Travis County

Emergency Services District 2

Pflugerville Fire Department

Pflugerville, Texas

Community Risk Assessment

Community Risk Reduction Plan

2022

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Executive Summary

Purpose

The purpose of a Community Risk Assessment is to evaluate a community's risks prior to the development and implementation of a Community Risk Reduction Plan. The 2020 Edition of National Fire Protection Association (NFPA) Standard 1300, *Standard on Community Risk Assessment and Community Risk Reduction Plan Development* details the responsibilities and requirements on the process to conduct a community risk assessment and to develop, implement, and evaluate a community risk reduction plan.

In addition to NFPA 1300, this document will follow the best practices and industry standards for Community Risk Assessments and Community Risk Reduction Plans set forth by Vision 20/20. Vision 20/20 is a project hosted by the Institution of Fire Engineers (IFE) – USA Branch (IFE-USA), a 501(c) (3) non-profit global organization. A coalition of national organizations and experts guides the Vision 20/20 Project exemplifying how collaboration, communication, and commitment to data-based solutions saves lives and property.

Background

TCESD2 completed its first Community Risk Assessment and Community Reduction Plan in 2019. This 2022 update to both the Community Risk Assessment and Community Risk Reduction Plan builds upon the solid foundation developed in 2019.

NFPA 1300 recommends conducting the Community Risk Assessment every five years, or more frequently based on community need. NFPA 1300 further recommends an annual review of the Community Risk Assessment to identify emerging trends that could impact the current Community Risk Reduction Plan and Community Risk Reduction Programs.

Methodology

Vision 20/20 defines Community Risk Reduction as "a process to identify and prioritize local risks, followed by the integrated and strategic investment of resources (emergency response and prevention) to reduce their occurrence and impact." Vision 20/20 sets forth a six-step process for Community Risk Reduction to develop the TCESD2 Community Risk Assessment and Community Risk Reduction Plan. The first two steps of the process comprise the Community Risk Assessment, and the last four steps relate to the Community Risk Reduction Plan.

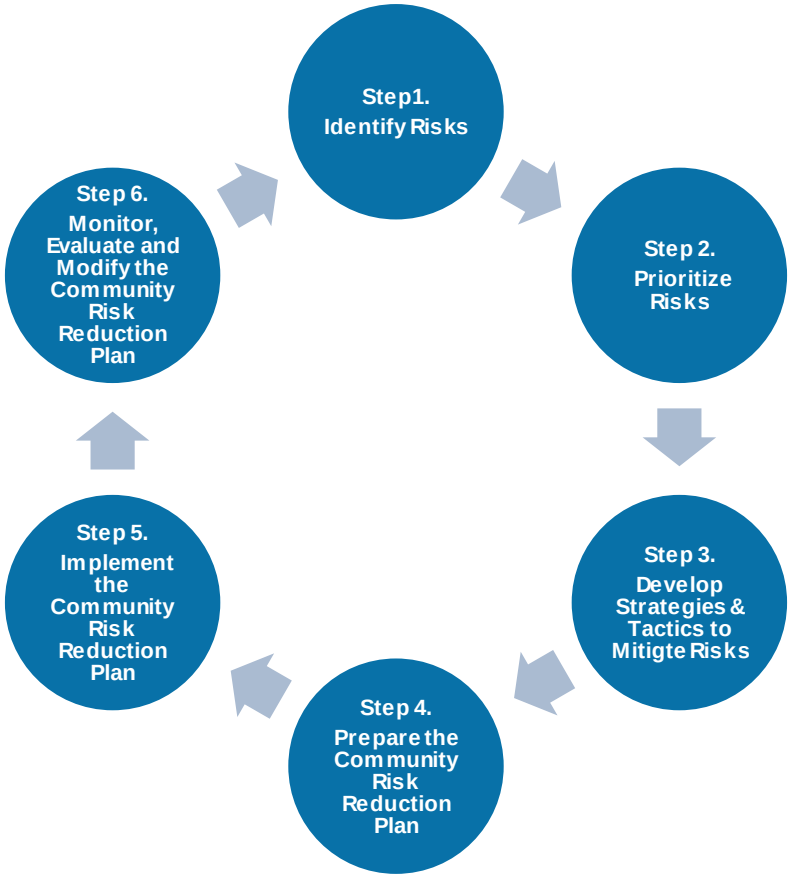
Conducting a Community Risk Assessment and developing a Community Risk Reduction Plan requires an objective, systematic approach. This approach shall include the following six steps as recommended by Vision 20/20 and in accordance with NFPA 1300:

The Vision 20/20 Community Risk Reduction Process[1]

Step 1. Identify Risks: Collect empirical data (data that is capable of verification or is known to be true) regarding the community's demographics, building stock profile, geography, past loss history and potential likelihood or anticipated future events.

Step 2. Prioritize Risks: Define the problem by identifying the potential risk and their root causes and develop programs appropriate to mitigate the identified risks within the available resources.

Step 3. Develop Strategies & Tactics to Mitigate Risks: This part of the process requires brainstorming with a variety of individuals involved, including those most affected by the risk.



Step 4. Prepare the Community Risk Reduction Plan: Analyze the data and identify gap areas where actual conditions vary from desired outcomes to develop the Community Risk Reduction Plan.

Step 5. Implement the Community Risk Reduction Plan: The process to implement the plan should include timelines for each goal and objective. Based on the needs of the community and the available resources, these timelines can be of short or long duration.

Step 6. Monitor, Evaluate, and Modify the Community Risk Reduction Plan: Validate the Community Risk Assessment by comparing the findings of the Community Risk Assessment with the available data to ensure they are consistent with the community's level of acceptable risk, capabilities, and resources. All risks considered in the Community Risk Assessment might not appear in the Community Risk Reduction Plan. Adjust as necessary to ensure the plan meets desired goals and objectives and has the desired

[1] http://riskassessment.strategicfire.org/

impact. Monitoring the plan should be ongoing and any needed plan modifications should be made in a timely fashion.

Acknowledgements

Travis County Emergency Services District 2

Dynamix Consulting Group would like to thank the elected and appointed officials of Travis County Emergency Services District 2 (TCESD2) Pflugerville Fire Department, the members of the fire department, and specifically, Chief Nick Perkins, Director of the Community Risk Reduction Division Daniel Berger, Educator / Specialist Casey Villanueva, and Information Technology and Special Projects Director Victor Gonzalez for their assistance with this project. The TCESD2 Community Risk Assessment and Community Risk Reduction Plan would not have been possible without their cooperation and support.

Dynamix Consulting Group

Project Team

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Quality Assurance

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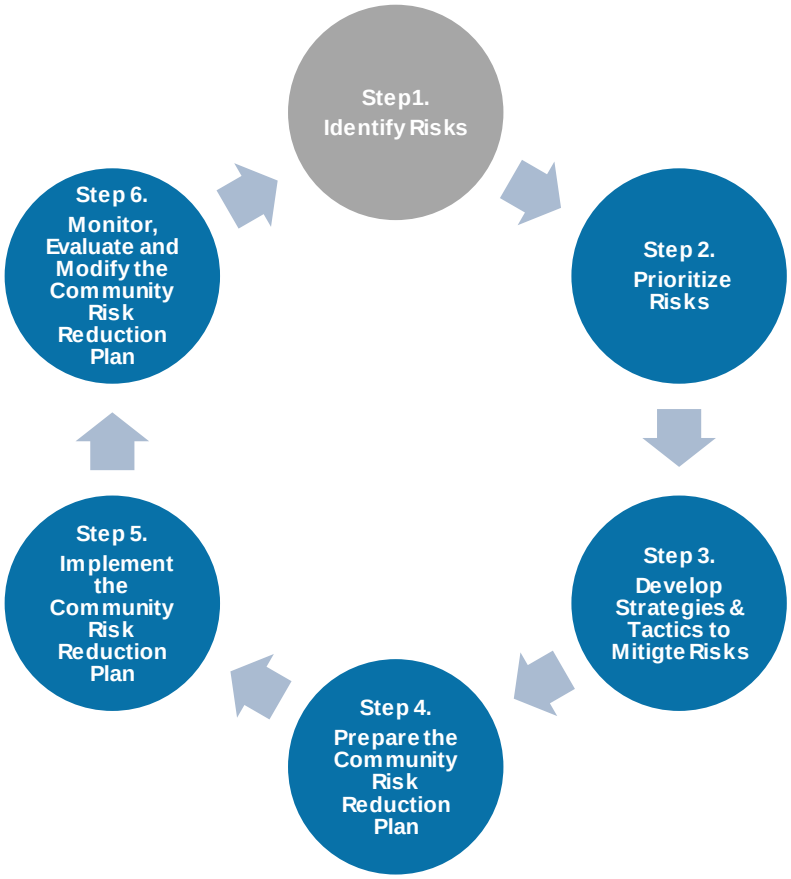
Community Risk Assessment

The Risk Assessment represents Step 1 in the Risk Reduction Process.



Stakeholders

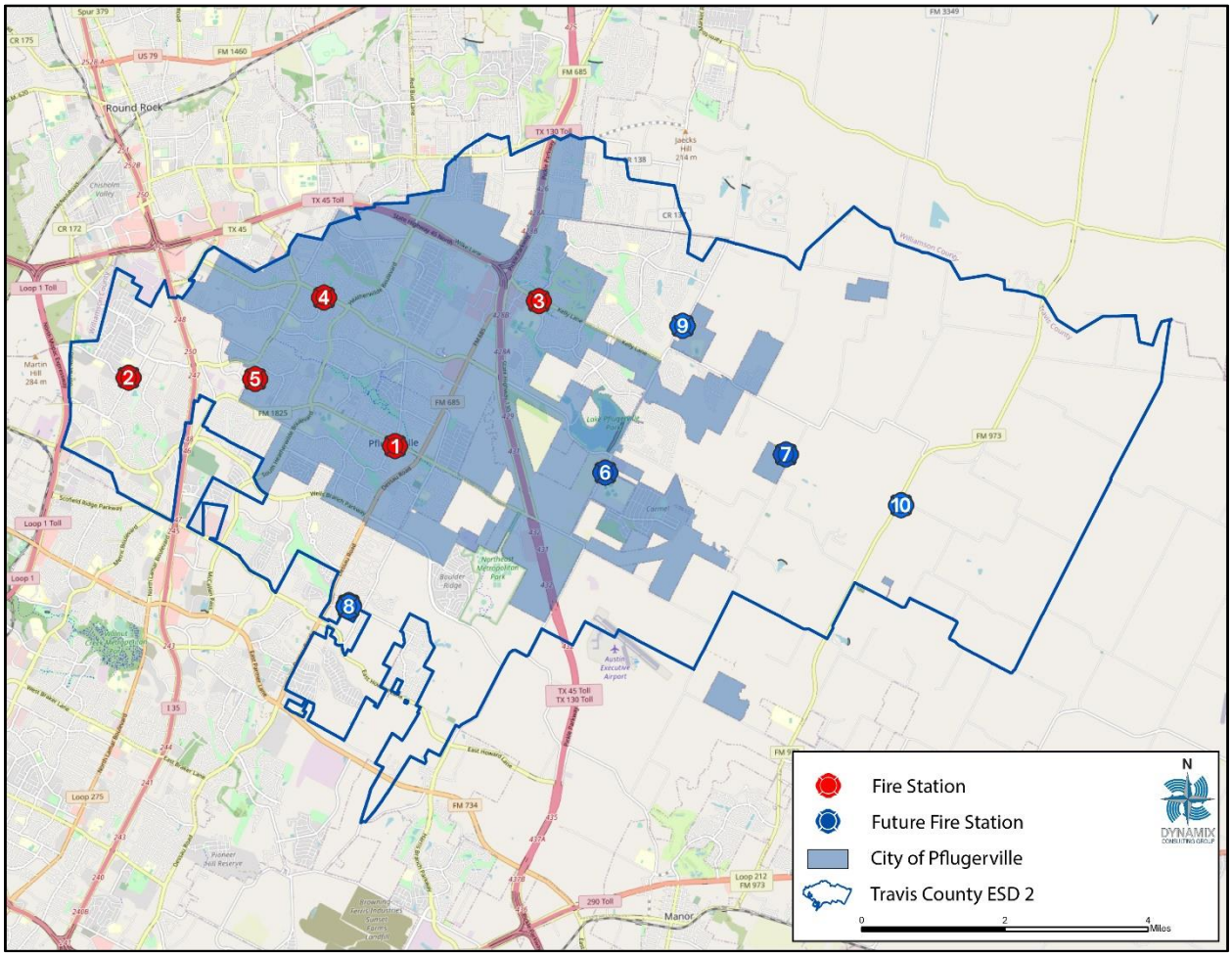
The identification of stakeholders is a critical component of both an inclusive Community Risk Assessment and Community Risk Reduction Plan. The people directly affected by fire and other emergency incidents are often valuable partners in creating and implementing strategies to prevent and mitigate risks.

Service Area

TCESD2 is an independently funded and managed Emergency Services District (ESD) providing fire suppression, Emergency Medical Services (EMS), fire code enforcement, and public education. Located on the northern border of the capital city of Austin, the principal municipality within the District is the City of Pflugerville. TCESD2 is situated 15 miles north of the Colorado River on the eastern edge of the backland prairies. The District is bound to the west by Farm-to-Market Road 1325, north to the Travis County line, east to Manda Carlson Road and Cameron Road, and south to Yager Lane, Dessau Road, and Howard Lane.

TCESD2 covers 75 square miles. The City of Pflugerville represents about one-third of the land area of the District and the other two-thirds are unincorporated Travis County.

TCESD2 Service Area



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Travis County Emergency Services District 2

On January 18, 1992, TCESD2 formed by conversion from Travis County Rural Fire Protection District No. 3 under Chapter 775 of the Texas Health and Safety Code. Following its creation and the adoption of an Order Canvassing Election, on January 21, 1992, the Commissioners Court upheld the creation of the new district. However, at that time, the Commissioners Court believed that the City of Pflugerville and City of Hutto were exempt from the district. The Texas Legislature resolved the question of District boundaries stating the intent of creating emergency services districts was an "all or nothing" proposition as part of SB 1229 and adopted by the legislature effective September 1, 1993. The validity of the District occurred when tax exempt bonds were subsequently issued and accepted by the Office of Attorney General of the State of Texas demonstrating the Attorney General's satisfaction of the district's validity as an existing political subdivision of the State of Texas.

Order Canvassing Election January 21, 1992

ORDER CANVASSING ELECTION

THE STATE OF TEXAS §
KNOW ALL PERSONS BY THESE PRESENTS:
COUNTY OF TRAVIS §

WHEREAS, at an election held on the 18th day of January 1992, in that part of Travis County, State of Texas, described as all of the territory within the boundaries of Travis County Rural Fire Prevention District No. 3 (the "District") as such boundaries existed and were identified in the order of this Commissioners Court dated November 26, 1991, calling said election, there was submitted to the qualified voters the question of whether that territory should be converted into an emergency services district under state law;

WHEREAS, at the election 213 votes were cast in favor of conversion of the District and 178 votes were cast against conversion;

WHEREAS, the conversion of the District received the affirmative vote of the majority of the votes cast at the election as provided by law;

WHEREAS, the converted district may not include territory in a municipality's limits or extraterritorial jurisdiction unless a majority of the voters residing in that territory who vote at the election vote in favor of converting the District and imposing a tax as authorized by state law;

WHEREAS, in the territory of the District that is within the the extraterritorial jurisdiction of the City of Austin 112 votes were cast in favor of conversion of the District and 76 votes were cast against conversion;

WHEREAS, in the territory of the District that is within the corporate limits of the City of Pflugerville 72 votes were cast in favor of conversion of the District and 76 votes were cast against conversion;

WHEREAS, in the territory of the District that is within the extraterritorial jurisdiction of the City of Pflugerville 8 votes were cast in favor of conversion of the District and 4 votes were cast against conversion;

WHEREAS, in the territory of the District that is within the extraterritorial jurisdiction of the City of Hutto 0 votes were cast in favor of conversion of the District and 0 votes were cast against conversion;

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WHEREAS, in the territory of the District that is also within the extraterritorial jurisdiction of each of the Cities of Austin and Pflugerville the conversion of the District received the affirmative vote of the majority of the votes cast in each of said areas; and

WHEREAS, in the territory of the District that is also within the city limits of the City of Pflugerville and the extraterritorial jurisdiction of the City of Hutto the conversion of the District did not receive the affirmative vote of the majority of the votes cast in each of said areas;

Now, therefore, the Commissioners Court of Travis County, State of Texas, finds and orders that the territory within the boundaries of Travis County Rural Fire Prevention District No. 3, excluding the territory that is within the corporate limits of the City of Pflugerville and the extraterritorial jursidiction of the City of Hutto, has been duly and legally converted into an emergency services district under the name of Travis County Emergency Services District No. 2, under Article III, Section 48-e, of the Texas Constitution, as proposed by S.J.R. No. 27, Acts of the 70th Legislature, Regular Session, 1987, and adopted by the voters at an election held November 3, 1987, and has the powers vested by law in an emergency services district.

The boundaries of Travis County Emergency Services District No. 2 are set forth in Exhibit A attached hereto.

The territory within the boundaries of Travis County Rural Fire Prevention District No. 3 as such boundaries existed and were identified in the order of this Commissioners Court dated November 26, 1991, and within the corporate limits of the City of Pflugerville and the extraterritorial jursidiction of the City of Hutto, shall continue to exist as Travis County Rural Fire Prevention District No. 3 and has the powers vested by law in such district.

The Commissioners Court of Travis County, Texas, finds and determines that said election was duly ordered, conducted and canvassed, that proper notice of said election was duly given and that proper election officers were duly appointed prior to said election, all in accordance with law and the orders of this Commissioners Court calling said election and establishing the polling places, voting precincts, election officials and other procedures relating to said election.

ORDERED on this the 21 day of Jan., 192.

Bill Aleshire, County Judge

Samuel T. Biscoe, Commissioner
Precinct No. 1

Barbara Carlson, Commissioner
Precinct No. 2

Valerie Bristol, Commissioner
Precinct No. 3

Marcos DeLeon, Commissioner
Precinct No. 4

Texas Session Laws, Seventy-Third Legislature, 1993 Regular Session, Chapter 195, Sections 7 and 8

<< Note: TX HEALTH & S § 775.036 >>
SECTION 7. The legislature finds that:

(1) Chapter 673, Acts of the 70th Legislature, Regular Session, 1987, was adopted and approved, effective January 1, 1988;

(2) that Act, implementing Article III, Section 48-e, of the Texas Constitution, relates to the creation and operation of emergency services districts; Section 33 of that Act provides for the conversion of a rural fire prevention district to an emergency services district;

(3) the intent of the legislature in adopting Section 33 of that Act was that, if a majority of the voters in a rural fire prevention district voted to convert the district to an emergency services district, the boundaries of the emergency services district would be coextensive with the boundaries of the fire prevention district, and the territory within the boundaries of the emergency services district would be coextensive with the territory within the boundaries of the fire prevention district;

(4) in certain counties in this state, valid elections were conducted to convert certain rural fire prevention districts to emergency services districts, in which elections a majority of the participating voters voted in favor of the conversion; however, the boundaries of those emergency services districts are not coextensive with the boundaries of the fire prevention districts, and the territory within the boundaries of the emergency services districts is not coextensive with the territory that was within the boundaries of the fire prevention districts;

(5) the act of establishing boundaries of the emergency services districts that are not coextensive with the boundaries of the rural fire prevention district and the act of excluding from the emergency services districts territory that was within the boundaries of the fire prevention districts were inconsistent with Section 33 of that Act, contrary to the intent of the legislature, and invalid; and

(6) the health, safety, and welfare of persons and property in those counties creates an emergency that requires immediate action by the legislature.

<< Note: TX HEALTH & S § 775.036 >>
SECTION 8. On and after the effective date of this Act:

(1) the boundaries of an emergency services district that was converted from a rural fire prevention district following an election held for that purpose are coextensive with the boundaries of the fire prevention district;

(2) the territory within the boundaries of an emergency services district that was converted from a rural fire prevention district following an election held for that purpose is coextensive with the territory within the boundaries of the fire prevention district; and

(3) each act or attempted act of an emergency services district taken before the effective date of this Act is validated in all respects and applies to territory within the boundaries of the district as if it had been within the district when the act or attempted act was taken.

Pflugerville Fire Department

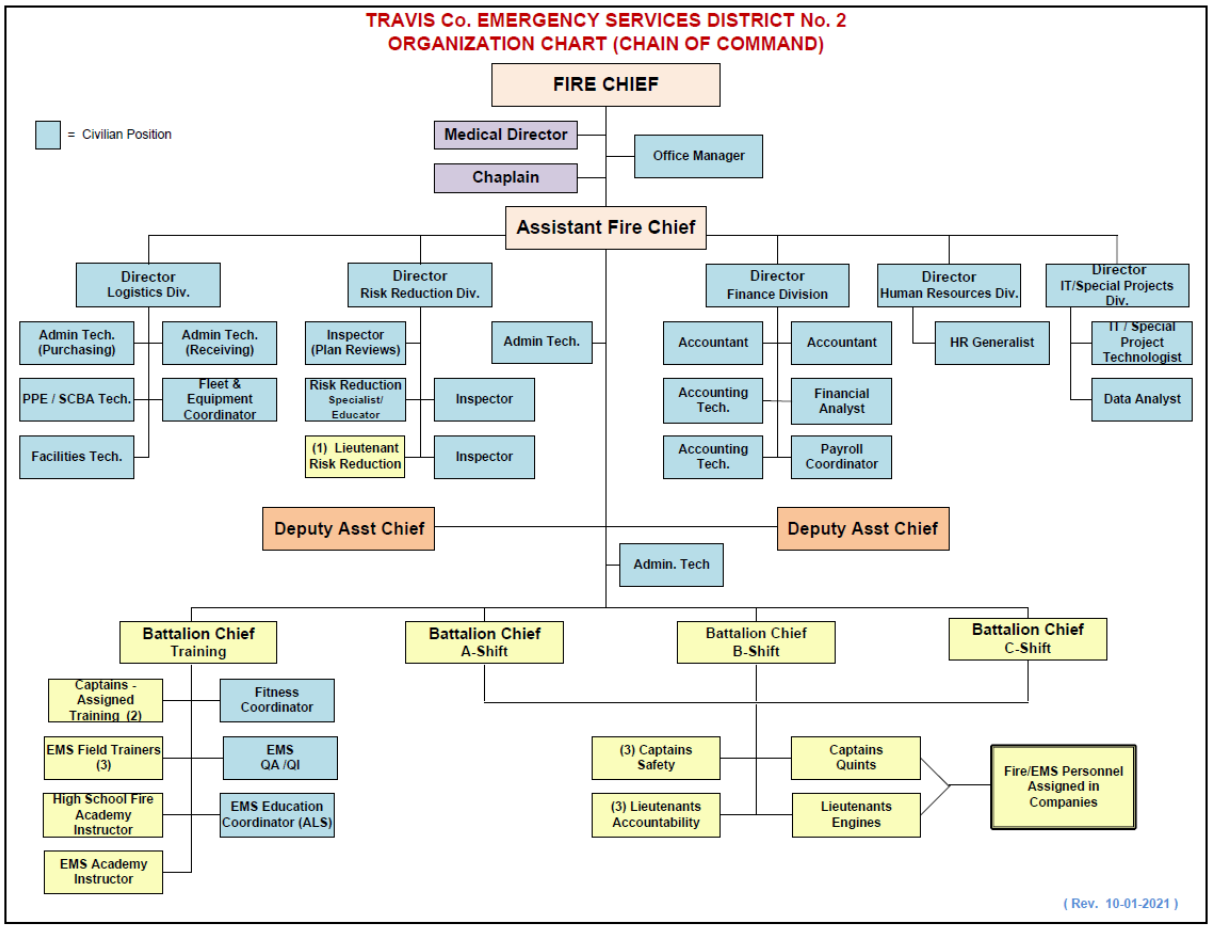
Pflugerville founded in 1860 when William Bohls established a general store and post office in his residence, and he named the town in honor of Henry Pfluger, according to city officials. Pfluger first arrived in the area in 1849, leaving his German homeland to escape the Prussian War.

As the community grew and Central Texas experienced the historic drought of the 1950s, concerned citizens walked across fields asking neighbors for donations to purchase a fire truck. In 1955, the Pflugerville Volunteer Fire Department formally chartered, followed by the purchase of a fire truck for $4,000. Ten years later, the City of Pflugerville incorporated. By the early 1990s, voters approved the formation of TCESD2, followed by support of the Texas Legislature. In 2017, the District began operating its own ambulance service staffed with paramedics.

Organizational Design

The following is the organizational chart for TCESD2. The Fire Chief is the head of the department, supported by an Assistant Fire Chief and two Deputy Assistant Fire Chiefs.

TCESD2 Organizational Chart



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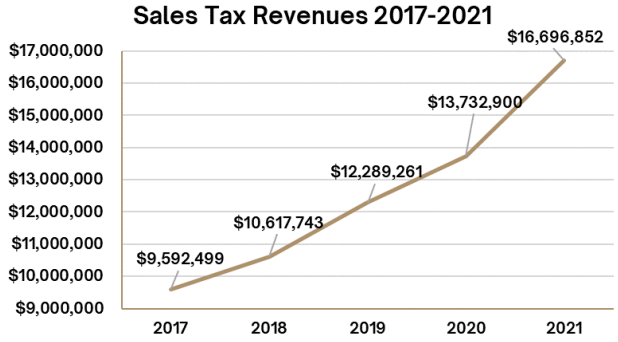
Financial Overview

Financial oversight of the District is the responsibility of the Board of Commissioners. The Board is appointed by the Travis County Commissioners' Court in accordance with state law. The commissioners possess decision making authority to designate management, influence operations, and are accountable for all fiscal matters. The Fire Chief and administrative staff develop and administer an annual budget, adopted prior to the start of the new fiscal year on October 1st. As required by state law, the District holds a public hearing on its revenue sources and projected budgets prior to formal adoption.

The District maintains one financial fund for the operation of the district, the General Fund. Two primary revenue streams fund TCESD2, property taxes (39% in 2021) and sales tax revenue (46%). The property tax levy is based on the assessed value of each property within the jurisdiction. Since 2016, the levy was set at $.010 per $100 of assessed value; however, in 2021 this rate reduced to $0.09 per $100 of assessed value due to the limitation to increase revenue more than 3.5% per year and a change in the delivery of Advanced Life Support (ALS) services. Additionally, assessed in ESD 17 is $0.045 cents per $100 of assessed value tax for Advanced Life Support (ALS) and Travis County provides a lump sum payment paid monthly for ALS coverage within the Extraterritorial Jurisdiction (ETJ) of the City of Pflugerville. The actual combined general revenue in 2021, generated $30,816,071 in property and sales tax collections, with an additional $4,950,827 in program revenues for a total revenue of $36,129,202, plus an additional $362,000 in other revenues.

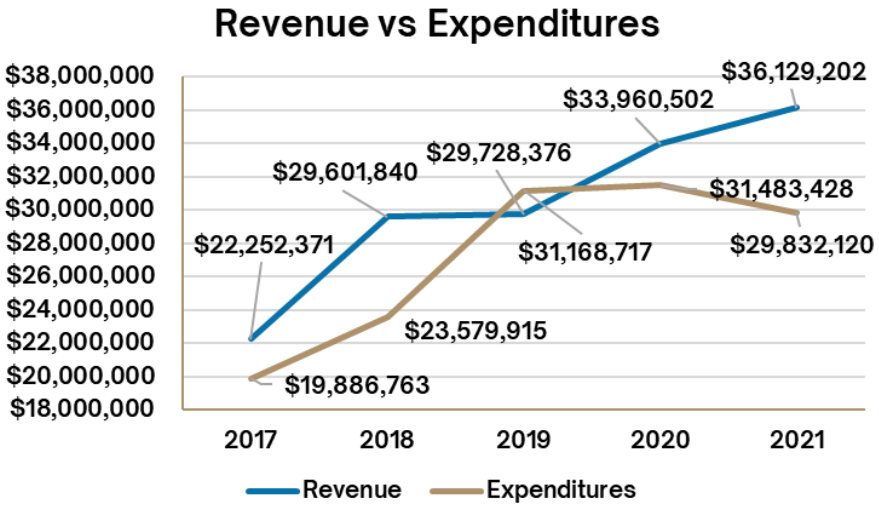
Sales tax is collected within the District above the Texas sales tax rate of 6.25%. Revenues from sales tax have also increased year over year with an average annual growth rate of 14.9% or 74% from 2017 through 2021.



Significant growth in the jurisdictional assessed value within the District in recent years positively impacted the property tax revenue. Additionally, new construction in the District area has added a substantial amount of value to the property tax roll. The average annual growth to assessed tax from 2017 through 2021 was 11% or 50% from 2017 through 2021.

TCESD2 also benefits from other revenue sources that augment tax collections. These include fees for services, grant funding, and other miscellaneous contributions. In 2021, the District received $3,576,647 in related fees and $1,374,180 in operating grants and contributions.

As the chart below depicts, TCESD2 experienced several years of revenues exceeding expectations due to delays in capital projects for building new fire stations. Typically, debt revenue would net out projected outlay for buildings; however, forecasting for these capital items is difficult due to unforeseen events such as the impact of Covid-19, sales tax revenue exceeding expectations which led to increased financial reserves, and the delay of multiple capital projects. Currently, the construction of Station 6 is underway and future projects include additional fire stations and the training field project.



In 2021, costs for operations related costs made up approximately 91% of the district's annual expenses. Today, the District can fund current levels of service with existing revenue sources. However, there are a substantial number of financial challenges on the horizon that require further planning and analysis.

Parcel Data

A limitation noted within this project was the number of parcels within the District containing either zeros or no data for the parcel. A review of the Travis Central Appraisal District's revealed numerous parcels with little information related to the size, height, or building value within a given parcel. This may account for the number of parcels within the analysis that display as zero or no data; however, the identification of whether an actual issue exists is outside the scope of this project. TCESD2 should seek to partner with the Travis Central Appraisal District to determine if a parcel layer exists containing enriched parcel and building information for use on future risk assessments and deployment considerations.

Community Profile

While it is intuitive that increases in population will result in increased demands for services, other factors also affect the community's dependence upon emergency services. When evaluating fire department incident data, it is necessary to identify those factors that contribute to the severity of the hazards and those populations at greatest risk. Understanding the causal factors and populations at greatest risk directly contributes to developing programs to address these problems.

Understanding the age, gender, and historical geographic distribution patterns among residents of the ESD is critical to developing appropriate community risk reduction strategies. Additionally, studies have shown that these same factors indicating populations at risk for death or injury from fire can also be good predictors of medical emergencies and diseases. These groups may require greater time, effort, and resources to prepare, evacuate, and recover from emergency situations. In addition to deciding where to focus risk reduction efforts within a community, TCESD2 should carefully consider these factors when creating emergency plans for wide-area disasters within the community. As part of Identifying Risks, Dynamix Consulting Group developed the following Community Profile for TCESD2.

Population

Unless otherwise noted, all population and demographic information specific to the TCESD2 response area is from the Environmental Systems Research Institute (ESRI). This is the most accurate source of information for the TCESD2 response area because the District does not align with municipal boundaries. Data for state and national comparables is from the U.S. Census.

TCESD2's 2022 estimated population is 148,633, with 51,779 households. Slightly less than half – 46.51% - or 69,122 of the District residents live within the City of Pflugerville.

Population Density

Knowing where the population within the District is located is an important aspect of classifying risk. Additionally, as the population of the District grows or shifts, TCESD2 should modify the response methodology accordingly.

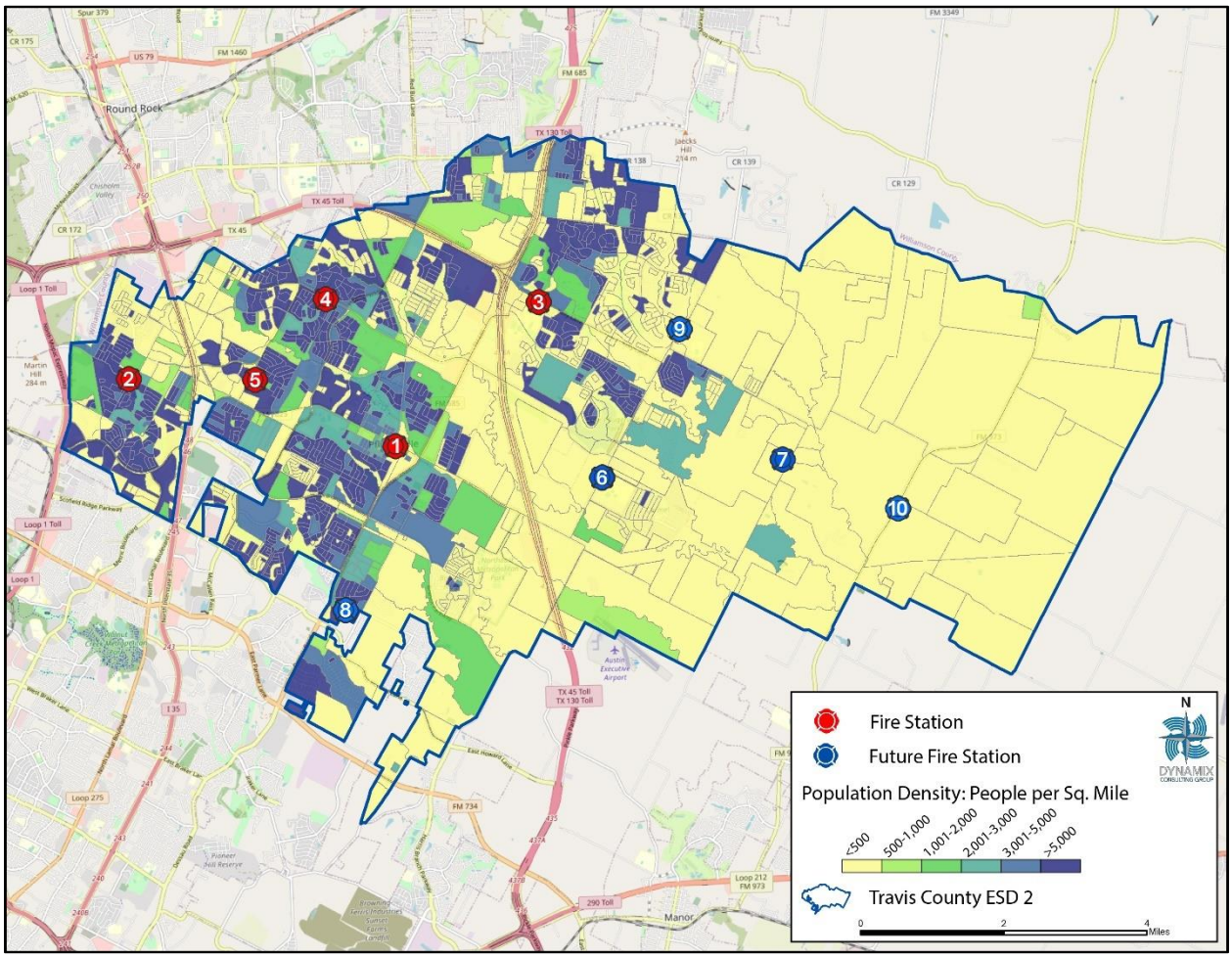
Population increases correlate to variations in population density or the population per square mile. Population density[2] for TCESD2's District is comprised of:

- Urban (> 1,000 people per square mile)
- Suburban (500–1,000 people per square mile)
- Rural (< 500 people per square mile)

The following figure provides population density by U.S. Census block groups, which are the smallest division used by the census. The areas of the densest concentration of people are in the west, south and center of the district.

[2] Using NFPA definitions for population density classifications.

2022 Population Density by US Census Blocks

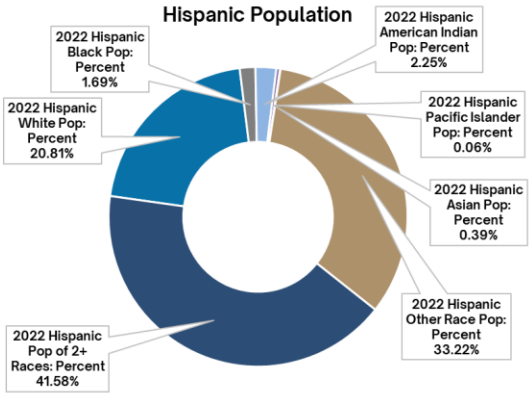


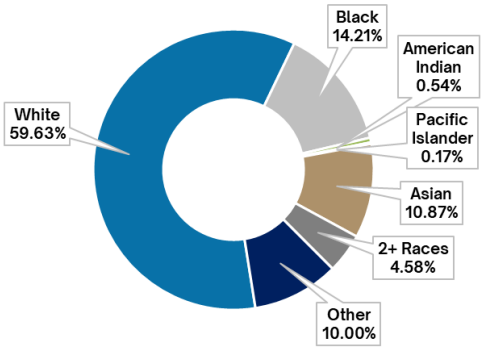
The overall population density for TCESD2 is urban at 1,934 people per square mile; however, with a compound annual growth rate of 3.9%, the District should anticipate continued growth for the foreseeable future with estimates for a population of 167,250 by 2026. The daytime population of the District decreases to 127,077 with 69,067 of that population represented by residents of the district.

Several relational factors result from a greater number of occupancies and residents within denser areas. Increased probabilities of emergency events or higher service demands can create reduced reliability of first-due and effective response forces. Potential additional impacts include consistent agency service as well as travel time benchmark performance. Traffic flow constriction on major thoroughfares may create performance gaps. Consider these factors when deploying the resources of TCESD2.

Ethnicity and Cultures

The State of Texas and TCESD2 have a long and proud Hispanic heritage. Within TCESD2, 29.32% is of Hispanic ethnicity with the majority of Hispanics identifying as two or more races (41.58%), as another race (33.22%), and as white (20.81%). Additionally, American Indian (2.25%), Black (1.69%), Asian (0.39%), and Pacific Islanders (0.06%) also identify as being Hispanic.



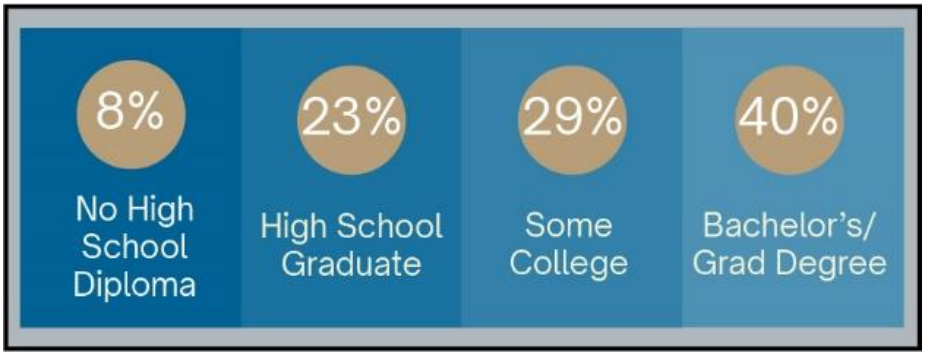


Slightly more than half – 59.4% - of the population of TCESD2's District is white while 14.21% is black, 10.87% is Asian, and 10.00% Other.

Education

Within TCESD2, 92% of the adult population graduated with a high school education.

This is higher than the percentage of high school graduates in the State of Texas (84.4%) and in the United States (88.5%). Within TCESD2, 40% of adults have a bachelor's degree or higher level of education. This is higher than the percentage of college graduates in both Texas (30.7%) and the United States (32.9%).



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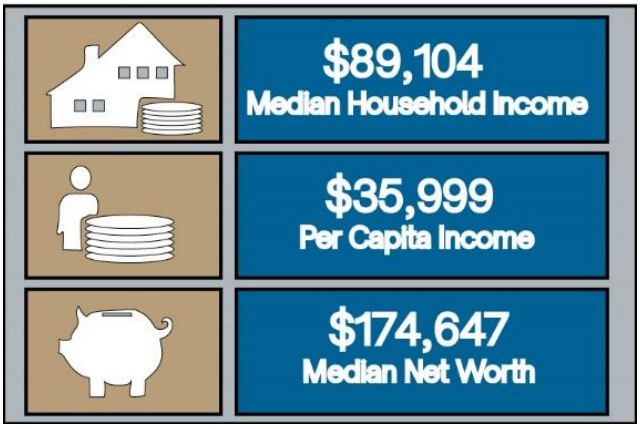
Economic Characteristics

Income

The median household income in TCESD2 is $89,104. This is significantly higher than the median income in Texas ($63,826) and the United States ($64,994). The per capita income within TCESD2 is $35,999 which is slightly higher than in the State of Texas ($32,177) and the United States ($35,384).

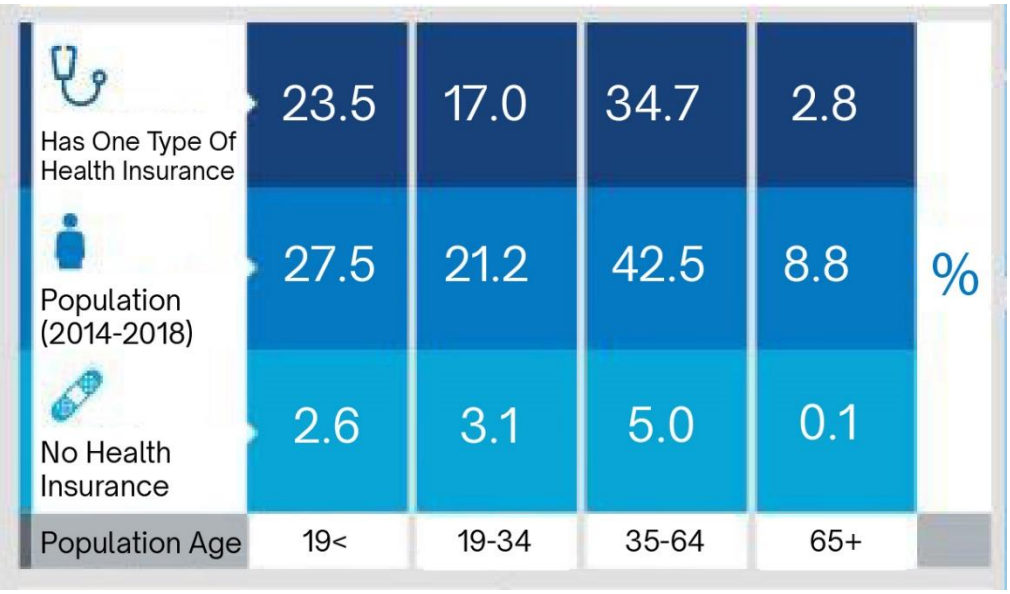


Health Insurance

Employed citizens have increased access to health insurance, and therefore have an increased likelihood of receiving preventative health care. Within TCESD2, 12.5% of the citizens do not have access to health insurance. This is lower than the State of Texas where 20.8% of the population is uninsured, but higher than the national rate of 10.2%. The benefit of health insurance extends to the frequency of pre-hospital emergency medical incidents, as citizens with health insurance tend to use primary health care providers instead of emergency room facilities when possible.

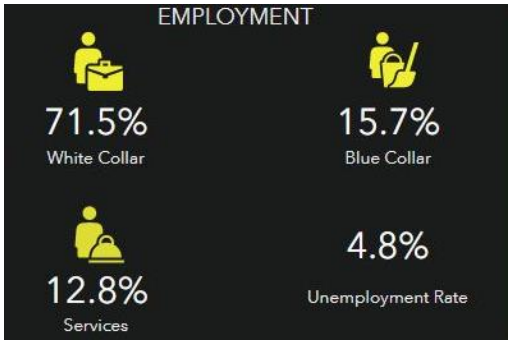
	19<	19-34	35-64	65+	
Has One Type Of Health Insurance	24.3	17.0	32.9	2.4	
Population (2014-2018)	28.2	22.2	41.6	7.9	%
No Health Insurance	2.4	4.1	5.8	0.2	
Population Age					

For sake of comparison, 10.8% of the residents within the City of Pflugerville do not have health insurance.



Employment Profile

The unemployment rate within TCESD2 is 4.8%. This is slightly higher than the Texas statewide unemployment rate of 4.3% and the national unemployment rate of 3.6%.[3] Among those who are employed, 71.5% work in "white collar jobs." White collar jobs are those of salaried employees whose duties do not call for the wearing of work clothes or protective clothing. Comparatively, 15.7% of the TCESD2 population works in blue collar jobs. Blue collar jobs are usually those of hourly employees who do wear work clothes or protective clothing. An additional 12.8% of the working population in TCESD2 is employed in the Service Industry.



[3] Bureau of Labor Statistics

Major Local Employers

There are 3,053 businesses that employ 33,255 employees within TCESD2. Listed below are the specific types of businesses and the number of employees working for each business in 2021.

TCESD2 Business Types and Number of Employees

Business Type	2021 Number of Businesses	2021 Total Employees
Service	1109	11721
Retail Trade	556	7351
Other Service	650	5485
Construction	326	4693
Manufacturing	124	3663
Education/Library	67	2942
Eating & Drinking	170	2804
Wholesale Trade	121	1481
Health Services	132	1356
Transportation	108	1251
Misc Retail	131	1231
Finance/Ins/Real Estate	233	1143
Furniture/Home Furnish	52	963
Agriculture/Mining	74	948
Movie/Amusement	101	884
Food Stores	66	819
Auto Services	119	728
General Merchandise	16	723
Real Estate/Holding	119	587
Government	28	583
Home Improvement	33	361
Auto Dealer/Gas Station	70	360
Insurance	51	237
Banks	40	234
Unclassified Establishments	342	230
Legal Services	28	174
Hotel/Lodging	13	152
Communication	25	137
Apparel/Accessory	18	89
Securities Broker	23	85
Utilities	7	53
Total	3053	33255

The single largest employer in Pflugerville by far is Amazon, with 2,000 employees. The second largest employer in Pflugerville is Brandt, with 306 employees. The following is a list of the top ten largest employers within Pflugerville.

10 Largest Employers in Pflugerville[4]

Business	Number of Employees	Industry
1. Amazon	2000	Sort Facility
2. Brandt	306	Electrical Contracting
3. Mtech	268	Headquarters, training, and fabrication
4. Cash Construction Company	250	Engineering Construction Services
5. Curative	268	Biomedical
6. Costco	200	Specialty warehouse/grocery
7. Flextronics	195	Electronics manufacturing services provider
8. Avant Technologies	155	Computer memory modules manufacturer
9. Austin Foam Plastics	137	Computer packing Solutions
10. Walker Engineering	130	Electrical Contracting

[4] Pflugerville Community Development Corp.

Individuals With Access and Functional Needs

Economic, physical, and social issues often influence risk for citizens. Individuals with "access and functional needs" are members of a community both with and without disabilities, who may need additional assistance because of any condition (temporary or permanent) that may limit their ability to act in an emergency thus placing them at greater risk for injury or death during emergencies[5]. Individuals with "access and functional needs" do not require any kind of diagnosis or specific evaluation and may include:

- Children
- Older adults
- People with disabilities
- People with chronic health conditions or pharmacological dependency
- People with limited English proficiency
- People with limited access to financial resources to prepare for, respond to, and recover from the emergency
- People with limited access to transportation

Several access and functional needs factors determine the population of at-risk individuals or groups within a community. Understanding the causal factors and populations of the community that are at greatest risk will contribute to programs and prevention efforts to address higher risk factors and reduce the effects of the associated risks. These factors also are important to consider when calculating demand for fire and emergency services within the community.

Dynamix Consulting Group notes that coupling two or more risk factors contribute to significantly higher levels of risk than those who only experience one risk category. Those with compounded risk factors should be a priority in Risk Reduction Programs and strategies.

Age

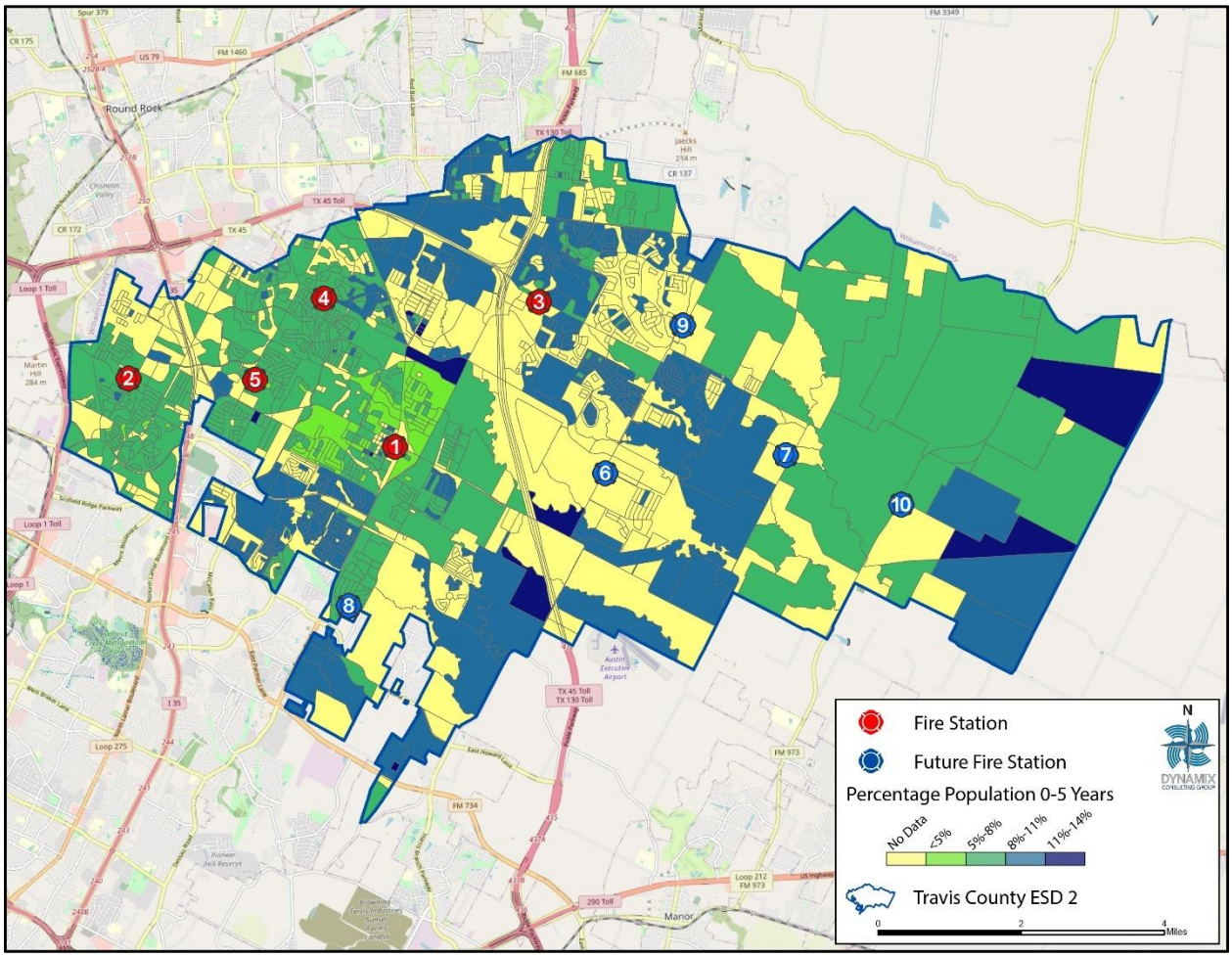
Children

Children are extremely vulnerable in emergencies. Emergencies can happen without warning and during times when children separate from their parents or other caregivers. Within TCESD2, more than one-quarter – 27.79% or 41,298 people are under the age of 18 and 9.33% - 13,863 people - are under the age of 5 years old.

[5] Centers for Disease Control and Prevention (CDC). (2021). Access and Functional Needs Toolkit: Integrating a Community Partner Network to Inform Risk Communication Strategies. Atlanta, GA: U.S. Department of Health and Human Services (HHS).

Within TCESD2 there is a concentration of children under the age of 5 years old in neighborhoods in the center and east sections of the District. This information can help TCESD2 in designing targeted risk reduction programs for children in these neighborhoods.

2022 Distribution of Population 0 to 5 Years



Older Adults

The age of the community served impacts demands for services. Generally, as a population ages, their need for emergency services increases. Older adults are more likely than younger populations to have chronic illnesses; functional limitations; and physical, sensory, and cognitive disabilities.

Nationally, efforts to reduce the number of fire deaths of children under five have been very successful, but there has been little change in the death toll of older adults. Several factors contribute to the older

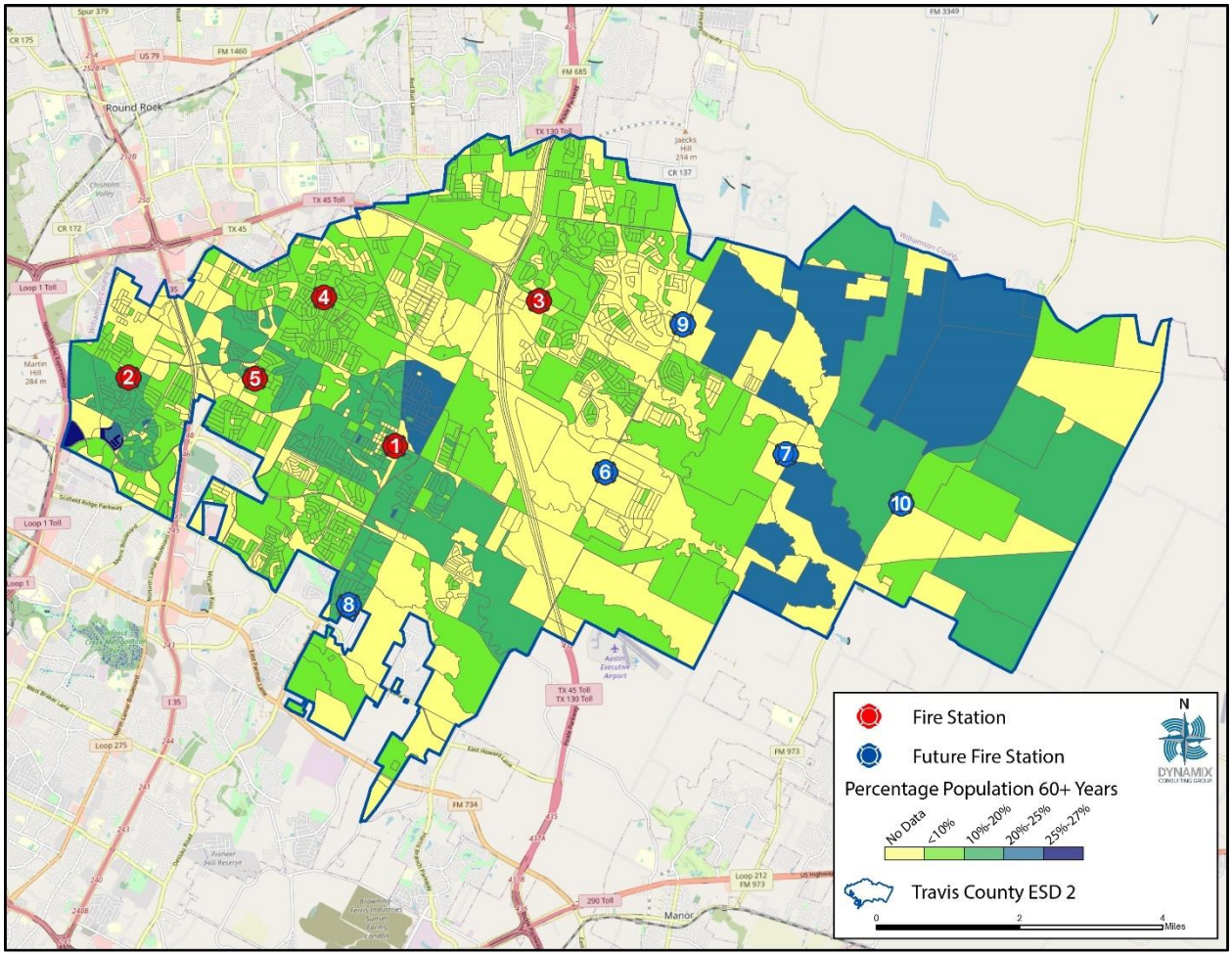
adult fire death toll, including the increasing age of the population overall, older adults increasingly living alone, the increase in disabilities with age, and the tendency for older adults to live in older homes. [6]

Between 2005 and 2015, the U.S. population 65 years and older increased by 30%, from 36.6 million to 47.8 million. This age group will more than double to 98 million people by the year 2060.

[6] National Fire Protection Association (NFPA) (2021): Fire Safety in the United States Since 1980

At the time of this report, 8.25%, or 12,255 people within TCESD2 were age 65 and older. As with children under the age of 5, knowing where these individuals live within TCESD2 can help the District design targeted risk reduction programs for these older adults. Within TCESD2, the largest concentration of adults aged 65 and older is in the east section of the district. There are also neighborhoods with higher concentrations of older adults in the west section of the District.

2022 Distribution of Population 65 and Older



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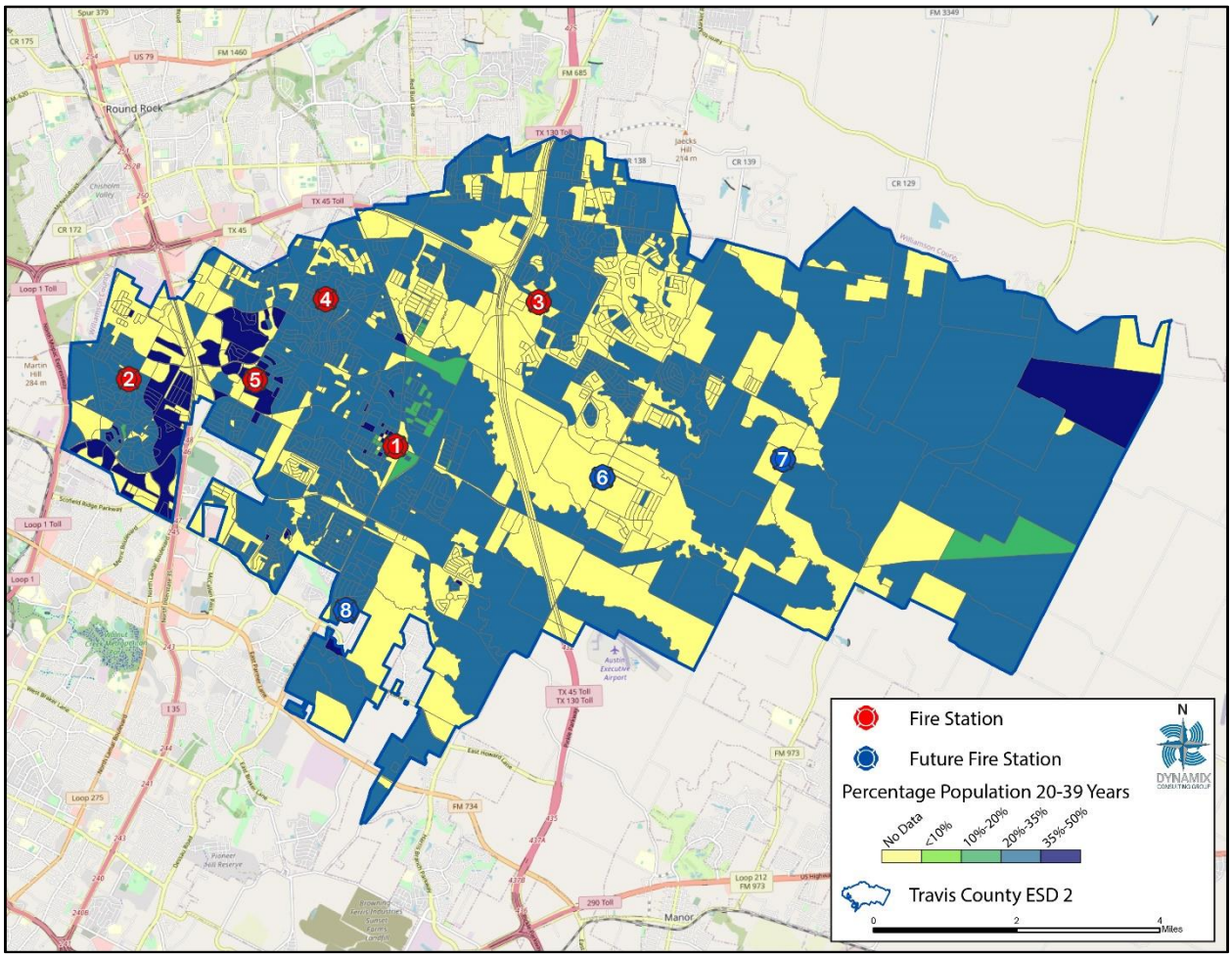
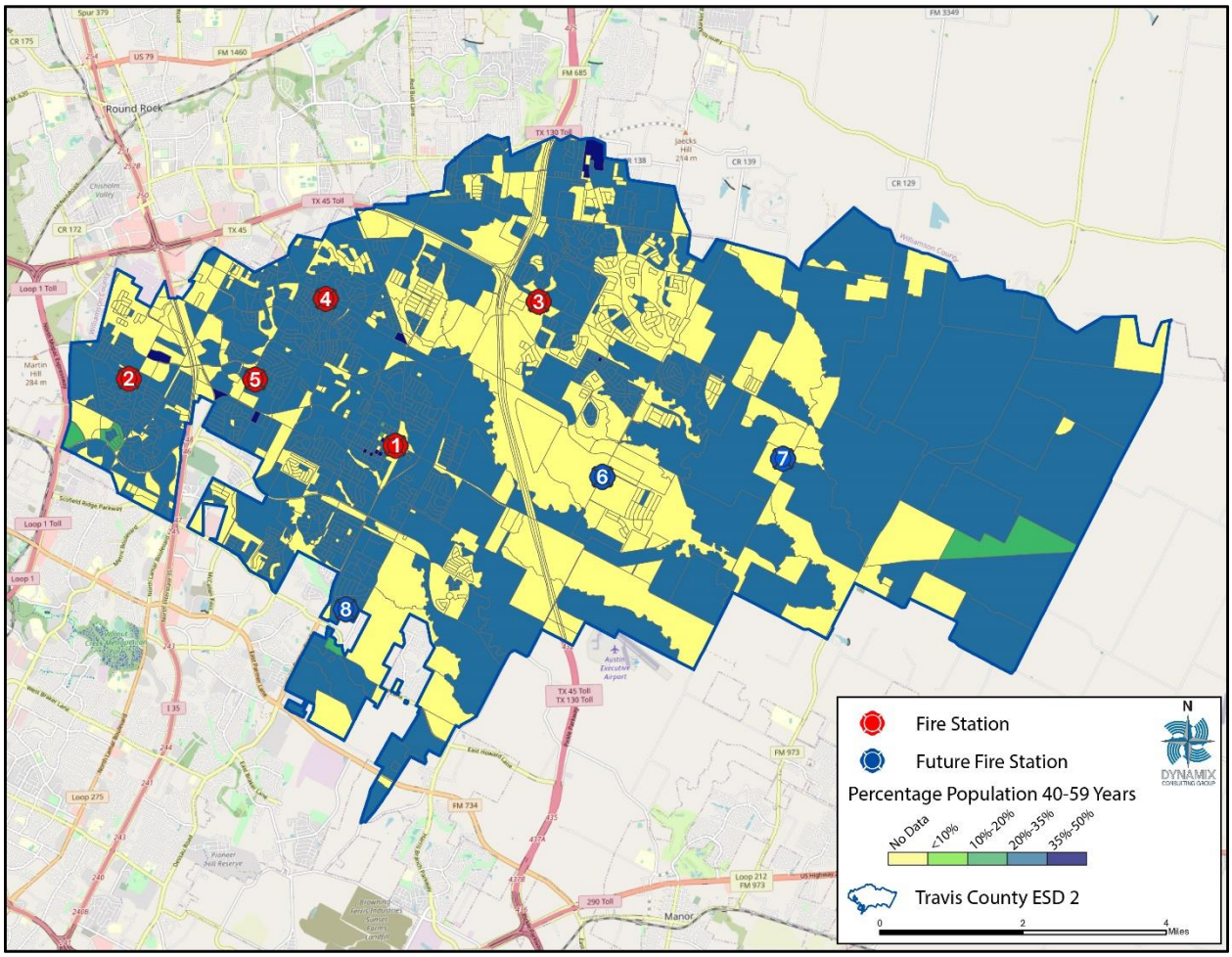
Dynamix Consulting Group prepared maps showing where adults aged 20 to 39 years old and 40 to 59 years old live within TCESD2 to assist the District in designing targeted risk reduction programs for these age groups as well. The following map illustrates the percentage of the population within each neighborhood in TCESD2 that is between the ages of 20 and 39 years old.

2022 Distribution of Population 20 to 39 Years



The next map illustrates the percentage of the population within each neighborhood in TCESD2 that is between the ages of 40 and 59 years old.

2022 Distribution of Population 40 to 59 Years



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People with Disabilities

Disabilities can relate to physical mobility, sensory, intellectual, developmental, cognitive, or mental challenges. An individual with a disability, as defined by the Americans with Disability Act (ADA), is a person who:

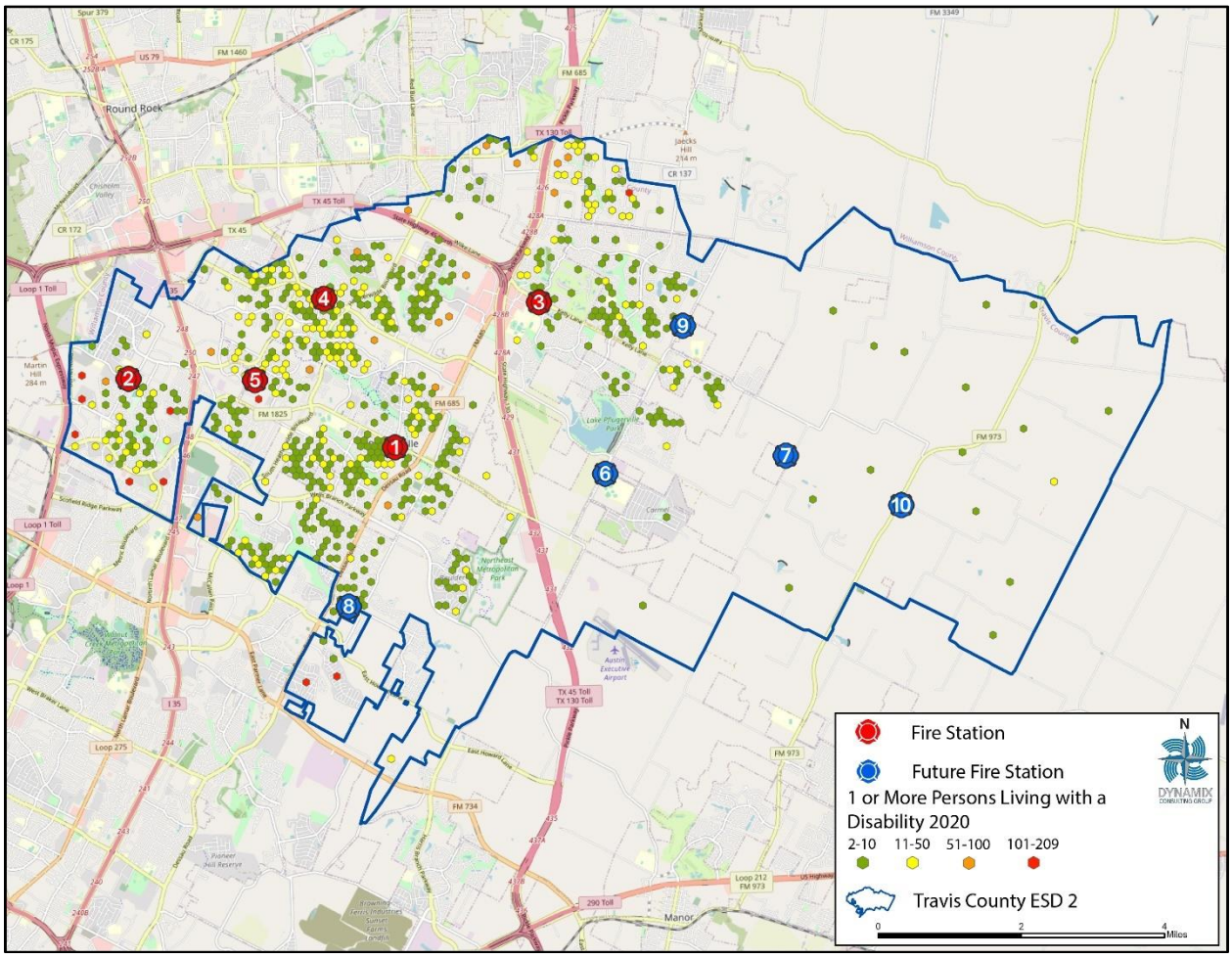
- Has a physical or mental impairment that substantially limits one or more major life activities, or
- Has a history of a physical or mental impairment, or
- Others perceive to have such an impairment.

The Federal Emergency Management Agency (FEMA) has expanded the term "disability" to include "people with disabilities and others with access and functional needs." This expanded definition of disability includes people who may or may not fall within the definitions of civil rights laws and encompasses cross-disability issues.[7]

Fires in the home can be potentially dangerous and deadly for everyone, but persons with disabilities and impairments face additional challenges. Persons with disabilities often have a challenging time identifying or escaping a fire. There are 8,915 households within TCESD2 that have identified as having at least one member with a disability. While these households are located throughout the central and western sections of the district, there are dense clusters of disabled households in the far western section of the district. This would potentially be an area for targeted programs to assist persons with disabilities during times of emergency.

[7] https://ncd.gov/publications/2014/05272014

Number of Households Reporting 1 or more Persons with a Disability
By 5-acre Hexagons 2020



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People with Chronic Health Conditions or Pharmacological Dependency

A chronic illness is a condition that lasts a year or longer and limits an individual's activity. Examples of chronic conditions include diabetes, heart disease, mental illness, and obesity. Approximately half of all adults in the United States have at least one chronic condition while one-quarter of the population suffers multiple chronic conditions.[8]

Disasters and emergencies can cause an increased hardship on people with chronic conditions who rely on medication or electricity-dependent equipment such as ventilators because they may lose access to the medication or electricity. A study after Hurricane Ivan affected Mobile, Alabama in 2004 found that 53% of pharmacies had depleted supplies and at least 26% had to prioritize distribution to patients because of limited supplies.[9] Five days after Hurricane Maria made landfall in Puerto Rico in 2017 (as a Category 4 hurricane), Healthcare Ready reported only about 29% of pharmacies were open.[10]

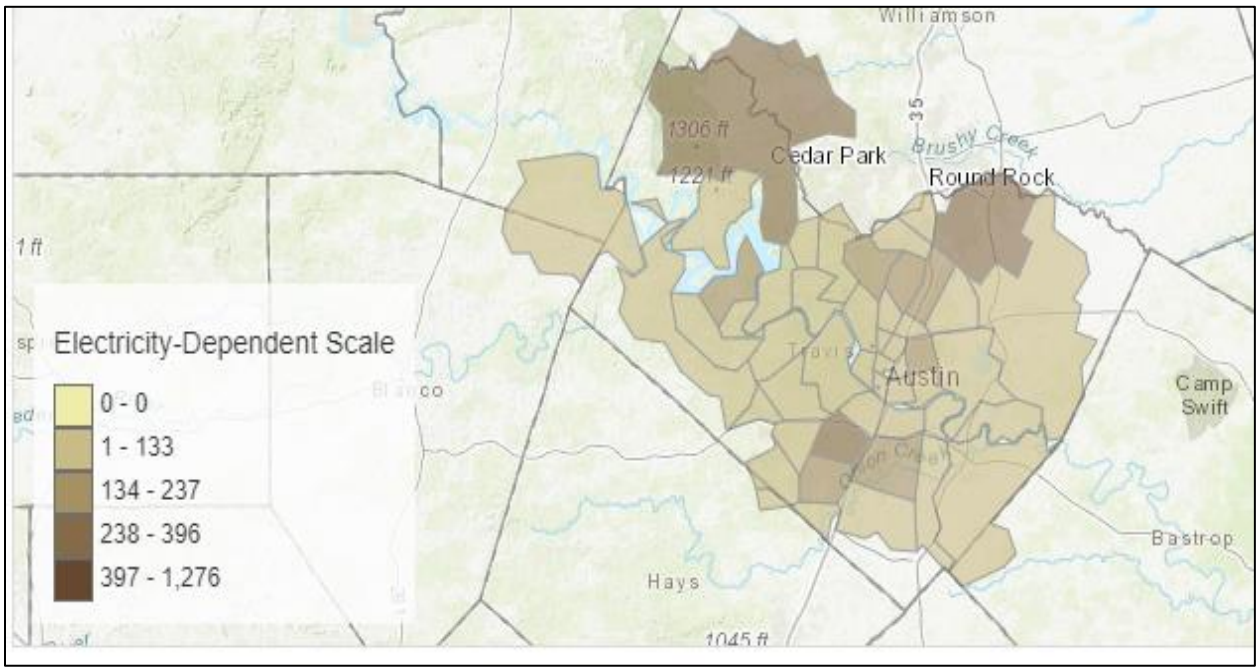
One resource that is available to TCESD2 is the HHS emPOWER Program, which is a partnership between the Office of the Assistant Secretary for Preparedness and Response and the Centers for Medicare and Medicaid Services. The HHS emPOWER Map (https://empowerprogram.hhs.gov/empowermap) is updated monthly and displays the total number of at-risk electricity-dependent Medicare beneficiaries in a geographic area as well as near real-time natural hazard data. The following map is a sample illustration on June 1, 2022.

[8] https://www.cdc.gov/mmwr/volumes/67/wr/mm6732a3.htm?s_cid=mm6732a3_w

[9] https://pubmed.ncbi.nlm.nih.gov/16381412/

[10] https://www.cdc.gov/mmwr/volumes/67/wr/mm6713a4.htm?s_cid=mm6713a4_w

emPOWER Map of TCESD2 Retrieved June 1, 2022



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People with Limited English Proficiency

According to the NFPA, "Language barriers, cultural differences, and inexperience with unfamiliar home technologies are factors that mark the challenges of helping newcomers live safely from the threat of fire in the home." By itself, speaking a language other than English at home does not directly contribute to a higher risk of emergencies; however, if a person has difficulty speaking English, it may contribute to delays or complications during an emergency.

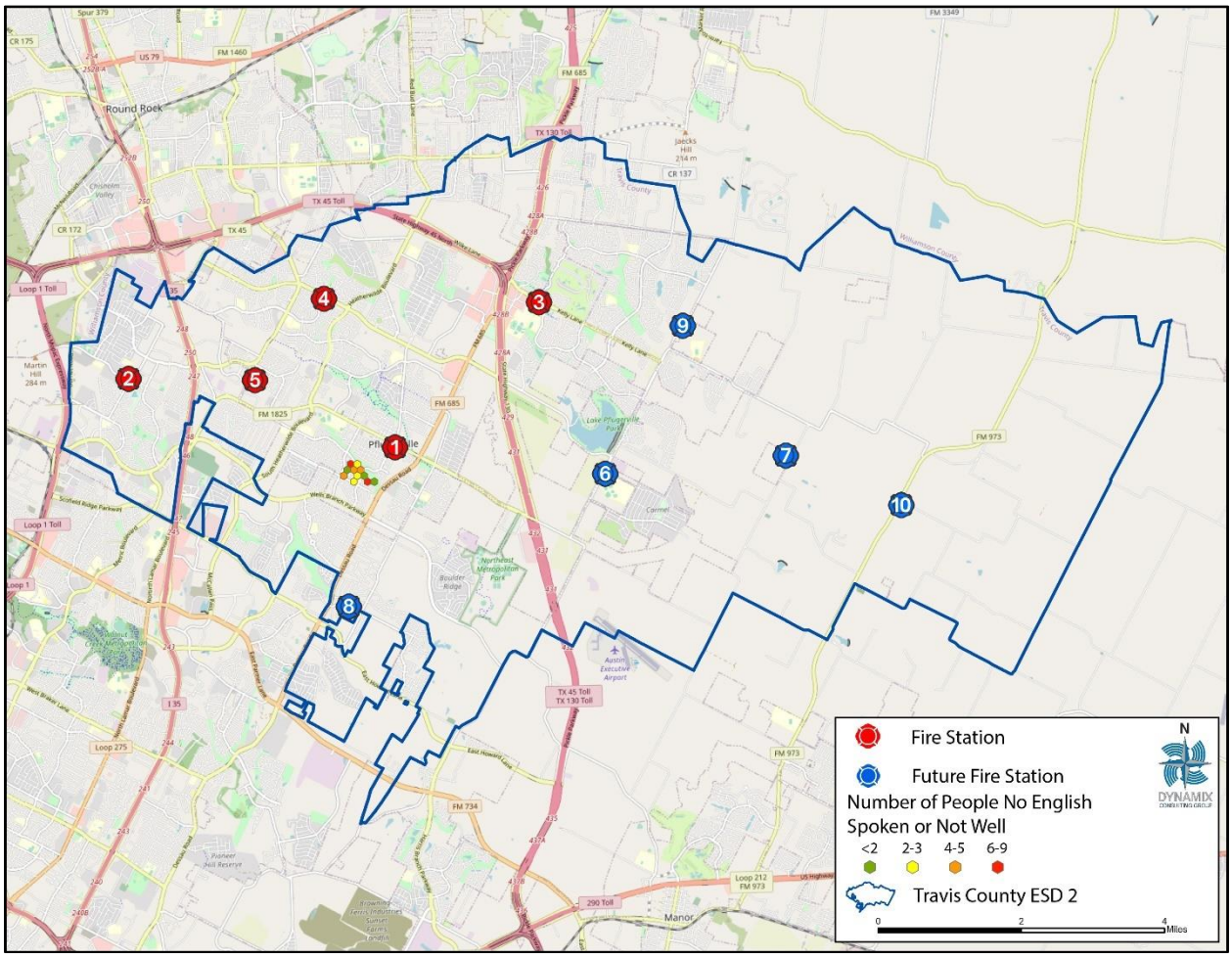
Within TCESD2, 4.58% (6,802 people) either do not speak English well or do not speak English at all. This

Language Spoken (ACS)	Age 5-17	18-64	Age 65+	Total
English Only	**16,727**	**53,193**	**7,527**	**77,447**
Spanish	**5,219**	**17,518**	**1,210**	**23,947**
Spanish & English Well	4,896	13,271	855	19,022
Spanish & English Not Well	241	3,315	246	3,802
Spanish & No English	82	932	109	1,123
Indo-European	**452**	**3,053**	**308**	**3,813**
Indo-European & English Well	435	2,606	267	3,308
Indo-European & English Not Well	17	349	34	400
Indo-European & No English	0	97	7	104
Asian-Pacific Island	**996**	**4,201**	**650**	**5,847**
Asian-Pacific Island & English Well	978	3,153	383	4,514
Asian-Pacific Island & English Not Well	18	964	223	1,205
Asian-Pacific Island & No English	0	85	44	129
Other Language	**364**	**1,592**	**54**	**2,010**
Other Language & English Well	351	1,475	34	1,860
Other Language & English Not Well	0	34	19	53
Other Language & No English	13	83	0	96

is important not only due to the risk of difficultly communicating during an emergency, but also for risk reduction efforts. Public safety educators must understand who their audience is, how they prefer to receive information, and the cultural norms in which they live. With this knowledge, TCESD2 can target at risk populations with targeted information that has the potential to improve or save a life and improve quality of life.

The majority of the people in TCESD2 who do not speak English or do not speak English well live to the southwest of Station 1. This would be a good area to begin disseminating risk reduction education materials in the native language of these residents. TCESD2 may also want to consider staffing bi-lingual firefighters at Station 1.

Number of Households Reporting No English Spoken or English Not Spoken Well
By 5-acre Hexagons 2020



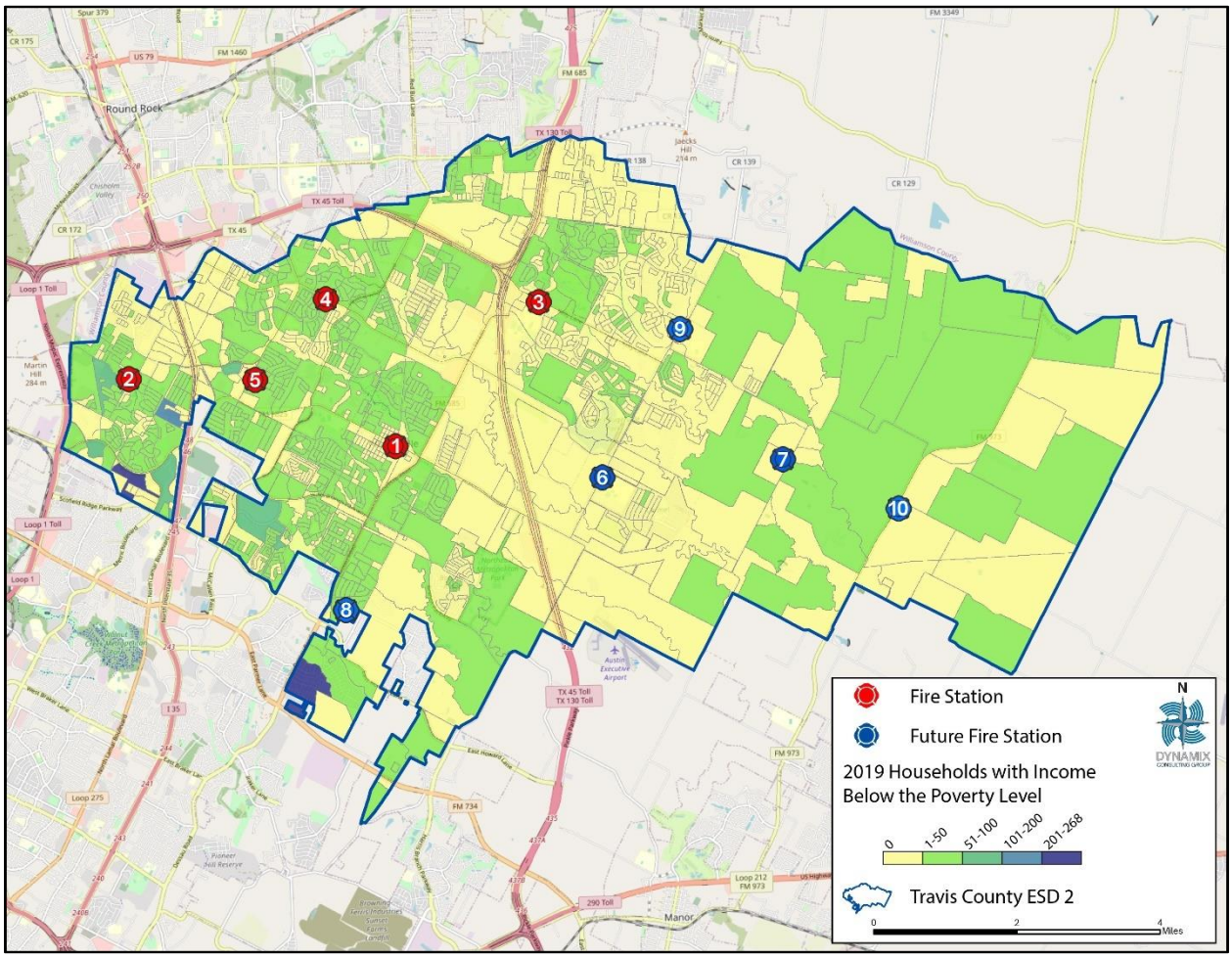
People with Limited Access to Financial Resources

Low-income residents typically utilize government services at higher rates than those people who are in other economic brackets. Persons living in poverty experience an increased risk from fire and medical emergencies due to the age and condition of their housing, inability to pay for routine medical care, lack of medical insurance, and general health conditions. Often associated with poverty is the lack of reliable transportation, which likewise leads to increased demand for local emergency services. There are 3,190 households (7%) below the poverty level within TCESD2.

In the October 2018 edition of *Health Briefs*, a peer-reviewed publication supported by the Robert Wood Johnson Foundation, published "Culture of Health." The article highlighted a strong link between health and income. The key findings were that there are significant morbidity disparities between the lower- and upper-income brackets in the United States, leading to gaps in life expectancy of as much as 15 years for men and 10 years for women. The publication stated that "Poor health also contributes to reduced income, creating a negative feedback loop sometimes referred to as the health-poverty trap."

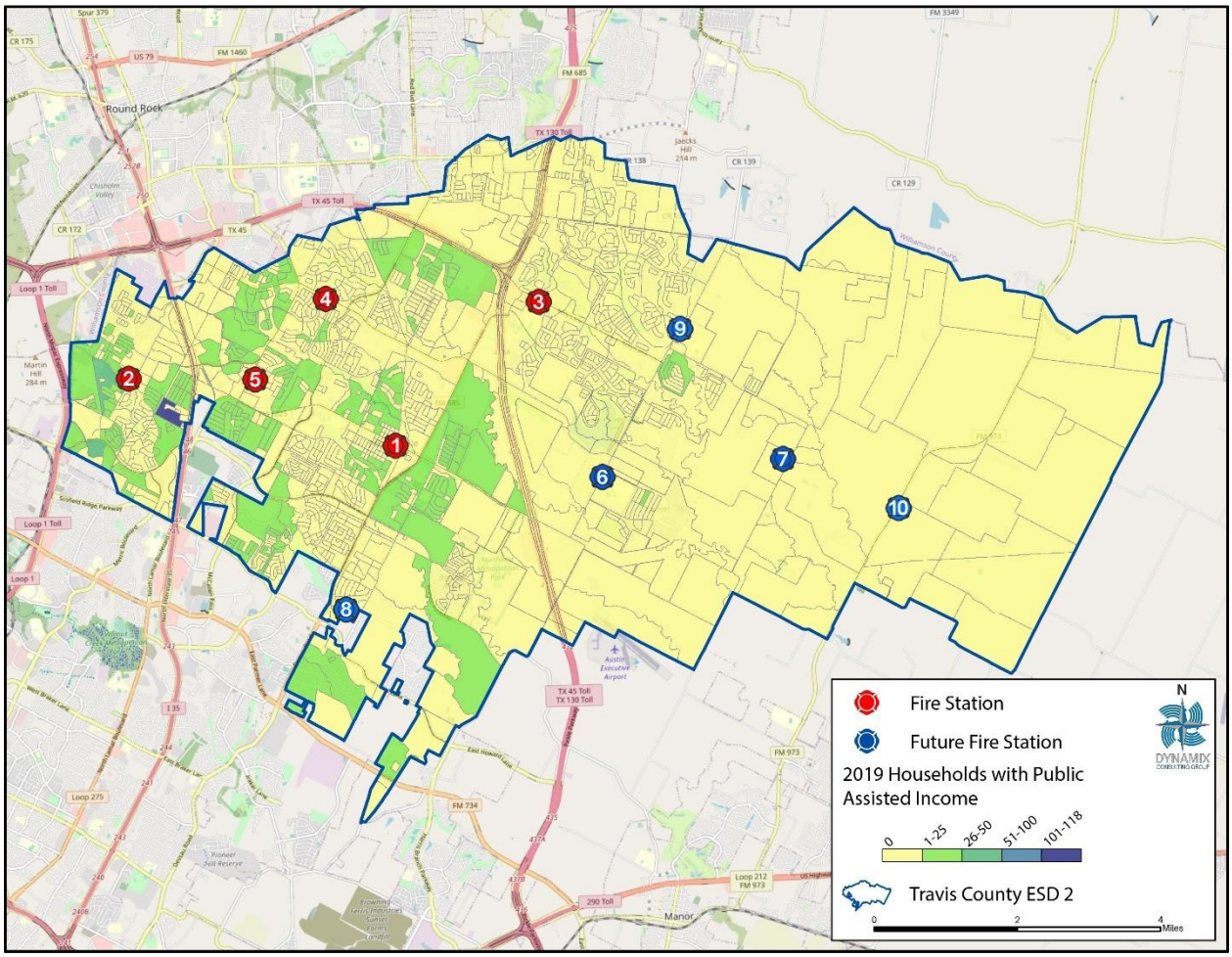
Geographically, the highest concentration of households below the poverty level are in the south and southwest neighborhoods of TCESD2.

2019 Households with Income Below the Poverty Level



Similarly, households in TCESD2 with publicly assisted income concentrate in the western neighborhoods.

2019 Households with Publicly Assisted Income



People with Limited Access to Transportation

"People with limited access to transportation" refers to individuals and families who do not have a personal vehicle. Reasons residents may not have access to transportation can include age, disability, temporary injury, income, legal restriction, or access to a personal vehicle. These individuals rely on public transportation daily for work, school, worship, and leisure. There are 1,682 households within TCESD2 that do not have personal vehicles. These individuals depend on public transit and will likely need transportation assistance in an emergency requiring evacuation.

Growth Trends

Expectations of how the population changes over time is an important consideration when developing community risk assessment priorities. While changes in population totals normally affect service demand, the demographics of the people arriving will also be impactful. This section provides an evaluation of changes to the population and demographics of TCESD2 and projections for future growth.

Population Trends

Since 2010, TCESD2 experienced significant growth throughout the district. From 2010 to 2020, TCESD2 experienced a population increase of 46,427 or a 48.5% increase over the 10-year period. During this time, a slight shift in demographics occurred with the most impactful being the total Asian population within the District nearly doubling from 2010 through 2021. TCESD2 should continue to monitor the demographics of the District to ensure that community risk reduction efforts account for different populations with varying means of receiving information. Hispanics represent approximately 30% of the population of TCESD2.

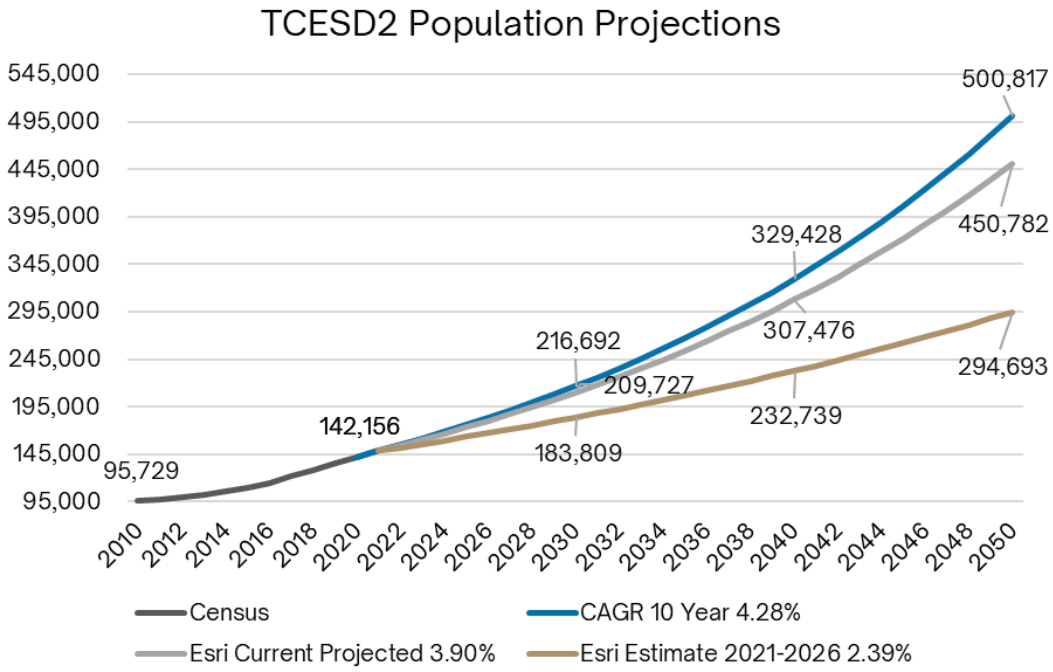
Racial Makeup of TCESD2 2010-2021

	2010 Total	2010 Percentage	2021 Total	2021 Percentage	2021 Percent Hispanic
White	59082	61.15%	88646	59.64%	20.81%
Black	14769	15.29%	21122	14.21%	1.69%
American Indian	675	0.70%	804	0.54%	2.25%
Pacific Islander	130	0.13%	246	0.17%	0.06%
Asian	8108	8.39%	16153	10.87%	0.39%
2+ Races	3813	3.95%	6803	4.58%	4.58%
Other	10046	10.40%	14860	10.00%	33.22%
Total	**96623**	**100.00%**	**148634**	**100.00%**	**100.00%**

Population Projections

Historical U.S. Census data and projections derived from those Census trends and from those developed by Esri assist in developing population projection models through 2050. While these models do not account for unforeseen changes to the economy or preference of where people will choose to live, it does provide insight into how the population of the District may look in the future. The values selected for the model used the Compound Annual Growth Rate (CAGR) for the last 10 years, 4.28% annually, and

represents the most aggressive of the models. Next, the current projected growth rate provided by Esri assumes 3.90% annual growth, and finally, Esri's predicted annual growth rate from 2021 through 2026 of 2.39%.



The Esri estimate 2021-2026 of 2.39% displays as a reduction in the trend of annual growth; however, estimates the population of the District in 2050 at just under 300,000 residents. The Esri current projected growth rate maintains a more linear projection until 2040 when the rise in population begins to take a more parabolic curve upward. Finally, using the CAGR calculated for the last 10 years, aggressively places the population near 500,000 residents by 2050. Conservatively, the population may be closer to 300,000 in 30 years; however, past growth trends show potential for continued growth within the district.

Hazard Analysis and Response

Travis County Hazard Mitigation Plan

While it is impossible to predict or prevent risks stemming from environmental events accurately, it is possible to identify these factors based on historical data and apply mitigation strategies to reduce the level of impact. TCESD2 has multiple weather-related, environmental, and technological risks of concern.

Travis County has developed a Hazard Mitigation Plan and updates it at least every five years in accordance with the Disaster Mitigation Act of 2000. The purpose for this is to maintain continuity between municipalities, districts, and the county. During emergencies, information flows from the local level to the county, the state, and ultimately the federal government if required. While not all countywide priorities specifically apply to TCESD2, using the county plan as a foundation is a sound starting point for more in depth analysis. The Travis County Hazard Mitigation Plan includes a thorough evaluation of local hazards. Dynamix Consulting Group referenced this assessment to ensure that TCESD2 is operating in concert with the planning efforts of Travis County. The current plan was approved in 2017 and was in the process of being updated during the development of the 2022 TCESD2 Community Risk Assessment and Community Risk Reduction Plan. Following the completion of the update of the Travis County Hazard Mitigation Plan, TCESD2 should review and update as necessary both the Community Risk Assessment and Community Risk Reduction Plan.

Upon a review of the full range of natural hazards suggested under the Federal Emergency Management Agency (FEMA) planning guidance, the Travis County Hazard Mitigation Plan[11] identified eleven hazards each addressed in the Hazard Mitigation Plan. These hazards include:

1. Extreme Heat
2. Hail
3. Lightning
4. Thunderstorm Wind
5. Tornado
6. Winter Storm
7. Drought
8. Flood
9. Wildfire
10. Expansive Soils
11. Dam Failure

[11] https://www.traviscountytx.gov/images/emergency_services/docs/hazard-mitigation-plan-2017.pdf

TCESD2 has included three additional hazards in its Community Risk Assessment that are not included in the Travis County Mitigation Plan. These hazards were selected because of their recent prevalence and potential direct impacts on the operations of the fire department as well as the community that is served by the fire department. These additional hazards are:

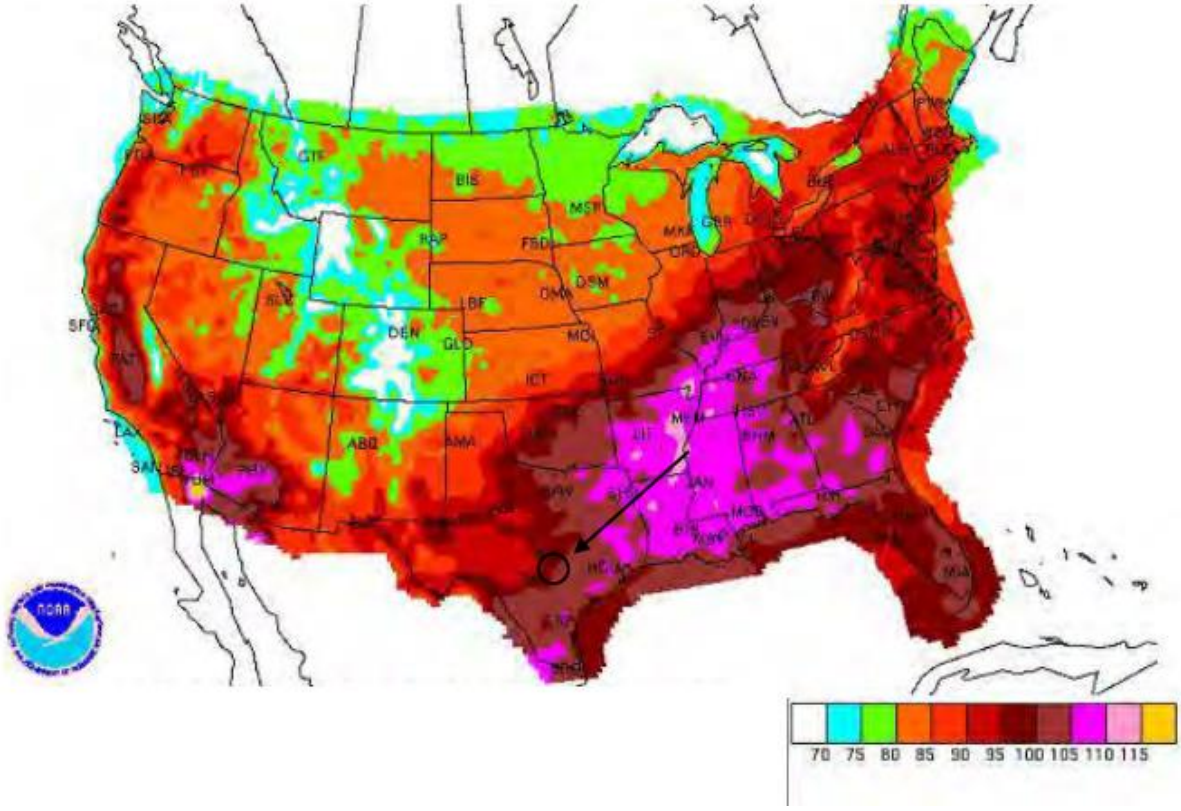
12. Pandemics
13. Civil Unrest
14. Cyber Attacks

Extreme Heat

Extreme Heat is the condition whereby temperatures hover 10 degrees or more above the average high temperature in a region for an extended period. TCESD2's summers are long and hot. Temperatures begin to reach 90 degrees or higher in May and remain in the 90s through September. Southeast winds transporting moisture from the Gulf of Mexico can increase humidity values, taking heat indices up above 110 degrees on occasion.

The following map displays the daily maximum heat index as derived from National Oceanic and Atmospheric Administration, based on data compiled from 1838 to 2015. The black circle shows the TCESD2 area. The brown and dark red colors indicate a daily maximum heat index of 90°F to 105°F. TCESD2 could experience extreme heat from 90°F to 105°F and should mitigate to the extent of "extreme caution," which can include sunstroke, muscle cramps, and heat exhaustion.

Average Daily Maximum Heat Index Days[12]



[12] National Oceanic and Atmospheric Administration

Hail

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and subsequent cooling of the air mass.

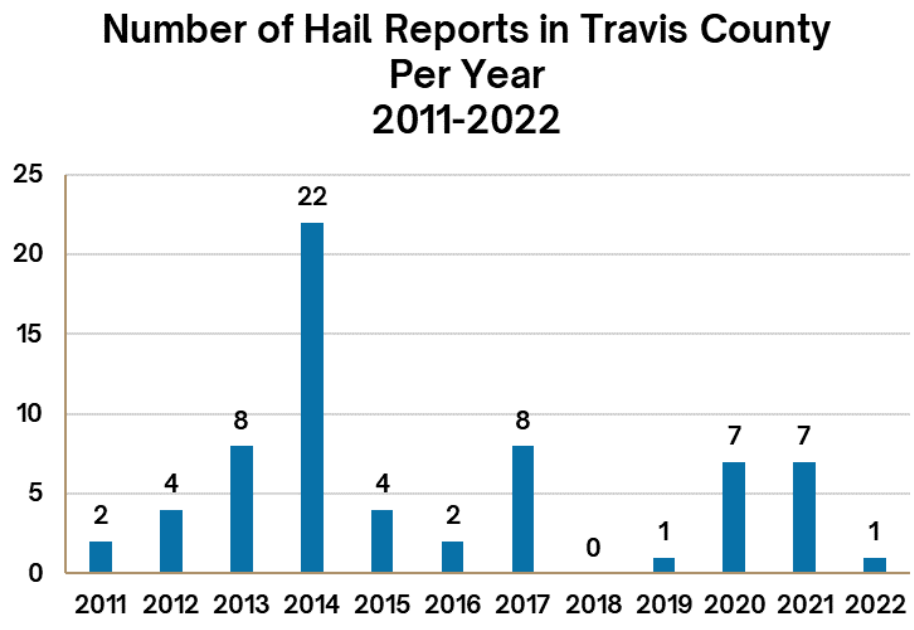
The National Weather Service (NWS) classifies a storm as "severe" if there is hail 3/4 of an inch in diameter (approximately the size of a penny) or greater, based on radar intensity or as seen by observers. The intensity category of a hailstorm depends on hail size and the potential damage it could cause, as depicted in the TORRO Hailstorm Intensity Scale below.

TORRO Hailstorm Intensity Scale[13]

Scale	Intensity category	Typical hail diameter (mm)*	Probable kinetic energy J m^{-2}	Typical damage impacts
H0	Hard hail	5	0-20	No damage
H1	Potentially damaging	5-**15**	>20	Slight general damage to plants, crops
H2	Significant	10-**20**	>100	Significant damage to fruit, crops, vegetation
H3	Severe	20-**30**	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-**40**	>500	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-**50**	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-**60**		Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-**75**		Severe roof damage, risk of serious injuries
H8	Destructive	60-**90**		(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-**100**		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100		Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

The figure below lists the number of hail reports in Travis County during each of the last 10 years.

[13] https://www.torro.org.uk/research/hail/hscale



[14]

Lightning

Lightning is a sudden electrostatic discharge that occurs during an electrical storm. Lightning is a major cause of storm related deaths in the U.S. A lightning strike can result in a cardiac arrest at the time of the injury, although some victims may appear to have a delayed death days later if resuscitated but have suffered irreversible brain damage.

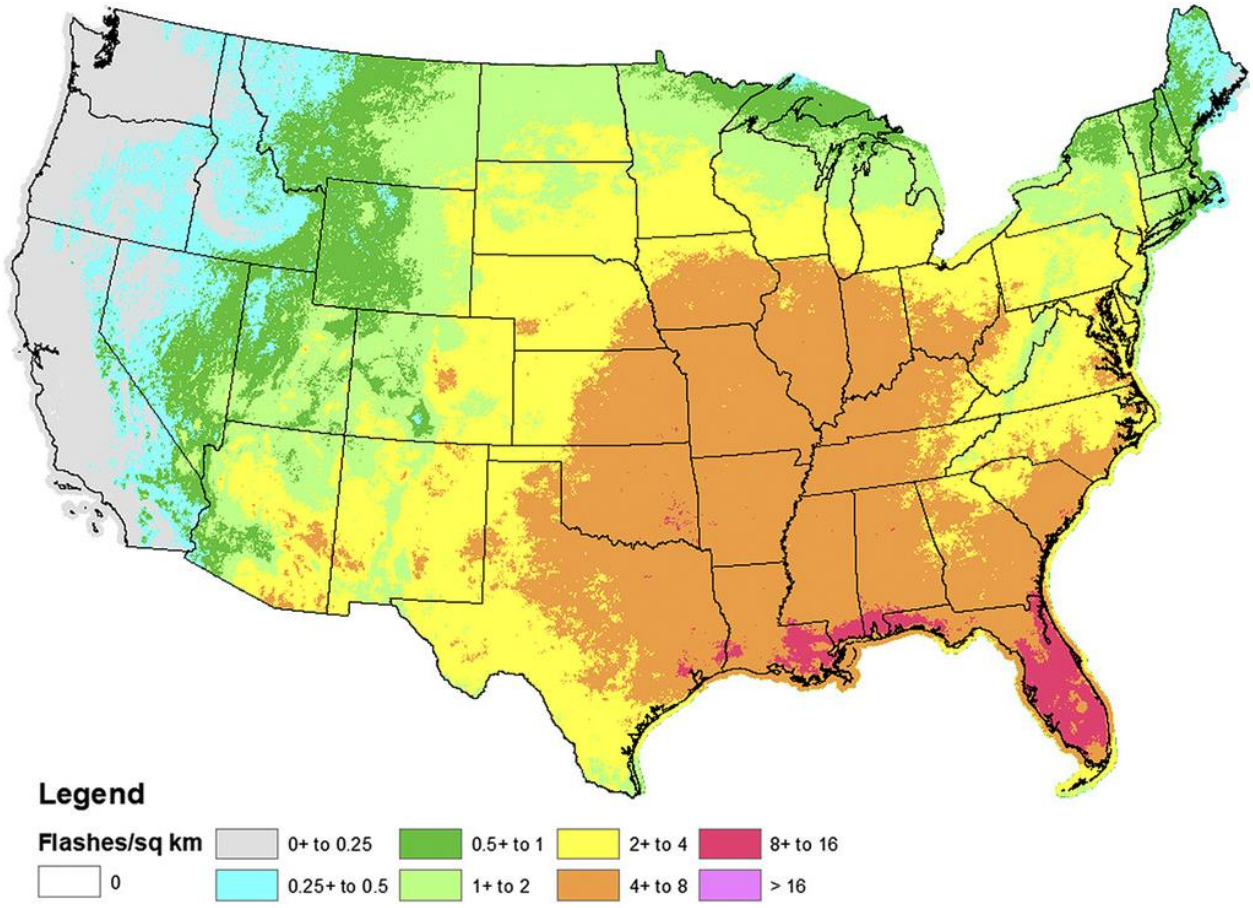
No other state has more yearly lightning strikes than Texas. In 2021, Texas recorded nearly 42 million lightning strikes. That is well beyond second place Florida with an overall total of 14.6 million.[15] . Florida did have the most lightning events in America per square mile. This 'lightning density' measurement ranks Florida first followed by Louisiana then Texas.

TCESD2 averaged 4-8 cloud-to-ground lightning flashes per square kilometer between 1993 and 2018.

[14] Stormersite.com

[15] Vaisala

Cloud-to-Ground Lightning Flash Density and Thunderstorm Day Distributions over the Contiguous United States Derived from NLDN Measurements: 1993–2018[16]



[16] https://journals.ametsoc.org

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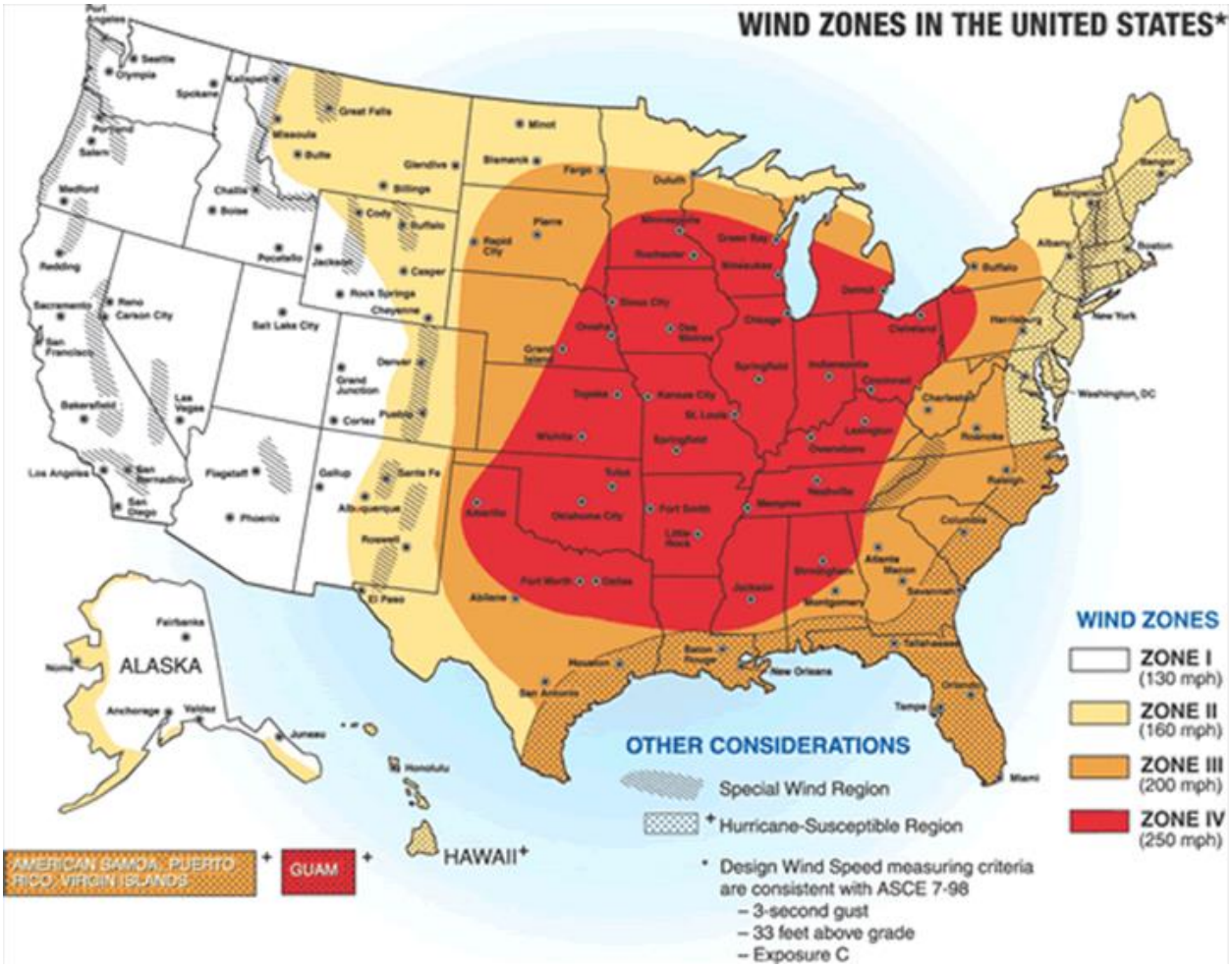
Thunderstorm Wind

Thunderstorms create extreme wind events which includes straight line winds. Straight line winds are responsible for most thunderstorm wind damages. One type of straight-line wind, the downburst, is a small area of rapidly descending air beneath a thunderstorm. A downburst can cause damage equivalent to a strong tornado and make air travel extremely hazardous. TCESD2 is located within Wind Zone III, which means that it can experience winds up to 200 mph.

Wind Zone Map[17]



[17] https://www.nist.gov/image/windzonemapjpg

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Tornados

Tornadoes are a violent rotating column of air that has contact with the ground and is often visible as a funnel cloud. Its vortex rotates cyclonically with wind speeds ranging from as low as 40 mph to as high as 300 mph. Tornadoes can create winds of over 300 mph, which will cause a significant threat to life and property. The Enhanced Fujita Tornado Scale measures tornado intensity with an intensity range from EF-0 to EF-5. The Enhanced Fujita Scale or EF scale became operational on February 1, 2007 and assigns a "rating" based on estimated wind speeds and related damage. The EF Scale revised from the original Fujita Scale, developed in 1971, to reflect tornado damage better. The following figure is a summary of the damage associated at the various levels.

Tornado Intensity, Enhanced Fujita Scale

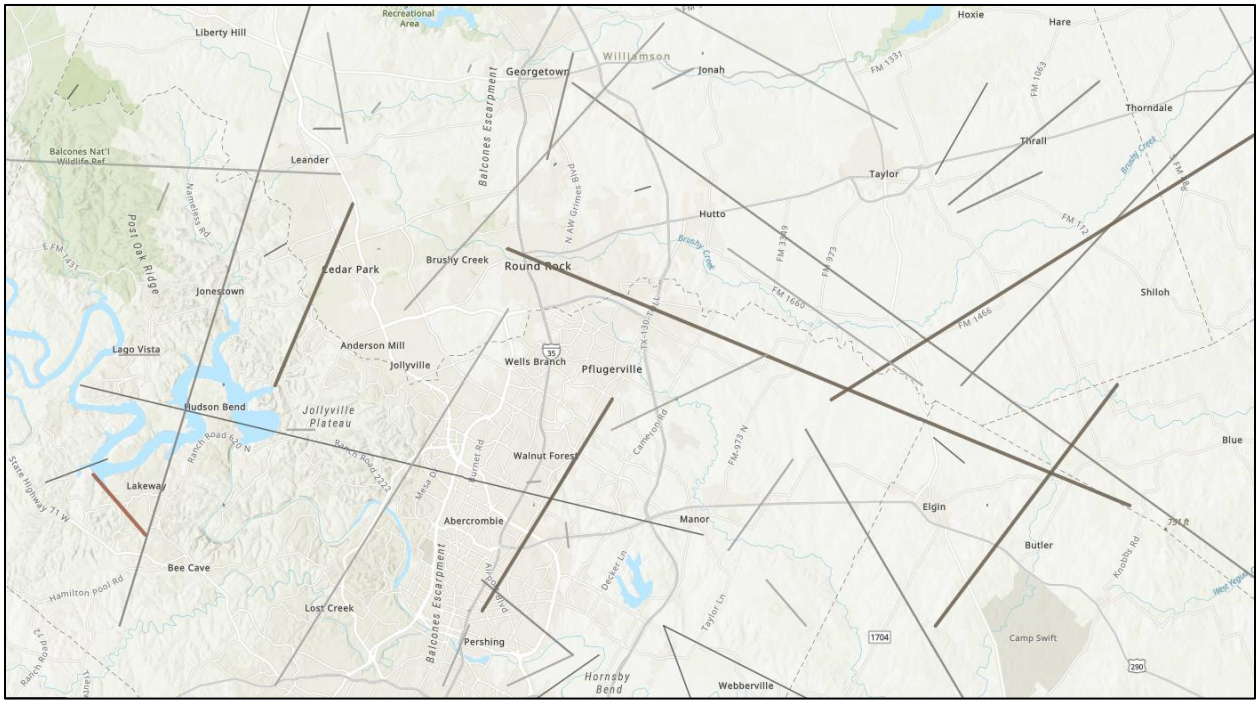
Designation	Wind Speed, mph	Typical Damage[18]
EF-0	65–85	**Minor or no damage.** Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) always rate EF-0.)
EF-1	86–110	**Moderate damage.** Roofs severely stripped; mobile homes overturned or heavily damaged; loss of exterior doors; windows and other glass broken.
EF-2	111–135	**Considerable damage.** Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off the ground.
EF-3	136–165	**Severe damage.** Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are heavily damaged.
EF-4	166–200	**Devastating damage.** Well-constructed and whole frame houses completely leveled; cars and other large objects thrown, and small missiles generated.
EF-5	> 200	**Extreme damage**. Strong-framed, well-built houses leveled off foundations and swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; cars, trucks, and train cars can be thrown approximately 1 mile (1.6 km).

While the Enhanced Fujita Scale lists ranges of winds, the wind estimate is not exact or verified in science and engineering. Different wind speeds may cause similar damage from place to place and even from building to building.

[18] https://en.wikipedia.org/wiki/Enhanced_Fujita_scale

The following map shows the paths of tornados in the past in or near TCESD2 from 1950 and 2017.

TCESD2 Tornado Tracks, 1950–2017[19]



[19] www.usa.com

A total of 28 historical tornado events that had recorded magnitude of 2 or above have occurred within 25 miles of TCESD2.

Magnitude 2 and Higher Tornadoes Near TCESD2[20]

Distance (miles)	Date	Magnitude	Start Lat/Log	End Lat/Log	Length	Width	Fatalities	Injuries	Property Damage	Crop Damage	Affected County
3.0	1980-04-07	3	30°29'N / 97°36'W	30°27'N / 97°31'W	5.70 Miles	33 Yards	0	3	250K	0	Travis
3.6	1957-03-31	2	30°30'N / 97°38'W		0.10 Mile	10 Yards	0	0	25K	0	Travis
4.1	1980-04-07	3	30°31'N / 97°42'W	30°29'N / 97°36'W	6.50 Miles	100 Yards	1	2	250K	0	Williamson
8.1	1959-05-10	3	30°17'N / 97°43'W	30°25'N / 97°37'W	11.00 Miles	667 Yards	0	0	250K	0	Travis
8.2	1957-03-31	2	30°23'N / 97°43'W		0.50 Mile	100 Yards	0	0	250K	0	Travis
8.7	1964-04-26	2	30°33'N / 97°42'W		1.00 Mile	17 Yards	0	0	3K	0	Williamson
10.5	1954-04-30	3	30°25'N / 97°27'W	30°26'N / 97°25'W	3.00 Miles	880 Yards	0	0	0K	0	Travis
11.6	1985-12-10	2	30°35'N / 97°40'W	30°39'N / 97°39'W	5.00 Miles	100 Yards	0	2	2.5M	0	Williamson
13.2	1980-08-10	2	30°15'N / 97°39'W	30°18'N / 97°43'W	5.40 Miles	150 Yards	0	4	250.0M	0	Travis
13.5	1980-04-07	3	30°27'N / 97°31'W	30°23'N / 97°15'W	16.50 Miles	33 Yards	0	0	250K	0	Bastrop
13.7	1997-05-27	3	30°33'N / 97°49'W	30°29'N / 97°50'W	5.60 Miles	200 Yards	0	15	70.0M	50K	Williamson
15.1	1981-02-10	2	30°40'N / 97°40'W		0.80 Mile	100 Yards	0	0	250K	0	Williamson
16.2	1974-10-30	2	30°41'N / 97°40'W		1.80 Miles	200 Yards	0	0	0K	0	Williamson
17.3	2000-03-16	2	30°36'N / 97°51'W	30°36'N / 97°50'W	1.50 Miles	200 Yards	0	0	300K	0	Williamson
18.0	1997-05-27	2	30°28'N / 97°56'W	30°26'N / 97°53'W	3.60 Miles	100 Yards	0	0	50K	10K	Travis
18.4	1954-04-30	3	30°26'N / 97°25'W	30°37'N / 97°12'W	18.10 Miles	880 Yards	0	6	250K	0	Williamson
18.6	1970-07-04	2	30°26'N / 97°55'W		1.50 Miles	47 Yards	1	4	0K	0	Travis
19.0	1957-04-24	3	30°16'N / 97°22'W	30°23'N / 97°17'W	9.60 Miles	880 Yards	0	1	250K	0	Bastrop
19.9	1973-01-20	2	30°21'N / 97°55'W		0.10 Mile	40 Yards	0	0	25K	0	Travis
20.6	1977-04-14	2	30°16'N / 98°00'W	30°34'N / 97°54'W	21.60 Miles	200 Yards	0	0	250K	0	Travis

[20] www.usa.com

20.7	1956-09-04	2	30°38'N / 97°39'W	30°09'N / 96°53'W	56.60 Miles	250 Yards	0	0	25K	0	Williamson
20.8	1978-07-28	2	30°36'N / 97°18'W		0.50 Mile	30 Yards	0	0	25K	0	Williamson
20.9	1957-04-24	3	30°23'N / 97°17'W	30°26'N / 97°14'W	5.10 Miles	880 Yards	0	0	250K	0	Williamson
22.3	1977-04-14	2	30°34'N / 97°54'W	30°50'N / 97°48'W	19.40 Miles	33 Yards	0	0	250K	0	Williamson
23.0	1980-04-07	3	30°23'N / 97°15'W	30°21'N / 97°13'W	3.00 Miles	33 Yards	0	0	250K	0	Lee
23.3	1989-05-17	3	30°46'N / 97°37'W	30°49'N / 97°36'W	3.00 Miles	1700 Yards	1	28	2.5M	0	Williamson
23.4	1997-05-27	5	30°49'N / 97°37'W	30°46'N / 97°40'W	5.10 Miles	650 Yards	27	12	40.0M	100K	Williamson
24.5	1997-05-27	4	30°22'N / 98°01'W	30°20'N / 97°59'W	5.60 Miles	440 Yards	1	5	15.0M	0K	Travis

Winter Storms

Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Blizzards, the most dangerous of all winter storms, combine low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing visibility to only a few yards. Ice storms occur when moisture falls and freezes immediately upon impact on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storms and ice storms can down trees, cause widespread power outages, damage property, and cause fatalities and injuries to human life.

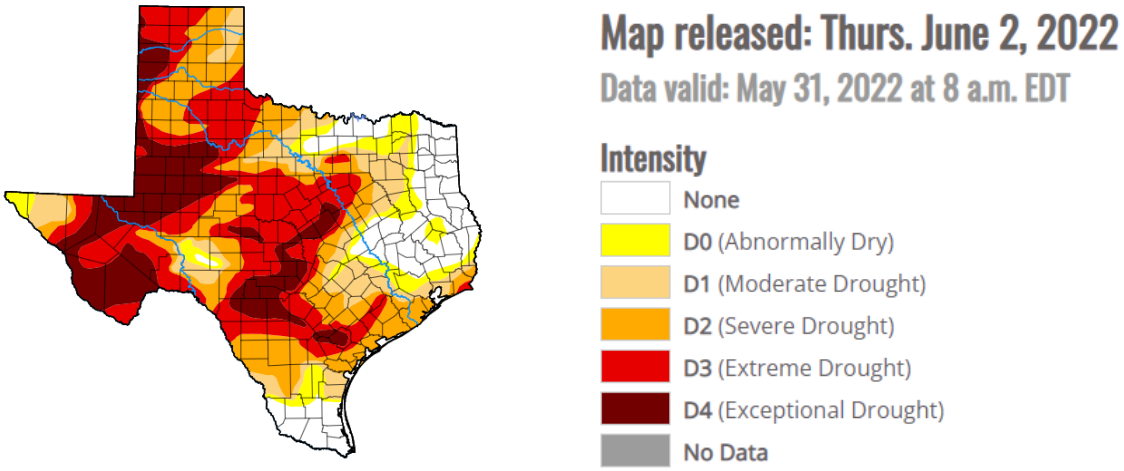
TCESD2 is at risk to ice hazards and extremely cold temperatures, as well as snow, however the effects and frequencies of winter storm events are generally mild and short-lived. Peoples are subject to health risks from extended exposure to cold air. Elderly people are at greater risk of death from hypothermia during these events. According to the U.S. Center for Disease Control, every year hypothermia kills about 600 Americans, half of whom are 65 years of age or older.

Winter Storm Uri occurred in February 2021. The storm created a power blackout spanned across most of Texas from February 15-18. A survey conducted by the University of Houston (UH) Hobby School of Public Affairs in mid-March found that more than two out of three, or 69%, of Texans lost power at some point during the storm or its aftermath and almost half, or about 49% had disruptions in water service. The storm contributed to at least 210 deaths, and sources cited by the Federal Reserve Bank of Dallas estimated the state's storm-related financial losses ranged from $80 billion to $130 billion.

Drought

A drought is a prolonged period of less than normal precipitation such that the lack of water causes a serious hydrologic imbalance. Common effects of drought include crop failure, water supply shortages, and fish and wildlife mortality.

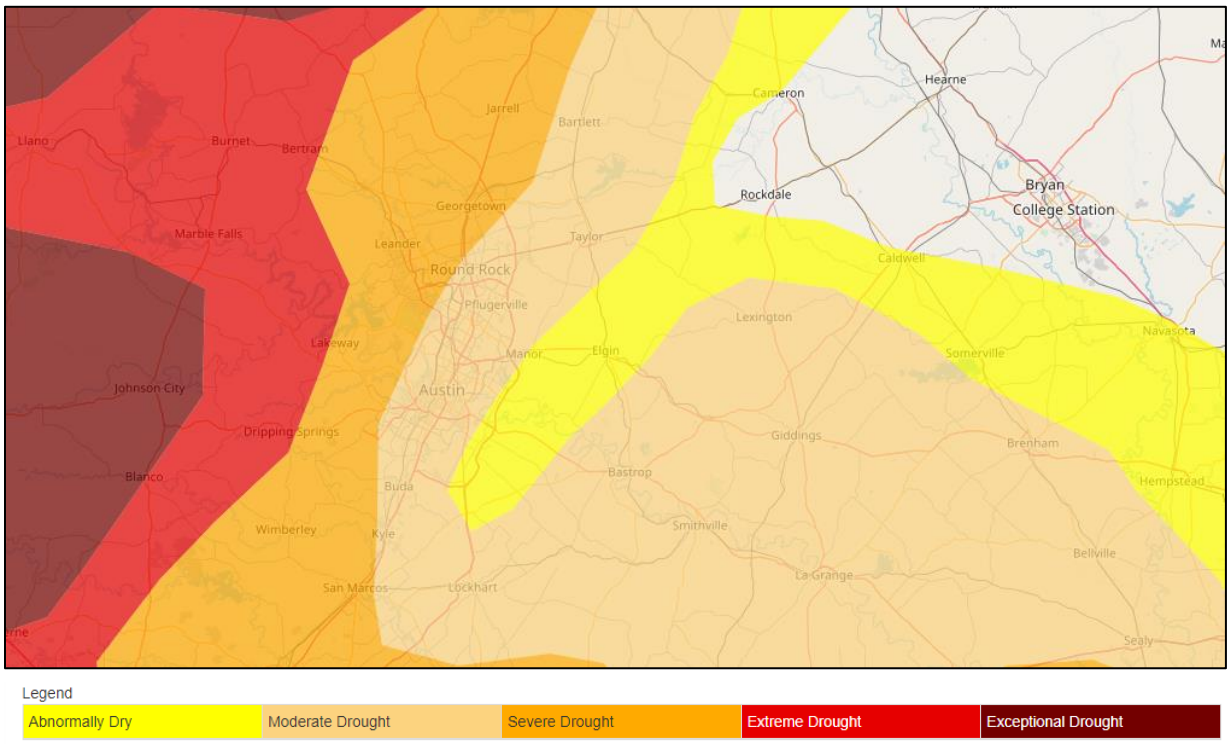
Droughts occur regularly throughout Texas. As of June 2, 2022, Texas is experiencing abnormally dry conditions.[21]



At the time of the release of this graphic and its information, TCESD2 was experiencing abnormally dry drought conditions.

[21] https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX

Drought Monitor[22]



[22] https://www.plantmaps.com/interactive-texas-drought-monitor-map.php

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Flooding

FEMA defines a flood "as two or more acres of dry land or two or more properties that are covered by water temporarily."

Hurricanes, severe rainstorms, and thunderstorms cause most flooding events in TCESD2. Thunderstorms in this area often produce substantial amounts of rain falling within a short period. Rainfall amounts have exceeded 5 inches in several hours.

Residents living in flood zones should remain informed of the risks. During the planning process, the District must consider station location and relocations in relation to flood zones. Flood zone and flood insurance information should be part of the public education process to ensure flood awareness and actions residents need to take to ensure readiness.

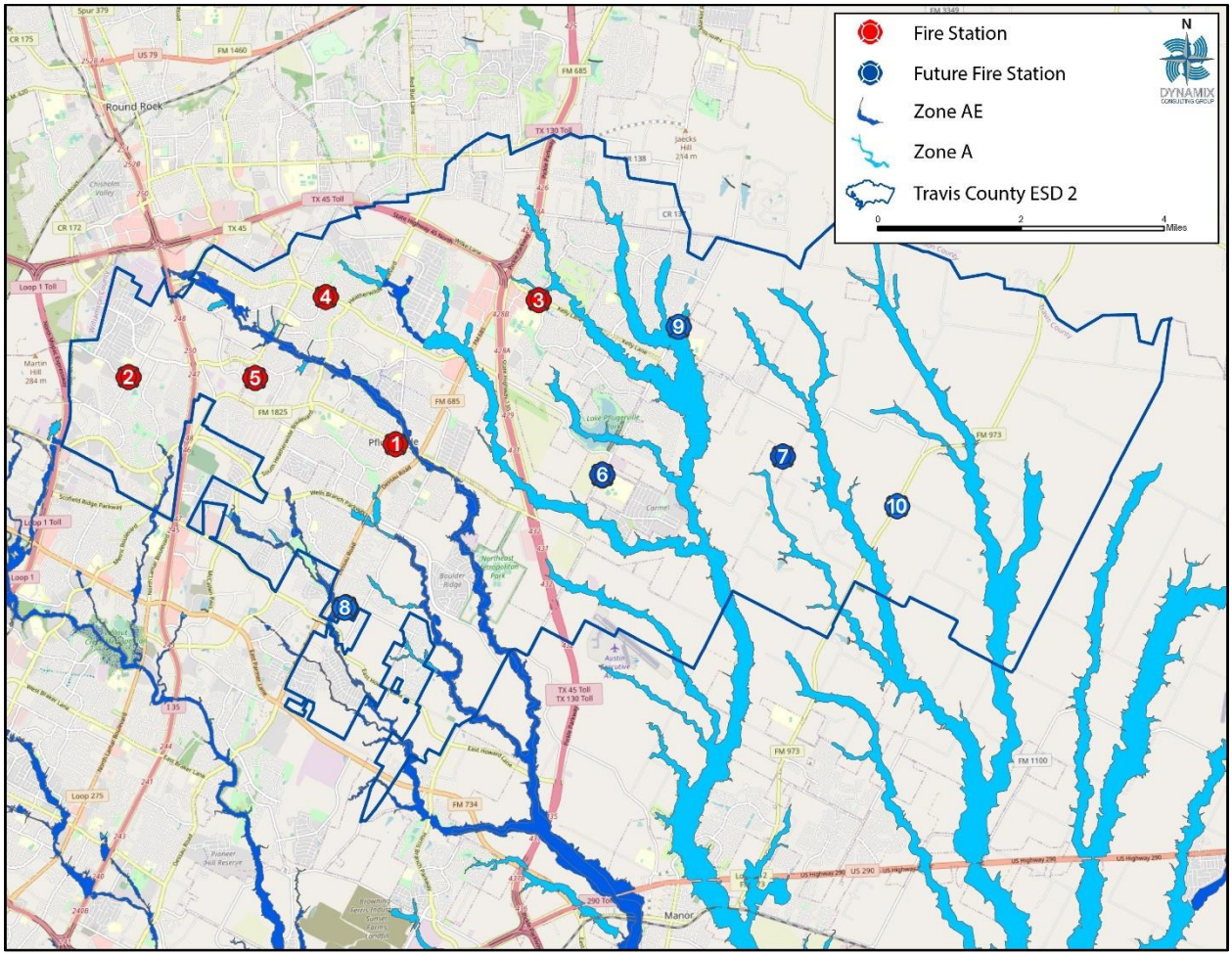
During a flood event, TCESD2 personnel may respond to incidents that involve moving water, potentially requiring intervention by specialty-trained technical rescue teams. In addition, after the flood, EMS-related incidents can increase as injuries and medical conditions occur. The following is a summary of flood zone risks.

Summary of Flood Zone Risks

Zone	Risks[1]
A Zone **AE Zone** **AO Zone**	High Special Flood Hazard Area (SFHA) Flood-prone building codes apply Flood insurance is mandatory for most mortgage holders • **A Zone:** 100-year floodplain, with no Base Flood Elevations (BFEs) determined. • **AE Zone:** 100-year floodplain, with BFEs determined. • **AO Zone:** 100-year floodplain with sheet flow, with BFEs determined.
VE Zone, V1–V30	High Special Flood Hazard Area (SFHA). Flood-prone building codes apply. 100-year floodplain with wave action, no base flood elevation determined.

The following figure illustrates the flood zones in TCESD2.

TCESD2 Flood Zones

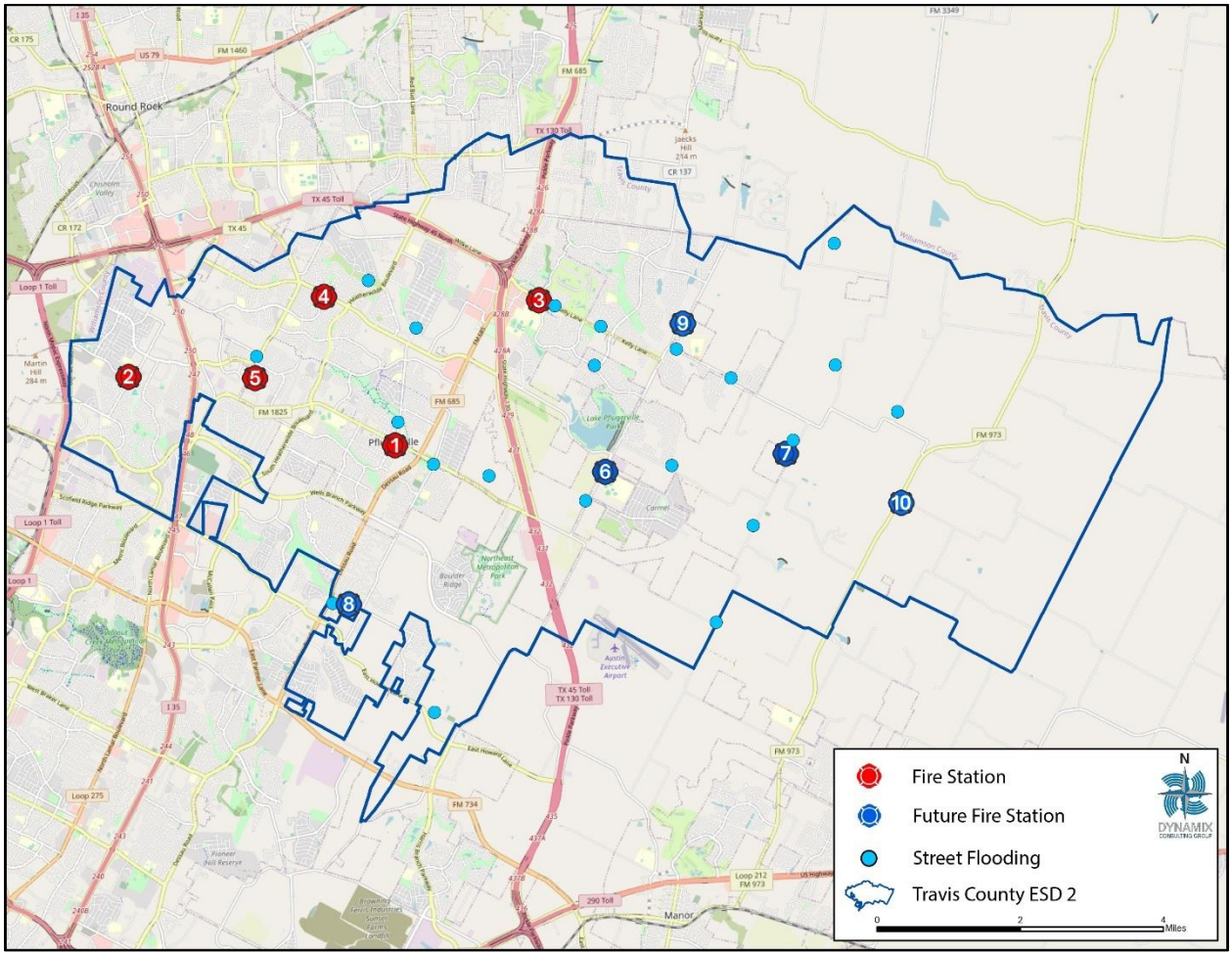


The risks of flooding increase with "low water crossings," which are sections of roadway that serve as bridges when water flow is low but under high flow conditions (such as heavy or persistent rainfall) the roadway floods and impairs vehicular traffic. The following low water crossings exist within TCESD2:

1. Cameron Road – 16300, 17600, 18700, and 20400 blocks
2. Cele Road – 5900 and 7200 blocks
3. Crystal Bend Road – 1700 block
4. Engelmann Road – 19400 block
5. Grand Avenue Parkway – 1400 block
6. Gregg Lane – 10200 block
7. N. Heatherwilde Boulevard – 18100 block
8. Hidden Lakes Drive
9. Immanuel Road – 1600 block
10. Jesse Bohls Drive – 6900 block
11. Kelly Lane – 2800 and 3400 blocks
12. N. Mammoth Cave Boulevard – 18100 block
13. Melber Lane – 21200 block
14. E. Pecan Street – 2000 block
15. N. Railroad Avenue – 600 block
16. Weiss Lane – 16800 block

Geographically, the low-water crossings disperse throughout TCESD2.

TCESD2 Low Water Crossings



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Wildfires

A wildfire is an uncontrolled fire burning in an area of vegetative fuels such as grasslands, brush, or woodlands. Heavier fuels with high continuity, steep slopes, high temperatures, low humidity, low rainfall, and high winds all work to increase the risk for people and property located within wildfire hazard areas or along the urban/wildland interface. Wildfires are part of the natural management of forest ecosystems, but human factors cause most wildfires.

Late winter is typically the peak of fire weather season across the area. Very dry air and gusty northerly winds that filter into the region behind passing cold fronts, as well as the generally dry conditions, create favorable conditions for wildfires.

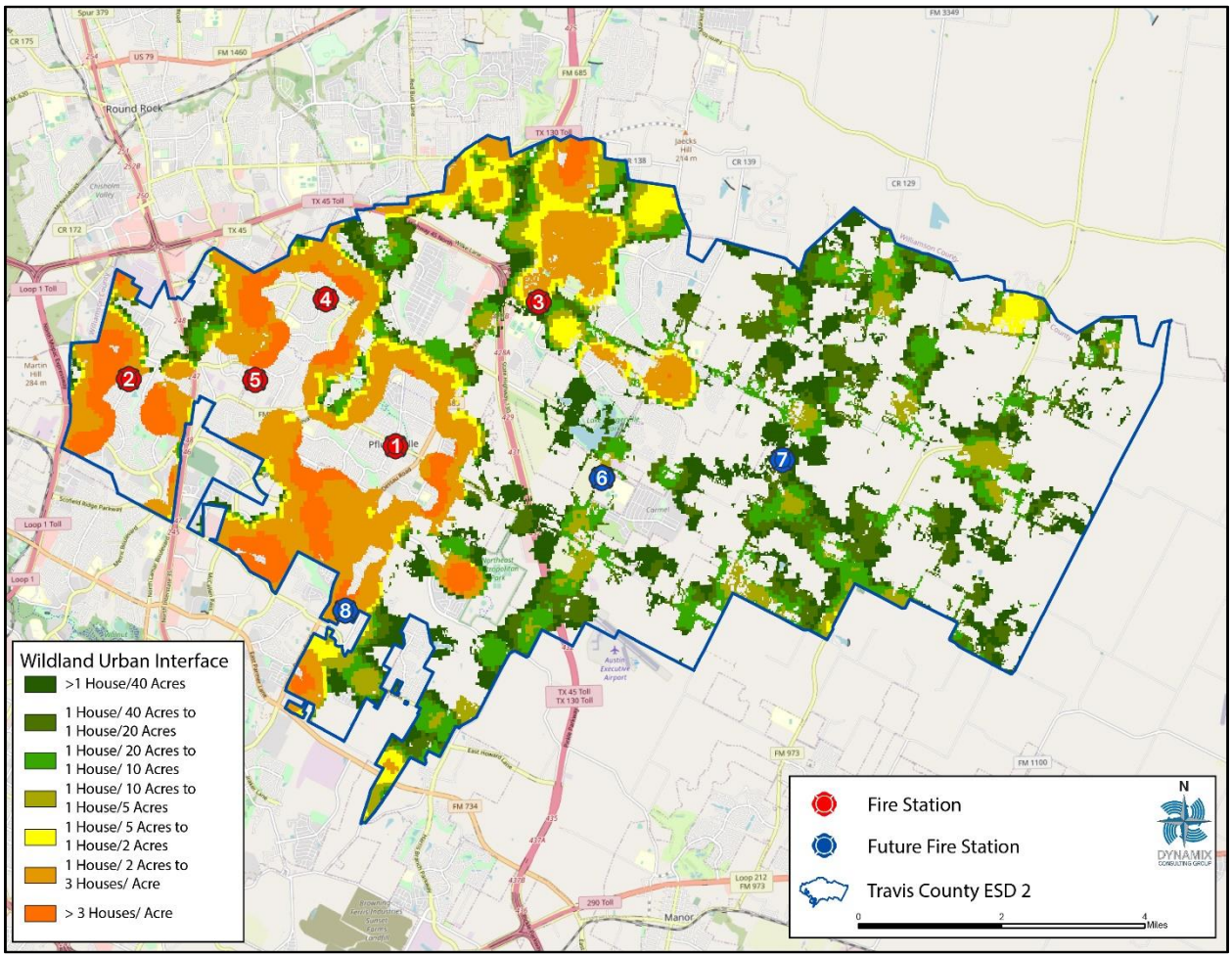
The Austin-Travis County Community Wildfire Protection Plan (CWPP)[23], developed and adopted in 2014, provides a comprehensive and in-depth analysis of the wildfire risk throughout the planning area.

Wildland data used within this Community Risk Assessment references the Texas A&M Forest Service but is entirely consistent with the CWPP creating a high level of confidence.

The Wildland-Urban Interface (WUI) is the contact zone between housing and contiguous wildland vegetation. This transitional environment is most susceptible to fire. As people and wildlands come into contact, conflict arises from the threat of wildfire or from emergency services inadequate to protect rural populations. Wildland-Urban Intermix areas are where housing and vegetation intermingle. The following map illustrates the interaction of residents and their homes with wildland fuels.

[23] https://www.austintexas.gov/page/austin travis-county-community-wildfire-protection-plan

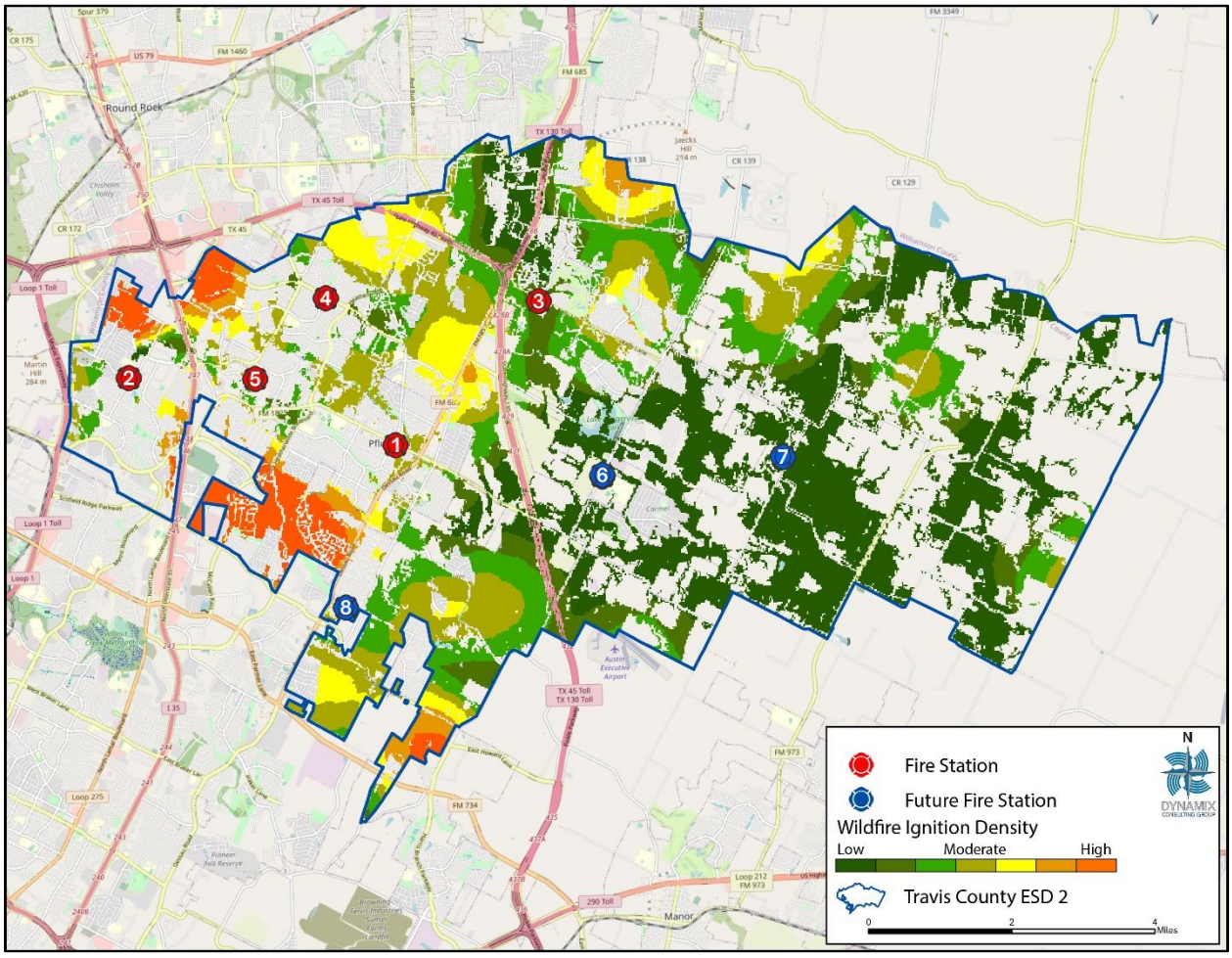
WUI Housing Density – Texas A&M Forest Service



As displayed in the WUI Housing Density map, areas on the western side of the District possess more densely populated areas abutting wildland interface areas.

Next, the wildland ignition densities displayed show the likelihood of wildfires occurring based upon historical ignition patterns.

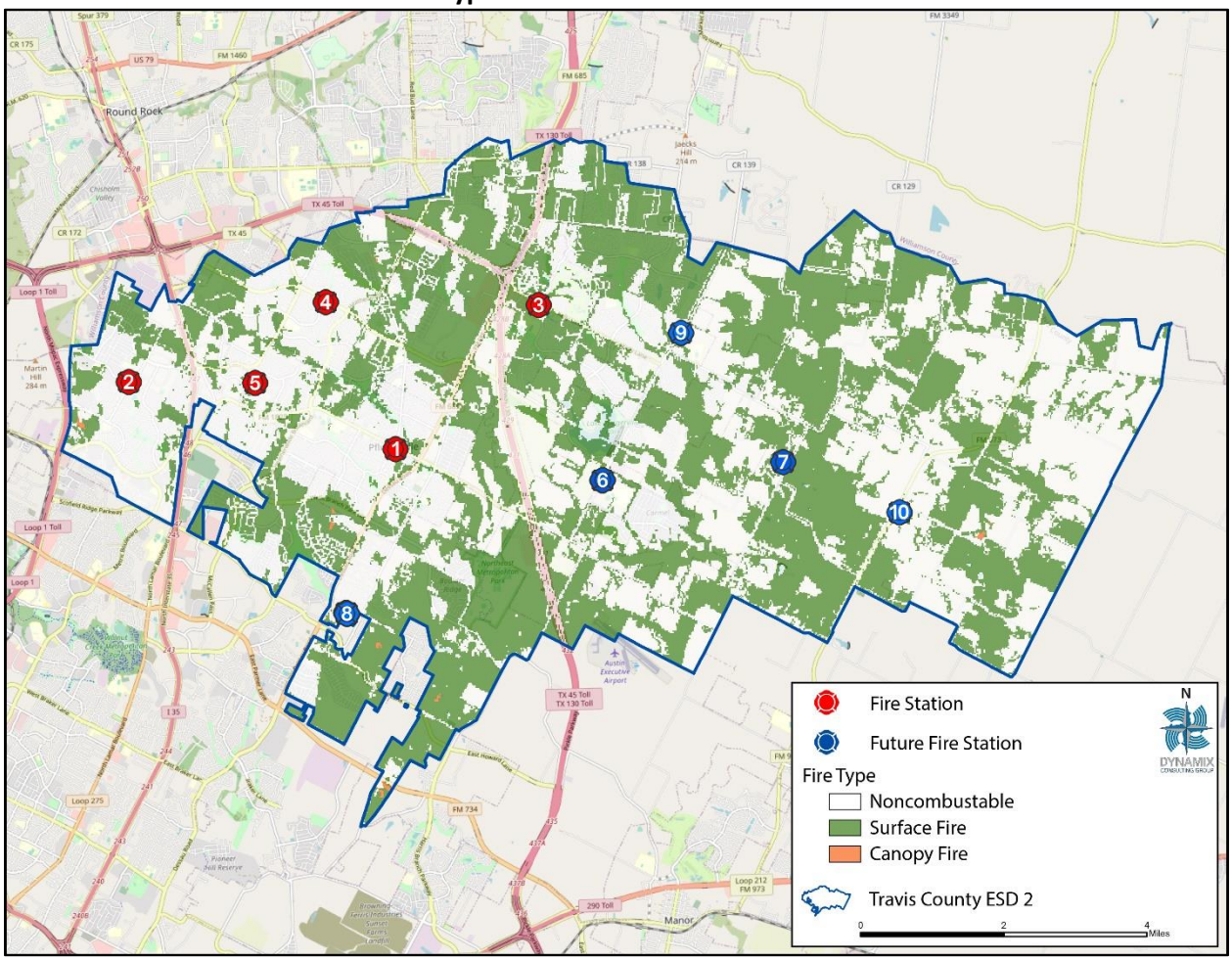
Wildland Ignition Density – Texas A&M Forest Service



As in the WUI map, the western side of the District has a greater risk for higher intensity wildland fires with areas in the southcentral and southwestern portions of the District possessing the higher levels of risk.

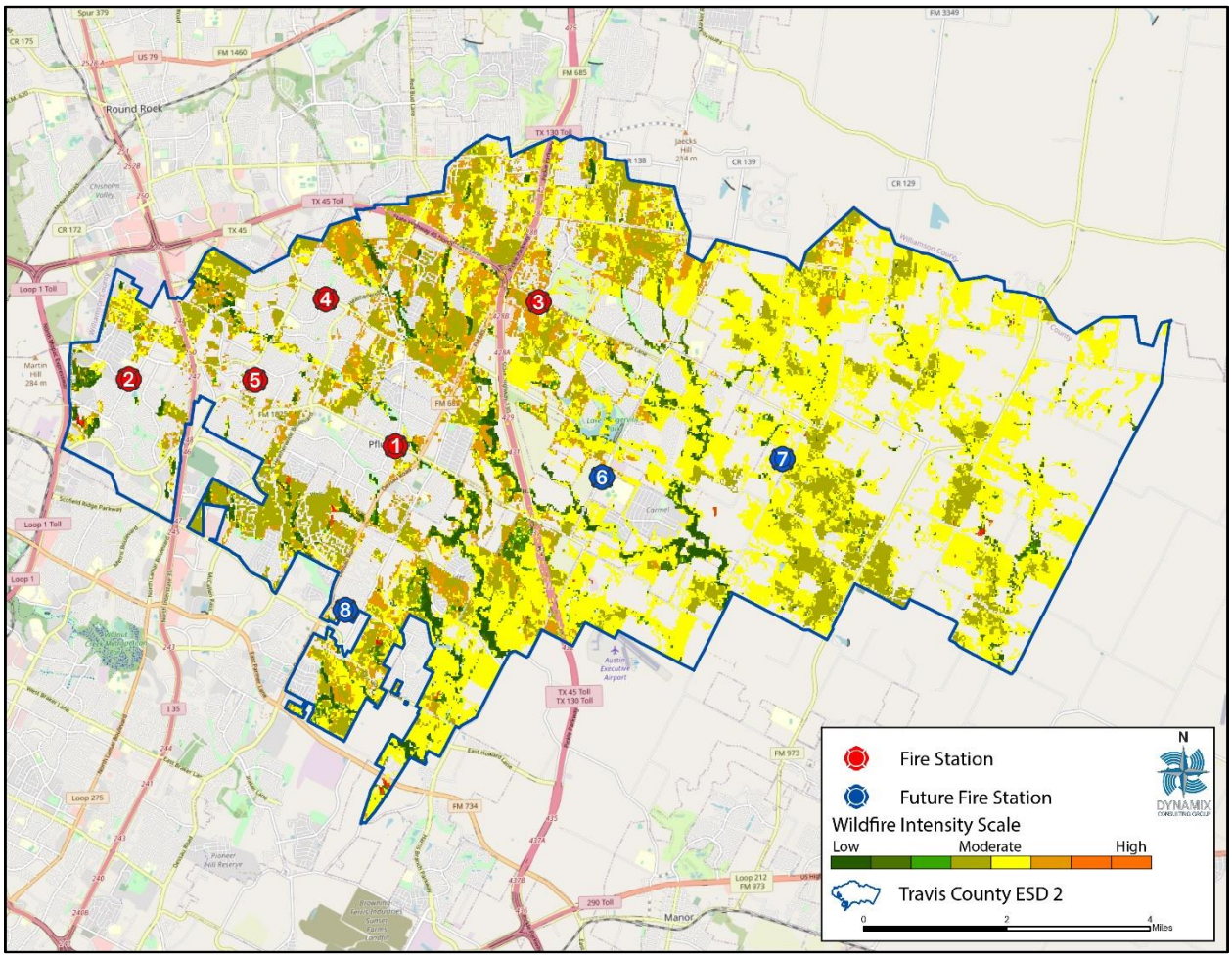
The most prominent wildfire type are ground fires; however, some potential for canopy fires exists within the district.

Fire Type – Texas A&M Forest Service



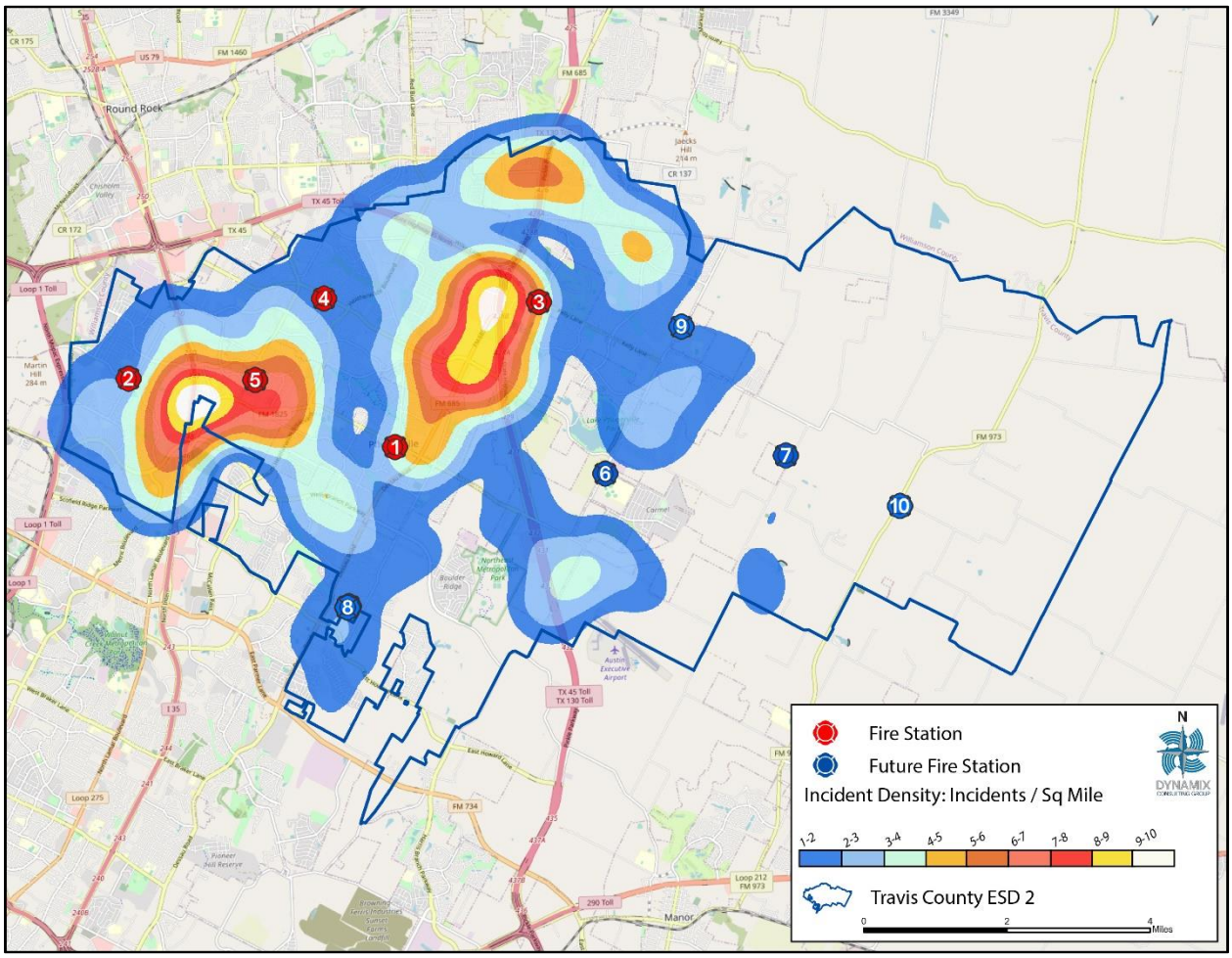
The fire intensities anticipated for most wildland fires are moderate throughout the District with some areas of high intensity fires possible. TCESD2 should consider response packages for some of these higher intensity areas, particularly if target hazards are located within or nearby.

Fire Intensity Scale – Texas A&M Forest Service



Finally, presented is a hot spot map of historic wildfires from 2019 through 2021. As found in previous analyses, the areas of highest density occurred in the western half of the District west of Station 3 and between stations 2 and 5.

Wildland Fires 2019-2021



Given the information presented in this section, TCESD2 may consider increasing the number of resources assigned to the initial alarm for working wildland fires to ensure protection of areas within the wildland urban interface, while also allowing for sufficient resources to extinguish the wildland fire.

Summary

TCESD2 has a low to moderate overall wildfire risk. While there is potential for grass or brush fires, generally this is not a high risk for the district.

In addition to the information available through the Texas A&M Forest Service, the City of Austin Fire Department's Wildfire Division offers several resources regarding wildfire risk in Travis County. The link below contains additional information regarding wildfire risks.

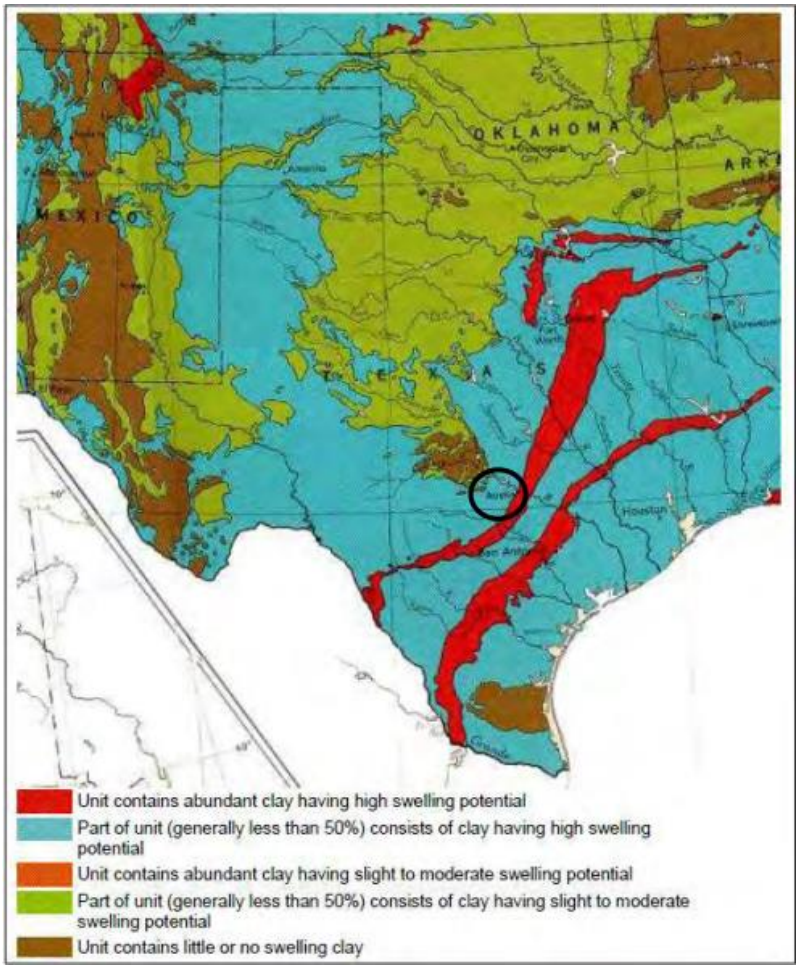
Austin Fire Department's Wildfire Division website: https://wildfire-austin.hub.arcgis.com/

Expansive Soils

Expansive soils are soils and soft rock that tend to swell or shrink due to changes in moisture content. Changes in soil volume present a hazard primarily to structures built on top of expansive soils.[24]

TCESD2 includes a band of expansive soils that stretches from northeast Dallas, southwest through San Antonio, towards Laredo, and along an area also known as the I-35 corridor. In the following figure, TCESD2 falls within the black circle. These areas receive the most moisture and are also vulnerable to droughts, which can cause the soils to expand and contract.

Texas Geological Survey

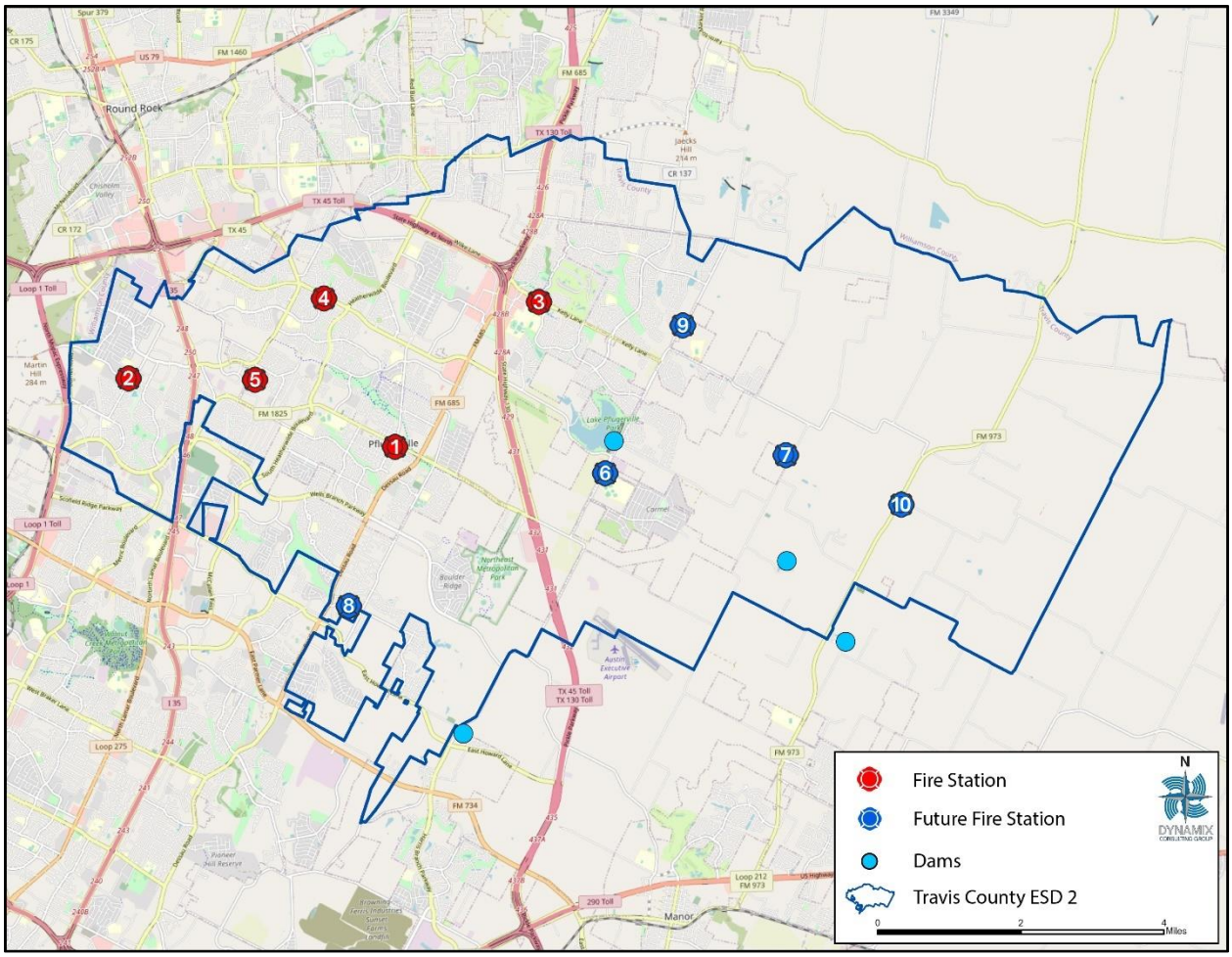


[24] https://www.usgs.gov/

Dam Failures

Dam failure is the collapse, breach, or other failure of a dam structure resulting in downstream flooding. In the event of a dam failure, the energy of the water stored behind even a small dam can cause loss of life and severe property damage if development exists downstream of the dam. There are two dams within TCESD2 and two additional dams near the District border.

Dams within or near TCESD2



Pandemics / Communicable Diseases

A communicable disease is an illness caused by an infectious agent or its toxic products that develops when the agent or its product transmits from an infected person, animal(s), or arthropod to a susceptible host. A successful communicable disease control program requires the distribution of pertinent information to families and communities as well as recommendations for implementation measures that control the spread of the disease. Resource management will be difficult to accomplish, especially if the disease outbreak is prolonged. The 2019 Novel Coronavirus (COVID-19) Pandemic economically and financially impacted the entire nation, including Texas, with conditions having an on-going impact on a local and state level.

Civil Unrest

The Federal Emergency Management Agency defines a civil disturbance as "a civil unrest activity such as a demonstration, riot, or strike that disrupts a community and requires intervention to maintain public safety."

Civil unrest has doubled in the past decade as citizens protest issues ranging from economic hardship to police brutality and political instability, according to the 2020 Global Peace Index.[25] The COVID-19 Pandemic could make things worse according to Steve Killelea, founder of the Institute for Economics and Peace (IEP), which annually publishes the index. "It's likely that the economic impact of COVID-19 will magnify tensions by increasing unemployment, widening inequality, and worsening labor conditions—creating alienation from the political system and increasing civil unrest. We, therefore, find ourselves at a critical juncture," Killelea said.

The United States Fire Administration offers guidance for responding to Civil Disturbances. Civil Disturbance Management should include coordination of response activities, modifying operations based on perceived threats or risk, and maintaining situational awareness.[26]

Cyber Attacks

A cyberattack is a malicious and deliberate attempt by an individual or organization to breach the information system of another individual or organization. Usually, the attacker seeks some type of benefit from disrupting the victim's network. Cyber-attacks can affect all aspects of the community including businesses, healthcare, banks, education, government, and utilities.

[25] https://www.euractiv.com/section/defence-and-security/news/civil-unrest-has-doubled-and-covid-19-could-make-things-worse/.

[26] https://www.usfa.fema.gov/operations/civil_unrest/operations.html.

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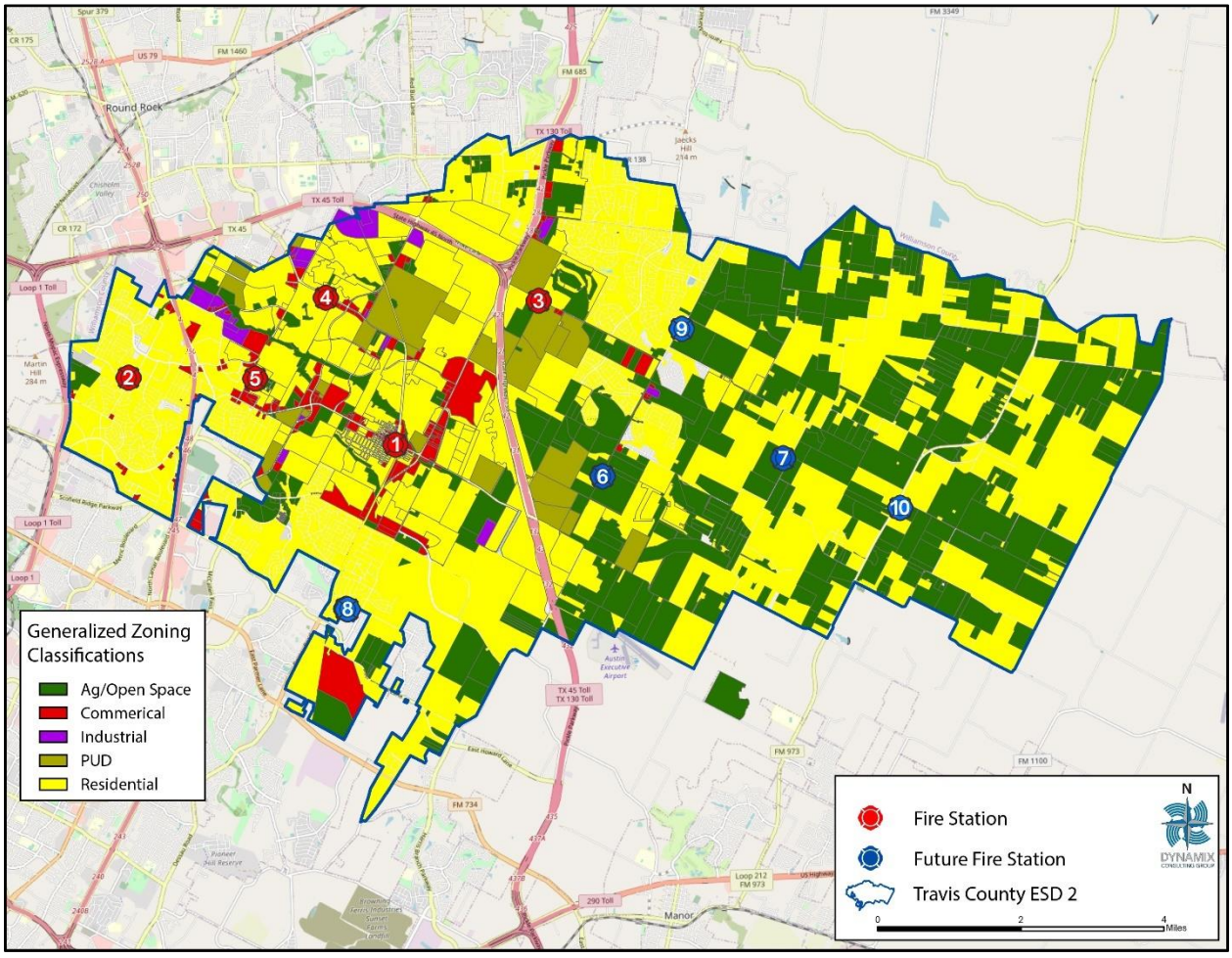
Current Land Use

Tracking or identifying activities occurring within a building or on an undeveloped property can often begin the process of risk classification. Zoning maps provide permitted use information for each parcel identified by land use designation. Vacant lots and open land often offer much lower risk than commercial or industrial occupancies as open areas lack the people and activities that are often associated with emergency incidents. Fires in commercial occupancies often lead to higher dollar loss than many residential properties, and the long-term income loss affects the people employed by the business when destroyed.

There are no zoning regulations in the unincorporated areas of TCESD2. The following figure provides a simplified illustration of the general classes of zoning found in TCESD2.

Generalized Zoning Classifications



Although in practice multiple zoning types exist which dictate the specific types of businesses, size of residential structure, or minimum amount of land, this map represents a generalized zoning schema for TCESD2.

Open space areas, agricultural, parks, and other open land are colored green. These are locations that currently do not possess structures; however, development could occur in the future.

Next, red areas represent commercial activities such as retail, offices, and other commercial activities within the district.

Purple areas represent zoning for industrial purposes such as manufacturing or other industrial processes. This is important because an incident at an industrial location could require additional resources or potentially trigger an evacuation of the surrounding areas if certain chemicals are involved.

All categories of residential are yellow with a special category of dark yellow indicating Planned Unit Developments (PUD)s. The distinction of PUDs reflects that the municipality established certain land use and construction requirements and that these areas may contain different layout characteristics than other residential areas.

The following figure translates zoning to categories of relative fire and life risk.

Fire and Life Risk

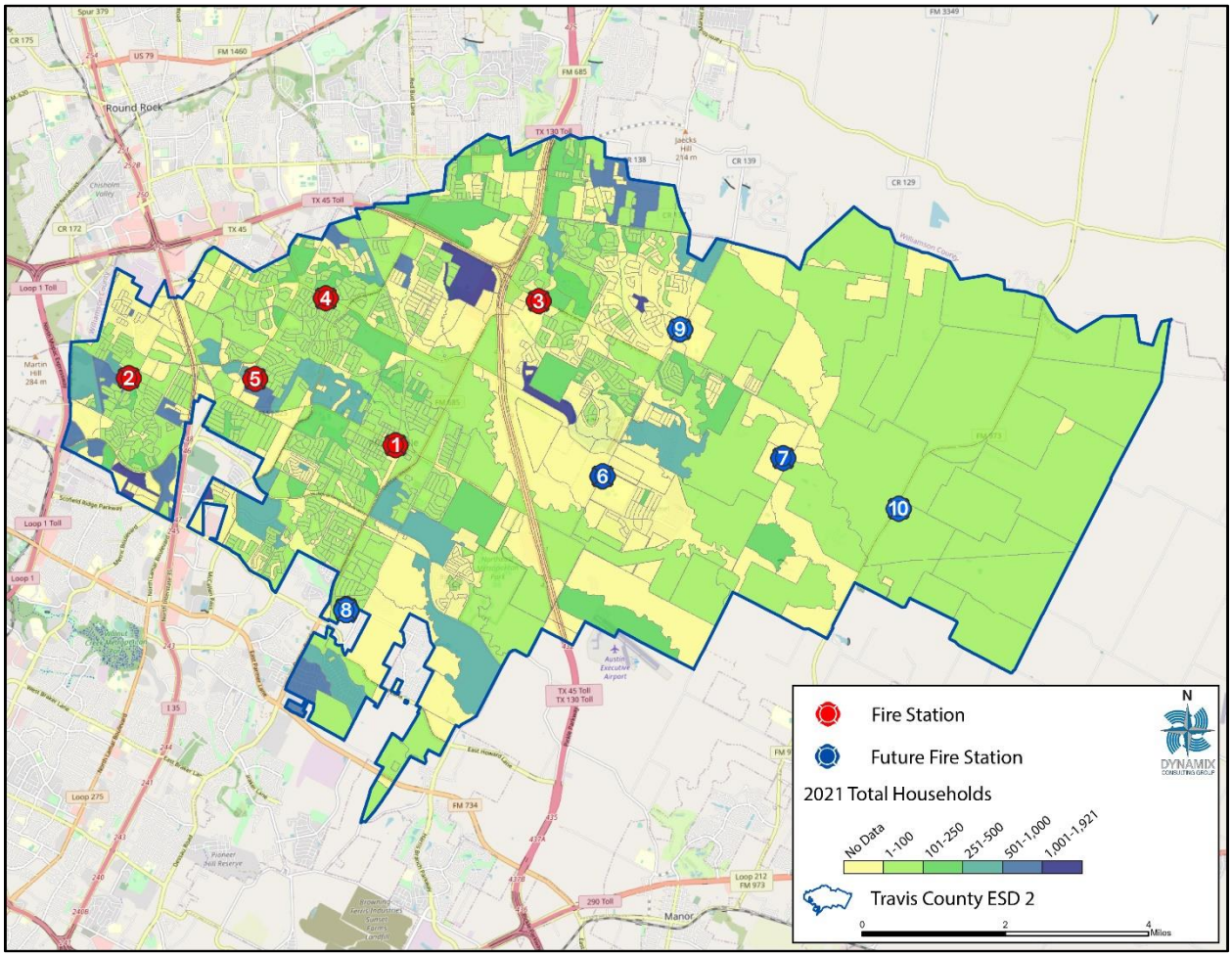
Relative Risk Category	Zoning
Low Risk	Areas zoned and used for agricultural purposes, open space, and very-low-density residential use.
Moderate Risk	Areas zoned for medium-density single-family properties, small commercial and office uses, low-intensity retail sales, and equivalently sized business activities.
High Risk	Areas zoned for higher-intensity business districts, mixed-use areas, high-density residential, industrial, warehousing, and large mercantile centers.

Building Stock

Housing Profile

There are 51,779 households within TCESD2. These households are located throughout the District with the densest concentrations in the north, south and western areas of the district.

2021 Total Households



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According to the NFPA, the top five causes of fatal fires, which account for 90% of fire deaths, are cooking, heating, electrical, intentional, and smoking. These types of fires occur in all residential types, warranting the need for a foundational fire safety campaign that incorporates educational information and messages for homeowners and renters alike.

Nationwide, a civilian died in a fire every 3 hours and 10 minutes, and a home fire injury occurred every 43 minutes. While there are fewer fires in the United States than in past decades, statistically, if a fire starts in a home, the occupants are more likely to die today compared to 40 years ago. Today's homes burn faster because of their synthetic furnishings and open floor plans.[27] Occupants may have fewer than three minutes to escape after a fire starts. Every 24 seconds, a US fire department responds to a fire somewhere in the country.

Age of Homes

A 2021 NFPA Study found that the death rate per 1,000 home structure fires is 55 percent lower in homes with working smoke alarms than in homes with no alarms or alarms that fail to operate[28].

A 2008 study prepared for the Centers for Disease Control[29]of lithium battery-powered smoke alarms installed in 1998–2001 in five states investigated whether these alarms were present and operational eight to ten years later. This study found that at least one of the installed alarms was still present and functional in only 38 percent of the homes visited. Slightly more than one-third (37%) of the installed alarms were missing, one-third (33%) were present and operational, and slightly less than one-third (30%) were present but not operational.

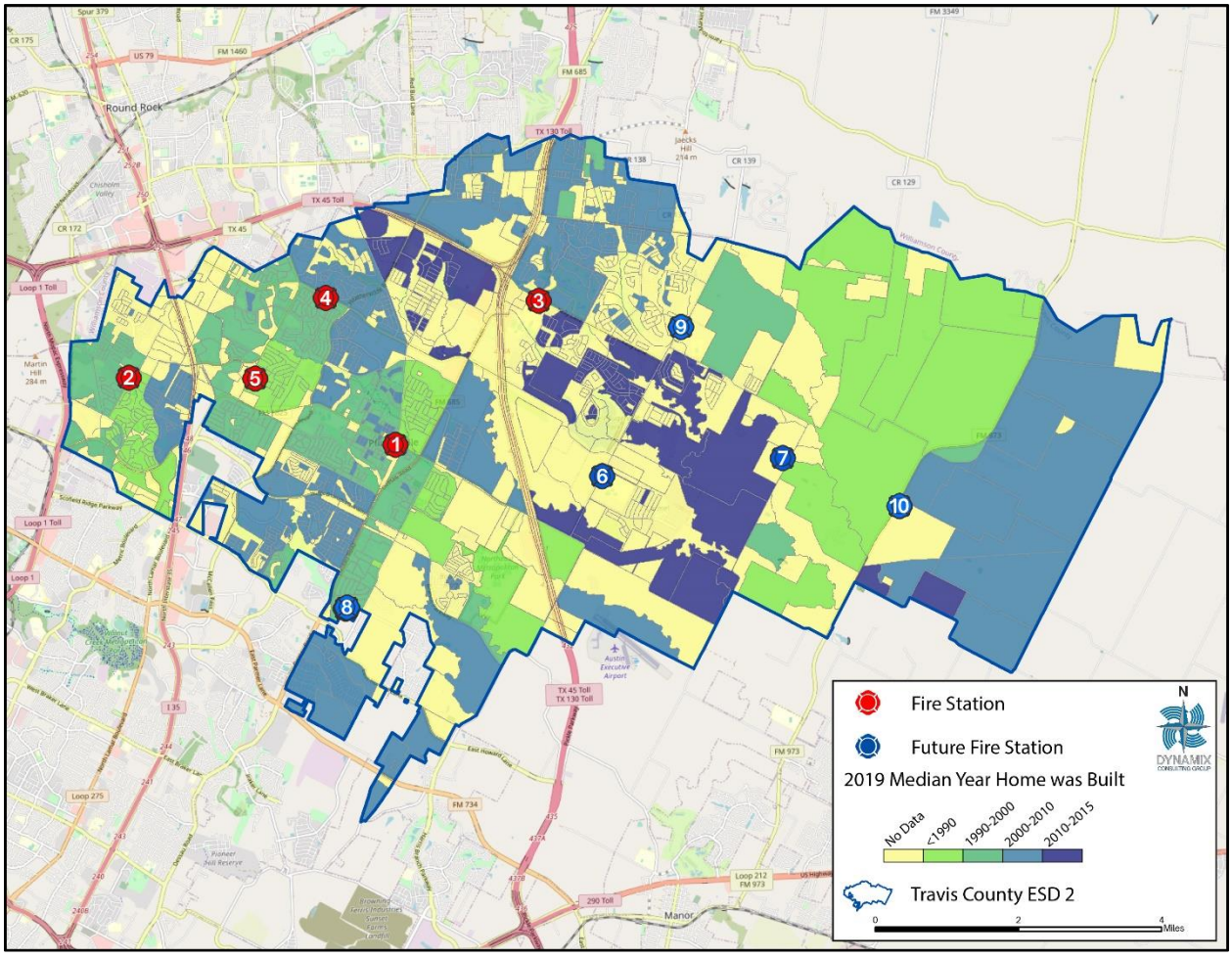
[27] Kerber, Stephen, "Analysis of Changing Residential Fire Dynamics and Its Implications on Firefighter Operational Timeframes," Fire Technology 48 (2012): p. 865-891.

[28] Smoke Alarms in US Home Fires (nfpa.org)

[29] Evaluation of the "10-Year" Smoke Alarm Project (nchharchive.org)

The following map shows the median year of construction of homes in the district. The light green areas represent neighborhoods homes built prior to 1990.

Homes by Median Year Constructed 2019



The aging home demographic within the District provides a need for focused Community Risk Reduction efforts related to smoke alarms within the community. In response to this need, TCESD2 applied for and received two federal grants for smoke alarms to improve the life safety of residents whose homes either did not have smoke alarms or had one that was over 10 years old. With the help of these grants and as of this publication date, TCESD2 firefighters have installed 5,500 alarms, which enhanced life safety to 6,075 people, including 2,000 children and 600 seniors.

Homeowner and Renter Occupied Residences

Risk indicators in a community involve property value, occupancy rate, and ownership status of home in the community's neighborhoods. Occupants perform less maintenance and repairs on low valued, vacant, or rental properties than higher value categories. Owners maintain owner-occupied homes more often as owners are seeking to maintain or improve property values.

In 2021, 34,350 - 66.7% - of the housing units within TCESD2 were owner occupied and 17,244 - 33.3% - were renter occupied.

Apartment Complexes

Fires in apartment buildings can present resource challenges for the fire department because of the potential need to both extinguish the fire and rescue a large number of people.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, recommends 17 firefighters for an initial full alarm assignment to a 2,000 square foot residential structure fire. This number increases to 28 firefighters for a 1,200 square foot apartment building (3-story garden apartment).

NFPA 1710 Initial Full Alarm Assignments

2,000 SF Residential Structure Fire		1,200 SF Apartment (3-story garden apartment)	
Incident Commander	1	Incident Commander	2
Water Supply Operator	1	Water Supply Operators	2
2 Application Hose Lines	4	3 Application Hose Lines	6
1 Support Member per line	2	1 Support Member per line	3
Victim Search and Rescue Team	2	Victim Search and Rescue Team	4
Ground Ladder Deployment	2	Ground Ladder Deployment	4
Aerial Device Operator	1	Aerial Device Operator	1
Rapid Intervention Crew	4	Rapid Intervention Crew	4
EMS Care		EMS Care	2
Total	**17**	**Total**	**28**

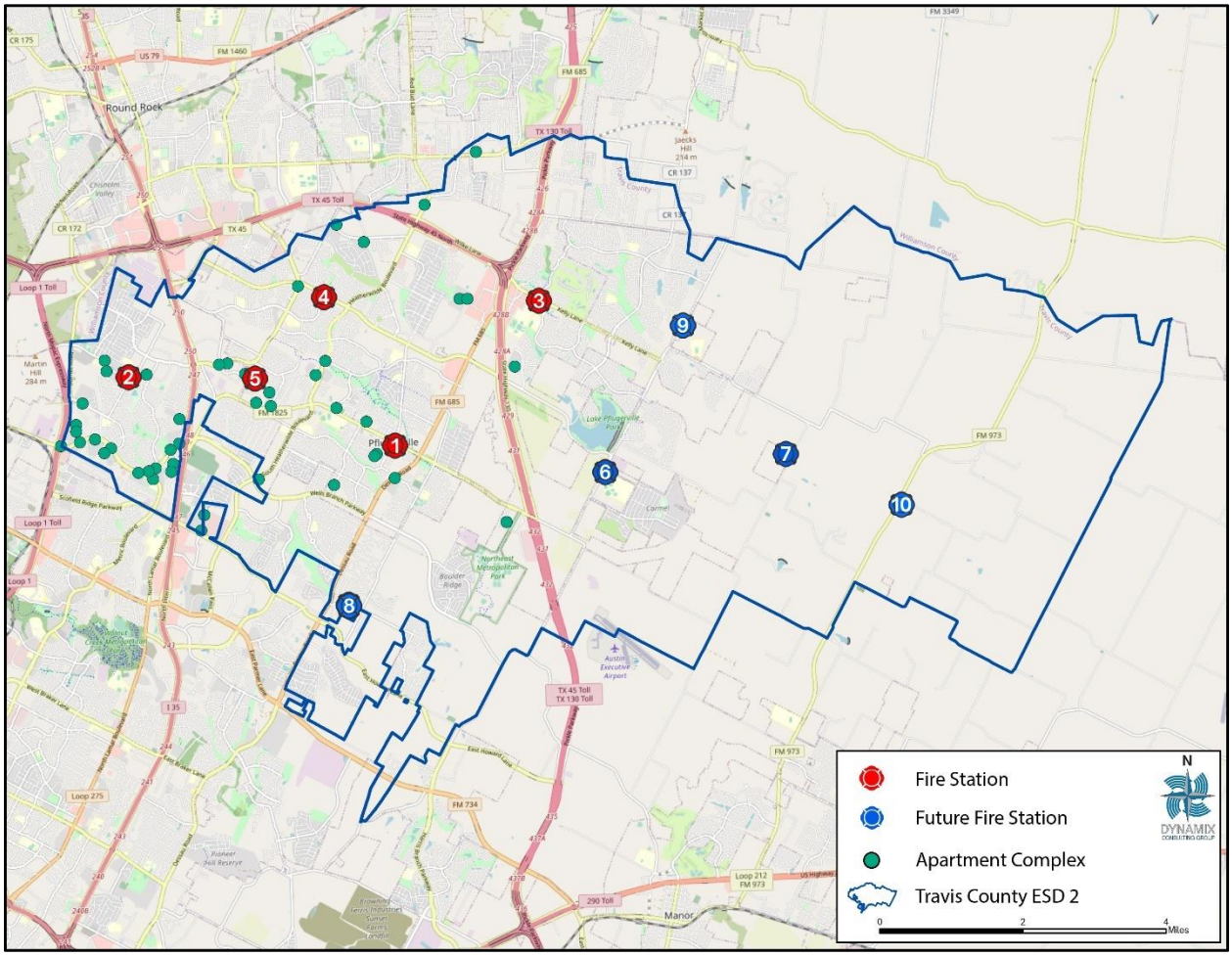
TCESD2 should ensure the dispatching of adequate resources to reported structure fires in the following apartment complexes and large living facilities. In addition to the high life hazard, should one of these apartment buildings, or multiple buildings, become untenable, dozens of people and families will be homeless and unable to work.

Apartment Complexes and Large Living Facilities

Name of Apartment	Address	Jurisdiction	Number of Units	Number of Buildings	Number of Floors	Sprinkled
Affinity at Wells Branch (senior living)	14508 Owen Tech Blvd	County	154	1	4	Yes
Allegre Point	1833 Cheddar Loop	County	170	11	3	Yes
Arbors, The	1831 Wells Branch Pkwy	County	212	16	2&3	Only Bldg. #5
Arts at Bratton's Edge	15405 Long Vista Dr.	County	78	5	3	Yes
Aura	3300 Wells Branch Pkwy	County	348	12	3	Yes
Autumn Ranch	413 Swenson Farms Blvd	City	336	14	3	Yes
Biltmore at the Park	16021 Biltmore Ave	City	250	12	3	Yes
Broadstone	1720 Grand Ave	County	280	12	3	Yes
Cambridge Villas Apts. (senior living)	15711 Dessau Road	City	208	55	1	Yes
Century Stone Hill	1225 Town Center Dr	City	370	30	2&4	Yes
Chardonnay	1801 Wells Branch Pkwy	County	504	23	2&3	Only Building # 19
Churchill Crossing	14100 Thermal Drive	County	372	24	2&3	No
Colonial Grand	1630 Wells Branch Pkwy	County	336	14	3	Yes
Conservatory, The (senior living)	14320 Tandem Blvd	County	216	3	4	Yes
Cottages, The	14300 Tandem Blvd	County	167	17	2	Only Bldg. #3
Cove at Heatherwilde (senior living)	16500 Yellow Sage	City	168	42	1	Yes
Emerson, The	1221 New Meister Lane	City	384	31	2	Yes
Estraya at Falcon Pointe	2132 Falcon Village Lane	City	324	26	3	Yes
Heritage Lakes (senior living)	2215 Kelly Lane	City	273		-	Yes
Highlands, The	1501 S. Heatherwilde Ave	County	264	14	3	Yes
Home Towne at Picadilly (senior living)	500 Grand Ave	City	168	22	3	Yes
Hunt Club	3101 Shoreline Drive	County	384	22	2&3	No
Hyde Park	2801 Wells Branch Pkwy	County	576	23	3	Yes
La Rue Condominiums	209 Noton Ct.	City	10	1	2	No
Lakes at Renaissance Park	14000 Renaissance Court	County	308	15	3	Only Building # O
Links at Forest Creek	20404 Poppy Hills Trail	County	220	55	2	Yes
Lodge at Merrilltown, The (senior living)	14745 Merrilltown Drive	County	294	59	1&2	No
Mansions at Stone Hill	1316 Town Center Dr	City	414	39	2&4	Yes
Milan	1720 Wells Branch Pkwy	County	263	9	3	Yes
Nine at Shoreline	3501 Shoreline Drive	County	282	4	2&3	Yes
Oaks at Tech Ridge	14000 The Lakes Blvd	County	336	12	3	Yes
Park at Wells Branch	1915 Wells Branch	County	304	18	2&3	No
Parkside Crossing	3400 Shoreline Drive	County	218	11	2&3	Only 3-story buildings
Pflugerville Meadow Apts.	201 Meadow Ln	City	19	6	1	No
Preserve at Wells Branch	1773 Wells Branch	County	308	15	3	Only Building # 1
Ridgecrest	3101 Wells Branch Pkwy	County	284	14	2&3	Yes
Riverhorse Ranch	1525 Grand Avenue	City	324	16	2&3	Yes
Riverhorse Ranch I	16107 White River Blvd	City	278	13	2&3	Yes
Rosemont at Heather Bend	16701 Heatherwilde	City	256	13	2&3	Yes
Sage at Place (1)	1001 Nimbus Drive	City	104	26	2	No
Sage at Place (2)	15835 Foothill Farms Loop	City	351	34	2&3	Yes
Sweetwater	2323 Wells Branch Pkwy	County	152	8	2&3	No
Townes on 10th	1200 S 10th St.	City	90	25	2	Yes
Villas at Spring Trails	901 New Meister Ln	City	270	22	2&3	Yes
Villas at Tech Ridge	13838 The Lakes Blvd.	County	350	12	3	Yes
Walter Avenue Apts	200 Walter Ave.	City	8	2	2	No
Westchester Woods	19600 Heatherwilde Blvd	City	250	25	2&3	Yes
Windermere Townhomes	15914 Windermere	City	80	22	2	Yes

As illustrated on the following map, most apartment complexes and large living facilities in TCESD2 are in the west section of the district. The largest concentration of apartment complexes and large living facilities is around Station 2.

Complexes and Large Living Facility Locations

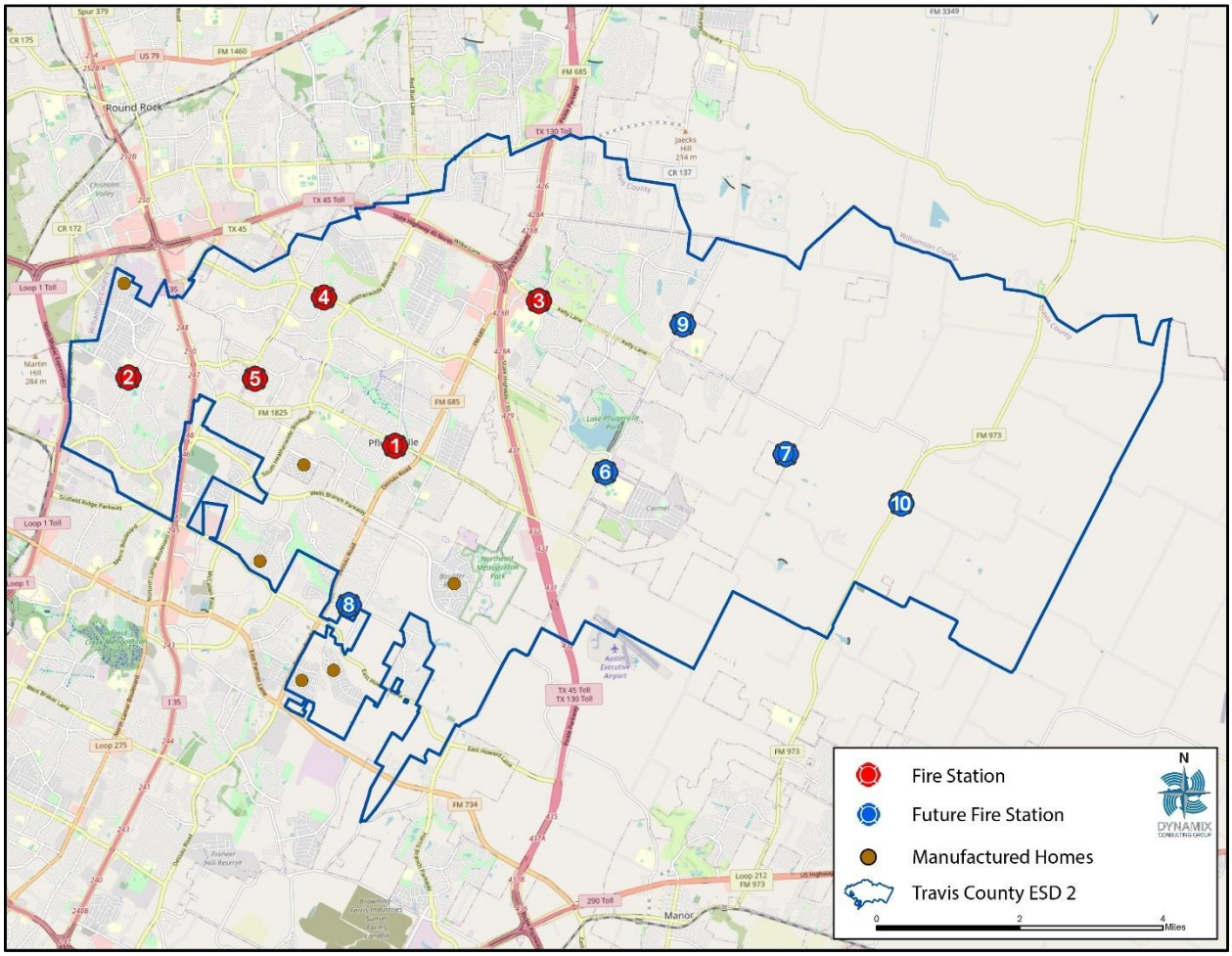


TCESD2 staffs a Risk Reduction Officer position with a lieutenant that rotates into this position annually. The Risk Reduction Officer inspects all multi-family occupancies annually. Dynamix Consulting Group notes that with the anticipated increase in apartment complexes and large living facilities in the coming years, a second Risk Reduction Officer position may become necessary.

Manufactured Home Communities

Manufactured housing refers to factory-built homes placed on a piece of land. Manufactured homes typically use light-weight construction which can ignite quickly and "which supports more rapid fire growth to flashover," per the NFPA's 2013 report on manufactured home fires. TCESD2 contains six communities of manufactured homes.

Manufactured Home Communities



The average household size based upon census blocks these manufactured homes are located within is 3.5 persons per household. This is greater than the Travis County average household size (2.5 per household), TCESD2's (2.9 per household), and near the average for Texas at 3.4 per household according to the 2021 ACS.

Target Hazards

The Federal Emergency Management Agency (FEMA) defines target hazards as "facilities in either the public or private sector that provide essential products and services to the general public, are otherwise necessary to preserve the welfare and quality of life in the community, or fulfill important public safety, emergency response, and/or disaster recovery functions." The NFPA further breaks these down into three risk categories for occupancies.

- **High-Risk Occupancy:** An occupancy that has a history of a high frequency of fires, high potential for loss of life or economic loss, or that has a low or moderate history of fires or loss of life, but the occupants have a high dependency on the built-in fire protection features or staff to assist in an evacuation during a fire or other emergency.
- **Moderate-Risk Occupancy:** An occupancy with a history of a moderate frequency of fires or a moderate potential for the loss of life or economic loss.
- **Low-Risk Occupancy:** An occupancy with a history of a low frequency of fires and minimal potential for life or economic loss.

Critical infrastructure is the assets, systems, and networks, whether physical or virtual, that are so vital to the community that their damage or destruction would have a debilitating effect. Examples of critical infrastructure or target hazards can include the following:

- Hospitals
- Assisted Living Centers
- Community Shelters
- Schools
- Hazardous Materials Sites
- Roadways
- Water/Sewage Treatment Facilities
- Communications Systems
- Utilities
- Emergency Operations Centers
- Airports
- Important Government Offices
- Assembly Occupancies
- Entertainment Venues

Large buildings, such as warehouses, malls, industrial complexes, and so forth, require larger volumes of water for firefighting. These incidents require additional firefighters to advance hose lines long distances in the building. Additional safety hose lines and rapid intervention crews (RIC) necessary at these emergencies also require additional personnel and water supply capabilities.

Large buildings and facilities also create a greater risk for occupants as search and rescue times increase in correlation to the number of stories and square footage of the structure. These structures rely on fire protection systems to extinguish and/or stop the fire from progress past the area or room of origin. Negative economic impacts follow an emergency incident of this magnitude.

Hotels

NFPA reported in 2019 that, on average, one of every 14 hotels or motels reported a structure fire each year. The majority of hotel fire deaths result from fires that started in the bedroom and cooking is the leading cause of hotel/motel fires. [30] There are nine hotels within TCESD2. They are:

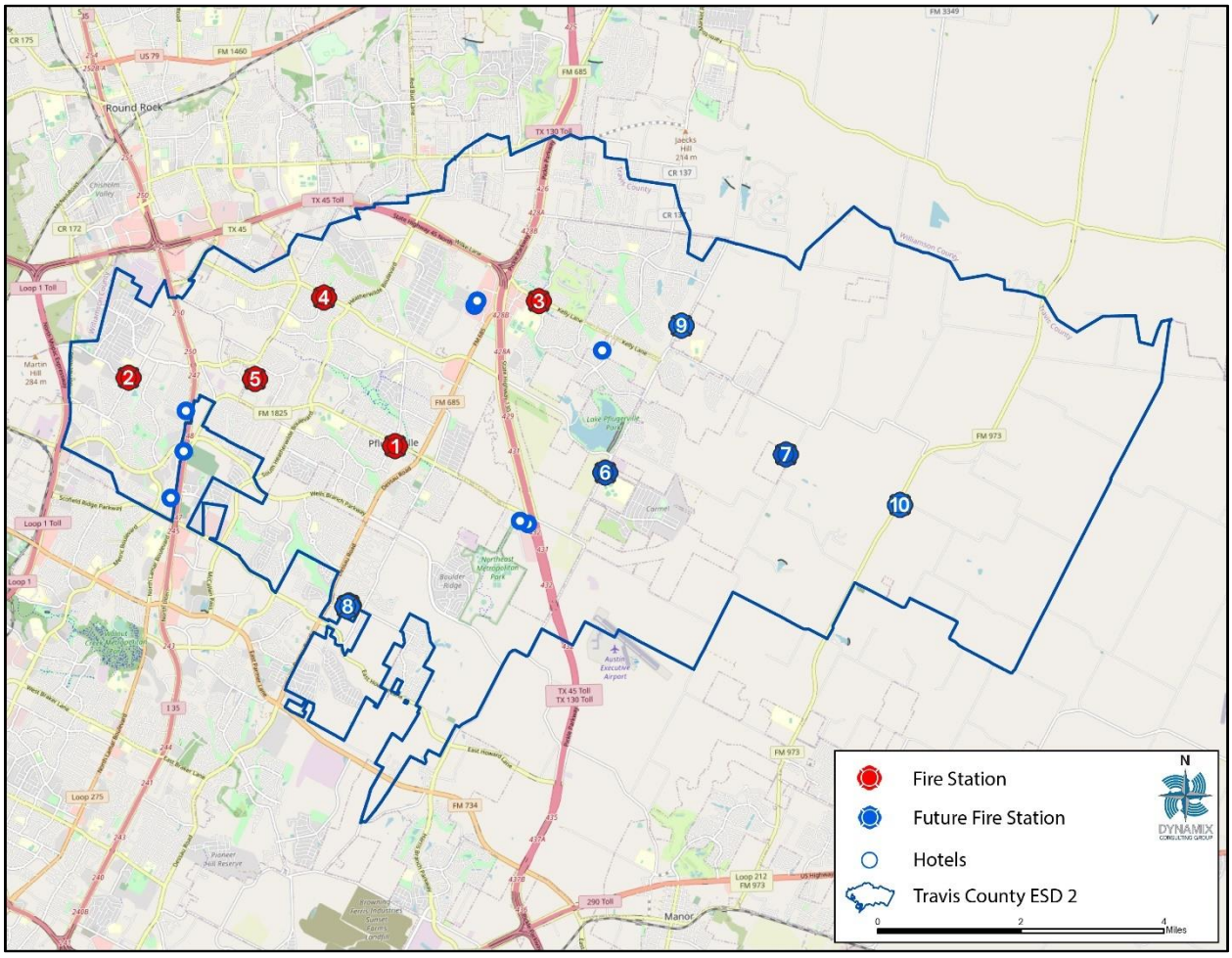
Hotels

Name	Address
Sleep Inn & Suites Austin North - I-35	14004 Owen-Tech Blvd
Country Inn & Suites by Radisson, Austin North (Pflugerville)	14620 N Interstate Hwy 35
Best Western Plus Executive Residency Austin	2021 Cheddar Loop Rd
Holiday Inn Express & Suites Austin North - Pflugerville	18616 Hill Top Commercial Dr
Tru by Hilton Pflugerville	18700 Hill Top Commercial Dr
Home2 Suites by Hilton Pflugerville	18700 Hill Top Commercial Dr
Plantation House	3603 Kelly Ln
Best Western Plus Pflugerville Inn & Suites	16101 Impact Way
Courtyard by Marriott Austin Pflugerville	16100 Impact Way

The hotels are located in the center and western section of the District with the largest concentration being between Stations 2 and 5.

[30] https://www.nfpa.org/-/media/Files/Public-Education/Resources/Safety-tip-sheets/HotelMotelSafety.ashx

Hotel Locations



Large Churches

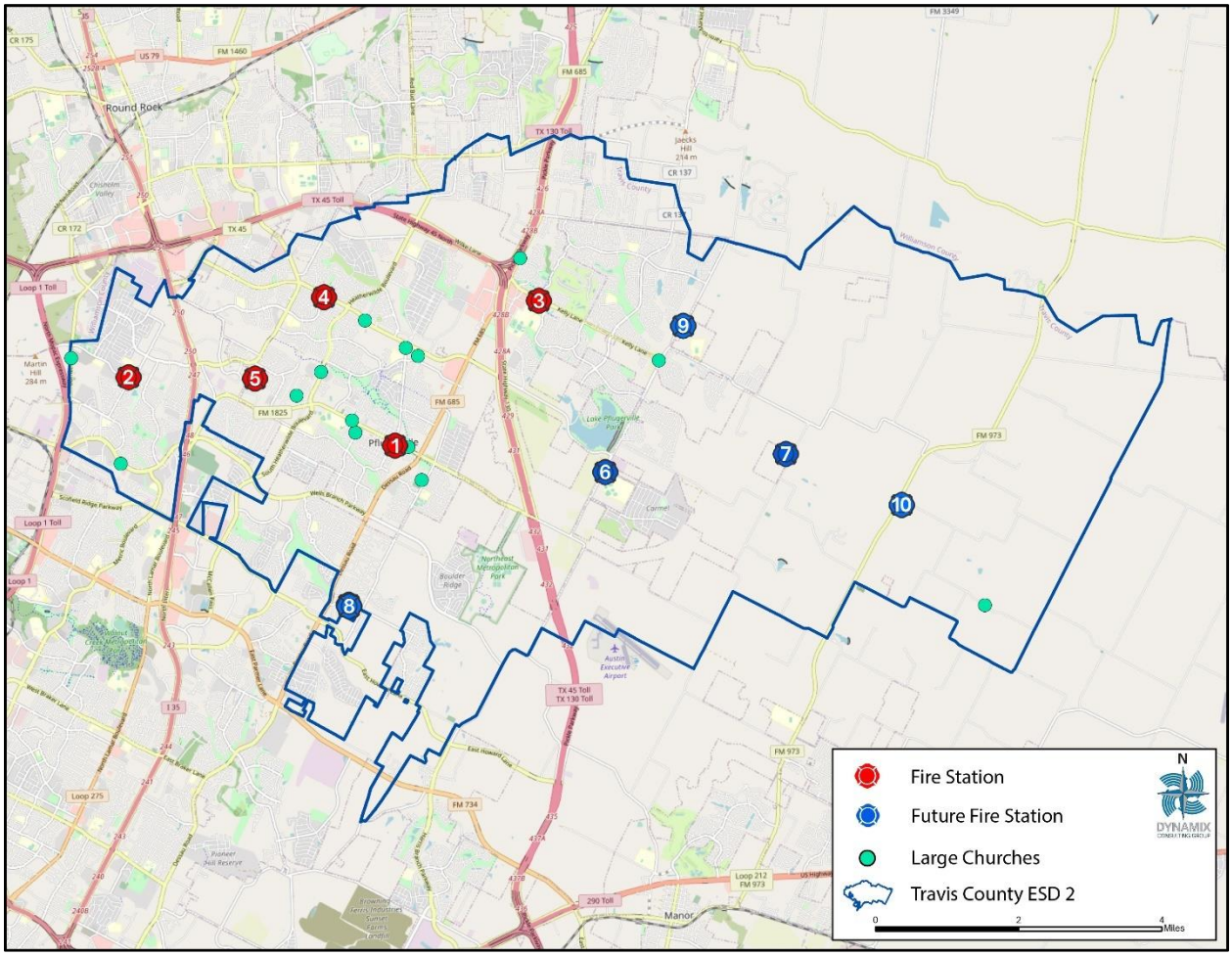
Large churches have a capacity of 300 or more people. There are 14 large churches within TCESD2.

Large Churches

Name	Address
CHURCH OF JESUS CHRIST OF LDS	700 N HEATHERWILDE BLVD
FIRST BAPTIST CHURCH	306 S 10TH ST
FIRST UNITED METHODIST CHURCH	500 E PECAN ST
HILL COUNTRY BIBLE CHURCH	303 E PFLUGERVILLE PKWY
IMMANUEL LUTHERAN CHURCH	500 IMMANUEL RD
NEW SWEDEN LUTHERAN CHURCH	12809 NEW SWEDEN CHURCH
PFLUGERVILLE COMMUNITY CHURCH	1214 E PFENNIG LN
POINT OF GRACE LUTHERAN CHURCH	19507 FM 685 RD
SHORELINE CHRISTIAN CENTER	15201 BURNET RD
ST. ELIZABETH'S CATHOLIC CHURCH	1520 N RAILROAD AVE
ST. MARY'S MISSIONARY BAPTIST CHURCH	1202 W PECAN ST
STONEHILL 7TH DAY ADVENTIST CHURCH	4301 KELLY LN
THE FAMILY ROOM CHURCH	16108 YELLOW SAGE
WELLS BRANCH COMMUNITY CHURCH	2113 E WELLS BRANCH PKWY

Most of the large churches in TCESD2 are located in the west section of the District near Fire Stations 1, 4, and 5.

Church Locations



Hazardous Substances and Processes

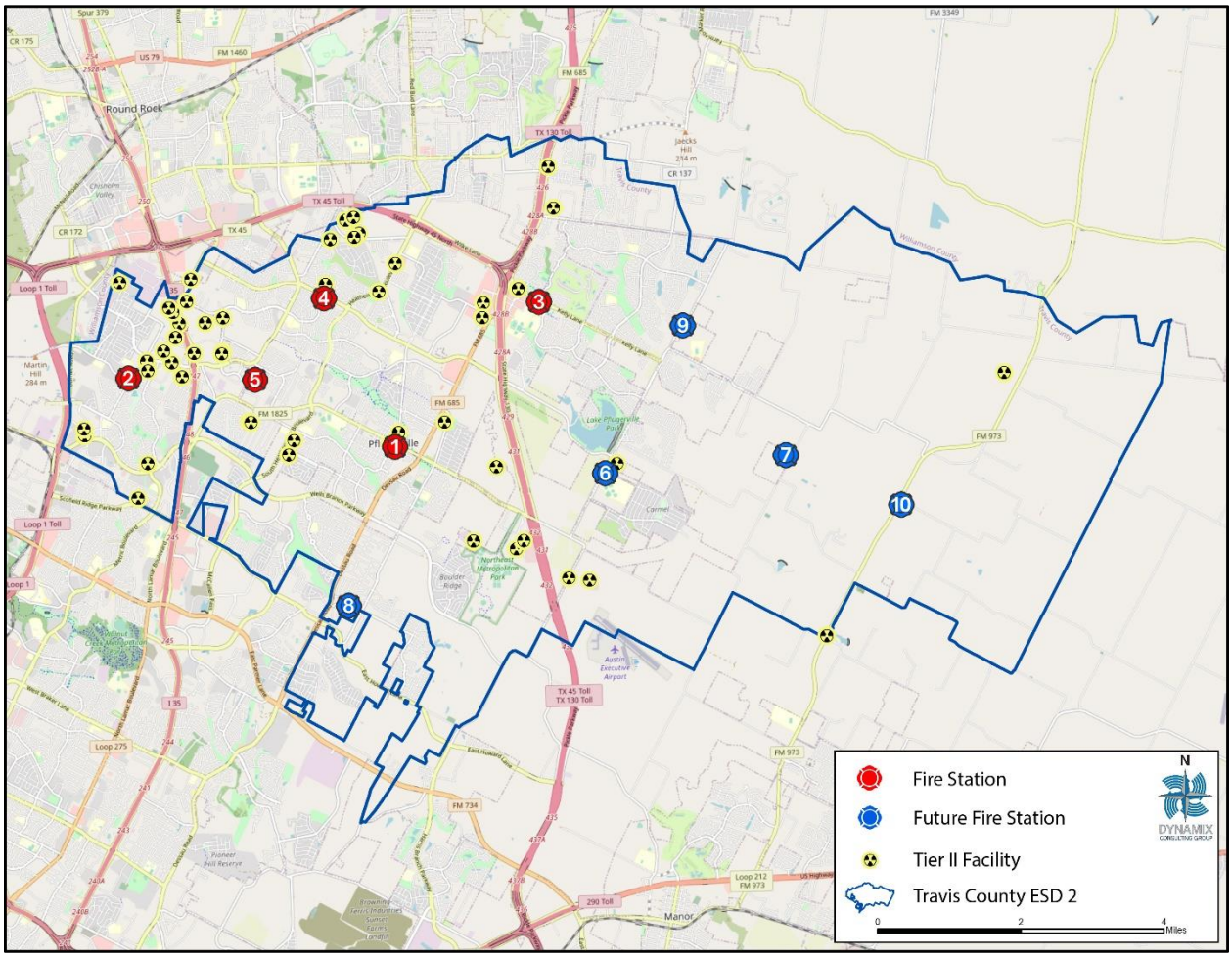
As of 1986, businesses that possess or maintain hazardous chemicals that exceed thresholds established by the Emergency Planning Community Right-to-Know Act must complete a Tier II Hazardous Chemical Inventory Report. The Environmental Protection Agency require these occupancies to annually submit Tier II reports to local fire departments, Local Emergency Planning Committees (LEPC), and State Emergency Response Commissions (SERCs) so that these agencies can plan for the response and mitigation of any potential spills or accidents. Additionally, the EPA requires the reporting facility to submit the designated emergency point of contact. The following is a list of the Tier II Facilities within TCESD2.

Tier II Facilities

FACILITY NAME	ADDRESS	CITY	STATE	ZIP CODE
844355 CCATT HWY 973	19210 FARM MARKET 973 NORTH	COUPLAND	TX	78615
ALAMO CONCRETE PRODUCTS COMPANY - HOWARD LANE # 16	2807 HOWARD LN	AUSTIN	TX	78728
AMERICAN BOTTLING AUSTIN	2120 GRAND AVENUE PKWY	AUSTIN	TX	78728
AT&T - TXE080/XP6553	307 N RAILROAD AVE	PFLUGERVILLE	TX	78660
AUS2	2000 E PECAN ST	PFLUGERVILLE	TX	78660
AUSTIN DATA CENTER 2	14219 TANDEM BLVD	AUSTIN	TX	78728
AUSTIN PFLUGERVILLE 251 CO XP3101	103 S 1ST ST	PFLUGERVILLE	TX	78660
C M C CONSTRUCTION SERVICES - ROUND ROCK	16709 CENTRAL COMMERCE DR	ROUND ROCK	TX	78664
CASH CONSTRUCTION COMPANY, INC	18607 N HEATHERWILDE BLVD	PFLUGERVILLE	TX	78660
CENTEX MATERIALS LLC - ROUND ROCK PLANT	16432 N IH 35	AUSTIN	TX	78728
CITY OF PFLUGERVILLE - WELL 6	1605 GLEN ROSE CHASE	PFLUGERVILLE	TX	78660
CITY OF PFLUGERVILLE - WELL 7	266 CHISHOLM TR. PFLUGERVILLE, TX 78660	PFLUGERVILLE	TX	78660
COSTCO LOGISTICS MDO 4086	828 NEW MEISTER LN STE 100	PFLUGERVILLE	TX	78660
COSTCO WHOLESALE (1322)	1901 KELLY LN	PFLUGERVILLE	TX	78660
CSG SYSTEMS	15404 LONG VISTA DR	AUSTIN	TX	78728
FEDEX GROUND - AUSTIN 787	15904 IMPACT WAY	PFLUGERVILLE	TX	78660
FLEX 2	900 NEW MEISTER LN	PFLUGERVILLE	TX	78660
GILLELAND CREEK SUBSTATION	16275 CAMERON RD	PFLUGERVILLE	TX	78660
GREENLAWN	3551 GREENLAWN BLVD	ROUND ROCK	TX	78664
H & H OIL	20909 FM 685	PFLUGERVILLE	TX	78660
H-E-B, LP - PFLUGERVILLE #479	201 FM 685	PFLUGERVILLE	TX	78660
HOLT CAT PFLUGERVILLE	16017 N INTERSTATE 35	PFLUGERVILLE	TX	78660
KEYSTONE - AUSTIN	2500 SCARBROUGH DR STE 100	AUSTIN	TX	78728
LAKE PFLUGERVILLE WATER TREATMENT PLANT	17601 WEISS LN	PFLUGERVILLE	TX	78660
LAUREN CONCRETE DISPATCH	1000 OLD AUSTIN HUTTO RD	PFLUGERVILLE	TX	78660
LAUREN CONCRETE INC, PLANT 3/4	2001 PICADILLY DR	ROUND ROCK	TX	78664
LIFELAST	3813A HELIOS WAY UNIT 190	PFLUGERVILLE	TX	78660
LTD MATERIAL, LLC	15600 BRATTON LN	AUSTIN	TX	78728
NTW 3289	1105 MEISTER LN STE 600	PFLUGERVILLE	TX	78660
PFLUGERVILLE FIELD OPERATIONS FACILITY	15500 SUN LIGHT NEAR WAY	PFLUGERVILLE	TX	78660
RELADYNE - VICTORY PLUMBING	1742 ROWE LOOP	PFLUGERVILLE	TX	78660
RELIANT DISTRIBUTION	4007 PRAIRIE LN	AUSTIN	TX	78728
SCHULTZ WELL	18415 1/2 SHULTZ RD	PFLUGERVILLE	TX	78660
SERVICE PARTNERS - 1161 AUSTIN	15855 LONG VISTA DR STE 101	AUSTIN	TX	78728
SPRINGBROOK PLANT	17821 MADDEN DR	PFLUGERVILLE	TX	78660
STRUCTURAL METALS DBA CMC METAL RECYCLING NORTH AUSTIN	1704 HOWARD LN	AUSTIN	TX	78728
SUBSTATION WELLS BRANCH	14608 SINGLE TRACE	AUSTIN	TX	78728
SUNBELT RENTALS PC 281	16256 N IH 35	AUSTIN	TX	78728
SUNSTATE EQUIPMENT CO-AUSTIN	16436 N IH 35	AUSTIN	TX	78728
TACON PLANT	15500 TACON LN	PFLUGERVILLE	TX	78660
TARGET STORE T-2495	18700 LIMESTONE COMMERCIAL DR STE 100	PFLUGERVILLE	TX	78660
THE HOME DEPOT DC #5837	1105 MEISTER LN	PFLUGERVILLE	TX	78660
THE HOME DEPOT STORE #6808	1517 TOWN CENTER DR	PFLUGERVILLE	TX	78660
THREE POINT - USID62739	15403 SCARLET ST	AUSTIN	TX	78728
TXDOT-AUSTIN-TAYLOR - REMOTE LOCATION 21	16000 FM-973 (FM 973 @ SCHMIDT LN)	MANOR	TX	78653
TXI ROUND ROCK READY MIX	2412 PICADILLY DR	ROUND ROCK	TX	78664
VERIZON WIRELESS AT&T TOWER (99810)	15501 TACON LN	PFLUGERVILLE	TX	78660
WASTE CONNECTIONS - PFLUGERVILLE	15711 CAMERON RD	PFLUGERVILLE	TX	78660
WELL 4	22511/2 PICADILLY DR	ROUND ROCK	TX	78664
WELL 4B	16211 1/2 CENTRAL COMMERCE DR	ROUND ROCK	TX	78664
WILKE WELL	18100 1/2 HEATHERWILD BLVD.	PFLUGERVILLE	TX	78660

While there are Tier II Facilities scattered throughout TCESD2, the largest concentration is in the far west end of the District between fire stations 2 and 5. This should be a consideration for the placement and deployment of hazardous materials mitigation resources within the district.

Tier II Facility Locations



The release of hazardous materials can occur throughout the community, either during transport or while in production, use, packaging, or storage in a fixed facility. These locations can create a dangerous environment for the community and first responders during a spill or fire. Special equipment such as protective clothing and sensors, along with specialized training, are necessary to mitigate a hazardous materials incident successfully.

Hospitals

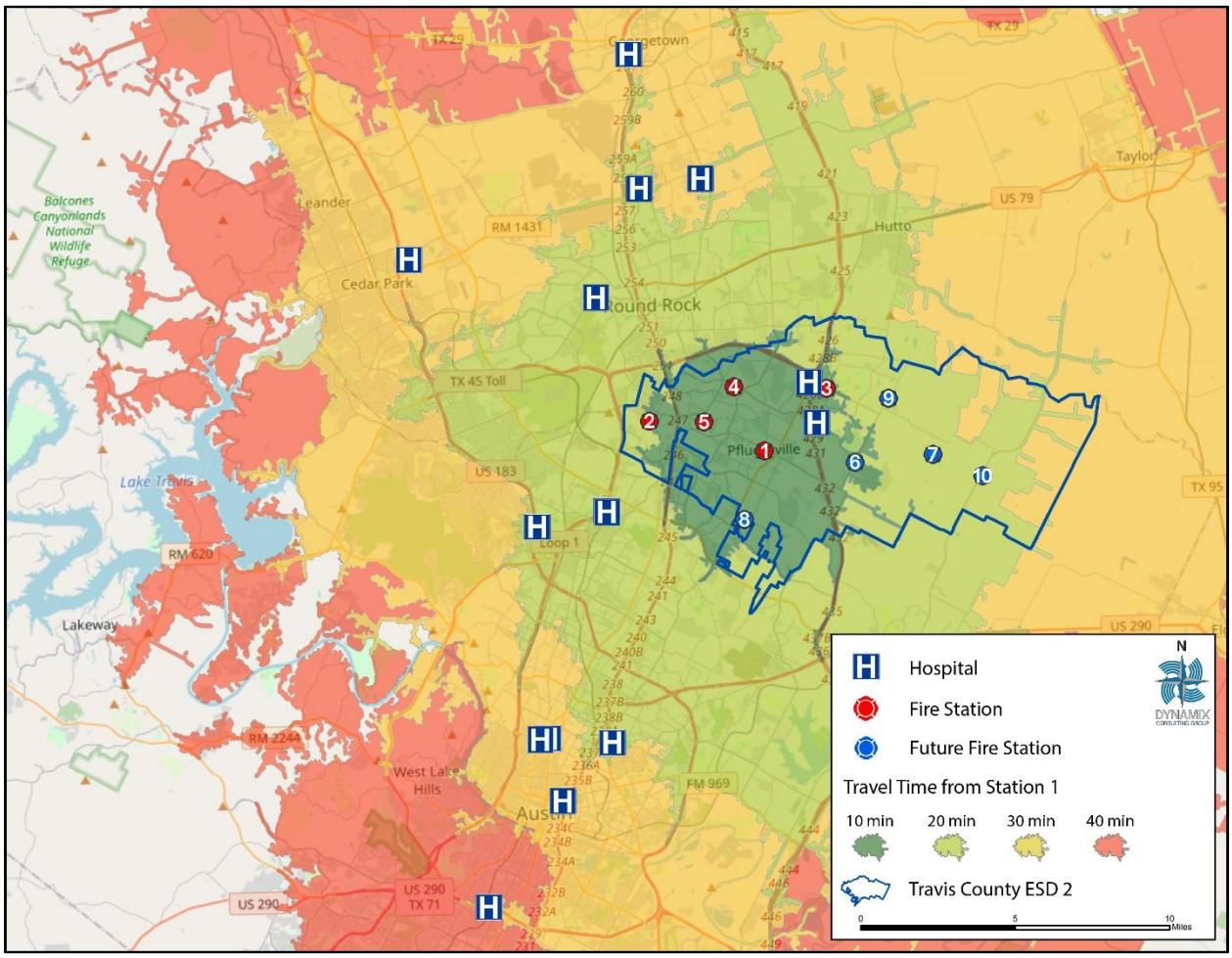
As an Advanced Life Support (ALS) transport provider, the accessibility of hospitals is a key factor in determining how quickly TCESD2 can respond to calls, transport patients to the hospital, and return to service. Between January 1, 2021, and June 30, 2022, TCESD2 totaled 7,424 transports to area hospitals. Although there are emergency rooms within the TCESD2 service area, the nature and severity of a patient's condition often dictate which emergency receiving facility is most appropriate for the patient. For example, a severe pediatric trauma patient would more greatly benefit from transport to a children's hospital specializing in treating severe trauma as opposed to a general emergency receiving facility that lacks the specialist doctors needed in those types of incidents.

Facility Name	Number of Transports by Quarter					
	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q2 2022	Total
Baylor Scott & White - Pflugerville	257	229	267	226	58	1,106
Baylor Scott & White - Round Rock	44	38	41	26	16	180
Cedar Park Regional		1	1			2
Dell Children's	30	37	43	30	17	176
Dell Seton Medical Center at UT (Brack)	4	5	7	6	5	30
Heart Hospital - Austin	2	2	1	1		7
North Austin Medical Center	596	554	557	458	296	2,820
Round Rock Medical Center	364	348	386	324	136	1,734
Saint David's Georgetown		1				1
Seton (Main) Medical Center	5	16	11	15	6	60
Seton Northwest	40	24	46	30	19	177
Seton Williamson Medical Center	173	155	148	151	45	731
South Austin Medical Center		1	1			2
St. David's (Main) Medical Center	7	12	13	8	1	43
St. David's Children's Hospital - North Austin	63	70	86	69	32	350
St. David's Pflugerville Freestanding ED			4	1		5
Total	1,585	1,493	1,612	1,345	631	7,424

Other factors influencing where patients are transported include the location of the incident relative the hospital, whether the emergency room is receiving patients at the time of the incident (also known as "on divert" meaning they are instructing ambulances to divert to another facility), traffic conditions, and the patient's desire to be taken to a preferred facility.

To provide an understanding of the area hospitals and projected travel times for incidents occurring within TCESD2, the following map provides projected travel times from Fire Station 1 in Pflugerville outward with locations of area hospitals displayed.

Travel Time from Fire Station 1 with Receiving ER Facilities



As illustrated in this map, many of the hospitals used by TCESD2 transport units fall within a 20–30-minute travel time from central Pflugerville to the facility. In addition to travel time, units must remain with the patient until a bed within the emergency room is open and patient care transfers to that facility, with typical times ranging from 20-45 minutes. Depending upon traffic, the facility selected, and wait times at the hospital, it is common for a unit to be out of service within the District for up to 1 ½ hours per patient transport. This is an important consideration when determining whether there are enough ambulances within the District to respond to the demand.

Schools

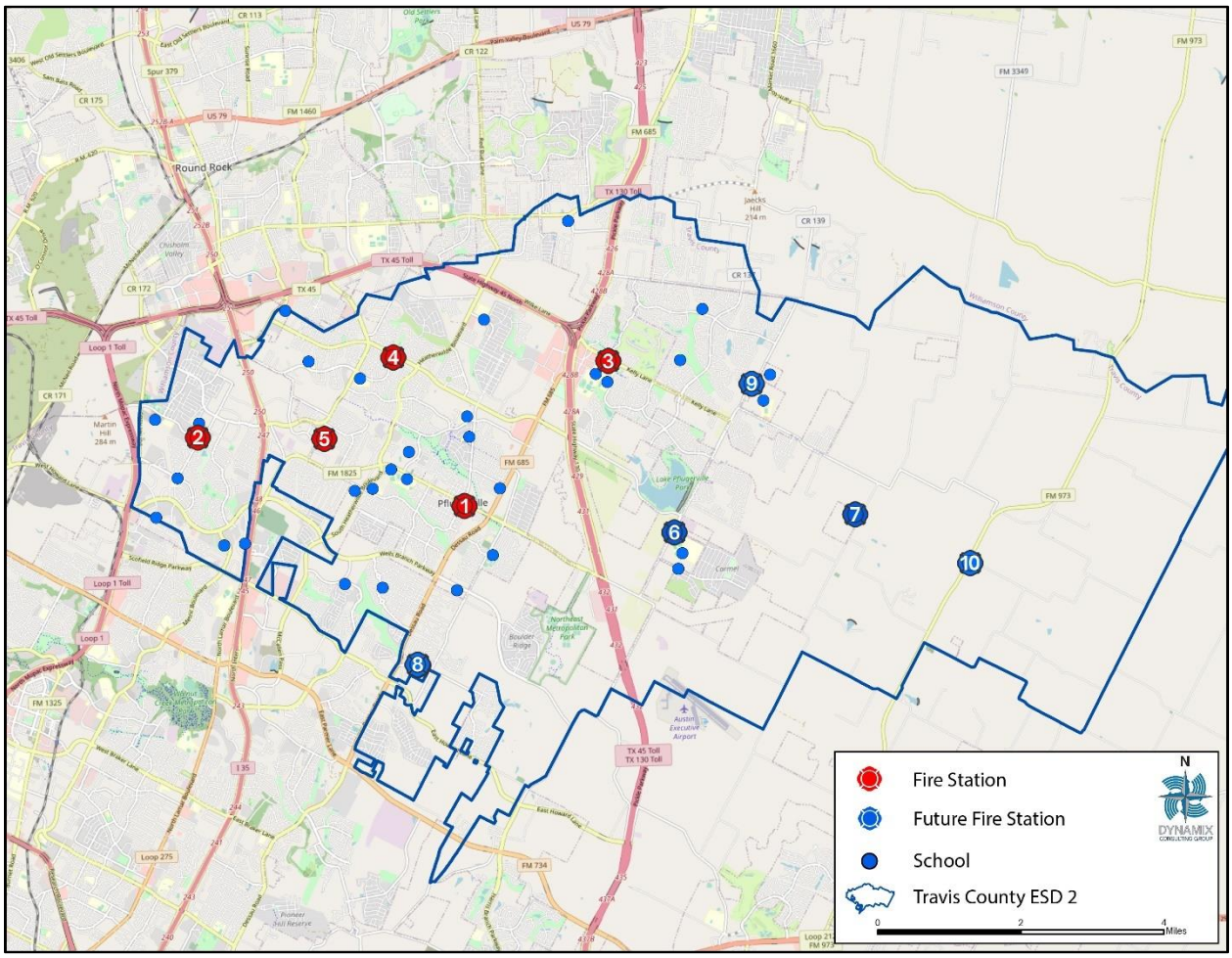
There are 35 schools within TCESD2. Approximately 29% of the schools in TCESD2 are not fully sprinklered as listed below.

School	Address	Sprinklers
BOHLS MIDDLE	5104 PLEASANTON PKWY	NO
BROOKHOLLOW ELEMENTARY	1200 RAILROAD AVE	YES
CALDWELL ELEMENTARY	1718 PICADILLY DR	NO
CARPENTER ELEMENTARY	5100 PLEASANTON PKWY	NO
CELE MIDDLE	6000 CELE RD	YES
CHAPARRAL STAR ACADEMY	14046 SUMMIT DR	YES
CONCORDIA HIGH SCHOOL	1201S HEATHERWILDE BLVD	NO
DEARING ELEMENTARY	4301GATTIS SCHOOL RD	YES
FANNIE MAE CALDWELL ELEMENTARY	1718 PICADILLY DR	YES
HARMONY CHARTER SCHOOL	1421WELLS BRANCH PKWY #200	YES
HENDRICKSON HIGH SCHOOL	19201COLORODO SAND DR	YES
HIDDEN LAKES ELEMENTARY	18218 HIDDEN LAKE DR	YES
HIGHLAND PARK ELEMENTARY	528 KINGSTON LACY	YES
IDEA PFLUGERVILLE ACADEMY	1901E WELLS BRANCH PKWY	YES
IDEA PFLUGERVILLE COLLEGE PREPARATORY	1901E WELLS BRANCH PKWY	YES
IDEA ROUND ROCK TECH ACADEMY	3301GREENLAWN BLVD	YES
IDEA ROUND ROCK TECH COLLEGE PREPARATORY	3301GREENLAWN BLVD	YES
JOE LEE JOHNSON ELEMENTARY	2800 SAULS DR	YES
JUBILEE WELLS BRANCH	15201BURNET RD	YES
KELLY LANE MIDDLE	18900 FALCON POINTE	YES
MOTT ELEMENTARY	20101HODDE LN	YES
MURCHISON ELEMENTARY	2215 KELLY LN	YES
NORTHWEST ELEMENTARY	14014 THERMAL DR	NO
PARK CREST MIDDLE	1500 N RAILROAD AVE	STAGE ONLY
PFLUGERVILLE ELEMENTARY	701IMMANUAL RD	NO
PFLUGERVILLE HIGH SCHOOL	1301W PECAN ST	PARTIAL
PFLUGERVILLE MIDDLE	1600 W SETTLERS VLY DR	NO
PFLUGERVILLE OPPORTUNITY CENTER	1404 W PECAN ST	YES
PREMIER H S OF PFLUGERVILLE	616 FM 685 SUITES 201-206B	YES
RENAISSANCE EDUCATION FOUNDATION	14401OEN-TECH BLVD	YES
RIOJAS ELEMENTARY	3400 CRISPIN HILL	YES
ROWE LANE ELEMENTARY	3112 SPEIDEL DR	YES
RUTH BARRON ELEMENTARY	14850 HARRIS RIDGE	YES
SPRINGHILL ELEMENTARY	600 S HEATHERWILDE BLVD	STAGE ONLY
TIMMERMAN ELEMENTARY	412 SWENSON FARMS BV	YES
TRAVIS CO JJA E P	1401W PECAN ST	YES
VALOR NORTH AUSTIN	14200 N INTERSTATE 35	YES
WEISS HIGH SCHOOL	5201WOLF PACK DR	YES
WELLS BRANCH ELEMENTARY	14650 MERRILTOWN DR	PARTIAL
WIELAND ELEMENTARY	900 TUDOR HOUSE RD	YES
WINDERMERE ELEMENTARY	429 GRAND AVE PKWY	STAGE ONLY
WINDERMERE PRIMARY	429 GRAND AVE PKWY	YES

Schools

These schools are located in the center and west sections of the district.

School Locations



Major Community Events

Major Community Events occur each year across TCESD2. Examples include sporting events, festivals, parades, conventions, dedications, memorials, and occasionally high-profile meetings or visits by dignitaries. In today's environment, special events can increase police, fire, and EMS workloads and may become terrorist targets due to large concentrations of crowds, the symbolic nature of the event, high-profile attendees, and increased media attention.

High concentrations of people can overwhelm first responders and compromise basic human services. Treating these events as "planned emergencies" and using the national incident management systems for planning and operating will allow for a rapid transition to emergency response should an incident occur during the mass gathering.[31]

Major community events that occur within TCESD2 include:

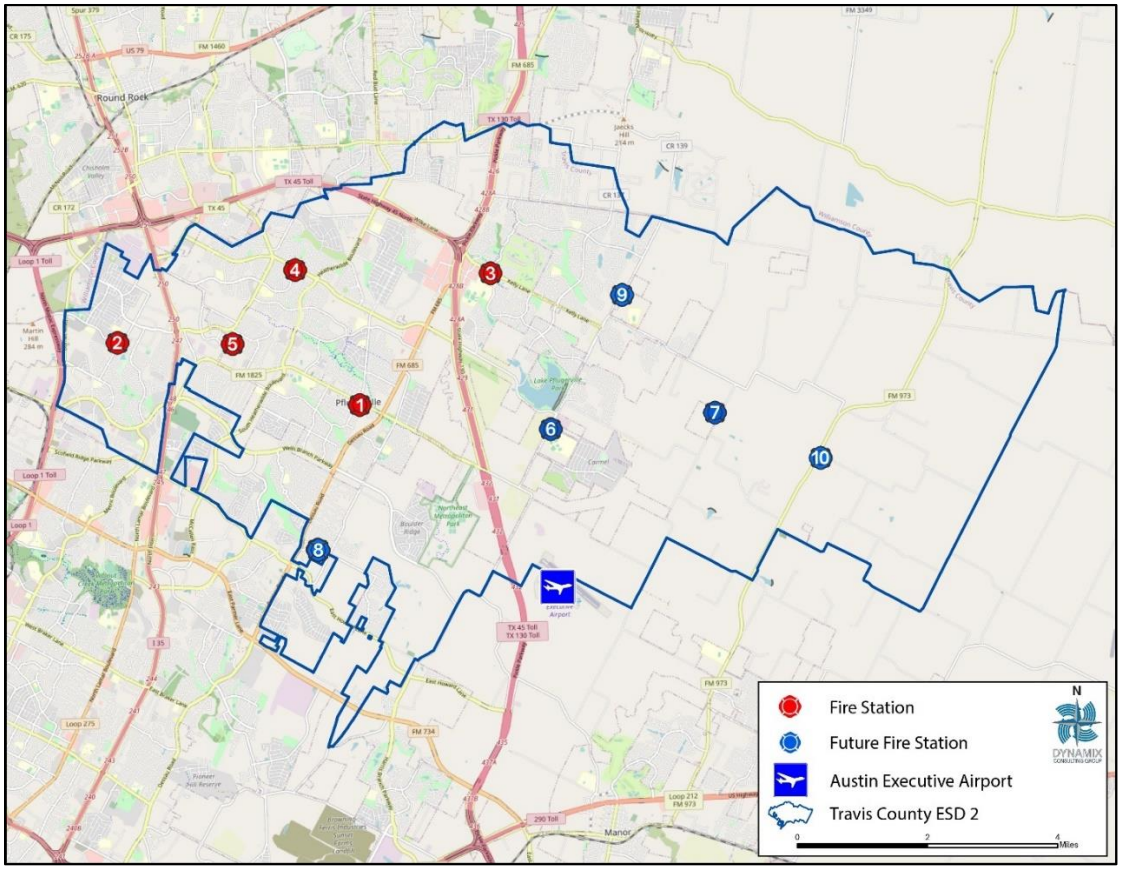
Major Community Events			
Date(s)	**Event**	**Location**	**Average # of Participants**
April 9th	Pflugerville Egg Palooza	Pfennig Park	700 attendees
4th Saturday in April	Pioneer Festival	Katherine Fleischer Park	500 attendees
May, June, August, and September, Last Friday of each month	Music in the Park	Pfluger Park	250-500 attendees
June 18th	Pride Event Partnership	Downtown Pflugerville	6,500 attendees
June 19th	Juneteenth Event	Wellspoint Soccer Complex	400 attendees
July 4th	Pfireworks Event	Typhoon Texas	1,000 attendees
July 4th	FourthFest	Katherine Fleischer Park	5,000 attendees
1st Weekend in October	National Night Out	Katherine Fleischer Park	500 attendees
October 14th - 15th	Deutschen Pfest	Pfluger Park	7,000+ attendees
October 16th	Deutschen Pfest Pfun Run	Pfennig Park	600+ attendees
October 31st	Truck-Or-Treat	Katherine Fleischer Park	600 attendees
November 19th	Pfall Craft Show	Downtown Pflugerville	700+ attendees
December 3rd	Pfestival of Lights & Parade	Downtown Pflugerville	4,000 - 6,000 attendees

Airport

While just outside of TCESD2, the Austin Executive Airport requires consideration because aviation emergencies often occur near but not at the airport. The Austin Executive Airport is a 585-acre public-use airport with two paved runways.

Austin Executive Airport

[31] *Topic Collection: Mass Gatherings/Special Events. Retrieved from: https://asprtracie.hhs.gov/technical-resources/85/Mass-Gatherings-Special-Events/0.*



Air transportation disasters are a real but infrequent risk for the community. These disasters do not always occur on airport grounds. The risk of an aircraft emergency occurring off airport property provides another variety in risk management for TCESD2. Aside from mechanical problems (crashes and accidents), the airline industry also produces risks for communities in the forms of terrorism, spread of diseases, and other out-of-the-ordinary events.

Utilities

There are two electrical distribution centers, one with a solar farm within TCESD2. Potable water resources within District boundaries include Lake Pflugerville and the water treatment plants.

Loss / Event History

The Loss/Event history provides an overview of the types of incidents that TCESD2 responded to, the impact to both the department and the community, and finally a prioritization of these risks. The risks identified in this section were a result of analyzing and comparing TCESD2 response data, identifying

trends within that data, and providing graphs and spatial analytics to assist TCESD2 in their community risk reduction efforts.

Using the National Fire Incident Reporting System (NFIRS) categorization process, call types were examined based on their frequency, potential impact to the department, the community, and to individuals, and all available background information provided. All call types not specifically identified in this section were grouped together as "Other" and did not experience any significant change year to year or from 2019 through 2021.

Limitations to the data included missing data from 2017 from the Records Management System (RMS) and limited to no access to annual service demand totals prior to 2019. Due to these limitations, the last three years of data was evaluated consistent with the Center for Public Safety Excellence (CPSE) accreditation standards. This section begins with an overview of TCESD2's service demand, followed by listing each general risk type in order of significance along with all available supporting information.

Fire and Rescue Services

The primary mission of TCESD2 is to provide fire suppression, emergency rescue and medical first response, and fire prevention to the district. Since 2000, the District experienced significant development and a consistent increase to its population. As more people move into the district, demands for service have increased as well.

Annual Incident Totals 2019-2021

	2019	2020	2021
Fire	2,517	730	923
EMS	6,983	8,130	9,656
Other	1,015	2,220	3,326
Total	**10,515**	**11,080**	**13,332**

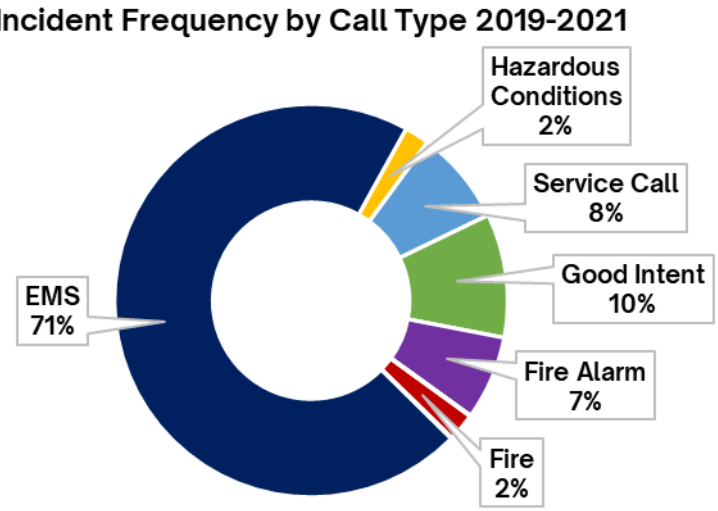
From 2020 to 2021, TCESD2 experienced a 20% increase in service demand with fire calls increasing 26%, EMS increasing 19%, and other call types increasing 50%. TCESD2 has recognized this increase in service demand and has responded by building new fire stations and ultimately adding suppression and EMS units to the system to keep pace with growth in the district.

Next, service demand by incident type was evaluated. Categories used in this analysis are based upon NFIRS guidelines for grouping of incident types. Within the NFIRS classifications, the following incident types are grouped within the corresponding series:

- 100 Fires
- 200 Overheat/Overpressure
- 300 EMS
- 400 Hazardous Conditions

- 500 Service Call
- 600 Good Intent
- 700 False Alarms
- 800 Severe Weather
- 900 Special Incident

The following figure displays service demand by frequency of call type from 2019 through 2021 based on general NFIRS classifications.



The majority of incident types for TCESD2 are EMS incidents (71%). It is common for fire rescue organizations, those who provide fire suppression and ambulance transport, to have EMS response frequencies between 70% to 80%. This is followed by Good Intent (10%) incidents (when someone mistakenly reports an incident that is not an emergency), Service Calls (8%), False Alarms (7%), Fires (2%), and Hazardous Conditions (2%). Of the call types to which TCESD2 responded in this timeframe, approximately 25% typically result in being nonemergent in nature and could potentially be reduced through fire prevention and community risk reduction efforts.

Most Prevalent Incidents Types

To assist TCESD2 in prioritizing risk reduction efforts, the top 10 incident types by NFIRS reporting number are presented. First, the overall top 10 which includes all responses run from 2019 through 2021 and second, the top 10 for those call types that are typically emergent in nature.

Top 10 Call Types 2019-2021	Percentage
321 - EMS call, excluding vehicle accident with injury	44.9%
311 - Medical assist, assist EMS crew	15.8%
611 - Dispatched & Canceled enroute	7.9%
322 - Vehicle accident with injuries	4.7%
554 - Assist invalid	3.9%
324 - Motor vehicle accident with no injuries	2.7%
320 - Emergency medical service (EMS) incident	1.7%
745 - Alarm system activation, no fire- unintentional	1.5%
622 - No incident found at dispatch address	1.3%
735 - Alarm system activation due to malfunction	1.2%

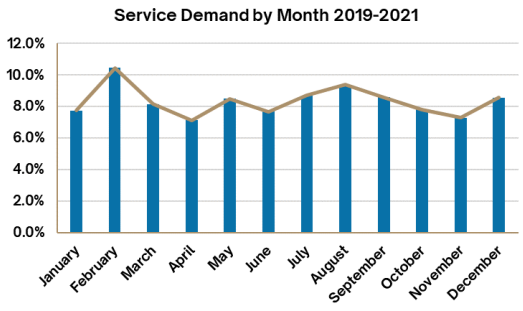
As illustrated in the chart above, calls for EMS are the most prevalent call type for TCESD2, followed by medical assist, and canceled enroute. Motor vehicle accidents rank fourth and sixth with public assistance ranking fifth. EMS once again appears at number 7, while the remaining call types are all nonemergent in nature.

Top 10 Emergent Call Types 2019-2021	Percentage
321 - EMS call, excluding vehicle accident with injury	54.8%
311 - Medical assist, assist EMS crew	19.2%
322 - Vehicle accident with injuries	5.8%
324 - Motor vehicle accident with no injuries	3.4%
320 - Emergency medical service (EMS) incident	2.1%
745 - Alarm system activation, no fire- unintentional	1.9%
735 - Alarm system activation due to malfunction	1.4%
743 - Smoke detector activation, no fire - unintentional	1.3%
700 - False alarms & false calls	1.2%
733 - Smoke detector activation due to malfunction	0.9%

When call types that are typically not an emergency, service calls, good intent, severe weather, and special incidents, are removed, EMS is once again the most prevalent incident type. It is once again followed by assisting EMS and motor vehicle accidents. Rounding out the list are false alarm calls.

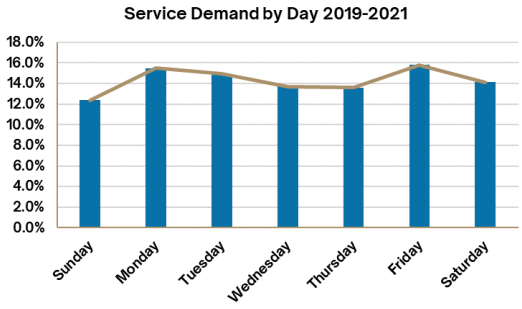
Temporal Variation

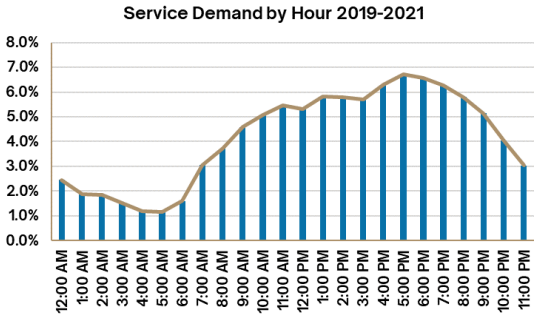
Temporal variation describes the patterns that occur over time. When analyzed and tracked over time, these patterns provide valuable insight as to when demands for services are greatest and when they are lowest. This is particularly important for TCESD2 as the District is experiencing heavy development in addition to substantial increases to its population.



When examining demand for services by month of the year, demand tends to increase during the summer months and decrease in the fall. This is a common trend seen in fire department's; however, in TCESD2 there is a spike in February, the shortest month of the year. When reviewing call types in February, more than half (54.2%) were EMS responses, followed by Good Intent/Cancelled Enroute (13.5%), Service Calls (13.2%), and (6.1%) being Motor Vehicle Collisions (MVC)s. The high value observed for the month of February is most likely due to the impact TCESD2 felt as a result of Winter Storm Uri in 2021.

When demand for services by the day of the week, Fridays (15.8%) are the day of greatest demand, while Sundays are the lowest (12.4%). Demand increases during the workweek and decreases on weekends, which is a typical pattern seen for fire departments.

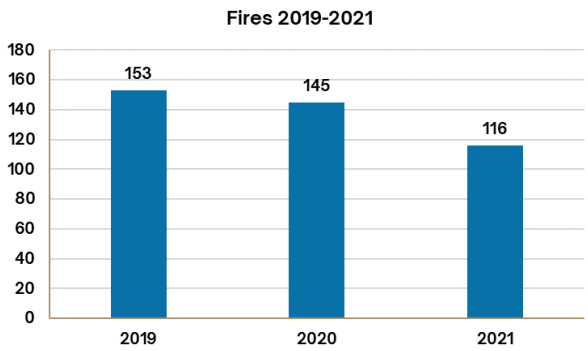




Demands for service by the hour of day also display a typical pattern in that demand increases in the morning, peaks near mid to late afternoon, and decreases to its lowest levels in the early morning. The most prevalent call types during the busiest times of day, between 4 p.m. to 8 p.m. are EMS (56.0%), Good Intent/Cancelled Enroute (14.3%), MVCs (9.4%), and Service Calls (8.1%). During this time of day, nonemergency call types, Service Calls and Good Intent, represent nearly a quarter (22.5%) of demand placed on the system.

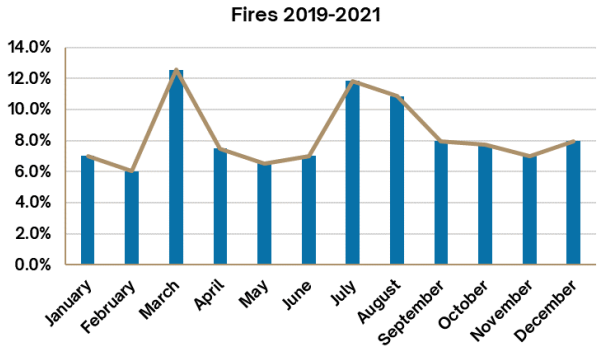
Fire Suppression

Fire suppression is one of the foundational purposes for the establishment of TCESD2. Fire possesses a serious risk to both responders, the community, and individuals and their possessions. Compounding the risk is the relative scarceness of structure fires today. Modern building codes prevent or limit the amount of damage that a fire can do, and in areas consisting mostly of new construction, fires that do occur are typically contained to within the room of origin. This limited fire exposure presents a potential issue for responding firefighters as many have little to no experience in suppressing a working fire. However, TCESD2 addresses this challenge through regular and consistent training to ensure crews are ready and equipped to mitigate a working fire.



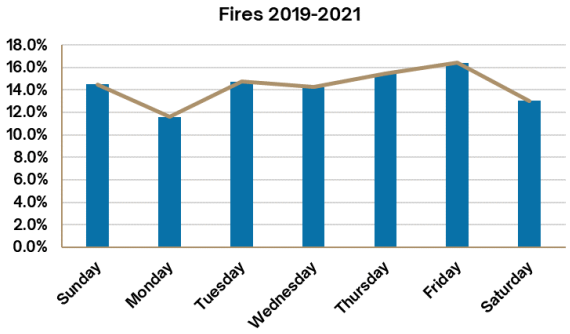
In TCESD2, the number of fires has declined year over year with a compound annual decline of -12.9% per year from 2019 through 2021.

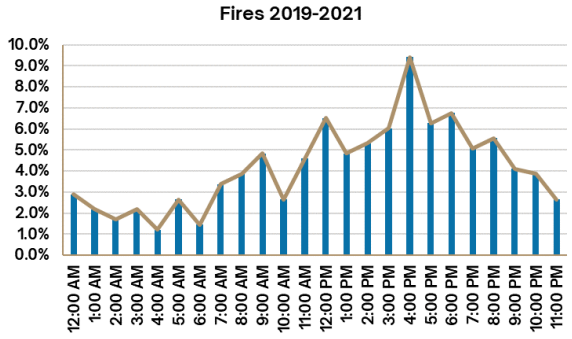
Between 2019 and 2021, TCESD2 responded to 134 structure fires that resulted in estimated total property damages of $6,665,555 and $1,773,350 in contents lost to fire. A limitation observed in the dataset is that the estimate pre-fire property values and contents are not consistently recorded, resulting in pre-fire values less than the amount consumed by fire. In the future, TCESD2 may consider reviewing structure fire reports and ensuring that appropriate pre-fire values are recorded within the data.



Temporal analysis of when fires occur indicate that March is the month in which the highest number of fires occur, followed by July and August.

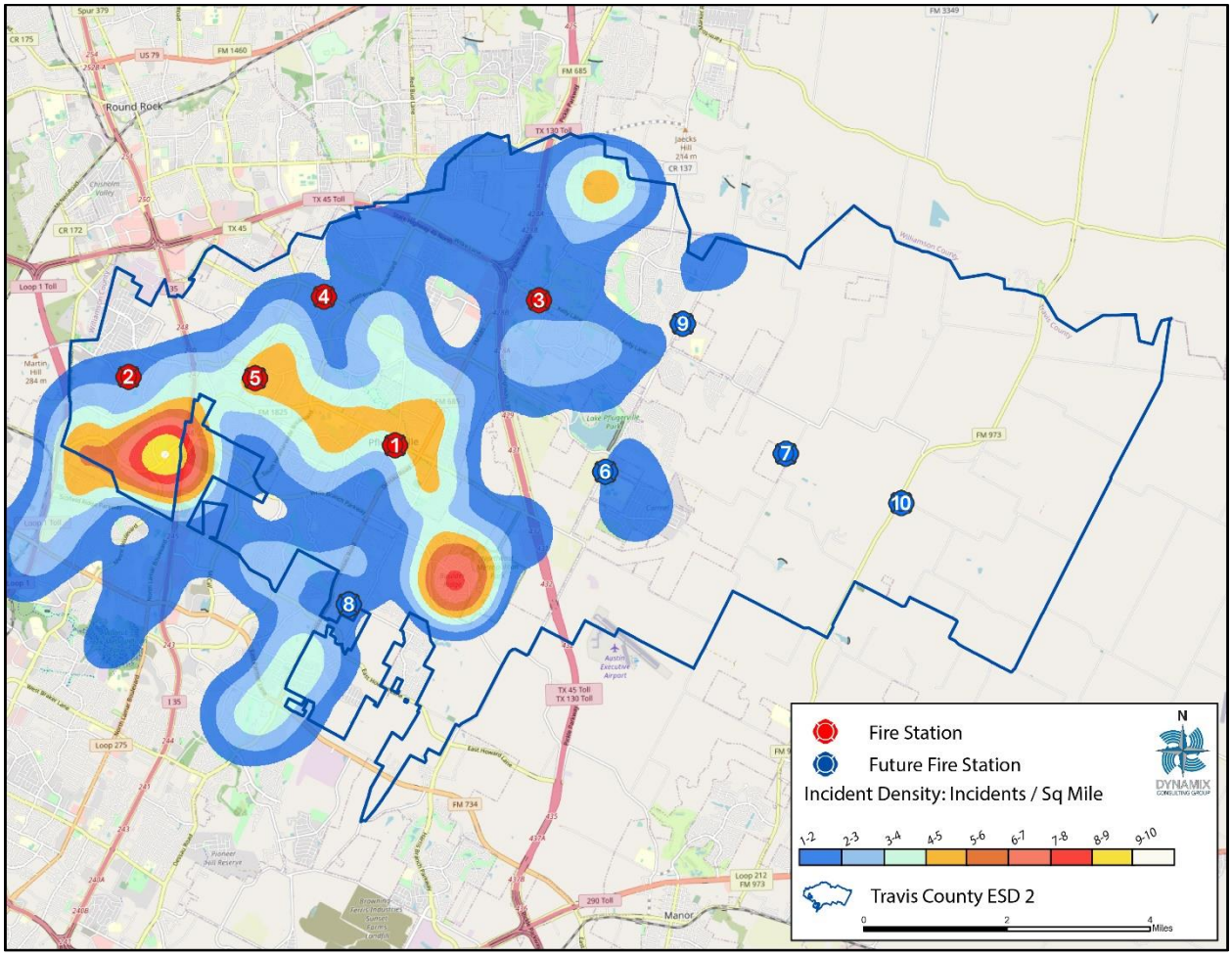
The end of the week tends to experience the most fires, with Mondays having the lowest number of occurrences.





While fire can happen at any time, most fires in TCESD2 occurred between 4pm and 6pm, followed by the noontime hour. This time of day also correlates to the time of day when the department is busiest responding to EMS incidents and attention should be paid to the number of crews typically available during this timeframe.

Structure Fires 2019-2021



Causes of Structure Fires

Incident data for structure fires from 2019 through 2021 was evaluated for the cause reported for fires occurring within TCESD2. Nearly half (49.0%) were unintentionally ignited with no cause provided for nearly 20% of fires. When adding other indeterminant causes for structure fires to these totals, cause under investigation and cause undetermined after investigation, 83.4% of structure fires within TCESD2 were assigned a cause type that provide little information as to what caused the fire. TCESD2 may consider reviewing the options within the RMS for structure fire causes and ensure specific options are available for selection by crews.

Reported Cause of Structure Fire	Percentage
Unintentional	49.0%
No Cause Provided	19.9%
Cause under investigation	9.3%
Failure of equipment or heat source	6.6%
Act of nature	6.0%
Cause undetermined after investigation	5.3%
Intentional	4.0%
Total Number of Fires	151

Property Use

The types of properties that experience the greatest number of fires is useful for community risk reduction personnel as it allows them to identify which communities to target with prevention and educational programs. For TCESD2, 1 and 2 family homes represent nearly two thirds of properties that experienced structure fires, followed by multifamily dwellings, parking garages, restaurants, and business offices.

Property Use	Percentage
1 or 2 family dwelling	62.0%
Multifamily dwelling	15.7%
Parking garage, (detached residential garage)	2.8%
Restaurant or cafeteria	2.8%
Business office	1.9%

Area of Origin

When investigating a fire, the source of a fire, identifying the area of origin is the first step in determining the fire's cause. The following areas were documented as being the top 10 areas of origin for structure fires in TCESD2.

Area of Origin	Percentage
Cooking area, kitchen	11.3%
Exterior balcony, unenclosed porch	11.3%
Attic: vacant, crawl space above top story	9.4%
Vehicle storage area; garage, carport	8.5%
Bedroom - < 5 persons; included are jail or prison	5.7%
Courtyard, patio, terrace	4.7%
Outside area, other	4.7%
Undetermined	4.7%
Wall surface: exterior	4.7%
Bathroom, checkroom, lavatory, locker room	3.8%

When examining this data, fires originating in cooking areas and exterior balconies are the most prevalent areas of origin, followed by attics, garages, and bedrooms. Based on these areas of origin, public education programs aimed at indoor cooking safety and use of a fire extinguisher, outdoor BBQ grill placement and precautions, and a juvenile fire setter program may be of value in reducing future structure fires in residences.

Heat Source

The source of heat that first ignited the fire also provides additional clues as to which risk prevention programs may be most impactful for TCESD2. The majority of responses in this category were entered as "Undetermined" (27%) meaning that the firefighters and investigators responding to the fire were unable to determine what initially started the fire. However, the categories of radiated heat, hot embers, sparks from equipment, and direct flames all point towards potential public safety education programs for indoor cooking and outdoor grilling. It is not uncommon for people to grill inside or partially inside their garage to avoid heat or rain, and the radiant heat and sparks, or coals from tipping over a grill have caused many fires.

Heat Source	Percentage
Undetermined	27.1%
Radiated or conducted heat from operating equipment	14.0%
Electrical arcing	10.3%
Lightning discharge	8.4%
Hot ember or ash	6.5%
Spark, ember, or flame from operating equipment	6.5%
Cigarette	4.7%
Heat from direct flame, convection currents	4.7%
Candle	3.7%
Heat from powered equipment, other	2.8%

Item First Ignited

Finally, the item first ignited provides additional information as to the contributing factors leading up to a structure fire. As in the last category, a large portion (29%) of these fires resulted in a finding of undetermined for the item first ignited. Structural members, boxes, cooking materials, upholstery, and cabinetry all appear within the top 10 items first ignited, while electrical wiring is the third most common item sited as being first ignited.

Item First Ignited	Percentage
Undetermined	29.0%
Structural member or framing	12.1%
Electrical wire, cable insulation	8.4%
Rubbish, trash, waste	4.7%
Box, carton, bag, basket, barrel	2.8%
Cooking materials, including edible materials	2.8%
Exterior sidewall covering, surface, finish	2.8%
Thermal, acoustical insulation within wall, partition or floor/ceiling space	2.8%
Upholstered sofa, chair, vehicle seats	2.8%
Cabinetry (including built-in)	19%

Summary

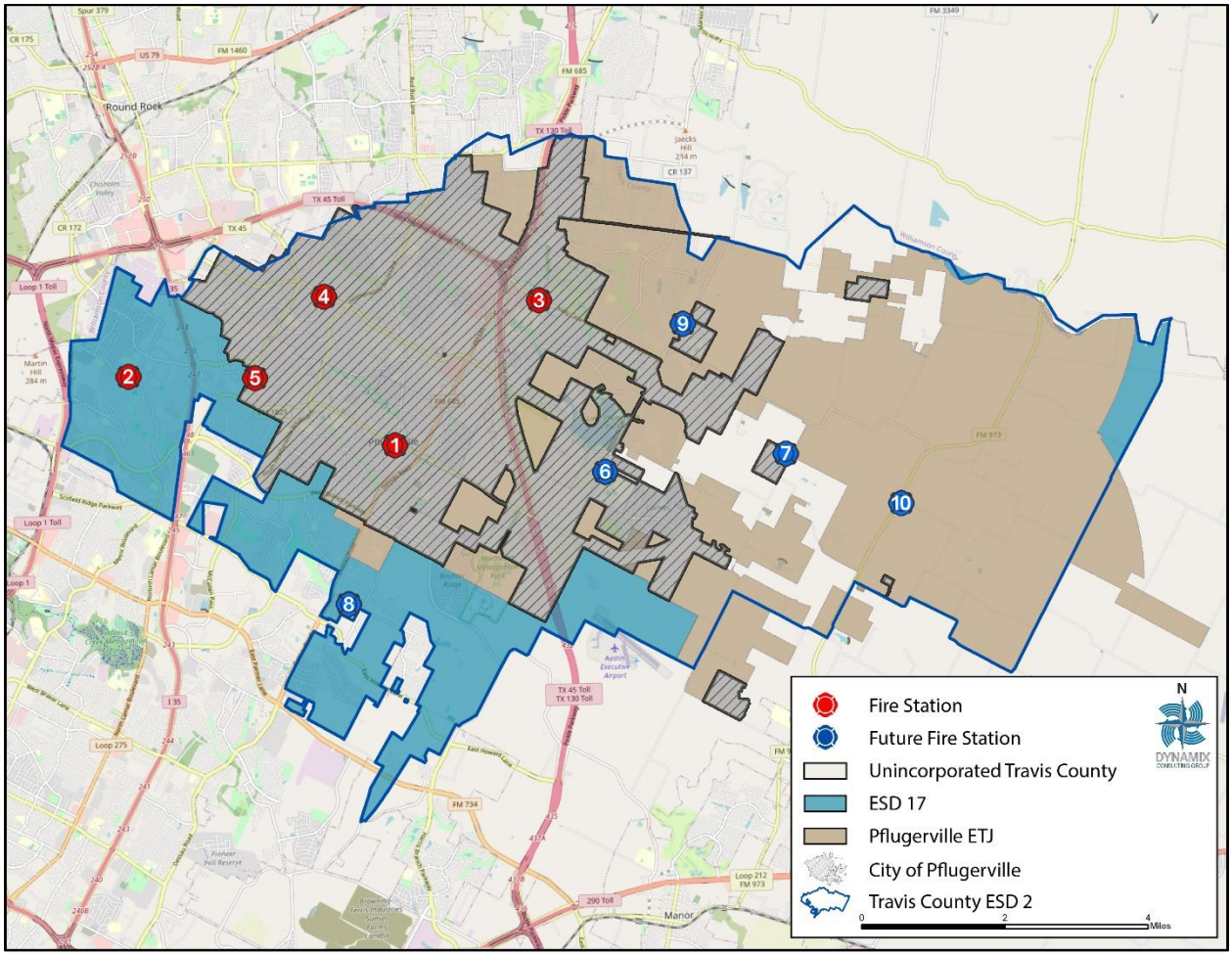
This section has provided insights into the most common causes for fires, and particularly structure fires, occurring within TCESD2. While there are other types of fires faced by the department such as wildland fires, trash fires, and other fire emergencies, ultimately the loss of a residential or commercial structure

poses the greatest risk. Wildland fires, covered in a previous section, can also be devastating to a community if vegetation is allowed to grow too closely and densely near a building. Should TCESD2 begin to experience or have a near miss with building loss due to wildland fires, this risk may become more elevated for the District in the future.

Emergency Medical Services

While TCESD2 provides fire suppression and first response EMS to all the district, for emergency medical services the service area subdivides into multiple areas, both for response, transport, and taxation.

TCESD2 EMS Service Areas



Although multiple TCESD2 fire stations are located within the City of Pflugerville, a third-party vendor provides ambulance transport services to the city (grey hash marked area). While TCESD2 still provides medical first response, the District contractually cannot transport patients within this area. This arrangement may become problematic for the city in instances of extremely high call volume, mass causality incident, or natural disaster where contracted resources become unavailable. Additionally, without formally addressing how to supplement resources and account for these resources using federal guidelines, reimbursement through federal funds may be difficult if not impossible.

TCESD2 and the city should evaluate available options to ensure the availability of sufficient resources in times of disaster or large-scale incidents, third-party vendor expectations and deliverables are identified and understood, and that resource tracking procedures are in place to receive federal reimbursement for incidents such as declared natural disasters.

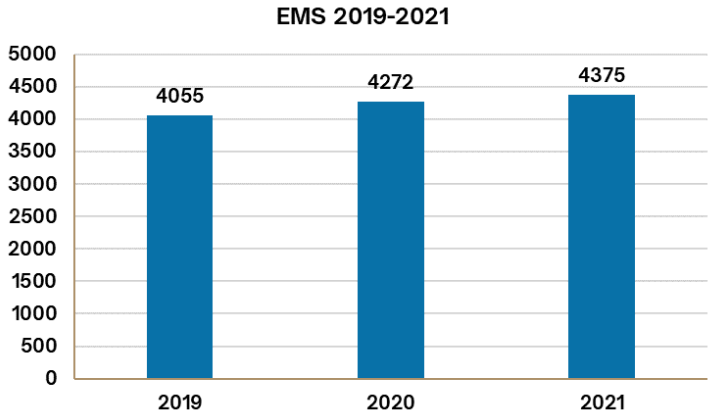
ESD 17 formed to provide additional revenue for EMS services within the blue areas shown above. The Pflugerville Extraterritorial Jurisdiction (ETJ) displays in brown and Travis County funds EMS transport for this area, along with unincorporated areas of the county.

Primary Actions Taken

Analyses of data fields from 2019-2021 determined the most common actions taken by responding crews to EMS calls. The most common actions taken were to Provide basic life support (BLS) (57.0%), Emergency medical services, other (22.3%), Provide first aid & check for injuries (9.3%), Provide advanced life support (ALS) 4.5%, and Provide manpower (2.2%).

EMS Actions Taken	Percentage
Provide basic life support (BLS)	57.0%
Emergency medical services, other	22.3%
Provide first aid & check for injuries	9.3%
Provide advanced life support (ALS)	4.5%
Provide manpower	2.2%
Action taken, other	1.3%
Investigate	1.1%
Assistance, other	1.0%
Transport person	0.8%
Control traffic	0.5%

Frequency and Location of EMS Incidents



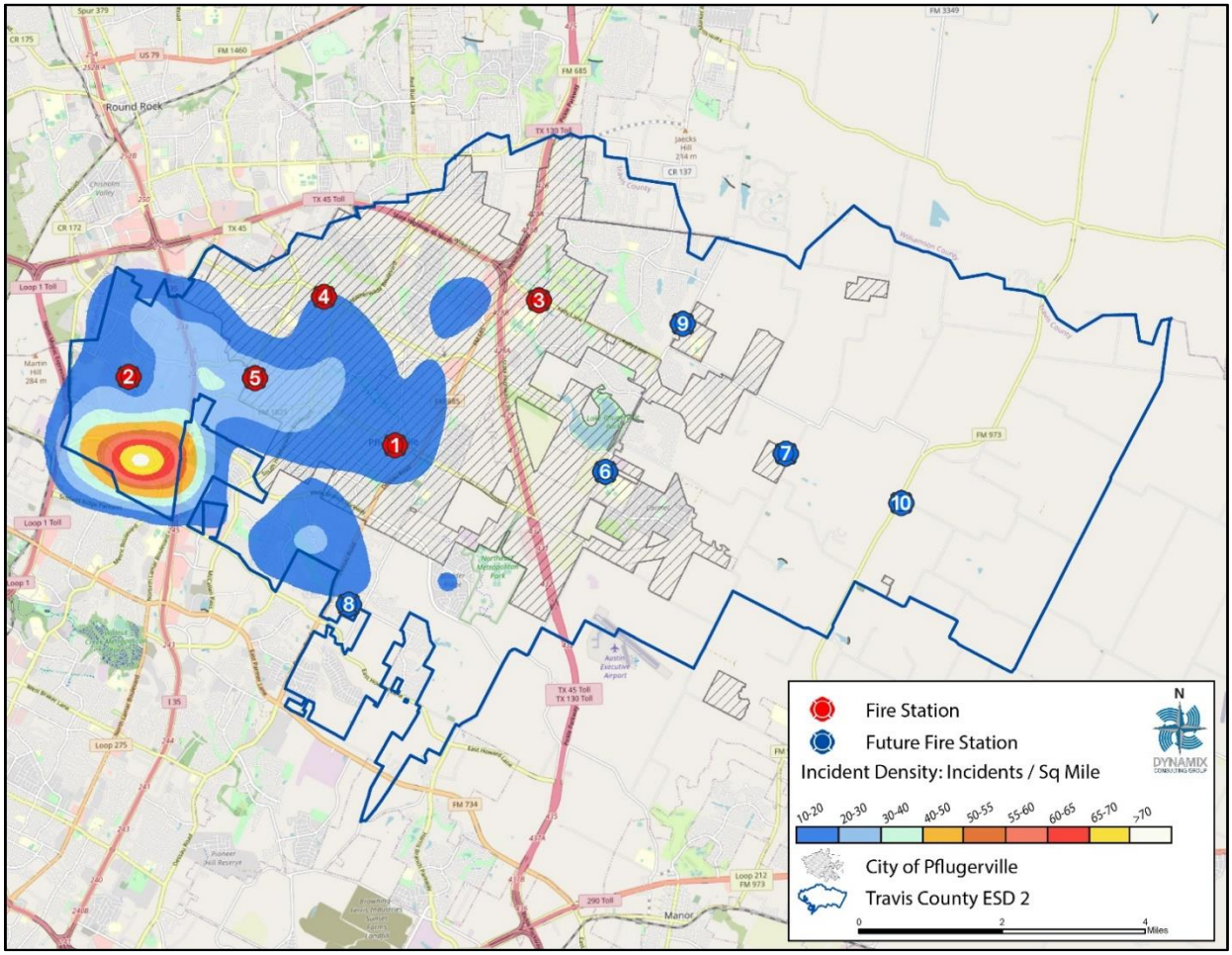
To assess the levels and types of risks within the community, it is necessary to establish an understanding of the location and frequency of EMS incidents. To accomplish this, the types of EMS risks within TCESD2 and where the risks are located display in the following series of maps. For each incident type, an analysis commonly referred to as a Hot Spot Mapping, calculates areas of greatest demand based on the density of incidents within an area. This analysis does not indicate how many calls occurred within each ring, but instead provides a way to compare each area to one another. In this analysis, calculations in each ring display incidents per square mile and provides a range of how densely located calls for service were to each other. For each incident type, the clustering of incident activity suggests areas where community risk reduction efforts may be successful, as well as what areas to target mitigation efforts.

Alcohol Related Incidents

According to a 2018 study by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the rate of alcohol-related visits to U.S. emergency departments increased by nearly 50 percent between 2006 and 2014, especially among females and drinkers who are middle-aged or older.[32] "In just nine years, the number of people transported to the ED annually for medical emergencies caused or exacerbated by alcohol increased from about 3 million to 5 million," said NIAAA Director George F. Koob, Ph.D. "These findings are indicative of the detrimental effects that acute and chronic alcohol misuse have on public health, and the significant burden they place on our healthcare system."

[32] https://www.niaaa.nih.gov/news-events/news-releases/nih-study-shows-steep-increase-rate-alcohol-related-er-visits

Alcohol Related Incidents 2019-2021

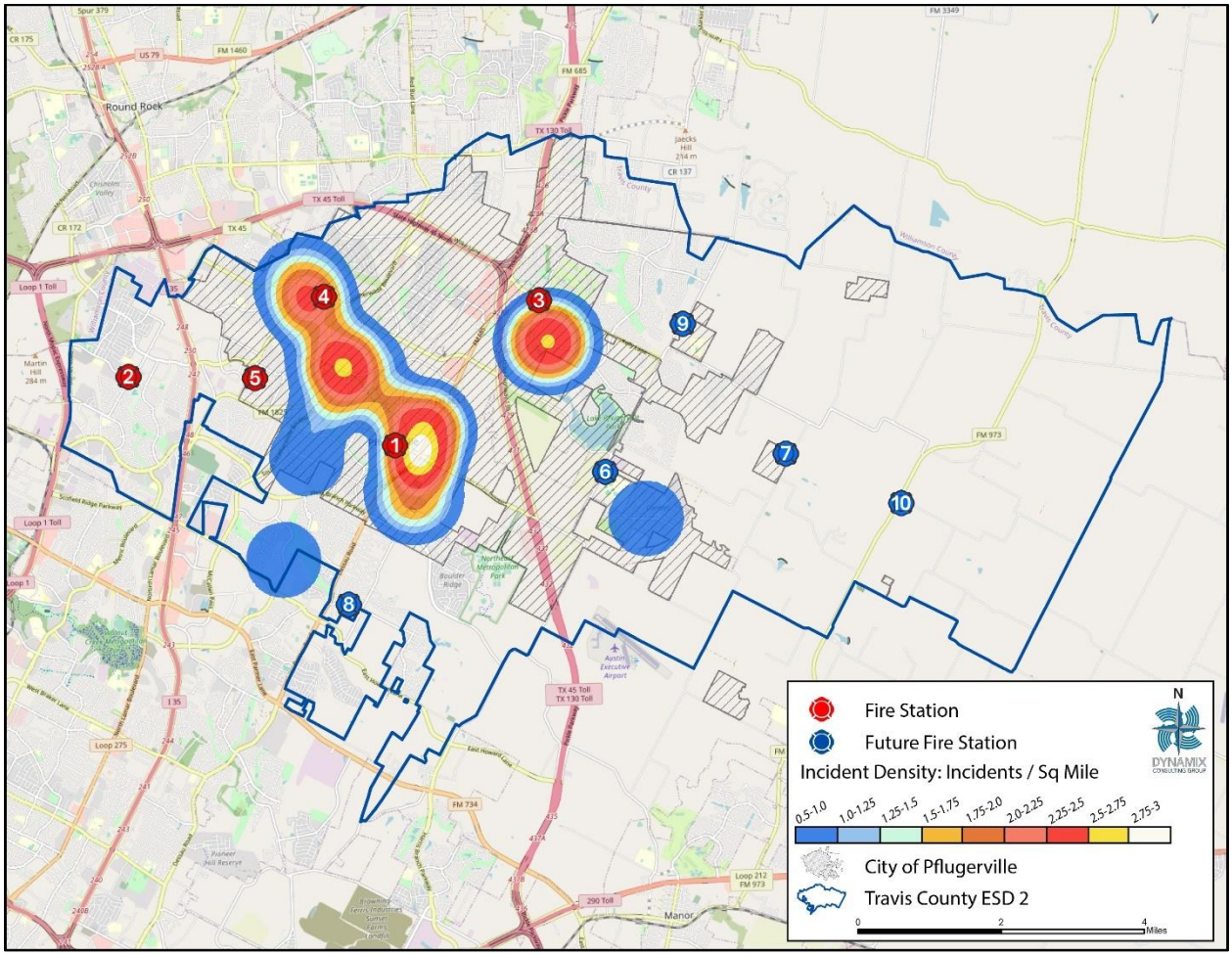


Carbon Monoxide Related Incidents

While carbon monoxide detectors have become more prevalent, not everyone is familiar with the hazards of carbon monoxide poisoning in the home. Sometimes referred to as "the invisible killer", carbon monoxide is an odorless, colorless gas that is the byproduct of incomplete combustion. Incomplete combustion occurs with fuels such as gasoline, wood, coal, natural gas, propane, oil, or methane) do not burn completely. Heating equipment, cooking appliances, vehicles and generators can all produce dangerous levels of carbon monoxide. Data from the Center of Disease Control and Prevention's (CDC's) National Center for Health Statistics shows that in 2017, 399 people died of unintentional non-fire carbon monoxide poisoning.[33]

Carbon Monoxide Related Incidents 2019-2021

[33] https://www.nfpa.org/Public-Education/Staying-safe/Safety-equipment/Carbon-monoxide



Cardiac Related Incidents

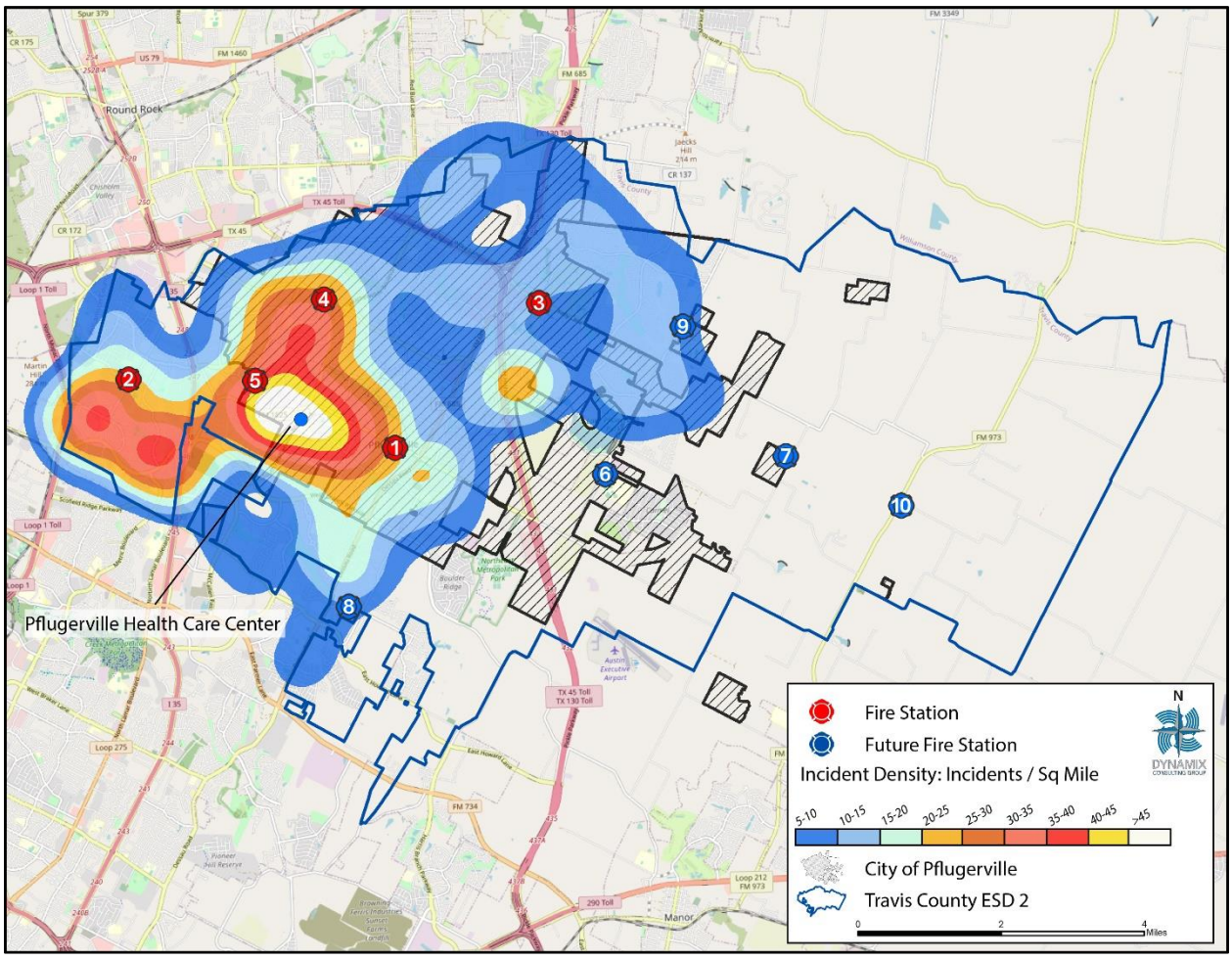
Cardiac arrest, also known as sudden cardiac arrest, occurs when the heart stops beating suddenly. This is a true life-threatening emergency where every second counts. The American Heart Association identified the following six links in the adult in the adult out-of-hospital Chain of Survival.

1. Recognition of cardiac arrest and activation of the emergency response system.
2. Early cardiopulmonary resuscitation (CPR) with an emphasis on chest compressions.
3. Rapid defibrillation.
4. Advanced resuscitation by Emergency Medical Services and other healthcare providers.
5. Post-cardiac arrest care.
6. Recovery (including additional treatment, observation, rehabilitation, and psychological support).

American Heart Association Chain of Survival

These six links can improve chances of survival and recovery for victims of cardiac arrest.

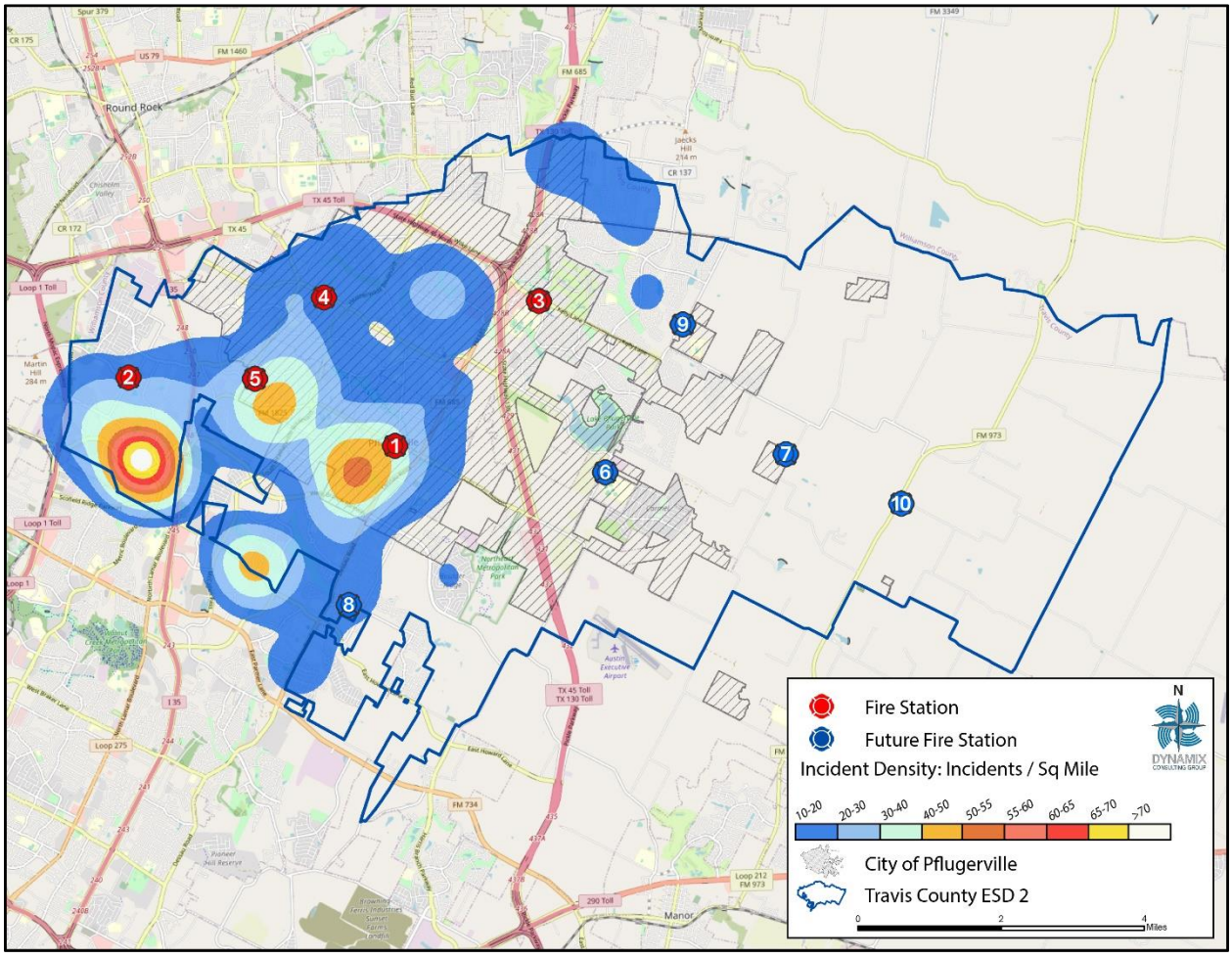
Cardiac Related Incidents 2019-2021



Diabetic Related Incidents

Diabetes is a chronic condition where the blood sugar level is too high. Insulin, a hormone produced by the pancreas, removes sugar from the blood and moves it into cells for the body to use. In people with type 1 diabetes, their pancreas does not make any insulin; in those with type 2 diabetes, it does not make enough. These can be life-threatening conditions that requires immediate medical treatment.

Diabetic Incidents 2019-2021



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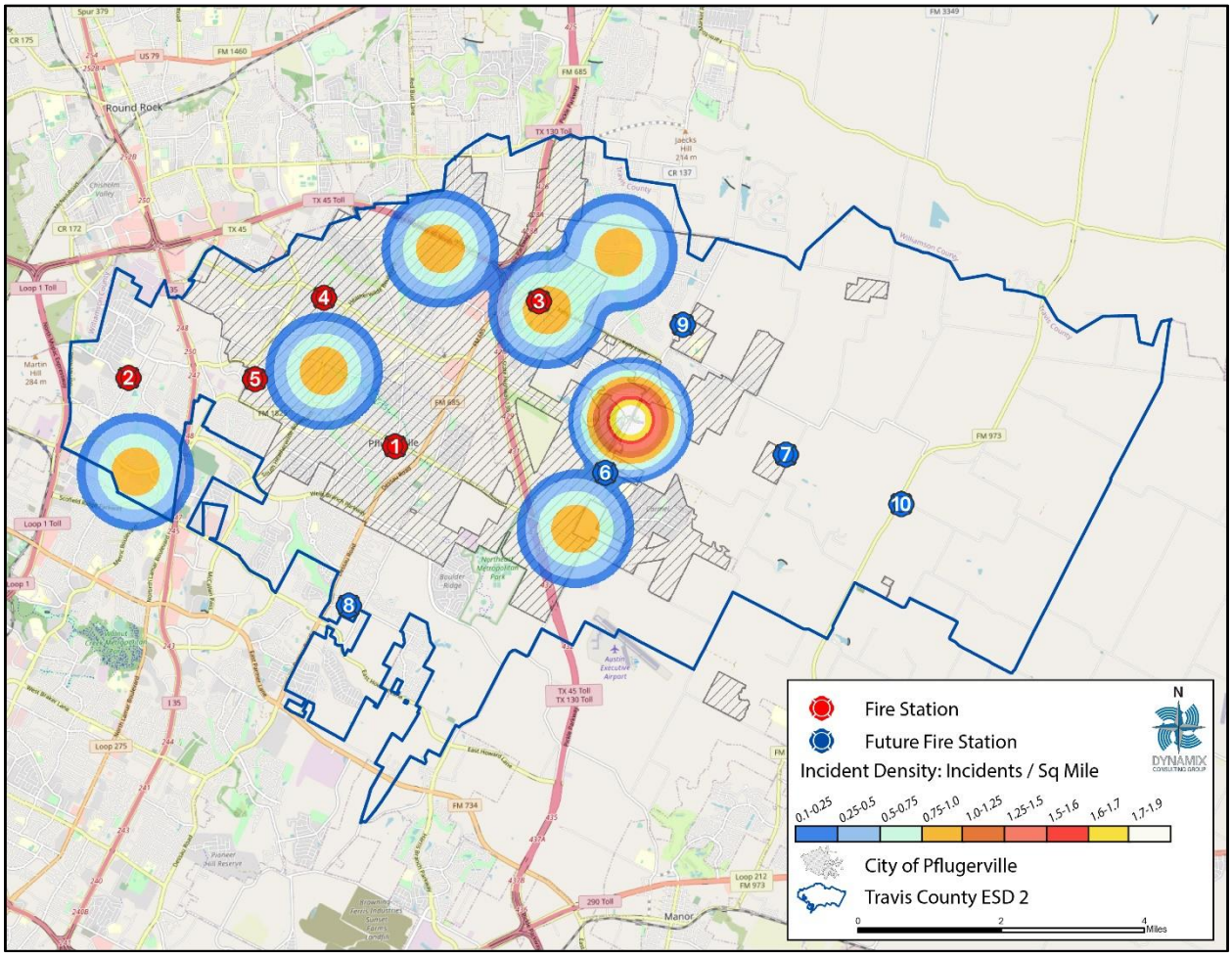
Drowning Events

Drowning is the process of experiencing respiratory impairment from submersion or immersion in liquid. Not all drownings are fatal.

According to the Centers for Disease Control (CDC), in the United States, more children ages one through four dies from drowning than any other cause of death except birth defects. For children ages one–14, drowning is the second leading cause of unintentional injury death after motor vehicle crashes. [34]

Drowning Events 2019-2021

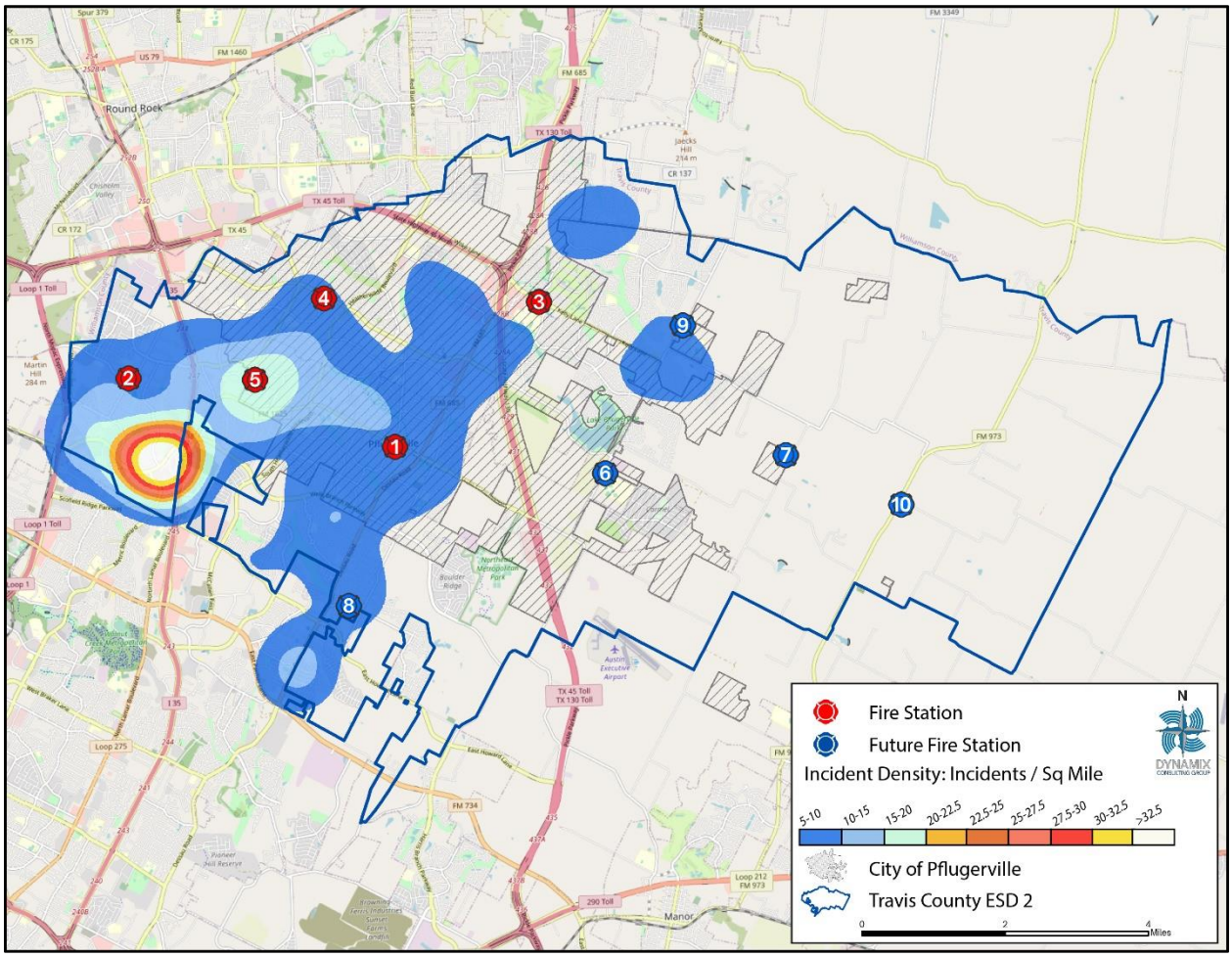


[34] https://www.cdc.gov/injury/wisqars/

Illegal Drug Use / Overdoses

According to the CDC, more than 932,000 people have died since 1999 from drug overdoses. In 2020, 91,799 drug overdose deaths occurred in the United States. The age-adjusted rate of overdose deaths increased by 31% from 2019 (21.6 per 100,000) to 2020 (28.3 per 100,000).[35]

Illegal Drug Use/Overdoses 2019-2021



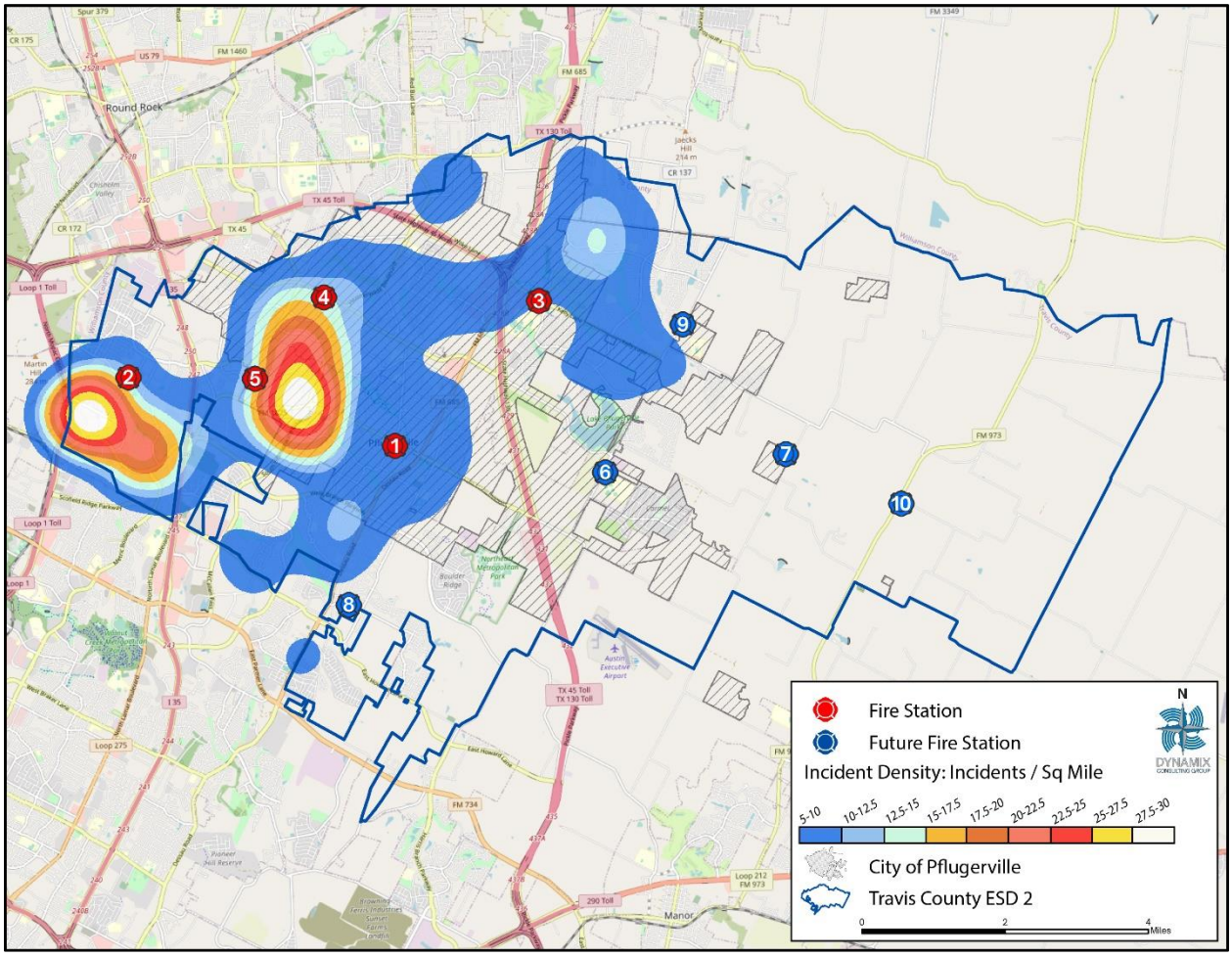
Cerebrovascular Events

A Cerebrovascular Accident (CVA) is the medical term for a stroke. A stroke is when blood flow to a part of your brain stops either by a blockage or the rupture of a blood vessel. Time of the essence in the event

[35] http://wonder.cdc.gov

of a cerebrovascular event. The more quickly the patient receives treatment, the better the prognosis. A stroke left untreated for too long can result in permanent brain damage and death.

Cerebrovascular Events 2019-2021



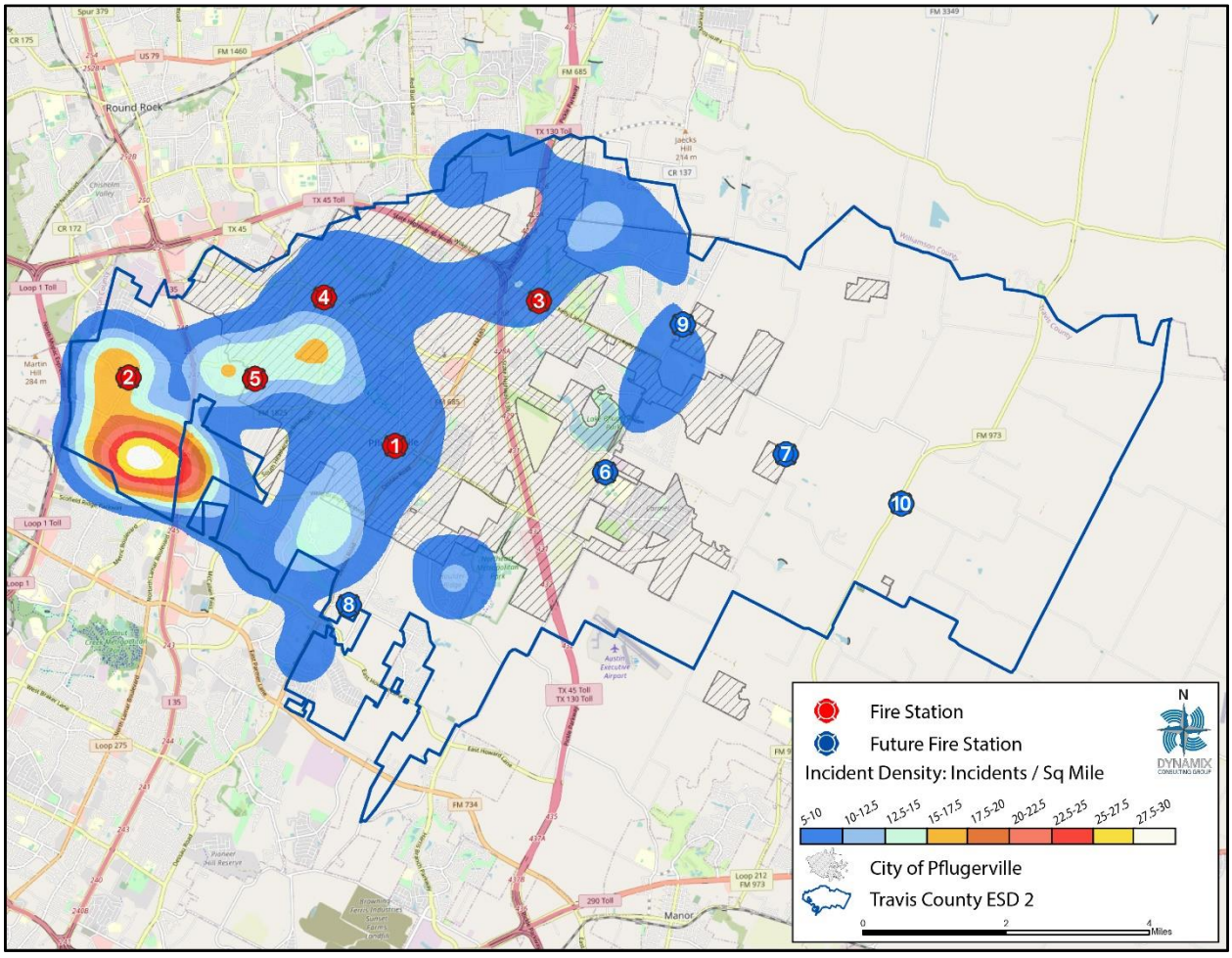
Suicide Related Incidents

Suicide is death caused by self-directed injurious behavior with intent to die as a result of the behavior. According to the CDC, in 2019: Suicide was the tenth leading cause of death overall in the United States, claiming the lives of over 47,500 people. It was also the second leading cause of death among individuals

between the ages of 10 and 34, and the fourth leading cause of death among individuals between the ages of 35 and 44.

There were nearly two and a half times as many suicides (47,511) in the United States as there were homicides (19,141).[36]

Suicide Related Incidents 2019-2021

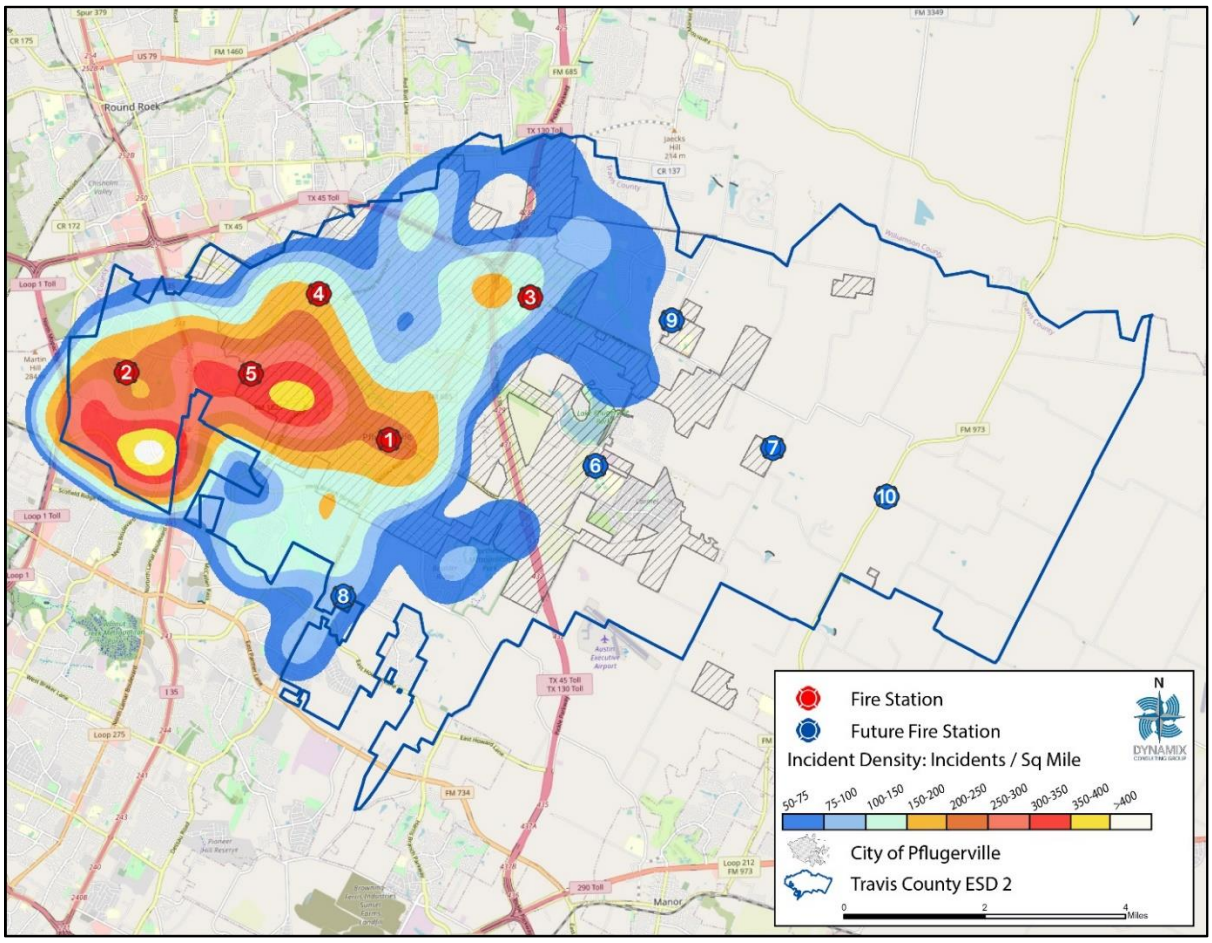


Trauma Related Incidents

Causes of trauma include a variety of external forces which affect the body. Some of the most common causes of traumatic injury include road traffic accidents, falls, violence, sports injuries, and penetration such as stab wounds or bullets. Traumatic injuries can be true life-threatening events and often require immediate medical care.

[36] https://www.cdc.gov/injury/wisqars/index.html

Trauma Related Incidents 2019-2021

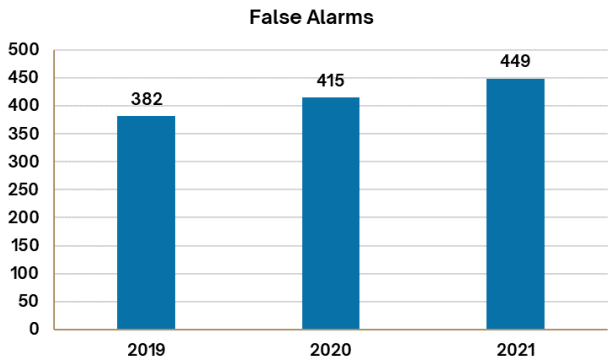


Summary

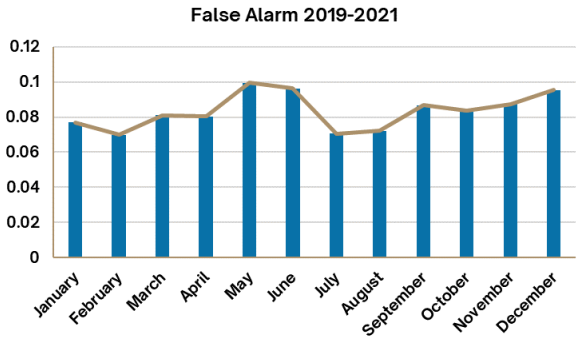
EMS was ranked second among the incident types as it presents potential hazards primarily to the patient, but also potentially to the responders. While not all inclusive, these analyses provide TCESD2 with a starting point for prioritizing risk reduction programs and the areas to target for mitigation efforts. Depending upon which programs TCESD2 selects, additional analysis may become necessary. As EMS represents the majority of incidents within the district, TCESD2 should include some programs targeted at EMS incidents that are within the capabilities of the department.

False Alarm Activations

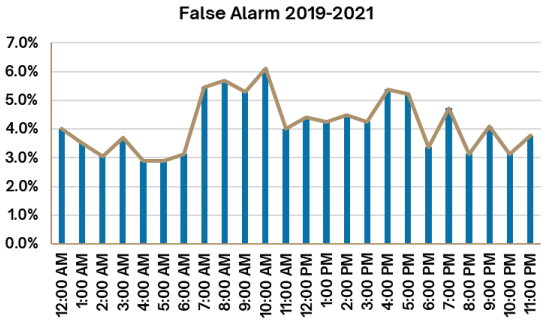
False alarm activations represent an unnecessary strain on frontline units who must respond to faulty detection system activations. While not all false alarms are due to a lack of care or maintenance, such as burning popcorn in the microwave or a forklift striking a sprinkler head, in many instances high or increasing in false alarm activity is indicative of the department requiring additional resources within the Risk Reduction.

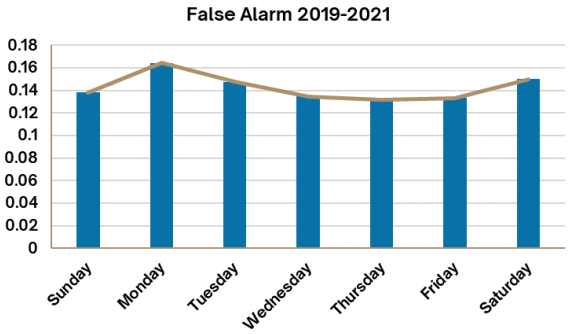


From 2019 to 2021, false alarms increased with a compound annual rate of 8.4% year over year.



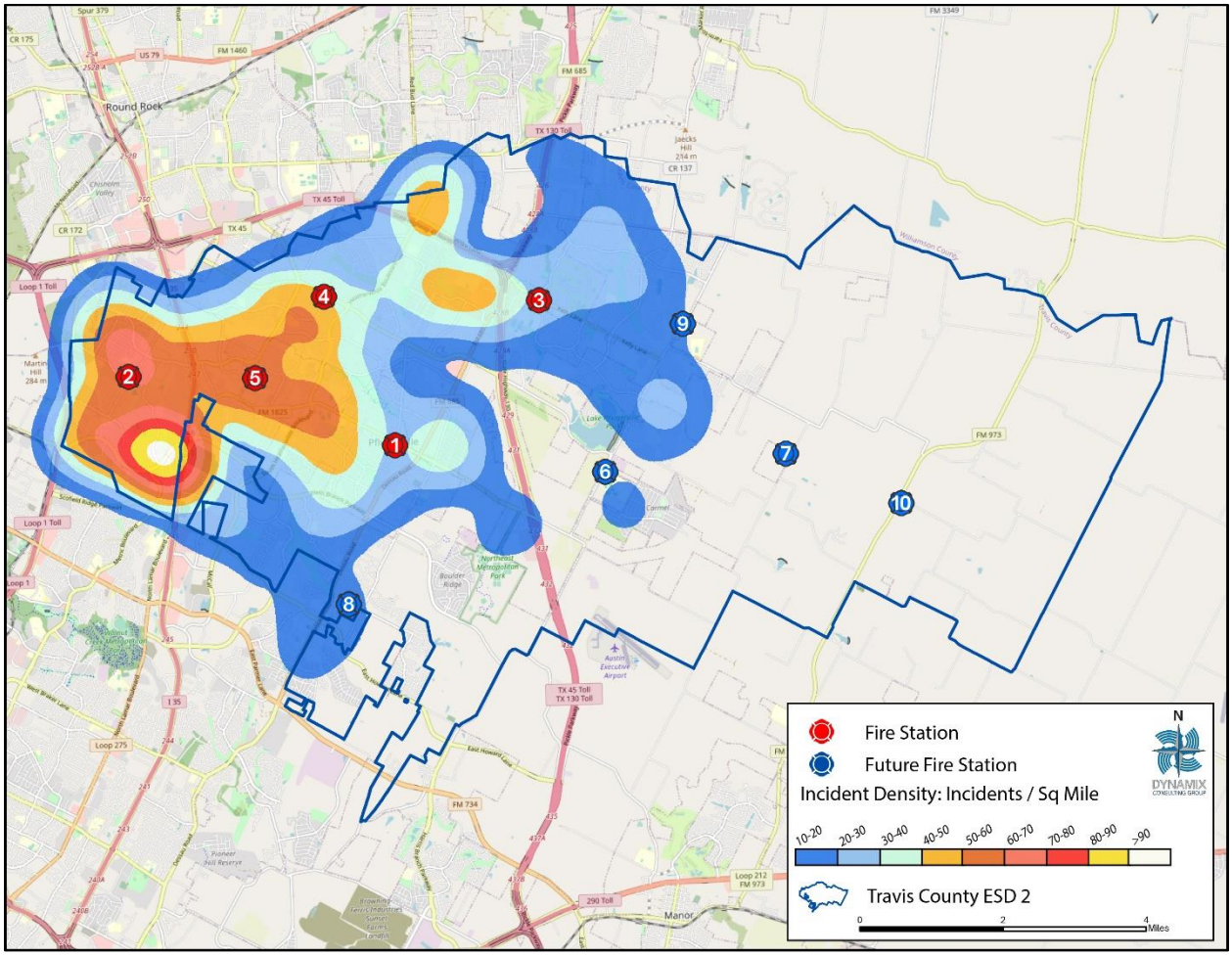
A review of the temporal variation shows that false alarms tend to occur most often in late spring and December, with the peak day being Mondays and Fridays. These false alarms are most abundant from 7 a.m. through 11 a.m. with another spike near close of business between 4 p.m. and 6 p.m.





False Alarm Actions Taken	Percentage
Investigate	54.5%
Restore fire alarm system	11.6%
Action taken, other	9.6%
Information, investigation & enforcement, other	6.7%
Systems and services, other	5.9%
Assistance, other	3.7%
Provide manpower	2.2%
Provide basic life support (BLS)	1.4%
Refer to proper authority	0.8%
Shut down system	0.8%

False Alarms 2019-2021

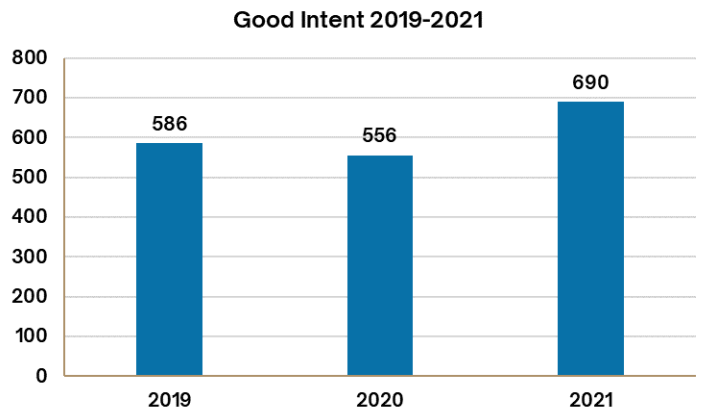


Summary

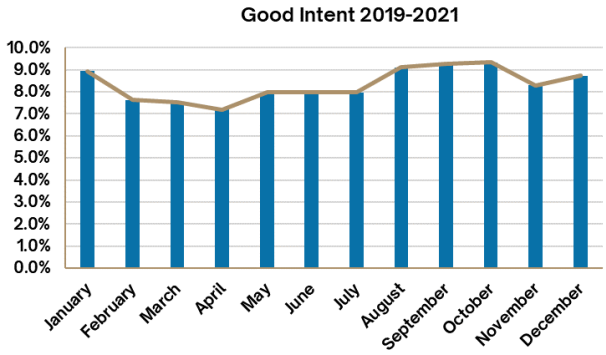
Although false alarms are realized not to be an emergency call upon arrival and confirmation, crews typically respond emergency to the scene until the nonemergency condition is confirmed. Emergency response is inherently dangerous to both responders and to citizens as crews travel throughout the district. False alarms were ranked third in the call type categories. They pose a potential risk to responders and citizens and, for the most part, are preventable.

Good Intent

Good intent incidents are as the name implies, someone trying to do something good, but there was no actual emergency. Included within the good category are canceled enroute. This occurs when one or multiple units are dispatched to an incident and prior to arrival it is realized that no emergency or assistance is required of that unit and the unit cancels its response.

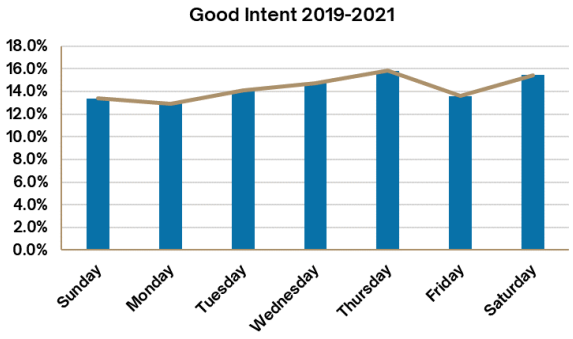


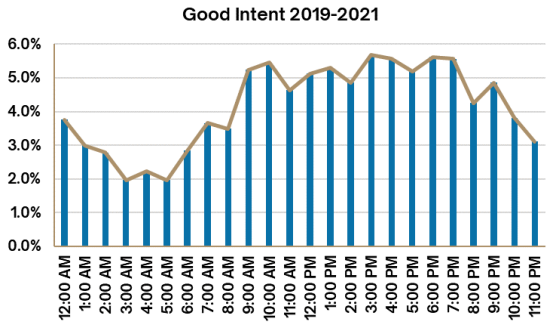
As observed in the graph above, good intent calls account for a substantial portion of responses by TCESD2. Since 2019, this call type has increased a compound average of 8.5% per year and from 2020 to 2021 increased 24.1%. There are several factors that can contribute to increases in good intent calls such as change in alarm assignments, change in dispatch protocol (i.e., Emergency Medical Dispatch protocols), automatic aid agreements, a misunderstanding of the community of when to call for assistance, or a combination of multiple factors. In any case, good intent incidents represent another opportunity for TCESD2 to potentially reduce this call type's impact on operations.



Good intent incidents tend to occur most frequently from August to November and in January. TCESD2 may consider further investigation as to what is driving this increase in good intent demand during these periods.

Thursday is the most active day for this call type, followed by Saturday and Wednesday with Mondays reporting the lowest demand.





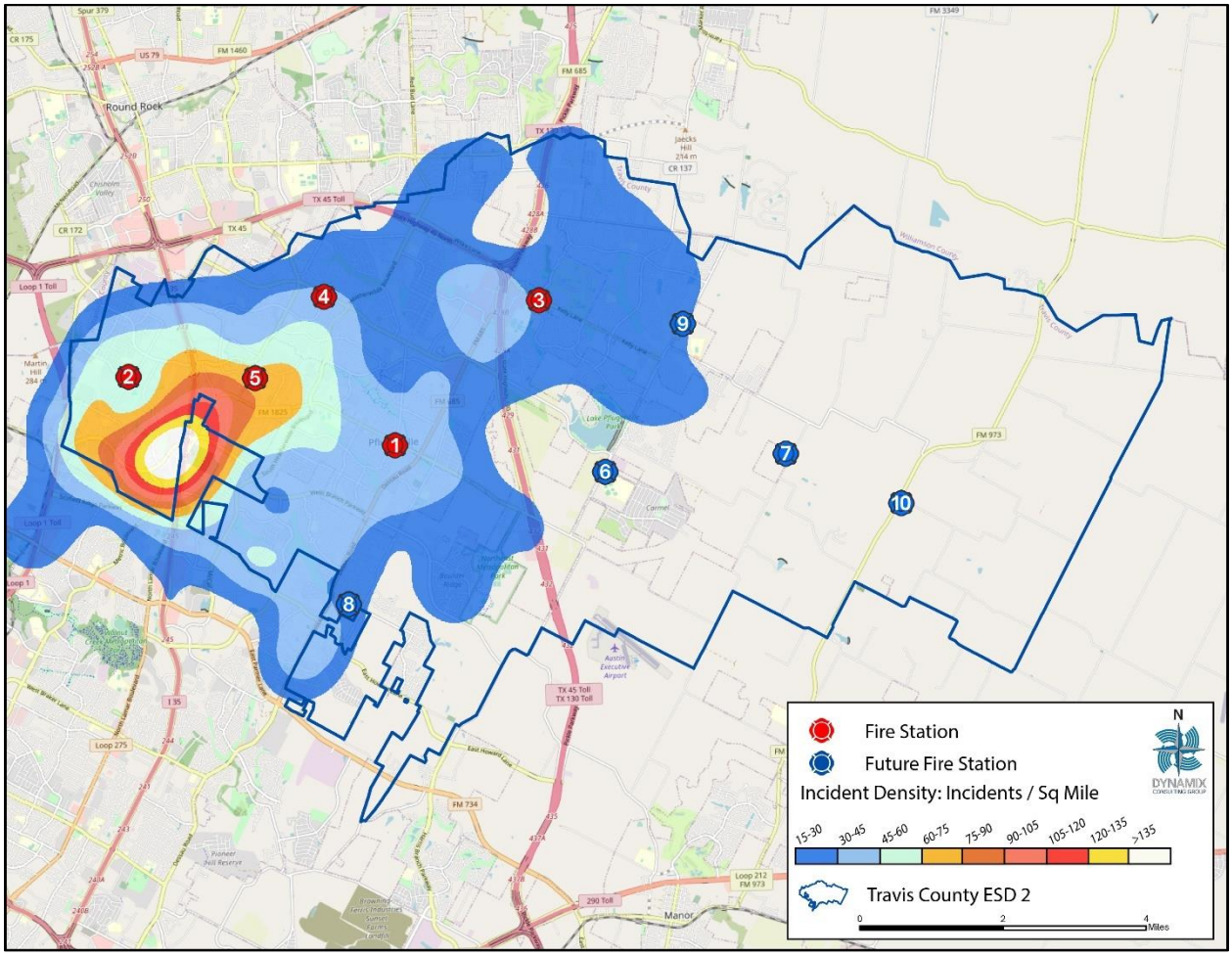
Interestingly, unlike normal call trending patterns, demand increases from 11p.m. to midnight, then tapers off to its low from 3 a.m. to 6 a.m. The peak times for good intent calls are from 3 p.m. to 8 p.m.

The vast majority of actions taken within this call type are canceled enroute (77.2%), followed by investigate (14.8%), other actions (3.0%), and assistance and referring to the proper authority both at 1.0%. The remainder of the top 10 actions represent a fraction of activity.

Good Intent Actions Taken	Percentage
Cancelled en route	77.2%
Investigate	14.8%
Action taken, other	3.0%
Assistance, other	1.0%
Refer to proper authority	1.0%
Emergency medical services, other	0.5%
Information, investigation & enforcement, other	0.4%
Assist physically disabled	0.2%
Provide manpower	0.2%
Search	0.2%

Finally, a hot spot map is provided to identify the densest locations of good intent incidents.

Good Intent Incidents 2019-2021



Located across the western half of the district, good intent calls are focused most densely on the southwest part of the district.

Summary

Good intent incidents are typically nonemergent in nature and experienced crews often recognize them as such at dispatch; however, that is not to say that these calls cannot be important. Citizens calling for assistance when they see smoke or believe someone is in danger may mean all the difference in the world if a true emergency is occurring. With that said, with further research, work with Travis County Sheriff or the communications center, or targeted public education programs, TCESD2 may be able to reduce the number of good intent incidents occurring annually. This call was ranked lowest as it typically does not constitute an emergency and crews are often familiar with the people involved.

Other Call Types

Other call types represent those incident types that possessed consistency year to year with no obvious trends apparent.

Actions Taken for Other Call Types

For the purposes of this evaluation, "Other" call types include categories such as Overpressured or Overheated items, False Alarms, Severe Weather, and Special Incidents. These incidents involve units responding in emergency mode while traveling to these incident types, as opposed to public assists, cancelled enroute, severe weather responses, or special incident types such as standbys. More than half (56.9%) of the incidents evaluated sited Investigate as the primary action taken. Following this, Action taken, other (10.8%), Restore fire alarm system (9.4%), Information, investigation & enforcement, other (6.7%), and Systems and services, other (5.0%) round out the top five actions taken on scene.

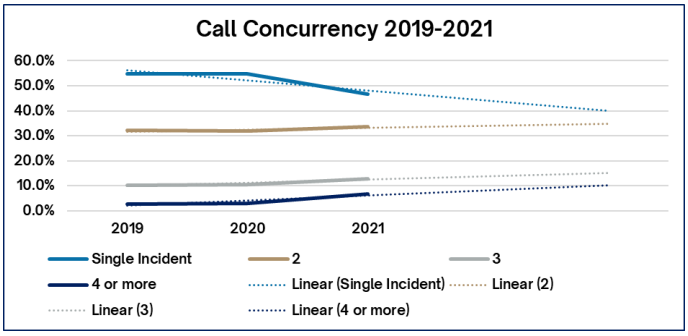
Other Actions Taken	Percentage
Assist physically disabled	46.5%
Investigate	18.4%
Assistance, other	12.5%
Action taken, other	6.9%
Provide manpower	3.8%
Provide basic life support (BLS)	3.4%
Refer to proper authority	2.5%
Information, investigation & enforcement, other	2.4%
Remove hazard	2.0%
Shut down system	17%

Call Concurrency

Call concurrency is a comparison of how often multiple calls occur and place additional demand on resources. A concurrent call occurs upon dispatch of a second unit to a separate incident prior to the first unit clearing the scene and becoming available. When two incidents occur simultaneously and a third separate incident emerges, three concurrent calls are present, and so on.

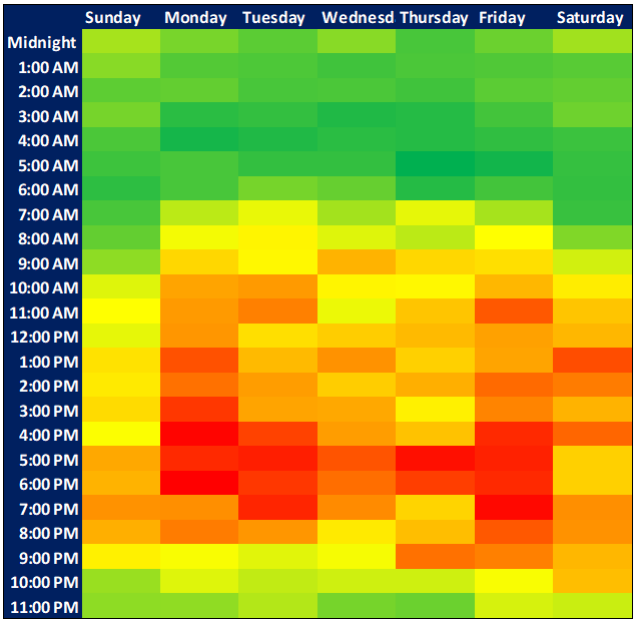
Call Concurrency 2019-2021			
	2019	2020	2021
Single Incident	54.8%	54.9%	46.7%
2	32.1%	31.8%	33.6%
3	10.3%	10.5%	12.8%
4 or more	2.8%	2.8%	6.8%

Call concurrency of two calls or more appears to be gradually trending upward as the occurrence of single incident calls are moving downward. Linear projections support this general trend of increasing call concurrency. Understanding call concurrency is important to ensuring that TCESD2 can respond enough firefighters to a moderate risk incident, such as a working structure fire in a 2,000 square foot single story home. Even if the department could meet NFPA 1710 standards for responding 16 to 17 firefighters and arriving within 9 minutes 20 seconds of the initial notification with all units in quarters and in service, current call concurrency suggests that when a call emerges, at least some resources normally assigned to the call will be dedicated to other incidents half of the time.



Displayed in the next chart is the time and day of the week that concurrent incidents occurred from 2019-2021. Similar to the findings in the temporal variation, the greatest amount of activity coincides with the highest levels of call concurrency. To determine whether call concurrency is adversely affecting TCESD2's ability to deploy sufficient resources to moderate risk call types, it is important to monitor the performance of arriving units and the number of firefighters arriving on scene.

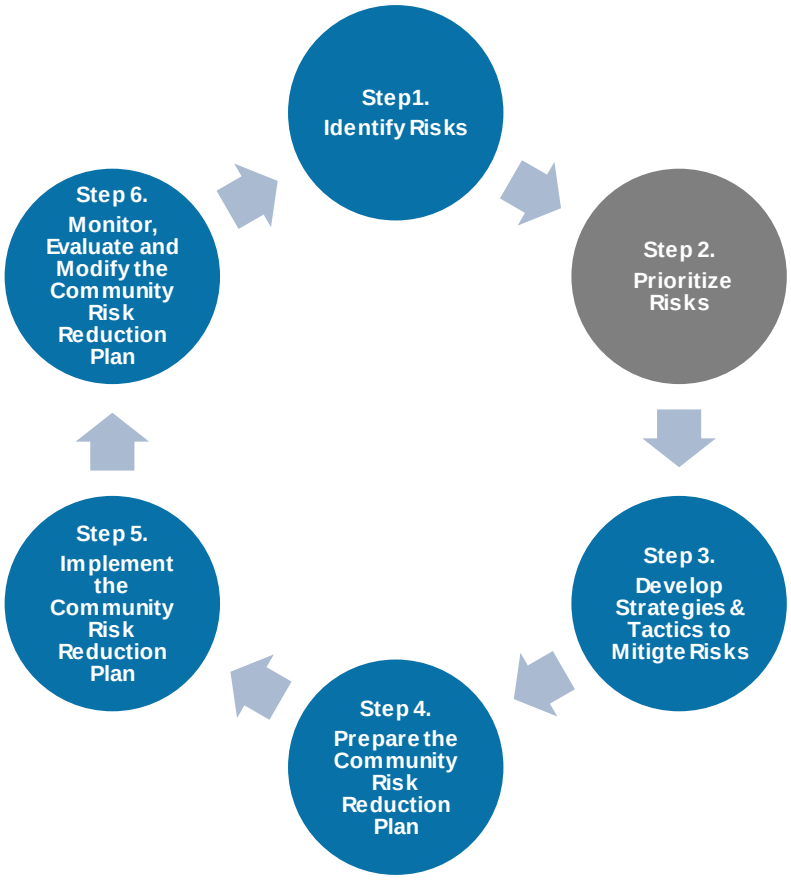
Concurrent Incidents 2019-2021



Prioritization of Risks

DYNAMIX CONSULTING GROUP

Risk Prioritization is Step 2 in the Community Risk Reduction Process.



Following the identification of 14 hazards in the community profile, the next step is to evaluate, quantify, and determine the consequences of each hazard and then to prioritize each risk.

Risk Categorization

Risk was categorized using the same criteria as the Travis County Hazard Mitigation Plan specific to TCESD2. Slight deviations in overall categorization exist between the County Hazard Mitigation Plan and the TCESD2 Risk Categorization to account for local knowledge regarding frequency of occurrence and the potential impact of each hazard within TCESD2.

Likelihood

The following criteria classify the likelihood of each risk:

Qualitative Measures of Risk Likelihood

Qualitative Measures of Risk Likelihood		
Level	**Description**	**Characteristics**
A	**Highly Likely**	▪ Event is probable in the next year. ▪ High level of recorded incidents and/or very strong anecdotal evidence. ▪ Strong likelihood event will reoccur. ▪ Strong opportunity, reason, or means to occur.
B	**Likely**	▪ Event is probable in the next three years. ▪ Regular recorded incidents and strong anecdotal evidence. ▪ Considerable opportunity, reason, or means to occur.
C	**Occasional**	▪ Event is probable in the next five years. ▪ Few infrequent, random recorded incidents, or little anecdotal evidence. ▪ Very few incidents in associated organizations or comparable facilities. ▪ Some opportunity, reason, or means to occur.
D	**Unlikely**	▪ Event is probable in the next ten years. ▪ No recorded incidents or any anecdotal evidence. ▪ No recent incidents in associated organizations or facilities. ▪ Little opportunity, reason, or means to occur.

Impact

The following criteria determine vulnerability in relation to each risk. *Vulnerability* is the susceptibility to suffer harm from an incident or event. Vulnerability may vary based on a variety of factors, including the level of preparedness and capabilities of emergency services providers. A community's ability to resist the impacts and effects of various hazards must be determined. The following figure is a qualitative measure to describe the consequences or impact of a particular risk or event.

Qualitative Measures of Risk Consequence of Impact

Qualitative Measures of Risk Consequence of Impact		
Level	**Description**	**Characteristics**
1	**Substantial**	▪ Multiple deaths. ▪ Complete shutdown of facilities for 30 days or more. ▪ More than 50% of property destroyed or with major damage.
2	**Major**	▪ Injuries and illnesses resulting in permanent disability. ▪ Complete shutdown of critical facilities for at least 2 weeks. ▪ More than 25% of property destroyed or with major damage.
3	**Minor**	▪ Injuries and illnesses do not result in permanent disability. ▪ Complete shutdown of critical facilities for more than 1 week. ▪ More than 10% of property destroyed or major damage.
4	**Limited**	▪ Injuries and illnesses are treatable with first aid. ▪ Shutdown of critical facilities and services for 24 hours or less. ▪ Less than 10% of property destroyed or with major damage.

Level of Risk

The following figure cross references the first two scores to determine the level of risk for each hazard.

Qualitative Measures of Risk Analysis: Levels of Risk[37]

Likelihood	Substantial (1)	Major (2)	Minor (3)	Limited (4)
Highly Likely	HR	MR	MR	MR
Likely	HR	HR	HR	MR
Occasional	HR	HR	MR	LR
Unlikely	HR	MR	MR	LR

Categories of Risk	
Level	**Description**
High Risk (HR)	Detailed research and management planning required at senior levels. Must act to reduce consequences or likelihood.
Moderate Risk (MR)	Must specify management responsibility, specific monitoring or response procedures required.
Low Risk (LR)	Manage by routine procedures

[37] City of Manningham (Victoria, Australia) CERM Plan (2009).

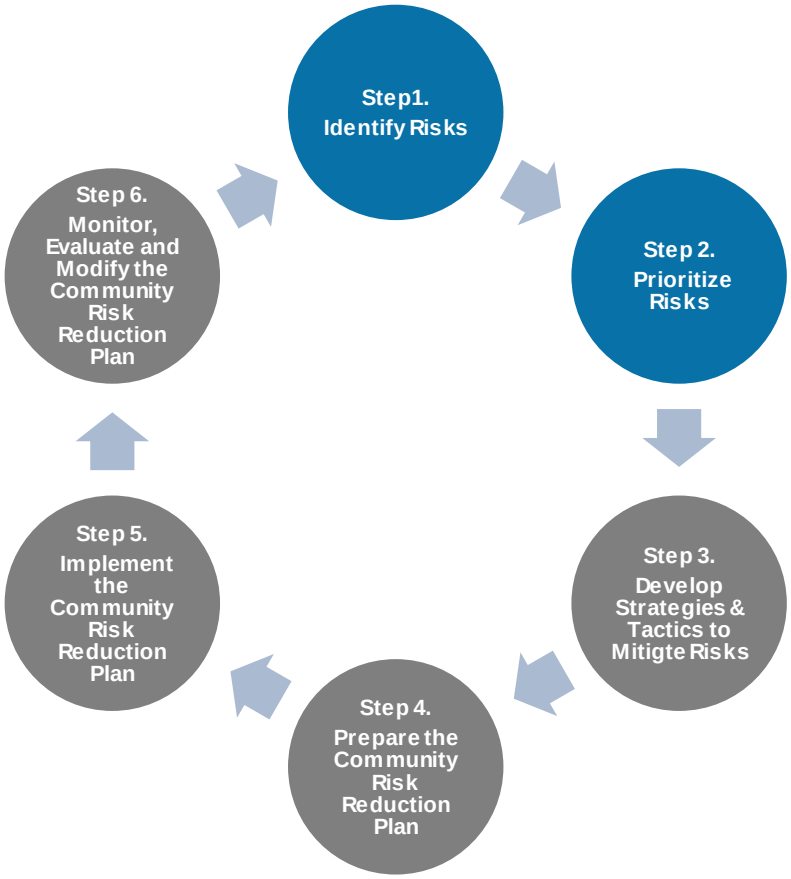
Hazard By Risk

The following table lists the evaluated hazards in descending order from extreme risks to low risks. As no fire department has unlimited funding, personnel, or resources, Dynamix Consulting Group recommends TCESD2's planning efforts should begin with the Extreme and then the High Risks to ensure the best use of the available resources.

Hazard	Frequency of Occurrence	Potential Severity	Ranking
Flood	Highly Likely	Substantial	High
Pandemic	Highly Likely	Substantial	High
Tornado	Highly Likely	Major	Moderate
Extreme Heat	Highly Likely	Major	Moderate
Thunderstorm Wind	Highly Likely	Major	Moderate
Wildfire	Highly Likely	Minor	Moderate
Hail	Highly Likely	Minor	Moderate
Drought	Highly Likely	Limited	Moderate
Winter Storms	Highly Likely	Limited	Moderate
Lightning	Highly Likely	Limited	Moderate
Cyber Attacks	Occasional	Minor	Moderate
Civil Unrest	Occasional	Minor	Moderate
Expansive Soils	Highly Likely	Minor	Low
Dam Failure	Unlikely	Substantial	Low

Community Risk Reduction Plan

The Community Risk Reduction Plan is a product of the completion of Steps 3, 4, 5, and 6 in the Community Risk Reduction Plan.



The Community Risk Reduction Plan typically results in a one to three-year work plan intended to guide the work effort of an organization toward a common set of goals and objectives. The process should include representation from every major interest group in the organization.

Using information obtained from both the current Community Risk Analysis and Prioritization of Risks conducted in Steps 1 and 2 of this document, Dynamix Consulting Group has developed a foundational Community Risk Reduction Plan to assist TCESD2 in initiating educational and interventional strategies within the community.

Dynamix Consulting Group recommends in future iterations of this Community Risk Reduction Plan when TCESD2 has a functional and reliable dataset, that TCESD2 consult with both internal and external stakeholders to ensure that the Community Risk Reduction Plan Programs selected by the department meet the expectations of the community.

Mission

A Mission Statement is an explanation of the organization's reason for existence. The Mission Statement supports the vision and communicates purpose and direction to employees, customers, and other stakeholders. The mission statement should answer the questions "What is our organization's purpose?" and "Why does our organization exist?"

TCESD2's Mission Statement is as follows:

We are committed to the preservation of life and property in that order. We will meet those needs by being a high-performing fire department that educates the community, administers the fire code, prepares for and responds to incidents involving Emergency Medical Services, Fire, Hazardous Materials, Water Rescues, Trench Rescues, Confined-Space Rescues, High- and Low-Angle Rescues, Building Collapses, Transportation Accidents, Unsafe Conditions.

Vision

A Vision Statement establishes the ideal image that the organization wishes to achieve. The Vision Statement should answer the questions "Where are we headed?" and "If we achieved all strategic goals, what would we look like 10 years from now?"

TCESD2's Vision Statement is as follows:

We serve and protect health and safety and strive to enhance the quality of life. We are recognized as the Fire Department that goes above and beyond, providing superior levels of traditional and innovative service.

Core Values

An organization's Core Values Statement includes the core principles that guide the organization and its culture. In a values-led organization, the values guide decision-making and establish a standard to gauge and assess all actions.

The Organizational Values Statement should answer the questions "What values should guide the operations of our organization?" and "What conduct should our employees and volunteers uphold?"

TCESD2's Core Values are as follows:

Core Values

Diversity

Performance

Excellence

Participation

Workforce Safety

Forward Thinking

Honesty, Integrity, & Ethics

Customer Service

Openness

Teamwork

and, Because We Care

The "Five E's" of Community Risk Reduction

National best practices suggest that Community Risk Reduction Programs should include the Five E's of Emergency Response: Education, Enforcement, Engineering, Economic Incentives, and Emergency Response.[38]

The Fire E's of Community Risk Reduction

Education can influence behavior by increasing awareness and providing information and knowledge with the intention of producing a desired behavior. Examples of educational interventions can include the following:

Engineering applies to changes in the physical environment. Modifying a product or environment to prevent or mitigate injury, death, or destruction of property is an engineering tactic. Changes are often the result of advances in technology.

Enforcement applies to reducing risks (hazards) through the legislative process of strengthening and adoption of applicable laws. This includes enforcing those laws through various inspection programs or methods, and, in some cases, imposing penalties for non-compliance.

Economic Incentives encourage or influence individuals and organizations to make certain choices or behave in specific ways. Incentives can influence behavior either negatively or positively. Negative economic incentives result in monetary punishment for "inappropriate" behavior or making certain choices. Fines, citations, and tickets are examples of negative incentives intended to discourage people from choosing unsafe behaviors.

[38] http://riskreduction.strategicfire.org/develop-mitigation-strategies-tactics/strategies-tactics/

Positive economic incentives reward people for behaving in a certain manner or making certain choices. Free smoke alarms are one example. Sales, coupons, and discounts are examples used to persuade people to do business. In one U.S. community, local government uses positive incentives by offering a one-time reduction in property taxes for retrofitting a home with a fire sprinkler system.

Emergency Response is the deployment of fire departments, EMS providers, and law enforcement agencies emergency response capabilities to mitigate risk. A community must consider the ability to provide adequate emergency services when developing a Community Risk Reduction Plan. Communities can only mitigate some risks by enhancing current capabilities, or by adding new emergency response resources.

The most effective risk-reduction strategies are those that apply a broad-based approach utilizing a combination of prevention and mitigation strategies. Using multiple interventions can prevent incidents from occurring, and when prevention fails, can reduce or mitigate the impact of an event.

Stakeholder Expectations

All participants in the Community Risk Reduction Plan must understand their roles, responsibilities, and authority. Even the members of the fire department who will not directly participate in the Community Risk Reduction Plan should have a basic knowledge of the plan.

Fire Department leadership should provide all members of the fire department and other key stakeholders who are not directly involved in the Community Risk Reduction Plan with a basic overview of the plan. If approached by members of the community, these individuals should be able to provide a simple explanation of the program.

To the extent possible, the fire department should make it a priority to keep the community informed about the development and implementation of the Community Risk Reduction Plan. Positive public support is critical to the success of the Community Risk Reduction Plan.

Definition of Terms

The following components make up this Community Risk Reduction Plan:

Initiative: The largest overarching element of a Community Risk Reduction, an initiative is a broad enterprise where there may be multiple areas of focus.

Goal: Focuses on one specific area but is still general in nature.

Objectives: A smaller component of and subordinate to a goal, an objective is specific, measurable, action-oriented, realistic, and time-sensitive. Planners consider goals accomplished with completion of each corresponding objective.

Strategies: Identifies the person tasked with completing each objective and a timeframe for work completion.

Coordinator: The individual responsible for coordinating the efforts of the partners and stakeholder groups involved in the implementation and delivery of the programs identified in the Community Risk Reduction Plan.

Timeline: Accomplishment dates for all objectives.

Data Collection and Frequency: Identification of the strategy to collect statistically significant data and how often the collection of this data will occur.

Communication: The methods of information sharing with both members of the fire department and members of the community.

Strategic Partners: Partners identified and recruited to assist in program implementation and delivery.

Process Outputs: Measures of activity level and performance including the frequency, quantity, and quality of the functions performed.

Impact Outputs: Measures of the changes in learning behaviors and actions that result from a specific Community Risk Reduction Plan goal or objective.

Outcome: Collect and compare data to the goals outlined in the Community Risk Reduction Plan. Where outcome data does not meet the desired goal(s) for the plan, make adjustments in plan implementation.

Monitoring, Evaluation and Modification

Vision 20/20 recommends there be ongoing monitoring, evaluation, and modification to Community Risk Reduction Plans.

Considering data was a limiting factor in this project, it is critical for TCESD2 to immediately begin collecting sufficient data to determine whether staff efforts are having the intended effect. Ongoing data collection should enable TCESD2 to compare the results from before and after implementation of the Community Risk Reduction Plan.

TCESD2 must consistently monitor the progress and effectiveness of the strategies employed within the Community Risk Reduction Plan. Develop consensus among the planning group if changes appear necessary, or if considering different strategies. When backed by data and an honest analysis, a change in course can minimize wasting time and resources. Always share changes in the program with both internal and external stakeholders. A transparent process will build credibility with all stakeholders.

TCESD2's Initiatives, Goals and Objectives

The following initiatives, goals, and objectives develop a strong foundation of data and relationships that will enable TCESD2 to build solid strategies for specific educational, enforcement, engineering, economic incentives, and emergency response activities within the community. Dynamix Consulting Group encourages TCESD2 to continue programmatic efforts currently underway while implementing the following initiatives, goals, and objectives that will enable the District to determine where to focus its resources next.

Initiative 1: Community Outreach

Goal 1.1	**Establish a Steering Committee comprised of representatives from a cross-section of local organizations that have a shared interest in the health and safety of the TCESD2 community.**
	Objectives: 1. Establish the mission of the Steering Committee. 2. Identify potential members of the Steering Committee. 3. Host a kick-off luncheon for members of the Steering Committee to explain the roles and responsibilities of this group as it relates to sharing information and resources that can contribute to improving the health and safety of the members of the TCESD2 community. 4. Share monthly data related to fire department responses with the Steering Committee as well as a summary of fire department activities; encourage feedback from Steering Committee Members. 5. Host a quarterly luncheon Committee for TCESD2 to share with Steering Committee Members data related to fire department responses, a summary of fire department activities and to feedback from Steering Committee Members including the identification of potential partners for new initiatives.
	Strategies: Build relationships with representatives of community organizations with a shared interest in the health and safety of the TCESD2 community to solicit input and identify potential partners for new initiatives.
	Coordinator: Casey Villanueva
	Timeline: 12 months
	Data Collection and Frequency: Send monthly emails to the Steering Committee that summarize fire department responses, activities, and solicit feedback. Once a quarter share this information in person at a luncheon hosted by the TCESD2.
	Communication: Monthly emails to members of the Steering Committee and quarterly in person luncheons.
	Strategic Partners: Pflugerville Emergency Management, members of city and county government including social workers, representatives of the school board and the police department; external stakeholder including hospital representatives, clergy, local emergency medical services, etc.
	Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.

	Impact Outputs: Quarterly summaries of progress to the Fire Chief.
	Outcome: The creation of a Steering Committee provides an opportunity to TCESD2 to solicit ongoing input related to its Community Risk Reduction Efforts and develop relationships that can lead to future partnerships for new initiatives.

Initiative 2: Data Collection

Goal 2.1	Define fire station first due response areas for the development of risk assessment zones.
	Objectives: 1. Define current fire station first due zones based upon travel time performance and proximity to other stations using GIS software. 2. Identify the types of buildings including size, height, and zoning within each zone. 3. Track the success rate of the first due unit arriving first on scene within its designated zone.
	Strategies: 1. Partner with GIS resources to define and determine the most appropriate zone boundaries for current fire stations. 2. Partner with Travis Central Appraisal District and the City of Pflugerville to obtain the most current parcel layer datasets. 3. Partner with Travis County Emergency Communications to ensure that current zones align with dispatch data to accurately capture the zone each call originates within.
	Coordinator: Daniel Berger
	Timeline: 12-36 months
	Data Collection and Frequency: Monthly
	Communication: Summary reports emailed to Fire Chief, Operations Chief, and Community Risk Reduction Division.
	Strategic Partners: GIS manager, Travis Central Appraisal District, Travis County Emergency Communications, Pflugerville Development Services, and Emergency Management
	Process Outputs: Monthly report identifying the status, progress, and challenges with each objective.
	Impact Outputs: Quarterly summaries of progress to the Fire Chief.
	Outcome: Through the building of partnerships and targeted analysis of key information, TCESD2 will develop an enriched database of information resulting in targeted community risk reduction initiatives.

Goal 2.2	**Enrich city/county property appraiser data to develop a risk assessment model based on building characteristics by parcel.**
	Objectives: 1. Assess the current information available and any limitations to the data. 2. Leverage partnerships to obtain and enrich current data. 3. Develop a risk assessment methodology using information from parcel layers to categorize each buildings risk level.
	Strategies: 1. Develop a baseline understanding of current data availability and limitations. 2. Partner with Travis Central Appraisal District and the City of Pflugerville for assistance in data collection. 3. Partner with operations and fire prevention to develop a methodology based upon available data.
	Coordinator: Daniel Berger
	Timeline: 18-36 months
	Data Collection and Frequency: Quarterly reports on progress emailed to the Fire Chief.
	Communication: Internally using email and staff meetings.
	Strategic Partners: GIS manager, Travis Central Appraisal District, Pflugerville Development Services, and Emergency Management
	Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
	Impact Outputs: Quarterly summaries of progress to the Fire Chief.
	Outcome: The development of a risk assessment model by fire station first due zone will enable TCESD2 to quickly assess the levels of risk within each zone and is CPSE CRA: SOC 6th Edition compliant.

Goal 2.3	**Create a master planning file containing key information from response data, building characteristics from parcel data, fire prevention key details, Tier II data, and key Community Risk Reduction information collected.**
	Objectives: 1. Integrate key details from fire inspection records such as suppression system type and locations of panels, pumps, and shutoff valves. 2. Combine key response details with the master planning file using the address, parcel number, or latitude/longitude information. 3. Combine Tier II information into the master file. 4. Collect any Community Risk Reduction details from incident reports such as the presence of smoke detectors or the specific cause of a fire.
	Strategies: Build relationships with multiple partners and work towards the development a master planning file.
	Coordinator: Daniel Berger
	Timeline: 24-48 months
	Data Collection and Frequency: Quarterly reports on progress emailed to the Fire Chief.
	Communication: Internally using email and staff meetings.
	Strategic Partners: GIS manager, data manager, fire prevention, operations, and community risk reduction
	Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
	Impact Outputs: Quarterly summaries of progress to the Fire Chief.
	Outcome: Work toward the creation of a master planning file will enable TCESD2 to analyze and identify targeted risk reduction initiatives and assist operations and fire prevention in their planning and staffing efforts.

Goal 2.4	**Develop a voluntary Special Needs registry to identify people who will require assistance if an extended power loss or extreme weather event occurs to reduce the impact of these events.**
	Objectives:

1. Identify the types of special needs that the program will address (i.e., oxygen dependent, power dependent, limited mobility). 2. Identify the methods of collecting information (i.e., online survey, public meetings, service organizations, etc.). 3. Determine how to store and analyze this information. 4. Create public partnerships with city, county, NPOs, and NGOs to develop strategies of transporting and sheltering those with special needs.
Strategies: Build relationships with multiple partners to harness the full potential of the community to response to a major impact to the community.
Coordinator: Casey Villanueva
Timeline: 12-36 months
Data Collection and Frequency: Monthly meetings to bring potential stakeholders together to increase potential reach of the program for both identifying those with special needs and the resources available.
Communication: Internally using email and staff meetings.
Strategic Partners: Pflugerville Emergency Management, city, county, NPOs, and NGOs
Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
Impact Outputs: Quarterly summaries of progress to the Fire Chief.
Outcome: The creation of a Special Needs registry will enable TCESD2 and its community to mitigate or eliminate preventable risks to individuals within the District during times of severe weather or emergency.

Initiative 3: Resource Deployment

Goal 3.1	Identify trends in response data and develop pilot programs to reduce call volume for primary response units.
	Objectives: 1. Analyze response data to discover trends to potentially address (i.e., nonemergency calls during periods of high call volume or multiple fire alarms at a location). 2. Develop cost effective strategies to reduce the impact of service demand on frontline units. 3. Pilot the program for a specified duration and review the impact of the program. 4. Make suggestions to fire administration based on the results of the program.
	Strategies: Identify recurring patterns or anomalies in response data to develop potential mitigation efforts.
	Coordinator: Daniel Berger
	Timeline: 6-36 months
	Data Collection and Frequency: Monthly reports emailed to the Fire Chief and Operations Chief.
	Communication: Internally using email and staff meetings.
	Strategic Partners: Data manager, Operations Chief, Fire Marshal
	Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
	Impact Outputs: Quarterly summaries of progress to the Fire Chief, Operations Chief, and Fire Marshal.
	Outcome: Through the identification of potential opportunities to reduce service demand impacts to frontline units (such as the reduction of nonemergency calls), TCESD2 can more cost effectively and proactively meet the needs of the community.

Goal 3.2	**Reduce the number of units responding to low acuity/low likelihood transport calls.**
	Objectives: 1. Identify call types that predominately result in low acuity and non-transport calls. 2. Identify response alternatives to these call types that allow more frontline units to remain in service or reduce overall costs to the district. 3. Pilot the program for a specified duration and review the impact of the program. 4. Make suggestions to fire administration based on the results of the program.
	Strategies: Identify opportunities for TCESD2 to match its response profile with the risk associated with specific call types.
	Coordinator: Daniel Berger
	Timeline: 3-36 months
	Data Collection and Frequency: Monthly reports emailed to the Fire Chief and Operations Chief.
	Communication: Internally using email and staff meetings.
	Strategic Partners: Data Manager, Operations Chief
	Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
	Impact Outputs: Quarterly summaries of progress to the Fire Chief and Operations Chief.
	Outcome: By modifying the typical response to known nonemergency, low likelihood transport, and frequently reoccurring call types, the impact of these incidents on frontline units can reduce, allowing TCESD2 to provide services to the community efficiently and reliably as possible.

Goal 3.3	**Identify alternative response options.**

Objectives: 1. Identify current resources available in lieu of frontline apparatus. 2. Identify opportunities to reduce nonemergency transports and allow transport units to remain in service (i.e., a medical supervisor using telemedicine with a patient as opposed to a nonemergency transport). 3. Pilot the program for a specified duration and review the impact of the program. 4. Make suggestions to fire administration based on the results of the program.
Strategies: By investigating and identifying alternative methods of service delivery, TCESD2 could reduce the impact of service demand on frontline units while potentially improving the level of care and reducing costs.
Coordinator: Daniel Berger
Timeline: 6-36 months
Data Collection and Frequency: Monthly reports emailed to the Fire Chief and Operations Chief.
Communication: Internally using email and staff meetings.
Strategic Partners: Data manager, Operations Chief, Medical Director
Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
Impact Outputs: Quarterly summaries of progress to the Fire Chief and Operations Chief.
Outcome: As technologies advance and specific and targeted data becomes available, TCESD2 can evolve its methodologies for service delivery to specific call types through innovative and effective alternatives to traditional fire department responses.

Initiative 4: Planning

Goal 4.1	TCESD2 should develop a plan to actively coordinate Emergency Management functions between the district, the City of Pflugerville, and Travis County.
	Objectives: 1. TCESD2 should offer to send a representative of TCESD2 to report in person to the City of Pflugerville Emergency Operations Center whenever activated. If TCESD2 also activates its Emergency Operations Center at the same time, the fire department representative in the City Emergency Operations Center would be the direct point of contact with the TCESD2 Emergency Operations Center to ensure an open line of communications and information sharing. 2. If TCESD2 activates its Emergency Operations Center, and the City of Pflugerville does not, TCESD2 should request a representative of the City of Pflugerville to report to its Emergency Operations Center. This representative would serve as the point of contact with the city if there were anticipated impacts that the city should be prepared to address or if there might be resources that the city could provide to assist TCESD2. 3. TCESD2 and the City of Pflugerville should each appoint a designated Public Information Officer. The two Public Information Officers should make it a priority to coordinate to ensure that TCESD2 and the City of Pflugerville disseminate consistent messaging during emergencies. 4. TCESD2 should enter discussions with the City of Pflugerville to determine what services, if any, it may need to provide to the City if the city's third service Emergency Medical Services Provider ceases to provide Emergency Medical Services based on any thresholds that may exist related to conditions specified in the contract. Examples may include times of high wind or other disaster conditions. By understanding these limitations, TCESD2 can plan to staff during these times accordingly. 5. TCESD2 should work with the City of Pflugerville to schedule a table-top Emergency Operations Center exercise to allow representatives of both agencies to practice working together and to develop relationships during a controlled non-emergency situation.
	Strategies: Identify opportunities for the District and the city to collaborate to better and more efficiently serve their citizens.
	Coordinator: Daniel Berger
	Timeline: 6-18 months

Data Collection and Frequency: Monthly reports emailed to the Fire Chief and Operations Chief.
Communication: Internally using email and staff meetings.
Strategic Partners: Data manager, Operations Chief, Fire Marshal, City of Pflugerville Emergency Management Coordinator
Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
Impact Outputs: Quarterly summaries of progress to the Fire Chief, Operations Chief, and Fire Marshal.
Outcome: Through the identification of potential opportunities for the District and the city to collaborate on Emergency Management Functions, both organizations can better and more efficiently serve their citizens.

Goal 4.2	**TCESD2 should develop a Fire Department Staffing Plan that ensures all alarm assignments initially dispatch adequate and appropriate resources to all call types and occupancies within the district.**
	Objectives: 1. TCESD2 should review all alarm assignments to ensure that they satisfy critical staffing functions for fires in occupancies such as strip malls and garden apartments by ensuring that the initial full alarm assignment deploys at least 28 firefighters. 2. TCESD2 should submit an annual report to the AHJ (Fire Commissioners) in accordance with NFPA 1710 4.1.2.5.1. ▪ The fire department shall evaluate its level of service and deployment delivery of alarm handling time, turnout time, and travel time performance objectives on an annual basis. ▪ 4.1.2.5.2* The evaluations shall be based on emergency incident data relating to the level of service, deployment, and the achievement of each travel time performance objectives in each geographic area within the jurisdiction of the fire department. ▪ 4.1.2.6 The fire department shall provide the AHJ with a written report annual. ▪ 4.1.2.6.1 The annual report shall define the geographic areas and/or circumstances in which the department fails to meet requirements of this standard. ▪ 4.1.2.6.2 The annual report shall explain the predictable consequences of these deficiencies and address the steps that are necessary to achieve compliance. ▪ 4.1.2.6.3 The annual report shall identify any anticipated deficiencies to develop in the next 3 years and address the steps necessary to continue to achieve compliance to this standard. TCESD2 currently collects and evaluates the data identified in this section of NFPA 1710. Dynamix Consulting Group suggests that TCESD2 should include a concise report to the AHJ that includes only the aforementioned information. This document should serve as an ongoing source of evaluation and discussion about the resources required to meet the established performance criteria.
	Strategies: Review all current alarm assignments as they relate to call type and occupancy in the District then develop a Fire Department Staffing Plan to ensures that all alarm assignments initially dispatch adequate and appropriate resources to all call types and occupancies within the district. Review this plan annually as the District continues to experience new development.
	Coordinator: Daniel Berger

Timeline: 6-36 months
Data Collection and Frequency: Monthly reports emailed to the Fire Chief and Operations Chief.
Communication: Internally using email and staff meetings.
Strategic Partners: Data manager, Operations Chief, Medical Director
Process Outputs: Quarterly report identifying the status, progress, and challenges with each objective.
Impact Outputs: Quarterly summaries of progress to the Fire Chief and Operations Chief.
Outcome: By developing a Fire Department Staffing Plan, TCESD2 will be able to ensures that all alarm assignments initially dispatch adequate and appropriate resources to all call types and occupancies within the district. Review this plan annually as the District continues to experience new development.

Conclusion

Dynamix Consulting Group would like to thank TCESD2 for their commitment to this planning process as well as their continuing efforts to improve the provision of fire and rescue services throughout the district.

Without the support of the Community Risk Reduction Division, Information Technology staff, and Fire Department leadership, this process could not have been possible. As TCESD2 moves forward, the District should continue to work towards the goals and objectives outlined in this plan to achieve the results desired.