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**Williamson County Community Interjurisdictional CWPP**

## **Annex 15: Taylor Fire Department**

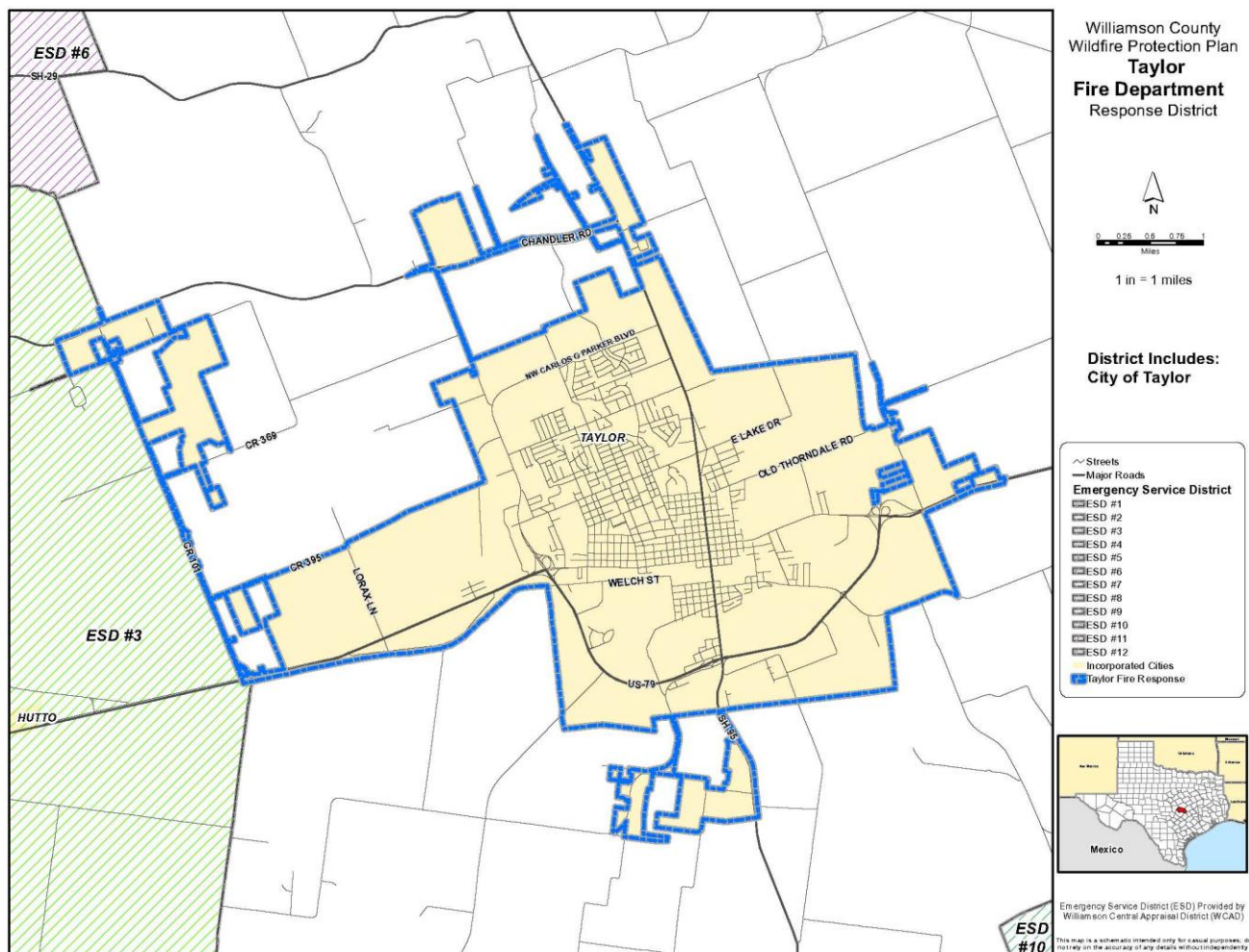
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## ANNEX 15: TAYLOR FIRE DEPARTMENT

### INTRODUCTION

#### Organization and Jurisdiction

Figure 1. Taylor Emergency Service Areas



### CURRENT /HISTORICAL MITIGATION ACTIONS AND PROGRAMS

The City of Taylor has submitted a completed Hazard Mitigation Plan for approval by FEMA.

### PUBLIC EDUCATION AND OUTREACH PROGRAMS

No information has been received.

CAPABILITIES ASSESSMENT

Emergency Response Capabilities

No information has been received.

Policies

No information has been received.

Regulations

No information has been received.

Ordinances and Codes

No information has been received.

IDENTIFY CRITICAL INFRASTRUCTURE AND COMMUNITY VALUES AT RISK

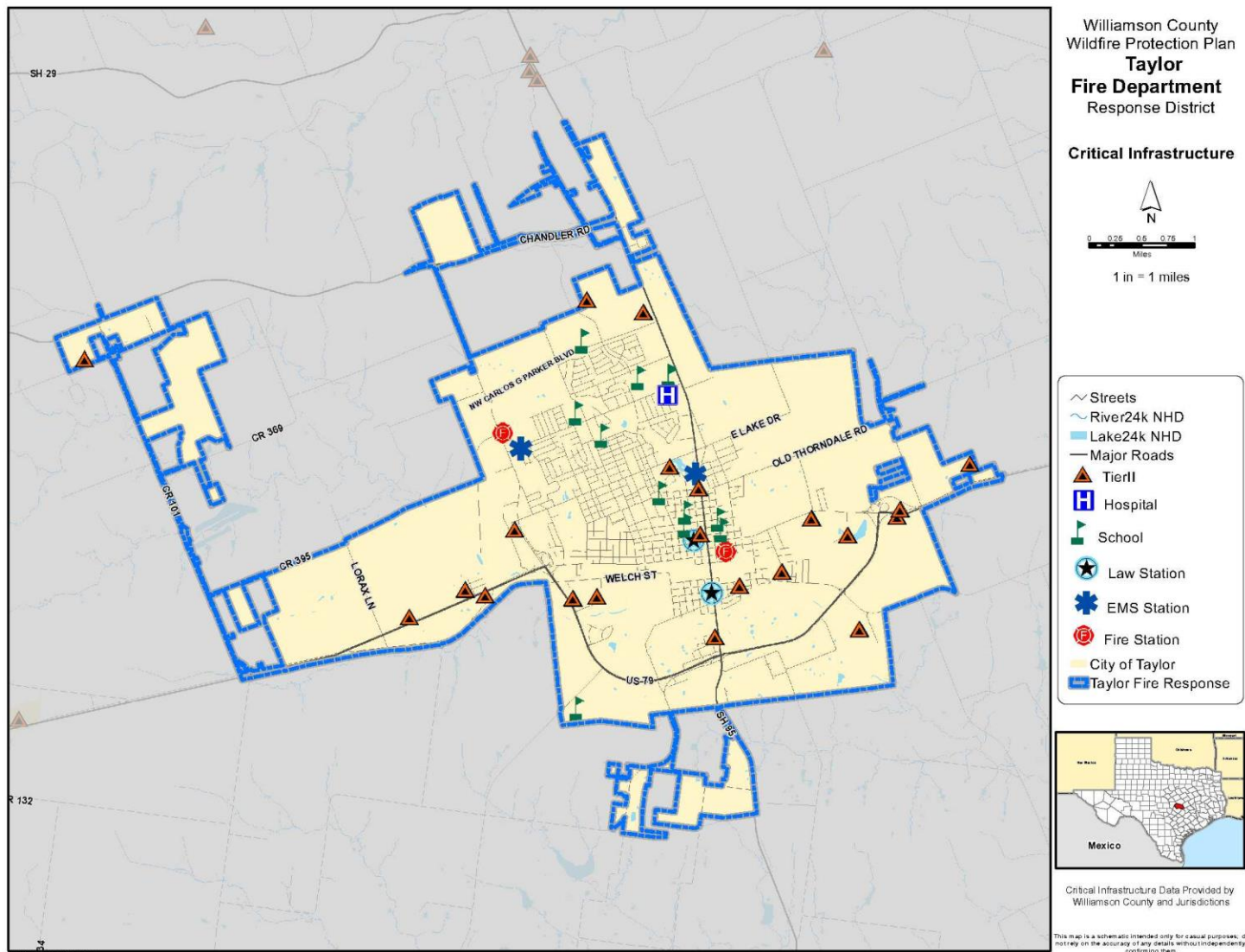
Critical Infrastructure within the Taylor Fire Departments

One of the critical elements of the Community Wildfire Protection Plan 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, EMS and Tier II facilities. Within the Taylor Fire Department there are facilities that have been designated as critical. The following summarizes the general types of critical facilities located within the District.

Taylor Fire Departments Critical Infrastructure Summary	
Facility Type	Number of Facilities
Hospitals	Not provided
Schools	Not provided
Law Enforcement	Not provided
Fire	Not provided
Emergency Medical Services (EMS)	Not provided
Tier II Facilities	Not provided

As mentioned above, once the critical infrastructure 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 A&M Forest Service. More detail is provided later in this annex as to the level and possible impacts of these five characteristics.

Figure 2. Taylor Critical Infrastructure



## Wildland Urban Interface Fire Hazard and Environment

As mentioned previously in the Williamson County Community Wildfire Protection Plan (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.

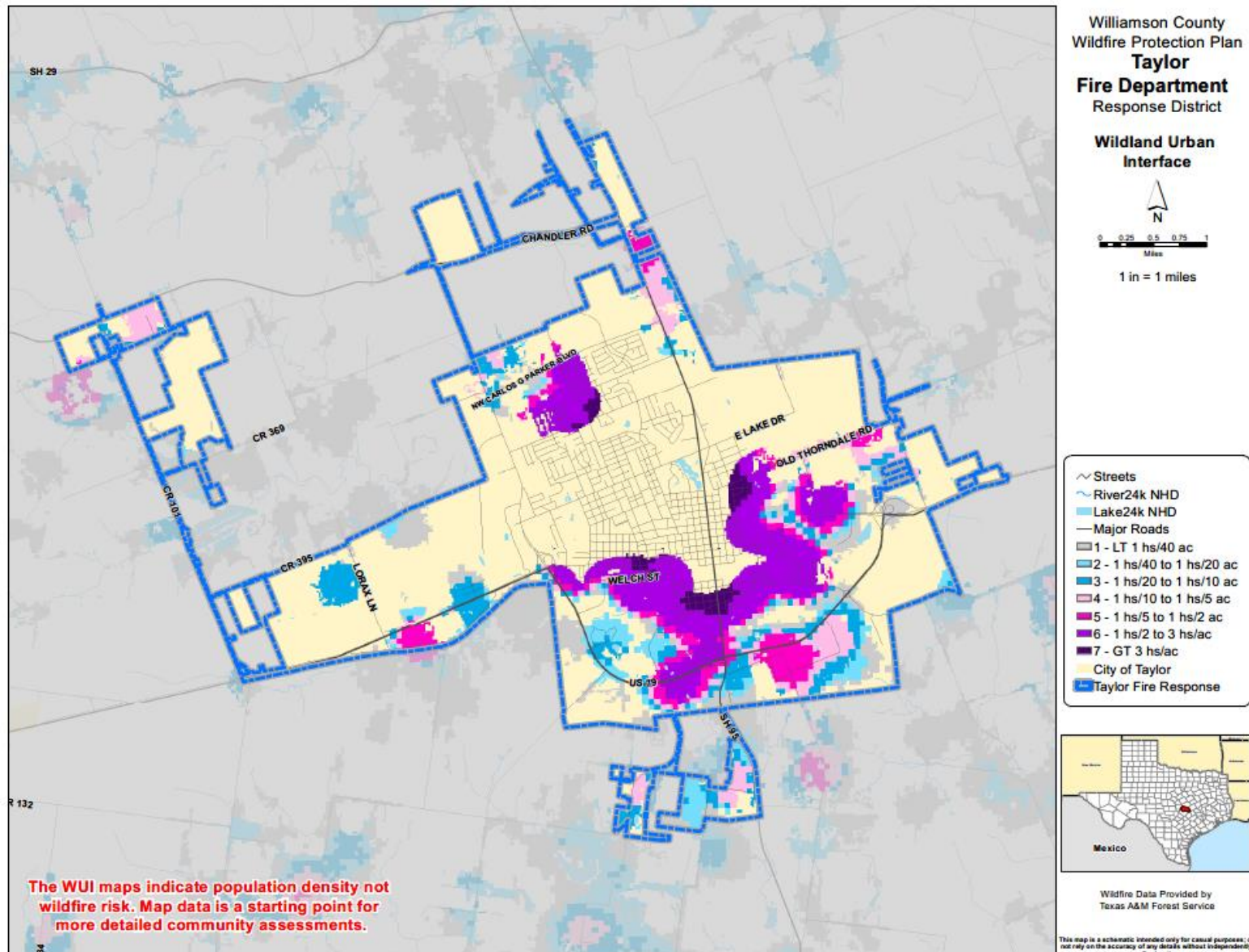
Other factors—including weather conditions and patterns, and the hazardous fuels conditions in the immediate vicinity of homes, businesses, and other structures—play important roles in the spread of wildland fire. Reducing hazardous fuel near communities may reduce, but not eliminate, wildfire risks 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).

The Texas A&M Forest Service WUI dataset is derived using advanced modeling techniques based on the Where People Live dataset and LandScan USA 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 3. Taylor Wildland Urban Interface



	Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
	LT 1hs/40ac	20	0.3 %	752	17.3 %
	1hs/40ac to 1hs/20ac	31	0.4 %	481	11.0 %
	1hs/20ac to 1hs/10ac	143	2.0 %	687	15.8 %
	1hs/10ac to 1hs/5ac	301	4.3 %	647	14.9 %
	1hs/5ac to 1hs/2ac	285	4.0 %	504	11.6 %
	1hs/2ac to 3hs/1ac	4,649	65.7 %	1,147	26.3 %
	GT 3hs/1ac	1,642	23.2 %	139	3.2 %
	<b>Total:</b>	<b>7,071</b>	<b>100.0 %</b>	<b>4,356</b>	<b>100.0 %</b>

## 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

There are two standard fire behavior fuel model sets published for use.

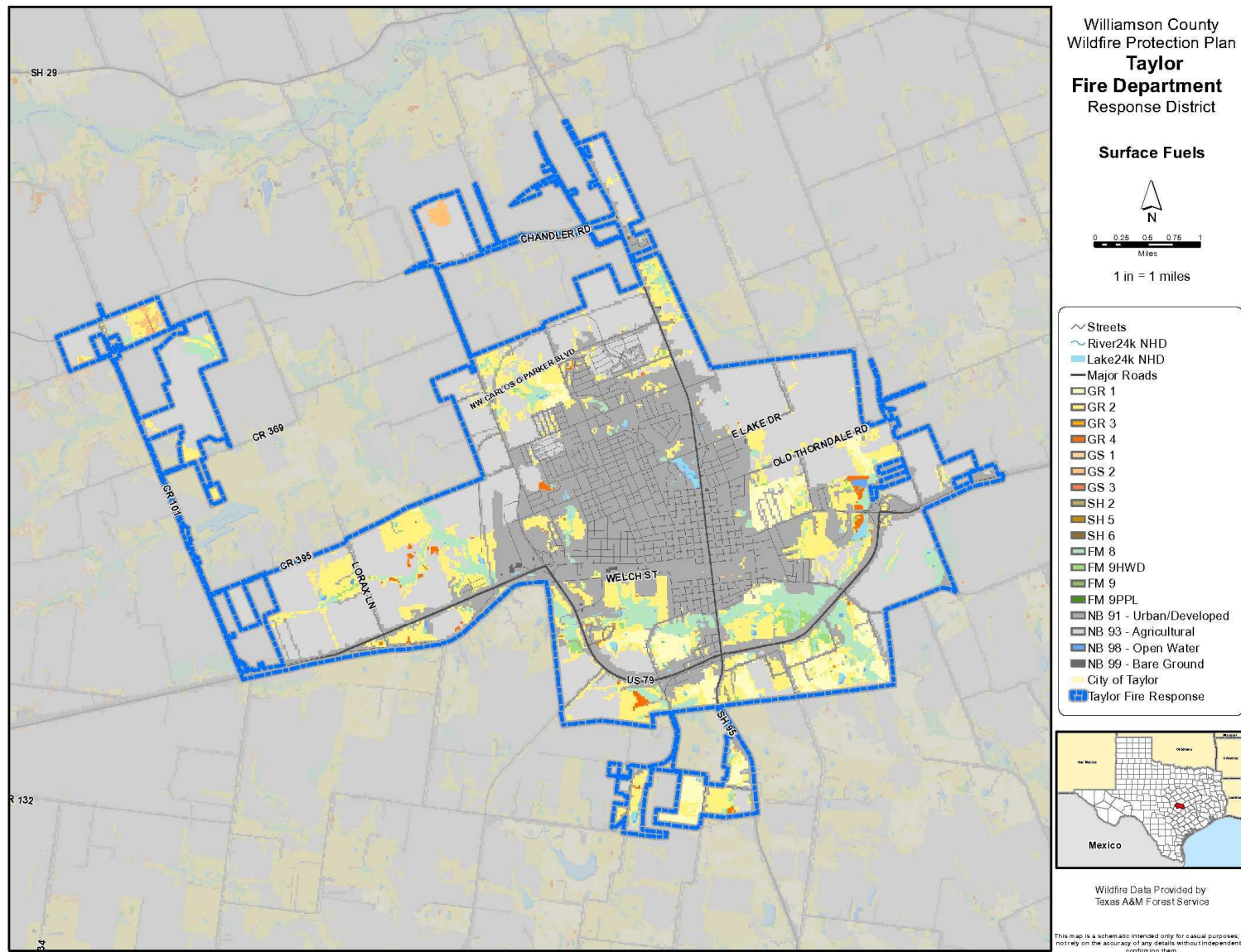
The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott and Burgan, 2005) contains 40 fuel models. The TWRA uses fuel models from both sets, as well as two additional custom fuel models devised by Texas A&M Forest Service.

Figure 4 shows that the county primarily consists of Moderate Load (32.3%), Urban/Developed at 17.8%, followed by Low Load, Dry Climate Grass at 16.4%, Short, Sparse Dry Climate Grass (Dynamic) at 10.3%, and Closed Timber Litter with 7.6%. Figure 3 Taylor FD's map showing all the surface fuel types follows below.

### 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.

Figure 4. Taylor- Surface Fuels by Type



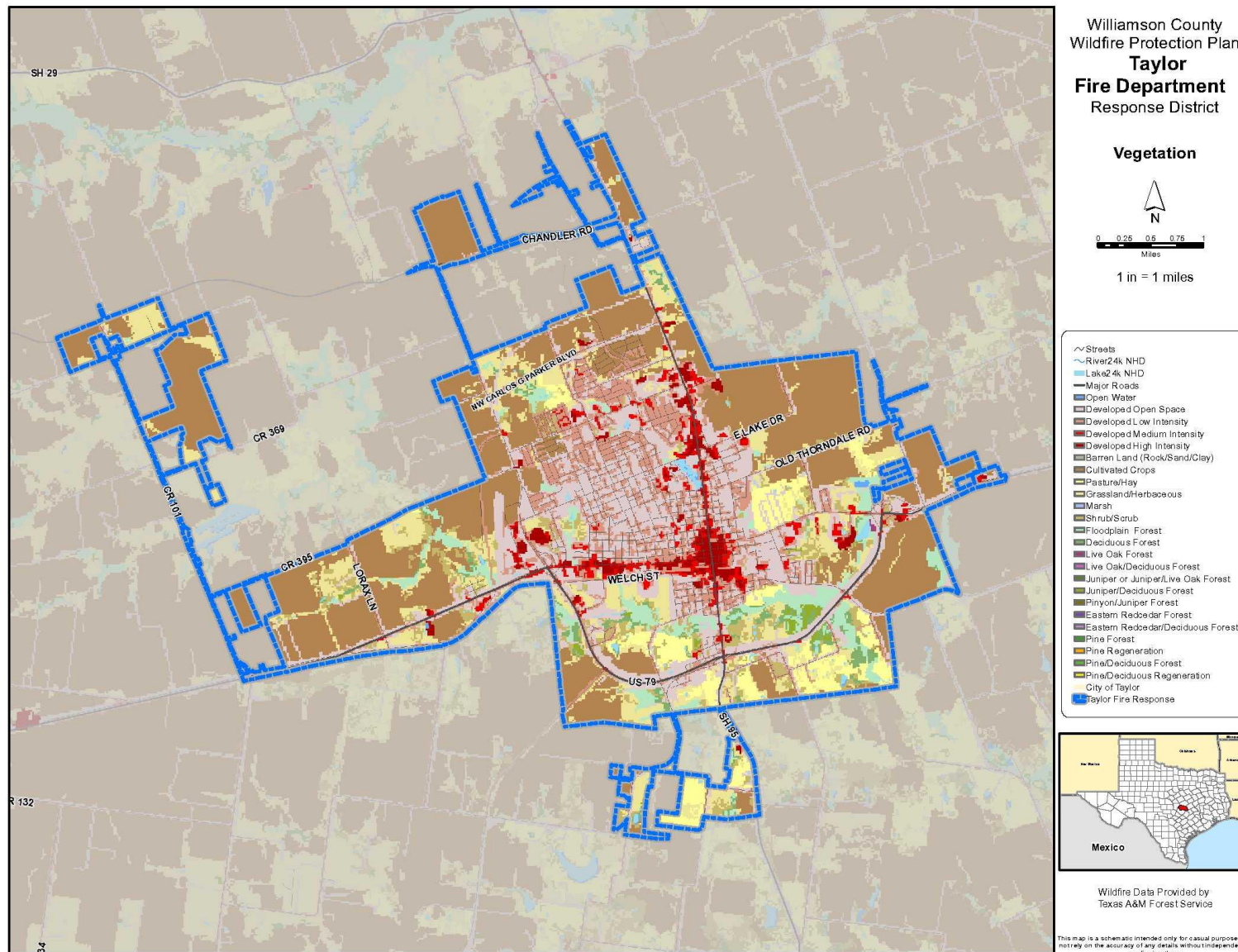


	Surface Fuels	Description	FBPS Fuel Model Set	Acres	Percent
	GR 1	Short, Sparse Dry Climate Grass (Dynamic)	2005	546	4.5 %
	GR 2	Low Load, Dry Climate Grass (Dynamic)	2005	1,883	15.6 %
	GR 4	Moderate Load, Dry Climate Grass (Dynamic)	2005	66	0.5 %
	GS 2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	2005	58	0.5 %
	FM 8	Closed timber litter (compact)	1982	691	5.7 %
	FM 9 HWD	Hardwood litter (fluffy) - Low Load for Texas	Custom	95	0.8 %
	NB 91	Urban/Developed	2005	4,483	37.1 %
	NB 93	Agricultural	2005	4,212	34.8 %
	NB 98	Open Water	2005	50	0.4 %
	NB 99	Bare Ground	2005	13	0.1 %
Total:				12,096	100.0%

## Vegetation

The Vegetation map describes the land cover and vegetation types across the Taylor area. 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. It should be noted that the area is dominated by cultivated crops make up 35.4% of the land, 20.3% of the land is developed open space, and 12.1% is classified as Grassland/Herbaceous.

Figure 5. Taylor Vegetation



	Class	Description	Acres	Percent
	Open Water	All areas of open water, generally with < 25% cover of vegetation or soil	28	0.2 %
	Developed Open Space	Impervious surfaces account for < 20% of total cover (i.e. golf courses, parks, etc...)	2,453	20.3 %
	Developed Low Intensity	Impervious surfaces account for 20-49% of total cover	1,512	12.5 %
	Developed Medium Intensity	Impervious surfaces account for 50-79% of total cover	291	2.4 %
	Developed High Intensity	Impervious surfaces account for 80-100% of total cover	241	2.0 %
	Cultivated Crops	Areas used for the production of annual crops, includes land being actively tilled	4,276	35.4 %
	Pasture/Hay	Areas of grasses and/or legumes planted for livestock grazing or hay production	547	4.5 %
	Grassland/Herbaceous	Areas dominated (> 80%) by graminoid or herbaceous vegetation, can be grazed	1,463	12.1 %
	Shrub/Scrub	Areas dominated by shrubs/trees < 5 meters tall, shrub canopy > than 20% of total vegetation	550	4.6 %
	Floodplain Forest	> 20% tree cover, the soil is periodically covered or saturated with water	506	4.2 %
	Deciduous Forest	> 20% tree cover, >75% of tree species shed leaves in response to seasonal change	170	1.4 %
	Live Oak Forest	> 20% tree cover, live oak species represent >75% of the total tree cover	3	0.0 %
	Juniper/Deciduous Forest	> 20% tree cover, neither juniper or deciduous species represent > 75% of the total tree cover	55	0.5 %
Total:			12,096	100.0 %

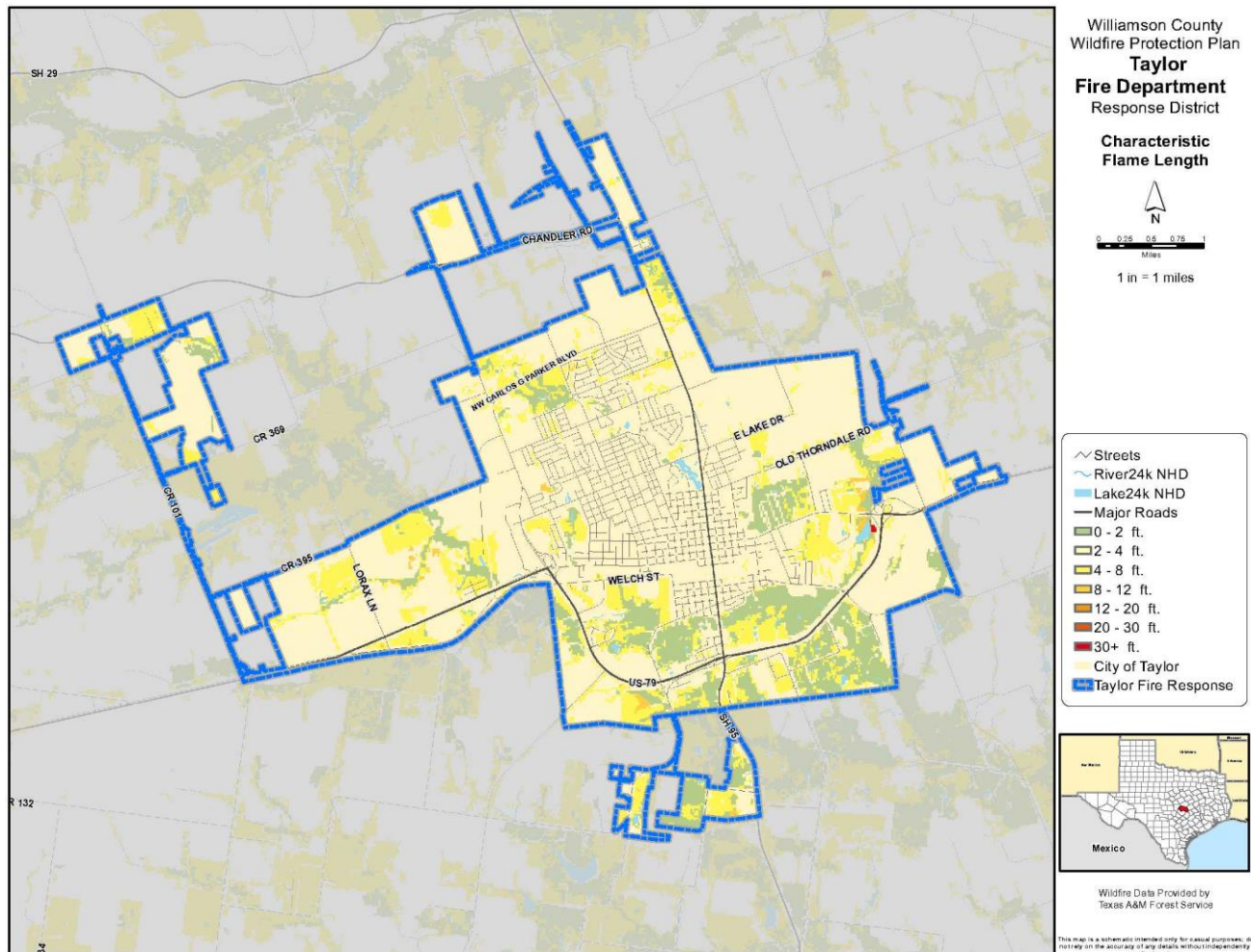
## Flame Length

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 Taylor area is dominated by non-burnable area at 72.4%, 15.4% of the area having a projected flame length of 4-8 feet, followed by 0-2 feet at 11.0 %, and 2-4 feet flame lengths are estimated at only .6% of the total area.

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 6. Taylor Flame Length



	Flame Length	Acres	Percent
	Non-Burnable	8,757	72.4 %
	0 - 2 ft.	1,331	11.0 %
	2 - 4 ft.	75	0.6 %
	4 - 8 ft.	1,865	15.4 %
	8 - 12 ft.	66	0.5 %
	20 - 30 ft.	1	0.0 %
	30 + ft.	2	0.0 %
Total:		12,096	100.0 %

Wildfire Threat

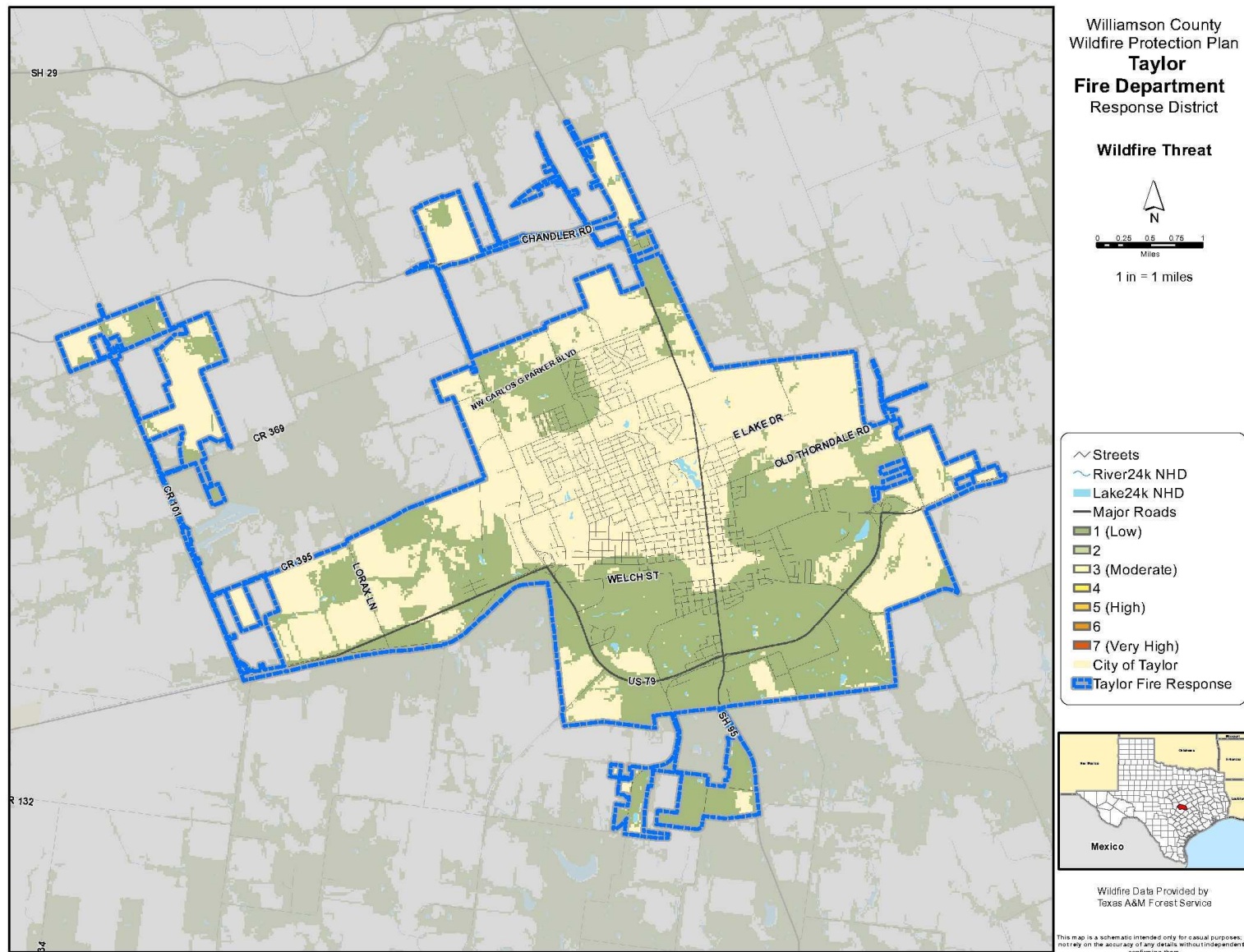
Per the Texas A&M Forest Service Wildfire Threat is the likelihood of a wildfire occurring or burning into an area. Threat is derived by combining a number of landscape characteristics including surface fuels and canopy fuels, resultant fire behavior, historical fire occurrence, percentile weather derived 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.

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. 55.2% of the area within the Taylor area is designated as non-burnable. The balance of the area or 44.8 % is designated as low (categories 1). A review of the data concludes that the area within the Taylor Fire District has a significantly lower wildfire threat than other areas of the county.

	Class	Acres	Percent
	Non-Burnable	6,682	55.2 %
	1 (Low)	5,414	44.8 %
Total:		12,096	100.0 %

Figure 7. Taylor Wildfire Threat



## WILDFIRE MITIGATION ACTIONS

Community Wildfire Risk Hazard Analysis (CWRHA) were conducted on select communities or subdivisions within this fire district. The CWRHA's are essential in identifying areas that are at risk for catastrophic wildfires leading to the destruction of private and commercial property along with environmentally sensitive areas. Assessments were performed overall of the community and not on individual home sites, which may not indicate increased totals for small or site-specific hazards.

Assessments were performed locally developed assessment criteria that addresses specific criteria and assigned a numerical value indicating the potential risk to the identified assessment area. Assessment areas include:

- Community Access / Egress
  - Access / Egress Points
  - Primary Road Width
  - Secondary Road Terminus
  - Accessibility (surface grade)
  - Subdivision Bridges
  - Roadway Fuels
  - Street Signs
- Home Site Hazards
  - Driveway Characteristics
  - Dominant Trees
  - Ladder Fuels
  - Vegetation
  - Slope of Property
  - Defensible Space
  - Lot Size
- Building Construction Hazards
  - Roofing Materials
  - Siding
  - Soffits
  - Foundation Type
  - Fencing
- Additional Factor Hazards
  - Fire Control Water Supply
  - Utilities
  - Surrounding Environment
  - Undeveloped Lots / Areas

*Note: Assessments did not include local firefighting capabilities as Williamson County maintains strong auto-aid and mutual-aid agreements amongst the local fire departments which greatly enhances the capabilities of each fire district.*

The CWRHA's were conducted utilizing the Crisistrack software and mobile application, which provides a comprehensive report for each selected assessment area. (available upon request)



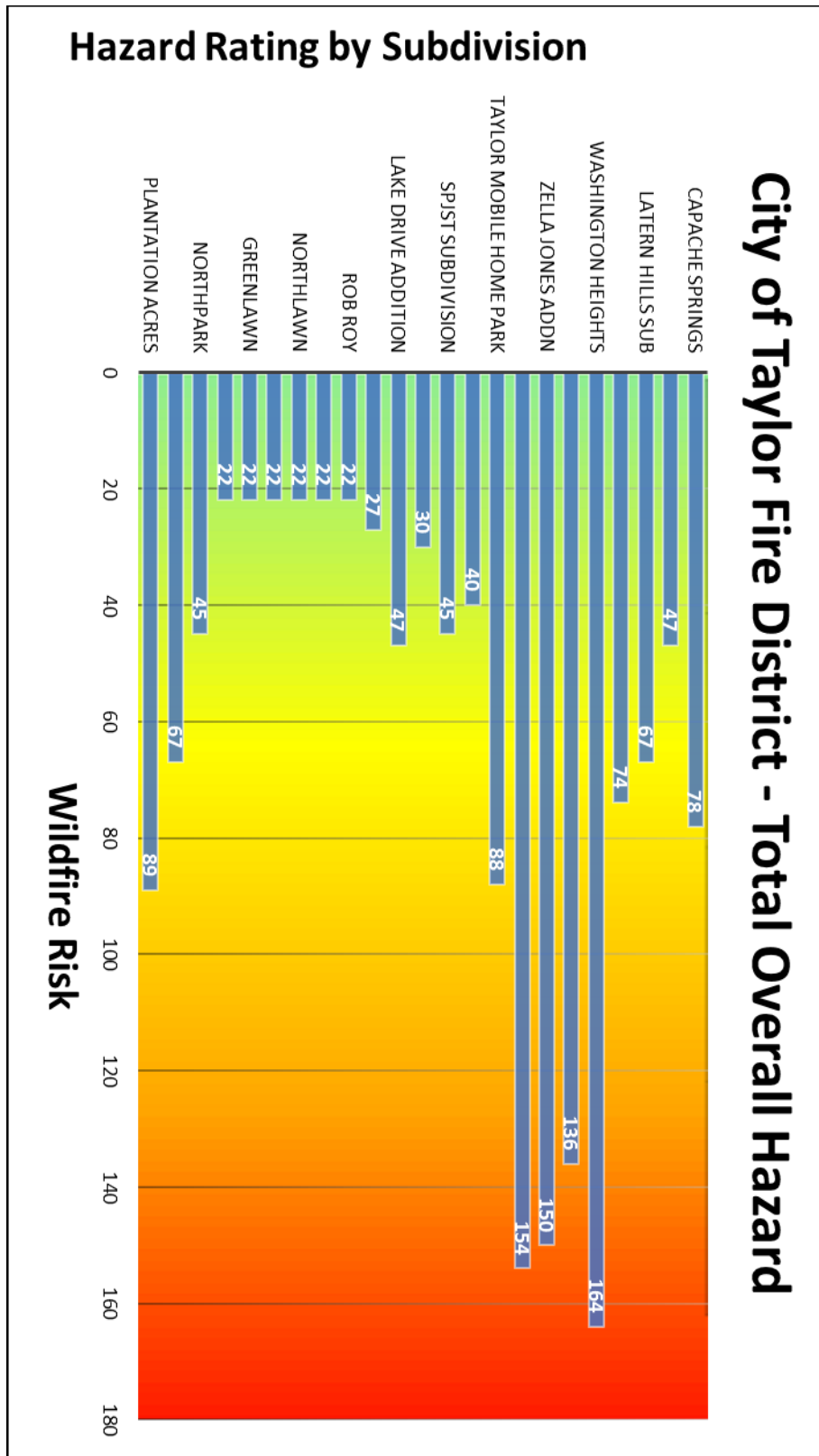
## Assessment Scoring

Section	Min	Mid	Max
Community Access/Egress Rating	0	19	38
Site Hazard Rating	5	62	119
Building Construction Hazard Rating	10	35	60
Additional Hazard Factors	0	25	50
<b>Total Hazard Factors</b>	<b>15</b>	<b>141</b>	<b>267</b>

## Community Hazards by Category

Name	Total Community	Total Site Hazard	Total Constuction Hazard	Total Addtl. Hazard	Total Overall Hazard
Plantation Acres	11	33	10	35	89
Summerwood	15	35	10	7	67
Northpark	2	33	10	0	45
John M Cuba	2	10	10	0	22
Greenlawn	2	10	10	0	22
MALLARD PARK	2	10	10	0	22
NORTHLAWN	2	10	10	0	22
BEL-AIR ADDITION	2	10	10	0	22
Rob Roy	2	10	10	0	22
Dahlberg Estates	7	10	10	0	27
LAKE DRIVE ADDITION	7	30	10	0	47
SUNSET ADDITION	5	10	10	5	30
SPJST SUBDIVISION	5	30	10	0	45
Steger Addition	0	30	10	0	40
Taylor Mobile Home Park	13	30	45	0	88
Southwood Hills Estates	14	95	10	35	154
Zella Jones Addn	18	75	35	22	150
Baker Addition	14	70	35	17	136
Washington Heights	17	80	35	32	164
HILLS OF MUSTANG CREEK	2	57	10	5	74
Latern Hills Sub	10	35	10	12	67
Taylor Southpark	7	5	10	25	47
Capache Springs	3	43	10	22	78

## Community Wildfire Hazard Rating



## WILDFIRE MITIGATION AND FUELS REDUCTION

### A. MITIGATION

Mitigation efforts for communities and subdivisions within the Taylor Fire District should focus on wildfire public education and the benefits of Firewise Programs. Education consisting of Ready-Set-Go and private property fuels reduction should be the primary focus of education.

### B. FUELS REDUCTION PROJECTS

No publicly owned properties requiring fuels reduction have been identified in the Taylor Fire District.

The Taylor Fire District is comprised primarily of developed communities, subdivisions, neighborhoods on lots less than one acre in size and surrounded by large tracts of cultivated crop land. Limited green space or undeveloped areas are noted which reduces the opportunity for large fuels reductions programs.