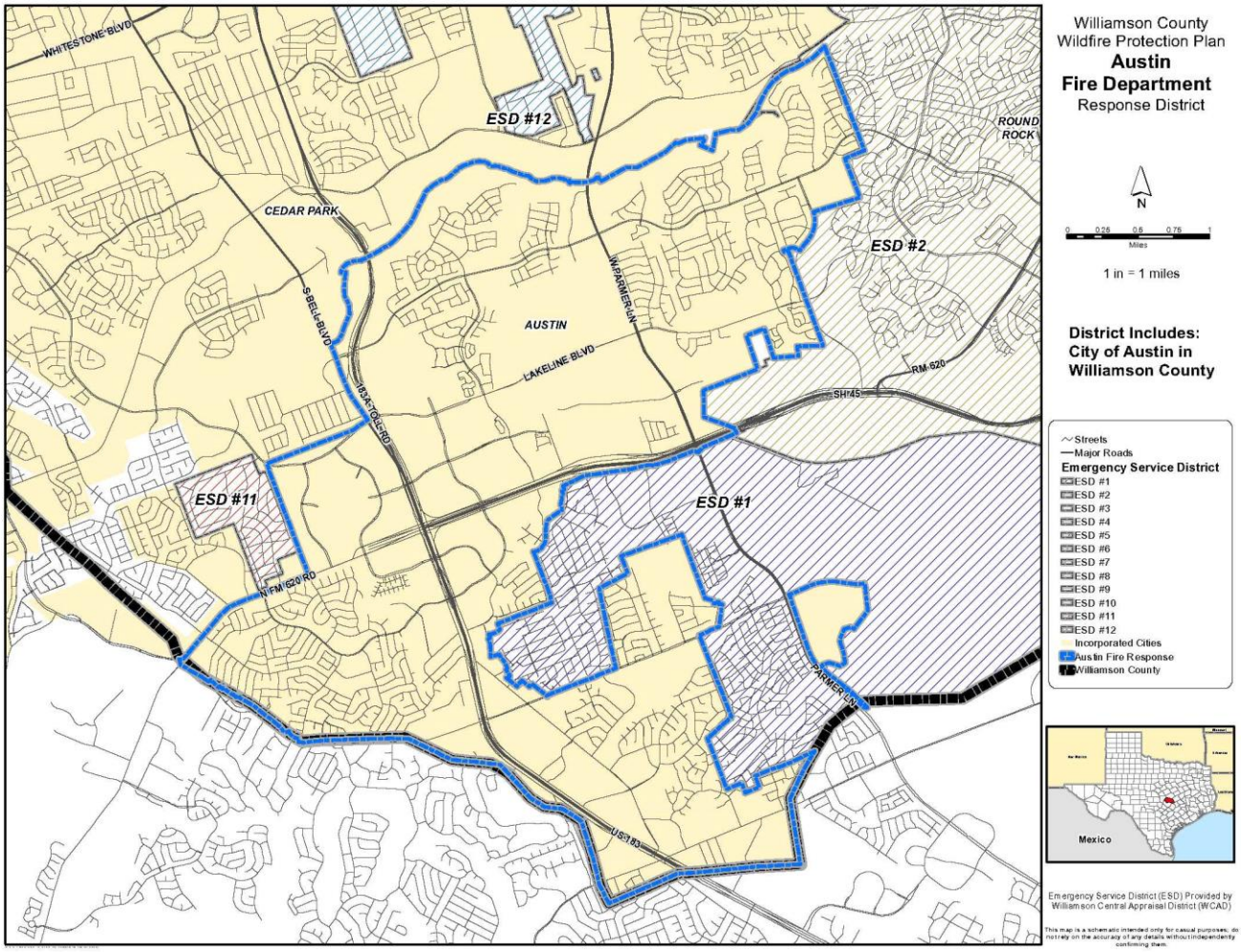
Annex 1: Austin Fire Department

Note: The Austin Fire Department maintains an independent Wildfire Protection Plan. This annex was included into this plan to provide a complete overview of all areas within Williamson County. For access to the Austin / Travis County Wildfire Protection Plan please visit http://www.austintexas.gov/wildfireprotectionplan.

ANNEX 1: AUSTIN FIRE DEPARTMENT

INTRODUCTION

Organization and Jurisdiction



The Austin Fire Department responds to over 85,000 calls each year. The Department has 1,129 firefighters who work across 45 stations and 7 other work sites. The Department has an International Organization for Standardization (ISO) Fire Suppression Rating Schedule of 2. The department is broken into 12 divisions that include:

- Aircraft Firefighting and Rescue
- Communications
- Community Outreach
- Education Services
- Fire Prevention – Fire Marshall's Office
- Investigations
- Medical Operations
- Operations
- Safety
- Special Operations
- Support Services
- Wildfire

The department utilizes the following equipment:

- 6 battalion vehicles
- 12 brush trucks
- 42 engines
- 5 ladder trucks
- 8 quints
- 3 rescue trucks
- 4 dozers
- 4 boats

The Austin Fire Department's Wildfire Division addresses the potential threat of wildfires in the Central Texas area through public education, fuel (vegetation) management and mitigation, and firefighter response. The Division also assists neighborhoods in becoming Fire Adapted Communities through public education by incorporating Firewise principles during community assessments and presentations conducted by the Firewise Program Coordinators.

The City of Austin is a Firewise community, which they achieved in 2014. They also participate in the Ready, Set, Go! Program managed by the International Association of Fire Chiefs to encourage and improve dialogue between dire departments and the residents they serve.

CURRENT /HISTORICAL MITIGATION ACTIONS AND PROGRAMS

Joint Wildfire Task Force (JWTF) – the JWTF was formed after the 2011 wildfires to address community needs for wildfire protection, suppression, mitigation and recovery and to identify steps to help Travis County become a fire-adapted community. The JWTF includes representatives from fire, law enforcement, and public works agencies within the City of Austin and Travis County. The JWTF also includes representatives from other local entities and municipalities.

PUBLIC EDUCATION AND OUTREACH PROGRAMS

The Austin Fire Department's Wildfire Division promotes wildfire preparedness in the Wildland Urban Interface (WUI) through public education and hazardous fuel management.

The Austin Fire Department and the Department's Wildfire Division both maintain Facebook pages and Twitter accounts to use as an effective tool to communicate with residents. The Department uses their Facebook page to post updates on fires, accidents, and rescue incidents; share public service announcements; and inform people of upcoming events.

Each year, the Department, in partnership with the Austin Travis County Wildfire Coalition, hosts a Wildfire Community Preparedness Symposium. It is open to community leaders, homeowners, neighborhood associations, and communities at risk. Subject matter experts discuss important topics pertaining to wildfire.

CAPABILITIES ASSESSMENT

Emergency Response Capabilities

The Wildfire Division mitigates risk through fuel (vegetation) management by following the National Cohesive Strategy in restoring and maintaining resilient landscapes. This is accomplished through reducing invasive plant species in a variety of methods including mechanical treatments and prescribed fire while preserving our delicate ecosystems.

All Department firefighters have received S-130/190 Wildland Firefighter Training in accordance with National Wildfire Coordinating Group (NWCG).

The City of Austin has numerous facilities that are equipped to serve as shelters. The City uses traditional media (television and radio), city and county websites, the Emergency Notification System, and the City's information lines (2-1-1 and 3-1-1) to inform residents of emergencies within the City.

Mutual Aid Agreements:

- Austin Fire Department, Austin Water Utility Department – Wildlands Conservation Division, and Texas A&M Forest Service have an interlocal agreement to provide mutual aid for prescribed fire management, fire prevention, and fire preparedness
- Austin Fire Department has a mutual aid agreement with Travis County Emergency Services Districts (ESDs) where they support each other during wildfire suppression, training, public education efforts, and wildfire mitigation activities.

Policies

No information has been received.

Regulations

Wildfire risk reduction is done through voluntary measures, guidelines and recommendations implemented at various scales inconsistently across jurisdictions.

Ordinances and Codes

The City of Austin has adopted the 2012 International Fire Code. The Austin Fire Code is codified as Sections 25-12-272 and 25-12-172 of the Land Development Code. Additional codes include discussions on wildfire: Parks and Recreation Department (Section 14), Land Development (Section 25), Parks and Recreation (Section 8), and Austin/Travis County Subdivision Regulations (Section 30).

The City of Austin has the following Land Development Code (LDC) chapters that guide location and development potential in certain flood-prone areas; however, they do not address wildfire high-risk areas:

- Obstructions, adjacent property responsibilities, studies prior to construction, mapping, engineering, access requirements, and hazard zones are addressed in Drainage LDC 25-7.
- Flood-resistant construction is addressed in Building Code Appendix G LDC 25-12-3.
- Other technical building codes related to site plans, development, land clearing, vegetation removal, and the environment are covered in LDC 25-5 and LDC 25-8.

Plans, Reports and Studies

The City of Austin has developed various plans, reports and studies that identify and plan for emergencies and natural disasters. These include:

- Community Wildfire Protection Plan (CWPP)
- City of Austin Emergency Operations Plan
- City of Austin Hazard Mitigation Plan
- School District Hazard Plan – required by the Texas Education Code §37.108 which states that each school district must adopt and implement a multi-hazard emergency operations plan for use in the district's facilities.

- Hospital/Nursing Home Hazard Preparedness and Response Plans – required by the Texas Administration Code §133.45 and §19.1914 which states that hospitals and nursing homes are required to adopt and implement hazard preparedness and response plans.

Resources

The following list identifies available resources to the Austin Fire Department:

- Texas A&M Forest Service (TFS) – provides technical assistance, capacity building, facilitating cooperative collaborations, forestry-related research, wildfire protection, and promotion of forest resources economic development. TFS also facilities and coordinates incident management for all types of disasters.
- Lone Star State Incident Management Team (LSSIMT)
- All Hazard Incident Management Team (AHIMT)
- Texas Intrastate Fire Mutual Aid System (TIFMAS) – provides grants, training and qualifications and mobilization systems to utilize local resources for statewide use.

IDENTIFY CRITICAL INFRASTRUCTURE AND COMMUNITY VALUES AT RISK

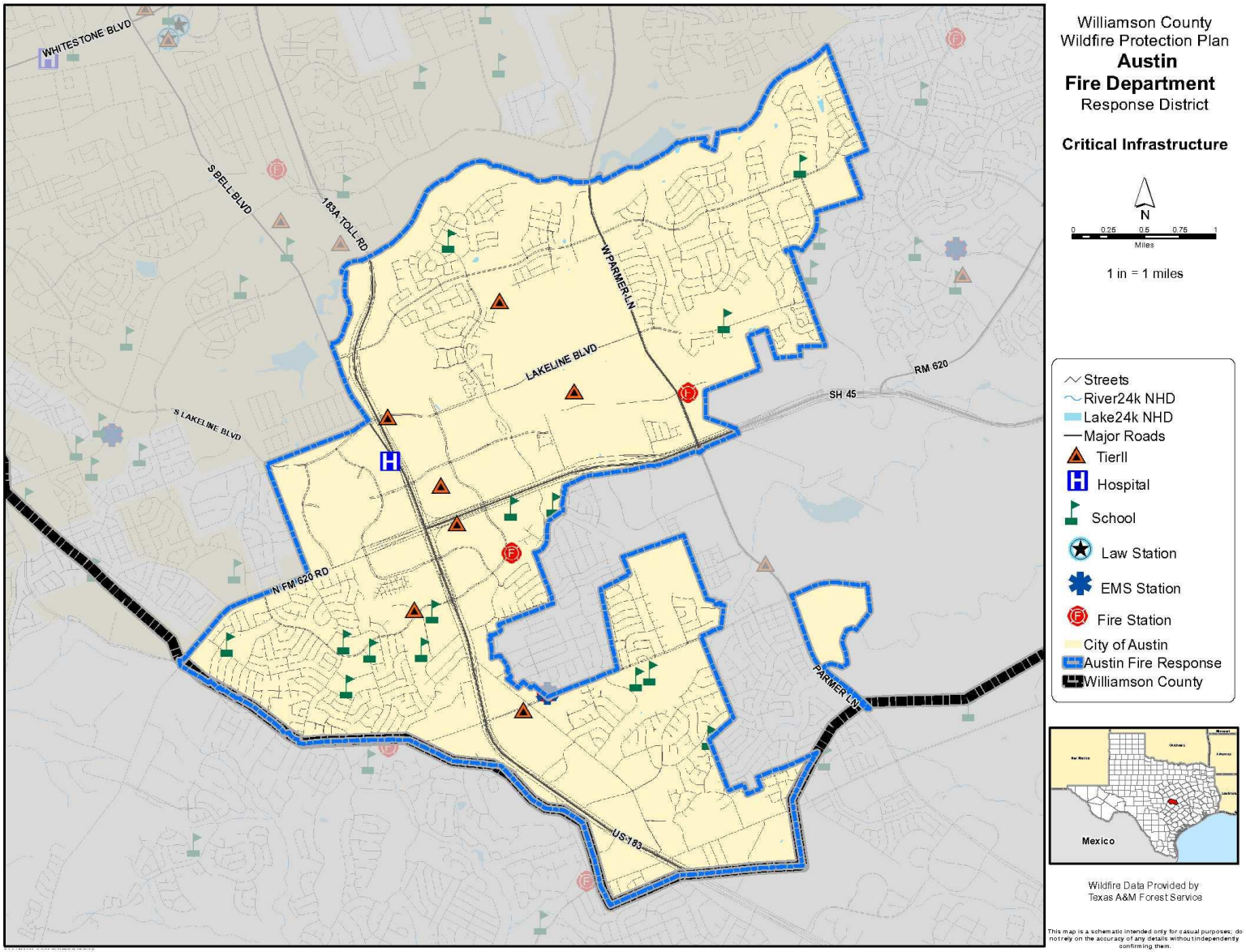
Critical Infrastructure within the Austin Fire Department

One of the critical elements of the CWPP is to analyze where the critical infrastructure within the district is located in comparison to the highest risk areas for wildfire. Critical facilities typically fall within the following categories: Hospitals, Schools, Law Enforcement, Fire, Emergency Medical Services (EMS) and Tier II Facilities. The following summarizes the general types of critical facilities located within the District.

AUSTIN FIRE DEPARTMENT AREA CRITICAL INFRASTRUCTURE SUMMARY	
Facility Type	Number of Facilities
Hospitals	1
Schools	14
Law Enforcement	0
Fire	2
Emergency Medical Services (EMS)	0
Tier II Facilities	7

As mentioned above, once the critical facilities are identified, the next step is to assess where and which facilities may be located in high risk areas and to then determine whether these facilities are candidates for special actions / measures like hardening, increased fire proofing, wildfire mitigation or relocation, etc. This plan analyzed impacts based in five wildfire factors: Wildland Urban Interface, Flame Length, Surface Fuels, Vegetation and Wildfire Threat as mapped and defined by the Texas State Forest Service and Texas A&M. More detail is provided later in this annex as to the level and possible impacts of these five characteristics.

Figure 1. Austin Critical Infrastructure



Wildland Urban Interface Fire Hazard and Environment

As mentioned previously in the Williamson County Interjurisdictional CWPP on the national level, following the establishment of the National Fire Plan via Executive Order due to the 2000 national wildfire season, work throughout the country was undertaken to identify areas at high risk from wildfire; this work would be used to identify the location of hazardous fuel reduction projects designed to reduce this risk. Communities across the nation that are considered to have a WUI have been identified; this list was subsequently published in the Federal Register.

Loss of structures due to wildland fires has been attributed to many factors, one of which is the proximity of hazardous fuels to homes and communities. During periods of hot, dry weather, the buildup of vegetation that has occurred on some Federal, State, and private lands in the vicinity of communities poses a potentially high risk of damage to homes and other structures, disruption to the local economy, or loss of life.

Other factors—including weather conditions and patterns, and the hazardous fuels conditions in the immediate vicinity of homes, businesses, and other structures—play important roles in the spread of wildland fire. Reducing hazardous fuel near communities may reduce, but not eliminate, wildlife risks to these communities. Some risk is inherent to communities that exist in fire-dependent ecosystems. Private landowners may help reduce this risk by creating defensible space around their homes and businesses, and by using fire-resistant materials in building those structures. Without such precautionary measures, fuel reduction on Federal land in the vicinity may be ineffective in significantly reducing community risk.

Per the Texas A&M Forest Service "The WUI is described as the area where structures and other human improvements meet and intermingle with undeveloped wildland or vegetative fuels. Population growth within the WUI substantially increases the risk from wildfire. In Texas nearly 85 percent of wildfires occur within two miles of a community." Texas is one of the fastest growing states in the Nation, with much of this growth occurring adjacent to metropolitan areas. This increase in population across the state will impact counties and communities that are located within the Wildland Urban Interface (WUI).

For the portion of the City of Austin located within the Williamson County, TX project area, it is estimated that 14,553 people or 32 percent of the total project area population (45,620) live within the WUI.

The Texas A&M Forest Service WUI dataset is derived using advanced modeling techniques based on the Where People Live dataset and LandScan USA (the Department of Energy's high-resolution geospatial and temporal modeling approach for population distribution and dynamics) population count data available from the Department of Homeland Security, HSIP Freedom Data Set. WUI is simply a subset of the Where People Live dataset. The primary difference is populated areas surrounded by sufficient non-burnable areas (i.e. interior urban areas) are removed from the Where People Live data set, as these areas are not expected to be directly impacted by a wildfire.

Figure 2. Austin Wildland Urban Interface

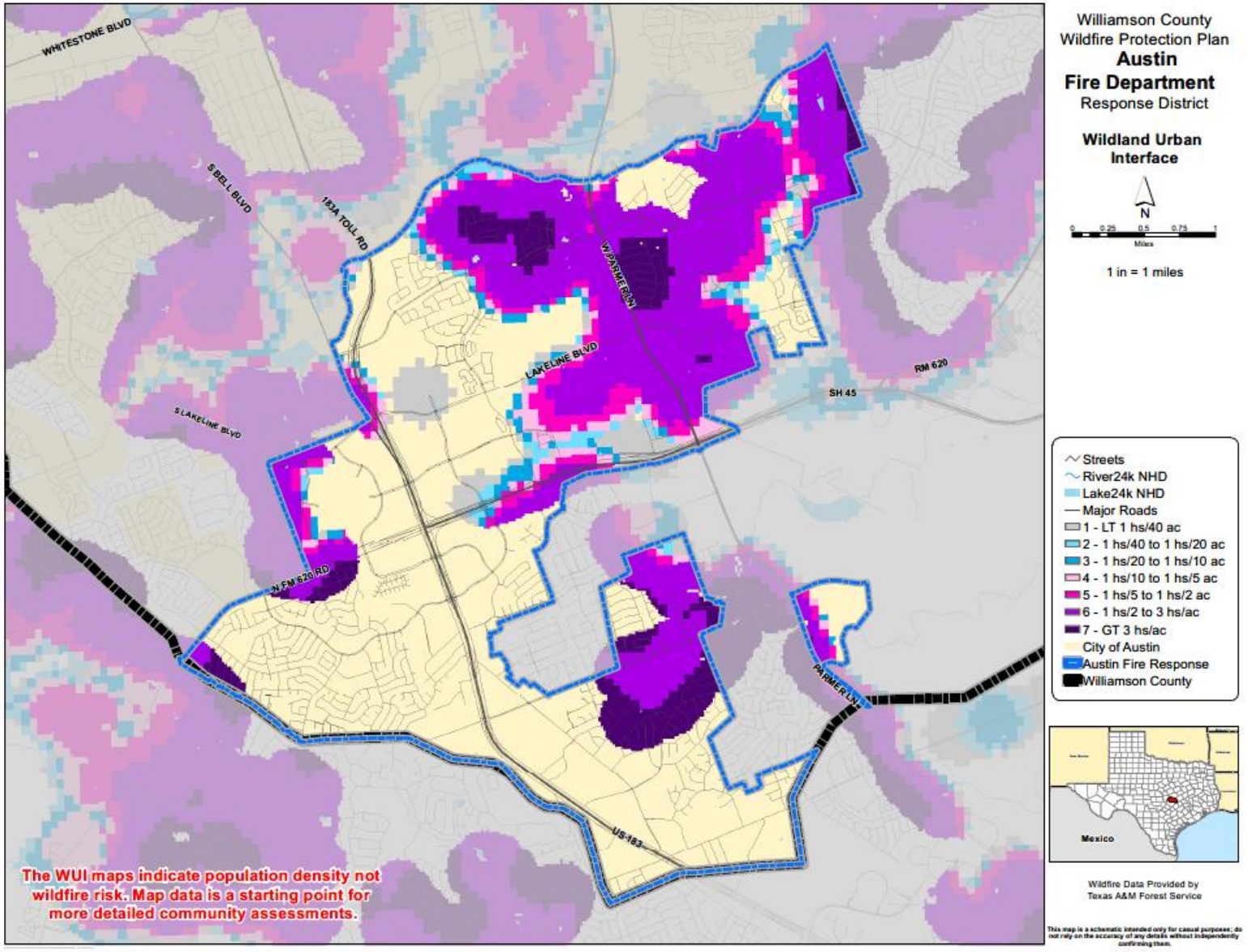


Table 1 Austin Wildland Urban Interface

	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	5	0.00%	315	7.90%
	1hs/40ac to 1hs/20ac	3	0.00%	125	3.10%
	1hs/20ac to 1hs/10ac	6	0.00%	177	4.40%
	1hs/10ac to 1hs/5ac	3	0.00%	263	6.60%
	1hs/5ac to 1hs/2ac	48	0.30%	433	10.80%
	1hs/2ac to 3hs/1ac	7,037	48.40%	2,121	52.90%
	GT 3hs/1ac	7,451	51.20%	571	14.30%
	Total:	**14,553**	**100.00%**	**4,006**	**100.00%**

Critical Infrastructure

Identify Critical Infrastructure and Community Values at Risk

It is estimated that 34.5% of the total population of the City of Austin lives within the WUI; however, the entire city has some level of wildfire risk. The overall level of concern for wildfires is located mostly along the perimeter of the WUI. Areas along railroads and homes in wooded, rural areas have an increased risk to wildfire. The following critical infrastructure were identified in the 2016 City of Austin Hazard Mitigation Plan has having moderate to high risk to wildfires:

Facility Name	Facility Type	Wildfire Risk
Seton Southwest Hospital	Hospital	Moderate
Austin Fire and EMS - 8700 W SH 71	Fire / EMS	Moderate
Austin Fire and EMS - 7701 River Place Blvd.	Fire / EMS	Moderate
Austin Fire and EMS - 4200 City Park Rd.	Fire / EMS	Moderate
Austin Fire and EMS - 11401 Escarpment Blvd	Fire / EMS	Moderate
Austin Fire and EMS - 3625 Davis Ln	Fire / EMS	Moderate
Austin Montessori School	School	Moderate
Bowie High	School	Moderate
Bridge Point Elementary	School	Moderate
Cedar Creek Elementary	School	Moderate
Clayton Elementary	School	Moderate
Four Points Middle	School	Moderate
Gorzycki Middle	School	Moderate
Grandview Hills Elementary	School	Moderate
Kiker Elementary	School	Moderate
Oak Hill Elementary	School	Moderate

Facility Name	Facility Type	Wildfire Risk
River Place Elementary	School	Moderate
Vandegrift High	School	Moderate
Baldwin Elementary	School	Moderate
Regents School of Austin	School	Moderate

According to the City's CWPP, there is one planning unit at highest risk, 7 at high risk, 12 at medium risk, 13 at low risk and 16 at lowest risk. The planning units identified as having high and highest risk in the City include: McNeil (highest)

- Brushy Creek (high)
- Emma Long Park (high)
- Harris Branch (high)
- Lower Walnut Creek (high)
- Oak Hill (high)
- Lake Austin (high)
- Del Valle (high

WILDFIRE ELEMENTS

Surface Fuels

Surface fuels are important to categorize for they account for the surface fire potential. Canopy fire potential is computed through a separate but linked process. The Texas Wildfire Risk Assessment (TWRA) Summary Report for Williamson County accounts for both surface and canopy fire potential in the fire behavior outputs.

Surface fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire:

- grass
- shrub/brush
- timber litter
- slash.

DEFINITIONS

Surface fuels—Surface fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics.

There are two standard fire behavior fuel model sets published for use. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott and Burgan 2005) contains 40 fuel models. The TWRA uses fuel models from both sets, as well as two additional custom fuel models devised by Texas A&M Forest Service. For a complete list of the fuel models utilized in the TWRA refer to the TWRA and Table 2.

Table 2 shows that the county primarily consists of Moderate Load, Dry Climate Grass at 14.6%, followed by Low Load, Dry Climate Grass at 11.7%, Hardwood Timber Litter at 10.2%, and Closed Timber Litter with 3.9% comprised of timber litter. Figure 3 is a City of Austin map showing all the surface fuel types.

Figure 3. City of Austin - Surface Fuels by type

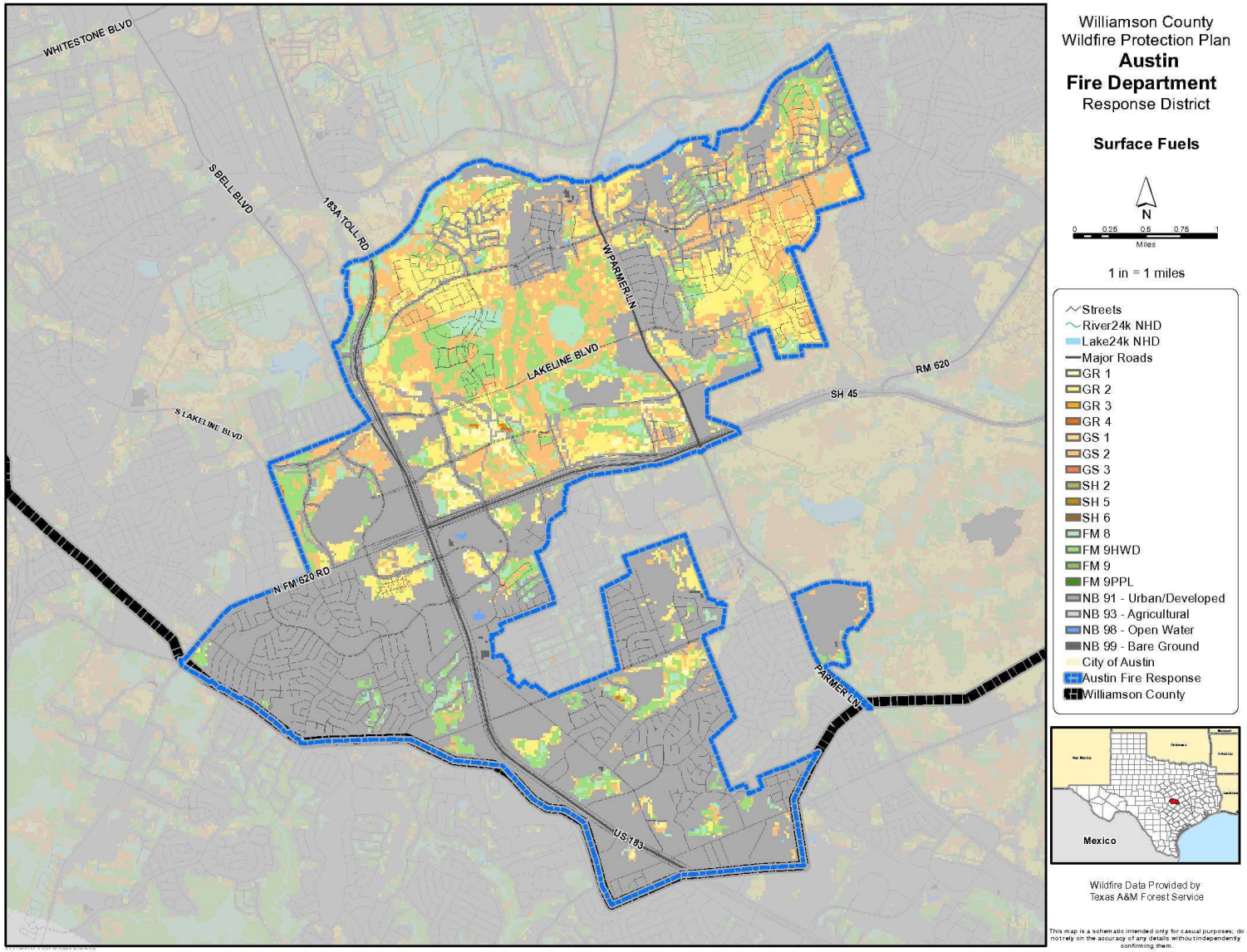


Table 2. Austin Surface Fuels by Type

	Surface Fuels	Description	FBPS Fuel Model Set	Acres	Percent
	GR 1	Short, Sparse Dry Climate Grass (Dynamic)	2005	90	1.0 %
	GR 2	Low Load, Dry Climate Grass (Dynamic)	2005	999	11.7 %
	GR 4	Moderate Load, Dry Climate Grass (Dynamic)	2005	5	0.1 %
	GS 2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	2005	1,249	14.6 %
	FM 8	Closed timber litter (compact)	1982	334	3.9 %
	FM 9 HWD	Hardwood litter (fluffy) - Low Load for Texas	Custom	874	10.2 %
	NB 91	Urban/Developed	2005	4,991	58.2 %
	NB 98	Open Water	2005	18	0.2 %
	NB 99	Bare Ground	2005	11	0.1 %
			Total:	**8,572**	**100.0%**

Vegetation

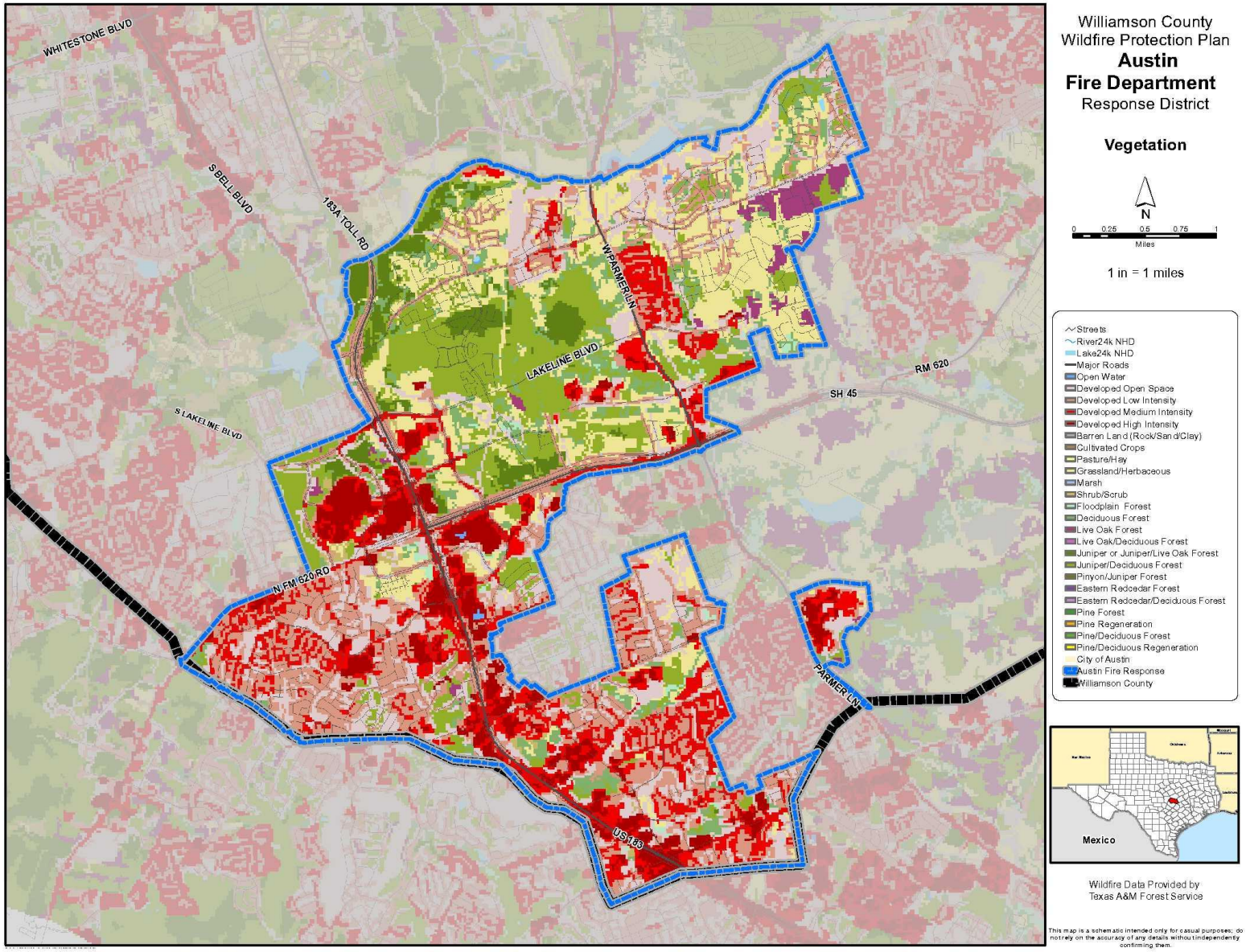
The Vegetation map describes the land cover and vegetation types across the City of Austin within Williamson County. In the Texas Wildfire Risk Assessment (TWRA), the Vegetation dataset is used to support the development of the Surface Fuels, Canopy Cover, Canopy Stand Height, Canopy Base Height, and Canopy Bulk Density datasets. The vegetation classes with descriptions are shown in the following table.

Table 3. Austin Vegetation

	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	13	0.2 %
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc…)	1,357	15.8 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	1,815	21.2 %
	Developed Medium Intensity	Impervious surfaces account for 50-79% of total cover	1,202	14.0 %
	Developed High Intensity	Impervious surfaces account for 80-100%of total cover	628	7.3 %

	Class	Description	Acres	Percent
	Grassland/Herbaceous	Areas dominated (> 80%) by grammanoid or herbaceous vegetation, can be grazed	1,291	15.1 %
	Shrub/Scrub	Areas dominated by shrubs/trees < 5 meters tall, shrub canopy > than 20% of total vegetation	43	0.5 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	45	0.5 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	533	6.2 %
	Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	136	1.6 %
	Juniper or Juniper/Live Oak Forest	> 20% tree cover, juniper or juniper/live oak species represent > 75% of the total tree cover	316	3.7 %
	Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	1,192	13.9 %
		Total:	**8,572**	**100.0 %**

Figure 4. Austin Vegetation



Flame Length

Characteristic Flame Length is the typical or representative flame length of a potential fire based on a weighted average of four percentile weather categories. Flame Length is defined as the distance between the flame tip and the midpoint of the flame depth at the base of the flame, which is generally the ground surface. It is an indicator of fire intensity and is often used to estimate how much heat the fire is generating. Flame length is typically measured in feet. Flame length is the measure of fire intensity used to generate the response index outputs for the TWRA. Flame length characteristics are varied in the portion of the City of Austin located within Williamson County but are predominantly non-burnable at 58.6%, followed by 4-8 feet at 16.9%, 0-2 feet at 9.2% and 30 feet plus at 7.7%.

Flame length is a fire behavior output, which is influenced by three environmental factors - fuels, weather, and topography. Weather is by far the most dynamic variable as it changes frequently. To account for this variability, four percentile weather categories were created from historical weather observations to represent low, moderate, high, and extreme weather days for each weather influence zone in Texas. A weather influence zone is an area where, for analysis purposes, the weather on any given day is considered uniform. There are 22 weather influence zones in the State of Texas.

Figure 5. Austin Flame Length

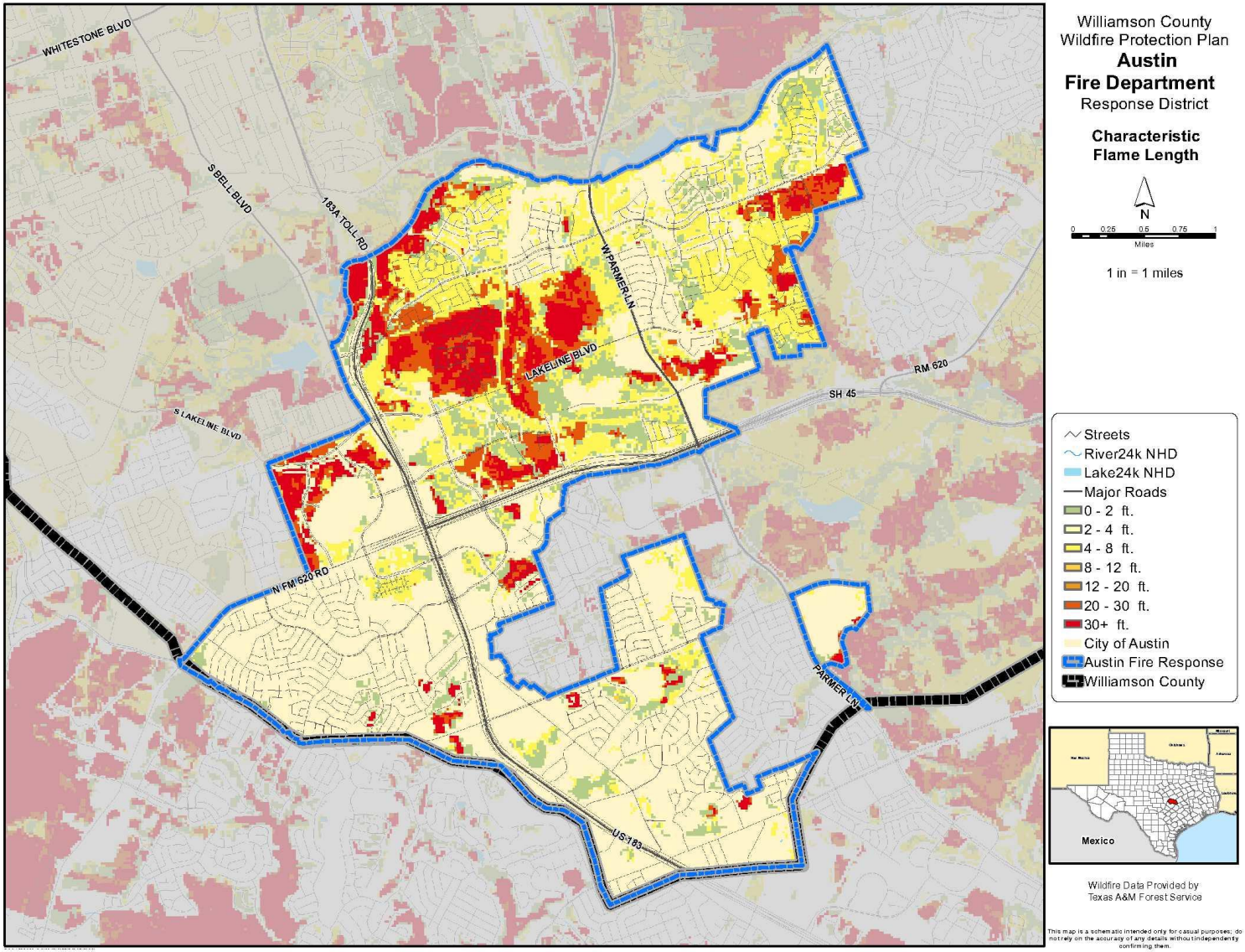


Table 4. Flame Length

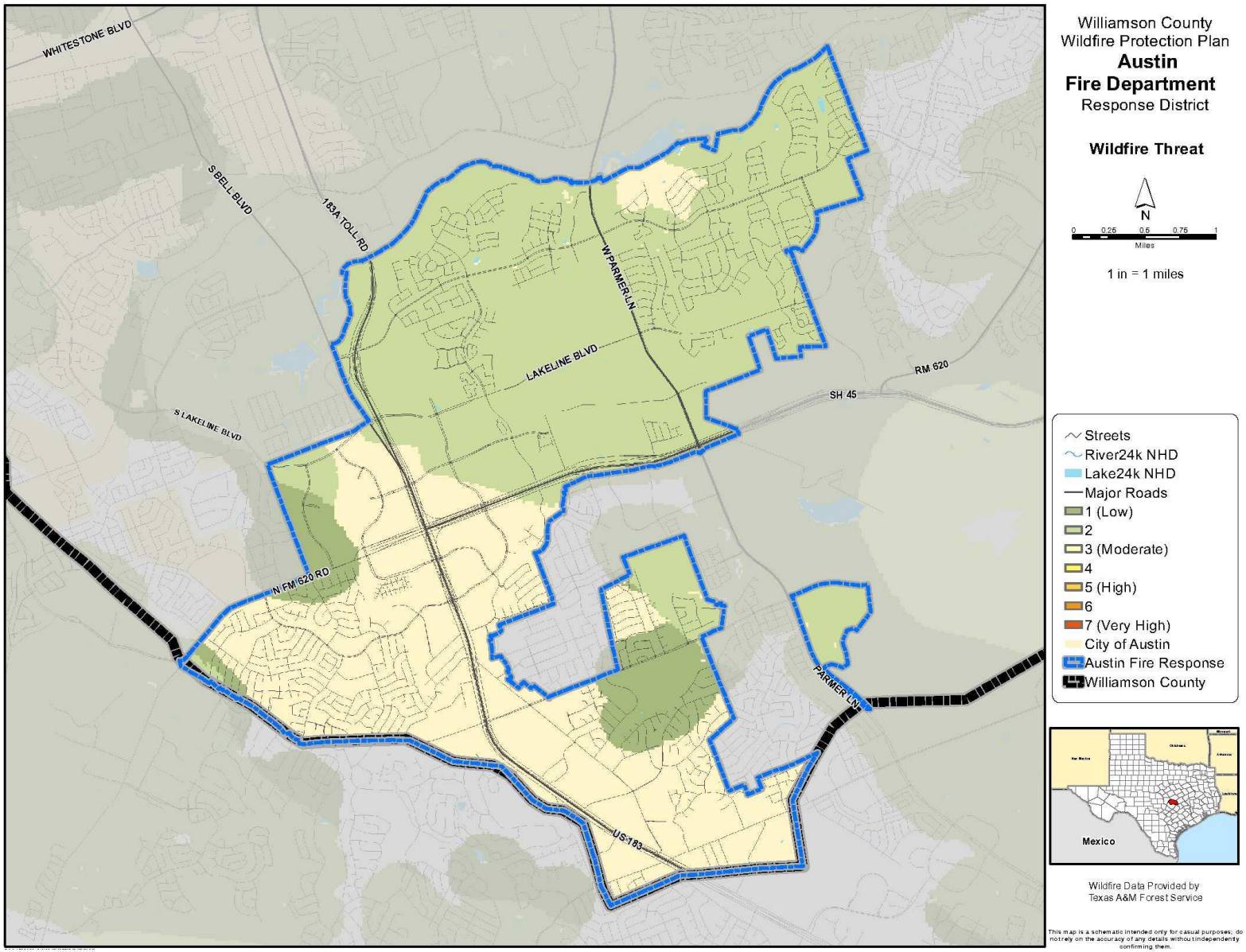
	Flame Length	Acres	Percent
	Non-Burnable	5,020	58.6 %
	0 - 2 ft.	786	9.2 %
	2 - 4 ft.	142	1.7 %
	4 - 8 ft.	1,451	16.9 %
	8 - 12 ft.	5	0.1 %
	20 - 30 ft.	510	5.9 %
	30 + ft.	656	7.7 %
	Total:	**8,572**	**100.0 %**

Wildfire Threat

Per the Texas A&M Forest Service Wildfire Threat is the likelihood of a wildfire occurring or burning into an area. Threat is derived by combining a number of landscape characteristics including surface fuels and canopy fuels, resultant fire behavior, historical fire occurrence, percentile weather derived from historical weather observations, and terrain conditions. These inputs are combined using analysis techniques based on established fire science.

The measure of wildfire threat used in the Texas Wildfire Risk Assessment (TWRA) is called Wildland Fire Susceptibility Index, or WFSI. WFSI combines the probability of an acre igniting (Wildfire Ignition Density) and the expected final fire size based on rate of spread in four weather percentile categories. WFSI is defined as the likelihood of an acre burning. Since all areas in Texas have WFSI calculated consistently, it allows for comparison and ordination of areas across the entire state. For example, a high threat area in East Texas is equivalent to a high threat area in West Texas.

Figure 6 Wildfire Threat



To aid in the use of Wildfire Threat for planning activities, the output values are categorized into seven (7) classes. These are given general descriptions from Low to Very High threat. 40.1% of the area within the Williamson County portion of the City of Austin is designated as non-burnable. The balance of the area or 59.9 % is designated as low (categories 1 & 2).

Table 5 Wildfire Threat

	Class	Acres	Percent
	Non-Burnable	,438	40.1 %
	1 (Low)	574	6.7 %
	2	4,560	53.2 %
	Total:	**8,572**	**100.0 %**

WILDFIRE MITIGATION ACTIONS

Mitigation strategies identified in the CWPP include:

- Develop LDC chapters to address development in wildfire high risk areas in the City
- Include high risk wildfire areas on zoning overlays
- Incorporate the WUI into the platting and subdivision processes
- Improve or modify existing building codes to address specific construction materials or processes to reduce ignition potential and improve safety
- Increase wildfire awareness through public education to engage the community in personal responsibility by creating a fire-adapted community, a fire-resilient landscape, and providing a safe, effective, and efficient firefighting environment
- Develop of local-level CWPPs to provide the framework for translating strategic principles into tactical solutions and community action
- Detail a Home Ignition Zone (HIZ) mitigation strategy that WUI homeowners can implement to protect life and property
- Further detail hazardous fuel reduction, as a companion to the HIZ discussion, because this mitigation strategy contributes significantly to minimizing wildfire impacts.
- Coordinating codes and regulations across all jurisdictions within the planning area to accomplish a balance between each respective entity's mission and needed wildfire mitigation.

Mitigation strategies identified in the Hazard Mitigation Plan that address wildfire:

- Provide a backup site for workers displaced due to a disaster
- Have a workshop on ways to retrofit historic homes to mitigate weather-related hazards
- Implement mitigation strategies that would strengthen and retrofit existing, pre-identified City of Austin facilities that serve as intermediate shelters, to include replacing windows with shatter-proof glass, upgrading fire systems, reinforcing wall and foundation connections, and other mitigation activities as required.
- Create and implement a component of the City of Austin Business Recovery Plan that will educate private business on the hazards the City is subject to and assist them with the identification of methods to mitigate the impact of those hazards on their business. This will help educate business owners on mitigation strategies that will make their properties more hazard resistant.
- Establish new rural roadway design criteria with wider paved shoulders where feasible for less potential of fire caused by vehicles or motorists and better performance of roadways on expansive

soils. Additional edge protection creates longer distance to fuel sources for fire and longer moisture path to travel lanes for soil stability.

- Initiate the adoption of the International Code Councils' Wildland Urban Interface Code or an equivalent regulatory framework, to mitigate the threat of wildfire in high risk areas of the city.
- Develop evacuation plan for areas without adequate collector roadways and connectivity during a wildfire or other emergency events. Plan may include the mitigation of pinch points, and high ignition corridors traffic control strategies.
- Utilization of goats to mitigate fire fuels in high risk areas where the use of mechanical equipment would result in environmental impacts. Establishment of contract services for grazing in designated high risk corridors.
- Replacement of wooden attachments to structures and installation of ember resistive ventilations systems. This project would include the replacement of existing combustible decks and fences with ignition resistant materials as well as retrofit of ventilation systems to include ember resistive components.
- Establish an alternate power supply at Austin Police Department station so law enforcement can continue to operate in an emergency that effects the city's power grid.
- Establish an alternate power supply at the City of Austin Public Safety Training Center (PSTC) so emergency services can continue to operate in an emergency that affects the city's power grid. This will include a generator and an Uninterrupted Power Supply (UPS).
- Create and implement an Extreme Event Recovery Plan that includes a Social Capital component. The plan would be based on expert knowledge in this area and would shares best practices with a variety of urban change makers.
- As the next step of the CHA/CHIP, Austin/Travis County Health and Human Services Department will initiate Building Resilience Against Climate Effects (BRACE), a CDC developed framework that allows public health departments put complex atmospheric science and climate projections into their mitigation, planning and response activities.
- Conduct public education to promote FIREWISE practices such as removing debris, and constructing fire-resistant structures.
- Conduct public education to promote Xeriscaping of vegetation that requires little water for times of drought when water resources are low.
- Purchase mobile back-up generators for critical nodes around AISD, such as the Service Center and the Skyline Building, both of which house network servers.
- Retrofit AISD facilities as a hardened shelter that will be upgraded for safe shelter use in hazardous weather events or man-caused hazards.
- Practice FIREWISE mitigation techniques such as creating defensible space around structures.
- Develop evacuation plan and routinely conduct evacuation exercises.
- Purchase NOAA "All Hazards" radios for early warning and event information to be placed throughout school district.
- Implement a public education program to increase public awareness by teaching students and faculty about the dangers of hazards and what precautions to take during a disaster or natural hazard.