in Smithville, as indicated by the presence of various low-income housing options, including public housing and Section 8 housing choice vouchers. These are essential for supporting low-income households in the area.



Senior Housing: Given the aging demographic in Smithville, there is a growing demand for senior housing. This includes developments that cater to the needs of older adults, providing accessible living spaces and community amenities that support aging in place.

Diverse Housing Options: To attract a broader demographic, including younger families and professionals, Smithville needs to expand its housing options. This includes developing a mix of housing types that cater to different income levels and family sizes.

Sustainable Development: As a community that values its natural surroundings, there is a push for development that respects and integrates with the environment. This includes green building practices and developments that minimize environmental impact.

Infrastructure Support: With any expansion in housing, corresponding developments in infrastructure such as roads, utilities, and public services are necessary to support the growing population.

Addressing these needs will require collaborative efforts from local government, developers, and the community to ensure that Smithville grows in a way that is sustainable and inclusive.

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Draft Housing Goals and Objectives

GOAL #1 Increase Housing Availability Based On The Needs Of All Smithville Citizens

Objective #1: Conduct a Housing Needs Assessment and Market Study Action - Establish who will be the lead entity for housing development

- Action - Clarify the goals of the Assessment and Study
- Action - Pursue partnership possibilities on the Housing Needs Assessment and Market Study
- Action - If no appropriate partnerships can be established, contract with a private firm to conduct assessment and study

Objective #2: Educate residents on the distinction between low-income and affordable housing

- Action - Publish articles in the local papers
- Action - Present housing study results and general housing terminology to community groups and organizations

Objective #3: Establish Smithville's Housing Priorities

- Action - Meet with all organizations/ groups that are or could become involved in housing provision
- Action - Study the results of the Needs Assessment and the Market Study
- Action - Examine programs presented in the plan, in relation to study results
- Action - Talk to funding providers (including local sources such as Banks) to broaden your understanding of available programs
- Action - Considering political will, determine which of the studied options will be the most beneficial to Smithville

Objective #4: Outline Action Steps for Implementing Priorities

- Action - Establish responsibility for each of the housing priorities to be implemented
- Action - Determine cost factors for each project
- Action - Establish a timeline for each project

GOAL #2 Promote Safe And Healthy Living Conditions For Smithville's Residents

Objective #1: Continue program to address unsafe buildings within the city limits

- Action - Annually update the list and map of unsafe buildings Action - Create and maintain a realistic timetable for renovating or the demolition of unsafe buildings
- Action - Actively enforce this timeline

Objective #2: Establish a Home Rehabilitation Program

- Action - Continue to apply for funding assistance from TDHCA and USDA.
- Action - Develop a self-help renovation project where low interest loans are available for the rehabilitation of owner-occupied housing stock.

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- Action - Develop a youth-build program that can teach kids construction skills while providing inexpensive labor for renovation projects.

Conclusion

Smithville's housing market is experiencing growth in home values and maintains a somewhat competitive environment. To accommodate modest population growth, replace aging housing stock, and address market demand, the city may need to develop approximately 1,400 new housing units over the next decade. This projection will be periodically reviewed and adjusted based on actual population trends, economic conditions, and housing market dynamics.

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SECTION E. WASTEWATER SYSTEM

The wastewater study inventories major components of the local wastewater system and identifies areas of operation requiring improvement to ensure safe, efficient, and economical collections and treatment. The study concludes by providing a prioritized summary of needed improvements and estimated costs.

Highlights

Most of the City of Smithville's existing sewage collection and treatment system was constructed in the 1950s. Based on the best information available, City staff believe the system consists mainly of the original clay and AC lines, with PVC replacements in some areas. Aged and deteriorating lines are a primary cause for constant leaks and subsequent repairs, as well as inflow and infiltration (I/I).

The current wastewater treatment plants (WWTP) are the 0.5 MGD Gazley Creek Plant and the 0.3 MGD Willow Creek Plant. The Gazley Creek Plant was built in the 1950s and is an activated sludge process plant operated in the contact stabilization mode. The Willow Creek plant was built in the 1990s and is an activated sludge process plant operated in the contact stabilization mode. Neither plant has had any recent major renovations. However, the city recently completed a WWTP expansion study that outlines recommended improvements. Collection systems of this age typically experience a significant amount of I/I into the system. Flows that exceed the system design capacity can cause the WWTP to experience solids washout and other plant failures that would in turn cause violations of the permitted effluent quality.

The map entitled *Smithville, TX Wastewater System* illustrates the collected information.

In addition, this plan includes recommended projects to replace aging, deteriorating, and undersized lines to support safe, efficient, and economical wastewater collection and treatment.

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Wastewater Collection System Inventory

Original System

Most of the City of Smithville's existing sewage collection and treatment system was constructed in the 1950s. Based on the best information available, City staff believe the system consists mainly of the original clay and asbestos cement and brick manholes, with PVC pipe and concrete manhole replacements in some areas. Collection systems of this age typically experience a significant amount of I/I into the system. Flows that exceed the system design capacity can cause the WWTP to experience solids washout and other plant failures that would in turn cause violations of the permitted effluent quality.

Previous Studies & Improvements

Wastewater collection system maps were generated as part of a wastewater treatment plant expansion study by BEFCO Engineering, Inc. and Lockwood, Andrews, & Newnam, Inc. In addition, the study recommends immediate improvements to Machuca lift station, Gazley and Willow WWTPs, and 3 trunk lines at an estimated cost of $8.1 Million and various upgrades to existing wastewater infrastructure as funding becomes available.

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Key Components

Table 1 inventories the collection lines associated with the wastewater collection system operated by the City of Smithville by size, total length, and percentage of the system.

Table 1: Major Sewer Collection System Components

Sewer Lines			
	Diameter (in.)	Length (ft.)	Percent
Force Mains			
	4"	4,382	12.66%
	6"	10,363	29.93%
	10"	9,992	28.86%
	Unknown	9,886	28.55%
Subtotal – Force Main		***34,623***	***100%***
Gravity Feed			

	2”	513	0.31%
	6"	72,725	43.38%
	8"	55,861	33.32%
	10”	14,949	8.92%
	12”	8,985	5.36%
	Unknown	14,608	8.71%
Subtotal – Gravity Feed		***167,641***	***100%***
Total Sewer Lines		202,264	**100%**

Table 2: Lift Station Inventory

Lift Stations			
Name	**Location**	**Year Built**	**Condition**
Gazeley WWTP	WWTP	1950s	Good
Willows WWTP	WWTP	1990s	Good
Eagleston	Eagleston St	2011	Good
Hardeman	Hardeman St	2000s	Fair
Hilly Jones	Hill ST	2011	Good
4th Ave	4th Ave	2023	New
Machuka	SE 2nd ST	2006	Fair
Faulkner	Faulkner Rd	Pre 1980	Fair
Whitehead	Whitehead and NE 6th	2000s	Good
Riverbend	Riverbend Park	2015	New

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Table 3 shows the location and capacity of generators used to support the Smithville wastewater system.

Table 3: Generator Locations & Capacity

Generator	Location	Capacity or Size
Quick Disconnect	Riverbend LS	NA
Backup Generator	Gazley WWTP	UNK

System Operations

TCEQ conducted a Comprehensive Compliance Investigation (CCI) in September 2019 on the Willow Creek WWTP. The CCI report indicates that the City of Smithville had four minor alleged violations for one of the two required on-site lift station pumps was not operational, blower No. 2 was observed to be not operational, the facilities high level audio alarm was not functioning, and an aeration supply line was disconnected/damaged, not allowing it function as designed.

TCEQ conducted a Comprehensive Compliance Investigation (CCI) in October 2023 on the Gazley Creek WWTP. The CCI report indicates that the City of Smithville had four minor alleged violations for the scum collection system appeared to be allowing solids to bypass the scum receptacle and build up in the clarifier. The skimmer arms were unlevel and the curtains were damaged and one other minor record keeping violation

City of Smithville staff indicate that these allegations are being resolved, or have been resolved, at the time of this plan.

Wastewater System Analysis

The wastewater system analysis evaluates the system components described in the previous sections with respect to the applicable standards and criteria.

This analysis will consider the following elements:

- Standards & criteria
- Wastewater treatment facilities
- Industrial waste & special treatment facilities
- Inflow & infiltration (I/I) problems
- Collection system conditions
- Lift station conditions
- Manhole & cleanout conditions
- Unserved/underserved areas
- Impact of soil & terrain characteristics
- Operational procedures

Standards & Criteria

The US Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ) outline the standards or criteria applicable to municipal wastewater system design and operation including influent quality, collection, and treatment, and effluent quality.

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Texas Administrative Code (TAC), Title 30, Part 1, Chapter 217 - *Design Criteria for Domestic Wastewater Systems* - outlines system design and operations in all respects.[1]

EPA requirements relate to discharge limitations and industrial wastewater treatment.

Treatment Facilities

TAC standards provide detailed information concerning expected wastewater treatment facility design flows and loadings for the average municipal wastewater effluent stream.

Design criteria for sewage treatment facilities are based on process type and address the individual system components.

Design standards account for:

- Design flow.
- Peak flow
- Influent characteristics
- Required discharge quality. The criteria are comprehensive and consider most treatment technologies currently in common use.

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Typically, effluent strength entering the treatment facility should not exceed 200-to-350 mg/L BOD-5,[2] depending on the characteristics of the influent stream and the source of the wastewater stream. BOD5 and TSS values higher than 200 mg/L would likely be the result of wastewater demand from industrial sources that should be pretreated or eliminated.

Specific authorized effluent discharge quality limitations are established in the individual municipality or operator's *Permit to Discharge Waste* and will vary based on local conditions. For example, the permitted average flow depends on the source. A residential subdivision would have a permitted design flow of 75-to-100 gallons per capita per day, but a hospital design flow would be approximately 200 gallons per capita per day.

The design flow criteria for a facility with expected flows of less than 1.0 Million Gallons per Day (MGD) establishes the permitted flow as the maximum 30-day average flow. This permitted flow is estimated by multiplying the average annual flow by a factor of at least 1.5 and dividing that value by 12. When site-specific data is unavailable, the two-hour peak flow must be estimated by multiplying the permitted flow

[1] Chapter 217 revises and replaced the TCEQ guidelines were originally set forth in TAC, Title 30, Part 1, 317: "*Design Criteria for Sewerage Systems*".
[2] Two hundred to three hundred fifty milligrams per liter biochemical oxygen demand

described above by a factor of four (4.0).

TCEQ regulations require public sewer system owners to begin planning for plant expansion or replacement when the system experiences average daily flows in excess of 75% of its permitted capacity for three or more consecutive months.

If average daily flows exceed 90% for three or more consecutive months, TCEQ requires that the owner begin construction on a new or expanded treatment facility.

Collection Systems

Design criteria for collection systems include standards for:

- Pipe size.
- Horizontal and vertical spacing
- Gradient
- Manhole spacing
- Lift station connections
- Allowable infiltration/inflow. The standards require a minimum diameter of 6" for gravity collection mains.

The standards also specify minimum gradients for various pipe sizes that will be required to achieve a flow velocity of at least two feet per second (2' fps).

Table 4 *lists* the grade requirements and pipe size minimums required within the Smithville system.

Table 4: Sewer Gradient Standards

Main Size (in.)	Fall in Feet per 100 Feet of Line (ft.)
6"	0.50
8"	0.33
10"	0.25
12"	0.20

The typical manhole spacing for 6"-to-12" main sizes with straight alignment and uniform grades is 500' (maximum). Reduced spacing may be necessary based on a system's ability to clean and maintain its sewer with available equipment.

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Lift station design criteria establish general requirements that include, but are not limited to, the following:

1. The raw wastewater pump, with the exception of a grinder pump, must be capable of passing a sphere of 2.5" or greater.
2. The raw wastewater pump must have suction and discharge openings of at least 3.0" in diameter.
3. The lift station pumping capacity must have a firm pumping capacity equal to or greater than the expected peak flow.
4. For a lift station with more than two (2) pumps, a force main in excess of ½-mile, or firm pumping capacity of 100 GPM or greater, system curves must be provided for both the normal and peak operating conditions at C values for proposed and existing pipe.
5. A collection system lift station must be equipped with a tested quick-connect mechanism, or a transfer switch properly sized to connect to a portable generator, if not equipped with an onsite generator.
6. Lift stations must include an audiovisual alarm system, and the system must transmit all alarm conditions to a continuously monitored location.
7. A lift station must be fully accessible during a 25-year 24-hour rainfall event.
8. A force main must be a minimum of 4.0" in diameter, unless it is used in conjunction with a grinder pump station.
9. For a duplex pump station, the minimum velocity is three feet per second (3 fps) with one (1) pump in operation.
10. For a pump station with three (3) or more pumps, the minimum velocity is two feet per second (2 fps) with only the smallest pump in operation. The use of pipe or fittings rated at a working pressure of less than 150 pounds per square inch (psi) is prohibited.

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Wastewater Treatment Facilities

The City of Smithville's wastewater treatment plants are activated sludge process plants operated in the contact stabilization mode. Smithville's Willows Creek WWTP was constructed in 1990's and the Gazley Creek Plant in the 1950s.

The BEFCO-LAN study noted that Gazley WWTP is experiencing industrial type wastewater influent that may be impacting the plants performance and recommended the City investigate to identify the source and enforce their wastewater pretreatment ordinance.

Willows Creek *Permit to Discharge Waste* (WQ10286003) authorizes the discharge of treated domestic wastewater effluent at a daily average flow not to exceed 0.3 Million Gallons Per Day (MGD). According

to operations staff, the current average daily flows at the facility are an estimated 0.141 MGD. The current estimated average daily flow represents roughly 47.0% of permitted levels (see Table 5).

The Permit allows an average discharge during any two-hour period (two-hour peak) of 729 Gallons Per Minute (GPM), or 1.05 MGD. Measurements of the peak two-hour flows for the Willows Creek WWTP were not available at this time. However, according to city staff, peak flows are historically 4.0 times the average daily flow and are estimated at 0.56 MGD. (see Table 5).

Gazley Creek WWTP Permit (WQ10286001) authorizes the discharge of treated domestic wastewater effluent at a daily average flow not to exceed 0.5 million gallons per day (MGD). According to operations staff, the current average daily flows at the facility are an estimated 0.162 MGD. The current estimated average daily flow represents roughly 32.4% of permitted levels (see Table 5).

The Permit allows an average discharge during any two-hour period (two-hour peak) of 1092 Gallons Per Minute (GPM), or 1.57 MGD. Measurements of the peak two-hour flows for the Gazley Creek WWTP were not available at this time. However, according to city staff, peak flows are historically 4.0 times the average daily flow and are estimated at 0.65 MGD. (see Table 5).

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Table 5: Flows Standards & Current Performance

	Measure	Permitted [1]	Current (MGD)
Willow Creek WWTP	*Maximum Daily Average Flow* (MGD)	0.3	0.162 [2]
	Two-Hour Peak Flow (GPM or MGD)	729 or 1.05	0.56 [2]
Gazley Creek WWTP	*Maximum Daily Average Flow* (MGD)	0.5 [3]	0.162 [2]
	Two-Hour Peak Flow (GPM or MGD)	1092 or 1.57	0.65 [2]

[1] Based on current TPDES Permits (WQ10286003 and WQ10286001)
[2] Operations staff estimate
[3] Gazley's clarifier was not constructed large enough to meet the TCEQ permit limit of 0.500 MGD and instead is limited to 0.243 MGD.

Effluent samples are collected by the operator and analyzed by LCRA Environmental Laboratory Services for: Carbonaceous Biochemical Oxygen Demand 5-day (CBOD5), Total Suspended Solids (TSS), Ammonia Nitrogen (NH3-N), and E. Coli. Sample results were found to be compliant with permitted limits. The

operator performs total chlorine residual, dissolved oxygen (DO), and pH analyses. The contract laboratory used by the permittee was accredited by TCEQ to perform analytical methods for the permitted parameters. The City operates the chlorine analysis in-house.

Sludge Handling/Transporter: Republic Services hauls sludge from this WWTF to Austin Community Landfill (TCEQ Permit No. 2490) for disposal.

Inflow & Infiltration (I/I)

Inflow and Infiltration (I/I) are terms used to describe the flow of surface water or groundwater into a wastewater collection system.

Primary causes for I/I include:

- Deteriorated manholes that are no longer watertight
- Cracked or collapsed pipes.
- Disjointed pipe connections
- Inadvertent stormwater flows into the sanitary system via storm drains (cross-connections)

I/I is a serious, continuous, and cumulative problem that has a significant adverse effect on wastewater treatment facility operation costs and efficiency.

Acceptable I/I levels are determined by applying the standard of 200 gallons per inch of diameter per mile of pipe per day.

Using information collected in the system inventory, the allowable I/I for the City of Smithville's system would be about 43,241 GPD. This represents approximately 14.27% of the normal average daily flow.

Collection System Lines

Smithville's collection system consists of 202,264 Linear Feet (LF) of sewer line.

Many of the lines were installed with the original system in the early 1950s. The City's collection system is comprised of two different types of pipes: Clay and PVC. From the best available information, City staff estimate that 50% is original and 50% of pipe in Smithville's system are PVC.

Old, deteriorating pipes in the collection system are a primary cause for constant leaks and subsequent repairs, as well as inflow and infiltration (I/I). The City is currently developing a strategy to identify and

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address I/I through a project to improve the overall wastewater collection system operations in the near future.

Lift Stations

There are 11 lift stations operating within Smithville's collection system. According to the best information available, the lift station is a full-size lift station. Operations staff indicate that the sewer system requires rehabilitation, and that the City is considering strategies to improve overall system functionality.

Manholes & Cleanouts

Smithville's collection system includes approximately 346 manholes, and 5 cleanouts distributed throughout the system See *Map 6A: Existing Sewer System Map* for exact locations.

Older, deteriorating brick-and-mortar manholes are likely one cause of excessive inflow and infiltration (I/I) into the collection system. The City should continue to replace these brick manholes as resources allow.

Unserved/Underserved Areas

According to current system maps, the City of Smithville provides centralized sewer collection service to all residents within the corporate city limits, so the porosity and percolation characteristics of the local soils are not relevant. In addition, the collection system is relatively old in terms of service life and was installed in the late 1950s.

Soil Conditions

Soil and topography can impact wastewater system integrity by contributing to system infiltration and inflow, pipe breakage, and other construction issues.

For example, soils with high porosity characteristics may contribute to higher system infiltration rates, particularly when collection lines and manholes have deteriorated due to age and breakage. Soils that absorb water and swell, like fat clays, can crack sewer pipes and manholes, particularly when these components have been constructed with improper bedding material or techniques.

In areas that include septic systems, certain soils may be unsuitable for septic systems if they do not have suitable porosity and percolation characteristics.

Modern regulations require pipe installation to be constructed with engineered bedding materials that surround the pipe. These bedding techniques essentially remove the effects of swelling and shrinking clay soils and render the nature of the soil irrelevant.

Operational Procedures

Smithville's treatment facility is classified as a Class "C" facility and requires one operator with a Class "C" or higher license. The City of Smithville currently employs two Class "C" operators.

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Several treatment and collection issues that all sewer systems should address require minimal capital outlay. These issues are continuous and should be addressed by routine, scheduled operational procedures like the following.

- Establish a routine to locate sources of I/I and a plan to address these problems in a timely fashion.
- Establish a program for routine scheduled maintenance of plant mechanical equipment, possibly incorporating currently available technological systems such as SCADA (Supervisory Control and Data Acquisition) packages designed for this task.
- Monitor influent and effluent quality on a regularly scheduled basis, with appropriate recording and reporting procedures.
- Establish a routine line and manhole inspection schedule and a plan for the required line and manhole replacement and/or rehabilitation.

In many systems, these operational/maintenance practices occur in the form of repair as opposed to preventive maintenance. This situation appears to have occurred frequently in Smithville.

System Risks

Of the primary hazards listed above in the Hazards and Risks Assessment section, those with the potential and likelihood to impact Smithville's wastewater system are Flood, Lightning, Drought and Winter Storm. Table 6 lists potential impacts due to each hazard.

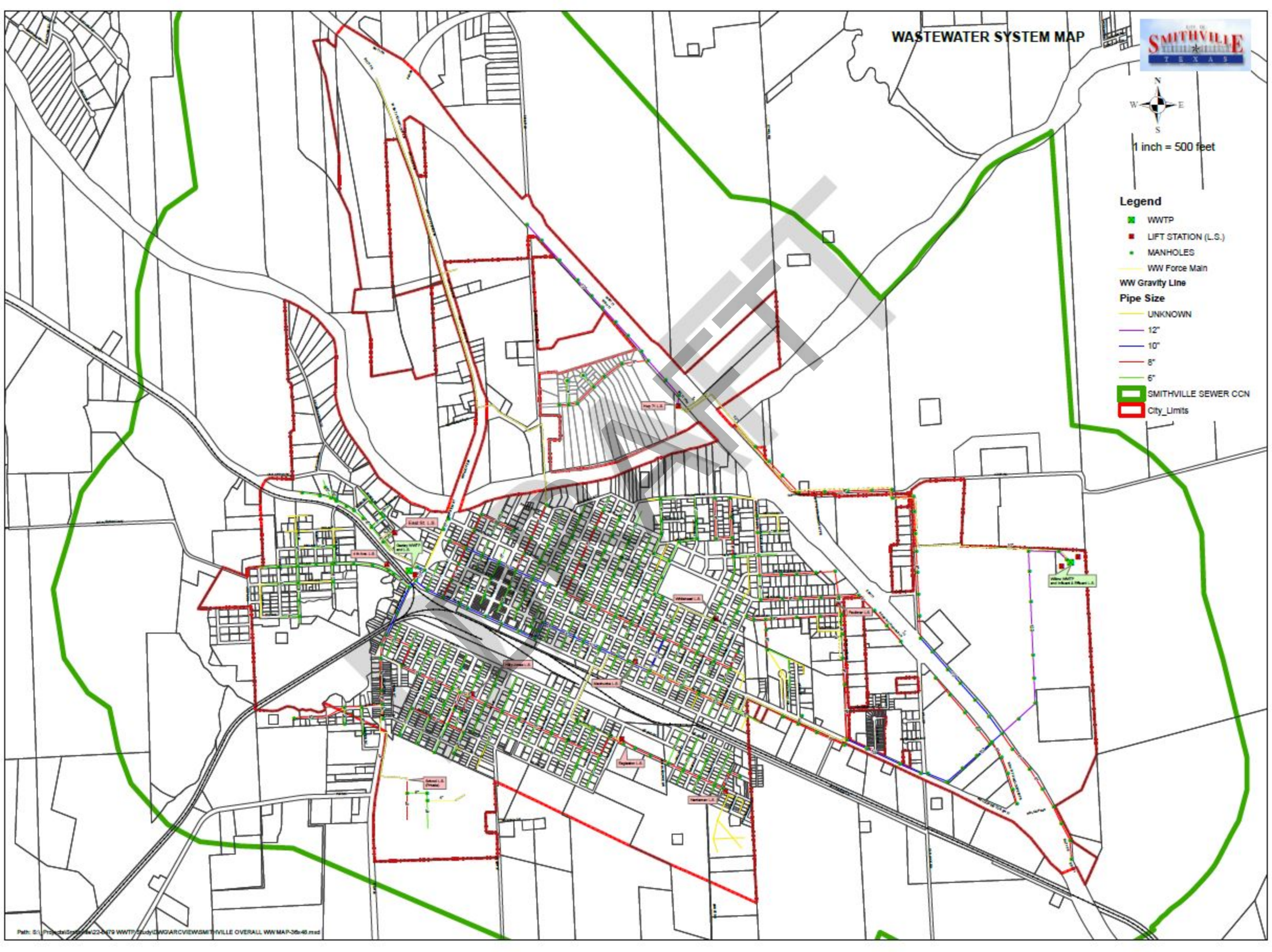
Table 6
Wastewater System Risks Summary

Hazard	Potential Impacts
Flood	Flooding of the collection system, lift stations, and treatment plants resulting in damage to system equipment, discharge of untreated wastewater, and system inoperability.
Lightning	Interruption of electrical service resulting in shutdown of entire or portions of the system due to inability to pump sewage from lift stations and operate treatment plants. Direct lightning strikes can also damage system facilities and injure personnel.
Drought	Severe drought can cause soil shrinkage resulting in pipe damage or failures.

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Winter Storm	Extended periods below 32° Fahrenheit have the potential to damage critical equipment, freeze water in exposed lines and inhibit emergency generator startups. In addition, heavy ice accumulation can interrupt electrical service.

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WASTEWATER SYSTEM MAP
SMITHVILLE
TEXAS
N
W
E
S
1 inch = 500 feet
Legend
WWTP
LIFT STATION (L.S.)
MANHOLES
WW Force Main
WW Gravity Line
Pipe Size
UNKNOWN
12"
10"
8"
6"
SMITHVILLE SEWER CCN
City_Limits

C. STORM WATER SYSTEM

1. DESCRIPTION OF SYSTEM

Smithville manages stormwater drainage primarily through an open ditch network, with some underground pipes supplementing in higher density areas. Flooding risks are present in portions of the city. Here are key details about the stormwater drainage system in Smithville, Texas:

- Smithville has a system of open ditches, culverts, underground storm sewers, and detention ponds to collect and convey runoff.
- Most roadways utilize curbside open channels and ditches to drain stormwater.
- Some parts of town rely on underground storm sewers.
- Newer subdivisions tend to have storm sewers and drainage ponds for detention.
- Stormwater runoff eventually drains into Willow Creek or the Colorado River.
- Localized flooding occurs in low points during heavy rains as capacity is exceeded in places.
- The northern section of the city is bounded by the Colorado River, and the southern and eastern portions of Smithville are within the 100-year floodplain of Willow Creek.
- Drainage projects aim to improve major outfalls, increase drainage channel dimensions, and add detention basins.
- Storm drains and ditches are cleaned periodically to remove debris that can impede flow.
- Erosion in drainage ditches causes sedimentation issues in downstream water bodies after rainstorms.
- The city stormwater utility fee helps fund drainage capital projects and maintenance.

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a. Geographic Information

Smithville is in the Lower Colorado River watershed of the Alum Creek Colorado River Basin. Natural drainage occurs in a South-southeast direction. The highest elevation in Smithville is 325 feet above sea level. Smithville's drainage system was developed during the city's growth. Existing roadside ditches, culverts, curbs, and gutters serve as the primary roadway drainage infrastructure in the city.

The system does not function well in some areas in its present configuration. Ditches lack adequate capacity to convey runoff during average rainfall events, and many also do not drain well after the event. Inadequate ditches also do not provide positive drainage for the pavement resulting in pavement subgrade and surface deterioration. Moreover, localized flooding occurs due to the lack of ditches, culverts, and maintenance of curbs and gutters along local streets. The below sections examine the state of each drainage facility type in more detail.

2. Storm System Inventory

Smithville's mix of ditches, pipes, ponds, and structures work together to direct storm runoff through topography to Willow Creek or the Colorado River. Based on reviewing municipal documents and maps for Smithville, the city's storm drainage system includes the following types of structures:

- Open ditches - Grass-lined open channels along most streets and roads to collect and direct runoff.
- Culverts - Metal and concrete pipes of various diameters that allow drainage ditches to run beneath driveways, sidewalks, and road crossings.
- Storm sewers - Underground pipes typically 15 to 30 inches in diameter in older parts of town that carry runoff. Includes manholes for access.
- Inlets/Catch basins - Collect runoff into the storm sewer system from curbs and paved surfaces.
- Headwalls - Concrete structures at the outlets of larger culverts and drainage pipes.
- Detention ponds - Landscaped ponds designed to temporarily store and slowly release stormwater in some neighborhoods.
- Outfall structures - Where drainage systems discharge to streams and creeks. Includes riprap and concrete outlets.
- Channels - Larger open or concrete-lined channels downstream of drainage networks that lead to Rocky Creek.
- Weirs/flumes - Concrete control structures on open channels to regulate stormwater flows.
- Debris grates - Metal grates to trap litter and debris across culvert and outlet points prone to clogging issues.

Drainage systems typically consist of curbs and gutters, pipes, ditches, and bridges that use the natural topography or grade of the land to facilitate the movement of stormwater out of a community's developed areas. Drainage in Smithville relies on a system of curb and gutter, culvert pipes, roadside ditches, channels, and creeks to control excess stormwater and convey it to the Colorado River and its tributaries. Drainage channel/ditch types include roadside ditches, natural-lined channels, and concrete-lined channels.

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Table 1: Key Drainage System Components

	City Limits	Total
Drainage Ditch/Channel (LF)	430,011	430,011
Curb & Gutter (LF)	87,805	87,805
Area Inlets (#)	244	244
Curb Inlets (#)	102	102

Table 1 lists the storm drainage structures within the City of Smithville. The most current Storm Drainage Exhibit is displayed on the Map entitled *Smithville, TX Storm Water System*.

Table 2 inventories the number and general location of key elements in the Smithville area's drainage system. Culvert pipes found throughout Smithville include Corrugated Metal Pipe (CMP), Reinforced Concrete Pipe (RCP), Reinforced Concrete Box Culvert (RCBC), High Density Polyethylene (HDPE), and Cast Iron (Iron).

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TABLE 2: STORM DRAINAGE STRUCTURES INVENTORY

ID	INVENTORY	Headwall	Blockage	Condition	Maintenance
1	(3) 24" RCP	No	Blocked	Badly Damaged	City
3	SH-95 Bridge	-	-	Undamaged	TxDOT
6	Large Bridge	-	-	Undamaged	TxDOT
8	Large Bridge	-	-	Undamaged	TxDOT

9	(2) 12” HDPE	Yes	None	Undamaged	City
13	48” RCP	Yes	None	Undamaged	TxDOT
14	(3) 4’x8’ RCBC	Yes	None	Undamaged	City
15	(4) 4’x8’ RCBC	Yes	None	Undamaged	TxDOT
16	Large Bridge	-	-	Undamaged	TxDOT
17	(5) 4’x8’ RCBC	Yes	None	Undamaged	TxDOT
18	Large Bridge	-	-	Undamaged	TxDOT
19	96” CMP	No	Partially	Undamaged	City
20	75’ Bridge	-	-	Undamaged	TxDOT
21	24” HDPE	Yes	None	Undamaged	City
22	24” HDPE	Yes	None	Undamaged	City
23	15” HDPE	No	None	Undamaged	City
24	18” HDPE	Yes	None	Undamaged	City
25	12” HDPE	Yes	None	Undamaged	City
26	15” HDPE	Yes	None	Undamaged	City
27	12” HDPE	No	Mostly	Undamaged	City
28	12” HDPE	No	Mostly	Damaged	City
29	12” HDPE	No	None	Undamaged	City
30	12” HDPE	Yes	None	Undamaged	City
31	18” HDPE	Yes	None	Undamaged	City
32	15” HDPE	Yes	None	Undamaged	City

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33	12” HDPE	Yes	None	Undamaged	City
34	12” HDPE	Yes	None	Undamaged	City
35	12” HDPE	Yes	None	Undamaged	City
36	12” HDPE	No	None	Undamaged	City
37	12” RCP	No	None	Undamaged	City
38	15” HDPE	Yes	None	Undamaged	City
39	12” HDPE	Yes	None	Undamaged	City
40	12” HDPE	No	Mostly	Damaged	City
41	15” HDPE	Yes	None	Undamaged	City
43	12” HDPE	Yes	None	Undamaged	City
45	10” HDPE	Yes	Mostly	Undamaged	City
46	20” RCP	Yes	None	Undamaged	City
47	12” HDPE	No	Partially	Undamaged	City
48	8” HDPE	No	Completely	Undamaged	City
49	2” HDPE	No	Partially	Undamaged	City
50	15” HDPE	Yes	None	Undamaged	City
51	12” HDPE	No	Mostly	Undamaged	City
52	12” HDPE	No	Mostly	Undamaged	City
53	12” HDPE	No	None	Undamaged	City
54	(2) 30” RCP	Yes	None	Undamaged	City
55	12” CMP	Yes	None	Undamaged	TxDOT

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56	20” HDPE	Yes	None	Undamaged	City
57	20” HDPE	Yes	None	Undamaged	City
58	24” HDPE	Yes	None	Undamaged	City
59	18” HDPE	Yes	None	Undamaged	City
60	18” CMP	Yes	None	Undamaged	City
61	12” CMP	Yes	None	Undamaged	City
62	15” HDPE	Yes	None	Undamaged	City
63	12” HDPE	Yes	None	Undamaged	City
64	12” HDPE	Yes	Mostly	Undamaged	City
65	15” HDPE	No	Mostly	Undamaged	City
66	18” HDPE	Yes	None	Undamaged	City
67	15” IRON	No	None	Undamaged	City
68	12” HDPE	Yes	None	Undamaged	City
69	12” HDPE	Yes	None	Undamaged	City
70	12” HDPE	Yes	Completely	Undamaged	City
71	36” RCP	Yes	None	Undamaged	City
72	36” RCP	Yes	None	Undamaged	City
73	18” RCP	No	None	Undamaged	City
76	12” HDPE	Yes	None	Undamaged	City
77	15” HDPE	No	None	Damaged	City

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78	(4) 16”x21” Arch CMP	Yes	None	Undamaged	City
79	15” HDPE	Yes	None	Undamaged	City
80	12” HDPE	Yes	None	Undamaged	City
81	12” HDPE	No	None	Damaged	City
82	30” CMP	Yes	None	Undamaged	City
83	12” RCP	Yes	None	Undamaged	City
84	12” HDPE	Yes	None	Undamaged	City
85	15”x20” Arch CMP	Yes	None	Undamaged	City
86	18” CMP	Yes	None	Undamaged	City
87	15” CMP	Yes	None	Undamaged	City
88	12” HDPE	Yes	None	Undamaged	City
89	12” Other	Yes	None	Undamaged	City
90	12” CMP	No	Mostly	Damaged	City
91	12” CMP	No	Mostly	Damaged	City
92	12” CMP	No	Mostly	Damaged	City
93	12” RCP	Yes	Partially	Undamaged	City
94	15” HDPE	No	None	Undamaged	City
95	15” HDPE	No	None	Undamaged	City
96	12” CMP	Yes	None	Damaged	City
97	12” CMP	Yes	None	Undamaged	City

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98	12” RCP	No	Partially	Undamaged	City
99	12” RCP	No	Partially	Undamaged	City
100	12” CMP	No	Partially	Damaged	City
101	12” CMP	No	None	Undamaged	City
105	12” CMP	No	Partially	Damaged	City
106	12” CMP	No	None	Undamaged	City
107	12” RCP	No	None	Undamaged	City
108	12” CMP	No	None	Undamaged	City
109	15” CMP	No	None	Undamaged	City
110	12” HDPE	No	None	Undamaged	City
111	21” CMP	No	None	Undamaged	City
112	12” CMP	Yes	None	Undamaged	City
113	12” CMP	Yes	None	Undamaged	City
114	15” CMP	No	Partially	Undamaged	City
115	12” CMP	No	Mostly	Damaged	City
116	18” CMP	No	Mostly	Damaged	City
117	12” RCP	No	None	Undamaged	City
118	12” HDPE	Yes	None	Undamaged	City
119	36” HDPE	Yes	None	Undamaged	City
121	12” CMP	No	None	Undamaged	City
122	12” CMP	No	None	Undamaged	City

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125	12” HDPE	Yes	None	Undamaged	City
196	12” HDPE	Yes	None	Undamaged	City
127	12” CMP	No	Mostly	Damaged	City
128	12” CMP	No	Partially	Damaged	City
129	12” HDPE	No	Mostly	Undamaged	City
130	15” HDPE	Yes	None	Undamaged	City
131	12” HDPE	No	Partially	Undamaged	City
132	12” RCP	Yes	None	Undamaged	City
133	30” CMP	Yes	None	Undamaged	City
134	12” CMP	Yes	None	Undamaged	City
135	15” HDPE	No	None	Undamaged	City
136	12” HDPE	No	None	Undamaged	City
137	12” RCP	No	None	Undamaged	City
139	12” HDPE	Yes	None	Undamaged	City
140	12” RCP	Yes	None	Undamaged	City
141	12” RCP	Yes	None	Undamaged	City
142	12” RCP	Yes	None	Undamaged	City
143	12” RCP	Yes	None	Undamaged	City
144	12” HDPE	No	None	Undamaged	City
145	30” HDPE	Yes	None	Undamaged	City
146	15” HDPE	Yes	None	Undamaged	City

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147	15” CMP	Yes	None	Undamaged	City
148	12” HDPE	Yes	None	Undamaged	City
149	12” RCP	Yes	None	Undamaged	City
150	12” HDPE	Yes	None	Undamaged	City
151	15” HDPE	Yes	None	Undamaged	City
152	12” HDPE	Yes	None	Undamaged	City
153	12” HDPE	Yes	None	Undamaged	City
154	12” HDPE	Yes	None	Undamaged	City
155	8” RCP	Yes	None	Partially	City
156	12” RCP	Yes	None	Partially	City
157	12” RCP	Yes	None	Undamaged	City
158	12” RCP	Yes	None	Undamaged	City
159	12” RCP	Yes	None	Undamaged	City
160	12” CMP	No	Mostly	Completely	City
161	(2) 12” HDPE	Yes	None	Undamaged	City
162	18” HDPE	Yes	None	Undamaged	City
163	12” RCP	No	None	Undamaged	City
164	15” HDPE	Yes	None	Undamaged	City
165	12” HDPE	Yes	None	Undamaged	City
166	12” HDPE	Yes	None	Undamaged	City
167	12” RCP	Yes	None	Undamaged	City

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168	12” RCP	Yes	None	Undamaged	City
169	12” RCP	Yes	None	Undamaged	City
170	18” RCP	Yes	None	Undamaged	City
171	18” RCP	Yes	None	Undamaged	City
172	30” CMP	Yes	None	Undamaged	City
173	30” CMP	Yes	None	Undamaged	City
174	30” CMP	Yes	None	Undamaged	City
175	12” HDPE	Yes	None	Undamaged	City
176	12” RCP	Yes	None	Undamaged	City
177	12” RCP	No	Mostly	Undamaged	City
178	12” CMP	No	Mostly	Completely	City
179	12” RCP	No	None	Undamaged	City
180	12” HDPE	Yes	None	Undamaged	City
181	12” HDPE	No	None	Undamaged	City
182	18” CMP	Yes	None	Undamaged	City
183	12” Other	Yes	None	Undamaged	City
184	18” CMP	No	Mostly	Completely	City
185	12” CMP	No	Mostly	Completely	City
186	12” HDPE	Yes	None	Undamaged	City
187	18” HDPE	Yes	None	Undamaged	City
188	12” CMP	Yes	None	Undamaged	City

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189	12” CMP	No	Partially	Completely	City
190	12” CMP	No	Partially	Completely	City
191	12” RCP	No	None	Undamaged	City
192	12” HDPE	No	None	Undamaged	City
193	12” HDPE	Yes	None	Undamaged	City
194	15” CMP	Yes	None	Undamaged	City
195	12” HDPE	Yes	None	Undamaged	City
126	12” Other	No	None	Undamaged	City
197	15” HDPE	Yes	None	Undamaged	City
198	12” RCP	No	None	Undamaged	City
199	12” CMP	Yes	None	Undamaged	City
200	12” CMP	Yes	None	Undamaged	City
201	30” CMP	Yes	None	Undamaged	City
202	36” CMP	Yes	None	Undamaged	City
203	(2) 12” RCP	Yes	None	Undamaged	City
204	12” CMP	Yes	None	Undamaged	City
205	(2) 15” HDPE	Yes	None	Undamaged	City
206	(2) 12” RCP	No	None	Undamaged	City
207	18” HDPE	Yes	None	Undamaged	City
208	12” HDPE	Yes	None	Undamaged	City
209	12” HDPE	No	None	Undamaged	City

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210	12” HDPE	No	None	Undamaged	City
211	12” HDPE	No	None	Undamaged	City
212	12” HDPE	Yes	None	Undamaged	City
213	12” HDPE	Yes	None	Undamaged	City
214	24” HDPE	Yes	None	Undamaged	City
215	12” HDPE	Yes	None	Undamaged	City
216	30” CMP	Yes	None	Undamaged	City

3. System Condition

Smithville's drainage system appears to be aged with moderate to significant deterioration observed that negatively impacts performance and drainage capacity in portions of the city during rainstorms. Based on research, here is an overview of the general condition of the existing storm drainage system in Smithville, Texas:

- Age - Much of the drainage infrastructure is old, with undersized systems dating back 50+ years that lack capacity for current runoff volumes.
- Pipe Condition - Older underground storm sewers deteriorate over time, leading to cracks, leaks and failures that contribute to infiltration and flooding issues.
- Ditch Erosion - Earthen ditches and channels have experienced erosion over time, reducing capacity and increasing sedimentation.
- Siltation - Buildup of silt, debris, and vegetation in ditches, culverts, and drainage paths obstructs flow and reduces capacity. Regular cleaning is needed.
- Structural Damage - Culverts, headwalls and other structures show signs of wear or distress such as cracking, subsidence, or exposed rebar.
- Undersized Capacity - Parts of the system are inadequate size to handle flows during moderate or major rain events, causing overflow and flooding.
- Lack of Detention - Few stormwater detention or retention ponds to attenuate flooding.
- Limited Mapping - Incomplete mapping and documentation of the overall drainage network makes assessment difficult.

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An Exhibit showing the 100-year floodplain within City Limits along with a National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM) 48021C0395F and 48021C0510F are provided on the Map entitled *Smithville, TX Storm Water System.*

The natural flow of surface runoff is often interrupted due to debris, silt, and overgrown vegetation in the culverts. The storm drainage structures need maintenance such as clearing and mowing.

This should be completed as needed but at the very least annually. Drainage overflow from the culverts has resulted in deteriorated roads with potholes and cracks throughout the City. Street damage and drainage flow interruptions are manageable infrastructure improvements, but due to the City's financial limitations, staying ahead of the maintenance and repairs is a challenge.

It is recommended that the City perform a drainage analysis on the City to determine the cause and severity of localized flooding. The drainage study should prioritize areas of flooding, identify solutions, and provide cost estimates for drainage improvements. It may be of interest for the City to research whether grant funds are available for a drainage study.

Currently, the City does not have a formal method for documenting flooding events.

It is recommended that the City consider a documentation plan to help keep records of such flooding incidents by recording the date, time, inches, drainage route, property owner calls and damage caused by each incident to allow for a better understanding of the impact of these events.

To protect the public health and safety, the City adopted an ordinance that prohibits the construction of buildings within the 100-year floodplain, restricts the use of floodplains for purposes that may be harmful to the public; and prevents the alteration of stream channels and flood zones that may increase flooding. Additionally, houses in the 100-year flood plain could potentially be bought out by the City and made into parkland or open greenspace. Money is available through FEMA's Hazard Mitigation Assistance Program for property acquisitions or buyouts within flood prone areas. The City should consider reviewing FEMA's grant assistance programs and researching buy-out programs.

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4. Maintenance Process

Routine maintenance allows for operational service life to last longer by preventing any prolonged drainage problems. Preventive maintenance is a precautionary method that helps reduce debris, sediments, and structural failure. Major maintenance is needed after severe damage has occurred. This type of maintenance is not needed on a regular basis. The following table gives examples for other maintenance activities and classifications recommended by this plan.

TABLE 3: MAINTENANCE PLAN

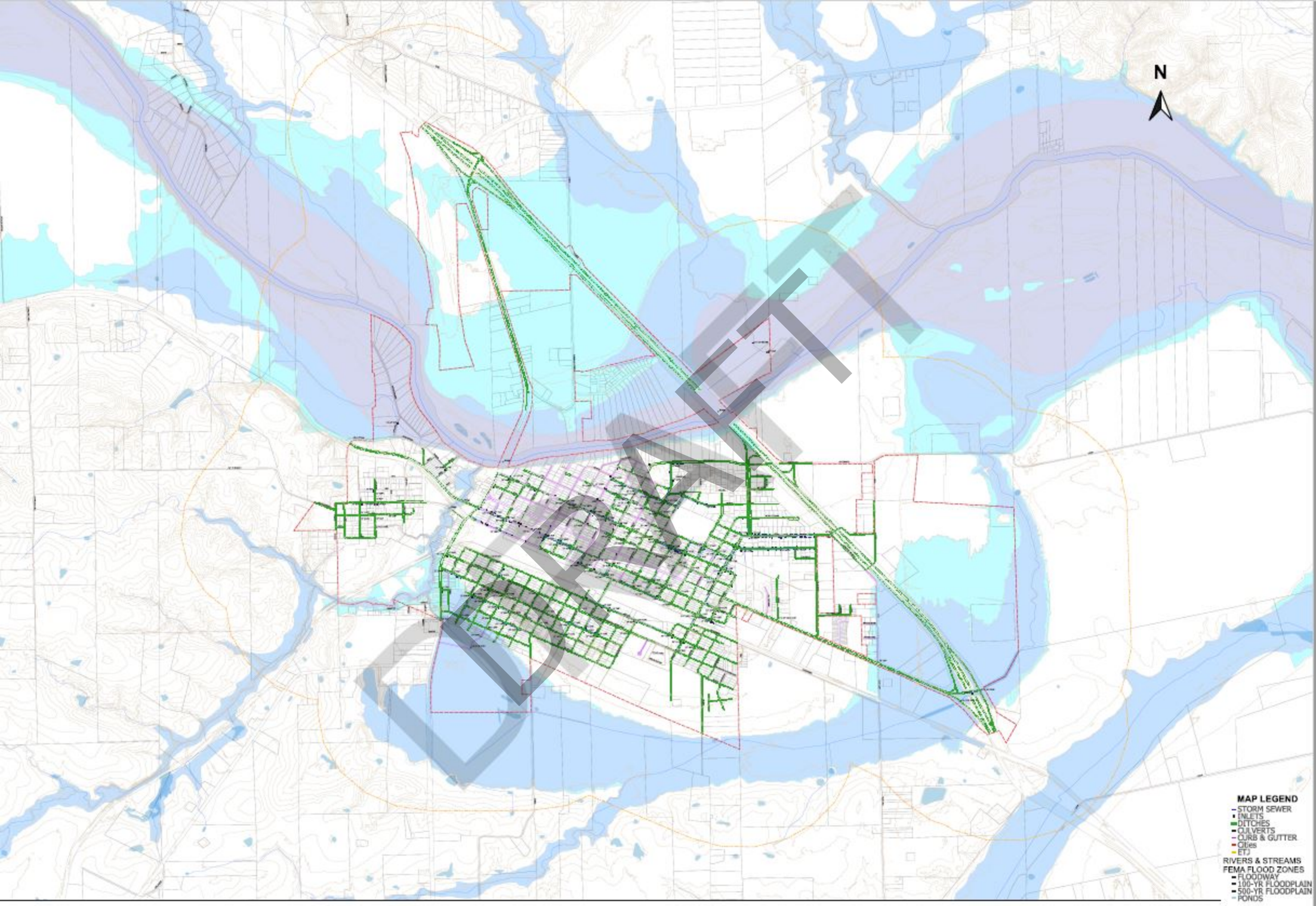
Routine Maintenance	Preventive Maintenance	Major Maintenance
*Litter and Trash Removal	*Debris Removal	*Construct New Drainage Channels
*Right-of Way Mowing	*Sediment Removal	*Replace Low Water Crossings
*Vegetation/Brush Management	*Channel Bank Stabilization * Concrete Repair	*Modify Drainage Structures (to increase capacity)

In order to properly maintain drainage areas, the City will need to invest in the proper equipment to perform the maintenance.

System Risks

Of the primary hazards listed above in the Hazards and Risks Assessment section, flooding is the primary hazard with the potential and likelihood to impact Smithville's stormwater system. Impacts to the stormwater system due to flooding include overwhelming of conveyance and detention structures capacity causing additional local flooding, damage or possibly destruction of stormwater culverts and underground storm sewers, and severe erosion of ditches. Wildfires can also damage stormwater infrastructure, particularly those not made of flame- or heat-resistant materials. Lightning and winter storm present minimal risks to Smithville's stormwater system because of the utilization of gravity to move water through the system.

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Smithville, TX
Stormwater System Map
City of Smithville, LCMS Inc., Ku & Associates

WATER SYSTEM

Water Service Area

The City of Smithville is a community water system that serves 2,040 total connections with a population of 4,130 (2020 US Census Bureau population estimate). The City of Smithville has three wells (Well No. 3, Well No. 5, and Well No. 6) on two pressure planes.

Description Of System

The City of Smithville's water supply and distribution system's original construction date, and approximately 65% of the original system remains. The original line material is clay, based on the best information available, City staff believe the system consists of .26% AC lines, .74% (CI) Cast iron, and .12% (DI) Ductile Iron with 35.3% PVC replacements. Unknown line material makes up 63.6% of the system and are believed to be original AC lines. Pipes range in diameter from 1"-to 16".

The map entitled *Smithville, TX Water System* illustrates the collected system information.

This plan evaluates the existing water system's ability to support future population growth and system resilience to hazards and includes recommendations for projects to address any related needs.

Public Water Supply (PWS) systems operating in Texas must adhere to TCEQ, AWWA, and EPA regulations and standards. The City of Smithville's water system is operating in accordance with all TCEQ-adopted minimum capacity standards for current active connections.

The Region K 2021 Regional Water Plan projects that water supplies for Smithville will be sufficient for the RCP planning period. However, the Region K 2021 Plan projects a water deficit may occur after 2050 based on population and demand projections. Regional Water Plans are updated every five years. The next review is in 2026.

Water System Inventory

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Original System

The City of Smithville's water supply and distribution system's original construction date, and approximately 65% of the original system remains. The original line material is clay pipe, based on the best information available, City staff believe the system consists of .26% AC lines, .74% (CI) Cast iron, and .12% (DI) Ductile Iron with 35.3% PVC replacements. Unknown line material makes up 63.6% of the system and is believed to be original clay lines. Pipes range in diameter from 1"- to 16".

Previous Studies & Improvements

Previous water system maps were generated by BEFCO Engineering. On January 7, 2020, the Texas Commission on Environmental Quality (TCEQ) received planning material with your letter dated December 24, 2019, for the proposed Storage Tank Rehabilitation. Based on our review of the information submitted, the project meets the minimum requirements of Tille 30 Texas Administrative Code (TAC) Chapter 290 Regulations for Public Water Systems and is approved for construction. The submittal consisted of thirteen sheets of engineering drawings and technical specifications. The approved project consists of:

• Interior and Exterior rehabilitation of the 197,000-gallon Keilberg Standpipe

• Interior and Exterior rehabilitation of the 50,000-gallon Downtown Ground Storage Tanks (GST);

• Interior and Exterior rehabilitation of the Recreation Center 200,000-gallon Pedosphere Elevated Storage Tank (EST);

• Interior and Exterior rehabilitation of the Dorothy Nichols (East Side) 200,000-gallon Pedosphere Elevated Storage Tank EST;

• Alternate bid items among other things include:

o Rehab Downtown Aerator;

o Rehab 5,000-gallon Keilburg Hydro pneumatic Tank;

o Rehab Downtown 147,000-gallon Elevated Storage Tank EST;

o Remove and dispose of 600,000-gallon Downtown Ground Storage Tank GST.

Key Components

Tables 1 and 2 show the inventory and locations of the various components associated with the

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water treatment, storage, and distribution system.

Table 1: Major Water System Components

Component	Location	Capacity or Size
Ground Storage Tank	NW 5th ST (Plant #1)	600,000 gallons
Ground Storage Tank	NW 5th ST (Plant #1)	50,000 gallons
Elevated Storage Tank	Recreation Center	200,000 gallons
Elevated Storage Tank	NW 5th ST (Plant #1)	147,000 gallons
Service Pumps (5)	NW 5th ST (Plant #1)	5,650 GPM
Ground Storage Tank	Near Hospital (Plant #2)	125,000 Gallons
Elevated Storage Tank	Near Hospital (Plant #2)	200,000 gallons
Service Pumps (2)	Near Hospital (Plant #2)	3,000 GPM
Standpipe (GST)	Keilburg Park	197,000 gallons
Hydro pneumatic Tank	Keilburg Park	1,500 gallons
Service Pumps (2)	Keilburg Park	800 GPM

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Table 2: Water Distribution System Components

Component	Linear Feet (LF)	Component	# Of Units
1” Line	1,098	Elevated Storage Tank	3
2” Line	49,171	Ground Storage Tank	4
3” Line	612	Service Pumps	9
4” Line	11,384	Fire Hydrant	128
6” Line	104,381	Valves	278
8” Line	47,743	Interconnection Valves	1
10” Line	19,657		

12” Line	2,516	
16” Line	11,432	
Unknown Size Line	11,514	
Service Connections: 2040 (TCEQ)		

Table 3 shows the location and capacity of generators used to support Smithville’s water system.

Table 3: Generator Locations & Capacity

Location	Capacity or Size
NA	NA

System Operations

TCEQ conducted a Comprehensive Compliance Investigation (CCI) No.1787191 in January 2022. The last CCI indicated that the system was operating at an average pressure of 49 psi with a residual chlorine level of 1.60 milligrams per liter (mg/L). The City employs two ground water operators for the system, both Class “C” operator.

Water System Analysis

The water system analysis evaluates the system components described in the previous section with respect to the applicable standards and criteria.

This analysis will consider the following elements:

- Standards & criteria
- Supply
- Storage
- Distribution
- System pressure
- Fire protection considerations.
- System revenues
- Water losses
- System interconnections
- Future development considerations

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- Regional & drought planning Standards & Criteria

The Texas Commission of Environmental Quality (TCEQ), the American Water Works Association (AWWA), and the US Environmental Protection Agency (EPA) have established regulations and standards for the safe treatment, storage, and distribution of potable water to the public.

All Public Water Supply (PWS) systems operating in Texas must adhere to these regulations and standards.

Table 4 compares TCEQ-adopted engineering standards for PWS minimum production and supply capacities with the Smithville Water Supply System's current capacities (according to copies of recent TCEQ routine compliance reports).

As Table 4 shows, the City of Smithville is operating in accordance with all established standards in all categories.

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Table 4

Plants	Supply (GPM)	Elevated storage (Gallons)	Ground Storage (Gallons)	Total Storage (Gallons)	Service Pumps (GPM)	Connections
Plane #1						
Plant #2: Near Hospital	1,450	200,000	125,000	325,000	3,000	**1,840**
Plant #1: NW 5th Street	1,500	200,000	600,000	800,000	1,750	
	550	147,000	50,000	197,000	900	
Plane #2						
Keilburg Park	0	5,000	197,000	197,000	800	**200**
Total Capacity Provided	**3,500**	**547,000**	**972,000**	**1,519,00**	**6,450**	**2,040**
TECQ Req Per Connection	0.6	100	NA	200	0.6	
Capacity Currently Required	1,224	204,000	NA	408,000	1,224	
Maximum Allowable Connections	5,833	5,470	NA	7,595	10,750	
85% Planning Rule Connections	4,958	4,650	NA	6,456	9,138	
Connections until 85% Planning	2,918	2,610	NA	6,456	7,098	
Maximum Additional Connections	3,793	3,430	NA	5,555	8,710	
Plane #1	3,500	547,000	775,000	1,322,000	5,650	**1,840**
TCEQ REQ	0.6	100	NA	200	0.6	
Capacity Currently Required	1,104	184,000	NA	368,000	1,104	
Maximum Allowable Connections	5,833	5,470	NA	6,610	9,417	
85% Planning Rule Connections	4,958	4,650	NA	5,619	8,004	
Connections until 85% Planning	3,118	2,810	NA	5,619	6,164	
Maximum Additional Connections	3,993	3,630	NA	4,770	7,577	
Plane #2*	900	5,000	197,000	197,000	800	**200**
TCEQ REQ	NA	20	NA	200	0.6	
Capacity Currently Required	NA	4,000	NA	40,000	120	
Maximum Allowable Connections	NA	250	NA	985	1,333	
85% Planning Rule Connections	NA	213	NA	837	1,133	
Connections until 85% Planning	NA	13	NA	837	933	
Maximum Additional Connections	NA	50	NA	785	1,133	

* Plane #2 is supplied by: PP1, (2) 450 GPM pumps drawing from 600,000-gallon Elevated Tank to PP2: 197,000-gallon Standpipe to (2) 400 GPM pumps to 5,000-gallon hydro tank.

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1. 85% of maximum capacity. If a water utility[1] reaches 85% of its capacity, it must submit a planning report to the TCEQ Director that addresses how it plans to expand system capacity to meet future demands (see Texas Administrative Code (TAC) Title 30, Chapter 291.93).

Water Supply

The City of Smithville is a community groundwater system that serves 2,040 total connections with a population of 3,952 (2020 US Census). The City of Smithville has three wells (Well No. 3, Well No. 5, and Well No. 6) and is operated as two pressure planes.

Well No. 3 (G0110003B); tested at 550 gallons per minute (GPM)) is equipped with a vertical turbine pump and discharges to a to a 600,000-gallon and 50,000-gallon ground storage tanks. Water discharges through an aerator to remove hydrogen sulfide present in water supply and hypo chlorination prior to ground storage. Two 500 GPM Service pumps and one 750 GPM service pump supply water to three Elevated storage tanks, two 200,00-gallon tanks and one 147,000 Tin Man in Pressure Plane One which float the distribution system.

Well No. 5 (G0110003A); tested at 1,500 gallons per minute (GPM)) is equipped with a vertical turbine pump and discharges to a 600,000-gallon and 50,000-gallon ground storage tanks. Water discharges through an aerator to remove hydrogen sulfide present in water supply and hypo chlorination prior to ground storage. Two 500 GPM Service pumps and one 750 GPM service pump supply water to three Elevated storage tanks, two 200,00-gallon tanks and one 147,000 Tin Man in Pressure Plane One which float the distribution system.

Well No. 6 (G0110003D); Industrial Well; tested at 1,300 GPM) is equipped with a vertical turbine pump and discharges to a 0.25 MG ground storage tank. The raw water is treated with polyphosphate, flows through an aerator, and is treated with gaseous chlorine prior to ground storage. Two 1,500 GPM service pumps supply water to three Elevated storage tanks, two 200,00-gallon tanks and one 147,000 Tin Man in Pressure Plane One which float the distribution system.

The City's water supply is rated as superior by the Texas Commission of Environmental Quality (TCEQ) Water System Data Sheet.

Water Storage

Texas Administrative Code, Title 30, Chapter 290, Subchapter D specifies water treatment plant design, operation, and maintenance requirements for public water systems.

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The code requires water systems with more than 250 connections to have storage capacity for the total number of connections served equal to or greater than:

(a) 200 gallons of total storage per connection

and

(b) (b) 100 gallons of elevated storage per connection, or a pressure tank capacity of 20 gallons per connection.

According to the TCEQ Water Utility Database, the City of Smithville's water system has 2,040 total connections.

Smithville's system meets the established minimum standards for water storage capacity with 745 gallons per connection of total storage and 268 gallons per connection of elevated storage.

Water Distribution System

The City of Smithville's water system includes approximately 259,508 Linear Feet (LF) distribution lines. Pipes range in diameter from 1"-to-16". Older line materials are primarily clay (AC). Newer replacement lines are primarily PVC.

Undersized water lines limit both volume and pressure within the distribution system. Texas Administrative Code (TAC), Title 30, Subchapter D, Section 290.44(c) prohibits the installation of new water lines smaller than 2". In addition, the standards only permit more than 10 connections on existing water mains when a licensed professional engineer deems it necessary.

Two-inch (2") and smaller diameter lines comprise approximately 20% (50,269 LF) of Smithville's water distribution system (see Table 2). Four-inch (4") diameter lines comprise an additional 4.62% (11,996 LF) of the system.

Undersized lines are located at the system's periphery where development intensity is low. However, a few undersized lines are located within established residential neighborhoods and have multiple single-family connections (see Map entitled Smithville, TX Water System).

The City of Smithville conducts line replacement as needed and when funding is available. The City replaces lines when required by events such as line breakage, valve malfunctions, or other related system failures.

System Water Pressure

Smithville's water system operates at a normal working pressure of approximately 49 pounds per square inch (PSI). This is sufficient to operate the system effectively.

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Water System Revenues

Table 5 indicates the City of Smithville's current rate schedule for water service.

Table 5: Minimum Monthly Water Fee

User	First 2,000 Gallons	Per/1,000 Gallons after
Residential (Base)	$18.00	$4.50
Res. or Comm. 1" Meter	$25.00	$4.50
Res. or Comm. 1.5" Meter	$50.00	$4.50
Res. or Comm. 2" Meter	$75.00	$4.50
Res. or Comm. 2.5" Meter	$125.00	$4.50
Res. or Comm. 3" Meter	$175.00	$4.50
Res. or Comm. 4" Meter	$300.00	$4.50

According to the information provided by City staff, the City's revenues and expenses as related to water services are as follows:

Table 6: Water Revenues & Expenses

Water & Operating Revenues	$1,261,820
Water & Operating Expenses	$412,171
Estimated Water Pumped	218,000,000 gallons

Water Losses

Unmetered water usage and/or unaccounted-for usage affects the cost to provide water services. City staff indicate that there are no unmetered or unbilled customers. In 2023, the actual number of gallons produced was 218,000,000 Gallons compared with 15,000,000 Gallons of unmetered use resulting in a water loss of 6.9%.

Major sources of water loss include:

- Line breaks

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- Aging or faulty meters
- Inaccurate or incomplete record-keeping
- Water theft and unauthorized use
- The City of Smithville plans to replace aging lines as funding becomes available.

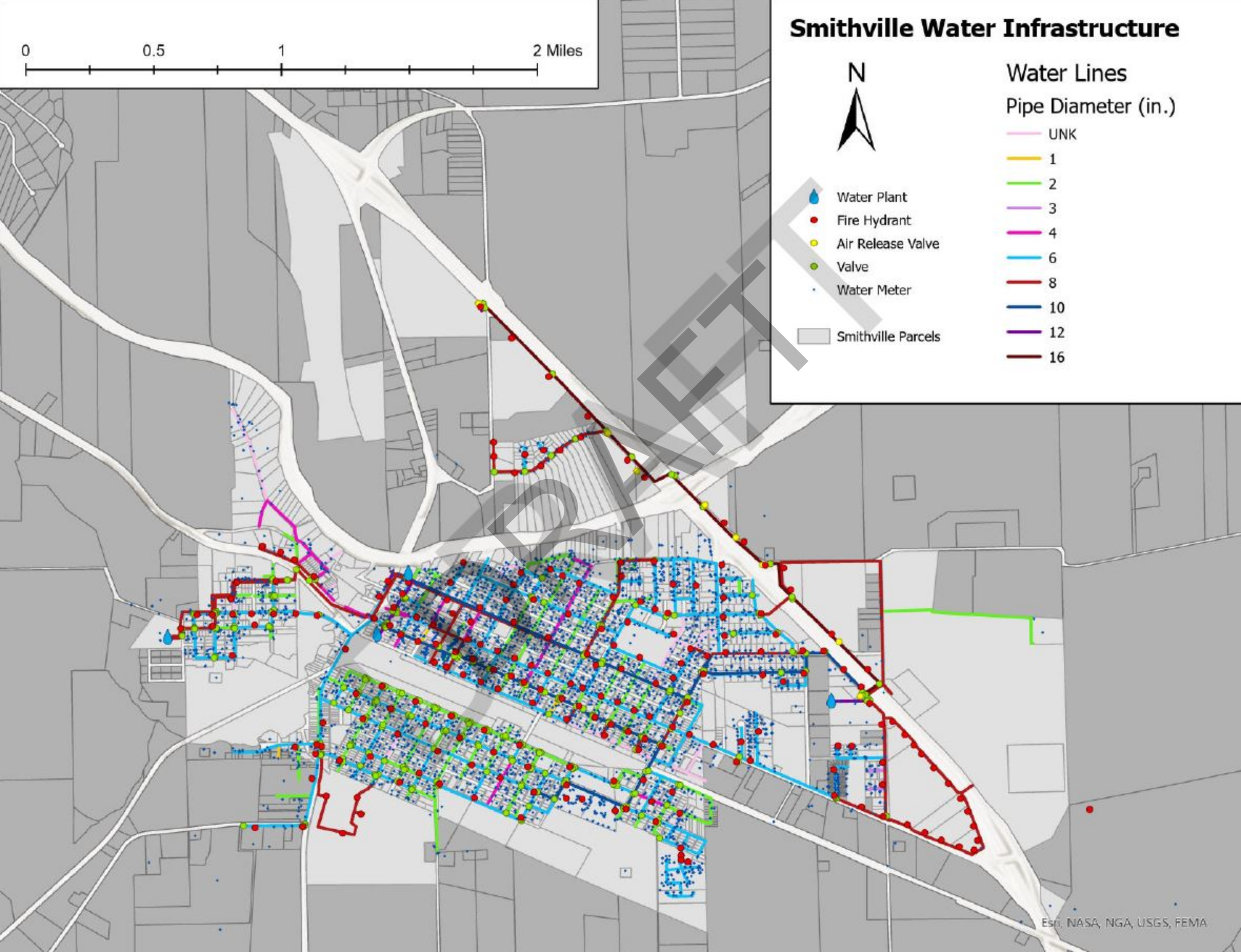
System Risks

Of the primary hazards listed above in the Hazards and Risks Assessment section, those with the potential and likelihood to impact Smithville's water system are Flood, Lightning, Drought and Winter Storm. Table 7 lists potential impacts due to each hazard.

Table 7
Water System Risks Summary

Hazard	Potential Impacts
Flood	Flooding of wells and treatment plants resulting in unsafe drinking water, damage to pipes, pumps, and tanks.
Lightning	Interruption of electrical service resulting in shutdown of entire or portions of the system due to inability to pump water from wells, operate treatment plants, and distribute water to the pipe network. Direct lightning strikes can also damage system facilities and injure personnel.
Drought	Severe drought could potentially impact well production capacity.
Winter Storm	Extended periods below 32° Fahrenheit has the potential to damage critical equipment, freeze water in exposed lines, cause line breaks, render treatment units inoperable and inhibit emergency generator startups. In addition, heavy ice accumulation can interrupt electrical service.

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Smithville Water Infrastructure
N
Water Lines
Pipe Diameter (in.)
UNK
1
2
3
4
6
8
10
12
16
Water Plant
Fire Hydrant
Air Release Valve
Valve
Water Meter
Smithville Parcels
0
0.5
1
2 Miles
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Esri, NASA, NGA, USGS, FEMA

SECTION F. ELECTRICAL SYSTEM

The City of Smithville Electrical distribution and transmission system was installed in 1895. Smithville Municipal Utilities is a Municipally Owned Electric Utility (MOU) which owns, operates, and maintains the transmission lines within the system. The City receives and purchases power from a single substation which is owned by LCRA. The City's staff indicated that no major electrical upgrades are required now. Minor improvements such as replacing poles and tree trimming will be required in the upcoming years.

The Smithville Municipal Utilities is a Public Power Utility that operates under the Public Utility Commission of Texas. The system has 1,650 service connections according to City staff. The City does not own high voltage transmission facilities or generation resources to meet the needs of its customers. The transmission source in the area is provided by LCRA TSC high voltage transmission and transformation facilities. The City has contracts in place to purchase its wholesale power requirements from LCRA.

The following section provides an inventory of the major components of the City's electrical system as of the date of this comprehensive plan. The plan will also identify operation areas where system improvements should be implemented to improve the system's safety, efficiency, and economy. The plan will conclude by providing a prioritized summary of the improvements needed and their estimated costs.

Electrical System Inventory.

Table 1 Shows the inventory of the various components associated with the electrical transmission system.

Table 1: Electrical System Components

Electrical System Summary of Facts and Statistics	
Year established	1895
Fiscal year begins	January
Population	4,130
Annual system peak demand	10.4 MW
Annual system energy sales	45,237 MWH
Annual electric revenue	$5,540,854
Connected meters	2,289
Miles of transmission lines	0
Distribution lines (overhead)	39.0 Miles
Distribution lines (underground)	4.0 Miles
Operating primary distribution voltage	12.47-Kilovolts (kV)

Electrical System Analysis

Standards and Criteria. The National Electrical Safety Code (NESC), Public Utility Commission of Texas (PUCT), North American Electric Reliability Corporation (NERC), and Southeastern Electric Reliability Council (SERC) have established regulations and standards to ensure safe and reliable delivery of electricity to its users. All electrical distribution systems within Texas will adhere to PUCT and NERC and

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must adhere to their regulations. SERC is a not-for-profit based organization which provides an independent platform for an efficient regional energy market. Due to its location, the City of Smithville is within SERC's region as opposed to the Electric Reliability Council of Texas (ERCOT) which manages over 90% of the State of Texas.

Electrical Rates. The City currently purchases electricity on a wholesale basis from LCRA. Table 2 below indicates the current customer rates averages for the City's system:

Table 2: Current Electrical Rates

Type	Rate/Charge	Wire Charge/KW HR
Residential	$10.00	$.0550
Commercial	$10.00	$.0550
Industrial	$25.00	$.0650

*The city administrator shall adjust the generation charge monthly to equal the total cost of generation supplied to the city.

Electrical Supply. The Smithville City Substation serves electric load to the City and BlueBonnet Electric Cooperative (BBEC). The electric load for these two customers is served from two transformers: PWT-Tl (City) and PWT-T2 (BBEC}. The total installed transformer capacity of PWT-Tl is 22.4/29.6 Mega-Volt-Amperes (MVA) (Summer/Winter), and the 2018 60-minute non-coincidental peak (NCP) kilowatt demand for the City of Smithville system was 10,441 kW.

There are presently three low voltage distribution feeders that originate at the Smithville Substation utilized to serve the area load efficiently and reliably. The City's electric load is comprised of approximately 70 percent residential, 30 percent commercial and zero percent industrial. The City's aggregate electric load power factor for the summer peak of 2018 was 96.43 percent, **which is below the current ERCOT requirement of at least 97%.**

Electrical Distribution System. The main electrical lines within the City's system are three-phase lines. Single phase lines are distributed throughout the system as needed for various customers within the city. Most of these lines are installed on treated wooden power poles. ANSI O5 defines the minimum standards for the quality of wood poles to be installed for electrical systems.

The City does not have an established program for routine line replacement. The national average for life expectancy of wooden poles are about 45 years without remedial treatment. The City replaces power poles periodically when required by events such as failures due to weather events.

Overhead and Underground Conductor Length in Miles

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Table 3: Conductor Inventory					
		Conductor Phase			
	Feeder	Single	Three	Two	Total (Miles)
Over Head	SL20	10.4	4.7	1.8	16.9
	SL30	2.8	4.6	0.6	8.0
	SL50	4.7	6.4	2.2	13.3
				Overhead Total	**38.2**
Underground	SL20	1.2	0.0	-	1.2
	SL30	0.0	0.0	-	0.0
	SL50	1.2	1.1	-	2.3
				Underground Total	**3.5**
				Grand Total	**41.7**

The City has a small number of underground electrical lines but does not have specific plans for converting more areas of the City. City staff have indicated that the City is interested in installing more underground lines if the appropriate funding mechanism can be established.

Prioritized Problems: City Leaders, staff, and consulting engineers have identified the following areas of concern regarding the electrical system.

1. Phase Balancing.
2. Power Factor Correction
3. Feeder Relay Breaker Settings
4. Vegetation trimming

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System Risks

Of the primary hazards listed above in the Hazards and Risks Assessment section, those with the potential and likelihood to impact Smithville's electrical system are Lightning, Extreme Heat, Wildfire, Windstorm and Winter Storms. Table 4 lists potential impacts due to each hazard.

Table 4 Electrical System Risks Summary	
Hazard	Potential Impacts

Lightning	Lightning can cause damage to electrical equipment resulting in the interruption of electrical service.
Extreme Heat	Extreme heat can increase demand on the system to the point of failure, overheat and damage electrical transformers and other critical components, and create electrical fires due to conductor insulation degradation and sagging of power lines near vegetation.
Wildfire	Wildfire can destroy electrical system components comprising the power distribution system.
Windstorm	High winds can damage power lines, break power poles, cause trees to down power lines, and propel debris into transformers and other critical electrical components potentially causing widespread power outages and fires.
Winter Storm	Extended periods below 32° Fahrenheit have the potential to cause electrical equipment failures. Ice accumulations can damage power lines, which can lead to widespread outages.

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E. TRANSPORTATION SYSTEM

a. Road Classifications and Inventory

Smithville's roads range from multi-lane state highways down to two-lane city streets and county roads. The state highways serve as the primary regional connectors.

A recent Street Conditions Survey and Maintenance Plan was completed by Freeland & Turk Engineering Group in April 2024. The main road classifications and important roads in Smithville, Texas:

- State Highways – State HWY 71 and State HWY 95 are the primary highways passing through Smithville. State HWY 71 leads northeast to Bastrop and southeast to La Grange. State HWY 95 links Smithville to Flatonia to the south.
- Farm-to-Market Roads - FM roads serve as important regional connectors from Smithville to surrounding rural areas. Notable ones include FM 2571, 535, and 153.
- City Streets - Within Smithville itself, main thoroughfares include Loop 230/N 3rd St, Gazeley St (State HWY 95), N 2nd St, Charlestown Blvd, and N 8th St.
- County Roads - A network of county roads provides local access and circulation throughout Bastrop County surrounding Smithville.

The following street inventory table, Table 1 has been provided. The table is organized by classification of road type, pavement width, right-of-way width in feet, and pavement type. These classifications have been used to better understand the street system and its components.

The road types have been classified into the following four (4) categories:

- State/County- Route between residential areas to state highways.
- Major Arterial- Road used for high traffic volumes.
- Minor Arterial-Road serves for moderate traffic volume.
- Residential-Roads allocated for residences.

Road type classification allows for future analysis on prioritizing road maintenance and budget improvements.

TABLE 1: ROAD CLASSIFICATION	
DESCRIPTION	**CLASSIFICATION NUMBER**
State/County	1
Major Arterial	2
Minor Arterial	3
Residential	4

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A comprehensive inventory of the City's streets is included below in Table 2.

There are two main types of surface pavements used for municipal roads, known as Hot-Mix Asphaltic Concrete (HMAC) and gravel or dirt (pit-run base). HMAC is a combination of heated stone, sand, or gravel bound together by asphalt cement from crude oil. The batch is then mixed, brought into the project site, and compacted into the streets. This method allows for a longer life span of 30- 40 years, with less frequent maintenance but at a higher cost.

Asphaltic penetration can also serve as a short-term solution to postpone long-term problems. Typically, it is applied by spreading oil on either an exposed road base or an existing roadway. Then the spreading and rolling aggregate are added into the surface. Usually either a one-course or two- course surface treatment is used, with a two-course surface used on new roads.

Another material used for road surface is known as gravel or dirt. This material is spread throughout the streets, allowing to facilitate the runoff into drainage ditches. It may either level out the surface or spread out where the gravel is not necessary. This method is the cheapest of both methods, but the least desired.

The total number of roads and their current known description is listed in the table below. The inventory list was retrieved based on the current city limits. The listed pavement width, right-of-way width and pavement type details are based on best available data provided, county records and site visits.

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TABLE 2: STREET INVENTORY

Street Name	Road Condition	Road Material	Road Width Feet	ROW Width Feet	Road Length Feet	Notes
Interstate						
None						
State/County Roads						
State Hwy 71	1	HMAC	160	200	10,080	Overlayed in 2020
State Hwy 95 (Gazeley St)	2	HMAC	55	65	9.610	Crosses Railroad Tracks
SL 230 (N 3rd Street)	4	HMAC	45	55	12,672	See TxDot Planned Projects
FM 2751	2	HMAC	35	45	3,320	

Major Arterial	Road Condition	Road Material	Road Width Feet	ROW Width Feet	Road Length Feet	Notes
Main Street	3	HMAC	60	70	2,290	Diagonal Parking Downtown
N 1st Street	3	HMAC	20-55	65	6,390	Diagonal Parking Downtown
N 2nd St	3	HMAC	20-55	65	6,550	Diagonal Parking Downtown
Martin Luther King	4	HMAC	20	30	6,920	
Taylor Street	4	HMAC	25	35	4,880	Crosses Railroad Tracks
Miller Street	4	HMAC	25	35	2,435	Crosses Railroad Tracks
Minor Arterial	Road Condition	Road Material	Road Width Feet	ROW Width Feet	Road Length Feet	Notes
Cleveland Street	4	Chip Seal	20	30	1,685	
Ramona Street	4	Chip Seal	40	50	2,065	
Olive Street	4	Chip Seal	40	50	1,660	
Gresham Street	4	Chip Seal	35	45	2,600	
N 4th Street	4	HMAC	45	55	6,335	
N 5th Street	4	Chip Seal	30	40	6.075	
S 2nd Street	4	HMAC	25	35	7,710	
S 4th Street	4	HMAC	35	45	4,670	
Residential	Road Condition	Road Material	Road Width Feet	ROW Width Feet	Road Length Feet	Notes
2nd Avenue	2	Chip Seal	20	30	785	No street view, satellite view
3rd Avenue	4	Chip Seal	20	30	1,520	
4th Avenue	4	Chip Seal	25	35	3,110	
5th Avenue	4	Chip Seal	20	30	1,990	

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6th Avenue	2	Chip Seal	15	25	175	
7th Avenue	2	Chip Seal	25	35	695	
Anderson Street	1	Chip Seal	30	40	200	No street view, satellite view
Ash Street	4	Chip Seal	20	30	1,030	
Bishop Street	4	Chip Seal	30	40	2,785	
Bluebonnet Circle	3	Chip Seal	25	35	770	Ends in 100' Cul De Sac
Bluff Street	4	HMAC	15	25	325	
Brazos Bend Avenue	2	Chip Seal	25	35	325	Ends in 70' circle Cul De Sac
Bunte Street	4	HMAC	20	30	2,830	CS Candidate
Burleson Street	4	Chip Seal	35	70	2,900	
Byrne Street	2	Chip Seal	35	45	1,560	
Caldwell Lane	2	Chip Seal	20	30	715	
Center Street	5	Dirt	15	25	240	
Charleston Blvd	2	Chip Seal	15	25	4,785	
Chase Street	2	Chip Seal	25	35	315	
Colorado River Road	5	Dirt	15	25	795	No street view, satellite view
Colorado Street	4	HMAC	35	45	3,500	
Craddock Ct St	2	Chip Seal	30	40	415	Ends with 75' Cul De Sac
Dorothy Nichols Road	4	HMAC	25	45	1,250	Appears to be partially TxDOT ROW
Eagleston Street or Ken Blaschke Drive	4	Hybrid	20	30	1,390	HMAC/Chip Seal
East Street	4	Hybrid	20	30	170	HMAC/Chip Seal
Faith Lane	2	Chip Seal	25	35	515	Both ends, 60'x 45' Cul De Sacs
Faulkner Road	2	Chip Seal	20	30	305	
Fawcett Street	4	Hybrid	65	75	1,630	HMAC/Chip Seal

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Garwood Street	4	Hybrid	40	50	3,450	HMAC/Chip Seal
Gentry Street	4	Hybrid	20	30	1,085	HMAC/Chip Seal
Hardeman Street	2	Chip Seal	20	30	625	Potholes near Martin Luther King Drive
Harper Street	3	Chip Seal	20	30	590	
Hickory Street	4	Chip Seal	20	30	2,750	
Hill Road	4	HMAC	25	45	2,645	
Hudgins Street	4	Chip Seal	40	50	3,060	
Joy Lane	2	Chip Seal	20	30	620	
Kings Way	2	Chip Seal	25	35	715	
Lee Street	4	HMAC	25	35	1,945	
Live Oak Street	4	HMAC	30	40	2,715	Includes all section
Loop Road	2	Chip Seal	20	30	2,170	
Lynch Street	4	Chip Seal	20	30	1,060	
Marburger Street	2	Chip Seal	20	30	1615	
Maple Street	4	Chip Seal	25	35	665	
McSweeney Street	2	Chip Seal	25	35	910	
Mills Street	1	Chip Seal	40	50	305	Diagonal Parking Downtown
N 6th Street	4	Hybrid	35	45	5,385	HMAC/Chip Seal
N 7th Street	4	Hybrid	35	45	5,220	HMAC/Chip Seal
N 8th Street	4	Hybrid	35	45	6,650	HMAC/Chip Seal
N 9th Street	3	Chip Seal	35	45	4,375	Includes all section
N 10th Street	3	Chip Seal	20	30	515	
N 11th Street	3	Chip Seal	20	30	550	
Nichols Street	1	Chip Seal	30	40	310	No street view
North Street	4	Chip Seal	20	30	1,190	
Pecan Shores Drive	4	Chip Seal	20	30	3,410	

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Pendergrass Lane	1	Chip Seal	30	40	245	No street view
Pine Street	5	Hybrid	20	30	2,115	HMAC/Chip Seal
Prima Street	2	Chip Seal	25	35	670	No street view, satellite view
Reed Street	1	Chip Seal	25	35	325	
Riverchase Avenue	3	Chip Seal	30	40	330	
Rivers Street	4	HMAC	25	35	1,950	Good candidate for CS
Ross Street	2	Chip Seal	30	40	1285	
S 5th Street	2	Chip Seal	20	30	3205	
S 6th Street	4	Hybrid	35	45	3,755	HMAC/Chip Seal
S 7th Street	3	Chip Seal	35	45	1,120	
Shade Street	2	Chip Seal	30	40	410	
Short Street	2	Chip Seal	25	35	2,750	No street view, satellite view
Smithfield Gardens Street	2	Chip Seal	25	35	650	Apartment complex
Tiger Drive	5	Dirt	10	20	175	Possible Driveway
Turney Lane	4	Chip Seal	20	30	1,030	
Upton-Smithville Road	4	Hybrid	20	30	1,820	HMAC/Chip Seal
Valley View Lane	2	Concrete	20	30	280	Apartment Road
Walker Street	2	Chip Seal	20	30	1850	
Washington Street	4	Hybrid	25	35	2,415	HMAC/Chip Seal
Webb Street	2	Chip Seal	25	35	1065	
West Street	2	Chip Seal	20	30	295	potholes @ intersect with Upton-Smithville Road
Whitehead Street	4	Chip Seal	25	35	4,135	
Wilkes Circle	2	Chip Seal	25	35	1905	
Woodress Street	2	Chip Seal	20	30	1155	
Yeager Street	2	Chip Seal	25	35	2,550	

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Smithville's location about halfway between Austin and I-10 to Houston leads to regular regional pass-through traffic on State Highway 71. Local daily traffic within the city is much lower. Unfortunately, there does not seem to be publicly available data on the specific average daily traffic counts within the city limits of Smithville, Texas. However, we can look at some related traffic data to get a general sense:

- On State Highway 71 through Smithville, average traffic counts range between 15,800 to 22,519 vehicles per day with the highest traffic counts occurring just outside the city limits towards Austin. This is expected as it is the main highway connecting the city to major urban centers.
- On State Highway 95 through Smithville, average traffic counts range between 2,308 to 6,642 vehicles per day with the highest traffic counts occurring near the intersection with Loop 230. This indicates that much of the traffic from SH 95 enters the downtown area in Smithville.
- Traffic is much lighter on the rural Farm to Market and county roads surrounding Smithville, perhaps only seeing a few hundred to more than a thousand vehicles per day.

Within Smithville itself, traffic is concentrated on N 3rd St/Loop 230 through downtown and thoroughfares like N 2nd Street and Charlestown Blvd, but as a small city of under 5,000 people, overall traffic is relatively light.

While exact numbers are unavailable, we can estimate average daily traffic counts ranging from several thousand on the highways down to just a few hundred on rural backroads around Smithville. Main Street and other arterials within the city see lighter local daily traffic as well.

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Table 3 - TxDot Planned Road Maintenance

Street	Project Length (Miles)	From	To	Scope	Cost
SL230	2.4	SH 95	SH 71	Overlay	$1,282,572
SH 95	.94	SL230	S. of FM535	Intersection/Operational Improvements	$1,188,000

Both projects are scheduled to begin in the next four years.

TxDot completed Overlaying of State HWY 71 from the Colorado River to Fayette County Line in 2020 coasting $2,815,000, and Seal Coating FM 535 in 2023 costing $1,647, 378.

b. System Conditions

From researching Smithville's local reports and news sources, here are some notes on the overall street conditions around the city:

- Many of the major roads and highways around Smithville are reported to be in decent condition, including State Highways 71 and 95 that pass through the city.

- However, some aging rural Farm-to-Market and county roads outside the city limits are said to have poorer conditions with cracked/crumbling asphalt.

Within the Smithville city limits, street conditions are good but require ongoing maintenance and repairs. Some specific problem areas have been reported:

- Sections of N 3rd St (SL230) require overlay, planned by TxDOT in the next four years.
- State HWY 95 from SL230 to FM535 require improvements intersections and operational controls. Planned by TxDot in the next 4 years.
- State HWY 95 from SL230 to FM535 require sidewalks curb and gutters.
- Downtown streets are older with limited lighting, drainage problems, and fading striping.
- The city has a street department that fills potholes and makes localized repairs but lacks funding for major reconstruction projects.

Overall, Smithville has a mix of both higher-traffic state highways in good shape as well as aging rural roads and city streets that require attention and maintenance. Potholes, cracking, drainage issues, and lighting are among the street conditions needing improvement around town.

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c. System Risks

Of the primary hazards listed above in the Hazards and Risks Assessment section, those with the potential and likelihood to impact Smithville's transportation system are Flood, Lightning, Extreme Heat, Wildfire and Winter Storms. Table 4 lists potential impacts due to each hazard.

Table 4
Transportation System Risks Summary

Hazard	Potential Impacts
Flood	Flooding of roadways and low-water crossings resulting impeding travel and/or potentially life-threatening situations, as well as damage to infrastructure.
Lightning	Interruption of electrical service resulting in shutdown of entire or portions of the traffic control system.
Extreme Heat	Extreme heat can cause buckling and rutting of pavement surfaces.
Wildfire	Wildfire can buckle or destroy pavement surfaces and traffic controls, render roadways impassable, or threaten drivers unable to flee.

Winter Storm	Extended periods below 32° Fahrenheit has the potential to damage roads and bridges. Ice and snow accumulations can cause dangerous driving conditions or render roadways impassable. In addition, heavy ice accumulation can interrupt electrical service to the traffic control system.

d. Street Maintenance Plan

Smithville, Texas currently does not have a formal, published street maintenance plan. However, some insights into the city's street maintenance approach can be gathered:

- The city has a Street Department that is responsible for maintaining Smithville's streets. They perform tasks like pothole patching, crack sealing, surface treatments, signage, and vegetation control.
- The annual city budget allocates funding for street department operations and supplies
- Occasional bonded projects and grants provide funding for major street reconstruction efforts.
- Priority is given to higher-traffic arterials and collectors such as N 3rd Street (Loop230) and Gazeley Street when it comes to major repairs and rebuilds.
- Most maintenance on lower-volume residential streets is done reactively as problems arise rather than proactively.
- The city relies on citizen reports of issues to identify areas needing maintenance. There is no regular street condition survey program.
- Long-term planning documents mention goals for upgrading streets but no dedicated street plan.

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In summary, Smithville performs street maintenance reactively with limited funding, focused on busier roads. A more robust, multi-year street maintenance plan based on programmed condition assessments could help improve road conditions across the city.

e. Maintenance Strategies

1. Crack Sealing
   Crack sealing is a maintenance technique that places sealant into roadway cracks in order to prevent water intrusion into the asphalt pavement. It is necessary to treat cracks; if not they will lead to even more crack failures which will add up to an even greater expense.

2. Base Repair

   The base repair consists of removing any distressed areas where the pavement has been

fractured and broken, which allows for water to weaken the subgrade under the roadway. Once the distressed asphalt has been removed, a tack coat is applied, and new base material placed and compacted to grade. This work is done to extend the life of the roadway.

3. Patching

Thin areas in the asphalt are patched with fine asphalt concrete. Typically, the asphalt depressions are small and have settled over time. The resultant repairs will have a patchwork appearance.

Resurfacing Strategies

1. Chip and Slurry Seal

This sealing application consists of thin asphalt emulsion (liquid asphalt) on existing asphalt roadway surface followed by placement of small rock chips on the existing pavement. Sealing is a pavement preservation treatment that help extend service life of the streets by 8 to10 years. The necessary steps usually taken for this procedure consists of crack sealing any selected cracks, patching any potholes or deteriorated areas, and placing of the slurry seal.

2. Asphalt Resurfacing or Overlay

A more precise form of street maintenance involves placement of a new layer of asphalt. Each layer is approximately one and a half inches thick. This method can provide an extended life on the street by 20 to 25 years throughout heavily used streets.

3. Reconstruction

This method is typically used when the street has been completely deteriorated and must be replaced. Reconstruction includes excavating the entire roadway, placing/compacting rock, placing/compacting Hot Mix asphalt and restoring adjacent properties. It is anticipated that reconstruction of roads will typically last for 20 to 25 years depending on traffic, weather conditions, and the proper strategy of treatments.

The City of Smithville needs to develop a Street Maintenance and Improvements Program as a process of identifying and prioritizing necessary street projects. The prioritizing systematic methodology of the program will allow for the application of projects to be made on a pay-as-we-go plan. This will alleviate any additional debt or disturbances within the current budget. Allowing for prioritizing of projects will allow the City of Smithville to better analyze their street system to better configure and budget the deteriorating streets that are in desperate need of improvements.

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Pavement Survey

The Street Maintenance and Improvements Program is a critical component in the maintenance of an effective city transportation system. In order for the Program to be effective, it must be based on the condition of the pavements comprising the network. Therefore, it is recommended

$$\text{Composite Rating} = \frac{65\%(Pavement\ Score)}{9} + \frac{35\%(Traffic\ Score)}{9}$$

that the City perform a formal Pavement Survey of all the City streets to supplement the Street Maintenance and Improvements Program. A pavement survey generally consists of an evaluation of the pavements to document the overall condition including, but not limited to, the type of pavement, the presence or absence of particular features such as curb and gutter structures, the presence or absence of distress to the pavement section, and the level of traffic on over the section. Typically, this evaluation is accomplished by visual observation of the pavement in question.

Of the features captured by the pavement survey, the level of distress to the pavement as captured in the pavement condition score and the volume of traffic captured by the traffic score are the most relevant. This is because the length of the remaining service life of a given pavement section is strongly related to its current level of distress and the volume of traffic running over the pavement. It is important to note that the rate of distress formation in a pavement is not linear. Rather, distress in a pavement begins relatively slowly and progresses slowly over the first few years of the pavement's life. The rate of distress formation accelerates over time, with a high rate of distress formation over a short period of time as the pavement reaches the end of its service life. The volume of traffic has an impact on the length of a pavement's service life as heavier traffic accelerates distress formation faster than lighter traffic.

After rating each street segment in terms of traffic and pavement condition, a composite rating may be generated that is based on both the traffic and pavement conditions of each segment. The composite rating weights the pavement and traffic conditions and can be calculated according to the following formula:

Once the composite ratings for each pavement segment is calculated, each section may then be ranked in terms of its priority for maintenance as well as what types of maintenance may be required to properly address the condition of each pavement section. Using the composite rating of each street segment along with specific visual observations of each segment, all street segments can be assigned to various maintenance and/or resurfacing strategist as described in the Street Maintenance and Improvements Program. The Pavement Survey should be updated on a 5-year revolving cycle.

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RCP Data Collection Update

2021 Region K Regional Water Plan
City of Smithville Water System Map – geo-referenced GIS Shapefiles
City of Smithville Wastewater System Map – geo-referenced GIS Shapefiles
Most recent TCEQ PWS Compliance Investigation Report for Smithville
TCEQ WWTP Permits for Gazley and Willow Creek WWTPs
LCRA 2019-2024 City of Smithville Electric System Study
City of Smithville Electric System Map – geo-referenced GIS Shapefiles
City of Smithville 2024 Street Assessment

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Smithville Water System Capacity Overview

System compliant with TCEQ capacity requirements

3 supply wells

2 pressure planes

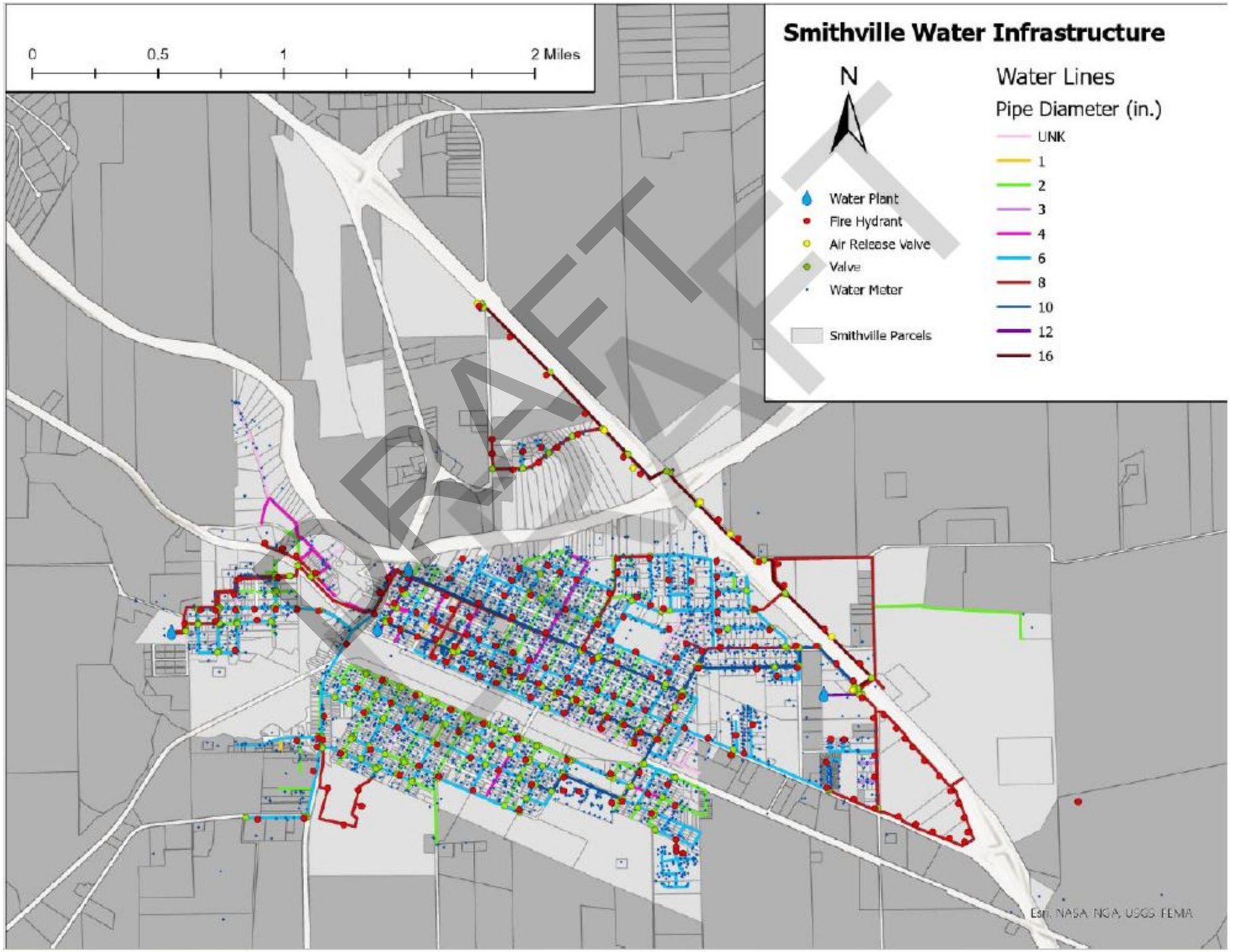
Elevated Storage Limiting Factor to growth in Plane 1

Hydrotank Capacity Limiting Factor to growth in Plane 2 near Keilberg Park

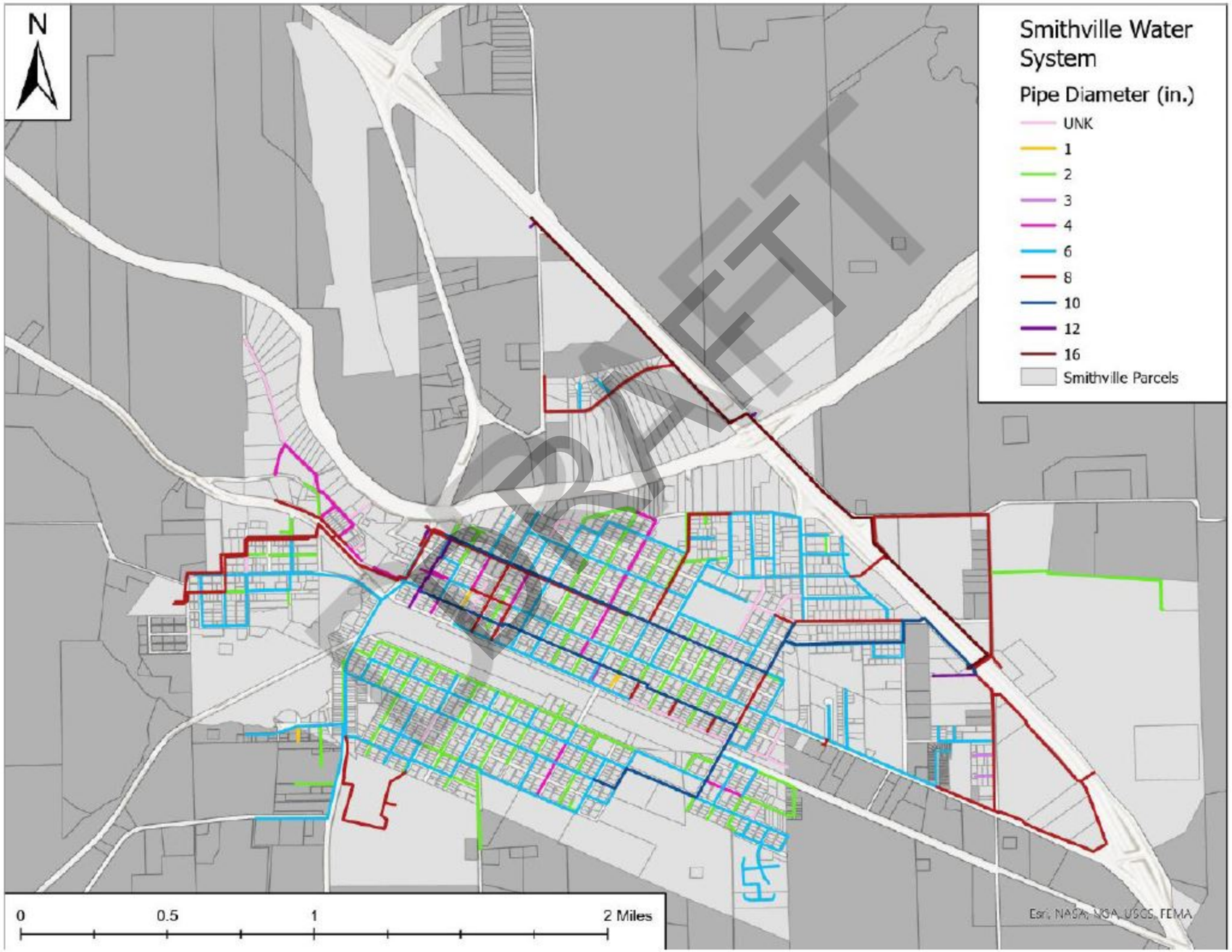
Pressure Plane	Supply (GPM)	Elevated storage (Gallons)	Ground Storage (Gallons)	Total Storage (Gallons)	Pumps (GPM)	Connections
Plane #1	3,400	547,000	775,000	1,322,000	5,650	1,840
TCEQ Req./Conn.	0.6	100	N/A	200	0.6	
Current Req. Capacity	1,104	184,000		368,000	0	
Max. Allowed Conn.	5,667	5,470		6,610	9,417	
85% Rule Conn.	4,817	4,650		5,619	8,004	
Conn. Until 85% Rule	2,977	2,810		3,779	6,164	
Max. Additional Conn.	3,827	3,630		4,770	7,577	
Plane #2*	900	5,000	197,000	202,000	900	200
TCEQ Req./Conn.	0.6	20	N/A	200	0.6	
Current Req. Capacity	120	4,000		40,000	120	
Max. Allowed Conn.	1,500	250		1,010	1,500	
85% Rule Conn.	1,275	213		859	1,275	
Conn. Until 85% Rule	1,075	13		659	1,075	
Max. Additional Conn.	1,300	50		810	1,300	
* Plane 2 is served by 5,000 gallon hydrotank						

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Smithville Water System Map



Smithville Water Pipe Network



Smithville Wastewater Overview

Two (2) Wastewater Treatment Plants (WWTPs), Gazley Creek & Willow Creek WWTPs with 0.5 Million Gallons per Day (MGD) and 0.3 MGD treatment capacity, respectively

Gazley WWTP at XX% capacity & Willow Creek WWTP at 57% capacity

WWTP expansion study currently underway with anticipated 1st draft by end of July 2024.

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Smithville WW Map

N
W E
S

1 inch = 500 feet

Legend

- WWTP
- LIFT STATION (L.S.)
- MANHOLES
- WW Force Main

WW Gravity Line

Pipe Size

- UNKNOWN
- 12"
- 10"
- 8"
- 6"
- SMITHVILLE SEWER CCN
- City_Limits

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