Community Risk Assessment/ Standards of Cover (CRA/SOC)

2023

COMMUNITY RISK ASSESSMENT/ STANDARDS OF COVER

10th Edition – January 2023

Submitted as partial fulfillment for CFAI Accredited Agency status for the period of 2018-2023

Northwest Fire District

Fire Chief Norman K. “Brad” Bradley III

Accreditation Manager

Division Chief Collin Wyckoff

As adopted by the Northwest Fire District Board,

Date, April 25, 2023

INTRODUCTION

This report serves as the Community Risk Assessment and Standard of Cover (CRA-SOC) for the Northwest Fire District (NWFD). The main purpose of this report is to identify and assess risks specific to the citizens, visitors, and businesses of the Northwest Fire District and to allocate an effective and efficient distribution and concentration of resources to appropriately respond to and mitigate the identified risks.

It is the intent of this document to meet the requirements of the 10th edition of the Commission on Fire Accreditation International (CFAI) Standards of Cover guidelines. CFAI defines the two core elements of this document in the following way:

- **Community Risk Assessment** is the identification of potential and likely risks within a community, and the process of prioritizing those risks.
- **Standards of Cover** are those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization.

The CRA-SOC is one of three documents required to maintain the District's accredited status. The two other documents required as a part of this process include the District's Strategic Plan and a Self-Assessment Manual that includes 11 categories with 46 criteria containing 250 performance measures of which 96 are core competencies. Creating this document required a detailed analysis of many aspects of our community and the manner that NWFD provides service. The CRA-SOC was created primarily utilizing in-District resources: District databases including various record management systems, computer aided dispatch (CAD), and geographic information services (GIS) resources. In addition, local and federal databases were consulted for demographic and other relevant data.

Section 1 provides an overview of how NWFD is managed and funded as well as community characteristics such as population density and geographical features.

Section 2 lists a brief discussion of the different services currently delivered.

Section 3 represents the community risk assessment portion of the document and includes assessments of large-scale risks such as major events followed by risk assessments for the different classes of risk that NWFD is responsible for managing: these include fire, emergency medical services, hazmat, and technical rescue. A result of the risk assessment is the development of critical tasks and the associated effective response forces designed to mitigate the identified risks.

Section 4 describes the current deployment of fixed and mobile resources and performance of emergency services provided with an emphasis on response time elements based on community expectations and NWFD standards.

Section 5 provides an evaluation of the current deployment and performance.

Section 6 presents the District's six step plan for improving and maintaining response capabilities.

The last section, Section 7, lists key findings resulting from the development of the CRA-SOC and lists associated recommendations.

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EXECUTIVE SUMMARY

Fire Chief Norman K “Brad” Bradley III

The development of the Community Risk Assessment-Standards of Cover (CRA–SOC) document represents the District’s comprehensive effort to identify and categorize risk in our community and develop performance objectives along with effective response models for fire, emergency medical services, hazmat, technical rescue, and wildland emergencies.

The CRA-SOC allows District residents, employees, and those who collaborate with us to better understand the capabilities, risk, and service levels that NWFD provides. Since the development of the first edition in 2006, the CRA-SOC has provided a clear plan to help us accomplish our mission to “Save lives, protect property and care for our community.”

The CRA-SOC is not intended to be a stand-alone document, but to be integrated with our Strategic Plan’s goals and objectives and self-assessment manual. It is designed to be a living, dynamic document that is continuously monitored through the various data collection applications currently used at NWFD.

Based on work completed in Section 1 - Area Characteristics, we learned that NWFD has grown in population by over 12 percent since 2010 and our urban density areas have increased significantly. Our area economics continue to improve, demonstrating strong growth in the North Battalion, and are expected to continue this trend in the near future. Countering our growth are on-going economic legislative constraints and inflationary costs of materials, a challenge to the sustainability of current service levels to our community.

The risk assessment identified nine key large-scale risks, some of which require the development of more detailed response plans. The fire risk assessment clearly identified that residential, to include single and multi-unit family residences, represents the vast majority of our working fire call volume. The fire risk assessment also highlighted the associated increased risk to the public and our firefighters due to modern construction techniques, and associated hydrocarbon and synthetic fire loads, which is the vast majority of the district-built environment.

Analysis of our call type and volume for the CRA-SOC demonstrated the continued increase in service demand for emergency medical services. NWFD, in recent years, has responded to this demand growth in various ways that range from implementing new EMS dispatch protocols, initiating ALS transport services in 2015, and entering into automatic aid agreements with GRFD and TFD in 2018. The challenge moving forward will be to continue to improve EMS response services while maintaining current fire and other hazard response capabilities in an increasingly constrained economy.

Our evaluation of current deployment and performance verified the need to locate an ALS ambulance at station 37 to improve EMS transport travel times into the northern most portions of the District and the need for two future fire stations based on growth in central and north Marana. The evaluation process also identified areas with excessive travel times where we will initiate more prevention and public education efforts.

The CRA-SOC identified that, overall, NWFD is currently meeting its baseline deployment and response time standards. That said, opportunities have been identified for response time improvement and are discussed in Section 5, Evaluation of Current Deployment and Performance and Section 6, Plan for Improving and Maintaining Response Capabilities. New response time benchmarks (goals) have been developed that NWFD will strive to reach in the coming years as we continue to identify methods for improvement through staffing efficiencies, and, when applicable, proven technological advances.

There is still much work to be done as a result of this document. Key to the on-going success of this CRA-SOC will be adhering to the plan for maintaining and improving response capabilities outlined in Section 6 and acting on the key issues and recommendations in Section 7. Current deployment performance will continue to be analyzed regularly, while validating our data collection platforms for accuracy to ensure we are delivering emergency services in the most effective and fiscally responsible manner possible.

Prevention and Community Relations Services will have a significant role as we continue to maximize risk reduction for the public and our members. The risk assessment process revealed that many of our occupancies have relatively low-risk categories because of effective plan review and inspection practices regarding fire suppression systems. The development of targeted prevention and public education programs in areas with extended response times and maximum fire risk occupancies are two examples of the key role Prevention and Community Relations Services will have as part of institutionalizing the CRA-SOC.

NWFD will continue to learn from the CRA-SOC process to adapt and respond to changing community needs and service demands as part of our commitment to the primary goal of the accreditation processes, *continuous quality improvement*. All inputs have yielded enormous value, yet the single most vital resource in the development of our CRA-SOC was the countless hours expended by many members of the organization – each bringing their expertise and experience forward for the benefit of our organization and community. I would like to sincerely thank all the CRA-SOC contributing members for their dedication to this effort.

SECTION 1

Documentation of Area Characteristics

CFAI Criterion 2A

Legal Basis for Existence and Description of the Governance Model

The Northwest Fire District (NWFD) was established in 1983 by a group of residents in the unincorporated area of northwest Tucson. Prior to the establishment of NWFD, fire and rescue services were provided by a private entity on a subscription basis. On August 23, 1983, an election pursuant to Arizona Revised Statute §48-261 was held for the purpose of creating the Northwest Fire District. On October 18, 1983, the Pima County Board of Supervisors passed Resolution No. 1983-244 (Appendix 1A), which stated that a majority of the votes cast in the election were in favor of forming the Northwest Fire District; and that the Northwest Fire District was duly organized and established; and furthermore, recognizing the boundary as described in the resolution.

Arizona Revised Statute §48-805 requires the Governing Board to meet monthly and as part of its duties to prepare an annual budget. The Governing Board, through resolution or via the budget process, reviews and approves policies or services provided by the District. NWFD is operated under the same title, Chapter 5, Article 1. In accordance with this statute, NWFD is administrated and directed by five elected board members who serve staggered four-year terms.

Figure 1.1
Northwest Fire District's Governing Board

GEORGE CARTER *CHAIRMAN* | **CYNDELL CHANEK** *VICE CHAIR* | **PEG GREEN** *CLERK* | **BRUCE KAPLAN** *BOARD MEMBER* | **DAVE TALAS** *BOARD MEMBER*

Northwest Fire District operates under mission, vision, and values statements (Appendix 1.A). These provide the foundation for the strategic plan and the annual strategic plan update. The strategic plan is intended to be a guiding document for the budget development process. An annual budget process is completed and adopted by the Governing Board.

Within its legal boundaries, NWFD provides prevention, fire, emergency medical services (EMS)and special operations response services to an area of approximately 155 square miles with a population of 127,525. NWFD protects property within its boundaries assessed at a total of approximately $1.373 billion.

Organizational Overview

Northwest Fire District has a chief administrative officer (Fire Chief) that serves on a contractual basis to the Governing Board. The Fire Chief is supported by an Essential Services Section Assistant Chief, an Administrative Services Section Assistant Chief, an Operational Services Section Assistant Chief, a Business Services Director, and a Medical Director. These positions are supported by additional staff as illustrated in the organizational chart in Appendix 1.B.

Major Milestones

Major milestones in the past five years are illustrated in the following timeline:

Figure 1.2
NWFD Milestones

2018
- Fire Chief, Norman K. "Brad" Bradley, assumes Organizational Command
- Marana Health contracted for Mental Health and Peer Support Team oversite
- Automatic Aid agreement between NWFD, GRFD & TFD
- 2018 ICC code adoption & IGA with RVFD for Prevention Services
- Received BLS CON
- Digital Radio transition (PCWIN)

2019
- NWFD received ISO 1 rating
- $5 Million bond sale for construction of NWFD Administration Complex
- Completed 2017-19 Strategic Plan
- Received $2,950,183.00 in grant funding for personnel and equipment
- Station 341 opened and Station 337 relocated

2020
- New workers' compensation insurer (Securis)
- Adopted the 2020-24 Strategic Plan
- NWFD Training Flashover Simulator

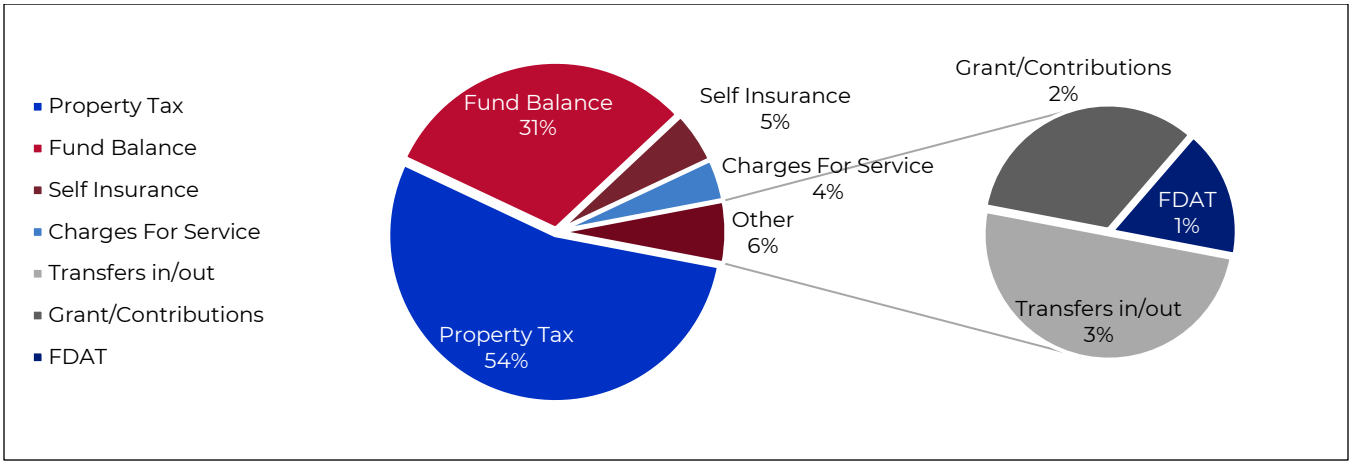
2021
- Fleet Enterprise
- Cordico Wellness Application for Employee Mental Health and Peer Support

2022
- New Administration Building Opened
- New Cardiac Monitors
- Lexipol Policy and procedure Solution
- IGA with Town of Marana for Fire Prevention Services in the town, but outside of NWFD

Funding Sources

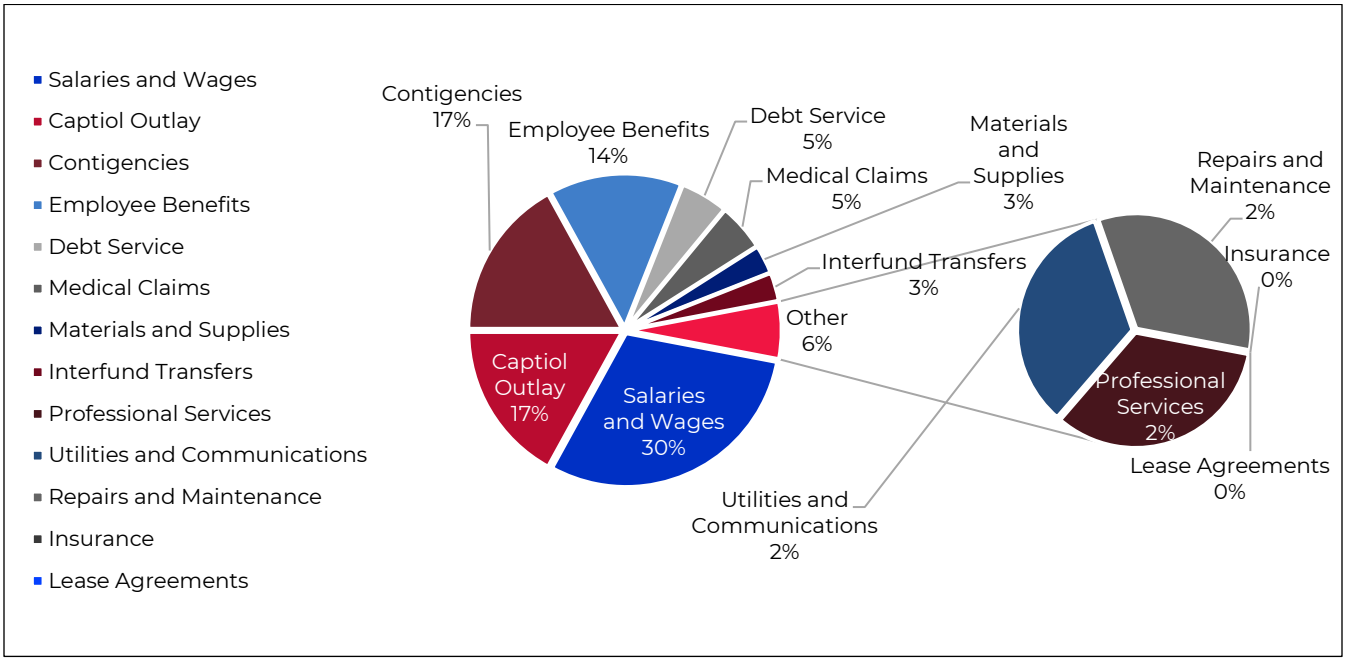
Slightly over three-quarters of funding comes from property tax. There are several other sources of funding, as illustrated in Figure 1.3. Expenditures by function are illustrated in Figure 1. 4.

Figure 1.3
Funding



* FDAT is Fire District Assistance Tax in accordance with Arizona Revised Statute §48-807.

Figure 1.4
Expenditures



Climate

According to the Köppen climate classification system, the Tucson area is classified as semi-arid. Average annual rainfall is slightly less than 12 inches, the vast majority of which falls during the summer "monsoon" season and the winter months. The typical relative humidity is low compared to many other areas of the country, with humidity readings in the single digits not uncommon in late spring and early summer months.

Major weather events in the District usually consists of severe thunderstorms that are triggered by a monsoonal moisture pattern from the Gulf of Mexico, generally occurring in late June, July, August, and early September. These storms often produce heavy lighting and wind. As a result, they can trigger flash flooding and strong microburst winds, which can approach upwards of 70 mph.

Winters are generally mild, with the number of nights dropping below freezing rarely exceeding ten. Snowfall is also rare, occurring on average every few years and generally light in accumulation. Daytime highs during winter months are generally 60-75 degrees, and daytime highs during the summer months range from 95-115 degrees. The area is susceptible to prolonged drought periods; since 2000, the longest duration of drought in Arizona lasted 512 weeks beginning on August 18, 2009, and ending on June 4, 2019. The most intense period of drought occurred the week of December 1, 2020, where "exceptional drought" affected 76.81% of Arizona land. The Pima County region has 37.9% of the population (374,020 people) affected by drought with 2022 being the 64th driest year in the past 128 years (Drought.gov). Many research studies suggest that this trend will continue for an extended time.

Figure 1.5
Weather Overview

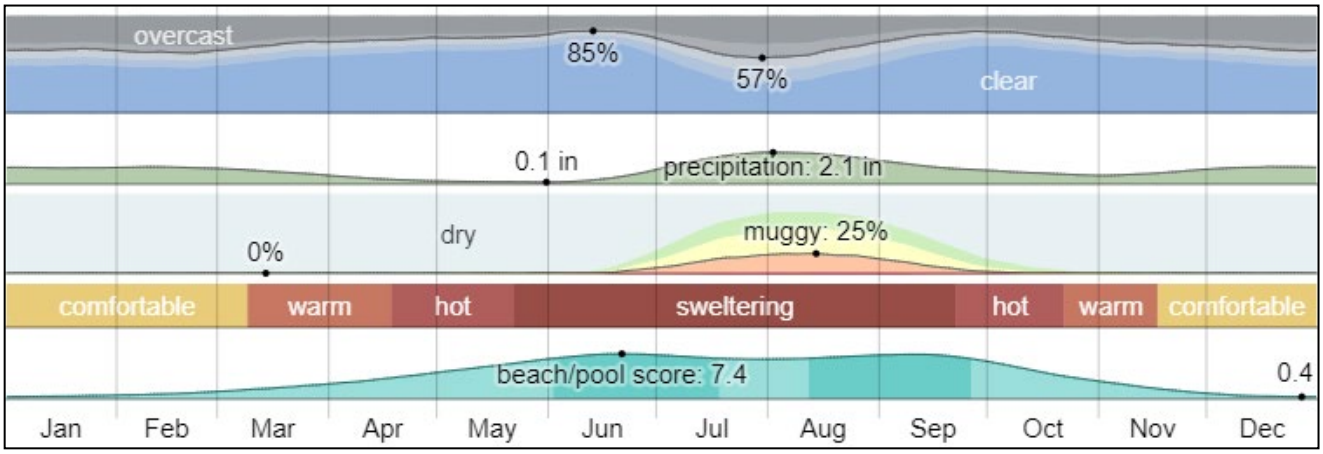


Figure 1.6
Annual Temperature

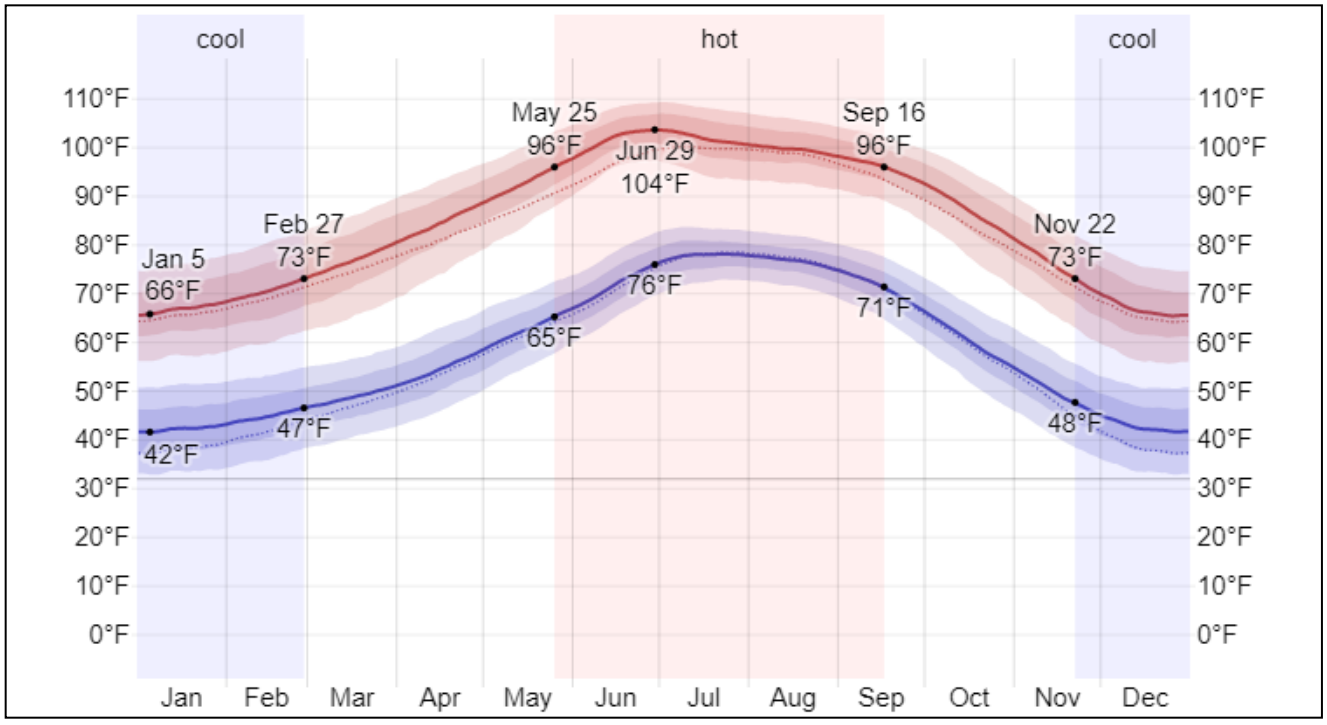


Figure 1.7
Annual Temperature by Month, Hour/Day

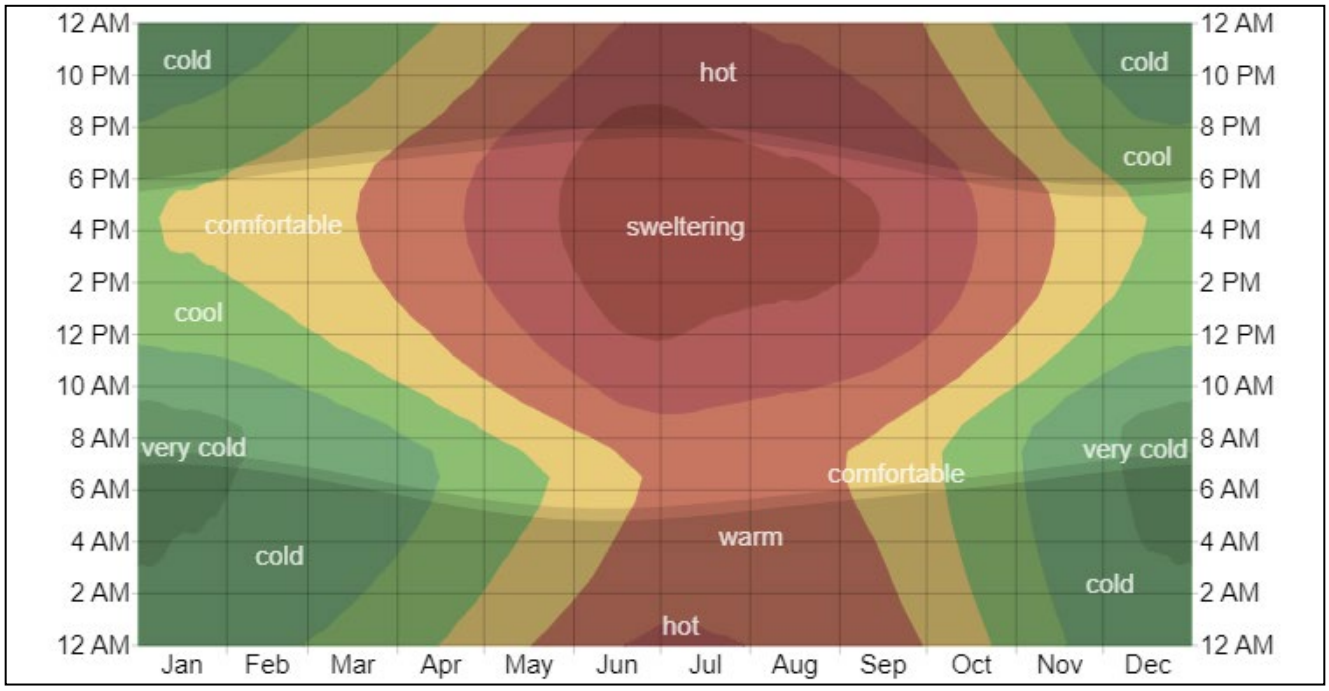
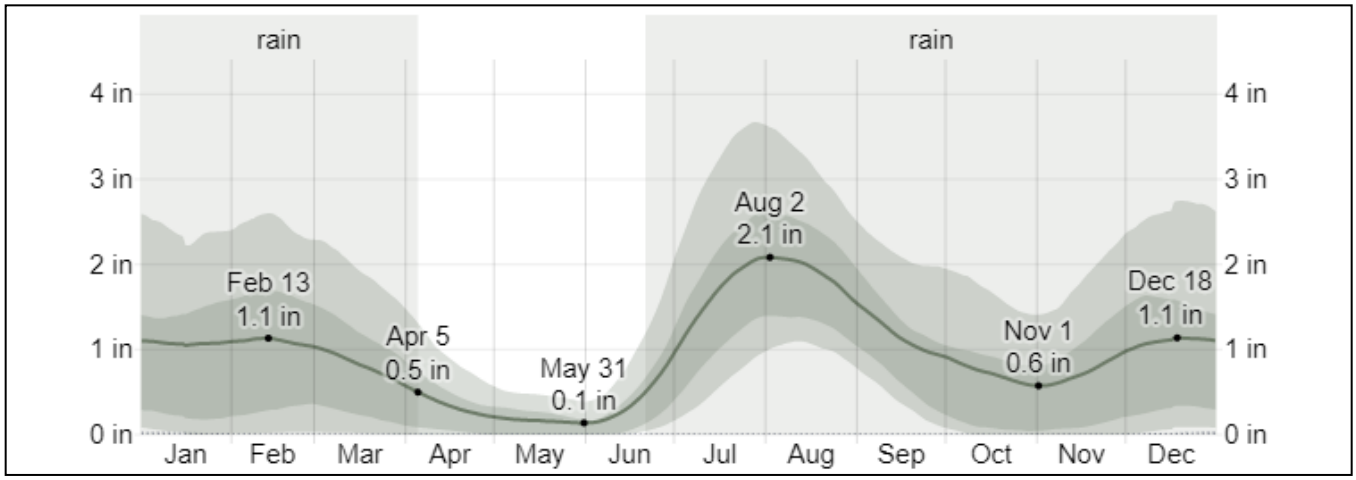


Figure 1.8
Annual Rainfall



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall	1.0”	1.1"	0.8"	0.5"	0.1"	0.3"	1.7"	2.1"	1.1"	0.7"	0.6"	1.1"

Reference: https://weatherspark.com/y/2591/Average-Weather-in-Marana-Arizona-United-States-Year-Round

Geographical/Topographical Description and Features

The Northwest Fire District is located within the Sonoran Desert in Southeastern Arizona. Elevations within the District range from approximately 2,200 feet along the Santa Cruz River floodplain, to approximately 4,100 feet above sea level in the Tortolita Mountains, along the northern edge of the District. The topography within NWFD varies from flat, potentially flood-prone land near the Santa Cruz and Rillito Rivers, to steep and rocky terrain in the Tucson and Tortolita Mountains. Much of the developed area of the District lies on gentle to moderate sloping foothills with typical Sonoran Desert vegetation that is light to moderate in density.

Santa Cruz River

The Santa Cruz River runs generally from south to north through the western section of the District and is the major drainage/water feature in NWFD. There is a substantial amount of commercial and residential development along the Santa Cruz River, nearly all of which is soil cement bank protected along the river channel. All the rivers and washes in NWFD are seasonal, with the exception of several miles of the Santa Cruz River which has a perennial low volume flow of treated effluent from a large wastewater reclamation facility that serves much of the Tucson metropolitan area. The transition areas between the mountains and floodplains are primarily alluvial fan deposits, areas that can be susceptible to localized flooding during periods of heavy rain that can fill and overflow normally dry washes.

Geology

There are two prominent geologic features in NWFD, the Tucson Mountains, generally running along the western boundary of the District, and the Tortolita Mountains at the far northern edge of the District. Neither mountain range is volcanically active. The Tucson Mountains primarily consists of igneous rock, including basalt and tuff. The Tortolita Mountains are primarily metamorphic, with granite and schist making up the dominant rock types with some old flows of volcanic basalt also present. As distance increases from these mountain ranges, rock formations give way to transitions of alluvium material and eventually axial stream deposits. These stream deposits along the major drainage features result in very granular, sandy type soils to relatively heavy, expansive clays. There are no known active major faults in either of the two mountain ranges.

Tortolita Mountains in Station 39's first-due area.

Alluvial fans are fan-shaped deposits of water-transported material (alluvium). They typically form at the base of topographic features where there is a marked break in slope. Consequently, alluvial fans tend to be coarse-grained soils, especially at their bases. At their edges, however, they can be relatively fine-grained.

Water Resources

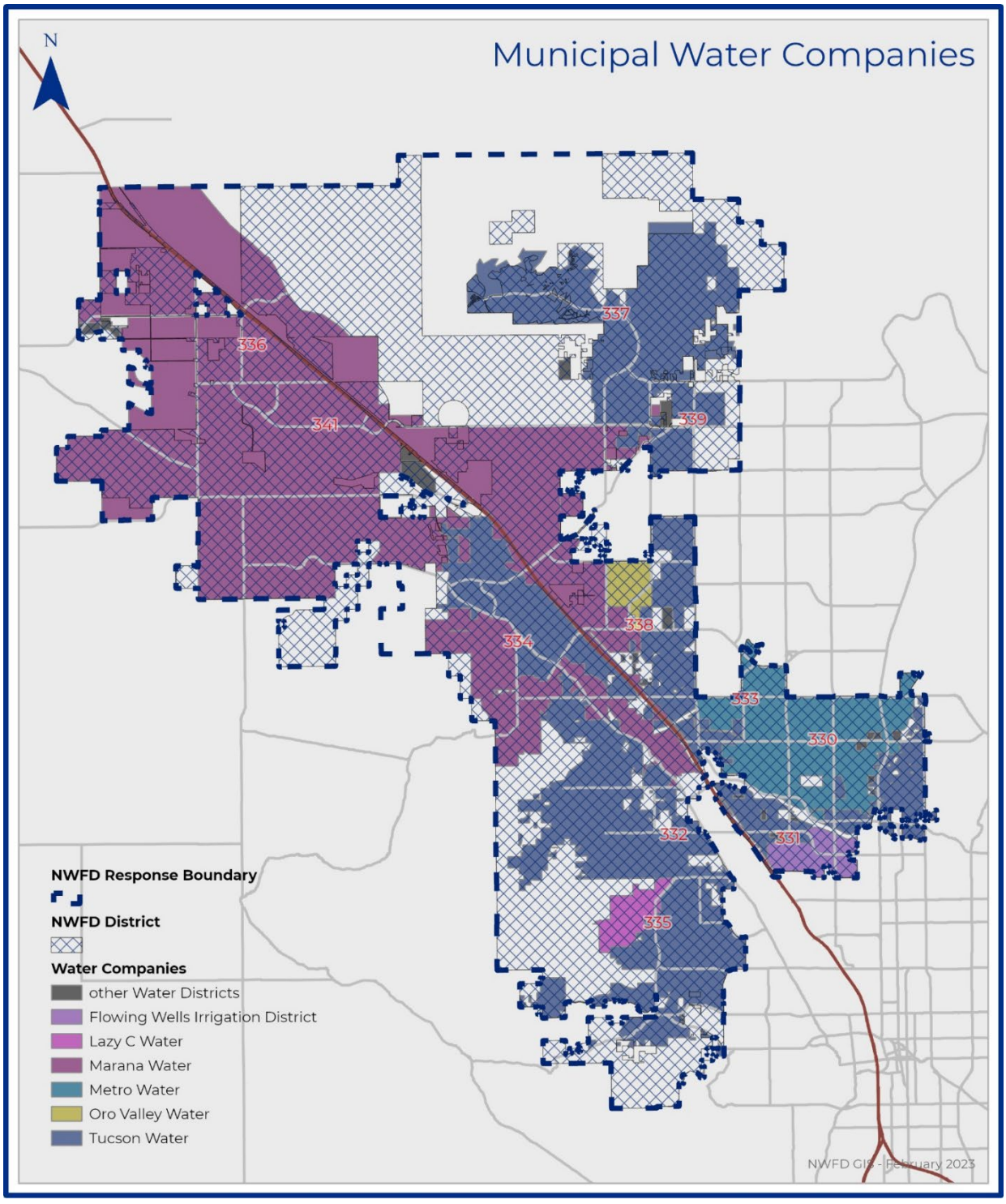
As in any desert community, water is a critical resource for the Tucson regional area. There are two basic sources of water in the District. Groundwater from beneath the Tucson Basin is a significant source of water. In addition, the Central Arizona Project Canal that delivers Colorado River water passes through the west side of the District and provides an additional shared source of water. This imported water is blended with native groundwater at a facility west of the District prior to service delivery. In the future this source will likely account for more of the water usage in the District. It is recognized, however, that at some point in the future the area's allocation of water from the Colorado River via the Central Arizona Project may decrease as other municipalities in Arizona, Nevada and California begin using their Colorado River water allocation at a higher volume.

Reclaimed water continues to be a growing resource; this resource is currently limited to irrigation of golf courses, parks, and other recreation areas in the District. With the continued development of the use of Central Arizona Project water and reclaimed water, along with aggressive conservation programs, it is projected the area will have sufficient water supply to keep pace with the projected growth for the near future. In the long term (20-50 years), there are many questions remaining regarding the adequacy of the area's water supply.

Five different water entities serve the District population. The boundary areas of these entities are illustrated in Figure 1.9. There are some individual residential occupancies on larger lots that are served by privately owned wells, but these are relatively rare. The vast majority of the District's developed areas are provided with adequate hydrant networks. Development areas without hydrants are further discussed and illustrated in Section 3.

The Central Arizona Project Canal and associated pumping station in NWFD.

Figure 1.9
Municipal Water Companies



Population and Demographics

Based on data provided by the US Census Bureau, US Census Bureau ACS 5-year 2015-2019, NWFD Community Risk Assessment Insight Generator (CRAIG), and NWFD ARCGIS, the total population of Northwest Fire District in 2020 is approximately 127,525. Of the total population served, 40% (51,908) reside in the Town of Marana with the balance (60%) residing in the unincorporated county area of NWFD. Figure 1.10 shows the population of the Town of Marana and unincorporated area of Pima County that NWFD serves. Figures 1.11 through 1.13 depict the gender, generation, and racial makeup of the area the District serves.

The Northwest Fire District uses the United States Census Bureau's urban-rural classification. The U.S. Census Bureau's urban-rural classification is fundamentally a delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses. An urban area will comprise a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses and territory with low population density included to link outlying densely settled territory with the densely settled core. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The Census Bureau identifies two types of urban areas:

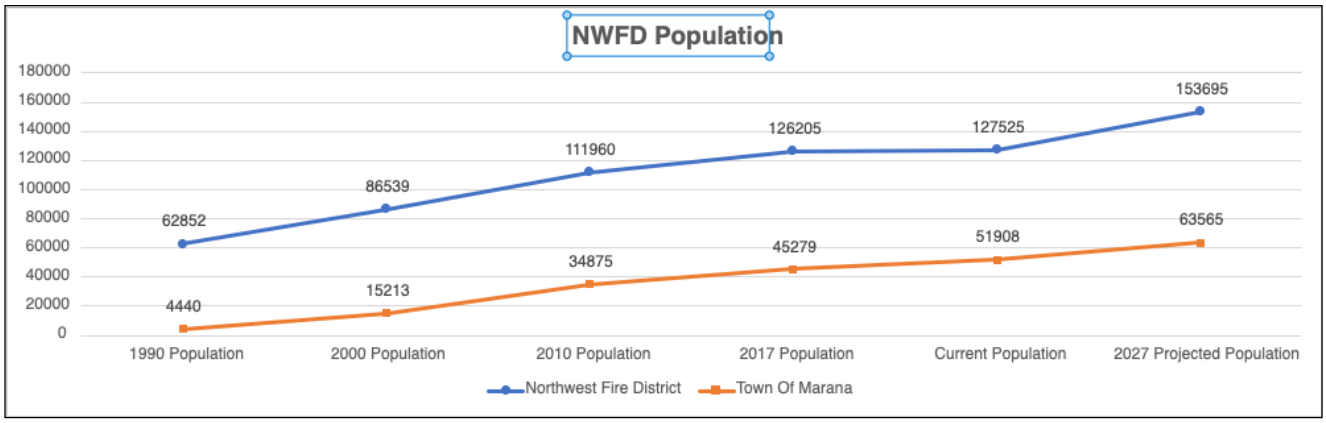
- Urbanized Areas (UAs) of 50,000 or more people.
- Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.

"Rural" encompasses all population, housing, and territory not included within an urban area.

Figure 1.14 illustrates the range of these population classifications in NWFD.

Example of rural population classification in Station 35's first-due area.

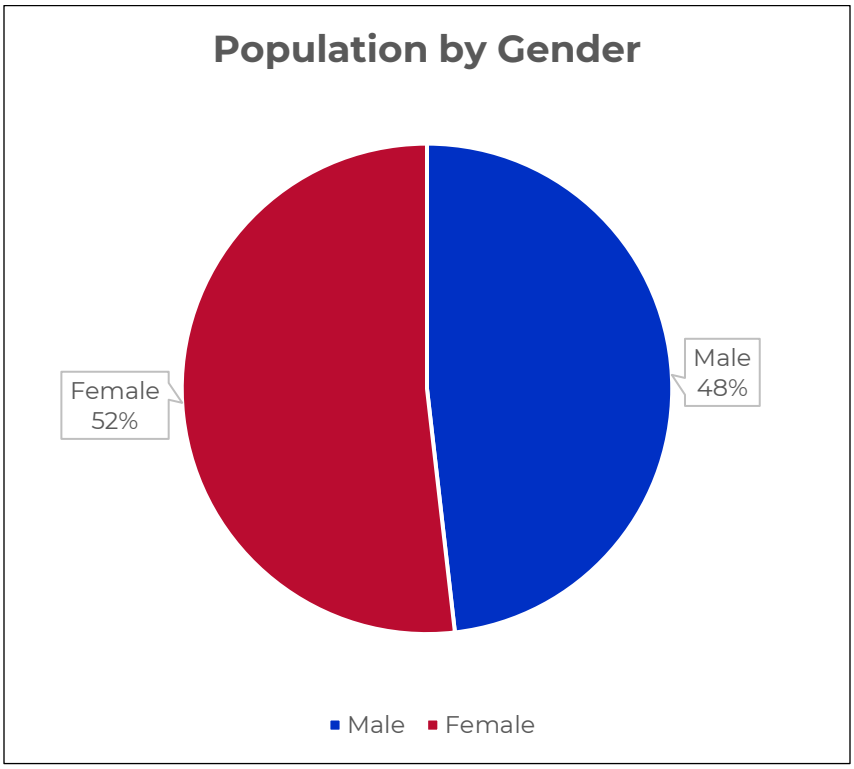
Figure 1.10
NWFD Population



CRAIG 1300

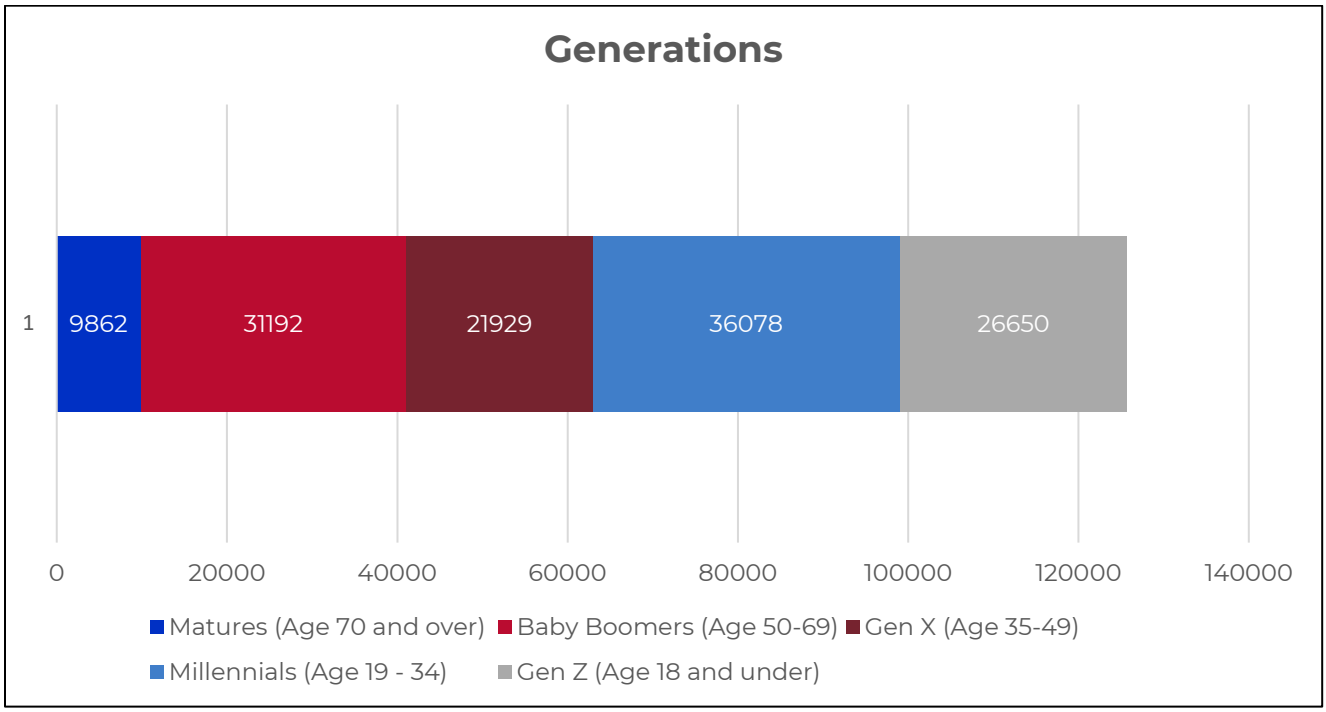
Marana population statistics from Town of Marana website, ECONOMIC DEVELOPMENT -Demographics — Town of Marana (maranaaz.gov). Unincorporated area statistics from the Pima Association of Governments (PAG). PAG is the region's federally designated metropolitan planning organization and consists of all major local government and tribal entities in the Tucson metropolitan area.

Figure 1.11
NWFD Population by Gender



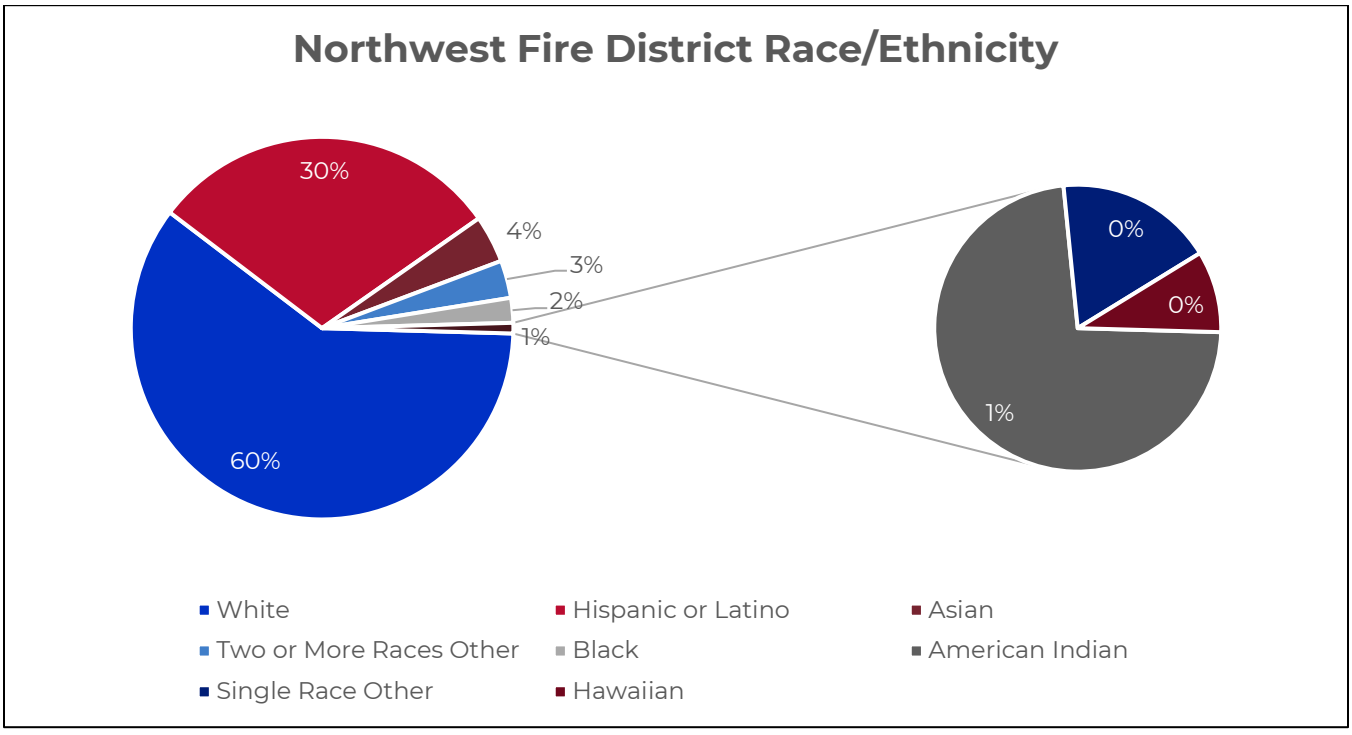
GRAIG 1300

Figure 1.12
NWFD Population by Generation



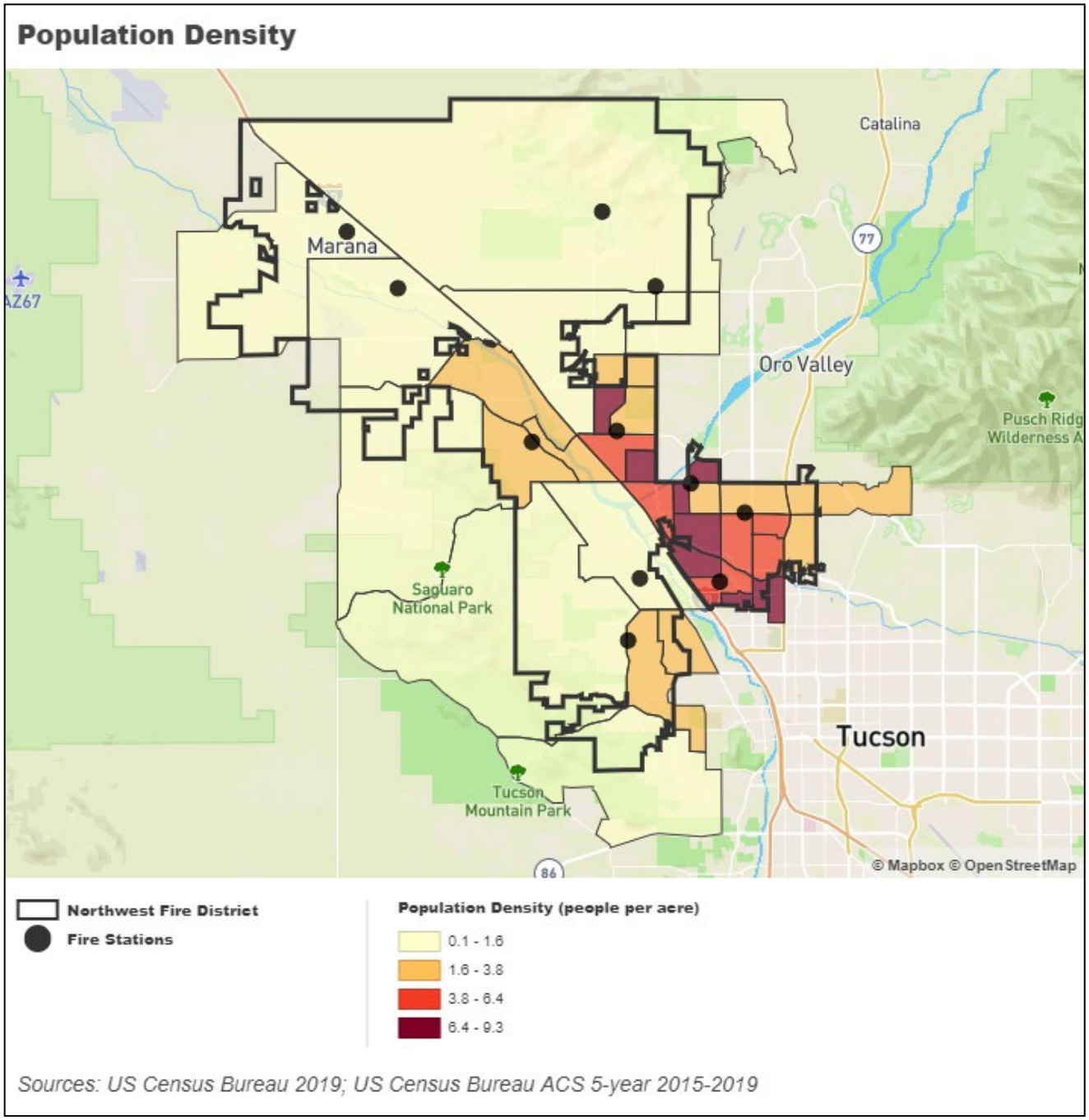
CRAIG 1300

Figure 1.13
NWFD Population by Race/Ethnicity



CRAIG 1300

Figure 1.14
NWFD Population Density

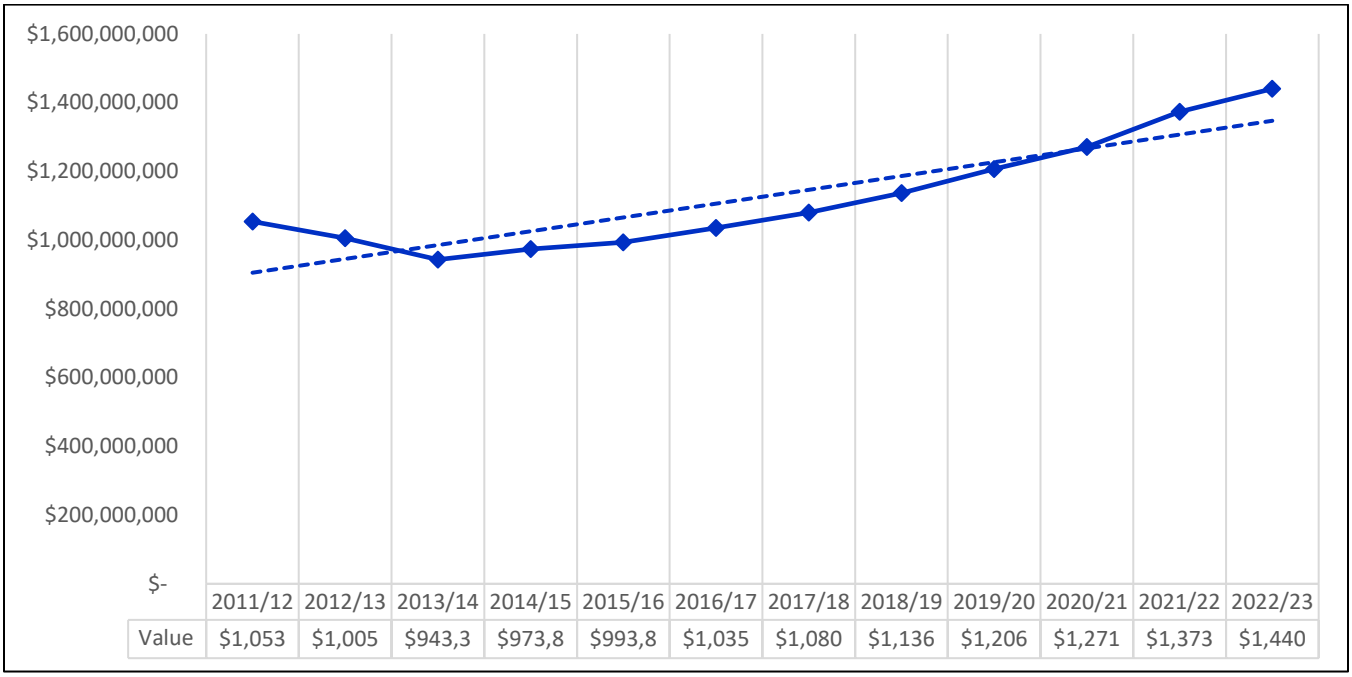


Area Economics

The economic base in NWFD is relatively diverse and is primarily supported by many large and small retail businesses, light industry, and the health service industry. Tourism also significantlyinfluences the economy within NWFD, contributing to a sizeable number of hotels and restaurants in the District. There are also a moderate number of local, county, state and federal government facilities and offices that contribute to the area economy.

The area economics have been steadily improving over the past ten years, albeit at a relatively slow rate. NWFD's assessed value chart below is indicative of this trend.

Figure 1.15
NWFD Assessed Value



	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Value	$1,053	$1,005	$943,3	$973,8	$993,8	$1,035	$1,080	$1,136	$1,206	$1,271	$1,373	$1,440

Statistics developed by the University of Arizona Eller College of Management[1] also reflect this ongoing trend, with a net gain of nearly 1.3% employment growth in 2022 in the Tucson area. The long-range forecast calls for Arizona to continue to outpace national growth, although those gains are expected to come at a much slower pace than during the prior 30-year period. Arizona is projected to add 1.4 million jobs from 2022 to 2052, which translates into an annual growth rate of 1.3% per year. That is faster than the national pace of 0.4% per year but much slower than the average annual growth rate of 2.3% per year during the prior 30 years.

The forecast calls for the Phoenix area to continue to drive state growth during the next 30 years, although Tucson contributes as well. While growth is projected to slow, Phoenix and Tucson population growth rates are forecast to far outpace the U.S.

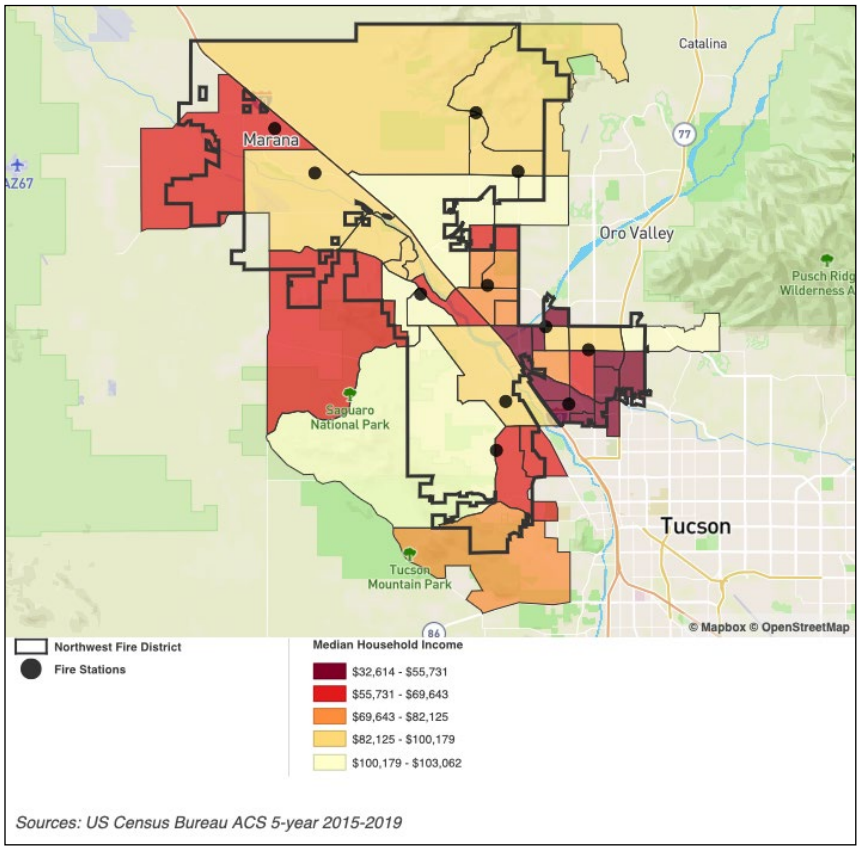
This trend is expected to increase slightly over the next several years, along with an anticipated continued slow rate of increase for assessed values.

[1] University of Arizona Eller College of Management, Economic and Business Research Center, http://ebr.eller.arizona.edu

Socio-Economics

Northwest Fire District serves a diverse socio-economic community from very low income/assessed value areas to affluent foothills areas with high net incomes and assessed values. Figure 1.8 illustrates the median income within the District which is evident of the diverse socio-economic community NWFD serves.

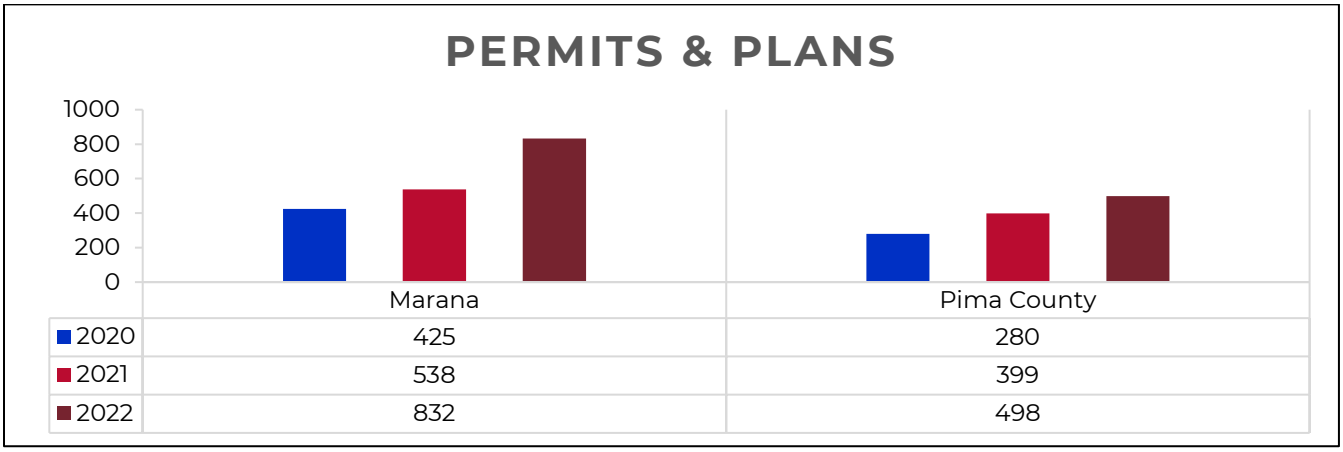
Figure 1.16
NWFD Median Household Income



Current and Future Development

New construction plan reviews by the Prevention Division have shown an increase in the past three years as the area economy continues to grow. The number of completed plan reviews in the past three years are included in Figure 1.17. Major projects expected to impact service delivery are listed in Figure 1.18.

Figure 1.17
Permits & Plans



	Marana	Pima County
2020	425	280
2021	538	399
2022	832	498

Figure 1.18
Current & Future Developments

Current and Future Major Developments by Station First-Due Area

Station First-due Area	Description	Estimated Build-Out Time
30	Post-Acute Medical Center, 2025 W. Orange Grove Rd.	2021
30	Assisted Living, 1341 W. Orange Grove Rd.	2022-23
33	Large Apartments, 3915 W. Aerie Dr, 8 Building Apartment Complex.	2023
33	Large Apartments, 4105 W. Aerie Dr, 49 two-story apartment building.	2023
34	Water Treatment Campus, 9355 W. Lambert Ln.	2021
34	Water Treatment Campus, 8568 N. Continental Reserve Loop.	2021
34	Distribution Center, 7300 N. Silverbell Rd, 220,000sqft big box building.	2022
34	Manufacturing/Processing, 5505 W. Gillette Rd.	2021
34	Large Car Dealership, 6579 W. Twin Peaks.	2024-25
34	Large Apartments, 6101 W. Arizona Pavilions, 16 three-story apartment buildings.	2023
34	Large Apartments, 7760 N. Silverbell Rd, three-story 55+ adult apartments.	2023
34	Large Apartments, 7430 N. Silverbell Rd, 12 two-story apartment buildings.	2023
36	Office Building, 13535 N. Marana Main Street, Three-story office building.	2022
36	SFR community, 10332 W. Mike Etter Blvd, 136 SFR lots.	2023
37	Manufacturing/Processing, 11835 N. Tangerine Business Loop, 11,000sqft building.	2023
37	Storage yard, 11651 N Marana Tech Dr, 16 contactor's storage yard.	2023
37	Pet Boarding Facility, 11862 N. Tangerine Business Loop.	2023
37	SFR community, 13181 N. Tortolita Rd. 82 SFR lots.	2023
38	Storage, 6245 W. Marana Center Blvd, 1 three-story 140,000sqft building and 3 single story 53,000sqft buildings.	2023-24
38	VA Medical Clinic, 3920 W. Linda Vista Blvd.	2021
38	Large apartments, 6355 W. Marana Center Blvd. 12 three-story apartment buildings.	2023
41	Fabrication, 11871 N. Marana Tech Dr.	2017-2027
41	Medical Research, 9821 W. Tangerine Rd.	2022-23

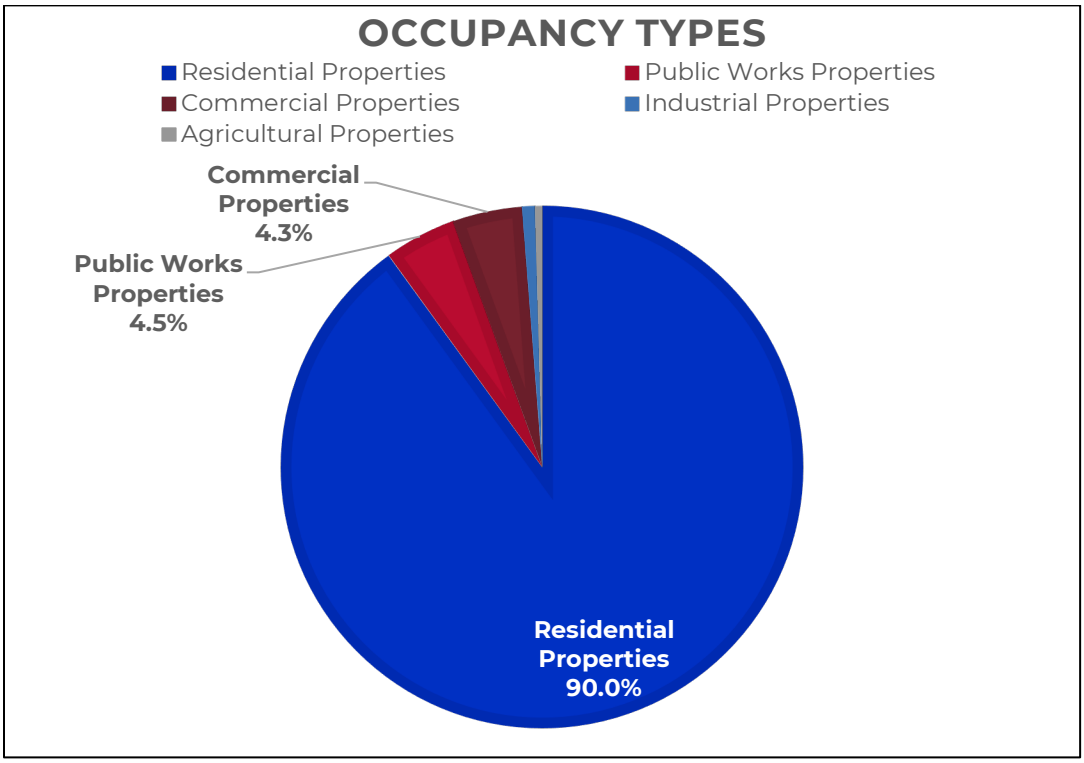
This information indicates that the overwhelming majority of growth will occur in the North Battalion. Station 34's area will have the most growth in the short term, followed by stations 41, 38, and 36 first-due areas. The completion of the Tangerine Road widening project in 2018 is also expected to accelerate commercial growth in Stations 37's and 39's first-due area.

A slower development pace with generally smaller projects is expected in the South Battalion. Should another recession occur in the near future, as some economic models indicate, this expected growth in both battalions would likely be affected significantly.

General Description of Occupancies

The dominant occupancy type in NWFD is the single-family residence (SFR). These can range in size from less than 1,000 square feet in the District's higher density population areas to residences that exceed 10,000 square feet in the Tucson and Tortolita Foothills areas. Most of the SFRs in the District are of relatively new construction, less than 40 years old. The District also has a substantial number of residential mobile homes and multi-family apartment complexes.

Figure 1.19
Occupancy Types



Sources: County Tax Assessors 2021

Figure 1.20
Median Home Age

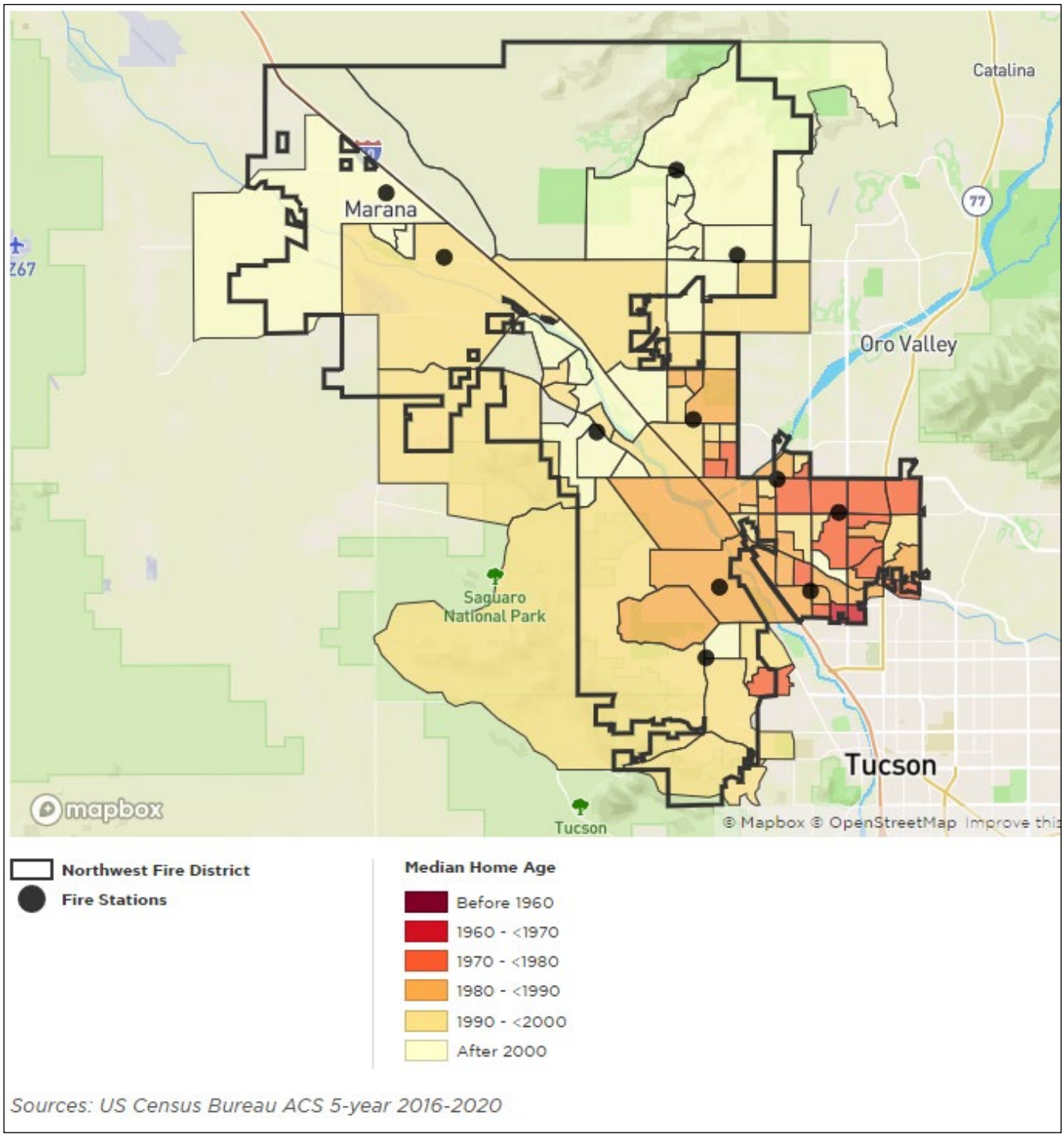
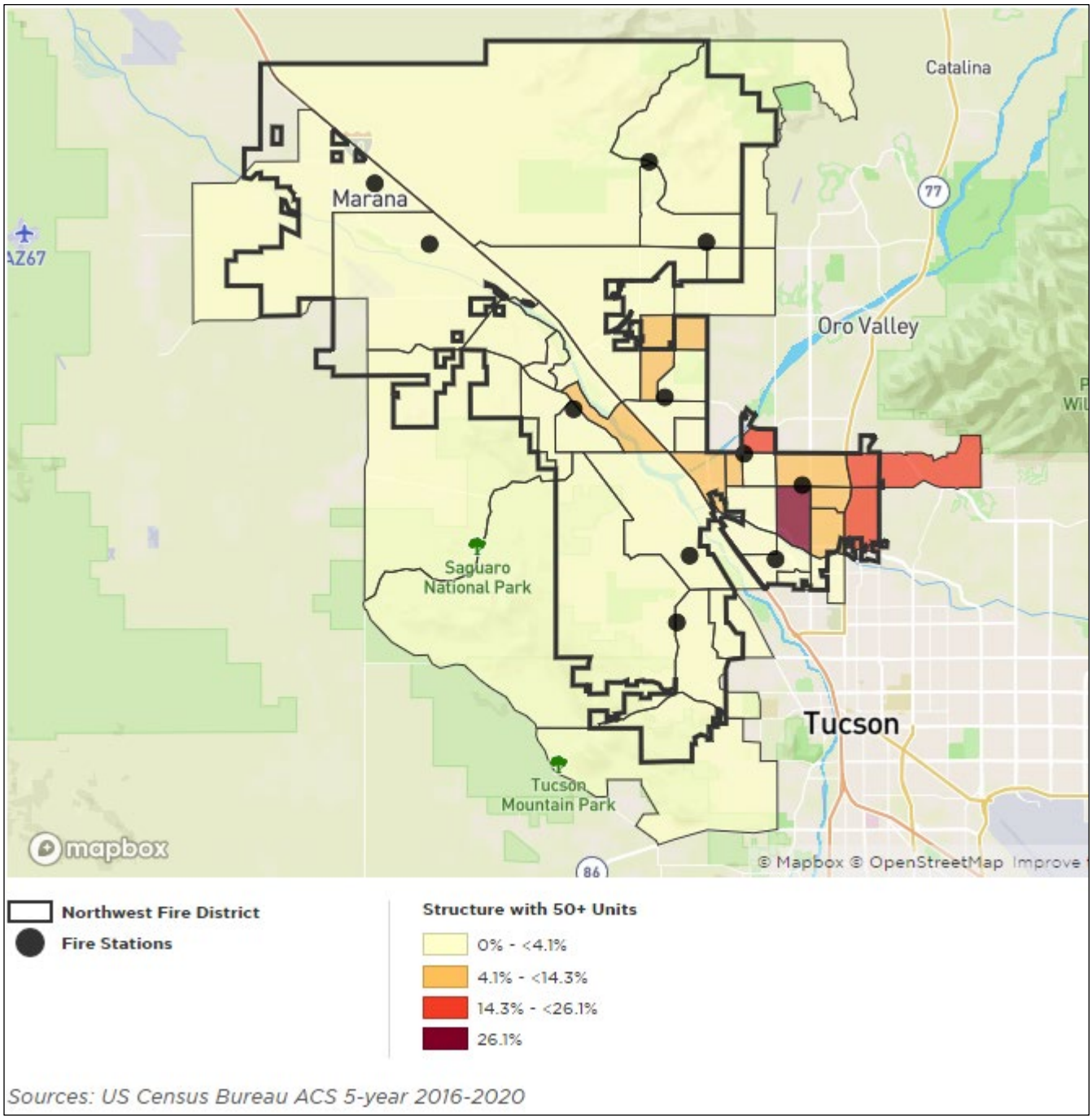


Figure 1.21
Multi-unit Residential Concentration



Commercial occupancies are varied, from small stand-alone occupancies to large malls and big- box type retail centers. Small to medium strip malls and business park style occupancies are the most common type of commercial and business occupancies. There are a number of medium sized, chain-type motels/hotels and two large scale resorts in the District. There is a concentration of light industrial occupancies along Interstate 10 between Ina and Cortaro Roads and along the Tangerine Road and Interstate 10 corridor, with some additional light industrial occupancies located mostly in the South Battalion of the District.

Tucson Premium Outlets – Marana Center, the largest retail mall in NWFD.

Service Type Infrastructure

There are two major petroleum pipelines in NWFD that run parallel to Interstate 10. In addition, there is a large diameter natural gas line that runs through the western portion of the District. There are two major propane businesses in NWFD that have large storage capacity. Both businesses are in a predominantly industrial area of the District.

There are several high-voltage (>138 KV) electrical transmission lines that traverse through the District, along with several substations at various locations. The locations of these energy related infrastructures are documented and available to Operations personnel. The largest waste treatment facility in the metro Tucson area is located in NWFD. The Tres Rios Wastewater Reclamation Facility is capable of treating up to 50 million gallons of effluent a day. There are numerous communication towers and facilities located throughout the District, including key communication facilities located atop the Tucson Mountains.

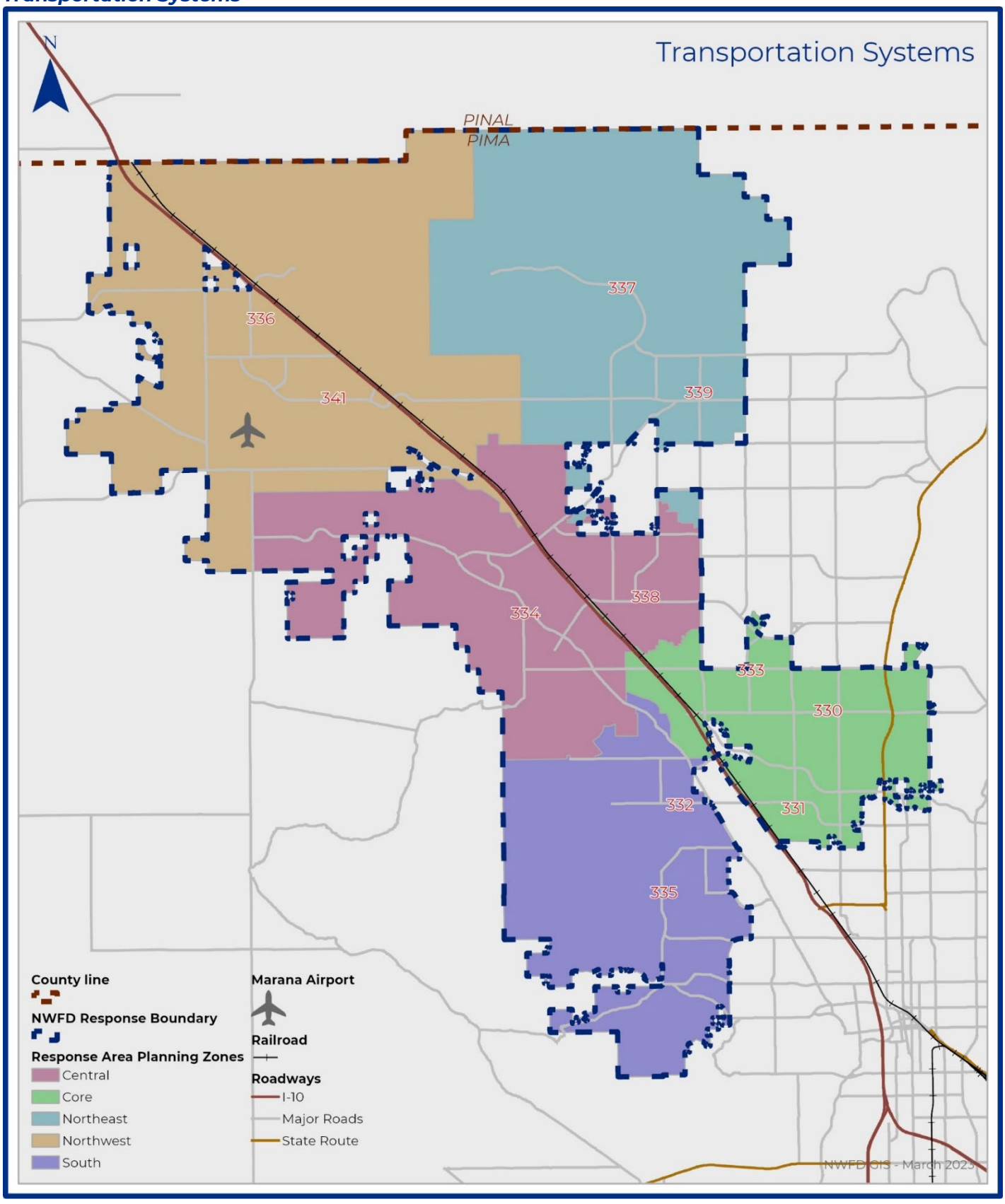
Transportation Infrastructure

The major transportation infrastructure feature within the District is Interstate 10 which traverses the District in a north-northwest/south-southwest direction and totals approximately 21 miles within NWFD. Additionally, State Highway 77, is a divided median six-lane highway that runs north-south along the District's east side. The remainder of the vehicle transportation infrastructure consists of major arterial roadways, with associated residential streets. Many of the major roadways support bicycle lanes or paths. The majority of the residential streets in NWFD are not laid out in a typical grid pattern, but rather in a less conventional manner with many of the streets not continuing directly through a neighborhood and including many cul-de-sacs.

Major arterial roadways west of the freeway are few and far between, and several do not have engineered storm water systems. These, and several other primary roadways throughout the District, are susceptible to seasonal flooding which can make them impassible for short periods of time, ranging from less than an hour to several hours. There are also a few roadways and long private driveways in the foothill areas of the District that are challenging for apparatus access.

There is a transcontinental railroad owned and operated by Union Pacific that parallels Interstate 10. Train traffic averages approximately 70 to 80 trains per day. Amtrak also operates two passenger trains that pass through the District three days a week. There are two major arterial road at-grade railroad crossings that can cause response delays. This issue is further discussed in Section 3.

Figure 1.22
Transportation Systems



SECTION 2

Description of Methodology

The process of documenting NWFD programs and services with measurable goals begins by compiling and monitoring data through the agency's record management systems that interface with the agency's computer aided 911 dispatch system. Call types, levels of risk, effective response force personnel, socio-economic, demographic, and various other data points are available throughout NWFD and organized into geographical planning zones.

NWFD developed and uses a methodology in the form of an integrated compliance, budget, and plan (ICBP). ICBPs function as the agency's program appraisals and are approved and adopted by the fire board annually during the agency's budget adoption process. ICBPs are aligned with the CPSE 10th edition model for continuous quality improvement's performance measures broken out by department and division. Each manager's ICBP provides the determined and documented service levels for all service program areas throughout the organization. The ICBP documents are completed using current data that is provided for program manager analysis.

Performance is evaluated and reported on a monthly basis culminating in annual performance report. NFPA standards are accepted as many of the agency's program benchmark goals with one exception being in unit travel times which are NWFD specific. The ICBPs are the agency's documented and adopted plan for the maintenance and improvement in service delivery, linked to the NWFD strategic plan, and NWFD budget.

Description of NWFD Programs and Services

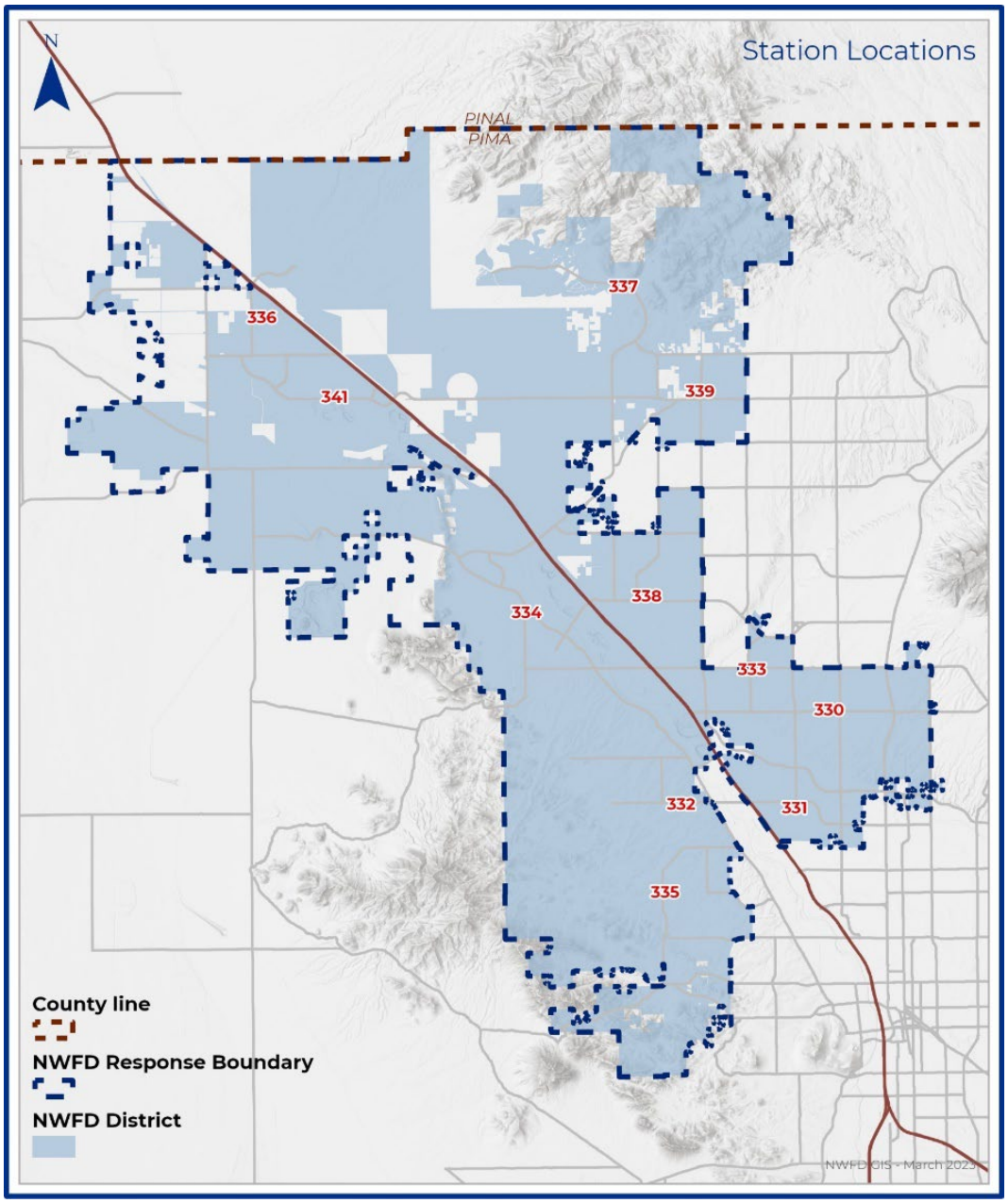
Northwest Fire District provides a wide array of programs and services that are reflective of its all-hazard response approach. The District provides two distinct levels of programs and services to its residents, businesses, and visitors - prevention (proactive) and emergency response (reactive).

External Service Programs

Fire Station Locations

NWFD provides services from 11 fire stations, the locations of the fire stations are presented in Figure 2.1. The stations and other support facilities are described in more detail in Section 4.

Figure 2.1
Fire Station Locations



Prevention

The Prevention Services Division is committed to protecting the people and property within the Northwest Fire District from fire and other hazardous conditions through active involvement with citizens and community partners. This is accomplished through focusing on the development and delivery of comprehensive fire prevention programs including engineering/plan review, fire and life safety inspections, active code enforcement, fire investigations, and response to fire protection system activations. Situated under the Operational Preparedness Branch, the Division is comprised of 11 highly trained, customer service-oriented individuals dedicated to serving the District's mission of saving lives, protecting property, and caring for our community. In FY21/22, Prevention personnel from NWFD strengthened relationships with arson investigators from the Pima County Sheriff's Department, who assume lead investigation authority in the event of a fire fatality or suspected arson. In addition, the Division continued its joint fire investigation response with the Golder Ranch Fire District through an automatic aid agreement. The Prevention Division continues to support the Rincon Valley Fire District prevention program through an intergovernmental agreement (IGA). Prevention personnel remained committed to continuing education in FY21/22 and sent two members to the Reid Technique Class (interviewing and interrogation techniques), two members to an Advanced Arson Seminar, two members to the NWFD Captain Certification Program, and participated in multiple online and in-house trainings for all personnel. Prevention personnel also provided education to other members of the District by teaching classes to recruits in two separate fire academies.

Employee Count
Employees: 11

Inspections Count
General Inspections: 3,059
General Re-Inspections: 510
Construction Inspections: 1,051
Construction Re-Inspections: 80
Code Complaints / Deficiency Inspections: 128

Code Violations
Total Count of Code Violations: 1,883
Top 5 violations:

- Fire protection systems not maintained per NFPA/IFC interval
- Portable extinguishers not maintained with current records
- Fire protection and utility equipment markings not current
- Knox Box or Knox Box keys not current
- Firestop systems have penetrations or are not adequately maintained

Plan Reviews

Type	Count of Plan Reviews	Associated Revenue
Residential	687	$159,118
Commercial	329	$123,753
Utility/Misc.	169	$76,023

Average # of Days to Complete Plans Review: 6.7

Fire Investigations

	Total Count	% of Total Investigations	Property Loss Value	Property Saved Value
Act of Nature	7	3%	$0	$3,400
Failure of equipment	34	13%	$687,809	$10,678,622
Intentional	48	18%	$1,285,393	$2,802,255
Unintentional	79	30%	$2,017,426	$60,257,350
Undetermined	99	37%	$3,889,825	$7,907,505
Totals	267	100%	$7,880,453	$81,649,132

Investigations Conducted by NWFD Investigators:

- NWFD Jurisdiction: 57
- Rincon Valley Fire District Jurisdiction: 4

% of Working Fires Contained to the Area of Origin
Confined to Object of Origin: 27%
Confined to Room of Origin: 34%
Confined to Floor of Origin: 6%
Confined to Building of Origin: 23%
Fire Spread Beyond Building of Origin: 10%

Community Relations & Public Education

The Community Relations and Public Education Services Division were enthusiastic about making a return to programming that resembled pre-pandemic conditions in FY21/22. The team was able to attend community events in person once again and engage District stakeholders in one on one and group dialogue about fire and injury prevention.

NWFD Public educators were able to return to the classroom and teach students on their campuses. Additionally, District Mini Muster programs resumed, and we were able to provide Mini Musters

to 3rd graders who missed the opportunity during the COVID shutdown. This was a large undertaking since it doubled the number of Mini Musters that were historically offered in a conventional school year, but it ensured the continuity of fire prevention messaging that is critically important for these students. The popular Babysitter Course hosted the largest number of participants to date, with classes being offered at Golder Ranch Fire District, Northwest Fire District Training Center, and the brand-new NWFD Administration Building.

While there were transitions with staffing, the team remained focused on the District's mission to save lives, protect property, and care for our community through the thoughtful delivery of public education and community outreach public safety campaigns.

Employee Count
Employees**:** 4

Education Programs
Babysitter Course
In-person: 84 attendees
Online: 7 participants
Car Seat Installations: 135
Classroom Lessons
In-person: 5,800 students reached
Online: 916 students reached
Mini Musters: 2,060 attendees
Station Tours & Truck Demos: 1,192 attendees
Community Events: 11,185 community member interactions

Social Media Engagement
Twitter
Followers: 8,290
Profile Visits: 106,054
Tweets Published: 438
Impressions: 1,669,600
**Impressions: Number of times the tweet has appeared on a timeline as the tweets continue to be liked and shared.*
Instagram
Followers: 2,751
Profile Visits: 16,925
Posts: 411
User Reach: 116,589
**Reach: The number of unique accounts that saw any of your posts or stories at least once.*
Facebook
Followers: 6,640
Profile Visits: 18,548
Posts: 531
User Reach: 214,434
**Reach: The number of people who saw any content from your page or about your page, including posts, stories, ads, and social information from people who interact with your page.*

Fire Suppression Service

Northwest Fire District provides fire suppression services for all types of fires. In general, NWFD aims to meet NFPA 1710, Organization and Deployment of Fire Suppression Operations by Career Fire Departments, 2020 Edition, Chapter 5 regarding fire suppression services including staffing and deployment.

Fire services are managed under the Operations Division by a deputy chief who supervises a division chief of response and six shift battalion chiefs. Fire suppression services are provided from 11 fire stations that house 12 four-person engine companies, including one peak activity company, two cross-staffed ladder companies, one cross staffed squad (heavy rescue/hazardous material) and five two-person ambulances. Available ancillary apparatus includes two water tenders, Air and Power Unit (air/light/salvage), rehab truck, light squad with six seat all-terrain vehicle, two type III brush trucks, and one type VI brush truck. An incident command vehicle is also available to respond to and assist with the management of larger incidents. All engine, ladder, squad, and tender apparatus meet NFPA 1901, Standard for Fire Apparatus, and FEMA Resource Type I requirements.

Emergency Medical Services (EMS)

The EMS Division continued to focus on providing the highest quality pre-hospital emergency care and transport for residents and visitors in FY21/22. The EMS Division, in conjunction with the District's base hospital physicians at Banner University Medical Center, delivered online and in-person education for NWFD's 224 EMTs and Paramedics. Training hours were tracked to ensure all personnel would have more than enough continuing education hours to satisfy their recertification requirements and content was selected to maximize positive outcomes of patients. Beyond the traditional continuing education, the EMS Division deployed 25 new cardiac monitors to the field, delivering in-person training to all response personnel over three days. The EMS Division also purchased two new CPR mannequins to replace older models.

In partnership with Tucson Fire, NWFD provided a vehicle and driver training for use by the Medical Direction Team. The Physician Response Vehicle program allows the NWFD Medical Direction team of Emergency Room Physicians in a specially equipped vehicle to respond to emergencies alongside firefighters and paramedics, providing advanced medical care at an emergency scene. Adding a physician-level resource to prehospital patient care strengthens the overall care continuum—from the 911 response to hospital discharge. The responding physicians will respond and assist on various emergency scenes, providing real-time medical direction and advanced patient care for critically injured, ill

patients. This program enhances the high-quality and compassionate emergency medical care Northwest Fire District first responders provide.

Supply shortages in the wake of the COVID-19 pandemic required EMS personnel to seek alternative options to commonly used medications and equipment. Working with the NWFD Medical Direction Team and the Warehouse Services Division, alternative medications and equipment were deployed, and training was developed to ensure the highest level of readiness was maintained.

The aftermath of the COVID-19 pandemic also revealed new challenges that were not anticipated by the medical community. During the height of the pandemic NWFD saw a decrease in requests for transports to local hospitals. In FY21/22 there was a noticeable spike in 911 calls and requests for transport. This increase, coupled with staffing shortages at local hospitals, led to increased patient transfer times. NWFD participated in a regional workgroup comprised of representatives from all regional hospitals and ambulance providers to find solutions to the extended transfer times. A regional plan garnered positive results and was replicated by other regions throughout the state.

To increase safety for patients and providers, new mounts for cardiac monitors were purchased and installed on all ambulance gurneys with help from the Fleet Services Division. These mounts secure the cardiac monitor in case of collision and position the monitors so the paramedics can monitor a patient's vitals more easily. Working with NWFD community partner Pima Community College, an internal testing process was held and five EMTs were selected to attend school to become paramedics. These five personnel were part of a regional group of students who will become the next generation of Paramedics in Southern Arizona. The six-month long class utilized an accelerated platform and required the students to focus solely on their education. While arduous, the platform has proven to be a successful and superior process for training Paramedics.

DISPATCH/GIS

In August of 2021, a uniformed fire officer was assigned to the City of Tucson Public Safety Communications Department (PSCD). This officer was sent to Dispatch with two goals in mind: become a trusted liaison to all nine agencies dispatched out of PSCD and act as a reliable problem solver for the units in the field and dispatch personnel alike. The Northwest Fire District Captain is one of three Captains from the Northwest Fire District, Tucson Fire Department and Golder Ranch Fire District in charge of supporting field units and the PSCD dispatchers and call takers.

This job description was loosely defined and fluid from the beginning to evolve into an informational and supportive hub for all Southern Arizona Fire Emergency Response Consortium (SAFERC) agencies and TFD operations. The three 24-hour Captains used their knowledge, skills, and abilities to create training programs, curriculum, and supportive structures that in benefiting PSCD in turn benefit all agencies involved. These Captains

streamlined the informational flow from multiple dispatchers operating emergency channels while answering questions and concerns to a single Captain that can answer or relay information to any agency 24 hours a day. These Captains are responsible for tasks such as unit coverage move-ups and the decision to change response models to storm dispatching for the entire city and county agencies.

The Alarm Room Captain (ARC) is in conversation with Chiefs from multiple levels and multiple agencies on a day-to-day basis creating a unique opportunity to help develop and advance commonalities between agencies supporting the overall regional goal of automatic aid which continues the Northwest Fire District mission of saving lives, protecting property, and caring for our community.

Employee Count
Employees: 6

Ambulance Transport
Total Count of Ambulance Transports: 4,535
Average Gross Charge per Transport: $1,525.89
Average Net Charge per Transport (after contractual adjustments): $850.22
Average Collection per Transport: $564.55

Bystander CPR Rate: 73.7%

On-Scene to Transport Rate: 65%

Arrival to 12 Lead Rates
The average time from patient contact to the first 12 Lead reading was 4 minutes 47 seconds.
The average time from scene arrival to the first 12 Lead reading was 6 minutes 1 second.

Code Saves
Code Saves: 21
Life years added: 372

Time Off Chest Standard Compliance and/or CPR Fraction
88.09% compression fraction
Compression fraction goal met 100% of the time

Call Volume
Total consortium call volume: 46,403
NWFD specific call volume: 18,524

NFPA/CFAI Call Processing Benchmark: 99th percentile - 224.4 seconds

Average Time (or Fractal) for Initiating CPR Instructions:
99th percentile - 152.1 seconds

Special Operations – Hazardous Materials and Technical Rescue

The Northwest Fire District maintains a Special Operations response force capable of responding to technical rescue and hazardous material incidents. All suppression personnel are trained to a minimum of operations level in Hazardous Material Emergency Response (HAZWOPER), and awareness level in six disciplines of technical rescue. The Special Operations Team provides technician level mitigation for hazardous material responses and six technical rescue disciplines. These disciplines include Rope Rescue, Swift Water, Confined Space, Trench Collapse, Emergency Building Shoring (EBS), and Industrial Machinery/Heavy Extrication. The annual training requirement for awareness and operations personnel is a minimum of 16 hours, and technician level personnel is an additional 88 hours to maintain proficiency in the various mitigation strategies. This is accomplished through scheduled company training, and in coordination and cooperation with Pima Regional Hazardous Material and Technical Rescue Teams. Northwest Fire District is a participating member in each of these teams and tracks the training in Target Solutions.

Throughout the evolution of the Special Operations program, it was determined through the Standards of Cover, that to properly respond to complex special operation incidents, a total of 14 technician level responders would be required per shift. This is known as the Effective Response Force (ERF). To supplement the NWFD response to special operation incidents, automatic aid is provided by Golder Ranch Fire District (GRFD) and Tucson Fire Department (TFD). To facilitate the required 14 technicians and support personnel, NWFD maintains technician level staffing for Hazardous Material and Technical Rescue from a single station (Station 338), housing seven technician level personnel, staffing one Engine (4 personnel), one Squad (1 personnel), and one Transport (2 personnel). Light Squad 337 is located at Station 337 and is equipped with low angle rescue equipment, supplemental technician level equipment, and is deployed as the REMS (Rapid Extraction Module Support) apparatus with a towable utility task vehicle (UTV).

In February 2022, the automatic aid agreement with NWFD, GRFD, and TFD continued to evolve with the adjustment of response plans. In short, the resources determined for hiker rescue and swift water rescues were reduced to improve response reliability during high call volumes as are commonly seen during severe weather. Northwest Fire District, Golder Ranch Fire District, and Tucson Fire Department have benefited from attending the same initial technician trainings, continuing education, regional team participation, and the development of professional relationships by shaping a similar and effective response model over the last several years.

Employee Count
Certified Personnel Assigned to Special Operations (Station 338): 21
Cross-trained Hazardous Material/Technical Rescue Team (TRT): 18
Technical Rescue Team (TRT) Qualified Only: 0
Trained in 1 or More Disciplines: 3

Certified Personnel Not Currently Assigned to the Team: 89
Cross-trained Hazardous Material/Technical Rescue Team (TRT): 35
Technical Rescue Team (TRT) Qualified Only: 2
Trained in 1 or More Disciplines: 52

Incident Count (FY21-22)
In-District: 280
Out-of-District: 68

Automatic Aid Responses
Northwest Fire District, Golder Ranch Fire District, and Tucson Fire Department Special Operation teams have provided technician level mitigation capabilities to our communities by sharing manpower and resources to fulfill the necessary requirements and safety considerations involved with technical rescue and hazardous material incidents. Special Operations respond to support the first responder operations and incident command personnel by delivering specialized and technical assistance. In FY21/22 this assistance was required on several incidents.

Identified Response Changes
The most common technical rescue incidents are related to injured hikers found on several hiking trails throughout NWFD's jurisdiction. These incidents are often in steep terrain or austere environments requiring rope and litter assistance to extract. To further support the response to these frequent incidents, technical rope rescue training was delivered to all operations personnel with the intent to raise the base level competency of all suppression units. Technical rope rescue was adopted into the recruit training curriculum, and a 12 person Rope/Swiftwater Technician program was created to begin training response personnel. In FY21/22 a change in tactics was implemented to have first arriving companies assume a Recon or Hasty Rescue role. The intent is to expediate the identification of needs to stabilize and extricate an injured hiker.

The addition of a constantly staffed Safety Officer (SO331) was deployed in August of 2021. The position offers a dedicated safety officer each day who is dispatched to major incidents to support and enforce safety considerations. SO331 works in conjunction with on duty Captains, Battalion Chiefs, and the Health and Safety Officer. The addition of this resource complements the effective response force by elevating the awareness of known and unknown threats, hazards, and risks associated with emergency response.

Equipment
Special Operations continued to improve its capabilities by leveraging technological advances. 2021 grant funding provided an additional Rescue Boat, Personal Flotation Devices (PFDs), Tandem Tension Rope Systems, and an Unmanned Aerial System (drone). Budgeted improvements include upgrading rope systems to 11mm packages, purchasing and deploying Hasty packs to all Engine and Ladder Companies, upgrading a line gun for swift water rescue, and maintaining the Weapons of Mass Destruction testing kits.

Special Operations continued to evolve, finding new areas of improvement, and capitalizing on the effectiveness of new equipment. The acceptance of this equipment drove the training toward utilization of equipment and reallocation of personnel. One example is the adoption of approving 11 mm rope into NFPA 1983. This advancement led to the purchase of 11mm rope and new descent technology (Clutch). The result is a lighter, faster response with streamlined equipment for a more efficient rescue design. The upgraded equipment can be utilized in a manner that frees a technician for alternative

duties. New and better practices continue to be discovered and implemented into response plans.

Special Operations Training
Special Operations continued to be involved with Pima Regional HazMat and TRT training and teams. Approximately 80 hours of training per member was provided through regional training opportunities. These training hours are tracked using Target Solutions and reported to the region for IGA review and approval on an annual basis.

Additional technician level training was offered through Pima Regional Hazardous Material Response team and Technical Rescue Team. Four NWFD personnel gained Hazardous Material technician level certification, and four members gained Technical Rescue Technician certification. Four members also received Tox-Medic certification through AHLS (Advanced Hazmat Life Support), as a regional sponsored program and requirement. NWFD hosted the Emergency Building Shoring and Industrial Entrapment courses as part of the 200-hour curriculum, further expanding expertise and training in these areas. NWFD Special Operations also conducted a Rope Rescue Technician course in FY21/22 gaining 12 additional Rope Technicians.

Wildland

The Wildland Team is a specialty team within the Northwest Fire District Operations Division. It consists of a full-time Wildland Coordinator and full-time firefighters assigned to fire stations. Various team members also hold administrative and support roles. Staffing of the engines and administrative functions within the team is based on an individual's qualifications. These qualifications are aligned with NWCG 310-1 standards, and all personnel qualifications are approved by the Fire Chief and by the Department of Forestry and Fire Management.

The Wildland Team is primarily responsible for mitigating the wildland and interface fire threats within the Northwest Fire District. Their secondary responsibility is responding to requests for assistance from other agencies and communities through the Auto Aid Agreement, State Mutual Aid Agreement, and through the Department of Forestry Fire Management Cooperative Fire Agreement.

In-District responsibilities include:

- Wildland qualified personnel regularly staff engines for District response during the fire season when periods of extreme fire danger and/or red flag conditions warrant. The Wildland Coordinator, or acting Duty Officer, works with the shift Battalion Chiefs and Operations Division Chief to increase staffing levels when conditions warrant. Support of on duty Operations Division officers and firefighters through

continuing education, skills training, and application of supplemental equipment for structural apparatus for wildland fire response.

- Hazard fuel reduction and mitigation in targeted areas, with recognition of target areas and notation of fuel breaks and available topographic control features.
- Education of District residents on wildland interface problems.
- The maintenance and creation of automatic aid, cooperative agreements.

In FY21/22 the Northwest Fire District responded to 158 wildland incidents within the District. 139 incidents were handled with the use of a single engine company. 19 incidents required the use of specialty trained personnel assigned to two of the District's brush trucks.

The winter months are the time that most of the Wildland Team members engage in necessary wildland training. During FY21/22, the District held one National Wildland Coordinating Group S230/S231 Single Resource Crew Boss/Engine Boss certification class at the NWFD Training Center. The District also assists in teaching and preparing future firefighters for the rigorous career in wildland firefighting. The Wildland Team began aiding the Pima County JTED (Joint Technical Education District) program in qualifying students in NWCG (National Wildfire Coordinating Group) basic wildland.

Improvements to the Wildland Team in FY21/22 included new equipment to replace old, outdated equipment that the team needs to complete necessary tasks safely. The annual wildland orientation program was updated for new team member training and explains existing participation expectations. The Wildland Team also supported the Training Division with a new wildland chapter to the NWFD Firefighting Manual. Based on feedback from suppression personnel, there was an update to the Northwest Fire District wildland refresher training to better prepare NWFD firefighters for the upcoming wildland fire season. The Wildland Team also assisted with revising Standard Operating Guidelines to ensure all applicable standards are maintained. The and the Wildland Team continue to provide support to the Audubon Society and Pima County in the Corazon fuels reduction project in the Santa Cruz River.

Out-of-District assignments in FY21/22 included: six individual overhead assignments, four type 3 engine assignments, and two REMS Team assignments. Additionally, the District provided personnel to the Coronado National Forest Fire Dispatch Interagency Center to staff a night dispatcher for approximately 122 nights in FY21/22.

Wildland Qualified Personnel
Engine Boss: 6
Engine Boss Trainee: 1
Division Group Supervisor: 1
Task Force Leader: 2
Strike Team Leader Trainee: 1
Incident Commander Type 4 & 5: 4
Logistics Sections Chief Type 2: 1
Situational Unit Leader: 1
Firefighter Type 1: 3
Firefighter Type 1 Trainee: 1
Firefighter Type 2: 17

In-District Incident Count: 158

In-District Brush Truck Staffing
Total Days Staffed: 27

Brush Truck Responses
Total: 19
Large Brush Fire Responses: 6

In State Engine Deployments
Type 3 Engine Deployments: 1
Total Days Deployed: 14

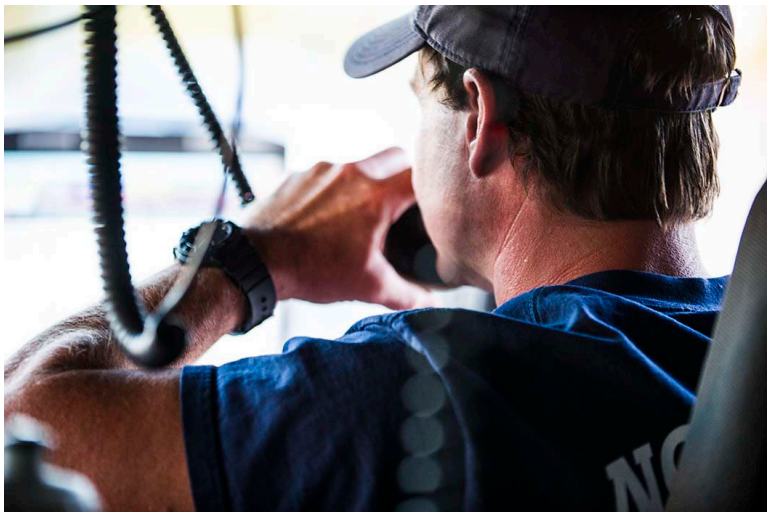
Out of State Engine Deployments
Type 3 Engine Deployments: 3
Total Days Deployed: 54

In State Single Resource Deployments
Task Force Leader Deployments: 1
Total Days Deployed: 16

Out of State Single Resource Deployments
Task Force Leader Deployments: 2
Supply Unit Leader Deployments: 3
Total Days Deployed: 81

REMS (Rapid Extrication Module Support) Team Deployments
Total Deployments: 2
Total Days Deployed: 26

Community Assistance Program (CAP)



The Northwest Fire District maintains a Community Assistance Program (CAP) designed to provide additional resources and support with occupant services. The CAP Team's primary function is to assess community member needs and provide resources to meet those needs. CAP Team members respond to major incidents at the request of responding crews and are automatically dispatched to working fire incidents. The CAP Team maintains relationships with various community groups and public safety agencies. The team provides the same services to Golder Ranch Fire District, Pima County Sheriff's Department, Marana Police Department, and Oro Valley Police Department upon their request.

The CAP Team is comprised of two personnel who share responsibility for responding for CAP services during the workday and alternate weekly for after working hour response in

an “on call” capacity. In FY21/22, the CAP Team worked with the University of Arizona to sponsor an internship program for undergraduate students. NWFD hosted one student who assisted the Team for the Spring Semester of 2022.

CAP experienced a 19% increase in incident responses compared to FY19/20. Calls for service have reached 549 (including non-emergent requests) for in-District responses and 309 (including non-emergent requests) for out-of-District responses. The value provided by the CAP Team was recognized by regional partners, creating an increase in out-of-District call volume. CAP remains one of the only programs statewide that provides on-scene and follow-up support.

CAP streamlined non-emergent referrals by creating a fillable form that captures necessary information and has been loaded as a worksheet into the Electronic Patient Care Reporting (EPCR) system. An automatic report is generated each day with referrals for service. CAP Team members share the responsibility of addressing the non-emergent referrals and resourcing appropriately.

CAP provided several presentations in FY21/22 regarding the program to further educate first responders on CAP services. This year the following agencies received presentations: Oro Valley Police Department semiannual Citizen Academy, Pima County Sheriff’s Department Peer Support Training, Golder Ranch Fire District Captain class, Northwest Fire District/Golder Ranch Fire District Battalion Chief class, Marana Police Department Sergeant meeting, and Pima County Sheriff’s Department briefings.

CAP Team members received the following awards and recognition in FY21/22: Golder Ranch Fire District Community Recognition Award, Oro Valley Police Department Citizens of the Year Award, and KOLD Television Heart and Soul of Tucson recognition.

Employee Count
Employees: 2

CAP Incident Count
In-District: 308
Out-of-District: 179

CAP Scene Incidents by Jurisdiction
Northwest Fire District: 308
Golder Ranch Fire District: 173
Tucson Fire Department: 4
Avra Valley Fire District: 1
Rural Metro: 1

CAP Scene Incidents by Call Category
(All Jurisdictions)
Call Type
EMS: 352
Fire/Rescue: 135

Internal Service Programs

Administrative Services

The Administration Services Division provides administrative support to the agency as a whole. The team oversees front lobby reception and customer care, annexations, public record requests, compliments and complaints, Custodian of Record duties, elections coordination, internal meeting facilitation, and compliance with Open Meeting Law as it pertains to the Governing Board. Administration Services staff also manage projects at the request of the Fire Chief. The Administration Services Team provides project management and administrative support for the Strategic Plan, Accreditation, and ISO.

Employee Count
Employees: 4

Customer Interactions: 4,483
Public Records Requests Processed: 344
# of Parcels Annexed: 230
Total Limited Assessed Value Added Through Annexations: $907,443

Human Resource Services

The Human Resource Services (HRS) Division is primarily responsible for the entire employee life cycle for all District employees. This includes benefits and leave management, compensation, compliance, onboarding/offboarding, employee and labor relations, professional development, training, talent acquisition and retention, performance management, and risk management.

During FY 21/22, HRS assisted in streamlining the process for recruitment by implementing several new software systems. Utilizing video interview software significantly reduced the amount of time it takes to hire and allowed for other efficiencies to occur within the Division.

Employee Count
Employees: 3

HR Staff to Member Ratio
1.12 full-time HRS staff per 100 employees

Organizational Vacancies
Average vacancy rate: 12.5%
Average vacancy duration for Civilian positions: 52 days

Recruitment

Civilian: 177 applicants to fill 14 positions
Uniform: 394 applicants to fill 16 positions in 1 academy

- Average number of days from first day of recruitment to first day of academy: 104

Promotional Processes
Engineer – 7 Participants – 320 Hours
Captain – 12 Participants – 85 Hours

Insurance
Health Insurance Budget: $3,500,000
Average Cost per Member: $13,060

Workers' Compensation Insurance Budget: $544,069
Average Cost per Member: $2,030
Number of Workers' Compensation Claims: 38

Total Medical Claims Versus Projected
$2,801,313 actual claims versus $2,758,212 expected claims (2021 Plan Year)

Retirement Benefits

- ASRS
  Budget $385,957
  ASRS System Wide Funded Status: 72.8%

- PSPRS
  Budget $6,137,678
  Tier 1 & 2 Funded Status: 69.5%
  Tier 3 Funded Status: 112.1%

Agency Demographics
41 Average Age
240 Males & 28 Females
Racial Diversity

- Asian 0.37%
- Black or African American 1.49%
- Hispanic/Latino 18.28%
- White 79.48%

20.50% of members are [normal] retirement eligible

Finance Services

The Finance Services Division is responsible for overseeing the financial functions of the District. Finance staff manages accounts payable, accounts receivable, payroll, procurement, operating and capital budgets, grants management, debt administration, risk management, internal controls, and financial planning, reporting, and forecasting.

In FY 21/22, Finance Services implemented a payment manager program with the District's current banking partners. The payment manager program has allowed staff to process payments to vendors and reimbursements to employees quickly and in their preferred method (ACH, virtual card, etc.). Also in this fiscal year, the financial software approval paths for purchasing were updated which created greater efficiency in obtaining and documenting system approvals for purchases. For approvals needed outside of the software, staff trained departments on electronic approvals. Both processes made purchases timelier to help mitigate supply chain delays.

In the pursuit of utilizing new aspects of the District's financial software, staff began scanning and attaching payment and fixed asset documents to their corresponding modules. This made it more efficient for departments to view backup documentation. After filling the Budget and Finance Analyst position and realigning grants management in the prior fiscal year, the District was able to submit and receive more grant awards in FY21/22 than typical. Also, having Procurement realigned to Finance Services has allowed for a greater connection to the budget. The Budget and Finance Analyst and Procurement and Contract Specialist are now working together during the Capital Improvement Program submission process, the yearly budget process, and on a regular basis to keep purchases within budgeted amounts. All of these improvements allow the District to continually streamline operations to fulfill the mission and better serve the public.

Employee Count
Employees: 6

Technical Services

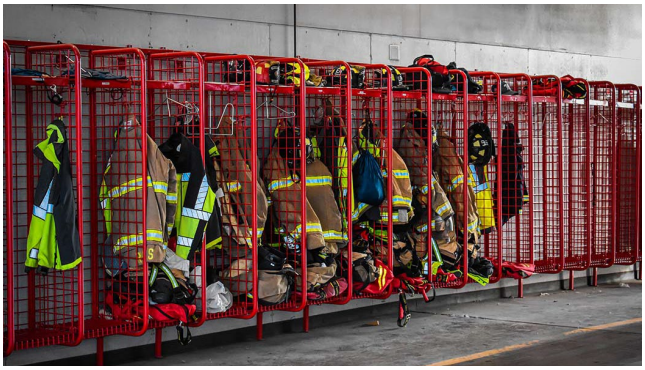
The Northwest Fire District Technical Services Division oversees various systems and hardware critical to the District's ability to serve its residents. Systems and hardware include endpoint computers, servers, cloud services, desk phones, cell phones, radios, and essential applications, all communicating over a redundantly connected network. Additionally, Technical Services manages the technology deployed in response apparatus such as tablets, ruggedized laptops, and mobile wireless networking devices.

In FY21/22, the Division implemented network infrastructure to support the District's new Administration Complex, which included working with a third-party internet service provider for fiber connectivity, acquiring and installing network switches and routers, and installing WiFi access points. Technical Services staff relocated the District's primary datacenter firewall, virtual servers, networking devices, storage area network, IP phone system, and back up appliance to a co-location datacenter. Other accomplishments include standardizing the Mobile Data Terminals (MDT) used in District apparatus, partnering with PCWIN to update all station radios, implementing a new asset management application, upgrading District issued cell phones, and upgrading the VMWare operating system on four physical servers that host the District's 28 virtual servers.

Employee Count
Employees: 5

Help Desk Metrics
Total service ticket/call count: 1,532
System uptime: 99%

Warehouse Services



Warehouse Services is comprised of seven individuals: (1) Warehouse Services Manager, (1) Supply Supervisor, (2) Warehouse Inventory Specialist II, (1) Fire Equipment Services Supervisor, and (2) Fire Equipment Services Worker I. The purpose of the Division is to provide the highest quality protective equipment, tools, materials, and supplies necessary for NWFD members to perform at maximal levels to save lives, protect property, and care for our community. The Warehouse Services Division is a component of the Essential Services Section providing warehousing, inspection, maintenance, repair and distribution of essential goods, services, equipment, and supplies.

Warehouse Services is responsible for providing and maintaining personal protective equipment, self-contained breathing apparatus (SCBA), hose, tool and equipment specifications, annual fit testing and certification related to particulate and SCBA masks, annual testing and certification of fire hose and ground ladders, repairing damaged or inoperable equipment, and management of surplus property.

The Division is also responsible for ordering, receiving, storing, distributing, and surplus disposal of all disposable and durable supplies necessary for daily operations including uniforms, medical supplies, office supplies, tools, and equipment, in addition to identifying and executing programs to streamline ordering and delivery processes and improve inventory/asset tracking accuracy and accountability.

Improvements during FY21/22 included dramatically improved uniform ordering and delivery processing times to members, improvements to the EMS supply inventory program, implementation of a power tools inspection, repair and maintenance program as well as PPV fan and generator inspection, repair and maintenance programs.

Employee Count
Employees: 7

Orders Processed
Purchase Orders issued: 3,650

PPE Inspections
Total Count of PPE Inspections: 212
Advanced PPE Inspection Compliance: 99%
Station PPE Inspection Compliance: 92%

Equipment Repairs
% of Repairs Completed In-House 100%

Type	# of Repairs
Equipment / Generator PM	3
Power Tools / Rotary Saw PM	5
Power Tools / Chainsaw PM	25
PPE Inspections / Brush Gear	137
PPE Inspections / Helmet	197
PPE Inspections / Hood	129
PPE Inspections / Structure Boots	198
PPE Inspections / Structure Gloves	180
PPE Inspections / Turnout Gear	212
SCBA Inspections	54
SCBA Repairs	26

Fleet Services

The purpose of Fleet Services is to keep the District's apparatus and motorized equipment safe, reliable, and efficient in support of District operations. The Fleet Services Division Manager evaluates vehicles and equipment in the creation of maintenance and replacement schedules and establishes preventative maintenance schedules conforming to manufacturer, industry, and government standards. Skilled Fleet Technicians conduct annual required pump and aerial ladder testing. Additional vehicles are kept in reserve, ready for emergency use, or to be placed in service when primary apparatus are being maintained. Fleet Services is central to ambulance inspections occurring annually in conjunction with the Arizona State Department of Health Services-Bureau of EMS and Trauma Systems. Upfitting, retrofitting, and custom fabrication is designed and accomplished as necessary to meet specific operational needs. The Fleet Services Manager also oversees the vehicle leasing program.

Employee Count
Employees: 8

Total Hours of On-Scene Support: 6

Total Hours of After-Hours Response: 184.5

Vehicle Replacement Plan
FY21/22 (completed)

- 1 Prevention Vehicle (lease)
- 1 Fleet Services Truck (lease)
- 3 Staff SUVs (lease)

FY22/23 (planned)

- 1 Rehab / Command / Air Utility*
- 2 Engines
- 1 Preparedness Branch Mid-Size SUV (lease)
- 1 Response Branch Mid-Size SUV (lease)
- 1 CAP Responder Small SUV (lease)

*This vehicle replacement was carried forward from FY21/22 due to delayed delivery by manufacturer.

Average Mileage All Vehicles
56,607 miles

Average Age All Vehicles
10 years

% of Repairs handled by in-house personnel versus outside vendor
15% Labor Hours are vendor
85% Labor Hours are in-house

Facilities Services

The purpose of Facilities Services is to provide a safe, comfortable, and efficient work/living space for the District's members. Due to the unique role of fire stations, they must be maintained as both a work environment, as well as a living environment. Timely and accurate repairs are essential to maintain emergency operations within the District. The Facilities Manager is responsible for all real property maintenance related planning, design, and construction as well as conducting regular assessments of all District facilities. The Facilities Manager works closely with battalion chiefs, station captains, and the Finance Services Division.

FY21/22 saw the completion of NWFD Administration Building. The focus of the Facilities Division over the fiscal year was building a team of technicians and identifying processes and contracts needing improvement. A number of process changes were implemented throughout the year, with contract changes taking effect in the FY22/23 budget.

Employee Count
Employees: 5

Total Facility Counts
19 facilities
Average square feet 11,109
Average age 17.3 years

CIP Projects Completed FY21/22

Asphalt Maintenance	$200,000
New Administration Building	$11,231,456

Completion of construction of the Administration Building on Marana Main Street

Training

The Training Division exists to serve the District's mission by training NWFD personnel to be safe, efficient, and effective so that firefighters master their craft and maintain their skills for the duration of their career. To accomplish this, training must be relevant and focused.

RELEVANT TRAINING:

- Utilizes up to date tactics that are considered "best practices" – data driven and scientifically proven.
- Utilizes a variety of teaching and instructional techniques and multiple learning platforms to meet diverse learning styles.
- Utilizes lesson plans with clearly defined objectives that reinforce existing SOGs (standard operating guidelines).
- Identifies areas where improvements in performance can be made.

FOCUSED TRAINING:

- Includes centralized training providing hands-on firefighting skills, using multiple repetitions under realistic and stressful conditions.
- Is prop-dependent for high-risk, low-frequency skills/tasks.
- Includes decentralized training to provide classroom style learning and continuing education.
- Establishes training relationships with neighboring districts/departments, public safety agencies, and colleges.

FY21/22 brought back a lot of in-person training at the NWFD Training Center. In July the District held the annual Engineer Continuing Education. August was busy with Captain promotional testing, Academy 21-01 graduation, Support Vehicle Operator class, a Company Readiness Drill that involved putting all crews from Northwest Fire District and Golder Ranch Fire District through the flashover chamber, and hosting a regional Health Safety Officer class. In November the NWFD Special Operations team hosted a regional EBS (emergency building shoring) and Heavy Vehicle Extrication class, and Recruit Academy 21-02 began. In 2022 the District hosted a motor vehicle fire investigator class that included students from around the country, Wildland S230/231 classes, a Driver Operator/Aerial Operator class, Probationary Firefighter testing for Class 21-01, an external Blue Card Incident Command certification class, a Battalion Chief certification class, Support Vehicle Operator class, the graduation of Recruit Academy Class 21-02, regional Leadership I, II, III series classes and an Engineer Academy program. You can see more details of these classes listed below.

The Engineer Academy was a new program for the District. An assessment center was held for members who met defined criteria and were interested in promoting to Engineer. The assessment process consisted of a written exam, basic practical evolution, and an oral board. Those that successfully passed the assessment process were invited to attend the Engineer Academy. Engineer Academy participants were pulled off shift to a 40-hour work week for eight weeks. During that time participants were immersed in becoming an Engineer. They took classes, pumped trucks, researched topics, gave presentations, visited with Fleet Services, Technical Services, Essential Services, and Redburn Tires, and ended with a final exam process. Those that passed were placed on an Engineer promotion eligibility list.

Employee Count
Employees: 5

Schedule Use and Participant Hours
Total participant hours: 135,114
Total participants: 19,227
Total Hours of Scheduled Training Center Use: 8,149

Internal Programs

- Recruit Academy 20-02
- Recruit Academy 21-01
- Probationary FF program
- Engineer promotional testing
- Battalion Chief promotional testing

Field Training Classes			
	Method of Delivery	# of Attendees	Total Participant Hours
Flashover Company Readiness Drills -NWFD & GRFD	Hands-on	361	1,444
Online Training Hours	Online	295	4,580
Facility Use	Hands-on	287	32,138

Company Training Hours	Hands-on	287	48,090

Certification Programs		
	# of Attendees	Total Participant Hours
Health & Safety Officer	15	360
Support Vehicle Operator Class 20-02 and 21-01	22	528
S-230/231	15	360
Driver Operator/Aerial Operator	26	832
Blue Card Incident Command Certification	10	240
G300/400	31	1,240
Battalion Chief Certification Program	4	540
Engineer Academy	4	1,280
Leadership I, II, III	26	1,248
Recruit Academy Class 21-01	14	12,320
Recruit Academy Class 21-02	12	11,040
Emergency Building Shoring	30	1,440

Health & Safety

The Health and Safety Division exists to administer and manage the District's Occupational Safety and Health Programs. In FY21/22, the Division was assigned a dedicated Division Chief for the role of Health and Safety Officer. The Division is responsible for ensuring that the District complies with applicable state and federal requirements and best practices by working with all divisions within the District. The Health and Safety Division plays a primary role in risk management, and is responsible for accident prevention training,

accident investigation, mental health, peer fitness, injury tracking and prevention, annual physicals, and investigation of any safety related issues that are brought to the Division's attention. Other responsibilities include OSHA compliance programs such as facility inspections, hearing conservation, infection control, electrical hazards, respiratory protection, lockout/tagout, and many others. Program administration is shared with shift assigned Safety Officers who are assigned specific programs.

COVID-19 continued to pose a health hazard for NWFD members in FY21/22. The Health and Safety Division, through its Shift Safety Officers, continued to follow the changing CDC guidelines to ensure the workforce remained healthy. Through the course of FY21/22 numerous employees were removed from the workforce to either isolate or quarantine.

New thermal imaging cameras (TICs) were purchased for all frontline Engine companies in November of 2021, following a decision by the Labor-Management Committee to commit to NFPA 1801 compliance. The new TICs offer enhanced thermal imaging which aids in conducting rapid search of low visibility areas, providing greater accountability of crews working in hot zones, and ensures operability in dangerous environments.

Employee Count
Employees: 4

Total Number of Employee Injuries/Exposures
Total number of employee exposures: 0
Total number of employee injuries: 38

Total Number of Occupational Health Visits
Return to work/fit for duty: 35
Annual physicals: 150

Total Lost Time Associated with Work Related Injuries/Exposures
Days off: 420.95
Days Light Duty: 312
Total number of retirements due to on-duty injuries: 3
Total days of lost work time related to mental health issue: 39

Average Cost per On-Duty Injury/Exposure: $6,555.61

Average Lost Time per Injury/Exposure
On-Duty Injury: 11.07 days
Off-Duty Injury: 17.22 days

Safety Specific Investigations
Personnel: 3 near miss incidents with employees
Facilities: 5 facilities inspections completed by Health & Safety staff
Apparatus: 7 accident investigations

Peer Support Team

The Peer Support Team offers an informal and private opportunity for firefighters and their families to speak with NWFD peers to assist with any issues that may be causing difficulties in their lives. The Team was developed to help employees, or their family members, share their concerns and explore available resources. Each of the District's 15 team members have completed formal training in listening skills and are able to recognize and refer, if needed, to a higher level of care or assistance. Major accomplishments this year included a new team coordinator, a new health and wellness mobile application called CORDICO, and growing relationships with other Peer Support teams throughout the region.

Employee Count
Peer Support Coordinator: 1
Peer Support Team Members: 15

Peer Support Interaction Count
107 interactions
28% referred to professional services

Peer Fitness Team

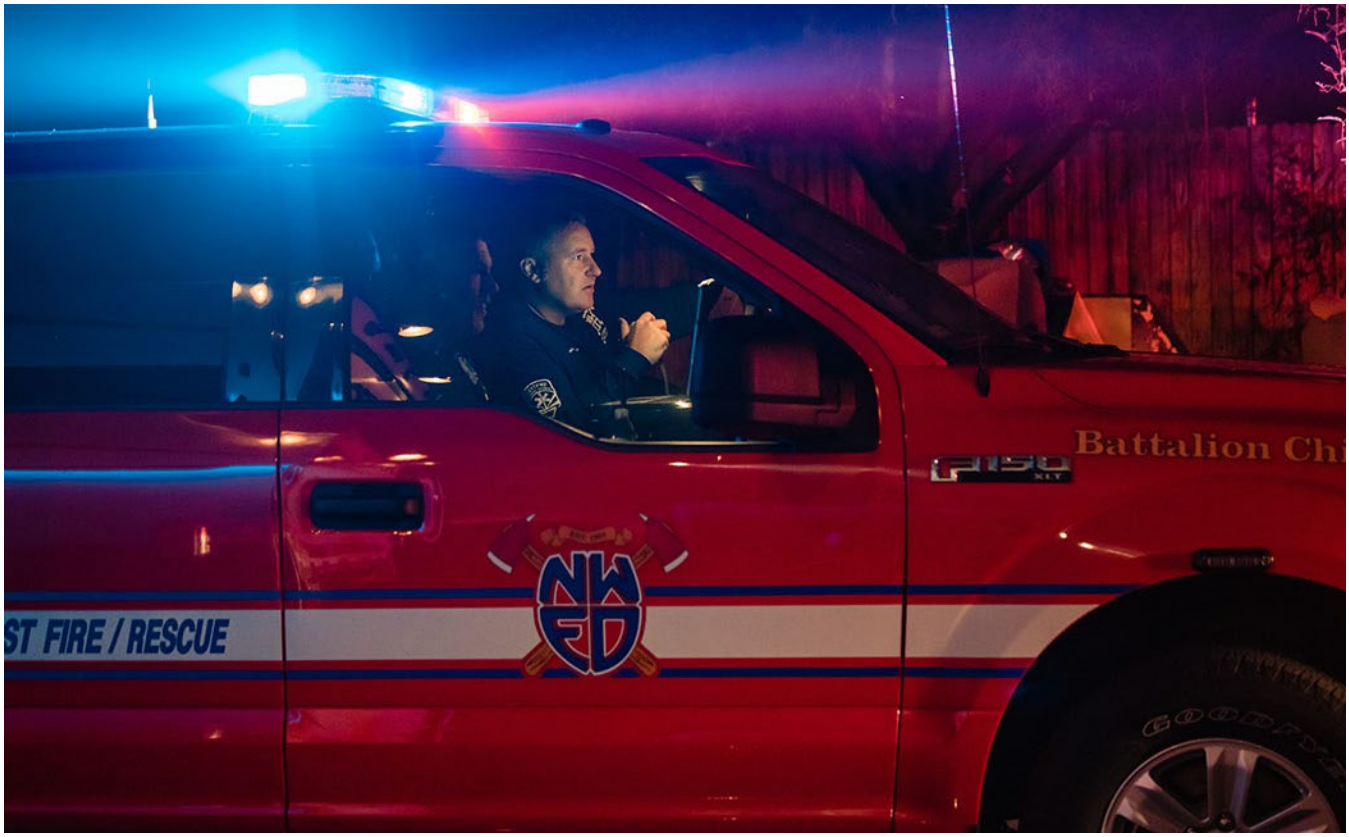
The Peer Fitness Team members are all ACE (American Council of Exercise) certified and aid with fitness program design and implementation to assist both suppression and administrative staff. The fitness trainers assist with the development of a fitness program for individuals and crews and provide fitness training to new recruits.

A major accomplishment this year was the development and implementation of a job hardening program for firefighters returning to shift work after recovery from an injury. This service is provided for employees who were injured either on or off duty.

Employee Count
Peer Fitness Coordinator: 1
Peer Fitness Team Members: 14

Peer Fitness Interaction Count
2 interactions

SECTION 3



All-Hazard Risk Assessment of the Community

CFAI Criterion 2B

Hazards, in the context of this document, are any condition, situation, or behavior that presents the potential for harm or damage to people, property or the environment; these include fires, medical emergencies, the release of hazardous materials, entrapments, and other natural and man-made hazards. NWFD has the responsibility of responding to emergencies associated with these hazards, and the associated risk is a measure of the probability and severity of adverse effects that result from exposure to a hazard. Risk can also be defined as an estimate of the probability of a hazard related incident occurring, the impact or drawdown to NWFD resources and the consequence, harm, or damage that could result to the community. The associated risk management is defined as a process to identify and prioritize local risks, followed by the integrated and strategic investment of resources to reduce their occurrence and impact. NWFD works to identify, evaluate, and prioritize the risks that pertain to the overall community and to select and implement control measures that lessen the probability, impact, and consequence.

It is important to note that there is always “residual risk”; it is not possible to eliminate all risk. The public’s tolerance of risk, as well as the elected Governing Fire Board members’ and senior management’s perspective of risk, determine the allocation of risk and the acceptable level of residual risk to the community. This is frequently accomplished through a risk-benefit/cost analysis and is directly tied to the resources that are available to reduce risk.

NWFD completed a comprehensive community risk assessment in summer of 2022 to identify, review, and update what the risks are in the District, their probability of occurrence, and the potential consequence to the community. Risk is sorted into categorical levels and, in turn, the varying levels of risk were analyzed to assist the District in identifying where and how to assess the current distribution and concentration of resources, in terms of the types and numbers needed to respond effectively to likely emergencies. NWFD has chosen to follow two credible risk assessment processes. The first is utilizing the United States Fire Administration approach12 to developing a successful risk management plan:

1. Identifying Risk Exposure
2. Evaluating Risk Potential
3. Ranking and Prioritizing Risks
4. Determining and Implementing Control Actions
5. Evaluating and Revising Actions and Techniques

NWFD has also incorporated guidelines from the *CPSE Quality Improvement for the Fire and Emergency Services 10th edition accreditation model* that outlines a four-step process regarding risk assessment methodology:

1. Identify the risk
2. Assess the risk
3. Classify the risk
4. Categorize the risk

Unique Risk Factors Associated with NWFD

When analyzing risk assessment and developing response performance goals, consideration must include many subjective and objective factors that are unique to an organization. These include, but are not limited to, CDC social vulnerability index (SVI*) factors like socioeconomic status, household characteristics, racial and ethnic minority status, housing type, and transportation as well as regional factors like political and legal realities, weather and topography, water supply, and transportation system components.

*CDC SVI Documentation 2020

Population Density/Demographics

Example of densely populated residential

As identified in Section 1, NWFD serves a wide array of population densities, ranging from many square miles of virtually uninhabited area to areas that exceed the U.S. Census Bureau's definition of urban, which is *at least 2500 people, and at least 1,500 of which reside outside institutional group quarters.*

During the past three CRA-SOC processes of analyzing population density at NWFD, only a very small area of "urban" density was identified. During this community risk assessment process, a more comprehensive and detailed GIS program was utilized in conjunction with the NFPA's CRAIG 1300. That, in combination with a net population growth of two percent since 2017 and a forecasted population growth of 17 percent from present to 2027, contributed to moderate increases of the urban density population classification during this Community Risk Assessment - Standards of Cover process. NWFD is forecast to see major increases in urban density throughout the response boundary by 2027 should area economics and construction continue to grow at current rates. This is relevant to assessing risk, as higher demand for emergency services generally can be associated with high-density concentrations of population.

Population data for two EMS and fire at-risk population age groups was acquired: under 18 years old and over 65 years old. This information is presented in Figure 3.1.

Figure 3.1
At Risk Population

At Risk Population		
Area	**Under 18 Years Old**	**Over 65 Years Old**
Unincorporated Pima County	21%	20%
Town of Marana	23%	21%

Multiple Jurisdictions

Relatively unique when compared to municipal fire departments, NWFD serves two different jurisdictions: unincorporated areas of Pima County and the Town of Marana. Maintaining an effective relationship with these two entities and ensuring NWFD has clear expectations from each regarding the delivery of emergency services and the associated level of risk is a key element to providing services to meet the identified risks in both jurisdictions.

Marana Sign

Transient Populations (Students, Seasonal Residents, Tourists)

NWFD experiences an increase in population during the winter months due to tourism and a sizeable winter resident population. To a lesser extent, during the University of Arizona academic year there is an increase in student population. Data regarding these population classifications is not readily available; however, the service impact of these populations is currently minimal as the call per month graphs in Section 4, Current Deployment and Performance indicates.

Geological/Geographical Hazards

The primary hazards associated with the area geology and geographical features include:

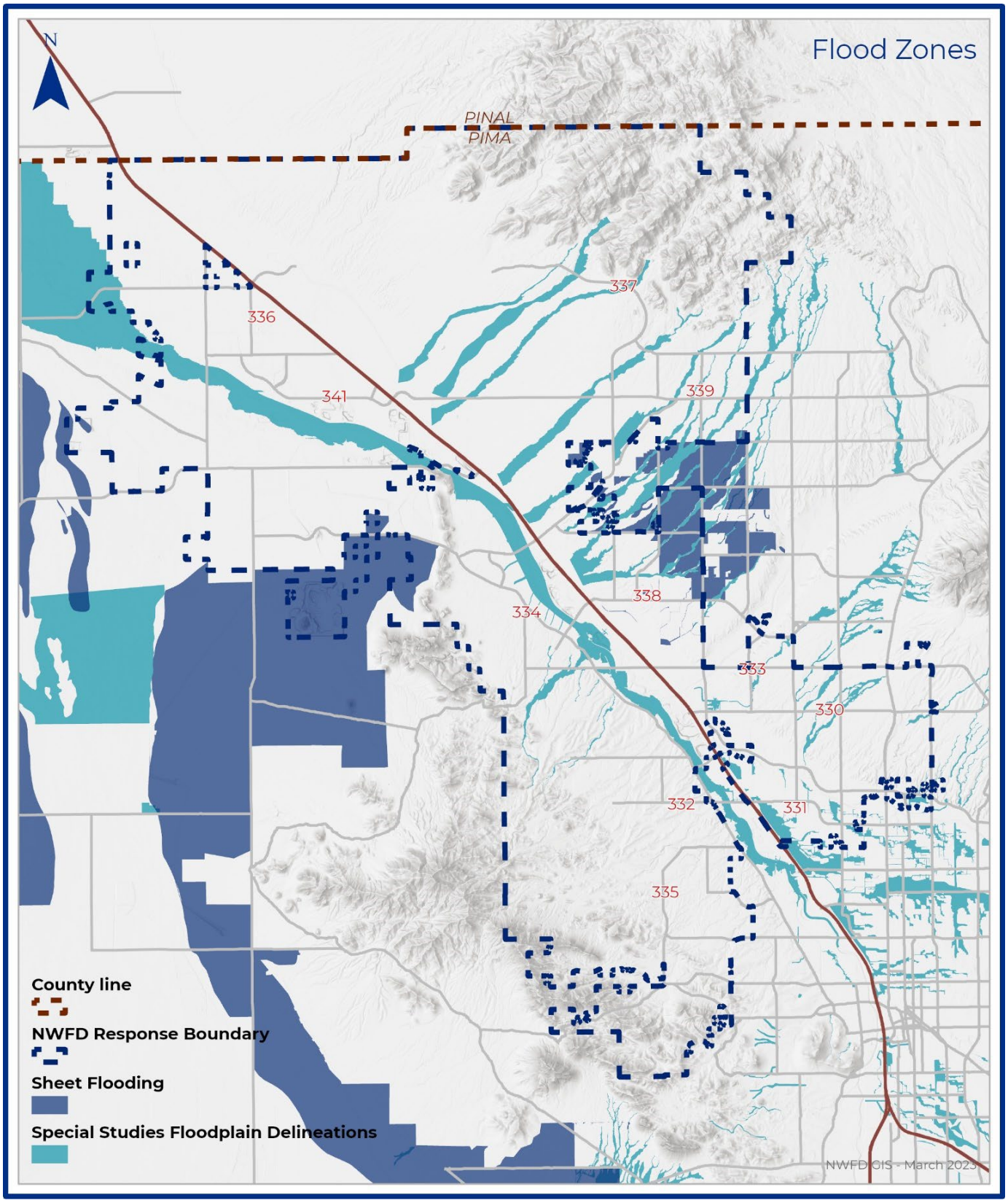
- Flooding
- Subsidence to due groundwater extraction
- Potentially damaging soil properties including expansive and collapsing soil types
- Debris flow and rock falls associated with the two identified mountain ranges

Flooding

All but the first hazard listed represent relatively minimal risk to life safety from a frequency and consequence risk perspective. Areas susceptible to flooding are presented in Figure 3.2. The most prominent flood feature is the Santa Cruz River (see photo below), which is discussed in greater detail later in this section as a large-scale risk.

Santa Cruz River looking north from the Cortaro Road Bridge.
The Continental Ranch Neighborhood is on the left.

Figure 3.2
Flood Zones



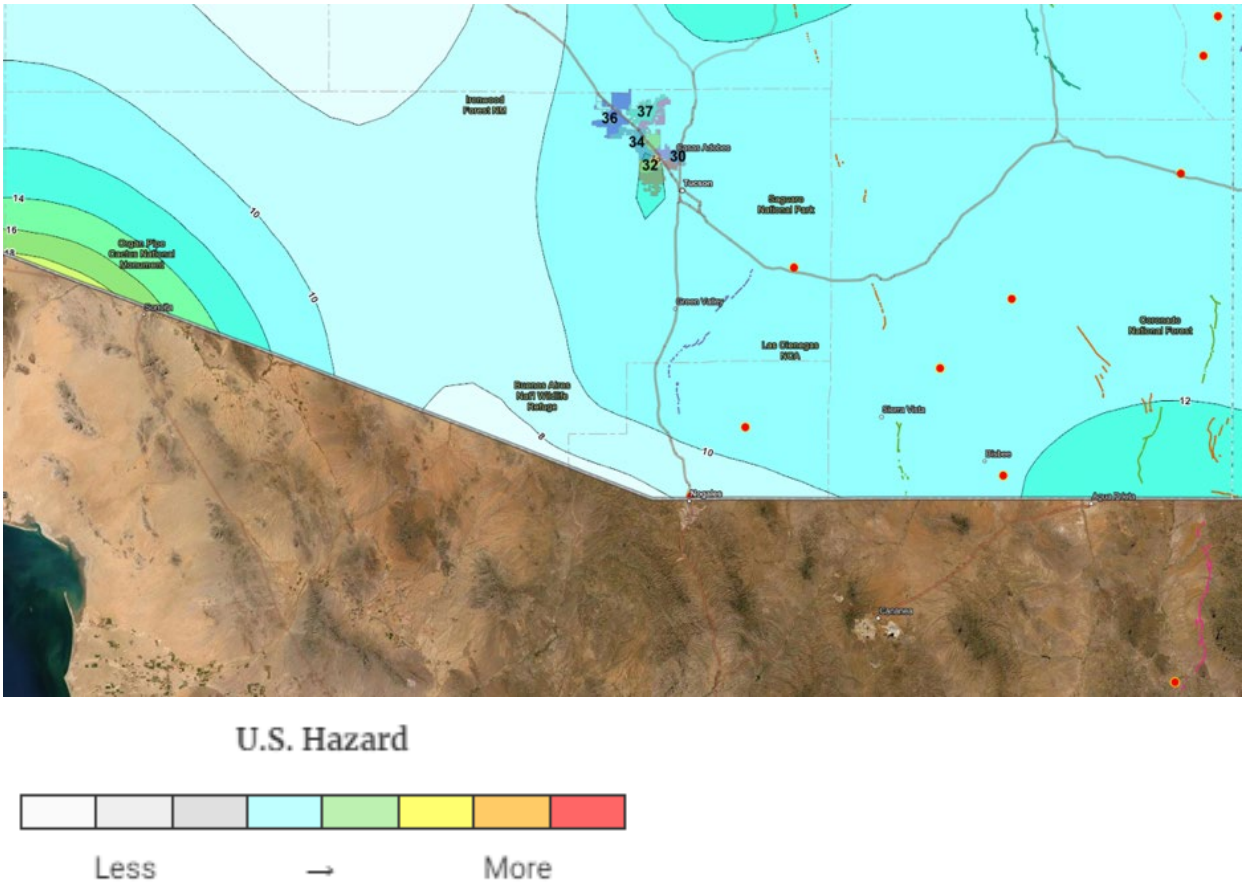
Earthquake Potential

The earthquake potential and associated risk in NWFD is minimal. FEMA classifies the region as a seismic design Category B, the second lowest risk rating. Figure 3.3 from the United States Geologic Survey also indicates a relatively low risk of earthquakes for the area (NWFD is in the teal-colored zone). The closest last major earthquake:

May 3, 1887, Sonora, Mexico (31.070°N 109.120°W) 7.4 magnitude, approximately 130 miles to the southeast of NWFD. The earthquake happened along the Pitaycachi fault near the Arizona -Mexico border, south of Douglas killed nearly 60 people and was felt widely throughout the Southwest, including Tucson. Newspaper accounts reported that the earthquake caused numerous large boulders to roll down the nearby Catalina Mountains, causing a large wildfire and some minor structural damage in the Tucson area.

While the earthquake risk is classified as minimal, there is a relatively large fault, known as the Santa Rita fault, that is located along the northern base of the Santa Rita Mountains located approximately 35 miles south of NWFD. This fault has been identified in some research sources as having the potential of an earthquake of up to a 6.5 magnitude. The probability of an earthquake along this fault is low, based on historical activity. However, as with most predictive earthquake models, there is a relatively low degree of confidence.

Figure 3.3
Historical Earthquakes 4.5+ and regional fault lines



Source: USGS website, Latest Earthquakes (usgs.gov)

Water Supply

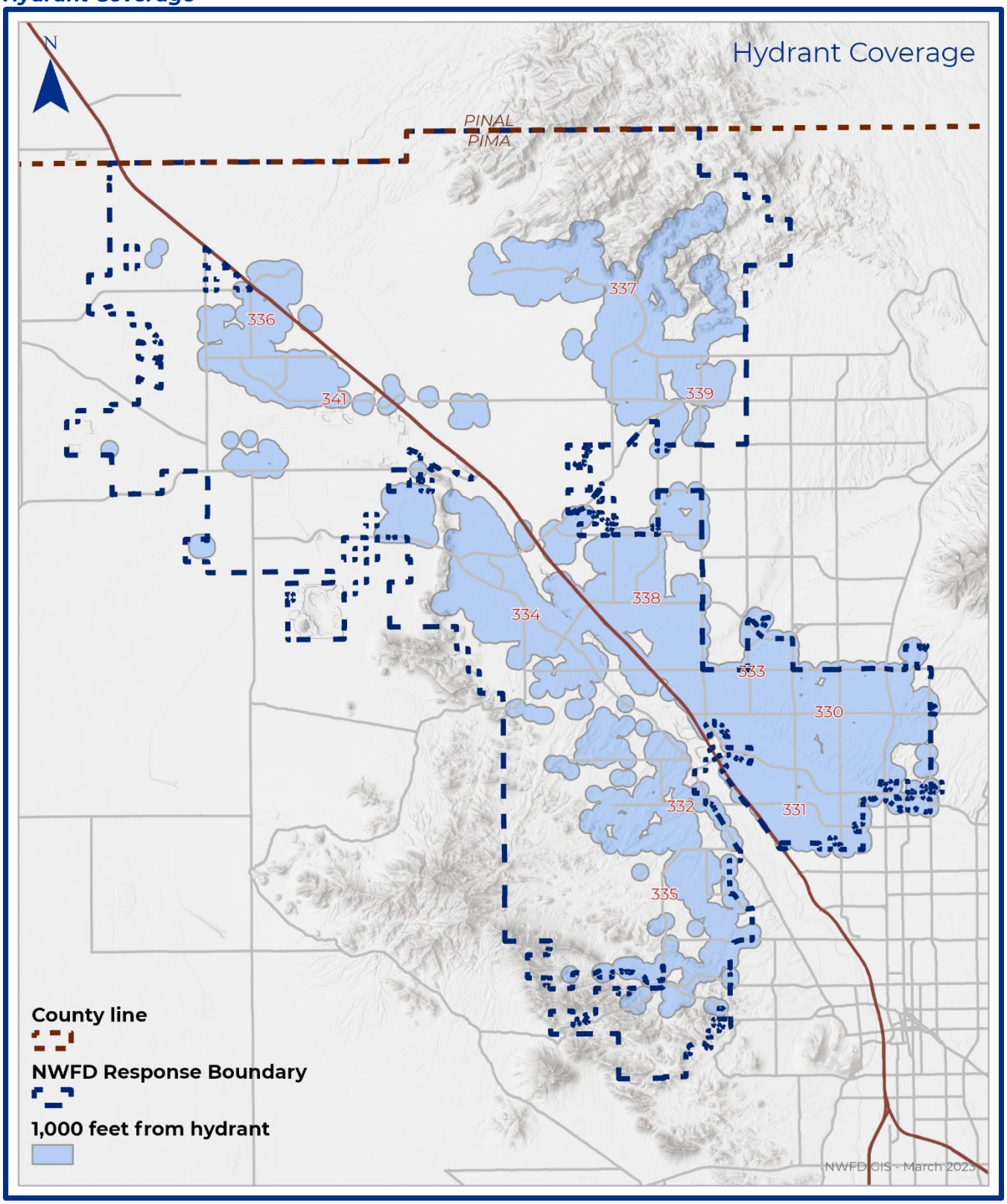
The vast majority of the urban/suburban developed area of NWFD has adequately spaced hydrants. This is generally defined as a hydrant within 1,000 feet of a commercial or residential occupancy, with a minimum flow of 1,000 gallons per minute (gpm). Areas that have occupancies greater than 1,000 feet from a fire hydrant are typically on large lots in low density areas. Figure 3.4 shows the areas that are not within 1,000 feet of a hydrant and require water supply by less conventional means. One method is relay pumping[2] a process that uses large diameter supply lines and adequately spaced engines to pump the supply lines. The second method is using water tender shuttles that bring the water directly to the scene from a reliable water source. Both methods of water delivery take longer to develop than using a conventional hydrant supply, thus increasing the risk in these areas. Areas without hydrants are identified on electronic response maps both at the dispatch center and in responding units. These areas receive a tender on the initial dispatch as part of the effective response force (ERF.)

Maintenance of the fire hydrants is the responsibility of the water entities; however, none of the water entities perform regular inspection functions at a level required by the Insurance Services Office (ISO.) As a result, NWFD performs this function annually (completed by first due companies using field maps application) and tracked in ARCGIS-Pro for each hydrant within the District. This effort requires a substantial amount of District resources each year. Flow capabilities vary widely with each entity.

Tender shuttle drill at NWFD Training Center.

[2] Relay pumping operations are designed for a distance up to approximately 3000' from the nearest hydrant.

Figure 3.4
Hydrant Coverage



Transportation System Associated Risks

Several significant transportation system elements are present in NWFD that can contribute to risk and delayed emergency responses.

Transcontinental Railroad

A transcontinental railroad traverses the District. In 2014, a new parallel track was constructed for increased capacity. Approximately 70-80 trains travel through the District daily. The length of these trains can exceed one mile. ADOT has been performing improvements to many of the old at-grade railroad crossings which has resulted in fewer response delays for the agency. Currently, two of the six primary crossings are at major arterial roadways that can cause delays in emergency response.

Example of Railroad Crossing in Station 38's First Due

Santa Cruz River

The Santa Cruz River traverses approximately 18 miles in the District, flowing south to north. It represents a significant geographical barrier for NWFD as there are only six bridges that span the river. The bridges are spaced at substantial distances, often making for less-than-optimal response routes. The addition of a bridge crossing at Sunset Road, completed in the first quarter of 2017, improved access across the river in the District's south planning zone area.

Roadways Without Drainage Management Systems

Many of the moderate volume arterial roadways and primary subdivision access roadways lack storm drain systems to carry roadway runoff. Culverts are also often lacking the capacity to manage drainage from washes that cross the roadways. Following large amounts of rainfall, often occurring in a short period of time, these roadways can become impassible. Compounding the issue, there are often no alternate means of gaining access to an incident when these conditions exist.

Roadway Network

The general lack of a centralized, grid-style street pattern typically found in municipally served fire departments adds significant travel time to responses. This characteristic is greatest in the Tucson and Tortolita Mountain foothills area of the District associated with the northeast and south planning zones, where the winding road system often includes dead ends, contributing to longer response times.

Example of winding road near Tucson Mountains

New Subdivision Roadway Trends

Identified trends in subdivision roadway design/access that are also contributing to slower response times include:

- Traffic calming devices (speed humps/bumps)
- Increased use of subdivision and residential access gates. Although most of the gates can be operated via the apparatus' Opticom system, the entry gates still cause a delay in emergency response.
- Increased use of roundabout style intersections in new subdivisions
- Creation of Geographical Planning Zones (GPZs)

The previous editions of the Standards of Cover have included two Demand Zones (see Section 4, Current Deployment and Performance) that were developed based on the urban area (Demand Zone A) and the rural area of NWFD (Demand Zone B). Their primary purpose was to establish a mechanism for response time standards.

While maintaining the two demand zones concept in this CRA-SOC, the District took the opportunity to create more detailed geographical planning zones to enhance the risk assessment process and to provide a more detailed analysis of response times. Five GPZs were created, and the zones were analyzed taking into account the following factors:

- Topographical and geological features
- Transportation elements such as roadways and the railroad
- Occupancy type
- Population density
- Risks* associated with Fire, EMS, Special Operations, and Service

** Three Axis Risk methodology is used to calculate risk for the realized incidents. The three-axis process consists of ranking probability, impact, and consequence based on realized performance factors and applying Heron's formula to output a risk score for that call type. Probability is based on frequency, or the total number of responses for a specific call type. Impact is based on the NWFD response plan from the critical tasking analysis and realized ERF 90th percentile response times for the year. Consequence is based on the built infrastructure risk assessment scores and injury effect potential to the citizens with the associated area's social vulnerability index. The core GPZ's call frequency totals are adjusted to align with the other two station GPZs for risk analysis. Risk scoring bands are as follows: Low Risk is 1-20, Medium is 20-35, High is 35-45, and MAX is 45+. **

The boundaries for the five GPZs are shown in Figure 3.5. The individual GPZs are further described in Figures 3.6 - 3.10 on the following pages.

Interstate 10, Kinder-Morgan petroleum product pipelines, Union Pacific RR, and high voltage transmission lines are some of the key risks identified along Stations 34's and 38's first-due boundary.

Figure 3.5
District Planning Zones

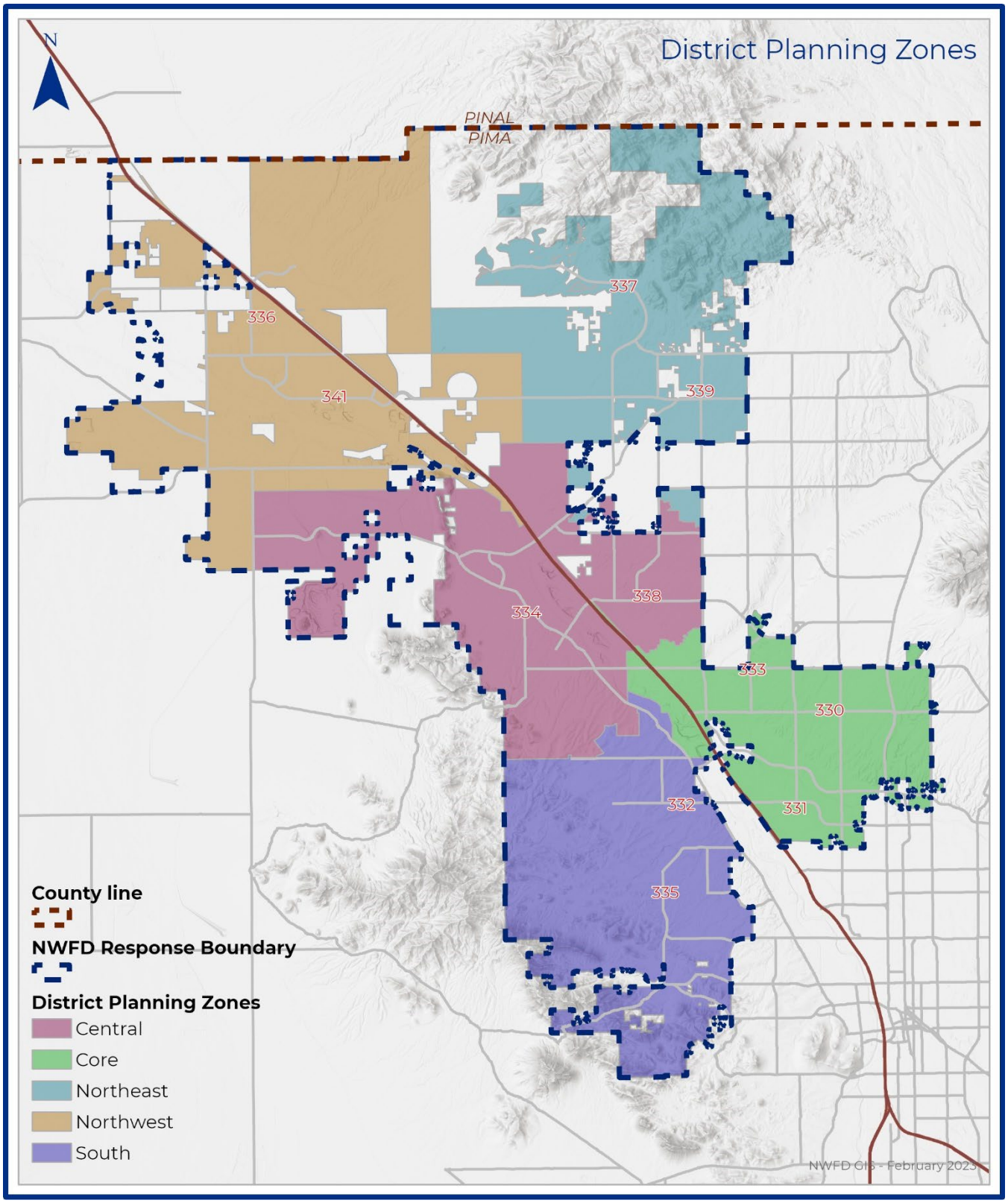
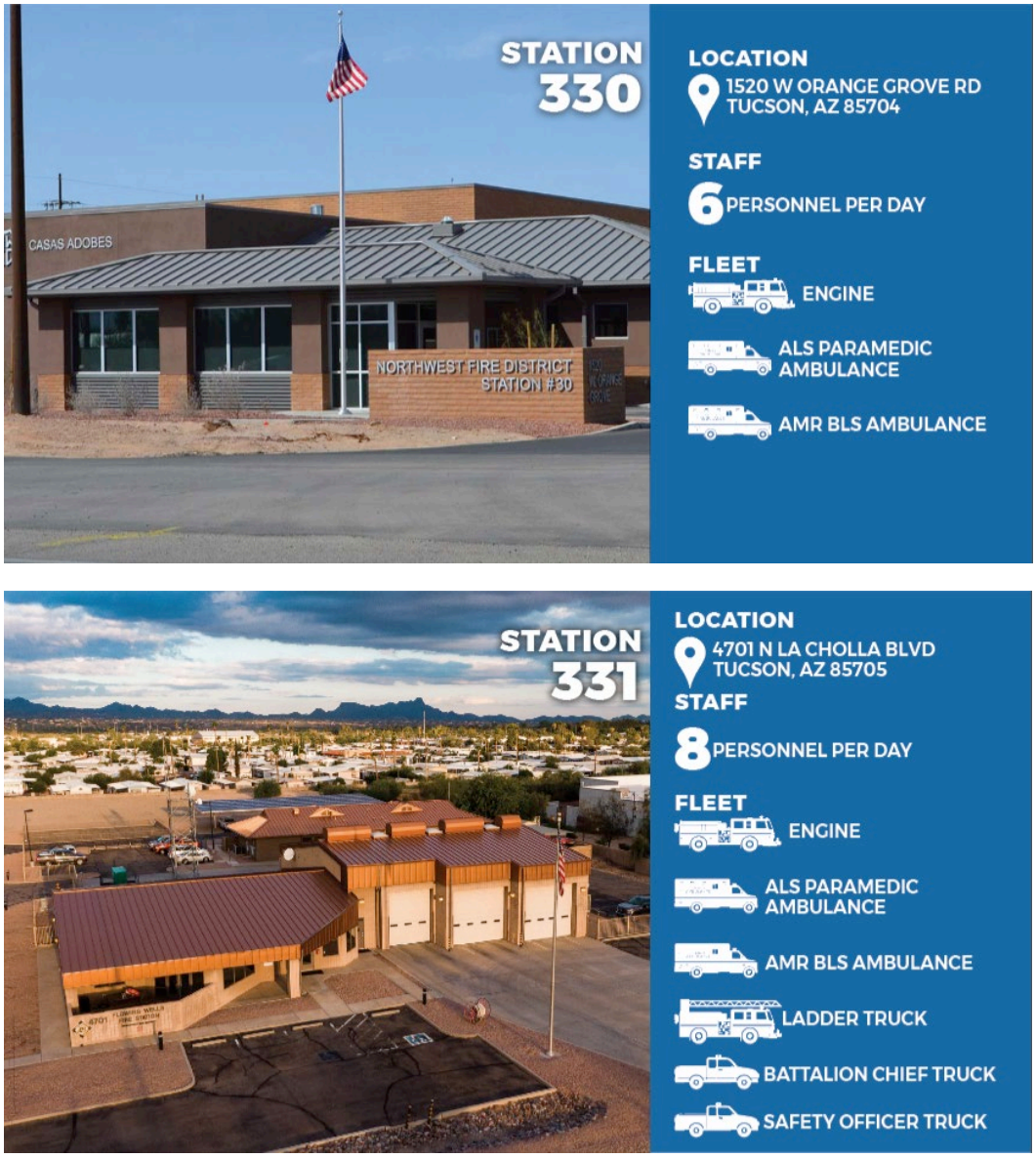
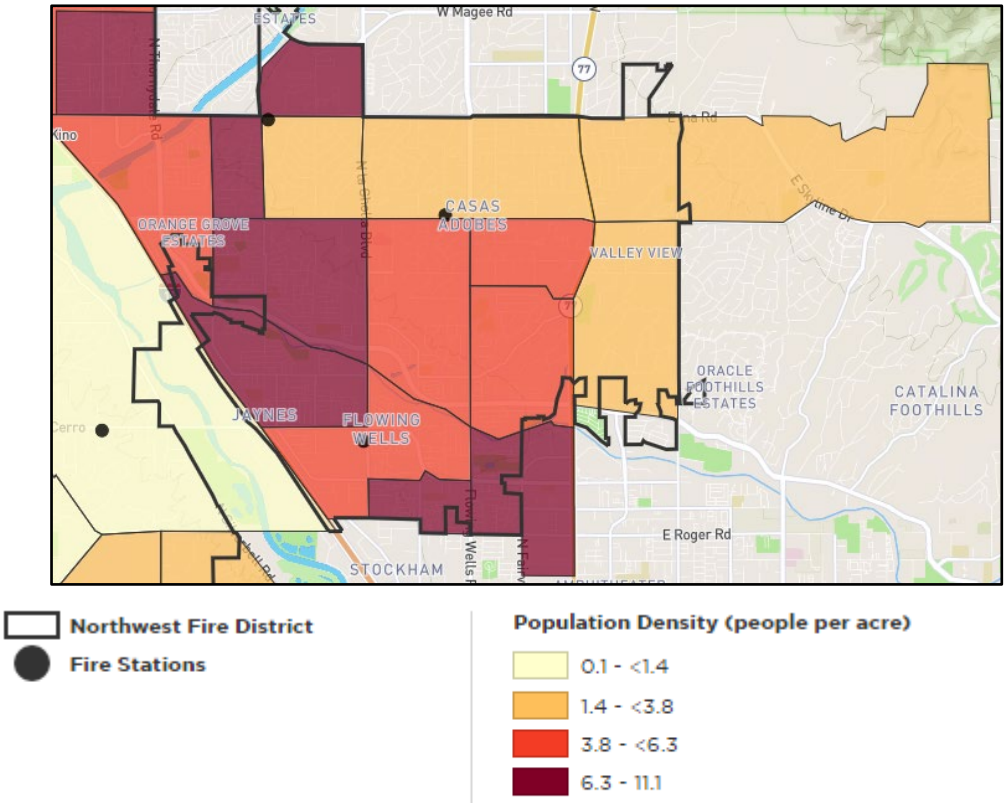


Figure 3.6
Planning Zone - Core

Planning Zone - Core	
Battalion	South
Stations & Apparatus	

Description	The Core Planning Zone consists of moderate and high-density residential homes including apartment buildings and mobile homes; a significant number of commercial occupancies including big box retail stores, strip malls, restaurants, and industrial; and a significant number of medical occupancies, skilled nursing facilities, and assisted care homes.
Population Density	 *Sources: US Census Bureau 2020; US Census Bureau ACS 5-year 2016-2020*

Critical Infrastructure	Marana	Pima County
Assembly	**71**	**153**
Assembly, other	3	6
Athletic/health club	4	11
Ballroom, gymnasium	7	8
Bar or nightclub	3	4
Bus station	1	
Church, mosque, synagogue, temple, chapel	5	24
Clubhouse	1	2
Convention center, exhibition hall		1
Film/movie production studio	1	
Library		3
Movie theater		1
Places of worship, funeral parlors, other		2
Playground		1
Restaurant or cafeteria	46	87
Swimming facility: indoor or outdoor		1
Variable-use amusement, recreation places, other		2
Common Values	**11**	**22**
Property Use, other	11	22
Educational	**6**	**20**
Adult education center, college classroom		1
Day care, in commercial property	2	6
Day care, in residence, licensed		1
Educational, other		4
Elementary school, including kindergarten	2	6
High school/junior high school/middle school	2	2
Health Care, Detention & Correction	**13**	**311**
24-hour care Nursing homes, 4 or more persons		37
Ambulatory Care Facility (outpatient surgery, sleep clinic))		8
Animal Care, Veterinary Clinic		2
Asylum, mental institution		1
Clinics, doctors' offices, hemodialysis center, other	5	69
Doctor or dentist office	8	186
Doctor, dentist, or oral surgeon office		1
Hospital - medical or psychiatric care		7
Industrial, Utility, Defense, Agriculture, Mining		**6**
Gas distribution, gas pipeline		3
Laboratory		2
Utility or Distribution system, other		1
Manufacturing, Processing	**5**	**24**
Manufacturing, Processing, Factory	5	24
Mercantile, Business	**214**	**790**
Bank	2	10

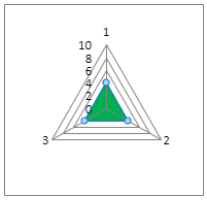
Business office	68	505
Clothing or shoe stores	6	7
Convenience store	3	4
Department or Drug store (Target, Kohls, Costco, Walgreens)	4	9
Gas station		11
General retail, other		21
Grocery store/Liquor store	2	11
Household goods, sales, repairs (Ace, Lowes, Home Depot, etc.)	1	
Laundry, dry cleaning	2	2
Mercantile, business, other	50	59
Motor vehicle or boat sales, services, repair		1
Motor vehicle or boat sales, services, repair including tire sales	28	42
Pool supply	1	2
Post office or mailing firms		1
Recreational stores - hobby, pet store, sporting goods	1	5
Retail/Specialty shop (auto parts, tobacco, bookstore, jewelry, flower shop)	18	26
Services: (receive service) nail salon, barber, beauty shops, groomer, massage	26	64
Veterinary Office	2	10
Outside or Special Property	**2**	**9**
Industrial plant yard - area		8
Parks, golf courses, cemeteries		1
Vehicle parking area (RV Storage)	2	
Residential	**11**	**104**
Boarding/rooming house, residential hotels		2
Hotel/motel	1	5
Multifamily dwelling		1
Multifamily dwelling, apartment	10	31
Residential assisted care		60
Residential, other		5
Storage	**23**	**58**
Fire station		5
Hanger (airplane, boat, vehicle storage)	1	6
Outbuilding or shed		1
Outside material storage area	2	12
Parking garage, general vehicle (commercial)		1
Self-storage unit	4	6
Storage, other	16	19
Warehouse		8

Social Vulnerability Index (SVI) - 0.55	Station 330 - 0.43 Station 331 - 0.81 Station 333 - 0.51

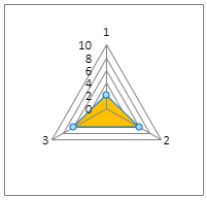
Fire: FY **18-22**	Fire Incidents: **2,631**	**TOP 10 FIRE CALLS**

Fire Risk

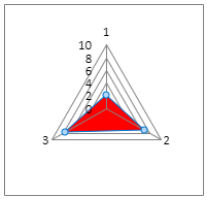
Call Type: Fire Alarm Low Risk-15



Call Type: Mobile Home Fire Medium Risk-34



Call Type: Building Fire High Risk-42

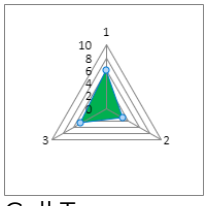


Top Fire Call Types	Risk Category	Count
FIRE ALARM	LOW	768
ODOR OF SMOKE	LOW	652
BRUSH FIRE	LOW	306
CAR FIRE	LOW	163
MOBILE HOME FIRE	MEDIUM	109
DUMPSTER FIRE	LOW	81
FIRE REPORTED OUT	LOW	68
ELECTRICAL MALFUNCTION	LOW	66
BUILDING FIRE	HIGH	62
1-STORY HOUSE FIRE	MEDIUM	52

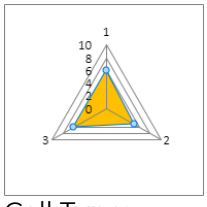
EMS: FY **18-22**	EMS Incidents: **37,280**	**TOP 10 EMS CALLS**

EMS Risk

Call Type: Law Enforcement Basic Life Support Low Risk-23

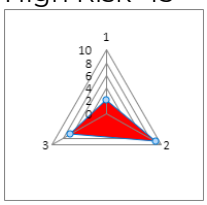
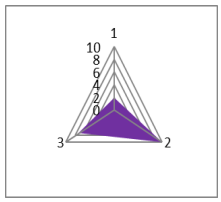
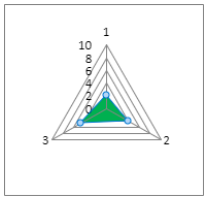
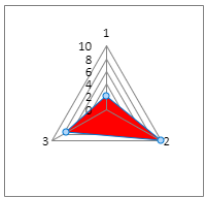
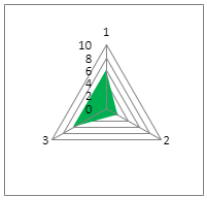


Call Type: Respiratory Distress Medium Risk-39



Call Type:

Top EMS Call Types	Risk Category	Count
LAW ENFORCEMENT -BLS	LOW	2,195
TRAUMA – BLS	LOW	2,043
SYNCOPE/WEAK – BLS	LOW	1,832
RESPIRATORY DISTRESS	MEDIUM	1,796
LAW ENFORCEMENT – ALS	MEDIUM	1,410
MVA – BLS	LOW	1,276
DIFFICULTY BREATHING	LOW	1,050
CHEST PAIN MALE >=40	MEDIUM	1,011
CHEST PAIN FEMALE >=45	MEDIUM	976
UNCONCIOUS, NON-RESPONSIVE	MEDIUM	928

	Gun Shot Wound High Risk-45  Call Type: Major Medical Max Risk-55 	
Special OPS: FY 18-22	Special Ops Incidents: 550	**TOP 10 SPECIAL OPS CALLS**
Special OPS Risk	Call Type: Investigate Odor Low Risk-15  Call Type: Hazardous Materials High Risk-55 	
Service: FY 18-22	Service Call Incidents: 3,696	**TOP 5 SERVICE CALLS**
Service Risk	Call Type: Service Low Risk-22 	
FY 18-22 Call	44,157 calls	1st in total call volume

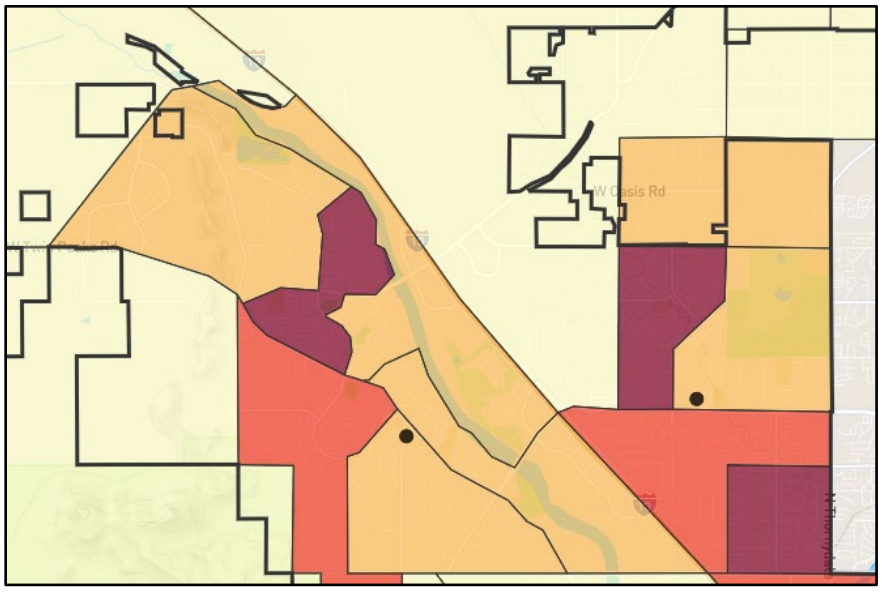
Top Special OPS Call Types	Risk Category	Count
INVESTIGATE ODOR	LOW	259
CO ALARM	LOW	78
NATURAL GAS LEAK	LOW	77
SPILL CONTAINMENT	LOW	59
BIO-HAZARD CONTAINMENT	LOW	23
CO2 ALARM	LOW	15
GAS CYLINDER LEAK	LOW	10
SPILL CONTAINMENT <50 GALLONS	LOW	9
HAZ MAT FULL	HIGH	6
SWIFT WATER RESCUE	HIGH	3

Service Call Types	Risk Category	Count
INVALID ASSIST	LOW	2670
SNAKE CALL	LOW	418
PUBLIC ASSIST	LOW	365
CHILD LOCKED IN CAR NEGATIVE DISTRESS	LOW	104
CAP Program	LOW	82

volume/rank		
FY 18-22 EMS total response time	7:23	
FY 18-22 Fire total response time	8:45	
FY 18-22 Spec Ops total response time	9:42	

Figure 3.7
Planning Zone - Central

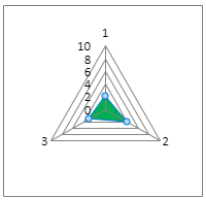
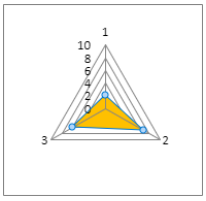
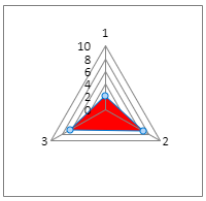
Planning Zone – Central	
Battalion	North
Stations & Apparatus	 

Description	The Central Planning Zone consists of a significant number of commercial occupancies including big box retail stores, light commercial, strip malls, hotels, and restaurants. The area contains several schools (including a high school), freestanding emergency room facilities, and a public library. The residential areas of the planning zone are mixed with rural to high-density single-family residences. There are also several apartment complexes found throughout the central planning zone.
Population Density	 *Sources: US Census Bureau 2020; US Census Bureau ACS 5-year 2016-2020*

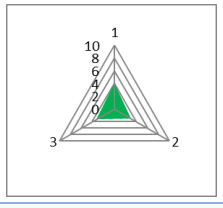
Critical Infrastructure	Marana	Pima County
Assembly	**113**	**15**
Assembly, other	1	
Athletic/health club	9	2
Ballroom, gymnasium	5	2
Bar or nightclub	1	
Church, mosque, synagogue, temple, chapel	11	6
Clubhouse	1	1
Film/movie production studio	2	
Movie theater	1	
Playground	1	
Radio, television studio	1	
Restaurant or cafeteria	70	4
Stadium, arena	1	

Swimming facility: indoor or outdoor	2	
Variable-use amusement, recreation places, other	7	
Common Values	**49**	**6**
Property Use, other	49	6
Educational	**7**	**8**
Adult education center, college classroom	1	
Day care, in commercial property		2
Educational, other	1	1
Elementary school, including kindergarten	3	2
High school/junior high school/middle school		2
Preschool	1	
Schools, non-adult, other	1	1
Health Care, Detention & Correction	**41**	**5**
24-hour care nursing homes, 4 or more persons	3	3
Ambulatory Care Facility (outpatient surgery, sleep clinic))		1
Clinics, doctors' offices, hemodialysis center, other	2	
Doctor or dentist office	34	1
Hospital - medical or psychiatric care	2	
Industrial, Utility, Defense, Agriculture, Mining	**8**	**3**
Ind., utility, defense, agriculture, mining, other	3	2
Laboratory	2	
Sanitation utility	1	
Water utility, canal or treatment facility	2	1
Manufacturing, Processing	**14**	
Manufacturing, Processing, Factory	14	
Mercantile, Business	**234**	**13**
Bank	6	
Business office	66	5
Clothing or shoe stores	14	
Department or Drug store (Target, Kohls, Costco, Walgreens)	10	
Gas station	10	2
General retail, other	1	
Grocery store/Liquor store	3	
Household goods, sales, repairs (Ace, Lowes, Home Depot, etc.)	1	
Laundry, dry cleaning	1	1
Mercantile, business, other	71	1
Motor vehicle or boat sales, services, repair including tire sales	9	1
Recreational stores - hobby, pet store, sporting goods	2	
Retail/Specialty shop (auto parts, tobacco, bookstore, jewelry, flower shop)	9	
Services: (receive service) nail salon, barber, beauty shops, groomer, massage	29	2
Veterinary Office	2	1
Outside or Special Property	**1**	**1**
Dump, sanitary landfill	1	
Outside or special property, other		1
Residential	**50**	**3**
Hotel/motel	13	

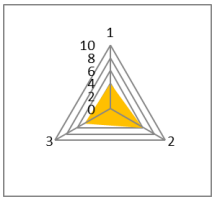
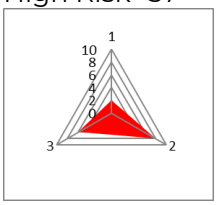
Multifamily dwelling	15	
Multifamily dwelling, apartment	21	3
Residential assisted care	1	
Storage	**19**	**2**
Fire station	2	
Outside material storage area	1	1
Self-storage unit	8	1
Warehouse	8	

Social Vulnerability Index (SVI) - 0.34	Station 334 - 0.32 Station 338 - 0.34	
Fire: **FY 18-22**	Fire Incidents: **1,196**	**TOP 10 FIRE CALLS**
Fire Risk	Call Type: Fire Alarm Low Risk-16  Call Type: House Fire Medium Risk-39  Call Type: Building Fire High Risk-42 	

Top Fire Call Types	Risk Category	Count
FIRE ALARM	LOW	512
ODOR OF SMOKE	LOW	255
BRUSH FIRE	LOW	98
CAR FIRE	LOW	68
HOUSE FIRE	MEDIUM	46
ELECTRICAL MALFUNCTION	LOW	37
FIRE REPORTED OUT	LOW	35
1-STORY HOUSE FIRE	MEDIUM	24
DUMPSTER FIRE	LOW	22
BUILDING FIRE	HIGH	14

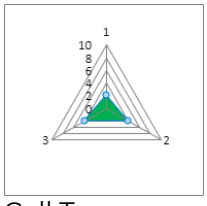
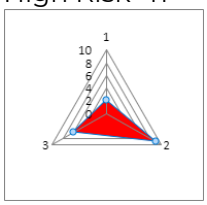
EMS: **FY 18-22**	EMS Incidents: **12,106**	**TOP 10 EMS CALLS**
EMS Risk	Call Type: Syncope/Weak - BLS Low Risk-15 	

Top EMS Call Types	Risk Category	Count
SYNCOPE/WEAK - BLS	LOW	655
LAW ENFORCEMENT - BLS	LOW	641
TRAUMA - BLS	LOW	580
RESPIRATORY DISTRESS	MEDIUM	544
MVA - BLS	LOW	449

	Call Type: Difficulty Breathing Medium Risk-29  Call Type: Interstate Motor Vehicle Accident High Risk- 37  Call Type: Major Medical, No Max Risk ERF Assembled	

LAW ENFORCEMENT - ALS	MEDIUM	397
MEDICAL ALARM	LOW	376
SIGN OF SHOCK AFTER SITTING/STANDING	MEDIUM	357
CHEST PAIN FEMALE >=45	MEDIUM	303
CHEST PAIN MALE	MEDIUM	279

Special OPS: **FY 18-22**	Special OPS Incidents: **343**	**TOP 10 SPECIAL OPS CALLS**

Special OPS Risk	Call Type: Investigate Odor Low Risk-14  Call Type: Swift Water Rescue High Risk-41 	

Top Special OPS Call Types	Risk Category	Count
INVESTIGATE ODOR	LOW	140
CO ALARM	LOW	76
NATURAL GAS LEAK	LOW	44
SPILL CONTAINMENT	LOW	24
CO2 ALARM	LOW	12
SPILL CONTAINMENT <50 GALLONS	LOW	8
BIO-HAZARD CONTAINMENT	LOW	7
SWIFT WATER RESCUE	HIGH	7
INJURED HIKER	MEDIUM	5
PEOPLE STRANDED IN WATER	LOW	5

Service: **FY 18-22**	Service Call Incidents: 2,549	**TOP 5 SERVICE CALLS**

Service Risk	Call Type: Service Low Risk-17	

Service Call Types	Risk Category	Count
INVALID ASSIST	LOW	1351
SNAKE CALL	LOW	644
PUBLIC ASSIST	LOW	401
CAP Program	LOW	64

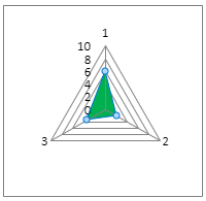
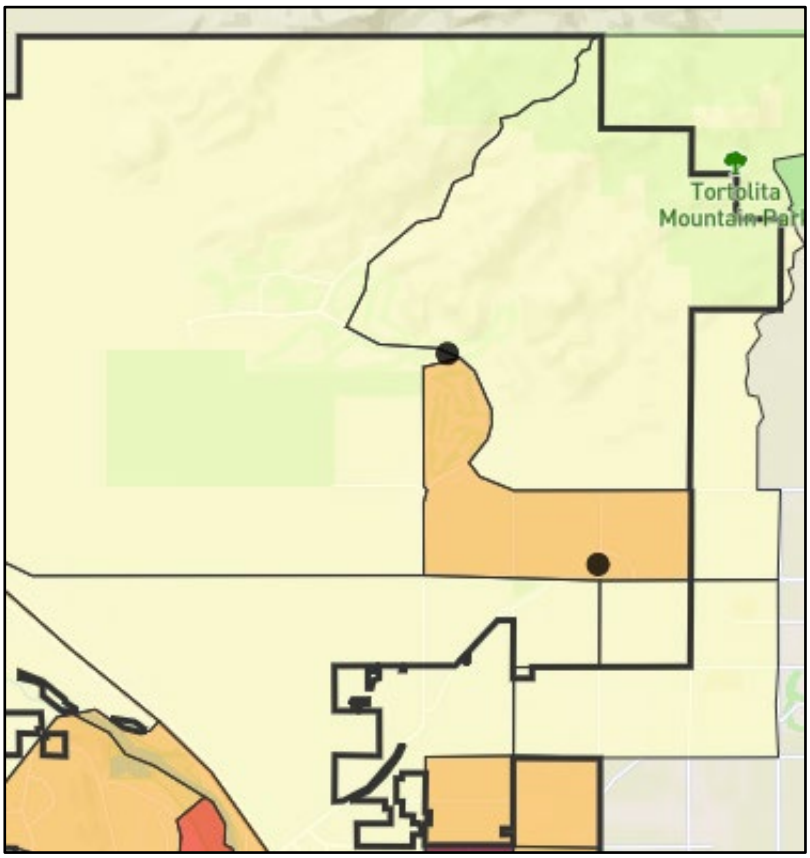
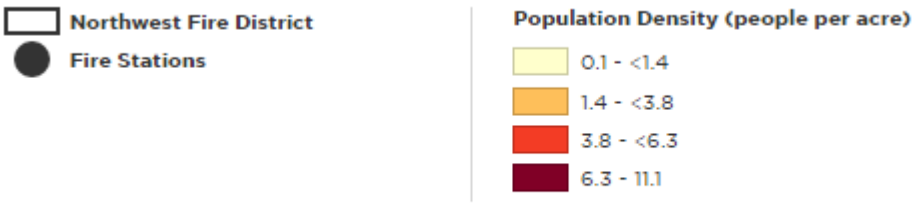
		**CHILD LOCKED IN CAR-NO DISTRESS**	LOW	63
FY 18-22 call volume/rank	16,194 calls		2nd in total call volume	
FY 18-22 EMS total response time	8:38			
FY 18-22 Fire total response time	10:32			
FY 18-22 Special Ops total response time	10:36			

Figure 3.8
Planning Zone - Northeast

Planning Zone - Northeast	
Battalion	North
Stations & Apparatus	

	
Description	The Northeast Planning Zone consists of low, moderate, and high-density single-family residences. The area contains a large retirement community, club house, and golf courses. It also contains light commercial/retail occupancies with a strip mall, restaurants, grocery store, and large resort hotel.
Population Density	



Sources: US Census Bureau 2020; US Census Bureau ACS 5-year 2016-2020

Critical Infrastructure	Marana	Pima County
Assembly	**21**	
Athletic/health club	2	
Clubhouse	5	
Clubs, other	1	
Public or government, other	1	
Restaurant or cafeteria	12	
Common Values	**11**	
Property Use, other	11	
Educational	**1**	
Elementary school, including kindergarten	1	
Health Care, Detention & Correction	**7**	
Ambulatory Care Facility (outpatient surgery, sleep clinic))	1	
Clinics, doctors' offices, hemodialysis center, other	4	
Doctor or dentist office	2	
Industrial, Utility, Defense, Agriculture, Mining	**1**	
Electrical sub-station, including utility poles/transformers	1	
Mercantile, Business	**40**	
Bank	3	
Business office	10	
Convenience store	3	
Gas station	3	
Grocery store/Liquor store	1	
Laundry, dry cleaning	2	
Mercantile, business, other	3	
Motor vehicle or boat sales, services, repair including tire sales	5	
Pool supply	1	
Retail/Specialty shop (auto parts, tobacco, bookstore, jewelry, flower shop)	3	
Services: (receive service) nail salon, barber, beauty shops, groomer, massage	4	
Veterinary Office	2	
Outside or Special Property	**4**	
Parks, golf courses, cemeteries	1	
Residential street, road or residential driveway	2	
Street or road in commercial area	1	
Residential	**4**	

Hotel/motel	1
Multifamily dwelling, apartment	2
Residential assisted care	1
Storage	**7**
Fire station	2
Outbuilding or shed	1
Parking garage, general vehicle (commercial)	1
Self-storage unit	3

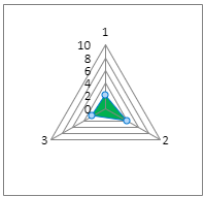
Social Vulnerability Index (SVI) - 0.31

Station 337 - 0.28
Station 339 - 0.31

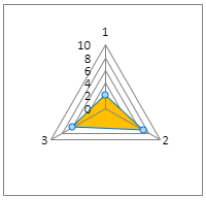
Fire: FY 18-22	Fire Incidents: **332**	**TOP 10 FIRE CALLS**

Fire Risk

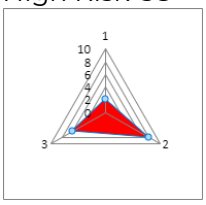
Call Type
Fire Alarm Low Risk-9



Call Type:
House Fire Medium Risk-34



Call Type
Apartment Fire High Risk-38

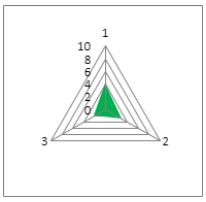


Top Fire Call Types	Risk Category	Count
FIRE ALARM	LOW	205
ODOR OF SMOKE/SMOKE IN AREA	LOW	43
BRUSH FIRE	LOW	14
ELECTRICAL MALFUNCTION	LOW	14
CAR FIRE	LOW	14
1 STORY HOUSE FIRE	MEDIUM	9
HOUSE FIRE	MEDIUM	8
APARTMENT FIRE	HIGH	5
FIRE REPORTED OUT	LOW	5
BUILDING FIRE	HIGH	4

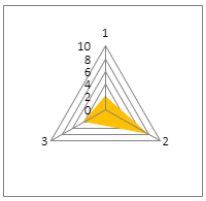
EMS: FY 18-22	EMS Incidents: **3,456**	**TOP 10 EMS CALLS**

EMS Risk

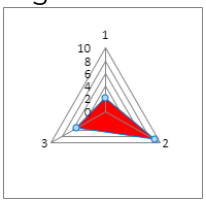
Call Type:
Syncope/Weakness
Low Risk- 10



Call Type:
Respiratory Distress
Medium Risk-26



Call Type:
Gun Shot Wound
High Risk-37



Top EMS Call Types	Risk Category	Count
SYNCOPE/WEAK - BLS	LOW	239
TRAUMA - BLS	LOW	153
RESPIRATORY DISTRESS	MEDIUM	152
CHEST PAIN FEMALE >=45	MEDIUM	125
SIGN OF SHOCK AFTER SITTING/STANDING	MEDIUM	123
MEDICAL ALARM	LOW	109
CHEST PAIN MALE	MEDIUM	106
MINOR INJURY W/ CONTROLLED BLEEDING	LOW	91
LAW ENFORCEMENT - BLS	LOW	90
UNCONCIOUS, NON-RESPONSIVE	MEDIUM	87

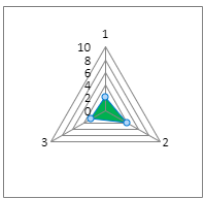
Special OPS FY 18-22

Special OPS Incidents: 100

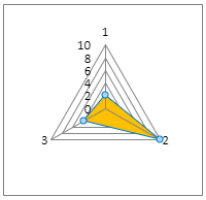
TOP 10 SPECIAL OPS CALLS

Special OPS Risk

Call Type:
Investigate Odor
Low Risk-10



Call Type
Injured Hiker
Medium Risk-32



Top 10 Special OPS Call Types	Risk Category	Count
INVESTIGATE ODOR	LOW	39
CARBON MONOXIDE ALARM	LOW	29
NATURAL GAS LEAK	LOW	10
INJURED HIKER	MEDIUM	9
SPILL CONTAINMENT	LOW	6
GAS CYLINDER LEAK	LOW	2
BIO-HAZARD CONTAINMENT	LOW	1
CO2 ALARM	LOW	1
HAZ-MAT FULL	HIGH	1
SPILL CONTAINMENT <50 GALLONS	LOW	1

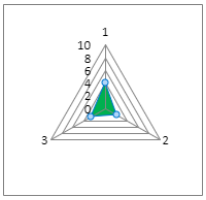
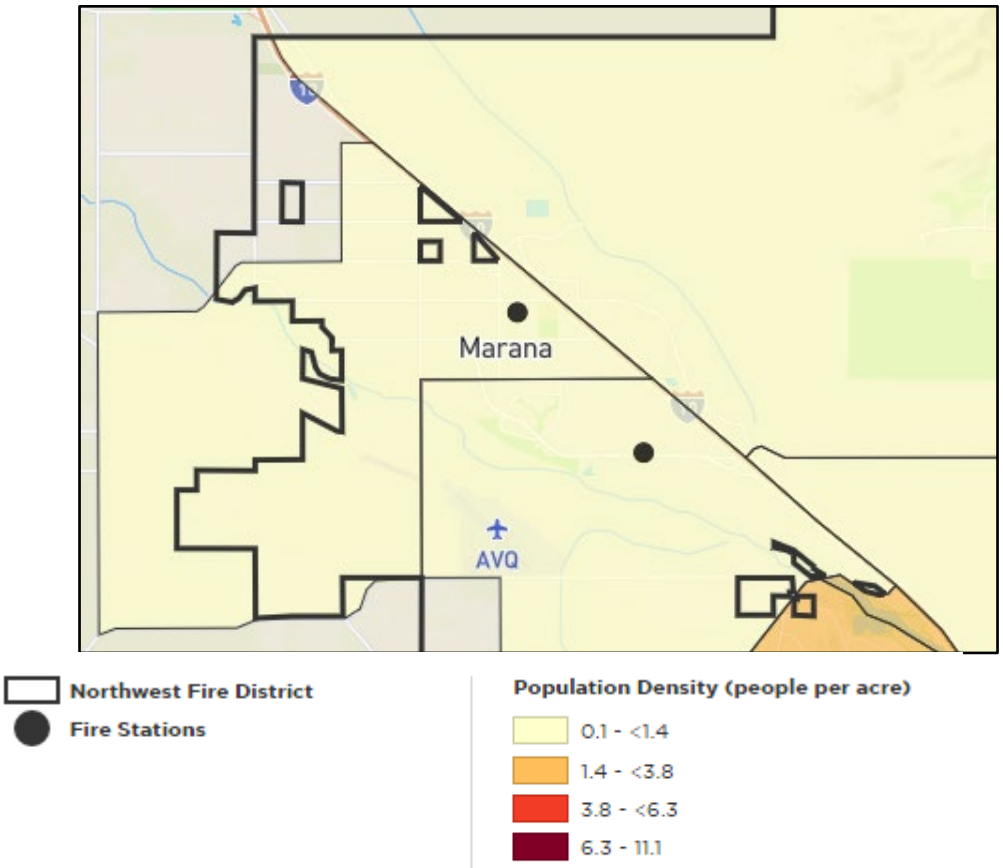
Service: FY 18-22	Service Call Incidents: 1,688	**TOP 5 SERVICE CALLS**
Service Risk	Call Type: Service Low Risk-10 	**Service Call Types** / **Risk Category** / **Count** **SNAKE CALL** – LOW – 673 **PUBLIC ASSIST** – LOW – 588 **INVALID ASSIST** – LOW – 394 **CAP Program** – LOW – 15 **CHILD LOCKED IN CAR NO DISTRESS** – LOW – 11
FY 18-22 call volume/rank	5,576 calls	3RD in total call volume
FY 18-22 EMS total response time	9:07	
FY 18-22 Fire total response time	10:38	
FY 18-22 Special Ops total response time	11:20	

Figure 3.9
Planning Zone - Northwest

Planning Zone - Northwest	
Battalion	North
Stations & Apparatus	

Description	The Northwest Planning Zone consists of a mix of rural to high-density single-family residences. The area contains a significant number of agricultural fields. Commercial growth for both light commercial occupancies as well as large manufacturing, distribution, and medical are currently underway. Central to the planning zone is governmental infrastructure for the Town of Marana and the Northwest Fire District.
Population Density	

Sources: US Census Bureau 2020; US Census Bureau ACS 5-year 2016-2020

Critical Infrastructure	Marana	Pima County
Assembly	**30**	
Airport passenger terminal	1	
Ballroom, gymnasium	1	
Bar or nightclub	1	
Church, mosque, synagogue, temple, chapel	8	
Clubhouse	3	
Funeral parlor	2	
Museum	1	
Public or government, other	1	
Restaurant or cafeteria	10	
Swimming facility: indoor or outdoor	1	
Variable-use amusement, recreation places, other	1	
Common Values	**5**	
Property Use, other	5	
Educational	**7**	
Elementary school, including kindergarten	3	
High school/junior high school/middle school	2	
Preschool	2	
Health Care, Detention & Correction	**7**	
Doctor or dentist office	3	
Hospital - medical or psychiatric care	2	
Jail, prison (not juvenile)	1	
Police station	1	
Industrial, Utility, Defense, Agriculture, Mining	**7**	
Greenhouses and nurseries	1	
Ind., utility, defense, agriculture, mining, other	1	
Mine, quarry, gravel pits	3	
Water utility, canal or treatment facility	2	
Manufacturing, Processing	**2**	**1**
Manufacturing, Processing, Factory	2	1
Mercantile, Business	**36**	
Bank	1	
Business office	12	
Convenience store	2	
Department or Drug store (Target, Kohls, Costco, Walgreens)	1	
Gas station	2	
Grocery store/Liquor store	2	
Household goods, sales, repairs (Ace, Lowes, Home Depot, etc.)	1	
Mercantile, business, other	2	
Motor vehicle or boat sales, services, repair including tire sales	5	
Post office or mailing firms	1	

Recreational stores - hobby, pet store, sporting goods	1
Retail/Specialty shop (auto parts, tobacco, bookstore, jewelry, flower shop)	4
Services: (receive service) nail salon, barber, beauty shops, groomer, massage	1
Veterinary Office	1
Outside or Special Property	**4**
Aircraft runway	1
Industrial plant yard - area	1
Residential street, road or residential driveway	1
Vehicle parking area	1
Residential	**5**
Multifamily dwelling	1
Multifamily dwelling, apartment	3
Residential board and care	1
Storage	**20**
Fire station	2
Hanger (airplane, boat, vehicle storage)	8
Livestock, poultry storage	1
Outside material storage area	2
Warehouse	7

Social Vulnerability Index (SVI) - 0.49

Station 336 - 0.57
Station 341 - 0.44

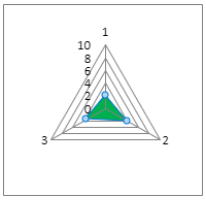
Fire: FY 18-22

Fire Incidents: **630**

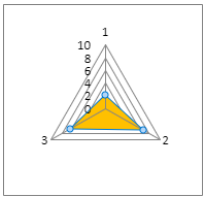
TOP 10 FIRE CALLS

Fire Risk

Call Type: Fire Alarm Low Risk-9

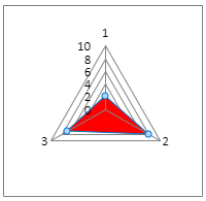


Call Type: House Fire Medium Risk-39



Call Type: Building Fire High Risk-44

Top Fire Call Types	Risk Category	Count
FIRE ALARM	LOW	193
BRUSH FIRE	LOW	150
ODOR OF SMOKE	LOW	104
CAR FIRE	LOW	79
FIRE REPORTED OUT	LOW	14
HOUSE FIRE	MEDIUM	14
TREE FIRE	LOW	12
ARCING WIRE	LOW	10
ELECTRICAL MALFUNCTION	LOW	10
BUILDING FIRE	HIGH	9



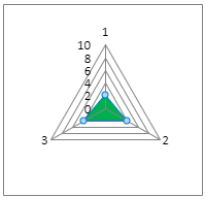
EMS: FY 18-22

EMS Incidents: **3,874**

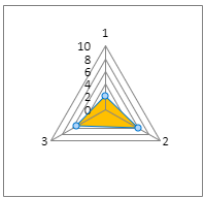
TOP 10 EMS CALLS

EMS Risk

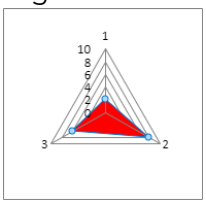
Call Type: Law Enforcement BLS Low Risk- 14



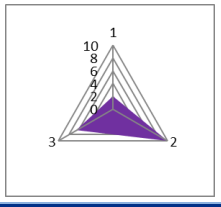
Call Type: Law Enforcement ALS Medium Risk-26



Call Type: Interstate MVA High Risk-37



Call Type: Major Medical Max Risk-50



Top EMS Call Types	Risk Category	Count
LAW ENFORCEMENT - BLS	LOW	250
SYNCOPE/WEAK - BLS	LOW	184
LAW ENFORCEMENT - ALS	MEDIUM	166
RESPIRATORY DISTRESS	MEDIUM	153
TRAUMA - BLS	LOW	130
CHEST PAIN FEMALE >=45	MEDIUM	127
CHEST PAIN MALE >=40	MEDIUM	116
MVA – BLS	LOW	113
DIFFICULTY BREATHING	LOW	99
MVA - ON THE INTERSTATE	HIGH	89

Special OPS: **FY 18-22**

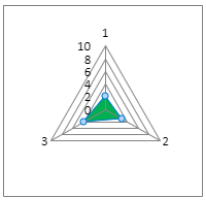
Special OPS Incidents: **122**

TOP 10 SPECIAL OPS CALLS

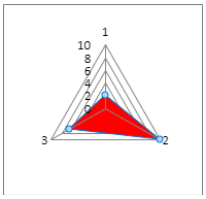
Special OPS Risk

Call Type: CO Alarm Low Risk-11

Top Special OPS Call Types	Risk Category	Count
INVESTIGATE ODOR	LOW	34
CO ALARM	LOW	33
SPILL CONTAINMENT	LOW	15



Call Type: Swift Water Rescue High Risk-50

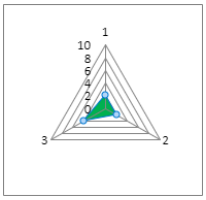


NATURAL GAS LEAK	LOW	11
CO2 ALARM	LOW	7
SWIFT WATER RESCUE	HIGH	4
AIRCRAFT IN THE CITY	HIGH	3
GAS CYLINDER LEAK	LOW	3
HAZ MAT FULL	HIGH	3
PEOPLE STRANDED IN WATER	LOW	2

Service: **FY 18-22**	Service Call Incidents: 413	**TOP 5 SERVICE CALLS**

Service Risk

Call Type: Service Low Risk-8



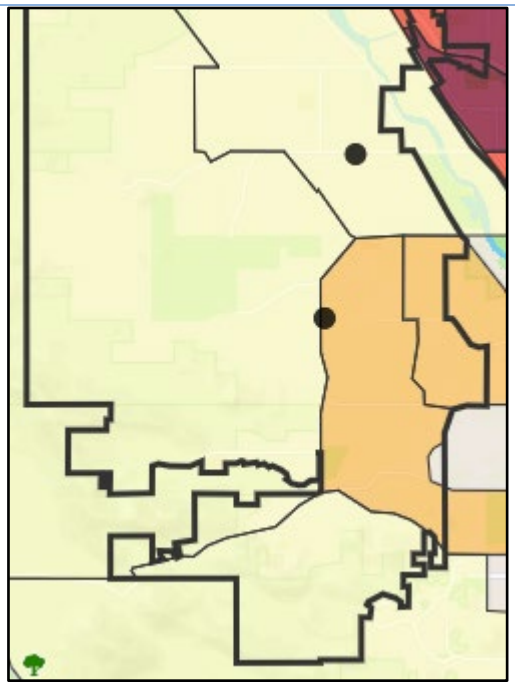
Service Call Types	Risk Category	Count
INVALID ASSIST	LOW	197
SNAKE CALL	LOW	101
PUBLIC ASSIST	LOW	76
CHILD LOCKED IN CAR NEG DISTRESS	LOW	21
CAP Program	LOW	10

FY 18-22 call volume/rank	5,039 calls	4th in total call volume
FY 18-22 EMS total response time	10:03	
FY 18-22 Fire total response time	12:24	
FY 18-22 Special Ops total response time	11:27	

Figure 3.10
Planning Zone - South

Planning Zone - South	
Battalion	South
Stations & Apparatus	 
Description	The South Planning Zone consists of primarily rural area with undeveloped land and low-density single-family residences. The area has a few higher density single-family residence communities.

Population Density

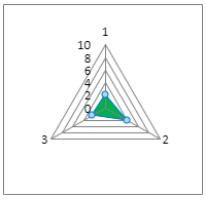
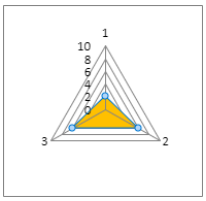


Sources: US Census Bureau 2020; US Census Bureau ACS 5-year 2016-2020

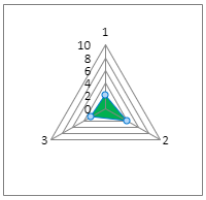
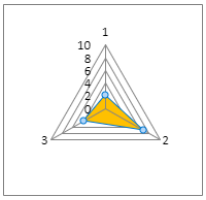
Critical Infrastructure	Marana	Pima County
Assembly		**5**
Church, mosque, synagogue, temple, chapel		2
Museum		1
Public or government, other		1
Restaurant or cafeteria		1
Educational		**1**
Educational, other		1
Health Care, Detention & Correction		**8**
24-hour care nursing homes, 4 or more persons		6
Alcohol or substance abuse recovery center		2
Industrial, Utility, Defense, Agriculture, Mining		**1**
Ind., utility, defense, agriculture, mining, other		1
Mercantile, Business		**1**
Veterinary Office		1
Storage		**2**
Fire station		2

Social Vulnerability

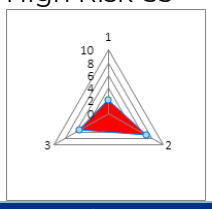
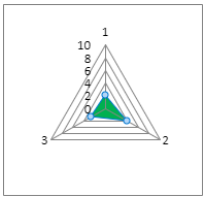
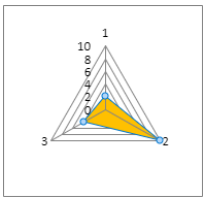
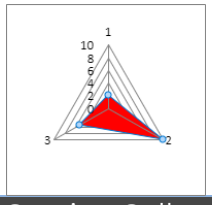
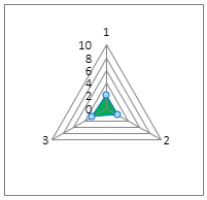
Station 332 - 0.24

Index (SVI) - 0.32	Station 335 - 0.32	
Fire: FY 18-22	Fire Incidents: **285**	**TOP 8 FIRE CALLS**
Fire Risk	Call Type: Odor of Smoke Low Risk-10  Call Type: House Fire Medium Risk-32  No High-Risk Fire Call Types in the prior 5-year period.	

Top Fire Call Types	Risk Category	Count
ODOR OF SMOKE	LOW	94
FIRE ALARM	LOW	78
BRUSH FIRE	LOW	31
CAR FIRE	LOW	17
HOUSE FIRE	MEDIUM	12
WIRE DOWN	LOW	11
ARCING WIRE	LOW	10
ELECTRICAL MALFUNCTION	LOW	8
1 - STORY HOUSE FIRE	MEDIUM	8
LARGE BRUSH FIRE	MEDIUM	3

EMS: **FY 18-22**	EMS Incidents: **2,810**	**TOP 10 EMS CALLS**
EMS Risk	Call Type: Trauma injury Low Risk-10  Call Type: Respiratory Distress Medium Risk-20  Call Type: GSW	

Top EMS Call Types	Risk Category	Count
TRAUMA - BLS	LOW	154
SYNCOPE WEAKNESS	LOW	135
RESPIRATORY DISTRESS	MEDIUM	127
MEDICAL ALARM	LOW	120
LAW ENFORCEMENT - BLS	LOW	108
CHEST PAIN FEMALE >=45	MEDIUM	82
MINOR INJURY W/ CONTROLLED BLEEDING	LOW	75
CHEST PAIN MALE	LOW	75
MVA - BLS	LOW	74
SIGNS OF SHOCK AFTER SITTING/STANDING	MEDIUM	71

<table>
<tr><td></td><td>High Risk-33
  </td><td></td></tr>
<tr><td>Special OPS:
FY 18-22</td><td>Special OPS Incidents: 93</td><td>TOP 10 SPECIAL OPS CALLS</td></tr>
<tr><td>Special OPS Risk</td><td>Call Type: Investigate Odor Low Risk-10
 
Call Type: Injured Hiker Medium Risk-32
 
Call Type: Swift Water Rescue 41
  </td><td>
<table>
<tr><th>Top Special OPS Call Types</th><th>Risk Category</th><th>Count</th></tr>
<tr><td>INVESTIGATE ODOR</td><td>LOW</td><td>26</td></tr>
<tr><td>INJURED HIKER</td><td>MEDIUM</td><td>19</td></tr>
<tr><td>CO ALARM</td><td>LOW</td><td>16</td></tr>
<tr><td>TRT FULL</td><td>HIGH</td><td>8</td></tr>
<tr><td>NATURAL GAS LEAK</td><td>LOW</td><td>6</td></tr>
<tr><td>SPILL CONTAINMENT</td><td>LOW</td><td>5</td></tr>
<tr><td>SWIFT WATER RESCUE</td><td>HIGH</td><td>3</td></tr>
<tr><td>PEOPLE STRANDED IN WATER</td><td>LOW</td><td>3</td></tr>
<tr><td>OCCUPIED VEHICLE IN SHALLOW WATER</td><td>LOW</td><td>2</td></tr>
<tr><td>SWIFT WATER RESCUE UNKNOWN IF OCCUPIED</td><td>HIGH</td><td>1</td></tr>
</table>
</td></tr>
<tr><td>Service:
FY 18-22</td><td>Service Call Incidents: 850</td><td>TOP 5 SERVICE CALLS</td></tr>
<tr><td>Service Risk</td><td>Call Type: Service Low Risk - 10
  </td><td>
<table>
<tr><th>Service Call Types</th><th>Risk Category</th><th>Count</th></tr>
<tr><td>SNAKE CALL</td><td>LOW</td><td>462</td></tr>
<tr><td>INVALID ASSIST</td><td>LOW</td><td>324</td></tr>
<tr><td>PUBLIC ASSIST</td><td>LOW</td><td>49</td></tr>
<tr><td>CAP PROGRAM</td><td>LOW</td><td>5</td></tr>
<tr><td>CHILD LOCKED IN CAR NO DISTRESS</td><td>LOW</td><td>4</td></tr>
</table>
</td></tr>
<tr><td>FY 18-22 call volume/rank</td><td>4,038 calls</td><td>5th in total call volume</td></tr>
<tr><td>FY 18-22 EMS total response time</td><td>9:45</td><td></td></tr>
<tr><td>FY 18-22 Fire total response</td><td>11:21</td><td></td></tr>
</table>

time	
FY 18 -22 Special Ops total response time	13:43

Large Scale Event Risk Assessment

As part of the community risk assessment, NWFD sought to identify large scale, low frequency/severe consequence risk. A multi-dimensional profile risk index (PRI) was utilized by the chief officer staff that resulted in the identification and ranking of nine large scale risks. The PRI process consisted of rating five elements with an associated weighted value.

The five elements and their associated weighted values are:

- Probability (30%)
- Vulnerability (30%)
- Spatial Extent (20%)
- Speed of Onset or Warning Notice (10%)
- Duration (10%)

The completed PRI scoring and associated discussion of each large-scale identified risk follow in rank order.

1. **Cyber-attack on NWFD IT System**

   PRI Score = 4.21, High Risk Category - Recognized as a large-scale risk for the District, a cyber-attack on the IT system would have an extremely serious effect on the District's ability to maintain effective internal and external service delivery for daily operations. The District has realized the effects of cyber security issues in certain software solutions utilized by the agency. Several fire departments and districts in the U.S. have experienced similar targeted attacks on their IT systems and the trend is increasing. Due to the District's extremely high reliance on functional IT systems coupled with the upward trend of these types of attacks, this risk was categorized as high.

2. **Pandemic**

   PRI Score = 3.84, Moderate Risk Category - In recent years, the United States has realized the increased risk of pandemics; most notably COVID-19. The residents of NWFD are at risk for a pandemic just as in other U.S. communities. The likelihood of another pandemic continues to increase primarily due to four factors:

   - The U.S. and world population continues to grow
   - Trends in urbanization continue to grow (concentration of population)
   - The population is travelling more frequently, faster, and farther
   - Trends in experimentation on gain of function research

   While the effect of the COVID-19 pandemic on NWFD had farther-reaching implications than many of the other large-scale risks identified, the main issues continued to be logistical challenges in PPE/supplies and

loss of personnel hours due to illness that affected operational readiness. The probability of another such event combined with the relatively slow speed of onset (detection) helped to classify this risk as moderate.

3. **Weapons of Mass Destruction (WMD) Event**

   PRI Score = 3.65, Moderate Risk Category - This risk can be the result of an intentional biological, chemical, or radiological event. NWFD has significant critical infrastructure and occupancies that can be considered hard and soft targets for this type of event. Combined with an instantaneous speed of onset and a recent increase in the trend of individual and organized terrorism events within the U.S. and abroad, the WMD PRI assessment resulted in a classification of moderate**.**

4. **Mass Casualty Incident (MCI)**

   PRI Score = 3.26, Moderate Risk Category - NWFD generally classifies an MCI as ten or more "immediate" or "delayed" patients. Incident history, potential for such an event due to the freeway and other causes of MCIs, and the lack of "detecting" these events ahead of time resulted in a moderate risk category rating.

5. **Large-scale Hazardous Material Incident**

   PRI Score = 3.25, Medium Risk Category - This risk, also known as a "Level 3" hazmat incident, is an incident involving hazardous materials that is beyond the capabilities of the NWFD hazmat response team and requires additional regional assistance. Level 3 incidents can require resources from state and federal agencies and private industry. These incidents generally pose extreme, immediate, and/or long-term risk to the environment and public health. NWFD has significant exposure to a Level 3 hazmat event due to large quantities of hazardous materials that are transported daily through the District on Interstate 10, via the Union Pacific Railroad and through large petroleum pipelines that run adjacent to the interstate.

6. **Wildland-Urban Interface (WUI) Fire**

   PRI Score = 3.18, Moderate Risk Category - The areas of wildland-urban interface fire risk in NWFD have been identified as part of the community risk assessment, as found in Figure 3.17 These areas primarily consist of the foothills areas of the Tucson and Tortolita Mountains, as well as a small area on the eastern edge of the District. The threat of a WUI event is directly linked to the light fuel vegetation growth, which in turn is tied to rainfall. Without a significant presence of these light fuels (annuals), it is difficult for a fire to carry over a significant distance. While there has not been a significant WUI event in NWFD's response boundary, the area has had large-scale brush fires, most recently the 2020 Bighorn and Westridge Fires that impacted the Santa Catalina and Tortolita mountain ranges.

7. **Extended Power Failure**

   PRI Score = 2.95, Low Risk Category - This risk likely would come in the form of a large-scale grid failure. NWFD experiences small to medium scale power failures several times a year, primarily due to area provider

equipment failure or damage caused by summer thunderstorms. These generally do not result in widespread and extended (more than a few hours) power outages. A large-scale power grid failure could result in no power for several days. The aging of the power grid infrastructure combined with the growing threat of an intentional physical or cyber-attack on the energy infrastructure are concerning, but at the time of this risk analysis this risk is low.

8. **Santa Cruz River Flood Event**

   PRI Score = 2.75, Low Risk Category - The Santa Cruz River runs through approximately 18 miles of the Northwest Fire District. Approximately half of the land has significant development or infrastructure adjacent to, or within the 100-year floodplain. While much of the river is lined with soil cement bank protection in developed areas, in the event of a failure of this flood control measure hundreds of homes would be at risk of flooding. There have been two significant flood events along the Santa Cruz within the District boundaries in the past 40+ years, occurring in 1983 and 1993. River embankment improvements combined with a perceived reduction in the likelihood of a large flood event due to continued long-term drought, helped limit this risk category to low.

9. **Severe Thunderstorm/Microburst**

   PRI Score = 2.16, Low Risk Category - A microburst is a localized column of sinking air (downdraft) within a thunderstorm and is usually less than two miles in diameter. Microbursts can cause extensive damage at the surface, and in some instances, can be life threatening. They can generate winds in excess of 60 mph and can result in very heavy, relatively short durations of rainfall sometimes occurring in the form of hail. The resulting aftermath of a microburst can include localized flooding as well as severe wind damage to buildings and power lines that can result in associated injuries to the public and cause access issues within the area affected.

Risk Assessment for NWFD Service Level Classifications

NWFD has completed risk assessments for the various service levels provided including:

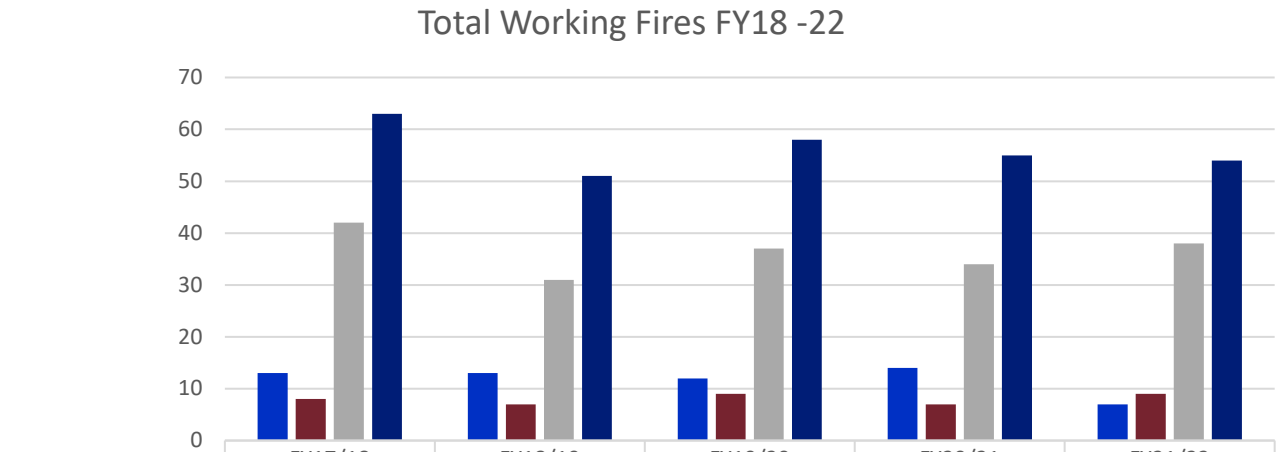
- Fire
- EMS
- Special Operations (HazMat & TRT)

As a result of identifying, assessing, and categorizing risks for these service levels, NWFD has performed critical task analyses for each specified level of risk and developed associated effective response forces to accomplish the desired performance objectives as listed in Section 5, Evaluation of Current Deployment and Performance. Critical tasks are defined as the activities that must be completed in a timely manner by firefighters at emergency incidents to stabilize and control the situation, with life safety as the #1 priority tactical objective. Effective response force is the minimum amount of staffing, apparatus, and equipment that must be present at a particular incident within a maximum prescribed total response time to accomplish the identified critical tasks.

Fire Risk Assessment

As with any risk assessment, it is important to review the history of the related risk. Below, Figure 3.11 shows the number of working fires in single-family residences (SFRs), apartments, and commercial occupancies during the period of FY2018-2022.

Figure 3.11
Working Fires (count)



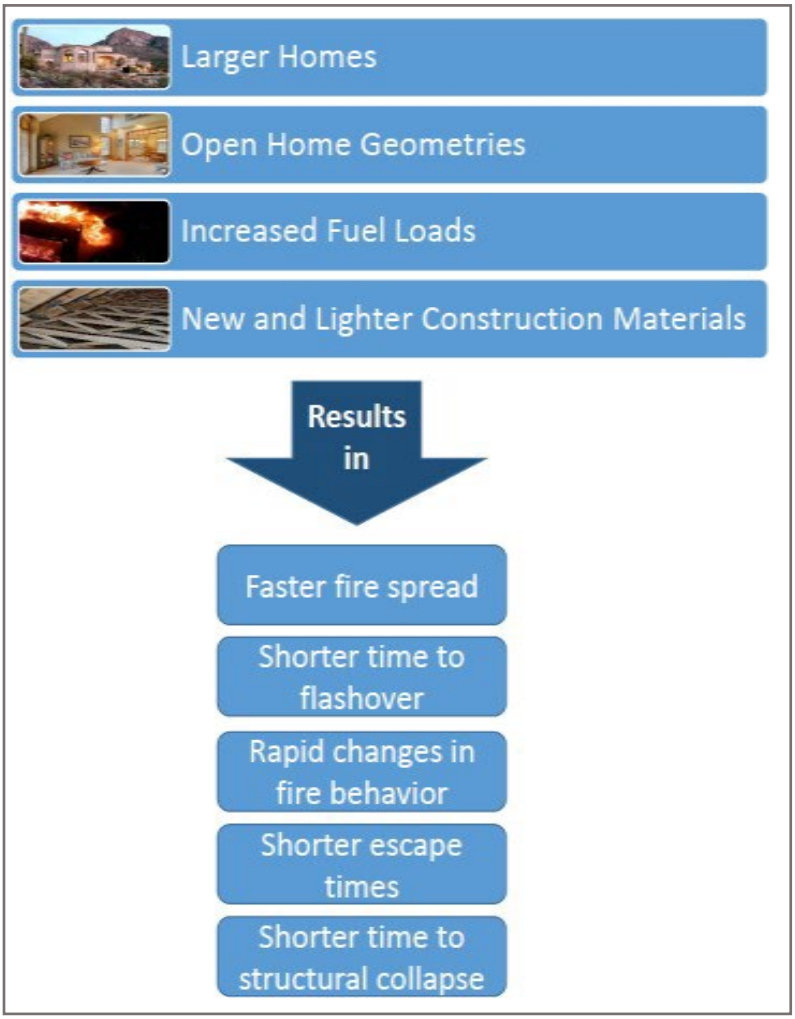
	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22
Commercial Fire	13	13	12	14	7
Apartment Fire	8	7	9	7	9
Residential Fire	42	31	37	34	38
Total Fires FY18-22	63	51	58	55	54

From fiscal year 2018 to 2022, 65% of the working structure fires were single-family residential, 21% commercial, and 14% apartment occupancies. This indicates that in terms of frequency alone, residential fires are a substantial fire risk in NWFD. Compounding this risk is that most residential construction in the District is relatively new, constructed in the past 30 years (often described in building construction as the "lightweight era"). Underwriter Laboratories (UL) authored a report[3] that addresses the changes in residential building construction materials and practices and how those changes in fire load quantity and material have contributed to a significant increase in risk to the public and firefighters at residential structure fires that are not sprinklered. The following graphic, based on the UL report's "Modern Fire Formula," illustrates this increased risk to both the public and firefighters. Therefore, while the frequency of structure fires has generally decreased in the

[3] Analysis of Changing Residential Fire Dynamics and Its Implications on Firefighter Operational Timeframes. Underwriter Laboratories, http://newscience.ul.com

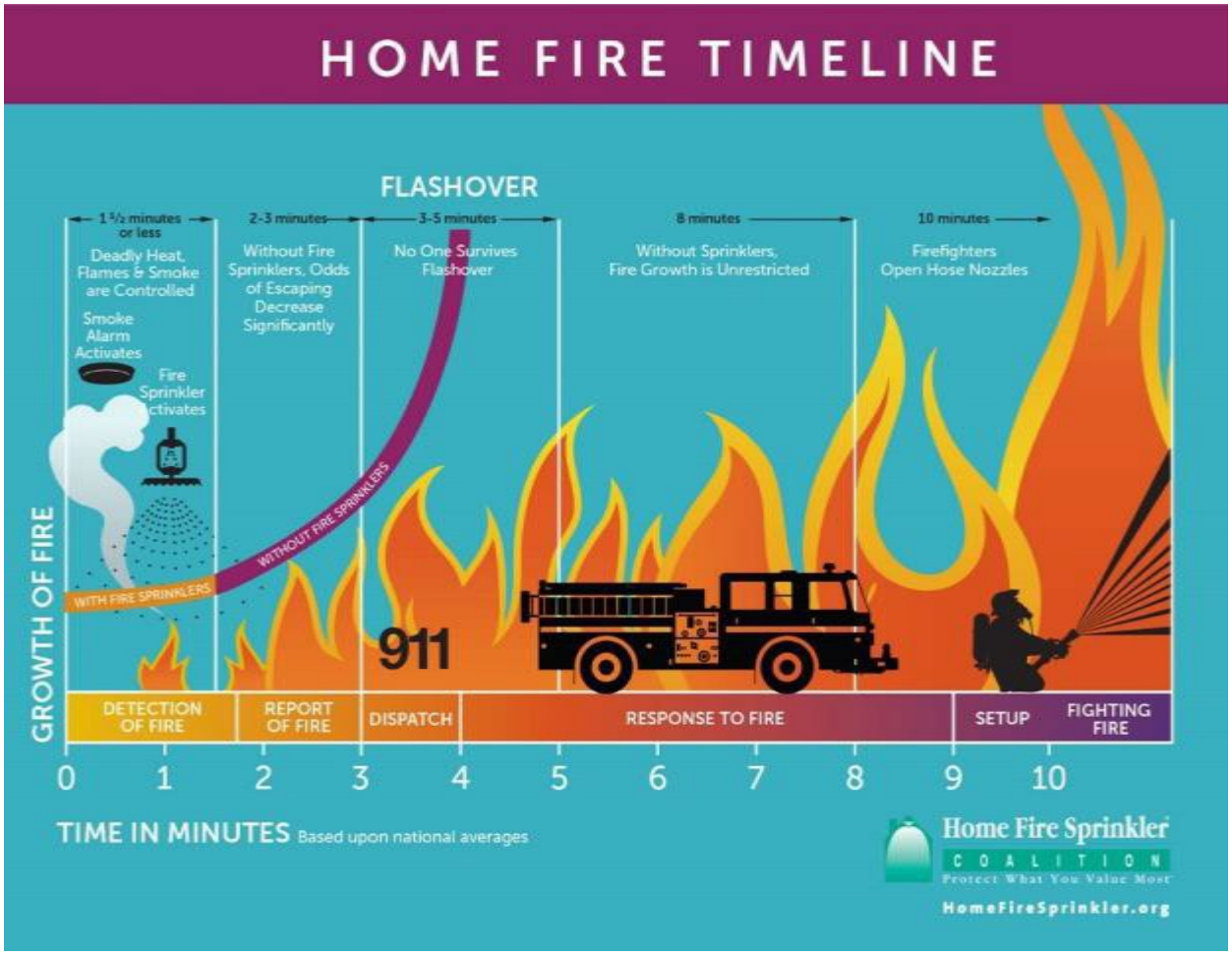
U.S. and NWFD, the factors contributing to a more severe outcome have increased.

Figure 3.12
UL Modern Fire Formula



Flashover is described as occurring when all surfaces and contents of a space reach their ignition temperature nearly simultaneously resulting in full room fire involvement. It generally represents a condition that is not survivable by occupants or firefighters. It is typically identified as a priority to prevent during fire suppression efforts due to its life-threatening potential. As noted in the UL-based illustration, the time to flashover conditions has drastically reduced in the modern construction era, often only five to seven minutes. While the instances of structure fires have decreased to some degree over the District's history, the decreased amount of time to flashover has further increased the risk to the public and firefighters at newer residential and commercial structures. The following chart illustrates the progression of fire to the point of flashover and the importance of timely intervention to prevent flashover. The figure also illustrates the value of fire sprinklers to prevent a fire from advancing to the point of flashover. The death rate from fires at residences with fire sprinklers is six times less than those without such fire protection systems.

Figure 3.13
Home Fire Timeline



Source: Home Fire Sprinkler Coalition, http://homefiresprinkler.org

Being able to contain a fire to the room of origin is central to not only limiting property loss, but to reducing civilian deaths. The NFPA's Fire Analysis and Research Division in its October 2021 Home Structure Fire report validates this as illustrated in Figure 3.14.

Figure 3.14
Extent of Fire Spread / Deaths / Injuries

Extent of Fire Spread	Fires		Civilian Deaths		Civilian Injuries		Direct Property Damage (in Millions)	
Confined Fire Identified by Incident Type	169,100	(49%)	0	(0%)	1,320	(12%)	$44	(1%)
Confined to Object of Origin	23,700	(7%)	60	(2%)	630	(6%)	$181	(2%)
Confined to Room of Origin	65,700	(19%)	420	(16%)	3,860	(35%)	$971	(13%)

Confined to Floor of Origin	17,600	(5%)	300	(11%)	1,320	(12%)	$732	(10%)
Confined to Building of Origin	59,400	(17%)	1,510	(58%)	3,250	(29%)	$4,309	(59%)
Extended Beyond Building of Origin	11,300	(3%)	340	(13%)	690	(6%)	$1,111	(15%)
Fire Spread Extended Beyond Room of Origin	88,300	(25%)	2,150	(82%)	5,260	(48%)	$6,151	(84%)
Total	**346,800**	**(100%)**	**2,620**	**(100%)**	**11,070**	**(100%)**	**$7,348**	(100%)

The data clearly validates the performance objective listed in Section 5, starting on page 186, which describes limiting the fire to the room of origin. Achieving this performance objective decreases property damage and, more importantly, reduces the chance of fire-related casualties[4].

As part of NWFD's fire risk analysis for occupancies, a risk scoring system was developed that included measuring 15 variables that collectively contribute to an overall occupancy risk score. The data is stored on the ESRI platform, and risk assessments are performed during annual occupancy inspections by NWFD's fire inspectors. Data entry is captured using the field maps application from ESRI annually. If the occupancy was sprinklered, the overall score was reduced by 50%. The Occupancy Risk Assessment Profile (ORAP) is based on early versions of occupancy vulnerability assessment profile models developed by various entities.

The ORAP metric used in the process is loaded into the ESRI platform calculation. The ESRI GIS risk map classifies sites into one of 16 critical infrastructure categories that align with the Federal Agency Cybersecurity & Infrastructure Security (CISA.gov) sectors[5]. A total of more than 1,500 occupancies were assessed to classify risk. The occupancies were broken down by planning zone to show the average risk score for the various infrastructure sectors. The 13 critical infrastructure sectors associated with the occupancies found within the Northwest Fire District and the average risk score for each sector by planning zone and overall sector score averages for the agency are listed in Figure 3.15.

[4] *Home Structure Fires (nfpa.org)*

[5] *Critical Infrastructure Sectors | CISA*

Figure 3.15
Average ORAP Risk Scores by Planning Zone and Critical Infrastructure Sector

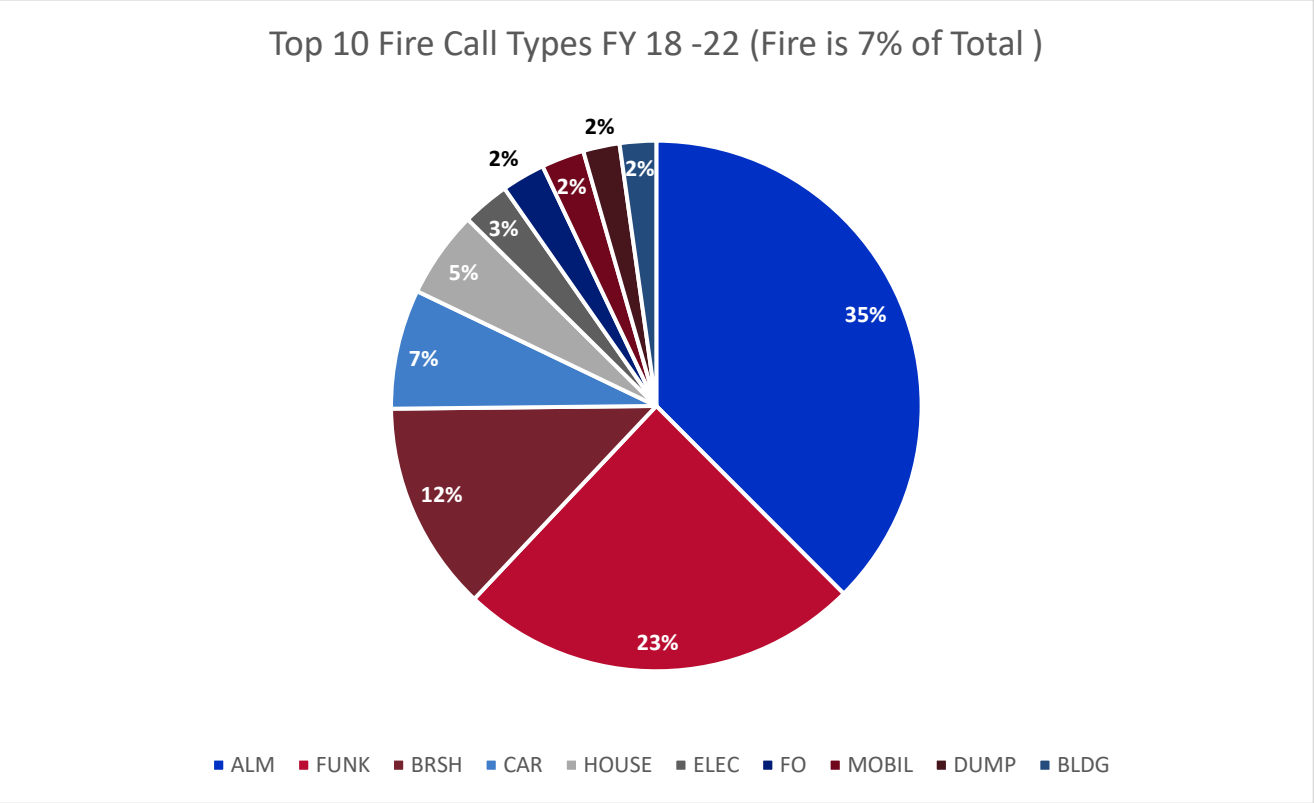
Planning Zone/Risk Category	Chemical Sector	Commercial Facilities	Communications	Critical Manufacturing	Emergency Services	Energy	Financial Services	Food and Agriculture	Government Facilities	Healthcare and Public Health	Information Technology	Transportation Systems	Water/Wastewater Systems	Avg. Risk Score by Category/CZP
Core	67	37	26	38	12	42	19	18	26	31	18	38	51	34
low		21	22	22	12		19	14	20	22	18	16		20
medium		41	35	48		37		38	43	39		43	40	41
high	67	71		70		64			65	68		74	61	71
max		98								116				99
Central		25	19	30	12	13	13	20	26	38		37	28	26
low		18	19	23	12	13	9	17	20	19			28	18
medium		43		38			34	37	36	50		37		42
high		67												67
Northwest		41		57	8	17		26	31	28		46	34	37
low		21			8	17		18	22	23		19	29	21
medium		45		40				34	40	41		47	37	44
high		65		74								69		67
max		98												98
Northeast		27			11		8	16	19	18				24
low		18			11		8	16	19	18				17
medium		47												47
high		62												62
max		108												108
South		34			14				33	33				30
low		25			14				23	27				22
medium		52							43	37				41
Avg. Risk Score by Sector	67	35	23	36	12	32	17	19	27	31	18	44	37	32

**Low Risk (0-30), Medium Risk (31-60), High Risk (61-90), Maximum Risk (>90)*

Typical high-density, single-family residence neighborhood in NWFD.
Non-sprinklered single-family residences are categorized as a high fire risk.

Typical non-sprinklered, garden style multi-structure apartment complex in NWFD.
This type of occupancy is categorized as a maximum fire risk

Figure 3.16
Top 10 Fire Call Types



Fire Risk Categories

In alignment with CFAI's 10th Edition, Community Risk Assessment/Standards of Cover section, NWFD has grouped fire risk into four levels of categorization: low, moderate, high, and maximum.

Fire Risk Category	General Description of Associated Risk
Low	Small size fires not endangering structures. 1 attack line can manage. Examples include car fire, dumpster fire, shed fire & small brush fire.
Moderate	Single family residences, mobile homes, sprinkler protected, small to medium size retail and office occupancies & moderate to large brush fires with or without urban interface.
High	Non-sprinklered small to medium commercial occupancies, or large sprinklered occupancies.
Maximum	Non-sprinklered large apartment complexes and various occupancies with special hazards.

Fire Critical Tasks

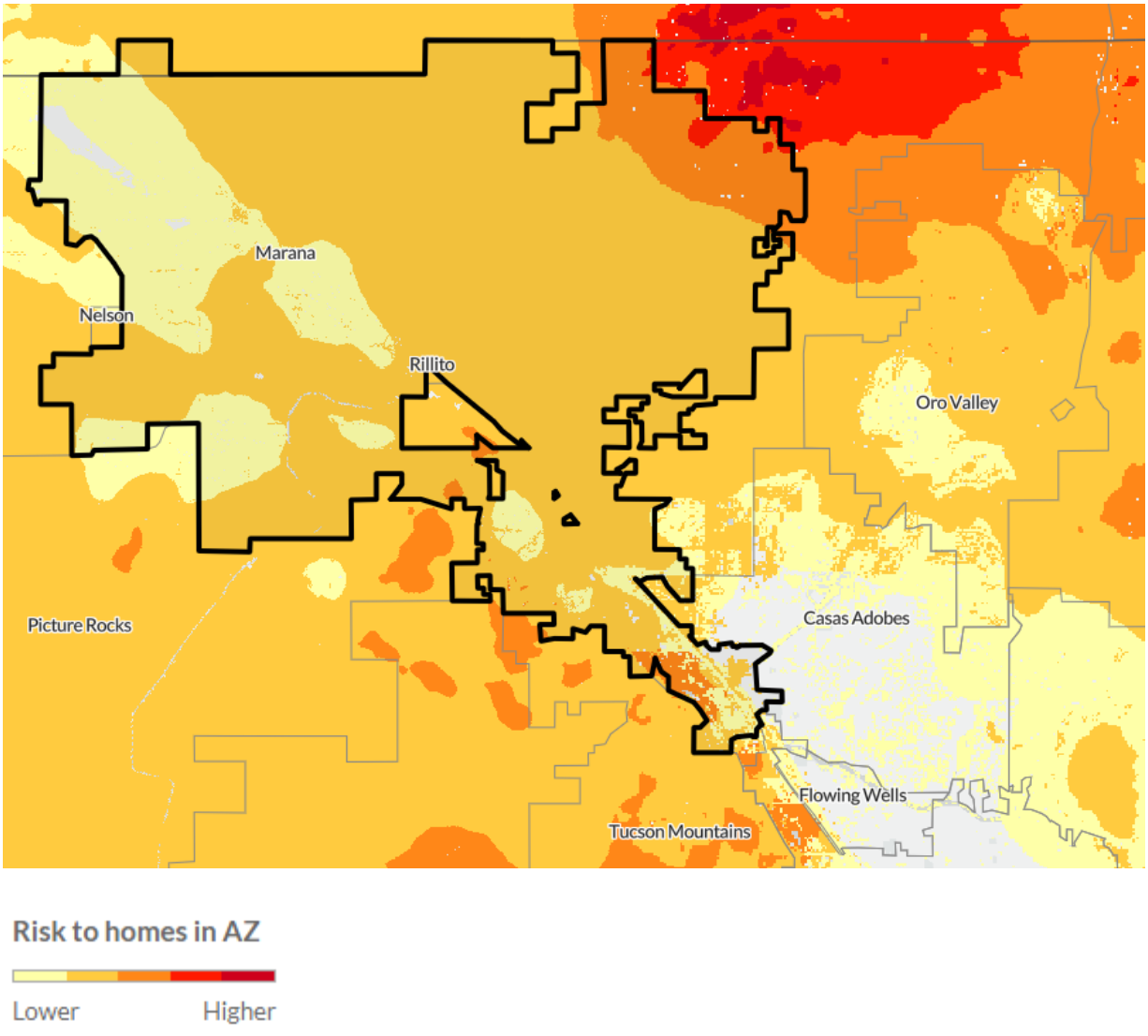
Fire Low Risk	
Still Alarm: Car Fire, Dumpster Fire, Shed Fire	
Task	**Personnel Required**
Command, size-up, safety	1
Pump Operator	1
Deployment and Operation of Fire Attack Line	2
Total Effective Response Force	**4**
Fire Moderate and High Risk	
Structure 1: House 1-2 story, mobile home, sprinkler protected, small to medium size retail and office occupancies.	
Task	**Personnel Required**
Dedicated Incident Commander outside of the hazard area for overall coordination and direction of the initial full alarm assignment with a minimum of one member dedicated to this task.	1
Incident Safety	1
Establishment of uninterrupted water supply of 400 GPM for 30 minutes	1
Establishment of effective water flow rate of 300 gpm from two handlines each with a minimum flow of 100 gpm with each handline operated by a minimum of two members to effectively and safely maintain the line.	4
Provision of at least one support member for each attack line and back up line, to provide hydrant hookup and assist in laying hoselines, utility control, and forcible entry.	4
Provision of at least one victim search and rescue team with each such team consisting of a minimum of two members.	2
Provision of at least one team, to raise ground ladders and perform ventilation.	3
At a minimum, an initial rapid intervention crew (IRIC) assembled form the initial attack crew and as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established	4
Total Effective Response Force	**20**
ERF assignment = 4 suppression companies, 1 ambulance, 1 Incident Safety Officer, 1 battalion chief	
NFPA 1710: 5.2.4.1.1 - The initial full alarm assignment to a structure fire in a typical 2000 sqft, two-story, single-family dwelling without basement and with no exposures shall provide the following: (above tasking).	
Fire Max Risk	
Structure 2 & 3: Commercial Strip mall, Apartment Fire, Building Fire	
Task	**Personnel Required**

Dedicated Incident Command outside of the hazard area for overall coordination, direction, and safety of the initial full alarm assignment with a minimum of two members dedicated to managing this task.	2
Establishment of two uninterrupted water supplies with a minimum of 500 GPM with each supply line maintained by an operator.	2
Establishment of effective water flow rate of 500 gpm from three handlines each with a minimum flow of 150 gpm with each handline operated by a minimum of two members to effectively and safely maintain the line.	6
Provision of at least one support member for each attack line, back up line, and exposure line deployed to provide hydrant hookup and assist in laying hoselines, utility control, and forcible entry.	3
Provision of at least two victim search and rescue teams with each such team consisting of a minimum of two members.	4
Provision of at least two teams, each team consisting of a minimum of two members to raise ground ladders and perform ventilation.	4
At a minimum, an initial rapid intervention crew (IRIC) assembled form the initial attack crew and as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established	4
Establishment of initial medical care component consisting of at least 2 members capable of providing immediate on-scene emergency medical support and transport that provides rapid access to civilians or members potentially needing medical treatment.	2
Total Effective Response Force	**28**
ERF assignment = 4 suppression companies, 2 ladder companies, 1 ambulance company, 1 incident safety officer, 2 battalion chiefs	
**NFPA 1710 (2020): 5.2.4.2.1 - The initial full alarm assignment to a structure fire in a typical open air strip shopping center ranging from 13,000 sqft to 196,000 sqft in size shall provide the following (as listed above):*	
** NFPA 1710 (2020): 5.2.4.3.1 - the initial full alarm assignment to a structure fire in a typical 1200 sqft apartment within a three-story garden style apartment building shall provide the following (as listed above):*	

Wildland Fire Risk Assessment

NWFD has substantial amounts of undeveloped area, the dominant fuel model being light grass/shrub type. There are areas of the District where this fuel model borders some developed areas, primarily medium to large single-family residences on larger lots. This area represents the wildland urban interface in the District that can be defined as locations in which the USDA has determined that topographical features, vegetation fuel types, local weather conditions, and prevailing winds result in the potential for ignition of the structures within the area from flames and firebrands of a wildland fire[6]. These areas of moderate to high-risk wildland urban interface are predominately along the Tortolita Mountains on the northern edge of NWFD and the Tucson Mountains on the southern edge of NWFD, see Figure 3.17.

Figure 3.17
Wildfire Risk to Homes in Arizona



[6] Definition source: NFPA 1143, Standard for Wildland Fire Management, 2014 Edition

Wildland Low Risk (Still)	
Task	**Personnel Required**
Command, size-up, safety	1
Pump Operator	1
Deployment and Operation of Fire Attack Line and Hand Tools	2
Total Effective Response Force	**4**
ERF assignment = 1 engine company	

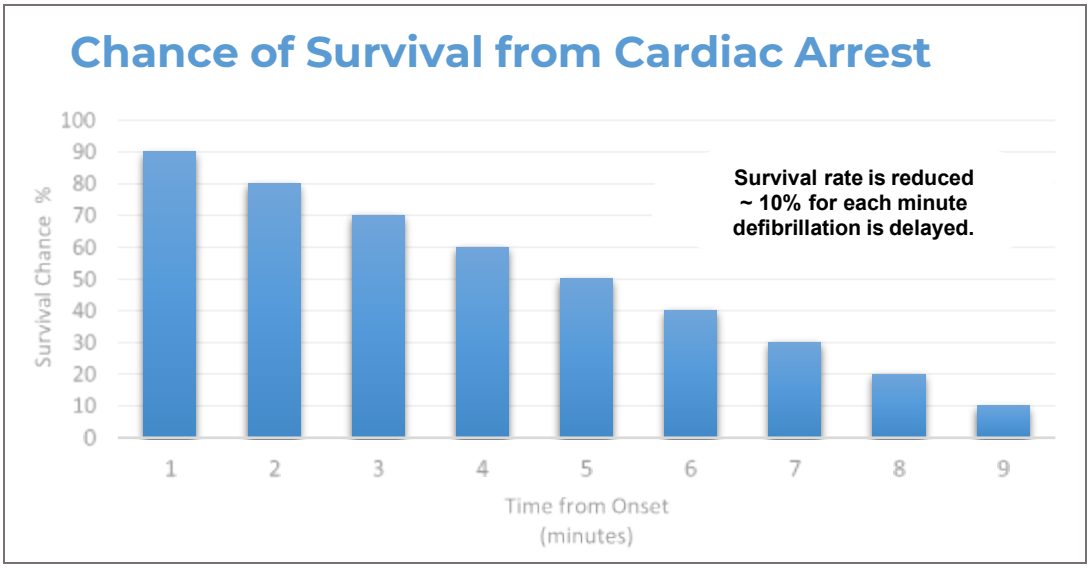
Wildland Moderate Risk (Structure 1)	
Task	**Personnel Required**
Incident command	1
Support Officer/Senior Advisor/Division Group Supervisor	1
Incident Safety	1
Pump Operation	1
Deployment and Operation of Initial Fire Attack Line and Hand tools	4
Advancement/extension of Fire Attack lines or small-scale line construction	4
Mobile Water Supply	2
On deck (RIC responsibilities)	4
Medical Stand-by and Rehabilitation	2
Total Effective Response Force	**20**
ERF assignment = 4 suppression companies (Sta.33/Sta37 crews toggle to the type 3 brush truck) 1 ambulance company, 1 incident safety officer, 2 battalion chiefs	

Wildland High Risk (Urban Interface, Structure 2 & 3)	
Task	**Personnel Required**
Incident command	1
Support Officer/Senior Advisor/Division Group Supervisor	1
Incident Safety	1
Pump Operation	1
Deployment and Operation of Initial Fire Attack Line and Hand tools	3
Advancement/extension of Fire Attack lines or small-scale line construction	4
Mobile Water Supply	2
On deck (RIC responsibilities)	4
Initial Structure Protection	10
Medical Stand-by and Rehabilitation	2
Total Effective Response Force	**28**
ERF assignment = 4 suppression companies (Sta.33/Sta37 crews toggle to the type 3 brush truck), 2 ladder companies, 1 ambulance company, 1 incident safety officer, 2 battalion chiefs, + request for state resources through the dispatch center	

EMS Risk Assessment

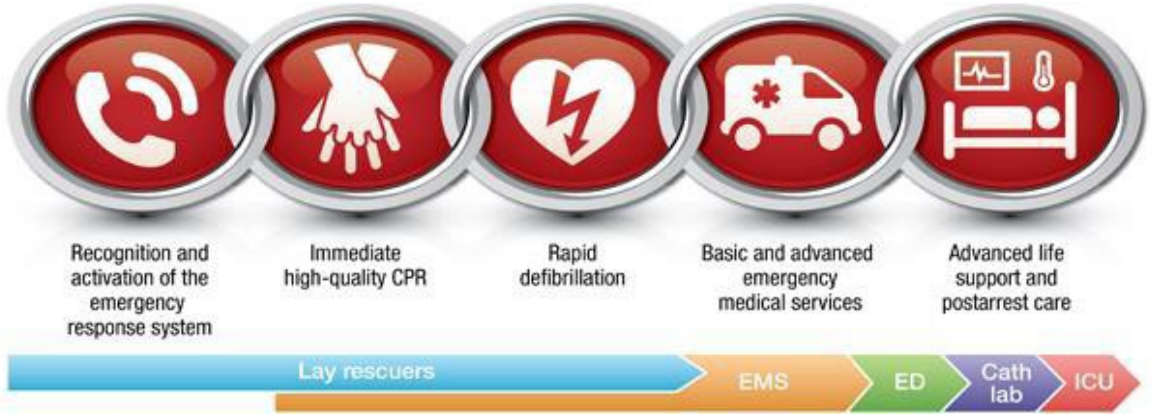
The risk assessment approach for EMS involved primarily a call type and history process; however, information was also utilized from sources such as NWFD's Banner UMC Medical Direction Team, the American Heart Association (AHA) and the National Institutes of Health to help assess the EMS risk. Both serious medical and trauma conditions are very time sensitive. Figure 3.18 shows the relationship of time and survival regarding a cardiac event.

Figure 3.18
Chance of Survival from Cardiac Arrest



The American Heart Association has five key elements of life-threatening medical emergencies, known as the Chain of Survival:

Figure 3.19
Chain of Survival



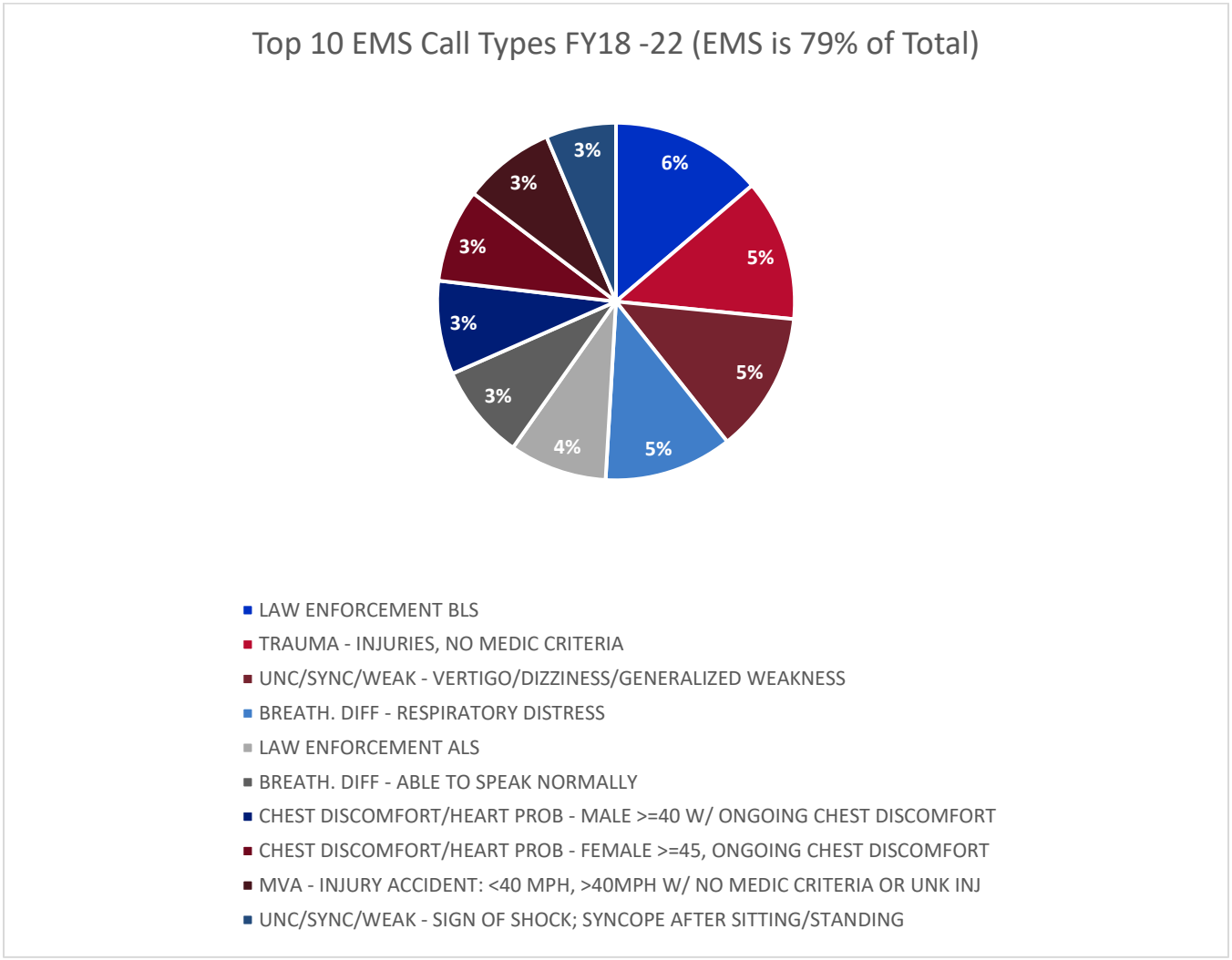
A strong Chain of Survival can improve chances of survival and recovery for victims of heart attack, stroke, and other medical emergencies. The first three links are predicated on actions prior to the arrival of NWFD resources. Educating the public about the importance of activating the 911 system as soon as a serious medical emergency is discovered is a key element in the first link listed, along with expeditious call processing (alarm handling) at the dispatch center.

NWFD is actively seeking to improve the delivery of immediate high-quality CPR and rapid defibrillation. The Prevention Division is currently working to identify and input community AED locations into the agency CAD system for pre-arrival CPR instructions for lay rescuers.

The remaining two AHA Chain of Survival links are part of the EMS service delivery system. As described in Section 4, Current Deployment and Performance, an advanced life support call receives an engine company with a minimum of one paramedic on board and one ambulance with a minimum of one paramedic on board. Combined with Banner UMC Medical Direction's evidence-based emergency medical oversite and practices, units are located such that the times associated with the identified medical and trauma risks are minimized to help optimize positive patient outcomes.

The well-known Golden Hour, the hour immediately following traumatic injury to the time the patient reaches surgery at an appropriate definitive trauma care facility, is a crucial element when assessing serious trauma risk. This type of injury is very time critical and given a high level of consideration when reviewing the current concentration and distribution of resources and planning for the future.

Figure 3.20
Top 10 EMS Call Types



EMS Risk Categories

EMS Risk Category	General Description of Associated Risk
Low	Injured or ill patient without airway, breathing, circulatory problems and that do not meet any additional risk criteria.
Moderate	Special criteria patient: ST-elevated myocardial infarction (STEMI), cardiac arrest, severe respiratory distress, time sensitive issues cerebrovascular accident, traumatic brain injury, and any patient meeting trauma center or other specialized medical facility criteria. Advanced life support required.
High	High mechanism of injury (rollover MVA, pedestrian/cyclist struck, and motorcyclist down) and drowning.
Maximum	Multi-patient incident (up to 6 trauma patients).

EMS Critical Tasks

EMS Low Risk (NWFD dispatch code BLS 1, BLS 2 & ALS 1)	
Task	**Personnel Required**
Command, scene safety/management	1
EPCR documentation, patient assessment, and care	3
Total Effective Response Force	***4**
ERF assignment = 1 engine company	

*Engine determines need for patient transport; BLS or ALS ambulance is then added to the assignment as necessary.

EMS Moderate Risk (NWFD dispatch code ALS 2)	
Task	**Personnel Required**
Command, scene safety/management	1
EPCR documentation, patient assessment, and care	3
Assist with patient care as necessary, provide patient transport	2
Total Effective Response Force	**6**
ERF assignment = 1 engine company, 1 ambulance company	

EMS High Risk (NWFD ALS 3, ALS 4)	
Task	**Personnel Required**
Command, scene safety/management	1
Scene stabilization, LZ establishment if necessary	4
EPCR documentation, patient assessment, and care	4
Assist with patient care as necessary, provide patient transport	2
Total Effective Response Force	**11**
ERF assignment = 2 engine companies, 1 ambulance company, 1 BC or SO	

EMS Maximum Risk (NWFD full medical alarm)	
Task	**Personnel Required**
Command, scene safety/management	1
Incident Safety	1
Medical Group supervisor	1
EPCR documentation, patient assessment, and care	12
Assist with patient care as necessary, provide patient transport	6
Total Effective Response Force	***20**
ERF assignment = 3 engine companies, 3 ambulance companies, 1 incident safety officer, 1 battalion chief	

*Additional engine companies and ambulances assigned as incident patient numbers and condition dictate.

Extrication Risk Categories

NWFD's emergency extrication services primarily consist of vehicle extrications. Interstate 10 and the primary arterial roadways are where the vast majority of these types of extrications take place. Extrications range from relatively simple, "child locked in a car", to

complex multi-vehicle extrications involving semi-trucks on Interstate 10. It should be noted that any motor vehicle accidents on the interstate, whether there is a need for extrication or not, include an incident safety officer on the initial dispatch.

Extrication Risk Category	General Description of Associated Risk
Low	Non-technical extrications such as elevator rescues, vehicle lockouts (with occupants such as a child or pet).
Moderate	Extrications requiring power driven rescue tools but not requiring any "specialized" rescue tools or training beyond the capabilities of a standard engine company.
High	Involving complex extrication tasks and/or potential multiple extrications, rail, aircraft, large truck, heavy equipment, etc.Requires specialized skills and extrication equipment.

Extrication Critical Tasks

Extrication Low Risk (BLS 1, BLS 2 & ALS 1)	
Task	**Personnel Required**
Command, size-up, safety	1
Rescue actions, generally light tools only	3
Total Effective Response Force	**4**
ERF assignment = 1 engine company	

Extrication Moderate Risk (ALS 3 & ALS 4)	
Task	**Personnel Required**
Incident command	1
Scene safety	1
Extrication	2 - 4
Patient triage, treatment	2 - 4
Patient transport	2
Total Effective Response Force	**8 - 12**
ERF assignment = 1 to 2 engine companies, 1 ambulance company, 1 incident safety officer, 1 battalion chief	

Extrication High Risk (Medical Full, TRT Team, & TRT Full)	
Task	**Personnel Required**
Incident command	1
Scene safety	1
Extrication	4 - 8
Patient triage, treatment	12
Patient transport	6
Total Effective Response Force	**20 – *31**
ERF assignment = 3 engine companies, 3 ambulance companies, 1 incident safety officer, 1 battalion chief *TRT Team (2 TRT EN, 1 Squad, 1PM)*	

Hazardous Materials Risk Assessment

Figure 3.21
Target Hazard - Hazmat Facilities

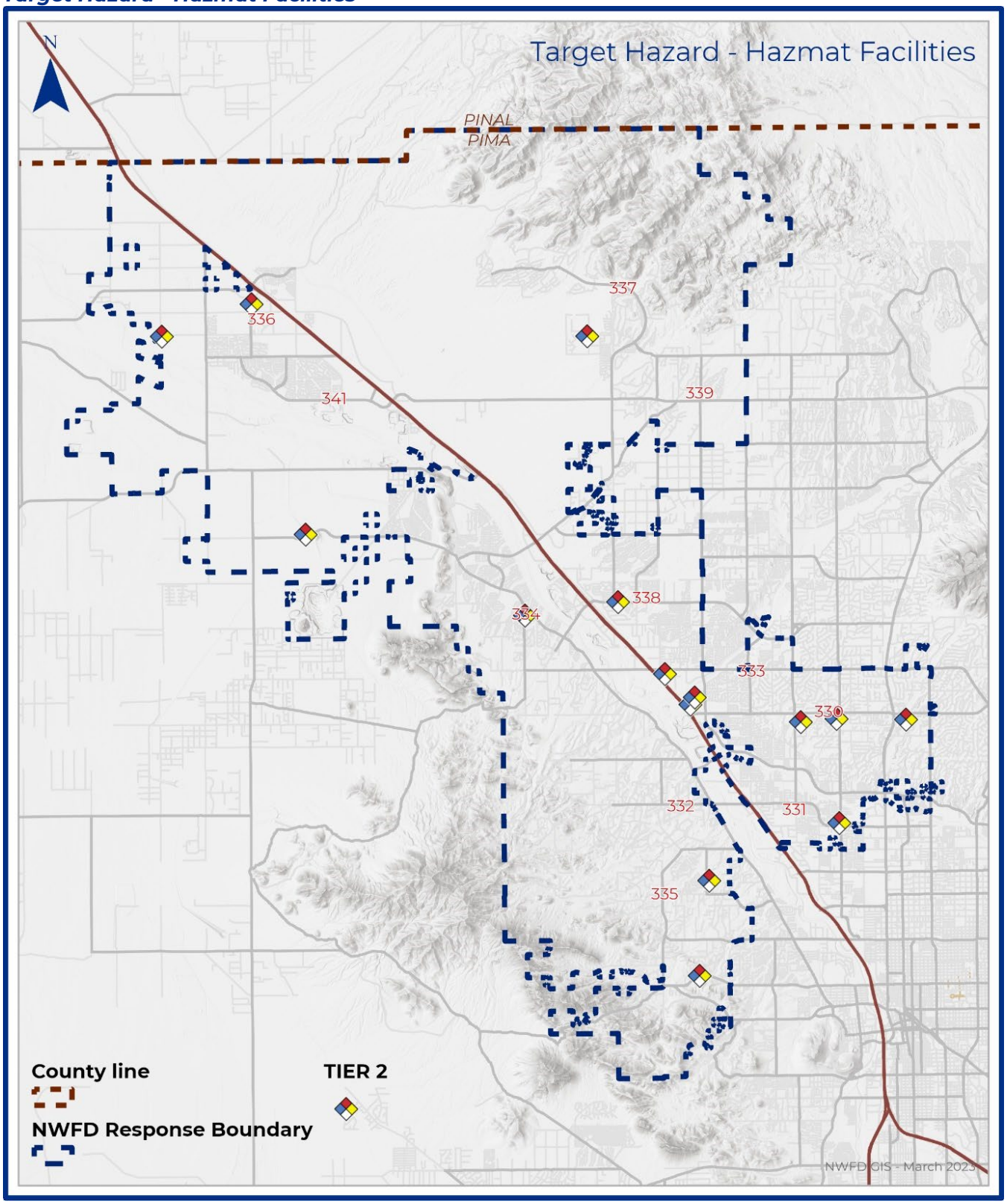


Figure 3.22
Target Hazard - I-10 / Pipelines / Railroad

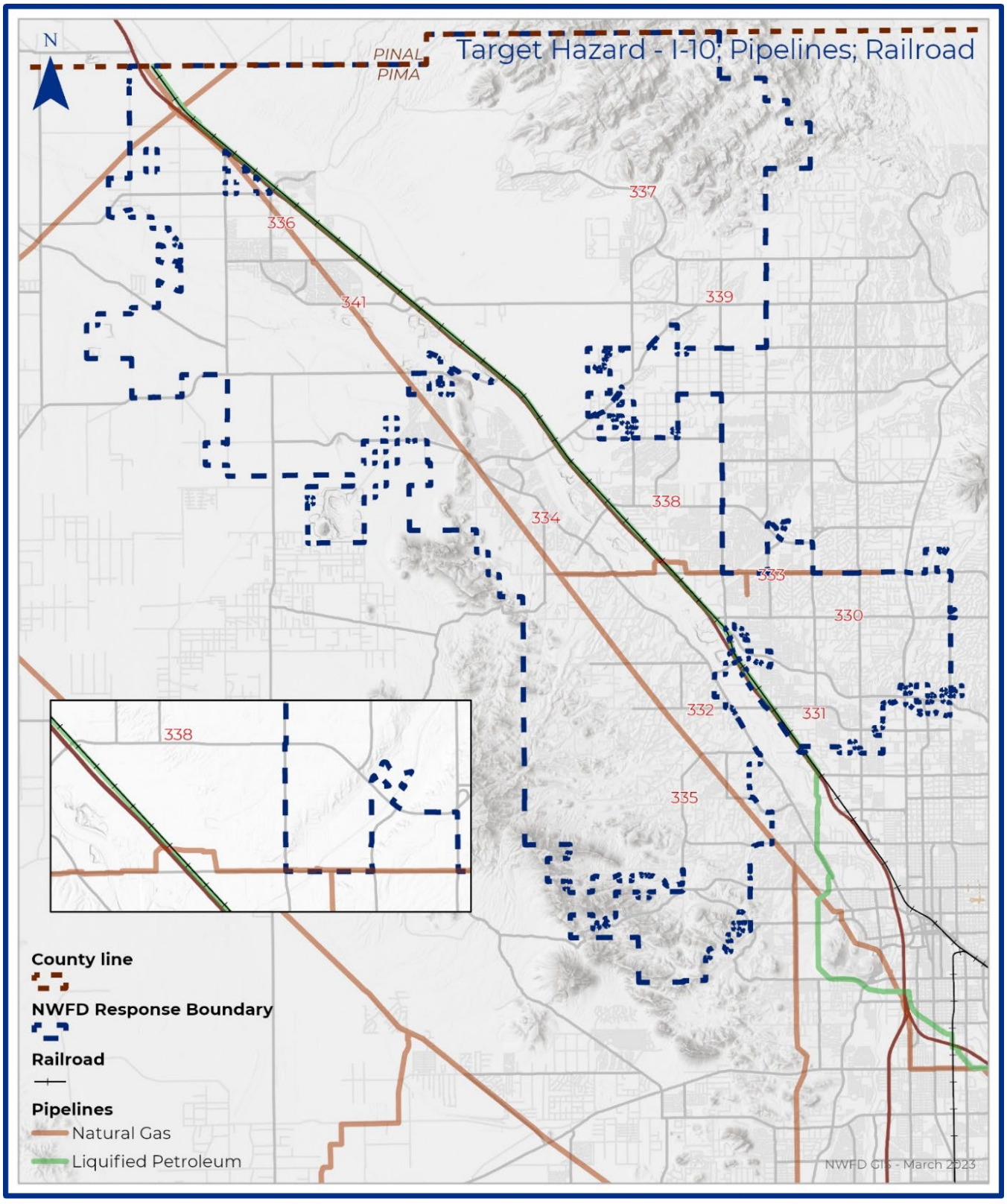
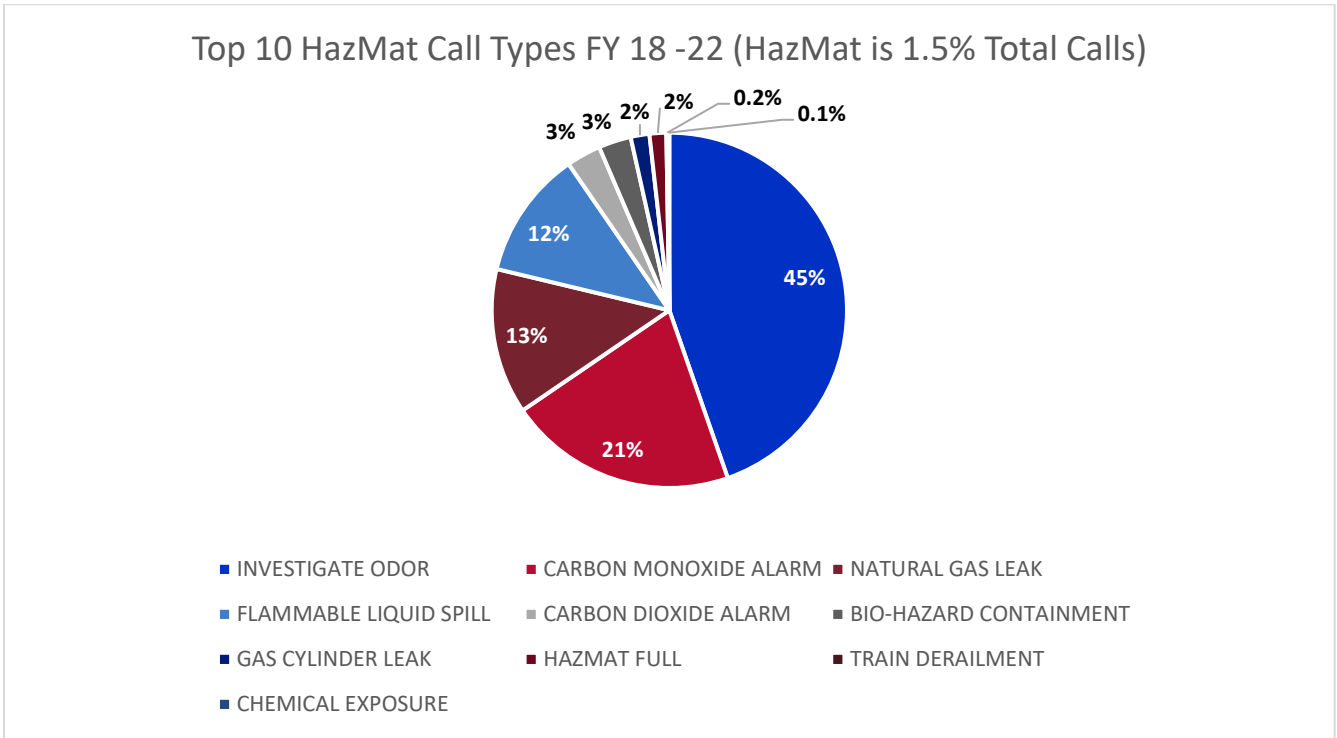


Figure 3.23
Top 10 HazMat Call Types



Hazmat Risk Category

Hazmat Risk Category	General Description of Associated Risk
Low	Residential CO alarms, small fuel spill containment, unknown hazmat investigations. Tasks limited to available equipment such as 4-gas detector, ERG, absorbent, etc. Technical mitigation or knowledge not required.
High	Large hazardous material (known or unknown) spills and/or releases creating IDLH environments. Large flammable liquid spills, natural gas leaks, or unknown hazardous substance spill. Advanced air monitoring and/or specialized equipment needed. Technical mitigation required. Level A or Level B PPE may be required for entry.

Hazmat Critical Tasks

HazMat Low Risk (Still)	
Task	**Personnel Required**
Command, size-up, safety	1
Operations level mitigation efforts including identification, evacuation, spill containment.	3
Total Effective Response Force	4
ERF assignment = 1 engine company	

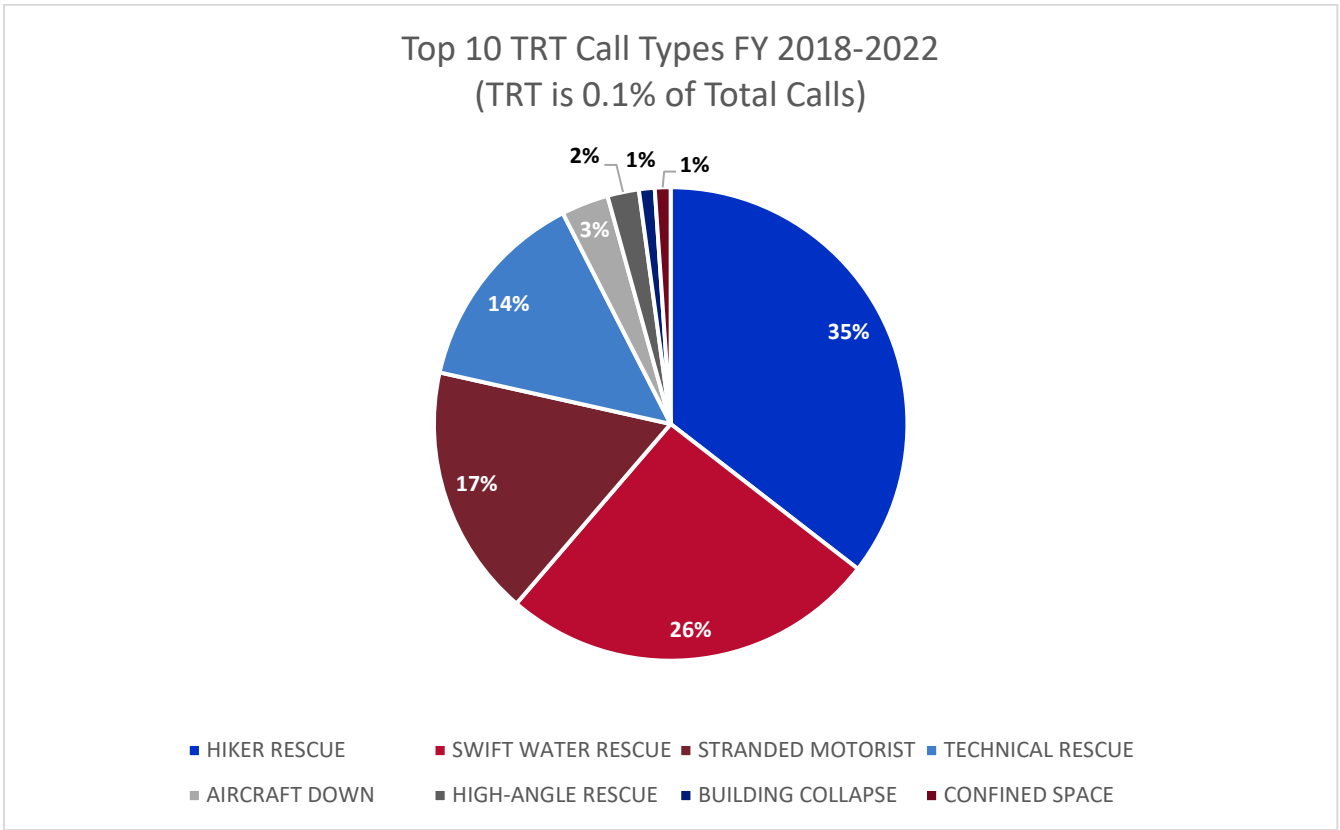
* Additional regional resources can be requested through existing automatic and mutual aid agreements as the incident dictates.

Hazmat High Risk (HazMat Full)	
Task	**Personnel Required**
Incident command	1
Scene safety	1
Isolation, evacuation, identification	4
HazMat Group	
HazMat Group Supervisor	1
Initial Research and Entry	3
Technical Safety Officer	1
Back-up Team, Entry support	4
Decontamination Supervisor	1
Decontamination	4
EMS stand-by	2
Total Effective Response Force	**22**
Operations Personnel	12
Technician Personnel	10
ERF assignment = 2 engine companies, HazMat Team (2 EN, 2 Squad, 1PM), 1 ambulance company, 1 incident safety officer, 1 battalion chief	

Technical Rescue Risk Assessment

Technical rescue responses are tiered in nature. NWFD relies on the first arriving unit to evaluate the nature of the scenario, recognizing limitations or capabilities of the individual company. Successful outcomes depend on the awareness of call takers, dispatchers, and company officers to recognize the significance of an incident and add appropriate resources early. All companies throughout the District have received operations level training in the more frequent technical rescue events (Hiker Rescue, Swift Water) with basic equipment to begin mitigation if possible. All companies train to the awareness level at a minimum in the less frequent incident types (Trench Rescue, Confined Space, Building Collapse) and have limited equipment within the scope of their training. The Special Operations Team is trained to the technician level in six disciplines of technical rescue and heavily equipped for these types of incidents. Fire officers may choose to continue large-scale responses or reduce the response force for incidents, depending on additional information received enroute or conditions found upon arrival.

Figure 3.24
Top TRT Call Types



Low to High Angle Rescue

The Tucson Mountains have a robust system of developed trails, and are frequented by hikers, equestrians, and mountain bikers whose experience level varies from limited to very experienced. Low angle rescue occurs frequently with outdoor enthusiasts such as hikers, mountain bikers and equestrians. The Tortolita Mountains has a similar network of trails that traverse through moderate to very rough terrain. Low angle rescue occurs frequently; high angle rescues are relatively rare. The increase in popularity of outdoor activities by residents in the Tucson area combined with the number of inexperienced users from a large destination resort at the base of the Tortolita Mountains has significantly increased the frequency/probability of these technical rescue calls. The complexity of rescues in this environment ranges from hiker dehydration on low angle trails to fall injuries in complex high angle situations.

Figure 3.25
Target Hazard – Trailheads (Hiker Rescue)

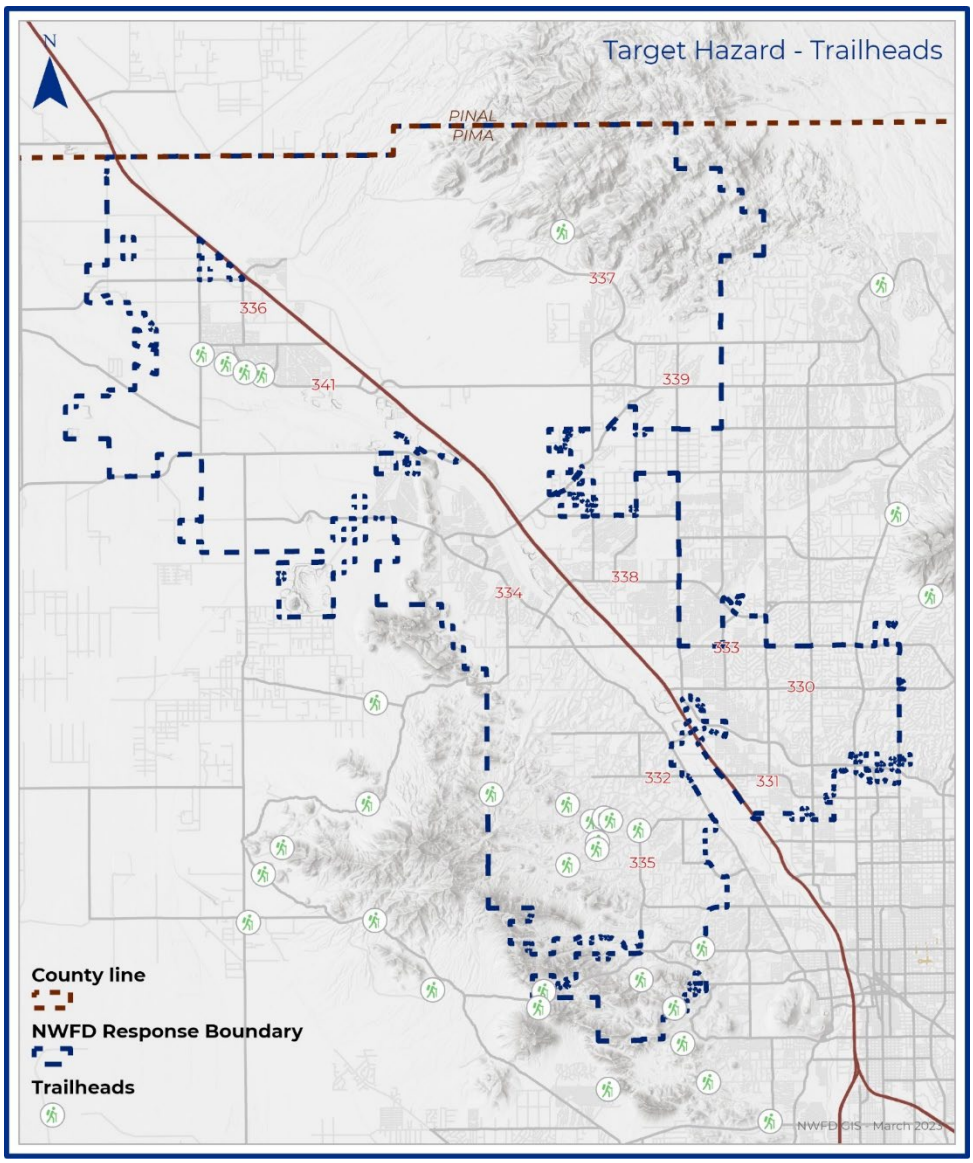


Figure 3.25 illustrates areas of the trail systems where these types of rescues are most likely to occur.

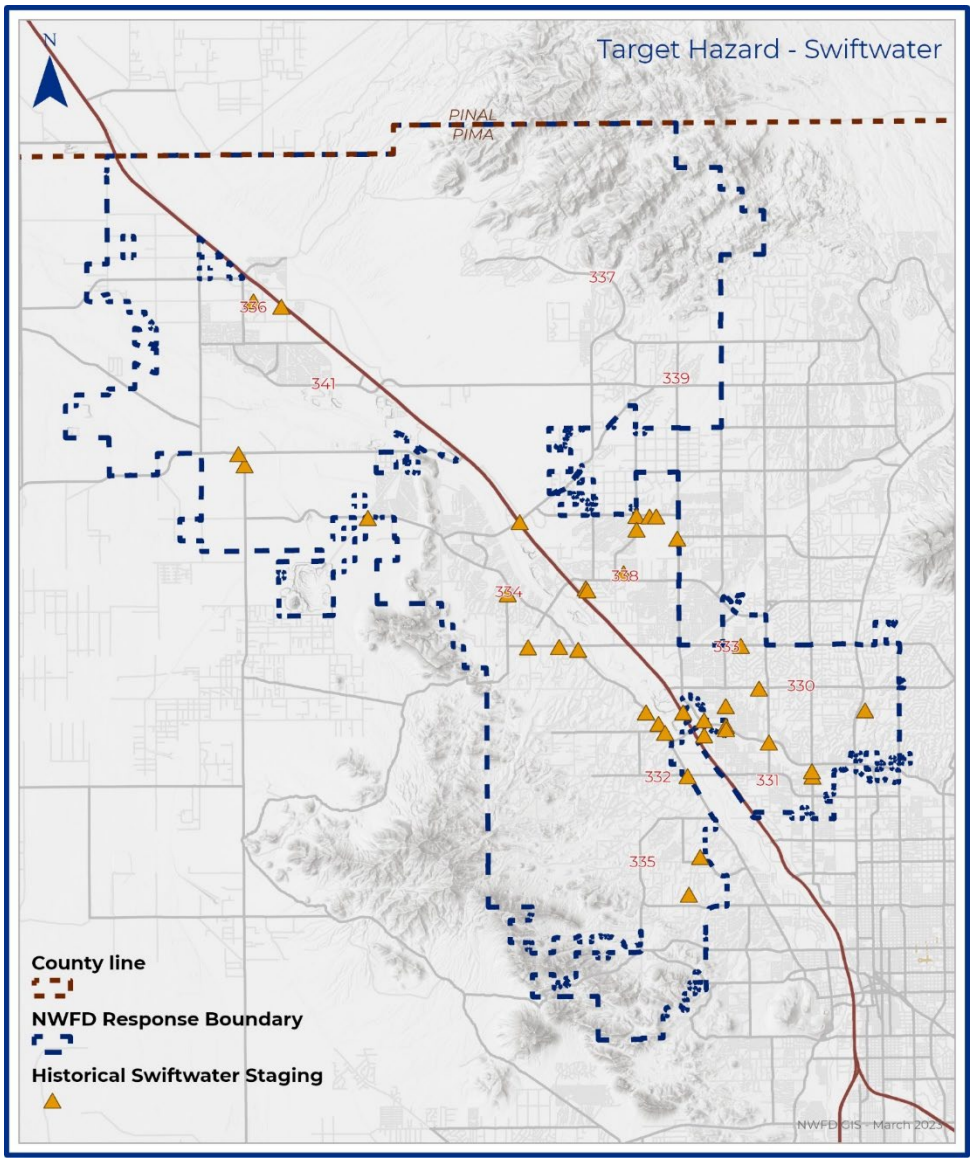
Sweetwater Preserve Trailhead, in Station 32's first-due area, part of an extensive hiking and mountain bike trail system in the Tucson Mountains.

Swift Water Risk

NWFD has numerous roads with dry wash crossings that can quickly fill with floodwaters during times of heavy rainfall and create the potential for swift water rescues. The largest concentrations of these washes are located in the Western portion of the District, but due to the area topography and ever-present road construction projects, there is little area in NWFD that is not periodically subject to heavy, unmanaged runoff. The Santa Cruz River runs south to north through the District, and provides drainage for a watershed area that reaches as far south as the International Border with Mexico. This drainage, though normally only containing a small stream of water from the Tres Rios Waste Water Treatment Plant, has the potential for becoming a raging river with water depths of over 20 feet, and up to a ¼ mile wide in places.

The Canada del Oro and Rillito Rivers and other local washes also have the capability for significant swift water flows. Though the Central Arizona Canal in the Northwest portion of the District is completely fenced and under security enforcement, it possesses the potential to entrap canal workers, or others who may breech the security measures. Smaller agriculture irrigation related canals are present in the northwestern area of the District can be the source of water rescues as these often run along established roadways and are unprotected by any sort of traffic barriers. Figure 3.31 illustrates the areas of highest potential for swift water related rescues.

Figure 3.26
Target Hazard –Swiftwater



Trench Rescue Risk

NWFD is currently experiencing relatively high levels of residential, commercial, and roadway construction; as such, there are numerous open utility construction trenches at any given time. Loose sandy soils that are often prevalent near major drainage features can significantly contribute to trench collapses, but pockets of this type of soil can occur in isolated areas throughout the District. Trench rescue operations are categorized as a singular high-risk.

Confined Space Risk

The Tres Rios Wastewater Reclamation Facility has numerous facilities where confined space rescue techniques may be required. Additionally, there are numerous construction and manufacturing companies located along the I-10 corridor that have conveyor belts, shafts, and other buildings that have a high risk of confined space incidents. Utility

company underground vaults are located throughout the District and the Central Arizona Project has confined spaces at its pumping station in the northwest planning zone's area of the District.

Structural Collapse Risk

The majority of residential and commercial structures in NWFD are relatively new, constructed within the past 20-40 years and built under recognized building codes. As such, the risk for structural collapse is relatively low. There are normally several moderate to large-scale construction projects in progress in the District at any one time that can pose a higher risk of structural collapse, depending on the stage of construction. As discussed in Section 1, the risk for damaging earthquakes that could trigger structural collapse is very low.

Technical Rescue Risk Category	General Description of Associated Risk
Low	Rescues involving stranded motorists in slow moving, non-rising water.
Moderate	Technical rescue involving hikers that are lost or injured on area trail systems.
High	Technical rescue involving people trapped in swift moving and/or rising water. High-angle rope recues on area trail systems or built infrastructure. Persons trapped or incapacitated in a confined space or trench.
Max	Technical rescue involving built infrastructure collapse with patients trapped under construction material debris and limited time of survival.

TRT Low Risk (Strand)	
Task	**Personnel Required**
Incident Command, scene safety	1
Reach, throw, wade rescue tasks	3
Total Effective Response Force	**4**
Operations Personnel	4
Technician Personnel	0
ERF assignment = 1 engine company	
TRT Medium Risk (Hiker)	
Task	**Personnel Required**
Incident Command	1
Scene safety	1
Recon Terrain/Locate Patient Access, evaluation, patient stabilization	4
Patient Packaging and Evacuation	4
Patient Transport	2
Medical Standby	2
Total Effective Response Force	**14**

TRT High Risk (High-Angle, Confined Space, Trench, TRT Full, Swift)	
Incident Command	1
Scene Safety	1
Recon/Locate Patient/ID Hot Zone	4
Rescue Group	
Rescue Group Supervisor	1
Technical Safety Officer	1
Entry/Rescue Team	4
Control/Backup team	4
Ladder Operations	4
Patient Transport	2
Total Effective Response Force	**22**
Operations Personnel	12
Technician Personnel	10
ERF assignment = 1 engine companies, 1 ladder company, TRT Team (2 EN, 2 Squads, 1PM), 1 ambulance company, 1 incident safety officer, 1 battalion chief	
TRT MAX Risk (CLAPS)	
Incident Command	1
Scene Safety	1
Recon/Locate Patient/ID Hot Zone	4
Rescue Group	
Rescue Group Supervisor	1
Technical Safety Officer	1
Entry/Rescue Team	4
Control/Backup team	4
Stabilization Team	4
Patient Transport	2
Total Effective Response Force	**22**
Operations Personnel	12
Technician Personnel	10
ERF assignment = 1 engine companies, 1 ladder company, TRT Team (2 EN, 2 Squads, 1PM), 1 ambulance company, 1 incident safety officer, 1 battalion chief	

*Additional NWFD and regional resources can be requested as complexity and conditions dictate.

Aviation Rescue Fire and Firefighting (ARFF) Risk Assessment

NWFD has one airport within its boundaries. The Marana Regional Airport (AVQ) is in the southern half of Station 41's first-due area and is classified as a general aviation reliever airport for the Tucson International Airport. The airport is home to more than 260 based aircraft and has more than 90,000 takeoffs and landings annually. The airport's main runway is 6,901 feet and the crosswind runway is 3,892 feet. Station 41 is the closest NWFD facility located approximately 1.5 miles northeast and 7 roadway miles from the airport.

In recent years, the airport has seen an increase in business jet traffic that includes aircraft with capacities up to 19 passengers. Marana Regional Airport has been accepted into the Federal Contracted Tower Program with control tower construction slated to begin in 2024.

Various branches of the military utilize the airport for a variety of training missions. The tragic outcome of one of these training missions resulted in the single largest loss of life in the history of NWFD. In 2000, an MV-22 Osprey crashed at the airport during a nighttime training mission, killing all 19 Marines on board. The site also includes a restaurant, service center, restoration company, and flight school. At present, there are no plans to seek FAA indexing status regarding ARFF capabilities, but it could happen in the future.

ARFF Risk Categories

ARFF Risk Category	General Description of Associated Risk*
Moderate	Single or twin-engine private aircraft, 1-6 passenger capacity
High	Any private jet aircraft, up to 6 passenger capacity
Maximum	Any private jet aircraft, approximately 7-19 passenger capacity, or any military aircraft

*with or without fire involvement

ARFF Critical Tasks

ARFF Moderate Risk (Structure 1)	
Task	**Personnel Required**
Incident Command	1
Incident Safety	1
Water supply, pump operations and tender supply	2
Fire attack (as necessary)	2
Extrication/Rescue	4
Patient treatment	6 *
Total Effective Response Force	**12**

*includes 2 initially dedicated crew members and reassigned extrication-rescue group

ARFF High Risk (Structure 2)	
Task	**Personnel Required**
Incident Command	1
Incident Safety	1
Water supply, pump operation and tender water supply	1
Fire attack (as necessary)	4

Extrication/Rescue	4
Patient treatment/transport	2
Hazmat functions, assist with extrication and patient care as necessary	6
Total Effective Response Force	**19***

ARFF Maximum Risk (Structure 2 or 3)	
Task	**Personnel Required**
Incident Command	1
Incident Safety	1
Water supply, pump operation, and tender water supply	2
Fire attack (as necessary)	2
Extrication/Rescue	3
Patient treatment/transport	8
Hazmat functions, assist with extrication and patient care as necessary.	12
Total Effective Response Force	**29***

*Additional ARFF regional and state resources can be requested through existing mutual aid agreements as the incident dictates.

It is recognized that the initial information Dispatch receives will not likely be available in sufficient detail or accuracy to determine which ARFF risk category the incident falls into. Therefore, the District has chosen to use a singular ERF assignment consisting of the formerly described structure 1 assignment. Depending on the additional information available from Dispatch, the response can be downgraded by the responding Battalion Chief, or additional assignment upgrades and transport units (ground and air) can be added to the deployment.

Marana Regional Airport is experiencing an increase in air traffic volume, including larger business jet aircraft.

SECTION 4

Current Deployment and Performance

CFAI Criterion 2C

In addition to a thorough risk analysis and resulting performance objectives, firefighter safety is a guiding principle for NWFD when considering deployment and performance. The District has adopted a universal risk management plan regarding responses to emergencies that aligns with NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter 8, 2021 edition, as it pertains to risk management at emergency operations and the International Association of Fire Chiefs Rules of Engagement:

- We will risk our lives to save savable life.
- We will risk our lives to a lesser degree to save savable property.
- We will not risk anything for life or property that is deemed lost or unsalvageable[7].

NWFD's risk assessment, community expectations, and objective data associated with fire behavior and clinical survival are primary factors in setting performance goals. NWFD

[7] NWFD SOG #7110

baseline and benchmark service level objectives are established and approved by the Governing Fire Board and are based on best practice and NFPA standards. These performance objectives (described in detail in Section 5) include alarm handling time, turnout time, travel time and total response time.

NWFD serves its jurisdiction with a higher concentration[8] and distribution[9] of resources in the urban/suburban area of the District verses the rural/undeveloped area of the District. This is in direct response to the higher call volume history and high consequence areas that are common to the urban/suburban areas.

Deployment

Fixed Assets (Facilities)

NWFD deploys its mobile emergency response resources from 11 station locations, split into two battalions as illustrated in Figure 2.1, Section 2. Figures 4.1 – 4.19 are a summary of all NWFD facilities, including fire stations (distribution) and support facilities. A summary of the concentration of apparatus (mobile assets), staffing, and service category delivery follows in Figures 4.20 and 4.21.

[8] Concentration, as defined by the Commission on Fire Accreditation International is the spacing of multiple resources arranged so that an initial "effective response force" can arrive on scene within the time frames outlined by the response time and on-scene performance objectives.

[9] Distribution, as defined by the Commission on Fire Accreditation International is the geographic location of all first-due resources for initial intervention.

Figure 4.1 - Station 330

<table>
<tr><th colspan="3">STATION 330
1520 W. ORANGE GROVE RD • TUCSON, AZ 85704
PLANNING ZONE - CORE</th></tr>
<tr><td colspan="2"> 
</td><td>Station 330 was built in 2011 and has the highest call volume of all NWFD stations. Station 330 serves a variety of medical related occupancies including numerous medical offices, several large extended care facilities, a stand-alone surgery center, and Northwest Medical Center. The remainder of station 330's area is comprised of a large resort, several large apartment complexes, single family homes, and a concentration of retail occupancies along State Route 77, a state highway. The intersection of Ina Road and SR77 (Oracle Road) is the second busiest intersection in Pima County, with over 96,000 vehicles passing throughout it daily.</td></tr>
<tr><td>Percentage of NWFD total property cash value protected by station's first-due area, and associated rank</td><td>15%</td><td>2nd/11 stations</td></tr>
<tr><td>Assigned Apparatus</td><td colspan="2">• Engine
• ALS Paramedic Ambulance
• AMR BLS Ambulance</td></tr>
<tr><td>Design and Construction</td><td colspan="2">The building is designed as a three-bay station and is primarily of masonry construction and classified as a Type III structure. The roof is a built-up flat roof.
• 11,093 Total Sq Ft
• Living/Workspace is 6,038 Sq Ft
• Bay is 5,055 Sq Ft</td></tr>
<tr><td>Code Compliance and Safety</td><td colspan="2">The station meets all current building and fire codes and is fully sprinklered. The parking area is accessible by access-controlled gates and entry into the building is by push button code system. Apparatus access onto Orange Grove Road is assisted by an Opticom device on the apparatus that activates a flashing warning sign in both directions of travel.</td></tr>
<tr><td>Staff Facilities</td><td colspan="2">The station currently houses six personnel 24/7 and two AMR Ambulance personnel. The station has sleeping quarters and living space for nine personnel.</td></tr>
<tr><td>Efficiency and General Facility Condition</td><td colspan="2">The general condition of the facility is excellent. If there is another company assigned on a full shift basis, there may be a need to relocate a unit.</td></tr>
</table>

Figure 4.2 - Station 331

STATION 331 4701 N. LA CHOLLA BLVD • TUCSON, AZ 85705 PLANNING ZONE - CORE		
	Station 331 was built in 1996 when it was part of the former Flowing Wells Fire District. It is adjacent to the District's Operations Headquarters and is the oldest fire station in the District. Station 331 serves some of the older neighborhoods in the District, consisting of small to medium size single family homes and numerous mobile home neighborhoods. There is a concentration of industrial type occupancies on the west side of 331's response area and two large propane distribution businesses. There are also several large apartment complexes and a four-story hotel in the response area. Station 331 has the second highest call volume in the District.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	5.9%	8th/11 stations
Assigned Apparatus	• Engine • ALS Paramedic Ambulance • AMR BLS Ambulance • Ladder Truck • Battalion Chief Truck • Safety Officer Truck	
Square Footage, Design, and Construction	The building is designed as a three-bay station and is primarily of masonry construction and classified as a Type III structure. • 7,701 Total Sq Ft • Living/Workspace is 3,220 Sq Ft • Bay is 4,481 Sq Ft	
Code Compliance and Safety	The station meets all current building and fire codes and is fully sprinklered. The parking area is accessible by access-controlled gates and entry into the building is by push button code system. Turnouts are stored in the apparatus bay.	
Staff Facilities	The station currently houses eight personnel including two AMR BLS Ambulance personnel. The station has sleeping quarters and living space for 10 personnel.	
Efficiency and Facility Condition	The general condition of the facility is fair; a light remodel is planned in the next couple of years. If there is another company assigned on a full shift basis, there may be a need to relocate a unit.	

Figure 4.3 – Station 332

STATION 332 4151 W. EL CAMINO DEL CERRO • TUCSON, AZ 85745 PLANNING ZONE - SOUTH		
	Station 332 was rebuilt on-site in 2011. Station 332 primarily serves a residential community on larger sized lots. There are a few conventional style subdivisions as well as remote large single-family residences. There are several popular hiking and biking trails in 332's area as well as some of the District's wildland/urban interface. Station 332's area is susceptible to temporary road closures after heavy rains. Water supply can be a challenge in some of this station's area due widely spaced hydrants and steep and narrow driveways. There is a large multi-user communication tower on site.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	4.6%	9th/11 stations
Assigned Apparatus	• Engine • Water Tender	
Square Footage, Design, and Construction	The building is designed as a two-bay station and is primarily ofmasonry construction and classified as a Type III structure. The roof is flat with a built-up roof. • 8,394 Total Sq Ft • Living/Workspace is 5,098 Sq Ft • Bay is 3,296 Sq Ft	
Code Compliance and Safety	The station meets all current building and fire codes and is fully sprinklered. The parking area is accessible by access-controlled gates and entry into the building is by push button code system. Apparatus access on to El Camino del Cerro is assisted by an Opticom device on the apparatus that activates a flashing warning sign in both directions.	
Staff Facilities	The station currently houses five personnel. The station has sleeping quarters and living space for six personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is excellent.	

Figure 4.4
Station 333

STATION 333 2821 W. INA RD • TUCSON, AZ 85741 PLANNING ZONE - CORE		
	Station 333 was relocated in 2009 to provide better response times for its first-due area. The station serves an area consisting of a mix of commercial and residential occupancies. There are several large apartment complexes in Station 333's area and several extended care facilities. This station has the third highest call volume in the District.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	12.2%	4th/11 stations
Assigned Apparatus	• Engine • ALS Paramedic Ambulance • Brush Truck • Engine 342 * Peak Activity Unit	
Square Footage, Design, and Construction	The building is designed as a "heavy" three-bay station and is primarily masonry construction and classified as a TypeIII structure. The roof is flat with a built-up roof. • 14,000 Total Sq Ft • Living/Workspace is 7,000 Sq Ft • Bay is 7,000 Sq Ft	
Code Compliance and Safety	The station meets all current building and fire codes and is fully sprinklered. The employee parking area is by access-controlled gates and entry into the building is by push button code system. Exiting apparatus can control the adjacent Ina/Shannon intersection by an Opticom device.	
Staff Facilities	The station currently houses 10 personnel that includes EN342 personnel Monday through Thursday 0800-1800 hrs. The station has sleeping quarters and living space for 13 personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is good.	

Figure 4.5
Station 334

STATION 334 8165 N. WADE RD • MARANA, AZ 85743 PLANNING ZONE - CENTRAL		
	Station 334 was constructed in 1993 and underwent a substantial remodel in 2004. It serves one of the more rapidly growing areas of the District and has the most diverse first-due area in terms of occupancies and other response aspects. Station 334's response areaincludes a large retirement community, light industry, many single-family residence subdivisions, remote large single-family residences, and several miles of I-10. Some of the major roadways in the south half of the first-due are susceptible to flooding during heavy rains. Station 334 is one of the District's two Ladder Company stations.	
Percentage of NWFD total property cash valueprotected by station's first-due area, and associated rank	19.6%	1st/11 stations
Assigned Apparatus	• Engine • ALS Paramedic Ambulance • Ladder Truck	
Square Footage, Design, and Construction	The building is designed as a two-bay station and is primarily ofmasonry construction and classified as a Type III structure. The roof is of a built-up flat design. • 7,323 Total Sq Ft • Living/Workspace is 2,959 Sq Ft • Bay is 4,364 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. The employee parking area is accessible by access- controlled gates and entry into the building is by push button code system.	
Staff Facilities	The station currently houses six personnel. The station has sleeping quarters and living space for seven personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is good.	

Figure 4.6
Station 335

STATION 335 3220 N. CAMINO DE OESTE • TUCSON, AZ 85745 PLANNING ZONE - SOUTH		
	Station 335 was constructed in 2006 as part of a residential house conversion. It serves a mainly rural/suburban area dominated by medium to large single-family residential occupancies. There are numerous hiking and biking trails on the west side of Station 335's first-due area. All the primary roadways in Station 335's area is susceptible to flooding during heavy rains that can create substantial response challenges during these conditions. In addition, steep, winding driveways in the foothills area can create access challenges to some of the largerresidential occupancies.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	6.5%	6th/11 stations
Assigned Apparatus	• Engine • Brush Truck	
Square Footage, Design, and Construction	The building is designed as a two-bay station and is primarily of masonry construction and classified as a Type III structure. The roof is of a built-up flat design. • 7,552 Total Sq Ft • Living/Workspace is 3,552 Sq Ft • Bay is 4,000 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. Employee parking is not access controlled and entry into the building is by a conventional lock system.	
Staff Facilities	The station currently houses four personnel.The station has sleeping quarters and living space for six personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is good.	

Figure 4.7
Station 336

STATION 336 13475 N. MARANA MAIN ST • MARANA, AZ 85653 PLANNING ZONE - NORTHWEST		
	Station 336 was constructed in 2006. The station was designed with a large capacity in anticipation of substantial growth expected in the first-due area. Station 336 serves a primarilysuburban and rural area, with several miles of I-10 traversing through the first-due. It also serves the only airport in the District, Marana Regional Airport. There are rapidly developing subdivisions in the eastern and southern areas of Station 336's first-due.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	3.7%	11th/11 stations
Assigned Apparatus	• Engine • Command Truck	
Square Footage, Design, and Construction	The building is designed as a "heavy" four-bay station and is primarily of masonry construction and classified as a TypeIII structure. The roof is of a built up flat/sloped design. • 13,534 Total Sq Ft • Living/Workspace is 6,134 Sq Ft • Bay is 7,400 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. The employee parking area is accessible by access-controlledgates and entry into the building is by push button code system.	
Staff Facilities	The station currently houses four personnel.The station has sleeping quarters and living space for 12 personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is good. The parking lot and detention basin needs major repair. CIP funds in FY23/24 should complete the St. 336 Erosion Project.	

Figure 4.8
Station 337

STATION 337 13931 N. DOVE MOUNTAIN BLVD • MARANA, AZ 85658 PLANNING ZONE - NORTHEAST		
	Station 337 was constructed in 2019 and serves the District's fastest growing area. Station 337 primarily serves medium to very large single-family residences and has a large retirement population that peaks during the winter season. Access to some large residences in the steeper sloped areas can be a challenge for full size apparatus. The station's first-due has an extensive network of hiking and biking trails, many of which originate from the Ritz- Carlton Resort area, an area that currently represents a response time challenge for the District.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	12.3%	3rd/11 stations
Assigned Apparatus	• Engine • Brush Truck • Light Squad	
Square Footage, Design, and Construction	The building is designed as a "medium" three-bay station and is primarily of masonry construction and classified as a TypeIII structure. The roof is mostly of a pitched design with a metal finish. • 8,900 Total Sq Ft • Living/Workspace is 3,985 Sq Ft • Bay is 4,915 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. The employee parking area does not have access-controlled gates and entry into the building is by push button code system.	
Staff Facilities	The station currently houses four personnel. The station has sleeping quarters and living space for seven personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition is good. Modifications to the drainage concern to reduce erosion around the station has been addressed and will continue to be monitored.	

Figure 4.9
Station 338

STATION 338 8475 N. STAR GRASS DR • TUCSON, AZ 85742 PLANNING ZONE - CENTRAL		
	Station 338 was constructed in 2007 and serves a wide array of occupancies including small tomedium single-family residences, large apartment complexes and medium to large retail occupancies. Station 338's first-due also includes the District's largest shopping mall and the District's only high school. The area is seeing substantial growth in the northwest area of it's first-due, which is presenting a challenge meeting current response time standards. Station 338 also serves as home for Battalion 332 (separate living quarters/bedroom) and is the District's only two-story station.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	9.9%	5^{th}/11 stations
Assigned Apparatus	• Engine • ALS Paramedic Ambulance • AMR BLS Ambulance • Special Operations Squad Unit • Battalion Chief Truck	
Square Footage, Design, and Construction	The building is designed as a "heavy" three-bay station and is primarily of masonry construction and classified as a TypeIII structure. The roof is of a built-up flat design. • 14,160 Total Sq Ft • Living/Workspace is 7,000 Sq Ft • Bay is 7,160 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. The employee parking area is accessible by access-controlledgates and entry into the building is by push button code system.	
Staff Facilities	The station currently houses 8 personnel including two AMR BLS ambulance personnel. The station has sleeping quartersand living space for 9 personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is good. The roof needs repair and is on the schedule for FY23/24. Modifications to the kitchen and upstairs living area are ongoing.	

Figure 4.10
Station 339

STATION 339 12095 N. THORNYDALE RD • MARANA, AZ 85658 PLANNING ZONE - NORTHEAST		
	Station 339 was constructed in 2010. It currently serves a rapidly growing area of the District. Station 339 primarily serves medium to very large single-family residences, with a small amount of office and retail occupancies. Building construction in station 339's first-due area is relatively new, with most structures less than 15 years old. Station 339's response area includes some of the longest travel times in the District, exceeding ten minutes near the northern end of its response zone.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	6%	7^{th}/11 stations
Assigned Apparatus	• Engine • Rehab Unit	
Square Footage, Design, and Construction	The building is designed as a "medium" two-bay station and is primarily of masonry construction and classified as a Type III structure. The roof is mostly of a pitched design with tile shingles. • 8,673 Total Sq Ft • Living/Workspace is 5,467 Sq Ft • Bay is 3,206 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. The employee parking area is accessible by access-controlledgates and entry into the building is by push button code system.	
Staff Facilities	The station currently houses four personnel.The station has sleeping quarters and living space for seven personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The facility is in excellent condition.	

Figure 4.11
Station 341

STATION 341 10350 W. TANGERINE RD MARANA, AZ 85653 PLANNING ZONE - NORTHWEST		
	Station 341 was constructed in 2019 and serves occupancies including small to medium single-family residences, with some light industrial and forecasted larger commercial big-box complexes. Station 341's first-due is also seeing substantial growth in areas north of the station along the I-10 freeway and between it and station 336.	
Percentage of NWFD total property cash value protected by station's first-due area, and associated rank	4.3%	10th/11 stations
Assigned Apparatus	• Engine • Water Tender • Air-Power Truck	
Square Footage, Design, and Construction	The building is designed as a two-bay station and is primarily of masonry construction and classified as a Type III structure. The roof is of a built-up flat design. • 9,000 Total Sq Ft • Living/Workspace is 3,549 Sq Ft • Bay is 5,451 Sq Ft	
Code Compliance and Safety	The station meets all current building and firecodes and is fully sprinklered. The employee parking area is accessible by access-controlledgates and entry into the building is by push button code system.	
Staff Facilities	The station currently houses 4 personnel. The station has sleeping quarters and living space for seven personnel.	
Efficiency and Facility Condition	The station currently meets all associated needs. The general condition of the facility is excellent.	

Figure 4.12
Training Center

NORTHWEST FIRE DISTRICT TRAINING CENTER 5125 W. CAMINO DE FUEGO • TUCSON, AZ 85743	
  	The Training Center site consists of 12.5 acres and was dedicated in 2012. Training amenities on site include: • Administrative offices for the training staff. • Three formal classrooms and breakout rooms with capacities of 32 students each. Rooms are equipped with modern technology, including restrooms and small-scale sinks and counter space. • Three informal, "dirty" classrooms designed for hands-on training. • Command Center classroom that is designed for computer-based simulations. • Five-story drill tower that is equipped with smoke generators and can be utilized for fire and technical rescue related drills. • Two-story Class A burn building with burnrooms on the first and second floors. • Hazmat props including two full-size RR tank cars and two over-the-road tankers. • Residential and commercial ventilation props. • Flashover prop. • Car fire prop. • Dumpster fire prop. • Pump test pit. • Candidate Physical Ability Test (CPAT) course.
Square footage, Design and Construction	Classrooms are reinforced concrete masonry and mortar construction. Roofs are of built-upflat type construction. The drill tower is structural steel construction, and the burn building is reinforced concrete with thermal paneling in the burn rooms. Construction typevaries; classrooms are Type III, training tower is Type II, and the burn building is Type I. • 28,777 Total Sq Ft
Code Compliance and Safety	The buildings meet all current building and firecodes. Occupied structures are fully sprinklered. The drill ground area is separated by a limited access gate.
Staff Facilities	Staff facilities are adequate for the current level of training staff. Training staff is nearing capacity and further increases will likely require a remodel effort in Building A.
Efficiency and Facility Condition	The buildings are fair condition. However, there is a substantial area of the paved areas that needs major repair that will be addressed in FY23/24. Training erosion has been identified as a problem and measures to improve storm water drainage and reduce negative effects of erosion is ongoing.

Figure 4.13
Administration Building

ADMINISTRATION 13525 N. MARANA MAIN ST MARANA, AZ 85653	
	The Administration Building was built in 2022. The construction of the New Administration Complex has allowed for numerous departments to be located at one location and improve efficiencies within daily District operations. The Governing Board, Fire Chief, Executive Team, HR, Finance, IT, Administrative Services, Business Services, Prevention, EMS, Community Relations, and Public Education are all officed at the building.
Square Footage, Design, and Construction	The three-story building is metal with stucco exterior and a lean-to style pitch roof. It is classified as a Type II structure. • 24,442 Total Sq Ft
Code Compliance and Safety	The building meets all current building and fire codes with sprinklers and a centrally monitored alarm system. It has public and employee parking in the rear with an automatic gate for response staff vehicles. The complex has capacity to support growth into the future.
Staff Facilities	The Administration Building currently houses 43 employees. The complex has plenty of room to add new staff as the District continues to grow. The complex has a Governing Board room and several medium and large conference rooms on each level to facilitate meetings and foster collaboration in the workplace.
Efficiency and Facility Condition	The building is about a year old,and in excellent condition.

Figure 4.14
Operations Headquarters

OPERATIONS HEADQUARTERS 4701 N. LA CHOLLA BLVD TUCSON, AZ 85705	
	The Operations HQ building houses a Battalion Chief, Safety Officer, Division Chief-Operations, and Community Assistance Program members. The building has a conference room and shares a back-up generator with Station 331. There is a helicopter landing pad SW of the building.
Square Footage, Design, and Construction	The building is reinforced masonry construction and classified as a Type III structure. The structure has a pitched metal roof. • 4,320 Total Sq Ft
Code Compliance and Safety	The station met all current building and fire codes at the time of construction. It is fully sprinklered. The parking area is unsecured and entry into the building is by push button code system.
Staff Facilities	The facility can provide office space for up to six staff members. It houses the sleeping quarters and living space for the Battalion Chief and Safety Officer.
Efficiency and Facility Condition	The facility currently meets all associated needs and is in good condition. Future development on District owned land to the west is prohibited by archeological features.

Figure 4.15
NWFD Family Care Center

NWFD FAMILY CARE CENTER (FCC) 8165 N. WADE RD MARANA, AZ 85743	
	The vacant administrative offices facility was constructed in 1993 and was originally the District's Training Division office and classroom and became the Emergency Medical Services administrative facility until recently when Emergency Medical Services was relocated to the new administration complex. The building is currently under construction for a light remodel to become the NWFD Family Care Center (FCC).
Square Footage, Design, and Construction	The building is of slump block and mortar construction, with a flat roof. It isclassified as a Type III structure. • 3,549 Total Sq Ft
Code Compliance and Safety	The building meets all current building and fire codes at the time of construction. The facility is fully sprinklered. It has an unsecured public parking lot with a security access gate into employee parking that is shared with station 334.
Staff Facilities	There are 7 rooms suitable for office space or exam rooms for the Nurse Practitioner and any additional staff. The building has 1 large conference room and a kitchenette area. There are additional rooms that are used for storage.
Efficiency and General Facility Condition	The building is approximately 25 years old, and in good condition. This facility underwent a major renovation in 2015. This facility is currently undergoing more renovations to accommodate the Nurse Practitioner Program.

Figure 4.16
Fleet Services

FLEET SERVICES 7375 N. STAR COMMERCE WAY TUCSON, AZ 85743	
	The Fleet Services building was constructedin 2004 and consists of administrative and parts warehouse space as well as three service bays. There is also a welding operations designated area.
Square Footage, Design, and Construction	14,900 sq. ft. The building is of a prefabricated, metal frame design and isclassified as a Type V structure. The structure has a pitched metal roof.
Code Compliance and Safety	The station met all current building and firecodes at the time of construction. It is fully sprinklered. The parking area is secure during non-business hours.
Staff Facilities	There is cubicle or individual office space for eight staff members. The space is currently adequate for staff needs.
Efficiency and Facility Condition	The building currently meets all associated needs. The facility is in good condition. There is room to add service bays if neededin the future.

Figure 4.17
Warehouse

WAREHOUSE 1520 W. ORANGE GROVE RD • TUCSON, AZ 85704	
	This facility was formerly a fire station and was renovated into the Logistics/Warehouse facility in 2012. It is located adjacent to the new Station 330. The Warehouse Manager, Warehouse Supervisor, and two Warehouse Inventory Specialists are all housed in this building. The old engine bays were reconfigured and now serve as a warehouse area. A large multi-use communication tower is located on the site.
Square Footage, Design, and Construction	The building is mostly slump block and mortar construction, although there is a small portion that is of frame construction. The roof is flat. It is classified as a Type III structure. • 9,539 Total Sq Ft • Living/Workspace is 6,039 Sq Ft • Bay is 3,500 Sq Ft
Code Compliance and Safety	The building met all current building and fire codes at the time of construction. It is fully sprinklered. There is a small parking lot in the frontof the building that is available to the public. The main employee parking is in a locked/gated area behind the facility. Parking is limited, but adequate for current usage.
Staff Facilities	There are seven rooms suitable for office space for theWarehouse personnel, and a large work area with twooffice spaces. There are additional rooms that are used for storage. Additionally, the old engine bays are used as a warehouse. There is a small room that houses a significant amount of critical IT hardware and software.
Efficiency and Facility Condition	The building is in good condition except for the roof over the warehouse which will need major repairs in the near future.

Figure 4.18
Facilities Headquarters

FACITLITES HEADQUARTERS 13001 N. TORTOLITA RD MARANA, AZ 85658	
	This facility was originally built in 1998 and served as the location for Station 337 for 21 years. Facilities Services personnel are presently housed out of the building. The division provides critical infrastructure support for the District. The Facilities Division's purpose is to ensure essential infrastructure is properly suited and maintained for optimal safety and reliability, and for our members to perform at maximal levels to save lives, protect property, and care for our community.
Square Footage, Design, and Construction	The building is mostly slump block and mortar construction, the roof is of a pitched tile over the construction type. It is classified as a Type III Structure. • 8,910 Total Sq Ft • Living/Workspace is 4,320 Sq Ft • Bay is 4,590 Sq Ft
Code Compliance and Safety	The building met all current building and firecodes at the time of construction. It is fully sprinklered. Parking space is adequate for current usage but is not secured.
Staff Facilities	There is adequate office and workspace for the current workload with room for expansion of staff and work in the future.
Efficiency and Facility Condition	The building is in fair condition with several major repairs and parking lot work needed soon. The building is well laid out for its new purpose. The paved areas need sealcoating.

Figure 4.19
Equipment Services Center (ESC)

EQUIPMENT SERVICES CENTER (ESC) 3701 W. QUASAR ST TUCSON, AZ 85741	
	This facility was originally built in 1993 and served as the location for Station 333 and the Wildland Operations Center. In 2016 the facility was converted to serve as the Equipment Services Center. It houses the Fire Equipment Services Supervisor and Fire Equipment Services Technician. It is the only facility that is not located within the Northwest Fire District.
Square Footage, Design, and Construction	The building is mostly slump block and mortar construction, the roof is of a built-upflat construction type. It is classified as a Type III Structure. • 6,182 Total Sq Ft • Living/Workspace is 1,782 Sq Ft • Bay is 4,400 Sq Ft
Code Compliance and Safety	The building met all current building and firecodes at the time of construction. It is fully sprinklered. Parking space is adequate for current usage but is not secured.
Staff Facilities	There is adequate office and workspace for thecurrent workload with room for expansion of staff and work in the future.
Efficiency and Facility Condition	The building is in fair condition. However, there is a substantial area of the paved areas that needs major repair.

Mobile Assets (Apparatus)

NWFD maintains a diverse fleet of apparatus equipped to handle the all-hazard approach to its mission. The various types of apparatus that NWFD deploys on emergencies, listed by their dispatch designator type, are described below.

Engine – Primary response unit from each station for most types of service requests. Each engine is equipped with a 1250 gpm pump, 500-gallon water tank, a Class A foam system, a set of hydraulic power rescue tools and a compliment set of equipment in accordance with NFPA 1901, Standard for Automotive Fire Apparatus, 2016 edition. All NWFD engines meet the requirements for FEMA Type 1 engine classification.

Ladder – Apparatus equipped with a minimum of 100' fixed aerial ladder or platform, an assortment of ground ladders, fixed and portable lighting, various power tools and salvage equipment, as in accordance with NFPA 1901, Chapter 6. NWFD ladder apparatus are designed as quints and are equipped with a 2000 gpm pump, 300-gallon water tank and a minimum of 300 feet of large diameter supply hose. All NWFD ladders meet the requirements for FEMA Type 1 ladder classification.

Ambulance – Apparatus equipped with emergency medical equipment that provide medical services and transport for patients to definitive care facilities. All NWFD ambulances meet therequirements for GSA Type 1 ambulance classification.

Tender – Vehicle designed to carry large quantities of water (2,500 gallons or more) to deliver water for firefighting efforts in remote areas that are not serviced by fire hydrants. All NWFD tenders meet the requirements for FEMA 508-4 Type 1 and NWCG S2 classification.

Brush – Small or medium sized apparatus specifically designed for wildland firefighting. They are all-wheel drive and carry from 300 to 500 gallons of water. They are in compliance with applicable sections of NFPA 1906, Wildland Fire Apparatus and are equipped in accordance with National Wildland Coordinating Group requirements.

Incident Command Vehicle – Specialized apparatus capable of being an incident command post with associated communication equipment and workspace.

Squad – Specialized apparatus that carries both a large inventory of technical rescue and hazmat equipment. This apparatus is designed to operate at a large incident for an extended period with minimal support.

Rehab – Vehicle designed for rehabilitation services for firefighters at an incident. It provides seating in a temperature-controlled environment and carries a variety of rehab equipment and supplies as a well as a restroom.

Air/ Power - A support vehicle that responds to all working fires and other large incidents to provide breathing air for self-contained breathing apparatus (SCBAs), scene lighting, salvage support, and light rehab services.

A summary of NWFD apparatus and associated distribution and staffing is listed in Figure 4.20.

Station 34's 105' ladder

Figure 4.20
Emergency Services and Associated Resources and Staffing

Service	Resources	Staffing
Fire Suppression	11 staffed engine companies 2 cross-staffed ladder companies 5 staffed paramedic companies 2 tenders 1 air-light (equipment) truck 1 rehab truck 1 fire investigator truck	**24/7 staffing** 4 per engine/ladder co. 2 per paramedic co. 1 tender 1 air/power 1 safety officer captain 1 fire investigator 2 battalion chiefs Total of 63 constant staffing **40-hour staffing** 1 staffed engine co (Mon-Thurs) 1 division chief (M-Thurs) 1 deputy chief (M-F)
Emergency Medical Services	11 staffed engine companies 2 cross-staffed ladder companies 5 staffed paramedic companies *Each company staffed with minimum of one paramedic.	**24/7 staffing** 4 per engine/ladder co. 2 per paramedic co. 2 battalion chiefs 1 safety officer Total of 63 constant staffing **40-hour staffing** 1 staffed engine co (Mon-Thu) 3 EMS division chiefs 2 EMS paramedic trainers (M-F) 2 EMS captains
Special Operations (Hazardous Materials & Technical Rescue)	1 IC/hazmat apparatus (Station 36) 1 hazmat/TRT apparatus (Station 38) 1 light squad apparatus (Station 37) 1 Gator ATV (Station 37)	**24/7 staffing** 7 cross trained TRT/HazMat technicians at Station 38
Wildland	2 Type 3 brush apparatus 1 Type 6 brush apparatus 1 Gator ATV	**24/7 staffing** Staffing as listed under Fire Suppression

Figure 4.21
Mobile Asset Locations and Associated Staffing

Station	Asset ID	Unit Designation	Description	Staffed		Constant Staff
				yes	no	
30	2101	EN330	2022 KME 1250 gpm pumper	x		4
	1803	PM330	2018 Dodge/Braun NW ambulance	x		2
31	1810	EN331	2018 KME 1250 gpm pumper	x		4
	0992	LD331	1999 Spartan/Smeal 100' platform	EN toggles to LD		
	1614	PM331	2016 Dodge/Braun NW ambulance	x		2
	1807	SO331	2018 Ford F-150 XLT truck	x		1
	1806	BC331	2018 Ford F-150 XLT truck	x		1
32	1007	EN332	2011 KME 1250 gpm pumper	x		4
	0801	TN332	2008 International/US Tanker 2700 gallon Type 1	x		1
33	1809	EN333	2018 KME 1250 gpm pumper	x		4
	1616	EN342	2016 KME 1250 gpm pumper	X*		4
	1901	PM333	2019 Dodge/Braun NW ambulance	x		2
	0805	BR337	2008 International/Placer Type 3 4x4 brush truck		x	--
34	1708	EN334	2017 KME 1250 gpm pumper	x		4
	1811	PM334	2018 Dodge/Braun NW ambulance	x		2
	0057	LD334	2005 Smeal 105' aerial ladder	EN toggles to LD		
35	1004	EN335	2011 KME 1250 gpm pumper	x		4
	0710	BR335	2007 Pride Enterprises Type 6 4x4 brush truck		x	--
36	1005	EN336	2011 KME 1250 gpm pumper	x		4
	0042	CV336	2004 Spartan/SVI incident command/hazmat		x	--
	1501	PM336	2015 Dodge/Braun NW ambulance		x	--
37	1707	EN337	2017 KME 1250 gpm pumper	x		4
	1401	LTSQ337	2014 Ford F450 utility box + ATV trailer		x	--
	0804	BR337	2008 International/Placer Type 3 4x4 brush truck		x	--
38	0803	EN338	2008 Pierce Arrow 1250 gpm pumper	x		4
	0901	SQ338	2009 Spartan/SVI Heavy Rescue		x	--
	1502	PM338	2015 Dodge/Braun NW ambulance	x		2
	1808	BC332	Ford F-150 XLT Truck	x		1
39	1006	EN339	2011 KME 1250 gpm pumper	x		4
	0521	RH339	2005 Chevrolet Supreme/Senator Bus rehab		x	--
41	0526	EN341	2005 Pierce Enforcer 1250 gpm pumper	x		4
	0985	AP341	1997 International/SVI air/light/salvage truck	x		1
	0973	TN341	1997 Semo 2775 gallon tender		x	--
Reserve	1003		2010 Chevrolet/AEV ambulance		x	--
	1615		2016 Dodge/Braun NW ambulance		x	--
	0802		2008 Pierce Arrow 1250 gpm pumper		x	--
	0518		2005 Pierce Enforcer 1250 gpm pumper		x	--
	0519		2005 Pierce Enforcer 1250 gpm pumper		x	--
	0527		2005 Pierce Enforcer 1250 gpm pumper		x	--
	0022		2002 Pierce Enforcer 1250 gpm pumper		x	--
	0023		2002 Pierce Enforcer 1250 gpm pumper		x	--

**EN342 is staffed four days a week, 0800-1800 hrs.*

Automatic and Mutual Aid

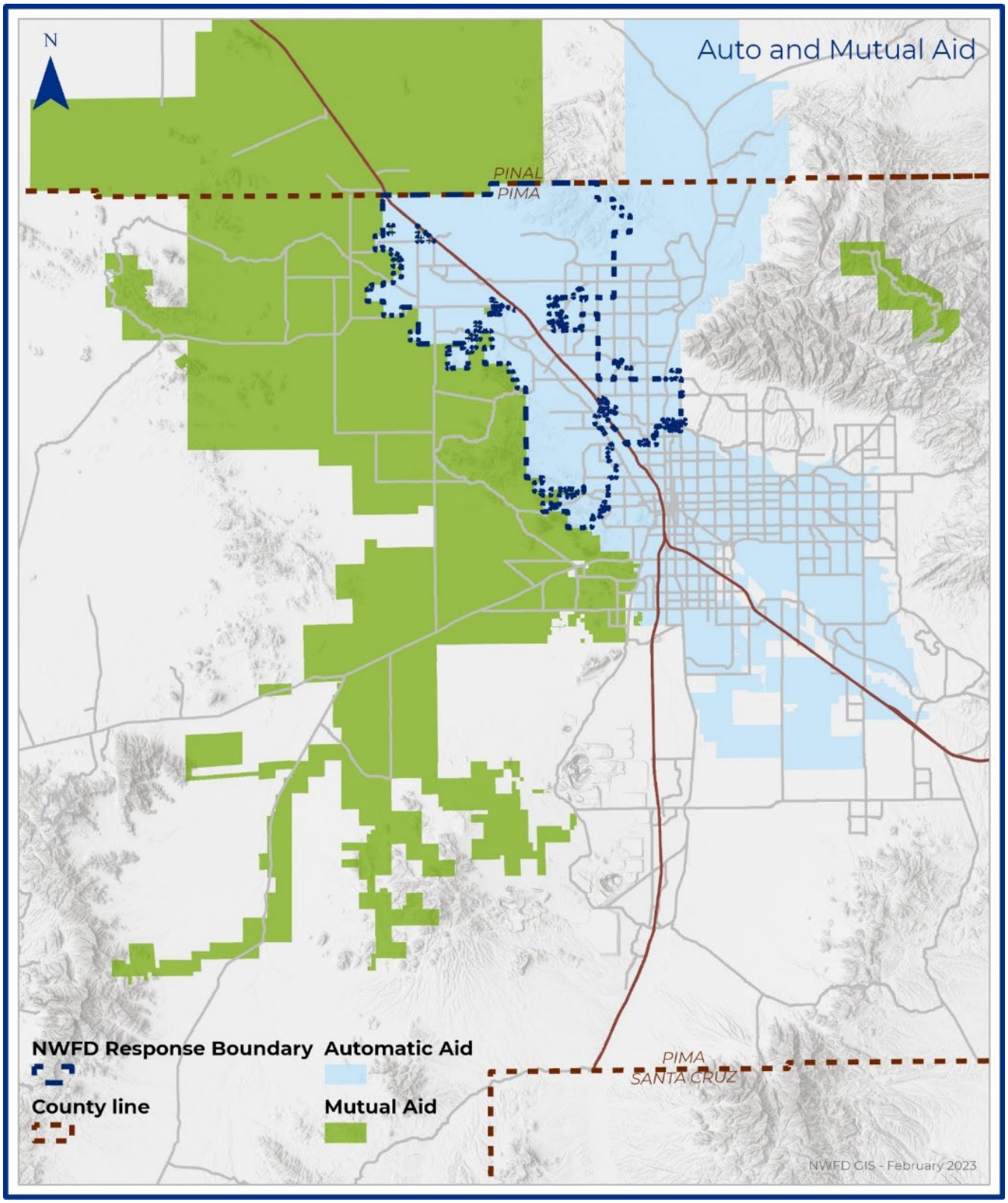
While NWFD has a strong response network that includes stations, apparatus, and personnel,the District recognizes the necessity of maintaining automatic[10] and mutual aid agreements. Since 2017, NWFD has participated in a Regional Automatic Aid Agreement with the Golder Ranch Fire District (GRFD). This agreement essentially doubles the number of resources available for emergency response. It also ensures that the closest, most appropriate units are dispatched to emergency incidents regardless of the jurisdictional boundary between both agencies. A new Southern Arizona Regional Automatic Aid Agreement went into effect in late 2019 between NWFD, GRFD, and the Tucson Fire Department (TFD). Like the original automatic aid agreement between NWFD and GRFD, once this new agreement becomes fully operational, it will have a positive impact on the effectiveness and efficiency of emergency response in the region. The current automatic aid agreement between the three agencies has been implemented for still alarms, fires, and special operations while work continues to extend to EMS services. NWFD is also part of the Arizona Statewide Mutual Aid plan and can request or be requested for assistance. Figure 4.23 shows NWFD in relation to our automatic aid partners and the most likely mutual aid requested areas served by bordering fire districts.

Figure 4.22
Auto/Mutual Aid Counts

	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22
Given to GRFD	994	1139	1245	1321	1393
Received from GRFD	621	716	668	879	1128
Given to TFD	43	46	105	201	199
Received from TFD	20	64	69	89	166

[10] Automatic aid is defined as a response agreement with another fire agency, where units are dispatched by the same dispatch center and dispatched on the initial alarm or dispatch, based on proximity to the emergency, without regard to agency boundaries. Mutual aid is defined as assistance that an agency requested from another; these units are not on the initial alarm or dispatch.

Figure 4.23
Auto/Mutual Aid Map



Golder Ranch Fire District and Northwest Fire District share resources in an automatic aid agreement. In addition to these two Districts dispatching the closest available unit without regard to GRFD/NWFD boundaries, standard operating guidelines and training activities are aligned whenever possible.

Performance

Insurance Services Office (ISO) Rating

Verisk Analytics is an advisory and rating organization that provides risk management analysis. Verisk focuses on understanding risk throughout a variety of markets. The community hazard mitigation market is administered by Verisk Analytics' Insurance Service Office (ISO).

> *ISO collects information on municipal fire-protection efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data using our Fire Suppression Rating Schedule (FSRS). Communities are then assigned a Public Protection Classification (PPC) from 1 to 10. Class 1 generally represents superior property fire protection, and Class 10 indicates that the area's fire suppression program doesn't meet ISO's minimum criteria.*

By classifying communities' ability to suppress fires, ISO helps the communities evaluate their public fire-protection services. The program provides an objective, countrywide standard that helps fire departments in planning and budgeting for facilities, equipment, and training. And by securing lower fire insurance premiums for communities with better public protection, the PPC program provides incentives and rewards for communities that choose to improve their firefighting services.

Source: https://www.isomitigation.com/ppc/

The Northwest Fire District submits our community to the ISO PPC program. Northwest Fire District provides comprehensive survey updates to allow ISO to have the most up-to-date information about the Northwest Fire District's fire prevention and fire protection services. The purpose of the FSRS schedule is to outline the criteria for our community's emergency communication center, fire suppression capabilities, water supply infrastructure, and community risk reduction efforts. The Northwest Fire District proudly maintains a Class 1/1Y PPC rating. The Class 1/1Y PPC places the District's fire protection in the top 1% of the country's communities. The enhanced score went into effect on July 01, 2019, and works to ensure lower insurance costs for property owners within much of the Town of Marana and areas of unincorporated Pima County northwest of Tucson served by the Northwest Fire District. Out of the nearly 39,000 fire departments/districts assessed by ISO, Northwest Fire District is one of 474 fire agencies in the United States to receive an ISO class 1 rating.

Figure 4.24
ISO Countrywide

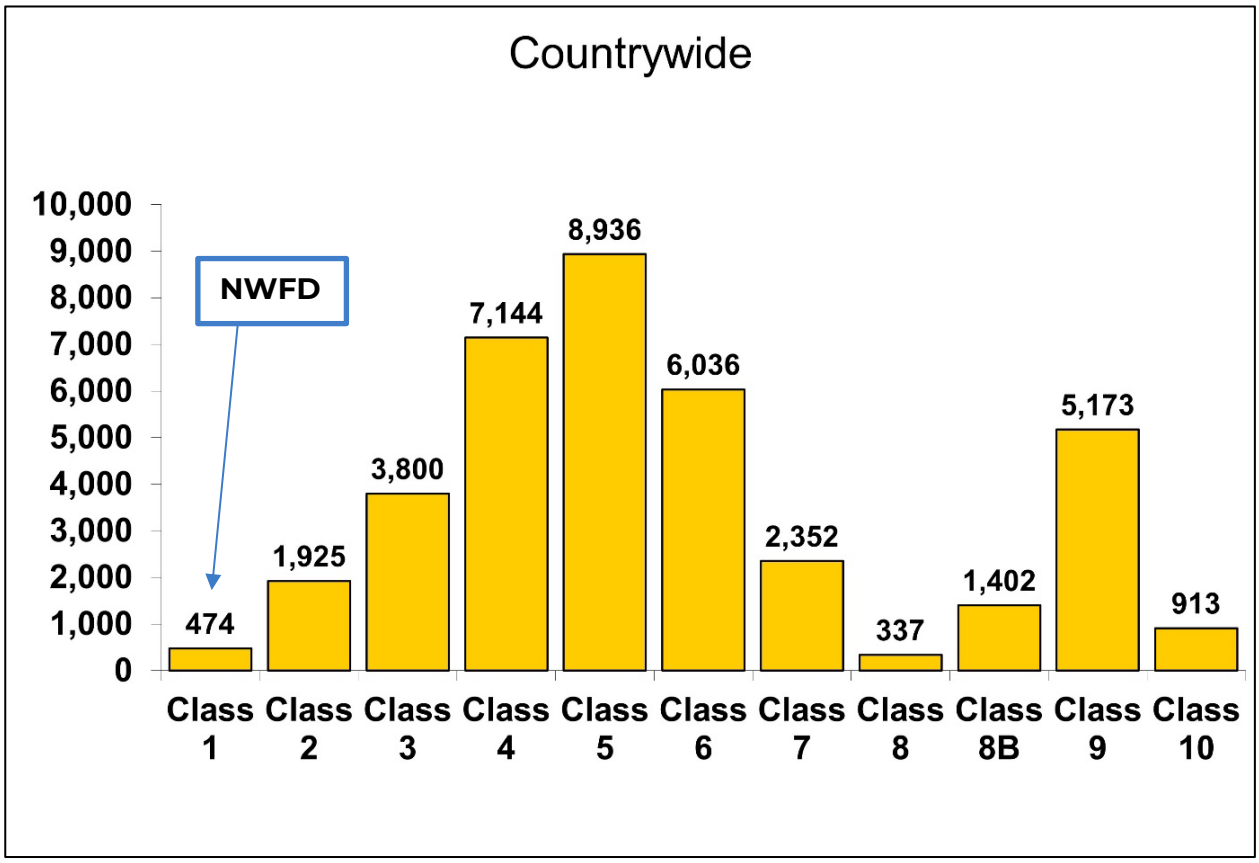
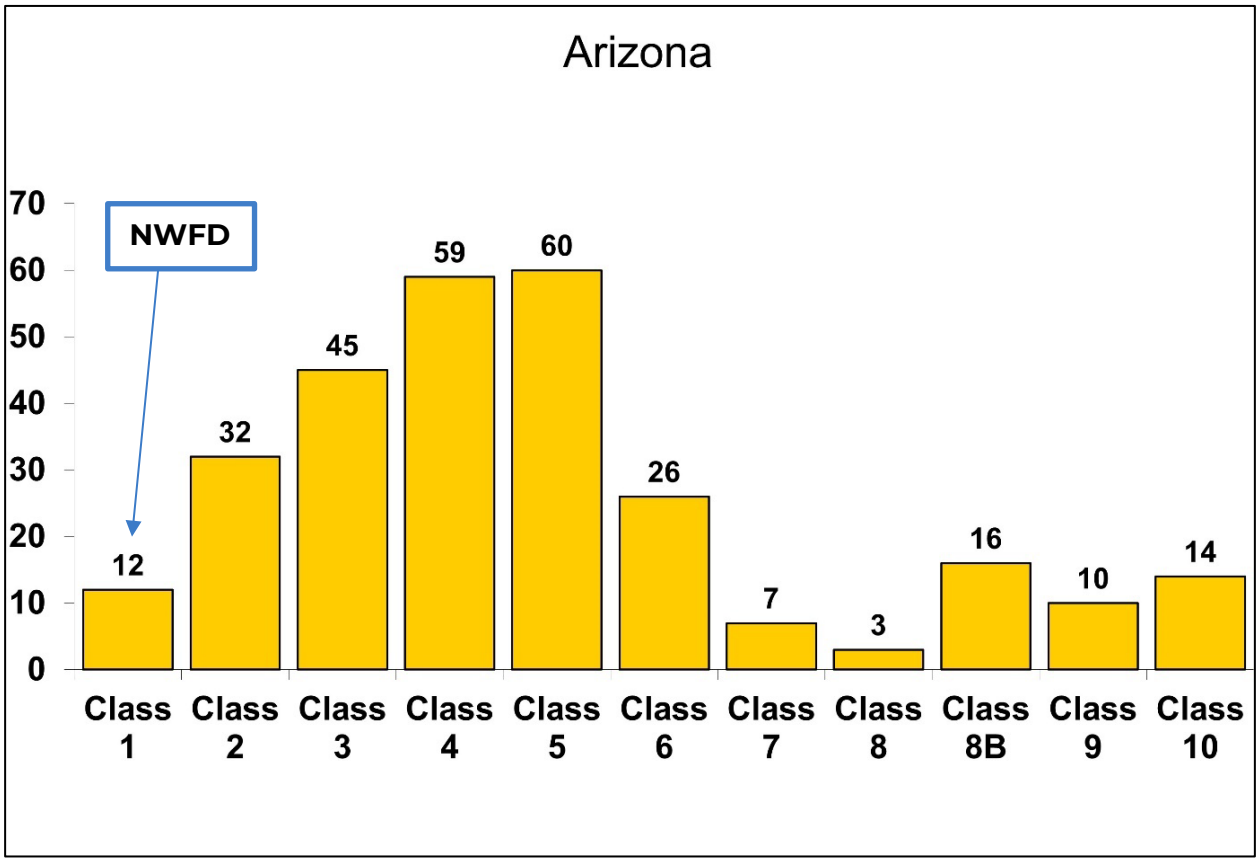


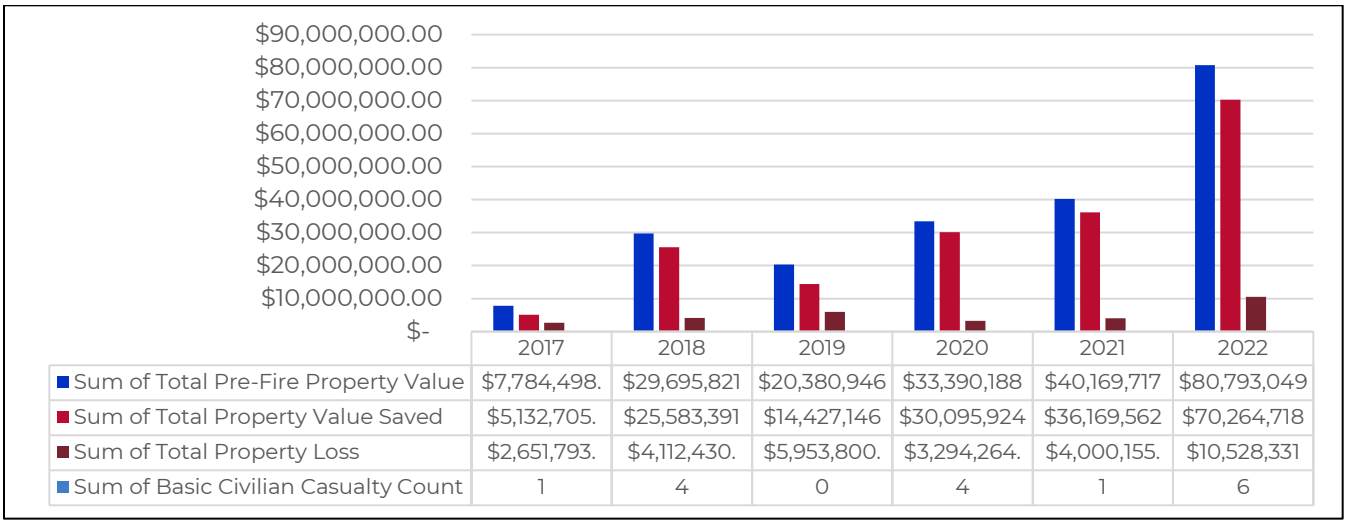
Figure 4.25
ISO Arizona



Fire Related Property Loss and Casualties

Performance can be measured in several ways. NWFD uses fire property value losses, civilian casualties (injuries or deaths) and the correlated property value saved as three of the performance dimensions as shown in Figure 4.26.

Figure 4.26
Property Value Loss/Saved & Civilian Casualty Count (Calendar Years)



	2017	2018	2019	2020	2021	2022
Sum of Total Pre-Fire Property Value	$7,784,498.	$29,695,821	$20,380,946	$33,390,188	$40,169,717	$80,793,049
Sum of Total Property Value Saved	$5,132,705.	$25,583,391	$14,427,146	$30,095,924	$36,169,562	$70,264,718
Sum of Total Property Loss	$2,651,793.	$4,112,430.	$5,953,800.	$3,294,264.	$4,000,155.	$10,528,331
Sum of Basic Civilian Casualty Count	1	4	0	4	1	6

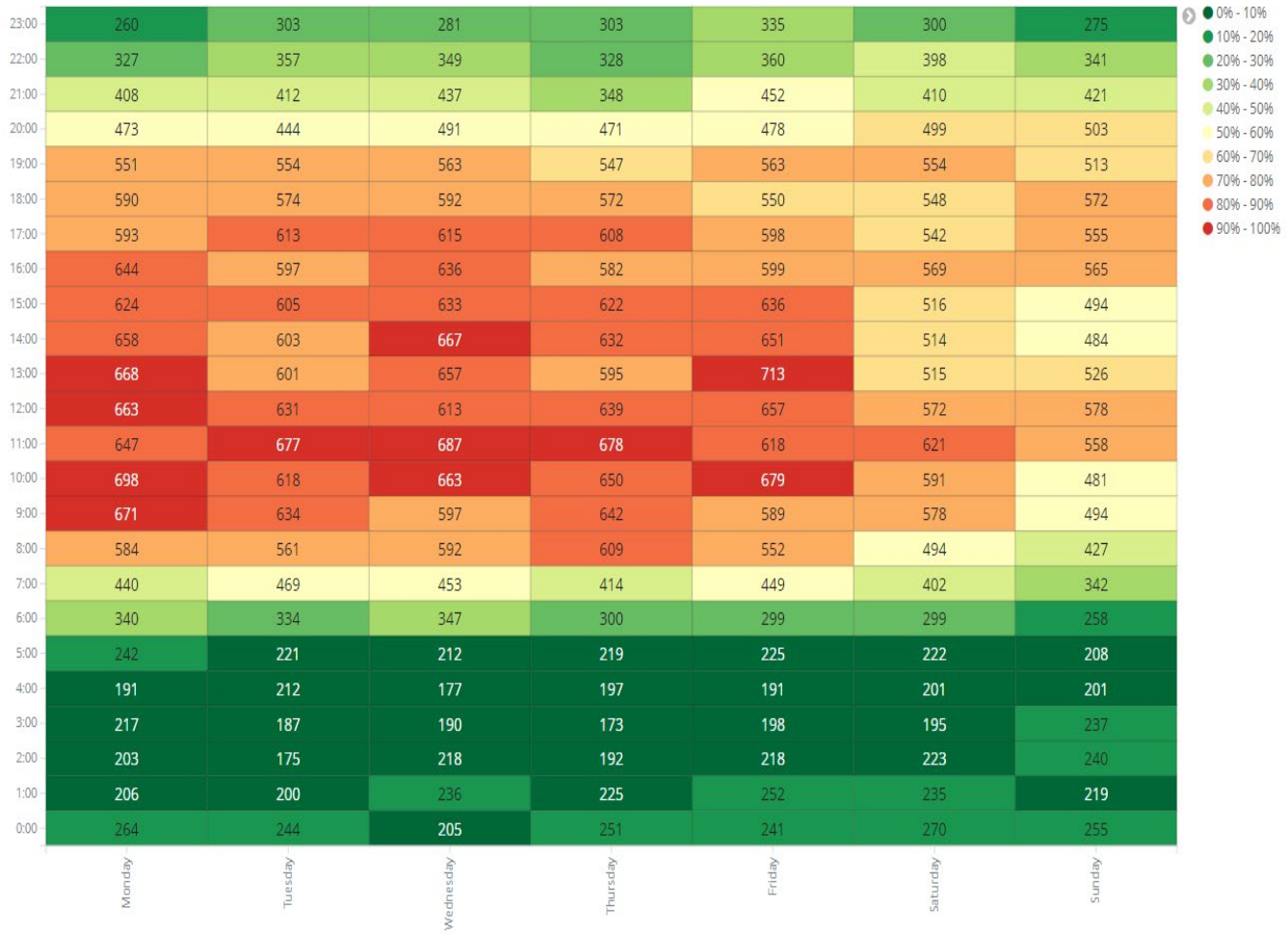
Structure fire property loss has generally been trending slightly upward for the past five years. Variability in the numbers are attributed to increases in construction and population which has resulted in more overall fire events.

Temporal Analysis

Reviewing the volume of incidents by differing time periods reveals when the greatest service demand is occurring. Figures 4.27-4.29 shows the change in activity for NWFD based on various measures of time. The hour-of-day heat map analysis revealed that the occurrences of calls is similar to the past three SOC analyses and is reflective of the national call time of day distribution. Call volume begins to pick up significantly after 0700 and begins a rapid drop-off after 1900 hours. A total of 71% of the calls occurred between 0700 and 1900 hours.

The day of the week analysis indicated that weekends had slightly lower call volume than the rest of the week. Sundays represented the slowest day of the week at 12.8% of total call volume. Mondays and Wednesdays were the busiest days of the week, each having 14.8% of the total call volume, with the overall weekday average call volume of 14.7% per day or roughly 9% busier than weekends.

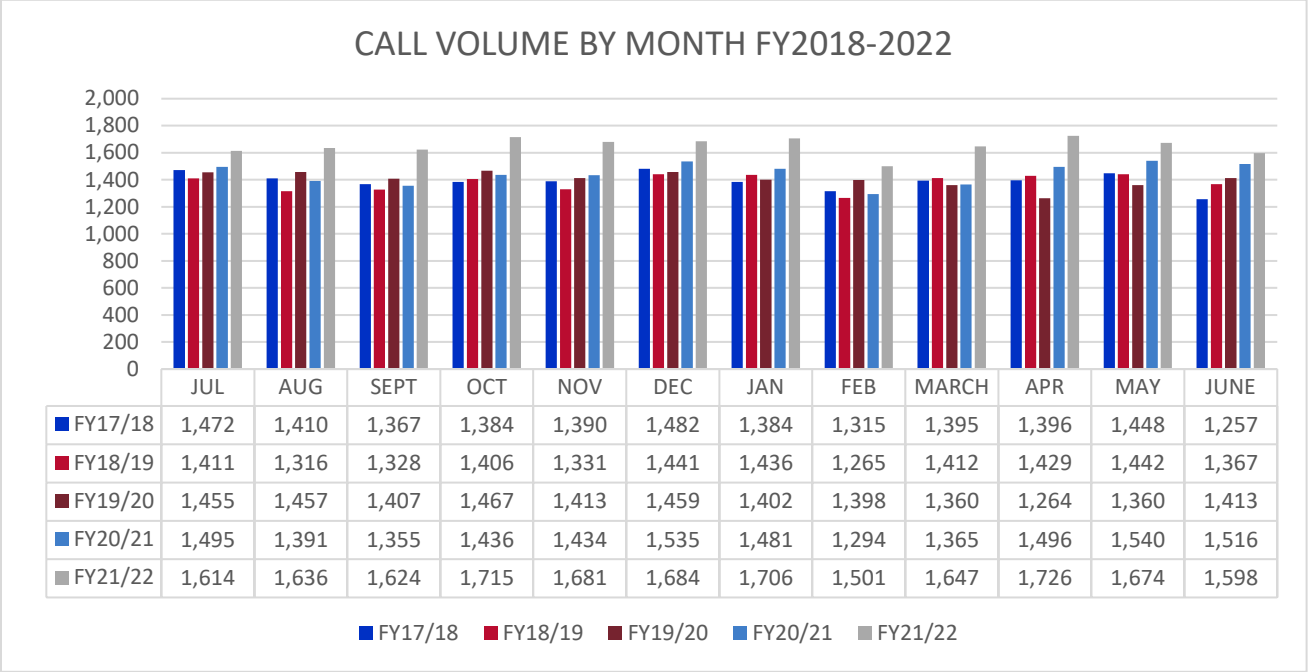
Figure 4.27
Call Volume by Day of the Week



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
23:00	260	303	281	303	335	300	275
22:00	327	357	349	328	360	398	341
21:00	408	412	437	348	452	410	421
20:00	473	444	491	471	478	499	503
19:00	551	554	563	547	563	554	513
18:00	590	574	592	572	550	548	572
17:00	593	613	615	608	598	542	555
16:00	644	597	636	582	599	569	565
15:00	624	605	633	622	636	516	494
14:00	658	603	667	632	651	514	484
13:00	668	601	657	595	713	515	526
12:00	663	631	613	639	657	572	578
11:00	647	677	687	678	618	621	558
10:00	698	618	663	650	679	591	481
9:00	671	634	597	642	589	578	494
8:00	584	561	592	609	552	494	427
7:00	440	469	453	414	449	402	342
6:00	340	334	347	300	299	299	258
5:00	242	221	212	219	225	222	208
4:00	191	212	177	197	191	201	201
3:00	217	187	190	173	198	195	237
2:00	203	175	218	192	218	223	240
1:00	206	200	236	225	252	235	219
0:00	264	244	205	251	241	270	255

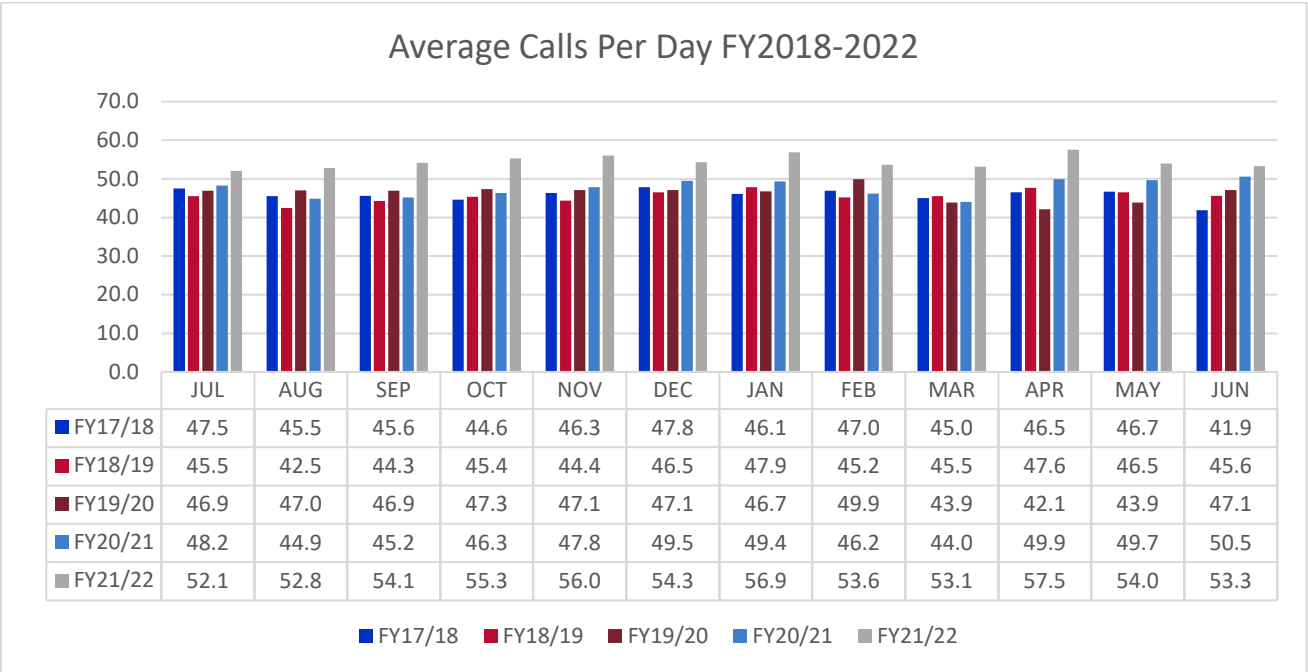
Call volume by month during the period of FY 2018-2022 showed minimal variance; February represented the slowest month at 9.00% total call volume, and December was the busiest at 10.1%. From FY 2018-2022, NWFD averaged 41.09 calls per day, with a realized peak calls per day average of 57.5 in April of 2022.

Figure 4.28
Call Volume by Month



	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MARCH	APR	MAY	JUNE
FY17/18	1,472	1,410	1,367	1,384	1,390	1,482	1,384	1,315	1,395	1,396	1,448	1,257
FY18/19	1,411	1,316	1,328	1,406	1,331	1,441	1,436	1,265	1,412	1,429	1,442	1,367
FY19/20	1,455	1,457	1,407	1,467	1,413	1,459	1,402	1,398	1,360	1,264	1,360	1,413
FY20/21	1,495	1,391	1,355	1,436	1,434	1,535	1,481	1,294	1,365	1,496	1,540	1,516
FY21/22	1,614	1,636	1,624	1,715	1,681	1,684	1,706	1,501	1,647	1,726	1,674	1,598

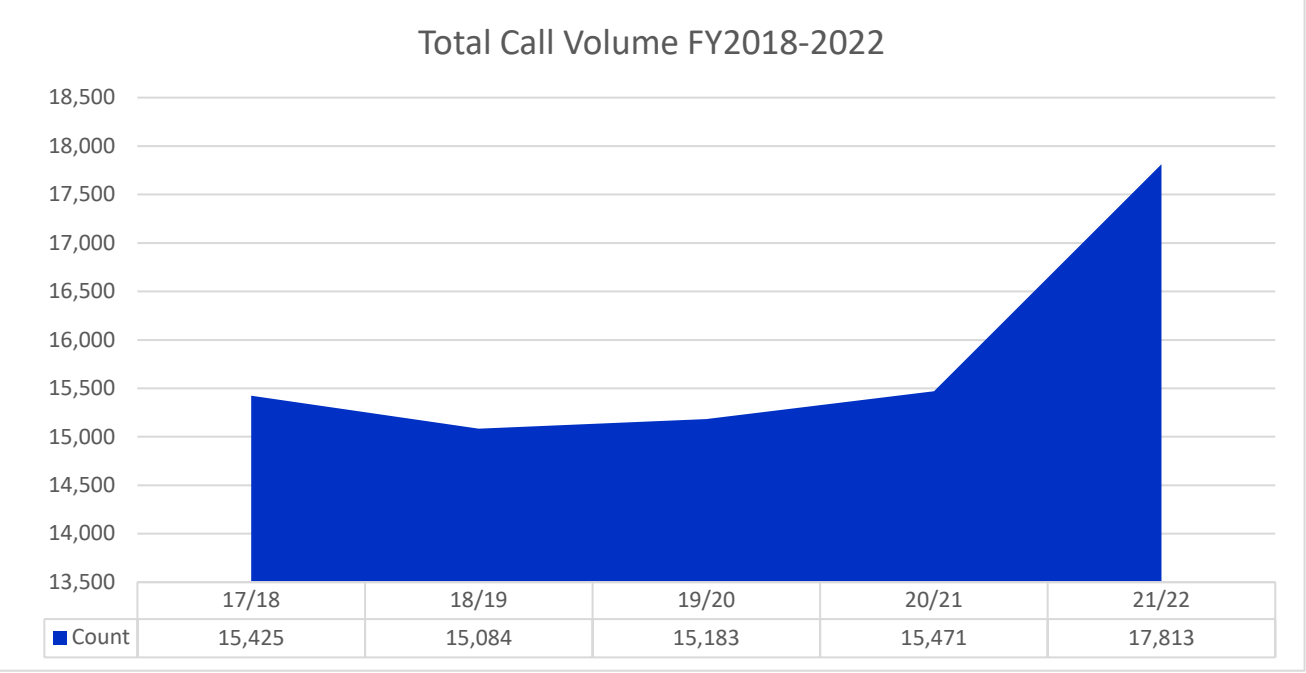
Figure 4.29
Average Calls per Day



	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
FY17/18	47.5	45.5	45.6	44.6	46.3	47.8	46.1	47.0	45.0	46.5	46.7	41.9
FY18/19	45.5	42.5	44.3	45.4	44.4	46.5	47.9	45.2	45.5	47.6	46.5	45.6
FY19/20	46.9	47.0	46.9	47.3	47.1	47.1	46.7	49.9	43.9	42.1	43.9	47.1
FY20/21	48.2	44.9	45.2	46.3	47.8	49.5	49.4	46.2	44.0	49.9	49.7	50.5
FY21/22	52.1	52.8	54.1	55.3	56.0	54.3	56.9	53.6	53.1	57.5	54.0	53.3

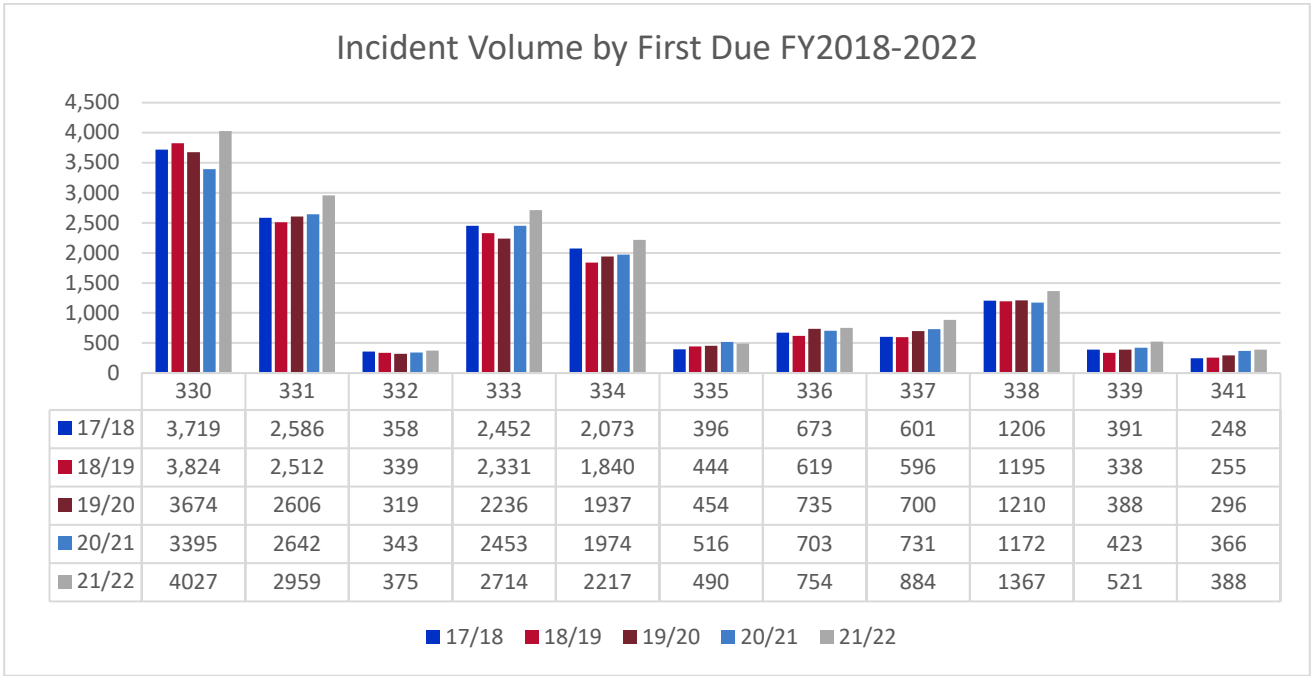
Call Volume, Distribution, and Type

Figure 4.30
Total Call Volume



	17/18	18/19	19/20	20/21	21/22
Count	15,425	15,084	15,183	15,471	17,813

Figure 4.31
Station Call Volumes



	330	331	332	333	334	335	336	337	338	339	341
17/18	3,719	2,586	358	2,452	2,073	396	673	601	1206	391	248
18/19	3,824	2,512	339	2,331	1,840	444	619	596	1195	338	255
19/20	3674	2606	319	2236	1937	454	735	700	1210	388	296
20/21	3395	2642	343	2453	1974	516	703	731	1172	423	366
21/22	4027	2959	375	2714	2217	490	754	884	1367	521	388

Figure 4.32
Percent Total Calls

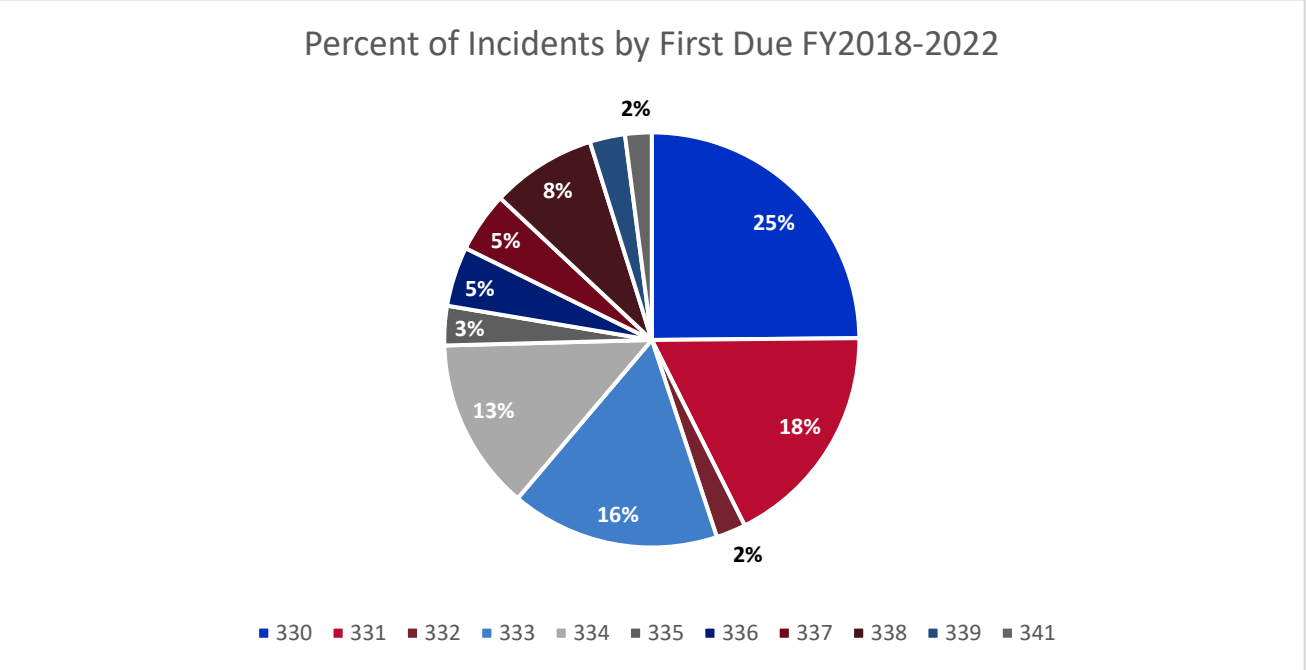
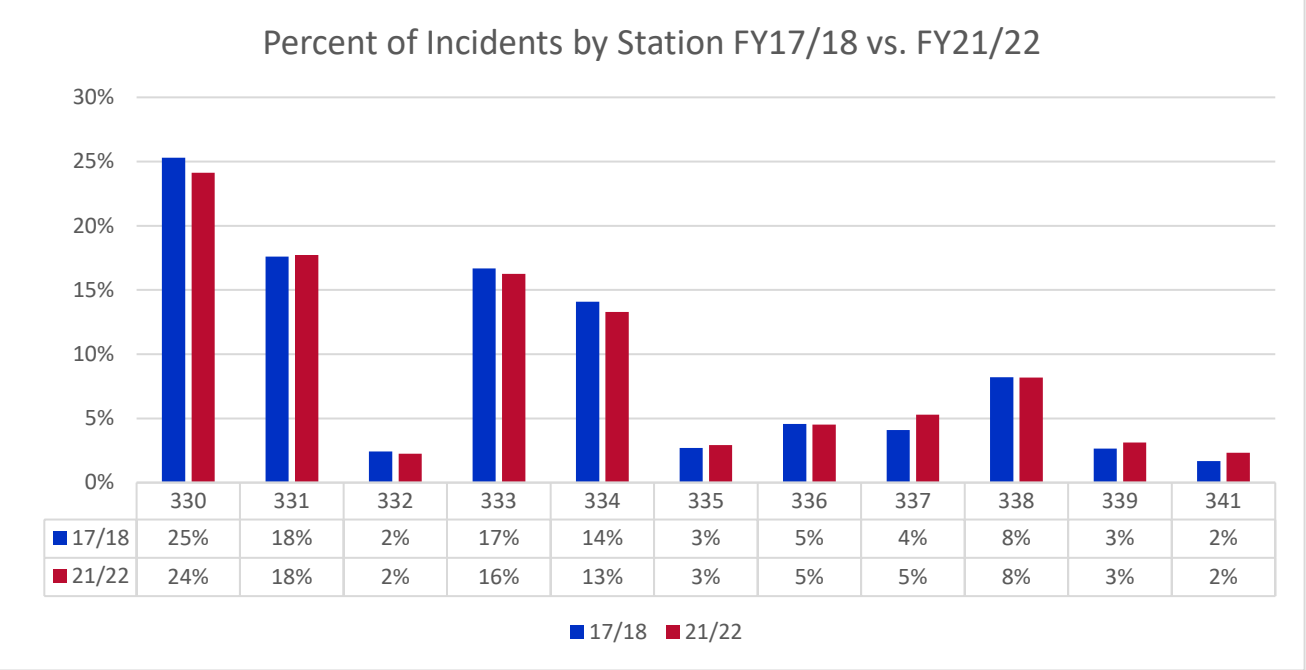


Figure 4.33
Percent of Calls by Station



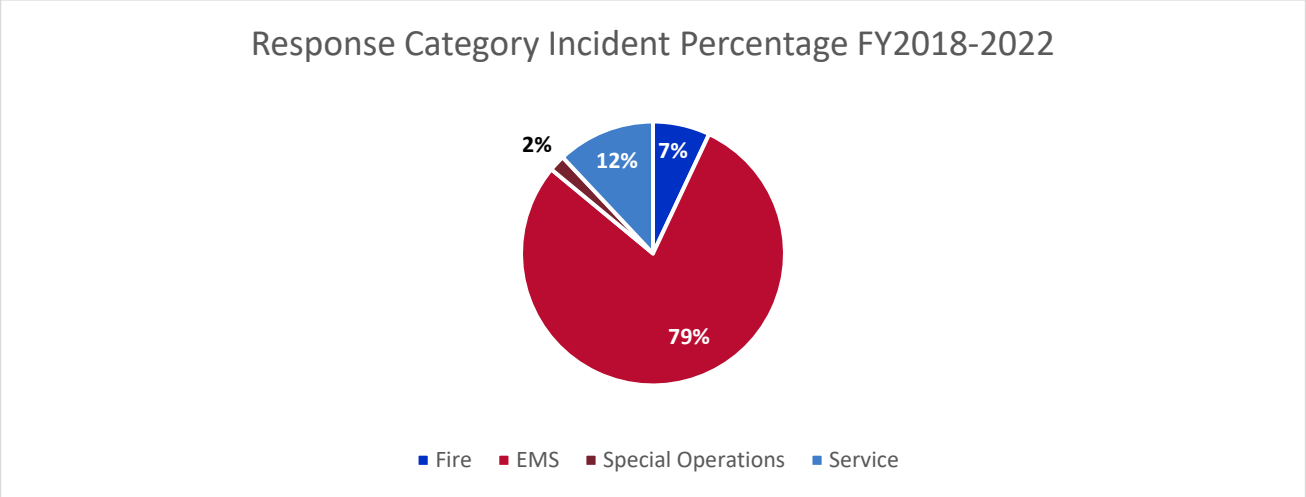
	330	331	332	333	334	335	336	337	338	339	341
17/18	25%	18%	2%	17%	14%	3%	5%	4%	8%	3%	2%
21/22	24%	18%	2%	16%	13%	3%	5%	5%	8%	3%	2%

Call Volume Discussion

Station call distribution shows that the Core Planning Zone runs 59%, the Central Planning Zone runs 22%, the Northeast Planning Zone runs 7%, the Northwest Planning Zone runs 7%, and the South Planning Zone runs 5% of the District's calls. The District's total call volume rose by 13.5% during this five-year period.

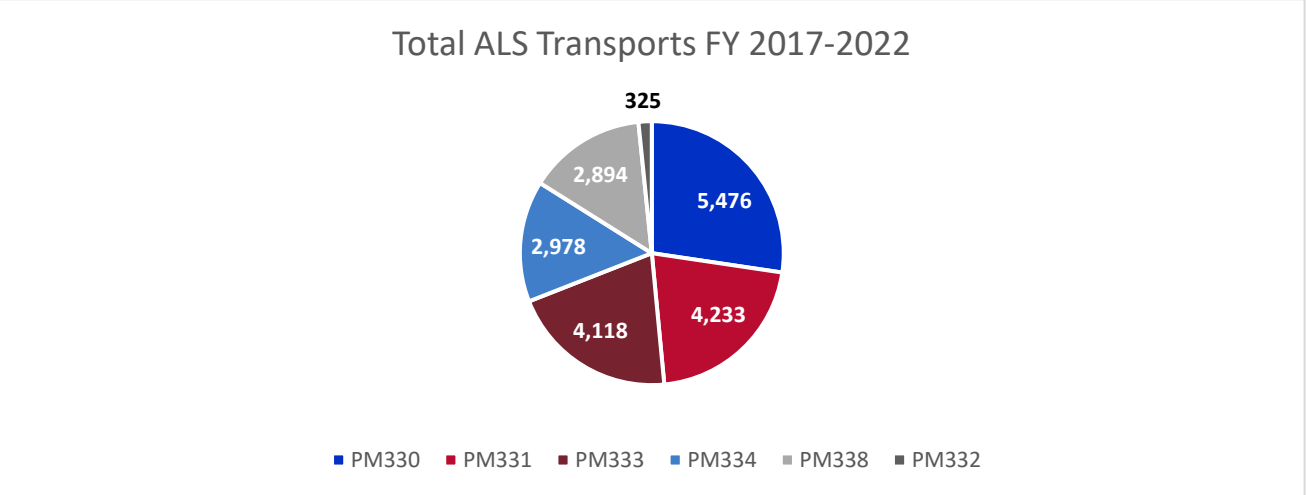
While Station 341 represented the greatest percentage gain in call volume, due to the new station coming online, Station 331 had the greatest gain in actual calls for the period of FY2018- 2022. Call volume in the core planning zone declined slightly which is attributed to COVID dispatch protocol changes during the pandemic.

Figure 4.34
Response Category Call Percentage



As discussed in Section 2, NWFD began ALS patient transports in June 2015. Total ALS transports for the period of FY2018-2022 was 20,024 in the District. This equates to an average of 11 transports per day.

Figure 4.35
ALS Transports by Unit



Customer Interval Discussion

In every emergency there is a sequence of critical events that occur. The following flow chartillustrates the events that occur prior to a unit arriving to an emergency.

Figure 4.36
State of Normalcy

	State of Normalcy	
	Recognition of emergency	There is a variable time interval from this point to calling 911.
	Event initiation Call 911	The initial 911 call is made.
	Call received at primary Public Safety Answering Point (PSAP)	Call received and answered at Pima County Sheriff's or Town of Marana Police PSAP.
	Call transferred to DispatchCenter (City Comm.)	Transferred from either the Town of Marana or Pima County Sheriff's PSAP.
Hard Data Available	**City Comm. answers transfer call and dispatches appropriate unit(s)**	Collects additional information from the caller about the emergency to determine which units to dispatch and from where, utilizing a computer aided dispatch system.
	Turnout time	The interval between the activation of a station/vehicle alerting device and the timewhen the unit is en route (wheels rolling).
	Travel time	Time from wheels rolling to arriving on the scene.
	Initiation of intervention	The interval from arrival at incident to point ofintervention to manage the emergency.
	Termination of event	Point at which unit(s) have completed tasks to manage the emergency and are placed back inservice.

Response Time Performance

Demand Zones

Response times are part of the performance objective matrix and are based on demand zones as determined by the United States Census Bureau's urban-rural classification. To qualify as an urban area, the territory identified according to criteria must encompass a densely settled core of census block that have at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The Census Bureau identifies two types of urban areas:

- Urbanized Areas (UAs) of 50,000 or more people;
- Urban Clusters (UCs) of at least 2,500 and less than 50,000 people.

"Rural" encompasses all population, housing, and territory not included within an urban area.

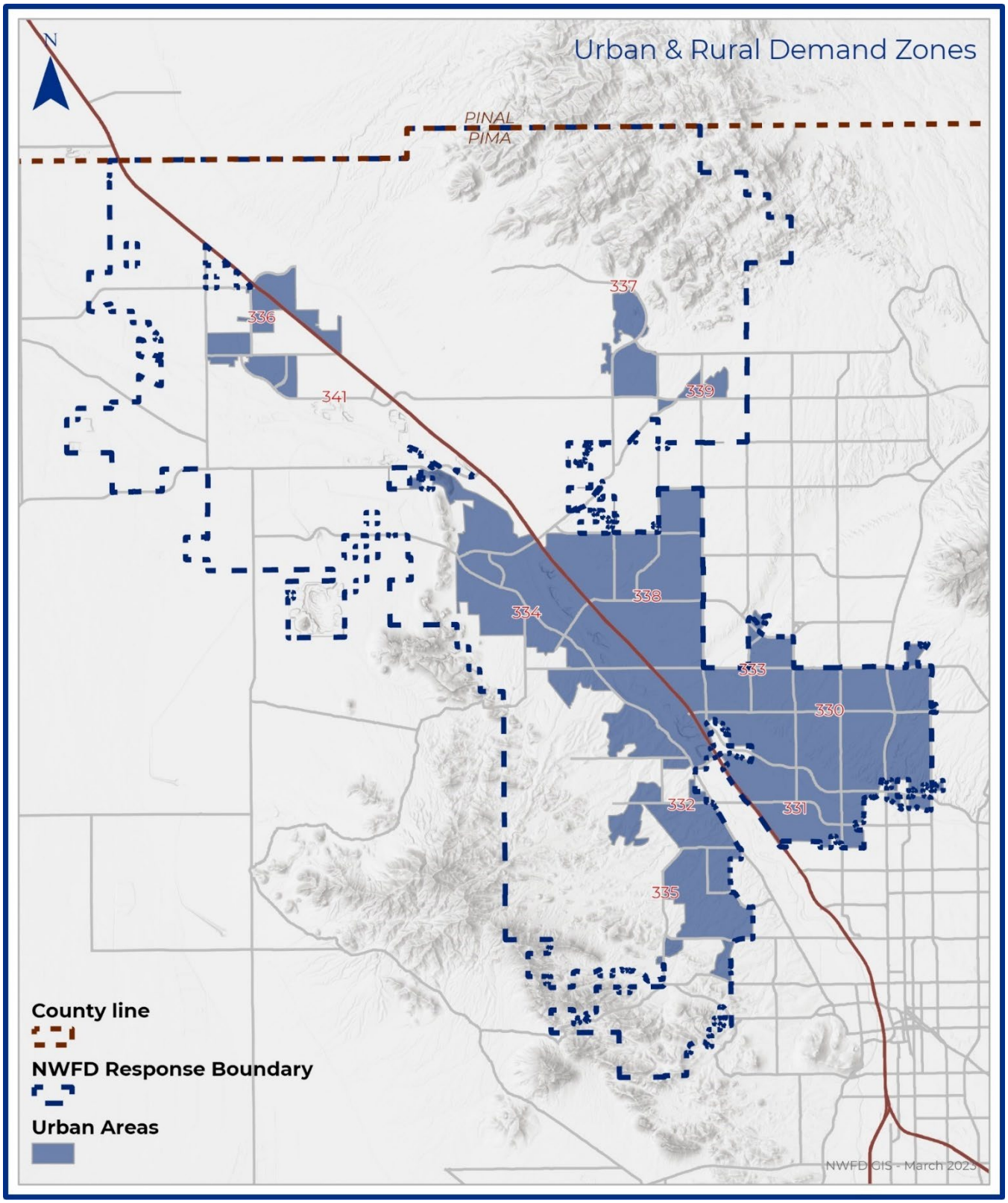
NWFD as in the past three SOC editions, maintains two Demand Zones with different characteristics for total response time measurement:

- *Urban Demand Zone* – Generally represents the area of the District that has a densely settled core of census blocks with greater than 2,500 population density and consists of areas of medium to high density subdivisions and multi-family occupancies, medical care/extended care facilities and business/industry development. The Urban Demand Zone represents approximately 89% of the District's call volume.
- *Rural Demand Zone* – Generally represents the area of the District that has a population density not included within the urban area delineation consisting of low-density residential occupancies as well as agriculturally related development such as ranches and farms. The Rural Demand Zone represents approximately 11% of the District's call volume.

The boundaries for the two demand zones were adjusted for this edition of the CRA-SOC to account for new areas of the District as well as new development. The demand zones are identified geographically in Figure 4.37.

Response time performance by demand zone is presented in the tables that follow. It is categorized by the three total response time elements for which credible data are available: alarm handling, turnout time, and travel time, resulting in total response time data. Total response times for all emergency calls, EMS, fire, hazmat and TRT are listed in Figures 4.38 –4.41 for Demand Zone A and B.

Figure 4.37
Urban & Rural Demand Zones



Data Evaluation

Figure 4.38
Response Times - Fire Suppression

(Low Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY2018-2022	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:21	2:30	2:23	2:21	2:23	2:00
		Rural		2:17	2:36	2:13	2:21	2:28	1:48
Turnout Time	Turnout Time 1st Unit	Urban		1:44	1:51	1:46	1:41	1:42	1:37
		Rural		1:44	1:45	1:42	1:54	1:46	1:33
Travel Time	Travel Time 1st Unit **Distribution**	Urban		8:08	8:09	8:33	8:05	8:16	8:00
		Rural		12:16	11:03	13:00	12:07	12:40	11:44
	Travel Time ERF **Concentration**	Urban							
		Rural							
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:15	9:13	9:16	9:44	9:04	9:11	8:55
				N=3694	n=837	n=718	n=699	n=666	n=774
		Rural	11:15	13:37	12:04	13:45	13:17	14:08	13:01
				n=768	n=166	n=186	n=149	n=126	n=144
	Total Response Time ERF **Concentration**	Urban							
		Rural							

Low Risk Fire Description: Small size fires not endangering structures. 1 attack line can manage. Examples include car fire, dumpster fire, shed fire, smoke in the area calls.

(Moderate Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:47	2:01	1:51	1:47	1:50	1:10
		Rural		2:09	2:24	1:47	2:15	1:38	1:01
Turnout Time	Turnout Time 1st Unit	Urban		1:29	1:29	1:20	1:20	1:20	1:19
		Rural		1:28	1:28	1:52	1:06	1:31	0:59
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:37	5:59	6:40	7:05	6:48	6:23
		Rural		10:23	10:11	11:39	9:06	13:40	7:04
	Travel Time ERF **Concentration**	Urban		17:02	15:51	19:34	19:19	21:52	15:41
		Rural		37:33	29:50	26:14	N/A	40:51	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:15	7:51	7:16	8:11	8:27	8:06	7:30
				n=404	n=67	n=92	n=91	n=75	n=79
		Rural	11:15	11:52	10:26	13:29	10:05	14:27	8:34
				n=38	n=12	n=7	n=10	n=75	n=3
	Total Response Time ERF **Concentration**	Urban	13:45	18:08	16:59	20:37	20:25	23:09	17:04
				n=185	n=35	n=35	n=43	n=29	n=43
		Rural	15:45	38:51	31:10	27:05	N/A	42:09	N/A
				n=11	n=4	n=3	n=0	n=4	n=0

Moderate Risk Fire Description: Single family residences, mobile homes, sprinkler protected, small to medium size retail and office occupancies.

(High Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:06	2:37	1:59	2:04	2:30	1:49
		Rural		2:02	0:46	2:02	2:02	0:48	1:17
Turnout Time	Turnout Time 1st Unit	Urban		1:18	1:10	1:24	1:19	1:27	1:13
		Rural		1:28	0:20	1:22	0:41	1:36	1:15
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:44	8:16	6:49	6:19	6:17	7:18
		Rural		8:48	5:48	7:38	4:53	8:59	8:40
	Travel Time ERF **Concentration**	Urban		15:39	19:39	15:50	17:09	15:01	11:56
		Rural		28:26	N/A	17:01	N/A	28:26	23:34
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:15	8:26	9:45	8:47	7:40	8:11	9:03
				n=145	n=26	n=34	n=29	n=30	n=26
		Rural	11:15	10:13	7:29	10:03	6:43	10:27	9:50
				n=11	n=1	n=2	n=2	n=2	n=4
	Total Response Time ERF **Concentration**	Urban	13:45	17:03	19:54	16:48	17:50	16:24	12:34
				n=89	n=15	n=20	n=20	n=18	n=16
		Rural	15:45	30:02	N/A	18:19	N/A	30:02	24:49
				n=3	n=0	n=1	n=0	n=1	n=1

High Risk Fire Description: Non-sprinklered small to medium commercial occupancies, or large sprinklered occupancies.

(MAX Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:20	N/A	1:01	0:56	1:24	1:04
		Rural		0:36	N/A	N/A	0:36	N/A	0:28
Turnout Time	Turnout Time 1st Unit	Urban		3:00	N/A	1:00	0:38	3:00	1:06
		Rural		0:23	N/A	N/A	0:23	N/A	0:31
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:17	N/A	3:33	4:51	6:28	4:04
		Rural		6:34	N/A	N/A	6:34	N/A	8:43
	Travel Time ERF **Concentration**	Urban		17:45	N/A	N/A	N/A	17:09	8:37
		Rural		N/A	N/A	N/A	N/A	N/A	1:02:30
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:15	9:00	N/A	4:35	5:29	9:00	5:30
				n=9	n=0	n=2	n=1	n=3	n=3
		Rural	11:15	7:16	N/A	N/A	7:16	N/A	10:12
				n=1	n=0	n=0	n=1	n=0	n=1
	Total Response Time ERF **Concentration**	Urban	13:45	18:21	N/A	N/A	N/A	17:50	9:37
				n=4	n=0	n=0	n=0	n=1	n=3
		Rural	15:45	N/A	N/A	N/A	N/A	N/A	1:03:01
				n=0	n=0	n=0	n=0	n=0	n=1

MAX Risk Fire Description: Non-sprinklered large apartment complexes and various occupancies with special hazards

Figure 4.39
Response Times - EMS

(Low Risk) EMS - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:08	2:09	2:12	2:17	2:05	1:56
		Rural		2:08	2:08	2:04	2:20	2:06	1:55
Turnout Time	Turnout Time 1st Unit	Urban		1:37	1:41	1:39	1:37	1:34	1:32
		Rural		1:48	1:44	1:48	1:47	1:39	1:32
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:54	7:01	6:50	6:43	6:48	7:03
		Rural		9:48	9:25	8:47	9:20	10:58	10:07
	Travel Time ERF **Concentration**								
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	7:59	8:11	7:58	7:50	7:47	8:03
				n=33345	n=7280	n=6482	n=6994	n=6301	n=6948
		Rural	10:45	10:55	10:33	9:58	10:44	12:06	11:07
				n=2843	n=729	n=586	n=569	n=504	n=455
	Total Response Time ERF **Concentration**								

Low Risk EMS Description: Injured or ill patient without airway, breathing, circulatory problems and that do not meet any additional risk criteria.

(Moderate Risk) EMS - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:51	1:52	1:56	1:59	1:46	1:41
		Rural		1:54	1:59	1:59	2:02	1:44	1:46
Turnout Time	Turnout Time 1st Unit	Urban		1:27	1:29	1:30	1:26	1:25	1:21
		Rural		1:26	1:30	1:25	1:29	1:23	1:25
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:07	6:17	6:07	6:01	6:01	6:02
		Rural		9:27	9:12	8:47	9:12	9:58	10:12
	Travel Time ERF **Concentration**	Urban		10:00	10:25	9:43	9:47	9:46	10:21
		Rural		17:50	18:28	16:28	17:17	18:21	19:33
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	7:13	7:27	7:17	7:10	7:06	7:03
				20991	n=4763	n=4122	n=4066	n=4075	n=3965
		Rural	10:45	10:34	10:16	9:57	10:23	10:48	11:01
				n=1844	n=497	n=407	n=346	n=295	n=299
	Total Response Time ERF **Concentration**	Urban	11:45	10:52	11:24	10:38	10:39	10:36	11:12
				n=20216	n=4584	n=3998	n=3956	n=3910	n=3768
		Rural	13:45	18:43	19:40	17:13	18:17	18:58	20:21
				n=1652	n=452	n=366	n=311	n=264	n=259

Moderate Risk EMS Description: Special criteria patient: ST-elevated myocardial infarction (STEMI), severe respiratory distress, time sensitive issues cerebrovascular accident, traumatic brain injury, and any patient meeting trauma center or other specialized medical facility criteria. Advanced life support required.

(High Risk) EMS - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:59	1:21	1:34	1:41	2:20	2:07
		Rural		1:36	1:26	1:38	1:26	1:52	1:40
Turnout Time	Turnout Time 1st Unit	Urban		1:22	1:16	1:29	1:27	1:24	1:15
		Rural		1:32	1:34	1:35	1:38	1:05	1:27
Travel Time	Travel Time 1st Unit **Distribution**	Urban		7:32	7:18	7:53	7:18	7:46	7:05
		Rural		10:14	14:24	9:27	9:00	10:44	8:41
	Travel Time ERF **Concentration**	Urban		19:28	30:41	20:42	11:34	35:04	16:55
		Rural		16:09	19:48	16:10	16:09	19:31:00	15:43
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	8:25	8:08	9:03	8:38	8:24	8:23
				n=308	n=55	n=70	n=60	n=67	n=56
		Rural	10:45	11:38	14:42	11:28	10:17	11:49	10:13
				n=151	n=25	n=36	n=33	n=32	n=25
	Total Response Time ERF **Concentration**	Urban	11:45	20:21	31:22	21:07	12:22	35:50	17:41
				n=84	n=11	n=22	n=13	n=22	n=16
		Rural	13:45	16:46	20:30	16:43	16:45	20:11	16:56
				n=64	n=5	n=15	n=15	n=14	n=15

High Risk EMS Description: High mechanism of injury (rollover MVA, pedestrian/cyclist struck, and motorcyclist down) and drowning.

(MAX Risk) EMS - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:40	1:23	2:50	3:49	1:05	1:43
		Rural		1:39	0:44	N/A	1:39	N/A	N/A
Turnout Time	Turnout Time 1st Unit	Urban		1:51	1:24	1:36	0:46	0:04	1:26
		Rural		0:57	0:37	N/A	0:57	N/A	N/A
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:12	6:45	5:57	4:06	0:30	6:13
		Rural		11:27	11:27	N/A	8:43	N/A	N/A
	Travel Time ERF **Concentration**	Urban		30:39	44:30	24:02	19:31	N/A	22:07
		Rural		21:50	N/A	N/A	21:50	N/A	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	7:27	8:10	6:47	4:52	0:34	7:28
				n=29	n=10	n=10	n=3	n=1	n=5
		Rural	10:45	12:10	12:10	N/A	10:07	N/A	N/A
				n=5	n=1	n=	n=4	n=0	n=0
	Total Response Time ERF **Concentration**	Urban	18:45	31:06	45:21	24:52	20:17	N/A	23:18
				n=13	n=5	n=4	n=1	n=0	n=3
		Rural	20:45	22:14	N/A	N/A	22:14	N/A	N/A
				n=1	n=0	n=0	n=1	n=0	n=0

MAX Risk EMS Description: Multi-patient incident

Benchmark Considerations: Effective Response Force (ERF) assembly requires ALS ambulance arrival. The agency's five ALS ambulances are distributed in the Core and Central Planning Zones. ALS ambulance concentration is supported through automatic aid and IGA partnerships with neighboring jurisdictions, Golder Ranch Fire District and Avra Valley Fire District.

Figure 4.40
Response Times - Technical Rescue

(Low Risk) Technical Rescue – 90th Percentile Times – Baseline Performance			Benchmark (Target)	FY2018-2022	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:31	2:36	N/A	1:47	1:12	N/A
		Rural		2:24	1:23	N/A	n/a	1:01	2:24
Turnout Time	Turnout Time 1st Unit	Urban		1:45	1:42	N/A	0:46	1:51	N/A
		Rural		2:02	2:02	N/A	n/a	1:37	0:55
Travel Time	Travel Time 1st Unit **Distribution**	Urban		16:52	16:47	N/A	3:27	16:34	N/A
		Rural		12:23	12:23	N/A	n/a	7:47	8:20
	Travel Time ERF **Concentration**								
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	17:25	18:19	N/A	4:13	16:40	N/A
				n=12	n=6	N/A	n=1	n=5	N/A
		Rural	10:45	13:24	13:26	N/A	n/a	9:24	9:15
				n=4	n=2	N/A	n=0	n=1	n=1
	Total Response Time ERF **Concentration**								

Low Risk Technical Rescue Description: A rescue situation that involves people stranded in water or occupied vehicles in shallow non-moving water.

(Moderate Risk) Technical Rescue - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:27	N/A	N/A	1:27	N/A	N/A
		Rural		4:58	3:11	4:41	5:14	5:55	N/A
Turnout Time	Turnout Time 1st Unit	Urban		0:43	N/A	N/A	0:43	N/A	N/A
		Rural		1:05	0:59	1:24	0:50	1:02	N/A
Travel Time	Travel Time 1st Unit **Distribution**	Urban		4:34	N/A	N/A	4:34	N/A	N/A
		Rural		14:53	13:33	15:22	14:23	7:26	N/A
	Travel Time ERF **Concentration**	Urban		17:59	N/A	N/A	17:59	N/A	N/A
		Rural		37:54	49:05	34:02	31:25	40:28	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	4:44	N/A	N/A	4:44	N/A	N/A
				n=1	n=0	n=0	n=1	n=0	n=0
		Rural	10:45	16:36	15:58	16:52	15:30	8:10	N/A
				n=28	n=8	n=12	n=6	n=2	n=0
	Total Response Time ERF **Concentration**	Urban	18:45	18:42	N/A	N/A	18:42	N/A	N/A
				n=1	n=0	n=0	n=1	n=0	n=0
		Rural	20:45	38:47	49:57	34:44	32:03	41:29	N/A
				n=28	n=8	n=12	n=6	n=2	n=0

Moderate Risk Technical Rescue Description: A rescue situation that involves injured person(s) on hiking trails.

Benchmark Considerations: Effective Response Force (ERF) assembly requires a portion of technician level personnel and apparatus from neighboring automatic aid jurisdictions to respond with NWFD technician level personnel and apparatus to meet the agency ERF requirements. Additionally, trail systems are in wilderness areas with limited access routes, and increased apparatus travel times.

(High Risk) Technical Rescue - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:30	2:06	2:44	2:24	2:29	2:34
		Rural		2:53	1:58	1:19	1:40	3:07	4:17
Turnout Time	Turnout Time 1st Unit	Urban		1:15	1:13	1:23	0:47	1:59	0:52
		Rural		1:22	0:52	1:27	1:25	1:10	0:52
Travel Time	Travel Time 1st Unit **Distribution**	Urban		15:21	14:08	5:24	5:52	16:18	21:14
		Rural		15:08	8:43	10:06	9:40	15:43	31:45
	Travel Time ERF **Concentration**	Urban		28:38	29:27	N/A	N/A	15:10	N/A
		Rural		42:47	30:34	25:00	N/A	42:47	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	16:30	15:44	5:55	6:48	16:38	22:50
				n=23	n=8	n=5	n=2	n=4	n=5
		Rural	10:45	15:58	9:48	11:44	10:30	16:25	32:31
				n=17	n=2	n=4	n=3	n=5	n=2
	Total Response Time ERF **Concentration**	Urban	18:45	29:48	30:38	N/A	N/A	15:18	N/A
				n=7	n=6	n=0	n=0	n=1	n=0
		Rural	20:45	43:29	31:26	25:39	N/A	43:29	N/A
				n=4	n=2	n=1	n=0	n=1	n=0

High Risk Technical Rescue Description: A rescue situation that involves swift water, or high-angle rope rescue.

Benchmark Considerations: Effective Response Force (ERF) assembly requires a portion of technician level personnel and apparatus from neighboring automatic aid jurisdictions to respond with NWFD technician level personnel and apparatus to meet the agency ERF requirements. Additionally, trail systems are in wilderness areas with limited access routes, and increased apparatus travel times.

(MAX Risk) Technical Rescue - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		1:21	N/A	1:21	N/A	N/A	N/A
		Rural		N/A	N/A	N/A	N/A	N/A	N/A
Turnout Time	Turnout Time 1st Unit	Urban		0:18	N/A	0:18	N/A	N/A	N/A
		Rural		N/A	N/A	N/A	N/A	N/A	N/A
Travel Time	Travel Time 1st Unit **Distribution**	Urban		5:08	N/A	5:08	N/A	N/A	N/A
		Rural		N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF **Concentration**	Urban		13:06	N/A	13:06	N/A	N/A	N/A
		Rural		N/A	N/A	N/A	N/A	N/A	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	5:26	N/A	5:26	N/A	N/A	N/A
				n=1	n=0	n=1	n=0	n=0	n=0
		Rural	10:45	N/A	N/A	N/A	N/A	N/A	N/A
				n=0	n=0	n=0	n=0	n=0	n=0
	Total Response Time ERF **Concentration**	Urban	18:45	13:24	N/A	13:24	N/A	N/A	N/A
				n=1	n=0	n=1	n=0	n=0	n=0
		Rural	20:45	N/A	N/A	N/A	N/A	N/A	N/A
				n=0	n=0	n=0	n=0	n=0	n=0

MAX Risk Technical Rescue Description: A rescue situation that involves building collapse.

Benchmark Considerations: Effective Response Force (ERF) assembly requires a portion of technician level personnel and apparatus from neighboring automatic aid jurisdictions to respond with NWFD technician level personnel and apparatus to meet the agency ERF requirements.

Figure 4.41
Response Times - HazMat

(Low Risk) HazMat - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:03	2:06	2:15	2:05	2:02	1:44
		Rural		2:07	2:37	1:58	3:21	1:51	2:05
Turnout Time	Turnout Time 1st Unit	Urban		1:42	1:48	1:50	1:40	1:36	1:29
		Rural		1:52	1:59	1:58	1:47	1:33	2:17
Travel Time	Travel Time 1st Unit **Distribution**	Urban		8:31	8:21	8:25	8:37	8:09	9:15
		Rural		10:41	10:53	10:30	11:44	10:23	10:15
	Travel Time ERF **Concentration**								
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	9:40	9:09	9:47	9:50	9:29	10:18
				n=961	n=222	n=178	n=201	n=179	n=181
		Rural	10:15	11:50	12:01	11:40	12:21	11:28	11:26
				n=135	n=41	n=26	n=21	n=26	n=21
	Total Response Time ERF **Concentration**								

Low Risk HazMat Description: Residential CO alarms, small fuel spill containment, unknown hazmat investigations.

(High Risk) HazMat - 90th Percentile Times - Baseline Performance			Benchmark (Target)	FY18-22	FY21-22	FY20-21	FY19-20	FY18-19	FY17-18
Alarm Handling	Pick-up to Dispatch	Urban		2:53	1:17	N/A	1:02	2:49	2:59
		Rural		2:15	1:14	1:49	2:20	1:46	1:14
Turnout Time	Turnout Time 1st Unit	Urban		1:04	1:09	N/A	1:00	0:40	0:49
		Rural		1:15	0:46	1:11	1:22	0:39	0:16
Travel Time	Travel Time 1st Unit **Distribution**	Urban		6:39	7:29	N/A	6:05	6:02	5:32
		Rural		12:40	6:46	11:07	9:03	14:57	9:07
	Travel Time ERF **Concentration**	Urban		49:41	21:34	N/A	25:44	32:23	1:06:59
		Rural		16:05	N/A	N/A	N/A	16:05	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:45	7:39	8:38	N/A	7:00	6:32	6:21
				n=11	n=2	n=0	n=4	n=3	n=2
		Rural	10:15	13:09	7:32	11:31	10:33	15:36	9:43
				n=11	n=1	n=3	n=3	n=2	n=2
	Total Response Time ERF **Concentration**	Urban	18:45	50:12	22:20	N/A	26:34	32:35	1:07:48
				n=10	n=2	n=0	n=4	n=3	n=1
		Rural	20:45	16:12	N/A	N/A	N/A	16:12	N/A
				n=1	n=0	n=0	n=0	n=1	n=0

High Risk HazMat Description: Large hazardous material spills and/or releases creating IDLH environments.

Benchmark Considerations: Assembly of Effective Response Force (ERF) requires special operations technician level trained personnel and units from neighboring automatic aid jurisdictions to join with NWFD technician level trained personnel and units to meet ERF personnel requirements.

SECTION 5

Evaluation of Current Deployment and Performance

CFAI Criterion 2D

Section 4 presented current deployment and performance data. This section evaluates deployment and performance in comparison to established District performance objectives and associated elements such as total response time. Comparison factors include NWFD performance standards as well as nationally recognized consensus standards from the NFPA. The section concludes with a deployment and performance comparison with six similar sized fire departments/districts.

Community Expectations
Prior to assessing deployment and performance, it is important to have a clear understanding of community expectations. NWFD, as part of a strategic planning process and in accordance with the CPSE model, seeks internal and external stakeholder input. External stakeholder input is solicited through community surveys every three years. In 2023, StrongPOINT Opinion Research was retained by the District to conduct a community survey to gain input about service delivery types and expectations on service delivery levels. The District's 2020-24 Strategic Plan and the CRA-SOC process utilize the community survey results in the planning processes and for analysis.

From the 2023 external shareholder input process, four main findings were evident:

- The stakeholder respondents are satisfied overall with the NWFD services.
- The Stakeholder respondents felt that the most important characteristics of our services are quick response times, professionalism, and high levels of training.
- The Stakeholder respondents felt that a clear distinction between fee services should be communicated.
- The Stakeholder respondents expressed interest in increased educational outreach in the community.

Service Level Performance Objectives
Service level performance objectives were developed based on community expectations, risk assessment, critical task development, and the demand zones as described in Section 4.

Performance objectives for each emergency service level are described on the following pages. This is followed by a summary of each of the response time components and total response time performance for Fiscal Year 2018-2022. Descriptions of each of the service level risk categories that are listed in the performance objectives can be found in Section 3,

Community Risk Assessment.

Total response time measurements (alarm processing time + turn-out time + travel time) for the performance objectives are listed by demand zone and by three levels of measurement:

- *Fiscal Year 2018-22 Baseline Performance* – the actual total response time performance to the 90th percentile over the previous five fiscal years.
- *NWFD Standard* – the total response time standard that the District desires to achieve on a daily basis.

Total response times are provided for the first-due company and the effective response force (ERF). All response times are reported in minutes and seconds and at the 90th percentile. Descriptions of the various risk categories are found in Section 3, Community Risk Assessment.

Fire Suppression

Low-Risk Fires

Performance Objective – To extinguish fire found and prevent the spread to adjacent exposures. The first arriving engine company shall initiate rescue (if necessary) and applicable fire attack operations.

Deployment – An initial effective response force of a minimum of four personnel consisting of a single engine company.

Measure – Total response time.

Demand Zone	Urban	Rural
FY2018-22 Baseline	9:13	13:37
NWFD Standard	9:15	11:15

Moderate-Risk Structure Fires

Performance Objective – To stop the escalation of a fire where found. This includes search and rescue for victims, confining the fire to the room of origin,
limiting the heat and smoke damage to immediate area of the room of fire origin; expected actions include the use of applicable fire suppression and ventilation tactics, providing for a rapid intervention crew, providing for property conservation, and protecting adjacent exposures.

Deployment – An initial effective response force (ERF) of a minimum of 20 personnel consisting of four engine companies, one ambulance company, one incident safety officer, and two battalion chiefs.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	7:51	18:08	11:52	38:51
NWFD Standard	9:15	13:45	11:15	15:45

High-Risk Structure Fires

Performance Objective – To stop the escalation of a fire where found. This includes search and rescue for victims, confining the fire to the room of origin,
limiting the heat and smoke damage to immediate area of the room of fire origin;
expected actions include the use of applicable fire suppression and ventilation tactics, providing for a rapid intervention crew, providing for property conservation, and protecting adjacent exposures.

Deployment – An initial effective response force (ERF) of a minimum of 20 personnel consisting of four engine companies, one ambulance company, one incident safety officer, and two battalion chiefs.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	8:26	1703	10:13	30:02
NWFD Standard	9:15	13:45	11:15	15:45

Maximum-Risk Structure Fires

Performance Objective - To stop the escalation of a fire where found. This includes search and rescue for victims, confining the fire to the room of origin, limiting the heat and smoke damage to immediate area of the room of fire origin; expected actions include the use of applicable fire suppression and ventilation tactics, providing for a rapid intervention crew, providing for property conservation, and protecting adjacent exposures.

Deployment - An initial effective response force of a minimum of 28 personnel consisting of four engine companies, two ladder companies, one ambulance company, one incident safety officer, and two battalion chiefs.

Measure - Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	9:00	18:21	7:16	N/A
NWFD Standard	9:15	13:45	11:15	15:45

Emergency Medical Services

Low Risk EMS

Performance Objective – Stop the escalation of a medical emergency, within the capabilities of the effective response force. Specifically, to determine and provide appropriate level of care and if required, determine the level of transportation (BLS or ALS) to most appropriate definitive care facility.

Deployment – An initial effective response force of a minimum of four personnel consisting of a single engine company.

Measure - Total response time.

Demand Zone	Urban	Rural
FY2018-22 Baseline	7:59	10:55
NWFD Standard	7:45	10:45

Moderate-Risk EMS

Performance Objective – Stop the escalation of the medical emergency, within the capabilitiesof the effective response force. Specifically, assess patient and prioritize care to minimize death and disability that includes providing advanced life support and transporting to the most appropriate definitive care facility.

Deployment – An effective response force of six personnel consisting of one engine company and one ambulance company to initiate advanced life support activities as appropriate.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	7:13	10:52	10:34	18:43
NWFD Standard	7:45	11:45	10:45	13:45

High-Risk EMS

Performance Objective – Stop the escalation of the medical emergency, within the capabilitiesof the effective response force. Specifically, assess patient(s) and prioritize care to minimize death and disability, that includes providing advanced life support, and transporting to the most appropriate definitive care facility.

Deployment – An effective response force of 11 personnel consisting of two engine companies, one ambulance company, and one battalion chief to initiate advanced life support activities as appropriate.

Measure - Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	8:22	16:34	11:40	16:44
NWFD Standard	7:45	11:45	10:45	13:45

Maximum Risk

Performance Objective – Stop the escalation of the medical emergency, within the capabilitiesof the effective response force. Specifically, assess patient(s) and prioritize care to minimize death and disability, that includes providing advanced life support and transporting to the most appropriate definitive care facility.

Deployment – An effective response force of 21 personnel consisting of three engine companies, three ambulance companies, one safety officer, and one battalion chief to initiate advanced life support activities and transport as appropriate for patients, depending on patient condition.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	7:08	24:56	12:10	22:14
NWFD Standard	7:45	18:45	10:45	20:45

Hazardous Materials

Low-Risk HazMat

Performance Objective – To isolate/identify the hazardous material(s) that created the emergency and effect evacuations as necessary. A limited offensive strategy may be utilized at this level, limited by the number and capabilities/competencies of the Operations level personnel on the responding company.

Deployment – An initial effective response force of consisting of four Operations level personnel on one engine company.

Measure - Total response time.

Demand Zone	Urban	Rural
FY2018-22 Baseline	9:40	11:50
NWFD Standard	7:45	10:45

High-Risk HazMat

Performance Objective – To isolate/identify the hazardous material(s) that created the emergency and effect evacuations as necessary. Test, sample, contain, extinguish, and/or abate the hazard(s). This includes utilizing any kind of specialized gear, tools, equipment, or knowledge that the NWFD hazmat team or other outside resources may need.

Deployment – An initial effective response force of 22 personnel consisting of two operation level engine companies, a HazMat Team (2 EN, 2 Squads, 1 PM), one ambulance company, one incident safety officer, and one battalion chief. NWFD automatic aid agreements are included to meet the HazMat Team components of the ERF.

Measure - Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	7:39	50:12	13:09	16:12
NWFD Standard	7:45	18:45	10:15	20:45

Technical Rescue

Low-Risk TRT

Performance Objective – To safely rescue victims stranded in water or occupied vehicles in shallow non-moving water, medically treat as appropriate, and transport as needed.

Deployment – An initial effective response force of four personnel consisting of one engine company.

Measure - Total response time.

Demand Zone	Urban	Rural
FY2018-22 Baseline	17:25	13:24
NWFD Standard	7:45	10:45

Moderate-Risk TRT

Performance Objective – A rescue situation that involves injured person(s) on hiking trails. Stabilize all hazard elements of the scene, provide rapid and safe extrication for patient(s), provide medical care, and transport as necessary.

Deployment – An initial effective response force of 14 personnel consisting of one operation level engine company, a TRT Team (1 EN, 1 Squads, 1 PM), one ambulance company, one incident safety officer, and one battalion chief. NWFD automatic aid agreements are included to meet the TRT Team components of the ERF.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	4:44	18:42	16:36	38:47
NWFD Standard	7:45	18:45	10:15	20:45

High Risk

Performance Objective – A rescue situation that involves swift water, or high-angle rope rescue. Stabilize all hazard elements of the scene, provide rapid and safe extrication for patient(s), provide medical care, and transport as necessary.

Deployment – An initial effective response force of 22 personnel consisting of two operation level engine companies, a TRT Team (2 EN, 2 Squads, 1 PM), one ambulance company, one incident safety officer, and one battalion chief. NWFD automatic aid agreements are included to meet the TRT Team components of the ERF.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	16:30	29:48	15:58	43:29
NWFD Standard	7:45	18:45	10:15	20:45

Maximum-Risk TRT

Performance Objective – A rescue situation that involves building collapse.

Stabilize all hazard elements of the scene, provide rapid and safe extrication for patient(s), provide medical care, and transport as necessary.

Deployment – An initial effective response force of 22 personnel consisting of two operation level engine companies, a TRT Team (2 EN, 2 Squads, 1 PM), one ambulance company, one incident safety officer, and one battalion chief. NWFD automatic aid agreements are included to meet the TRT Team components of the ERF.

Measure – Total response time.

Demand Zone	Urban		Rural	
	First-due	ERF	First-due	ERF
FY2018-22 Baseline	5:26	13:24	N/A	N/A
NWFD Standard	7:45	18:45	10:15	20:45

General Performance Discussion for all Measurable Components of Total Response Time

Dispatch Systems Performance

The area dispatch system consists of three elements, 1) receipt and transfer of the initial 911 call involving a public safety answering point (PSAP), 2) receiving (call answering) PSAP transfer calls at the dispatch center, and 3) dispatch of appropriate NWFD and automatic aid resources at the Dispatch Center.

PSAP Dispatch Component

Emergency request calls for NWFD services are first received at one of two public safety answering point (PSAP) call centers that are responsible for answering 911 calls for police, fire-rescue, and emergency medical services. The PSAPs receiving 911 calls for NWFD are the Pima County Sheriff's Department and the Marana Police Department. Calls for NWFD services are routed from these PSAPs to the Dispatch Center that in turn dispatches the appropriate NWFD resources.

While NFPA 1221, Standard for Installation, Maintenance, and Use of Emergency Services Communications Systems, 2019 Edition, has a PSAP transfer performance standard of ≤= 30 seconds 90% of the time, currently neither of the PSAP centers are formally tracking the

transfer times, thereby preventing any type of performance evaluation. However, it is generally acknowledged by the PSAP centers that typically the transfer times are between 15 and 30 seconds.

PSAP Call Answering
NWFD contracts with the City of Tucson for Dispatch Center services. This includes the answering of PSAP transferred calls and the associated dispatching of appropriate NWFD resources. Under the current hardware system, PSAP transferred call answering data is not available.

Alarm Handling (call processing)
NWFD contracts with the City of Tucson for dispatching services. A five-year summary of alarm handling at the 90th percentile and the associated NFPA Standard 1221, 2019 edition is listed in Figure 5.1. NWFD has adopted the NFPA 1221 alarm handling standard at the 90th percentile measure as an internal standard it strives for on a daily basis.

Figure 5.1
Alarm Handling Performance Fiscal Year 2018-2022 (Urban Demand Zone)

Year	Baseline Alarm Handling Time (min:sec) 90th Percentile	NFPA 1221 Standard	Variance in Seconds from NFPA 1221 Standard	Percentage by Time Exceeding NFPA 1221 Standard
FY2017-2018	1:51	≤ 60 sec	51 sec	85%
FY2018-2019	2:00		60 sec	100%
FY2019-2020	2:11		71 sec	118%
FY2020-2021	2:10		70 sec	117%
FY2021-2022	2:06		66 sec	110%
FY2018-2022 avg.	2:04		64 sec	107%

Figure 5.1 indicates there is substantial room for improvement regarding alarm handling times. Improvement for this response time dimension is a high priority for the District. Every 30-40 second improvement in alarm handling times equates to theoretically moving the station nearly a half mile closer to the call.

Although there have been several key factors put in place in recent years that are leading to improvements in alarm handling times, we continue to look for more impactful solutions. In 2014, NWFD assigned a 40-hour captain to the dispatch center to act as the District's liaison officer and assist with training of dispatchers.

Turnout Time Performance

Turnout time is defined as the time when a station or unit in the field is notified of a dispatch until the point of initial response. NWFD defines the point of initial response as

when “the wheels begin to roll” enroute to the incident.

NWFD measures turnout times for Fire (includes hazmat, TRT and wildland) and EMS as presented in Figure 5.2. 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, Chapter 4, states that the turnout time for fire and special operations should be 1 minute, 20 seconds and 60 seconds for all EMS call types. NWFD has adopted the 1710 standard and benchmarks to that standard for turnout time. There is more work to be done to move the realized baseline turnout times found in the table below to meet the benchmark NFPA 1710 standard.

Figure 5.2.
FY2018-2022 Turnout Performance

90th percentile Turnout time Total	FY17/18	FY18/19	FY19/20	FY20/21	FY21/22
Urban	01:30	01:33	01:36	01:38	01:40
EMS	01:28	01:30	01:34	01:37	01:38
FIRE	01:35	01:42	01:39	01:43	01:47
HazMat	01:30	01:36	01:39	01:50	01:48
TRT	00:52	01:56	01:29	01:23	01:38
Rural	01:31	01:35	01:44	01:42	01:41
EMS	01:29	01:32	01:43	01:42	01:40
FIRE	01:31	01:46	01:47	01:42	01:45
HazMat	02:10	01:33	01:45	01:56	01:59
TRT	00:55	01:29	00:47	01:26	01:39

The turnout time for all call classifications was 1:35 at the 90th percentile for the previous five fiscal years.

Turnout countdown clock located in all of NWFD’s stations

Travel Time Performance

Travel time is defined as the time the unit response begins (wheels rolling) to when the unit arrives on scene. NWFD follows NFPA 1500 and VFIS applicable apparatus operating and driving standards in the development of SOGs that guide operational responses to the scene. Safe driving practices at NWFD are a priority; if a responding unit fails to reach a scene because of an accident, the opportunity for NWFD to fulfill its mission in the most expeditious and effective manner has failed.

Travel times are limited by the existing roadway system's layout, and roadway system's status (i.e. traffic conditions, weather elements, etc.) but the process of maintaining current MDT maps that provide apparatus and personnel with the fastest expected routing to incidents greatly aids in travel time performance. Road closures and delays due to construction are input into MDT maps monthly and provide responders with updated area knowledge. NWFD utilizes the Opticom® preemption system to help reduce travel times and enhance safety at intersections. Travel time zones for first-due areas are illustrated in Figures 5.3 and 5.4. Travel times are generally in line with the NWFD response time standards. Figure 5.5 illustrates that the distribution of non-compliant travel times is roughly parallel with call density as presented in Section 4.

Excessive travel times were noted in two response areas in the western District response area associated with station 34 & 41's first-due areas. Additionally, certain Interstate 10 locations, due to access ramp locations, can result in excessive travel times (more than 8 min).

Paramedic truck travel times are governed by the Arizona Department of Health Services under ARS 36-2232. Ground ambulance service providers submit for a certificate of necessity (CON) that cites the performance standards an agency is required to meet. NWFD's CON response times are as follows:

- Ten (10) minutes on ninety (90) percent of all emergency (lights and sirens) ambulance calls
- Fifteen (15) minutes on ninety-five (95) percent of all emergency (lights and sirens) ambulance calls

And

- Twenty (20) minutes on ninety-eight (98) percent of all emergency (lights and sirens) ambulance calls

CON response times are for the entire agency service area boundary and NWFD maintains backup agreements with regional partners to ensure the most expeditious ground ambulance transport service for the community.

Figure 5.4 shows the paramedic travel times throughout the entire response boundary. Excessive travel times were noted in primarily two GZPs, the Northeast, primarily the northern portion of station 37's first due, and in the South, primarily the southern portion of station 35's first due. The ground transport coverage in the Northwest GZP has an overlapping CON with the Avra Valley Fire District were NWFD paramedic transports serve as a backup to AVFD ground transports.

Figure 5.3
NFPA Suppression Response Map

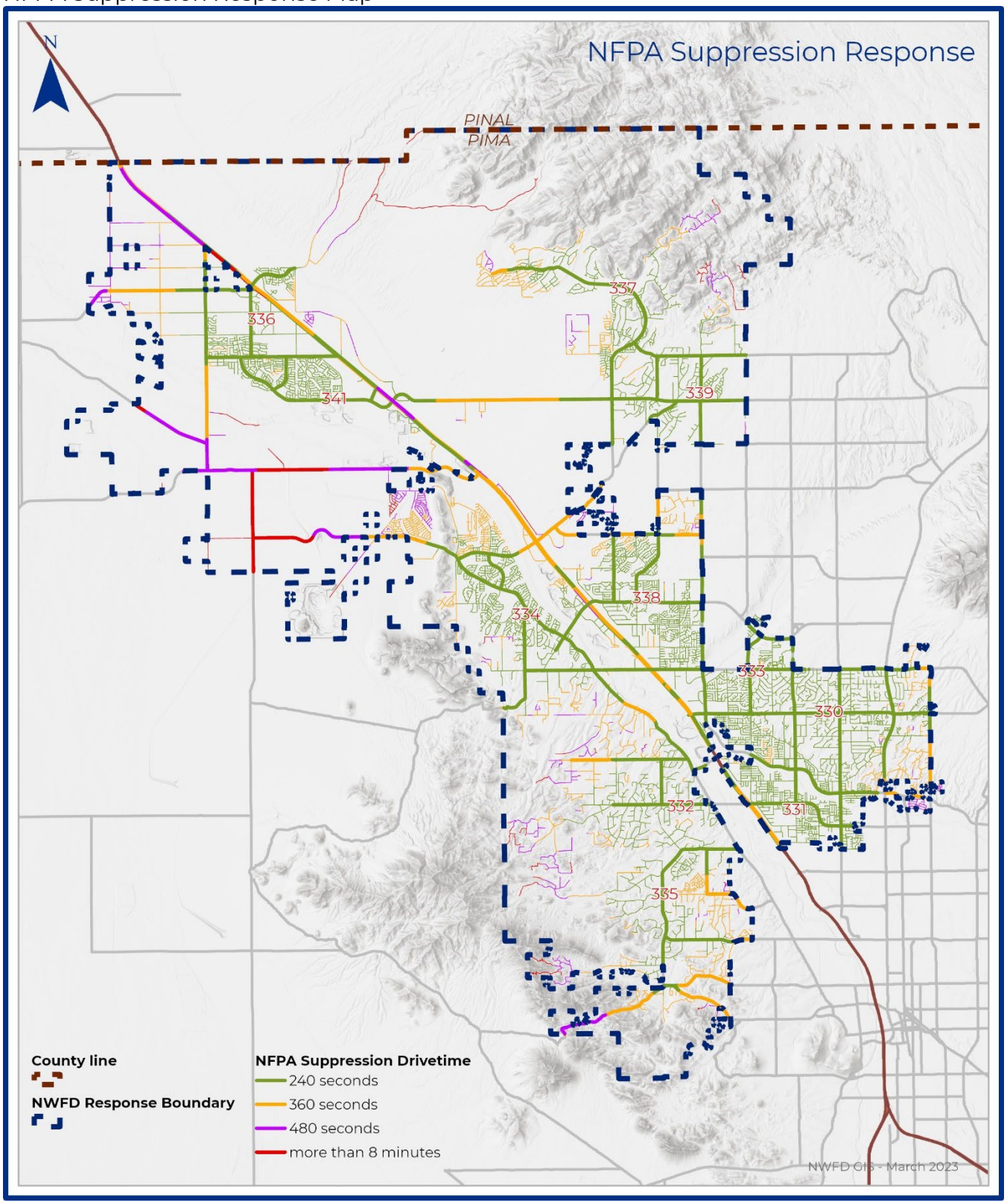
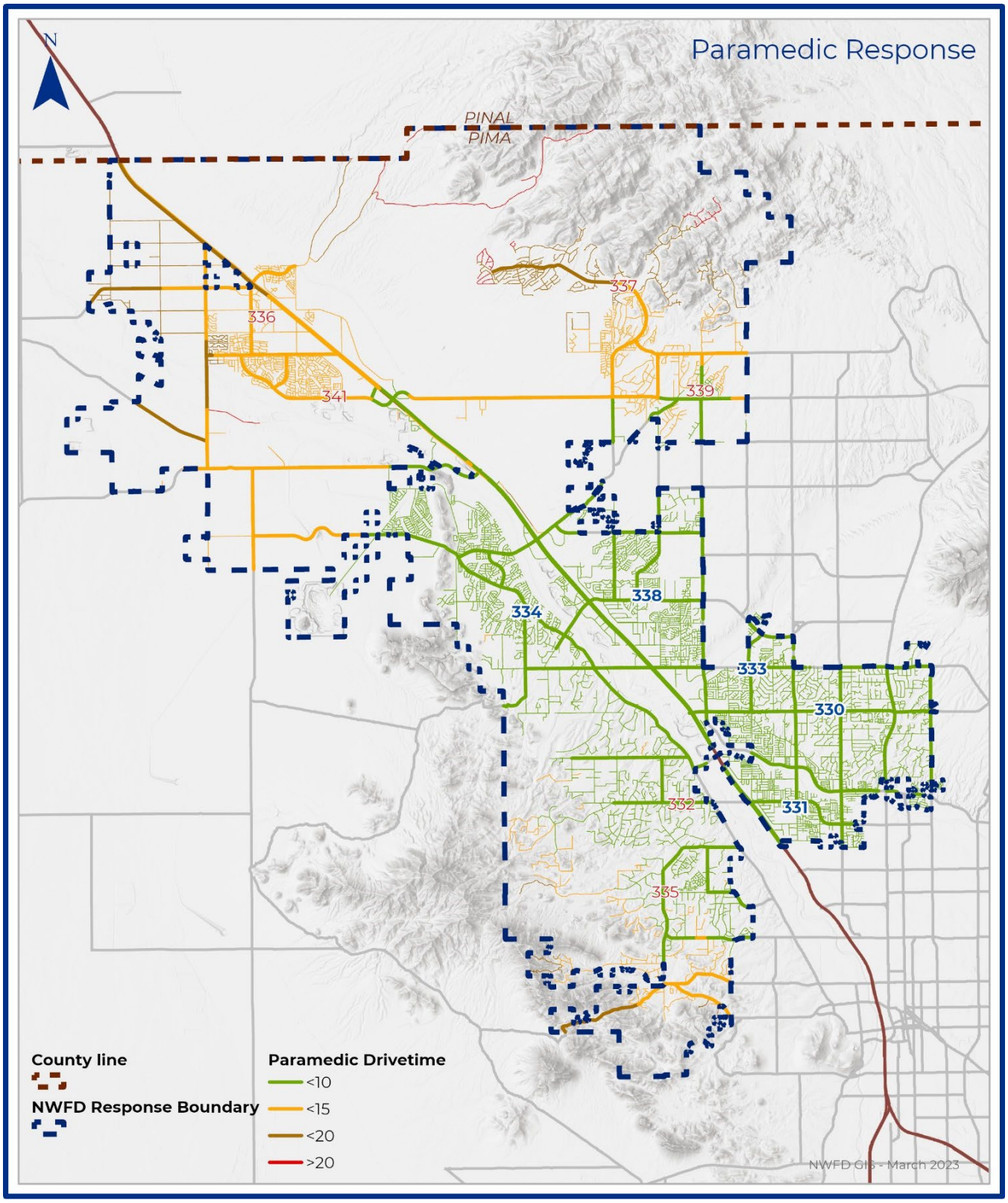


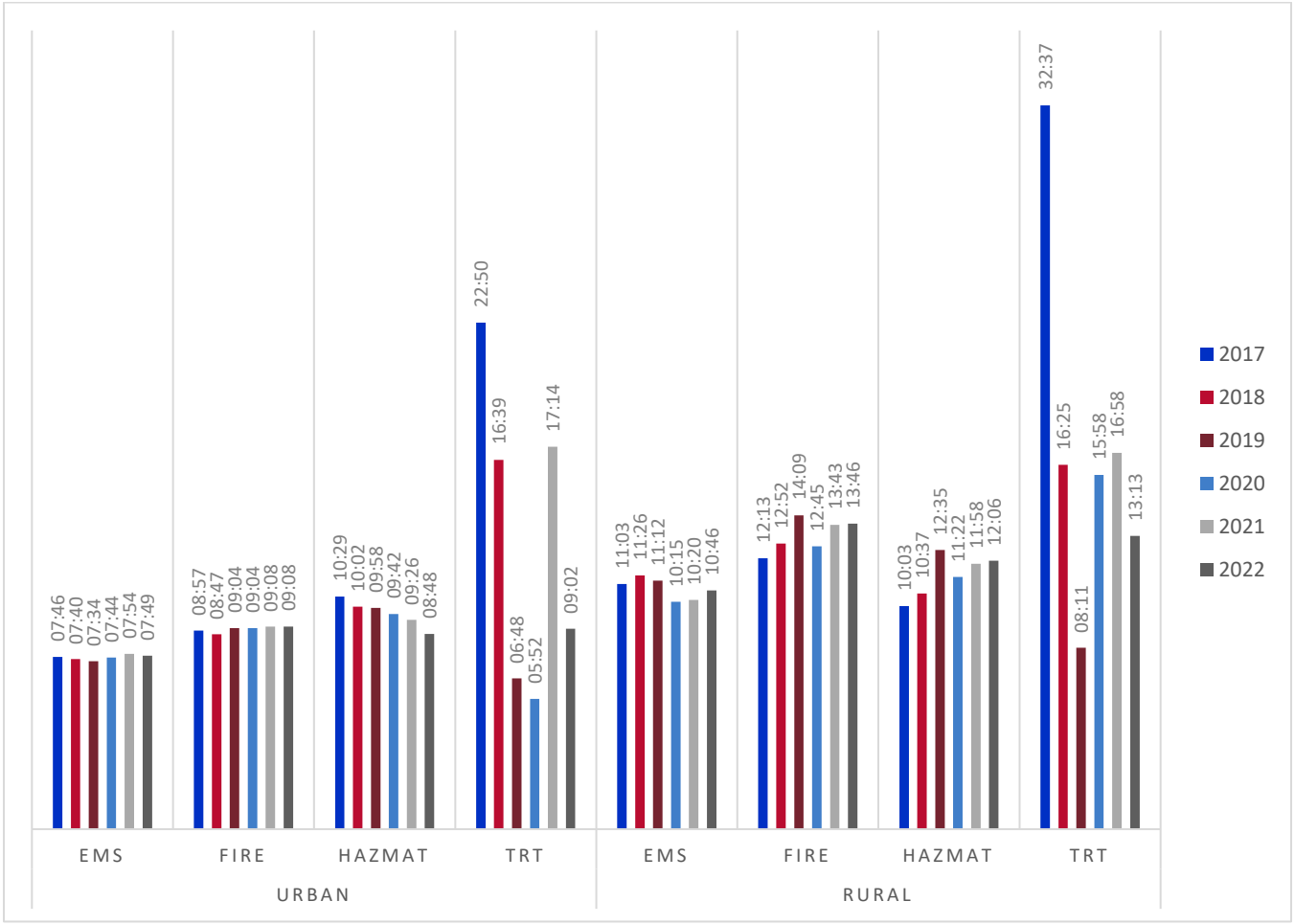
Figure 5.4
NFPA Paramedic Response Map



Total Response Time Evaluation

For the period of FY2018-2022, total response times for all emergency calls show that times have remained relatively consistent, with some notable challenges in response to TRT call types. The major factor in response times to TRT call types is in the locations of these events being primarily in difficult to reach outlying GZP response areas related to hiker rescues. The response data reflects several factors that contributed to response times including increases to population that has contributed to an 8% increase in call volume from 2017 through 2021, an observable increase in traffic volume in the District with some off-set from roadway infrastructure improvements mainly to arterial roadways and the I10 freeway interchange on and off ramps, the addition of station 341 in 2020, and the relocation of station 337 in 2019. In reviewing the data by first-due geographical planning zones (GPZ's), total response times fluctuated somewhat between the GPZ's when compared to the NWFD benchmark standard based on roadway infrastructure and station proximity to population centers.

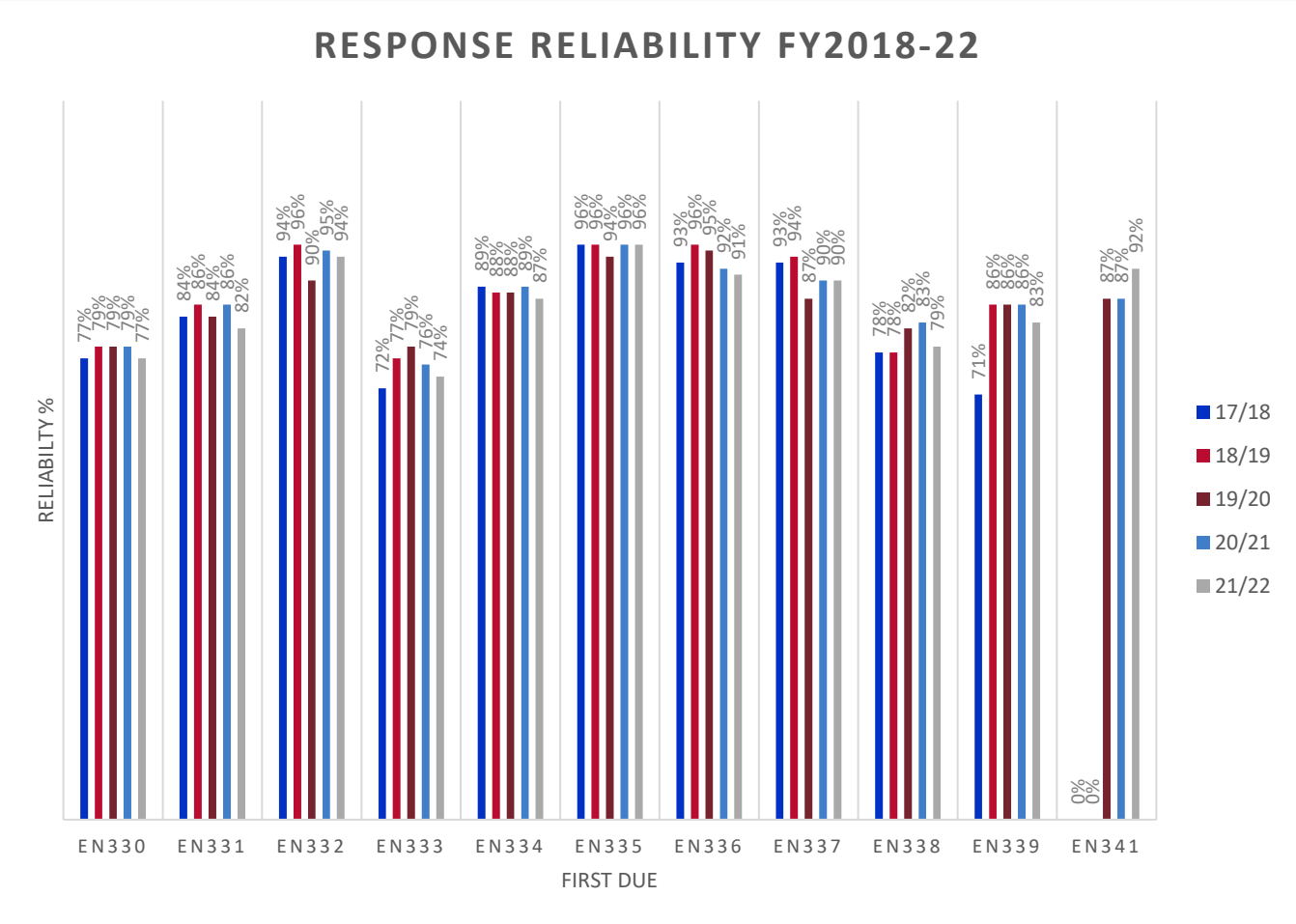
Figure 5.5
Total Response Time Evaluation FY2018-2022



Reliability

Reliability in context for this document can be described as "first-due" reliability, the percentage of time a company is available to respond to a call within their designated service area. With automatic vehicle locator technology available, the computer aided dispatch (CAD) system assigns a unit to an incident based on the calculated travel time. This is a much more efficient method to select appropriate units for an emergency.

Figure 5.6
Response Reliability



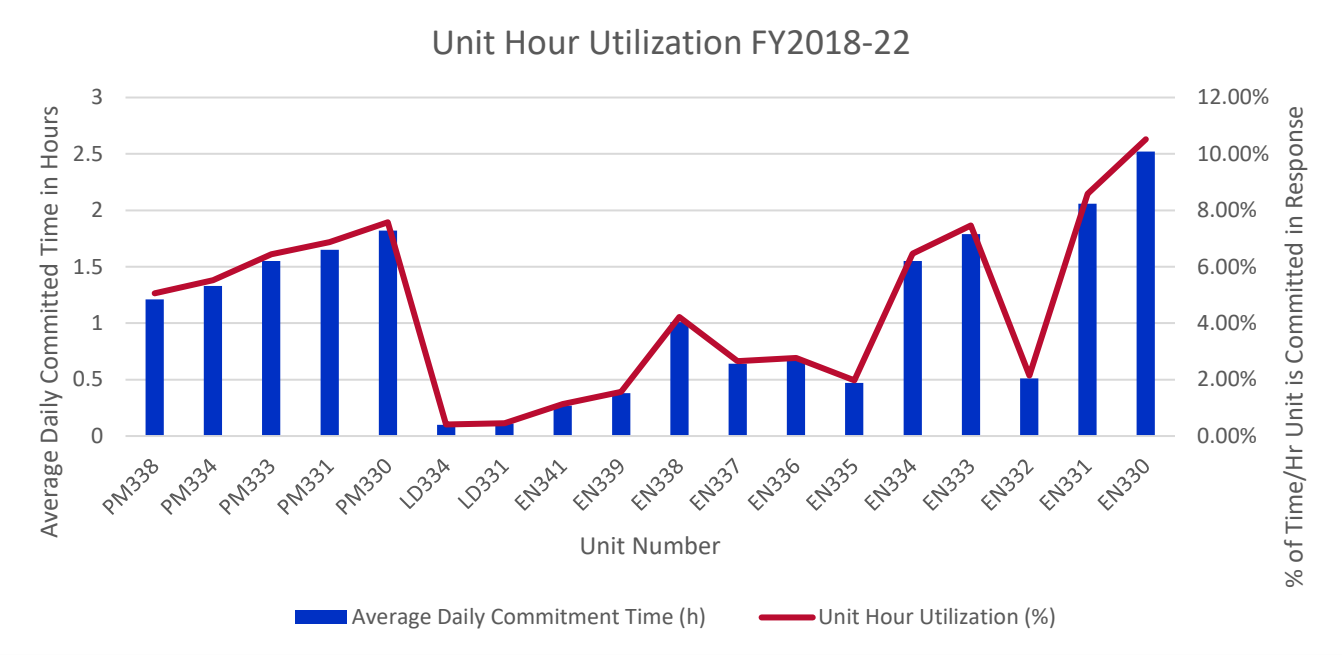
The addition of station 341 on November 11, 2019, improved both station 336's response reliability and increased response reliability into station 341's first-due as well as decreased travel times into the area previously serviced from station 336. Station 333 had the lowest response reliability which is due in part from the peak activity unit (EN342) housed out of that station picking up a portion of their call volume. Automatic aid responses have increased overall response reliability into the core and central planning zones but are not captured in the chart above.

Unit Hour Utilization

Unit Hour Utilization (UHU) is the percentage of time each hour in a day that an apparatus is committed to an incident. The calculation covers the time from when a unit receives a dispatch until the time it returns to service and is available for additional calls. The number in decimal form is the number of hours a unit is committed out of service on a scene

divided by the total number of hours in a shift period. NWFD operates a three shift, 24-hour shift schedule. Based solely on out of service time, Figure 5.7 presents the UHU for each NWFD staffed unit.

Figure 5.7
Unit Hour Utilization



External Agency Comparability/Benchmarking

As part of evaluating Northwest Fire District deployment and performance, a comparability study was completed assessing NWFD performance to similar sized agencies both within Arizona and the around the U.S. This information can be foundin Figure 5.8.

Figure 5.8
External Agency Comparability/Benchmarking

Agency	Population Served	Number of Stations	Alarm Handling	Turnout Time	Travel Time	Total Response Time
NWFD	127,525	11	2:03	1:34	7.04	8:13
Golder Ranch Fire District Arizona	99,238	10	1:49	1:36	6:32	8:49
Olathe FD Kansas	143,000	8	2:17	1:15	5:57	6:44
College Station FD Texas	126,000	6	1:31	2:00	5:02	7:38
Spokane Valley FD Washington	136,000	10	1:02	1:59	5:11	6:43
Surprise FD Arizona	153,000	7	1:32	1:16	6:41	7:30
Arvada FD Colorado	133,000	8	1:51	1:27	5:25	7:47

SECTION 6

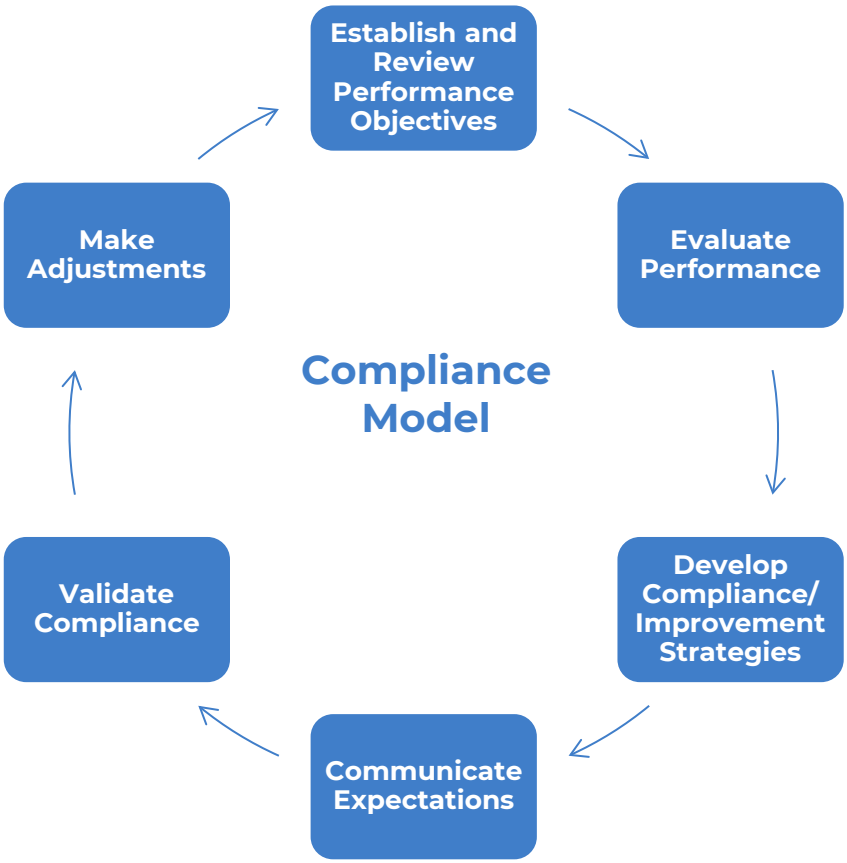
Plan for Improving and Maintaining Response Capabilities

There is a sizeable amount of information in the form of data and various methods of measurement presented in this document. Without a plan to not only maintain, but to improve performance, this information is of minimal value.

Compliance Model

To develop a plan to maintain and improve response capabilities, NWFD began with the provenDeming Model of Plan-Do-Check-Act. Using the Deming Model as a foundation, NWFD has adopted the following compliance model that also parallels the compliance model in the CFAI Community Risk Assessment/Standard of Cover, sixth edition:

Figure 6.1
Compliance Model



Implementing a plan to guide improving and maintaining SOC response capabilities and performance has been a weak link in the past two accreditation periods. To strengthen this weakness, the SOC team that was used to help develop this edition of the SOC will remain intact for the upcoming accreditation period. With facilitation by the Operations Division Chief and Accreditation Manager, the SOC team will be assigned the responsibility of managing the compliance model as outlined in the following steps.

Step 1 - Establish and Review Performance Objectives (CRA-SOC Sections 2-4)
To establish performance objectives, NWFD has completed the following:

- Identified services provided.
- Defined the levels of service.
- Identified and categorized levels of risk.
- Developed and reviewed performance distribution/concentration measures and associated objectives.

While much of this process may remain relatively the same with each CRA-SOC process, it is important to review the underlying organizational assumptions and ensure they are still accurate and relevant. This can be in the form of environmental scanning with an emphasis on community expectations, identifying any new risks, and assessing financial and political factors. In addition, updating and establishing any new performance measures will occur when:

- There is a change in the type(s) of services delivered by NWFD.
- New mandated laws or regulations require a change in the method of service delivery by NWFD.
- Significant change in NWFD boundaries[11] (growth or contraction).
- Any time the Governing Fire Board or the Fire Chief feel there is a need to adjust performance service delivery and associated performance objectives.

Step 2 – Evaluate Performance (CRA-SOC Section 5)
NWFD evaluates performance at several levels:

- Performance at a District-wide level.
- Performance at the geographical planning zone level (in progress, yet to be completed).
- Unit level (first-due).
- Effective response force level.

Step 3 – Develop Compliance Strategies (CRA-SOC Section 7)
The SOC team will develop compliance strategies that will include, but not limited to:

- Ensure maximization of existing resources including recommendations for reassignment of units.
- Evaluation of partnering opportunities.
- Consideration of alternate means of service delivery.
- Possible recommendations for allocating additional financial resources to improve service delivery.
- Individual or group actions that can improve service delivery.
- Recommend response performance reporting system(s).

[11] Service delivery impact analysis is part of a standardized evaluation process anytime there is a proposed annexation.

Step 4 – Communicate Expectations
This edition of the CRA-SOC clearly outlines service level response performance objectives. These performance objectives need to be communicated to the Operations personnel responsible for service delivery, as well as support personnel such as Fleet and Warehouse. The methods for communicating performance objective expectations may include, but are not limited to:

- Direct communication with crews by the battalion chiefs.
- Training via the video conferencing system.
- Posting of the CRA-SOC on the District's internet and intranet.

Using these and potentially other methods of communication, the SOC team will develop a plan to communicate expectations by the end of calendar year 2023. The plan will also include an element by which members can give feedback regarding the expectations.

SECTION 7

Key Findings and Recommendations

A principle benefit of developing a CRA-SOC are the resulting key findings and recommendations. NWFD's CRA-SOC development process identified a number of key findings,many of which resulted in associated recommendations. The organization will be responsible for the implementation of the listed recommendations.

Key Finding #1

There was nearly an 8% increase in total call volume from 2017 through 2021.

The service delivery category responsible for the greatest call volume increase was EMS. We expect this trend to continue as the community grows and population infill occurs.

> Recommendation – Continue to track the primary reasons behind the increase in call volume. Strategic planning for additional station locations and response apparatus should meet the needs reflected in response data. CRR Programs could reduce certain responses through updates to ICC Codes and targeted community risk reduction initiatives.

Key Finding #2

The maximum fire risk occupancies in NWFD are primarily non-sprinklered large garden style apartment complexes and trailer parks.

> Recommendation – A comprehensive CRR program needs to be developed for all non-sprinklered large garden apartment complexes and trailer parks.

Key Finding #3

Ambulance travel times in the Northeast GPZ are excessive.

> Recommendation – The current response data shows the immediate need for an ALS ambulance in the Northeast GPZ. The agency currently has the apparatus available and is waiting on staffing.

Key Finding #4

The turnout time standard analyzed in this document demonstrates a need for a specific focus on EMS turnout times.

> Recommendation - The District will provide monthly turnout time analysis that will be available to all personnel. Additionally, evaluate the opportunity to validate turn out time through GPS technology.

Key Finding #5

The District's contracted communications center alarm handling times do not meet recommended NFPA Standards. The 90th percentile alarm handling time is 2 minutes and 7 seconds in 2022.

> Recommendation – Continue to work with the contractor towards alignment with NFPA Standards and recommend a performance-based contract at the next renewal.

Key Finding #6

The most frequent low risk hazmat calls are odor, CO, and CO2 emergencies.

> Recommendation - Although the District has equipped all primary apparatus with enhanced air monitoring equipment, a need for additional CRR programs could reduce casualties associated with these incidents.

Key Finding #7

The most frequent medium risk technical rescue call is hiker rescue.

> Recommendation – The District has collaborated with local entities to provide additional safety information related to hiking safety and climate concerns specific to Southern Arizona. A continued effort towards education and trail closures on high heat index days is needed.

Key Finding #8

The call volume within the Core GPZ continues to increase and the expected impact of the full implementation of automatic aid with our neighboring agencies will result in a lower response reliability in the zone.

> Recommendation – Add an additional peak activity engine company to cover the increase in call volume. Also, evaluate the need for an additional ALS ambulance.

GLOSSARY

Accreditation: A process by which an association or agency evaluates and recognizes a programof study or an institution as meeting certain predetermined standards or qualifications. It applies only to institutions and their programs of study or their services.

Adequate: Providing what is needed to meet a given objective without being in excess.

Advanced Life Support (ALS): Emergency medical treatment beyond basic life support level as defined by the medical authority having jurisdiction.

Alarm: A signal or message from a person or device indicating the existence of a fire, medical emergency, or other situation that requires fire department action.

Alarm Answering Time: The time interval that begins when the alarm is received at the communication center and ends when the alarm is acknowledged at the communication center.

Alarm Handling Time: The time interval from the receipt of the alarm at the primary PSAP until the beginning of the transmittal of the response information via voice or electronic means to emergency response facilities (ERFs) or the emergency response units (ERUs) in the field.

Alarm Processing Time: The time interval from when the alarm is acknowledged at the communication center until response information begins to be transmitted via voice or electronic means to emergency response facilities (ERFs) and emergency response unties (ERUs).

Alarm Transfer Time: The time interval from the receipt of the emergency alarm at the PSAP untilthe alarm is first received at the communication center.

Automatic Aid: A plan developed between two or more fire departments for immediate joint response on first alarms.

Baseline Performance: Current level of performance.

Class A Foam: Used to extinguish and overhaul Class A fires. It has insulating qualities and reduces surface tension that results in in better penetration of water in Class A materials.

Benchmark Performance: Level of performance the District is trying to achieve long-term.

Community Risk Assessment (Analysis): The evaluation of a community's fire and non-fire hazards and threats, taking into account all pertinent facts that increase or decrease risk in orderto define standards of cover.

Company: A group of NWFD Operations members:

- Under the direct supervision of an officer;
- Trained and equipped to perform assigned tasks;
- Usually organized and identified as engine companies, ladder companies, rescue companies, squad companies, or multi-functional companies;
- Operating with one piece of fire apparatus (engine, ladder truck, rescue, squad) except where multiple apparatus are assigned that are dispatched and arrive together, continuously operate together, and are managed by a single company officer;
- Arriving at the incident scene on fire apparatus.

Concentration: Spacing of multiple resources arranged so that an initial effective response forcecan arrive on scene within the time frames outlined in the on-scene performance objectives.

Credible: Capable of being believed; believable as verified and/or validated.

Critical Task: A time-sensitive work function that is essential along with other work functions to ensure a positive outcome for a performance objective.

Deployment: The strategic assignment and placement of fire agency resources such as fire companies, fire stations and specific staffing levels for those companies required to mitigate community emergency events.

Distribution: Geographic location of all first-due resources for initial intervention. Generally measured from fixed response points, such as fire stations, and expressed as a measure of time.

Effective Response Force (ERF): The minimum amount of staffing and equipment that must reacha specific emergency zone location within a maximum prescribed total response time and is capable of initial fire suppression, EMS and/or mitigation. The ERF is the result of the critical tasking analysis conducted as part of a community risk assessment.

Fire Protection System: The regular interaction of dependent and independent sources of fire protection services, and includes both public and private organizations, apparatus, equipment, fixed and mobile, facilities, methods, human resources, and policies by the authority having jurisdiction.

First-Due Area: The portion of a jurisdiction that each response company has been assigned to be the first unit to arrive at the scene of an emergency. Usually the first-due company is responsible for most activities in that area. See Distribution.

Frequency: The number of occurrences per unit time at which observed events occur or are predicted to occur.

Geographic Planning Zones: The establishment of organized geographical response areas by: size(e.g. square mile or kilometer); or unique occupancy, demographic type or other risk-relevant characteristic.

Hazard: A condition that presents the potential for harm or damage to people, property, or the environment.

Incident: An occurrence, either human-caused or a natural phenomenon, that requires action orsupport by emergency services personnel to prevent or minimize loss of life or damage to property and/or natural resources.

Incident Commander: The fire department member in overall command of an emergencyincident.

Incident Safety Officer: An individual appointed to respond or assigned at an incident scene by the incident commander to perform the duties and responsibilities of that position as part of the command staff.

Mutual Aid: Reciprocal assistance by emergency services under a prearranged plan.

NFPA: Acronym for the National Fire Protection Association.

Outputs: The specifically intended types of results that can be expected from the activities andinputs that are placed into service.

Outcomes: Something that follows an applied activity as a result or consequence.

Percentile: One-hundredth parts; 90/100=90%.

PSAP: Acronym for "Public Safety Answering Point".

Rapid Intervention Crew (RIC): A dedicated crew of fire fighters who are assigned for rapiddeployment to rescue lost or trapped members.

Risk: A measure of the probability and severity of adverse effects that result from an exposureto a hazard.

Social Vulnerability Index (SVI): A number of factors, including poverty, lack of access to transportation, and crowded housing that may weaken a community's ability to prevent human suffering and financial loss in a disaster that is displayed as a numerical index from 0(low) to 1.0(high) vulnerability.

Standards of Cover: Those written policies and procedures that establish the distribution andconcentration of fixed and mobile resources of an organization.

Total Response Time: The sum of alarm handling (call processing), turn out, and travel times.

Travel Time: The time interval that begins when a unit is en route to the emergency incident andends when the unit arrives at the scene.

Turnout Time: The time interval that begins when the emergency response facilities and emergency response units (ERUs) notification process begins by either an audible alarm or visualannunciation or both and end at the beginning point of travel time.

Working Fire: Any fire within a structure or building fire causing significant damage to the building and its contents. Generally, requires commitment of all initial effective response force responding units.

APPENDIX

Appendix 1.A PIMA COUNTY BOARD OF SUPERVISORS RESOLUTION TO ESTABLISH NWFD

RESOLUTION NO. 1983- 244

CANVAS OF ELECTION RESULTS, FINDING THAT A MAJORITY OF ELECTORS FAVOR FORMING FIRE DISTRICT, ORGANIZATION AND ESTABLISHMENT OF NORTHWEST FIRE DISTRICT, AND ANNOUNCING OF THE ELECTED BOARD MEMBERS.

WHEREAS, heretofore a petition was duly filed with the Clerk of the Board of Supervisors of Pima County by more than three (3) qualified electors residing within the territory known as Northwest Fire District; and

WHEREAS, said petition contained the signatures of more than ten (10) percent of the qualified electors of said territory, and praying that they be permitted to organize a fire district therein; and

WHEREAS, pursuant to said petition the Board of Supervisors of Pima County duly called an election on the 23rd day of August, 1983, and there was held in the said territory an election for the purpose of determining whether said fire district should be formed and electing members of the District Board; and

WHEREAS, this Board has met and canvassed the returns of said election wherein 481 electors voted "Yes", and 117 electors voted "No"; and

WHEREAS, Judy Gafner received 426 votes; Charles A. Nowak received 426 votes, Harry D. Paulus received 422 votes, Joe Renfroe received 419 votes, and Thomas W. Snyder received 429 votes for board member;

NOW, THEREFORE, THE BOARD DOES FIND AND DECLARE:

1. That a majority of the votes cast at the said election were in favor of organizing a fire district administered by a district board;

2. That the Northwest Fire District is duly organized and established;

3. That the boundaries of the Northwest Fire District are as follows:

All of Sections 20 and 21, Township 12 South, Range 12 East,

That portion of Sections 22, 23, 25 and 26, Township 12 South, Range 12 East lying Westerly of the Easterly right-of-way line of the Southern Pacific Transportation Company.

All of Sections 27, 28, and 29, Township 12 South, Range 12 East.

The Northeast 1/4 and the East 1/2 of the Southeast 1/4 of Section 32, Township 12 South, Range 12 East.

All of Sections 33 and 34, Township 12 South, Range 12 East.

That portion of Sections 35 and 36, Township 12 South, Range 12 East lying Westerly of the Easterly right-of-way line of the Southern Pacific Transportation Company.

That portion of Section 33, Township 12 South, Range 13 East lying Easterly of Shannon Road and Southerly of Magee Road.

All of Sections 1 thru 3, Township 13 South, Range 12 East.

The Northwest 1/4 and the East 1/2 of Section 4, Township 13 South, Range 12 East.

The East 1/2 of Section 9, Township 13 South, Range 12 East.

All of Sections 10 thru 15, Township 13 South, Range 12 East.

The East 1/2 of Sections 16 and 21, Township 13 South, Range 12 East.

All of Sections 22 thru 27, Township 13 South, Range 12 East.

56

2

57

The East 1/2 of Sections 28 and 33, Township 13 South, Range 12 East.

All of Sections 34 thru 36, Township 13 South, Range 12 East.

All of Sections 1 thru 6, Township 13 South, Range 13 East.

That portion of Sections 7 and 8, Township 13 South, Range 13 East, lying outside the boundary of the Flowing Wells Volunteer Fire District.

All of Sections 9 thru 12, Township 13 South, Range 13 East.

That portion of Section 13, Township 13 South, Range 13 East, lying outside the City of Tucson Corporate limits.

That portion of Section 17, Township 13 South, Range 13 East, lying outside the boundary of the Flowing Wells Volunteer Fire District.

All of Sections 18 and 19 Township 13 South, Range 13 East.

That portion of Sections 20, 24, and 29, Township 13 South, Range 13 East, lying outside the Corporate Limits of the City of Tucson.

All of Sections 30 thru 32, Township 13 South, Range 13 East.

That portion of Section 33, Township 13 South, Range 13 East lying outside the City of Tucson Corporate limits. (Map attached)

4. That the members of the fire district board shall be Judy Gafner, Charles A. Nowak, Harry D. Paulus, Joe Renfroe and Thomas W. Snyder.

PASSED, ADOPTED AND APPROVED by the Pima County Board of Supervisors on this 18th day of October, 1983.

PIMA COUNTY BOARD OF SUPERVISORS

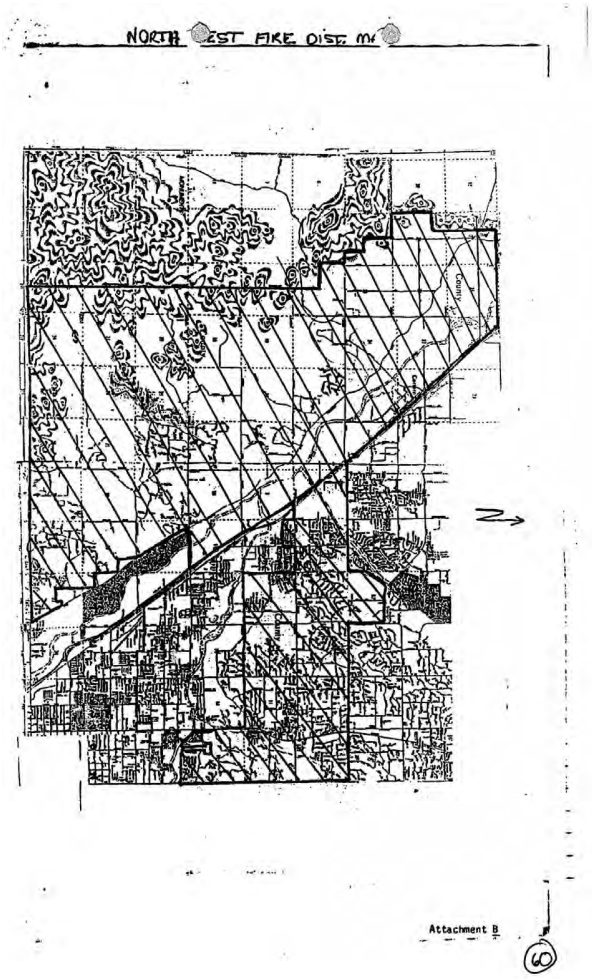
By Sam Lena
Sam Lena, Chairman

ATTEST:

Eugenia W. Wells, Clerk
Board of Supervisors

APPROVED AS TO FORM:

John R. Neubauer
Deputy County Attorney



Appendix 1.B

Mission

To save lives, protect property,
and care for our community.

Vision

Exemplary leadership and performance in serving our community.

Values

Honesty
We are forthright in our dealings; we stand by our word.

Integrity
We hold ourselves to the highest standards of professional and ethical conduct; we do what's right.

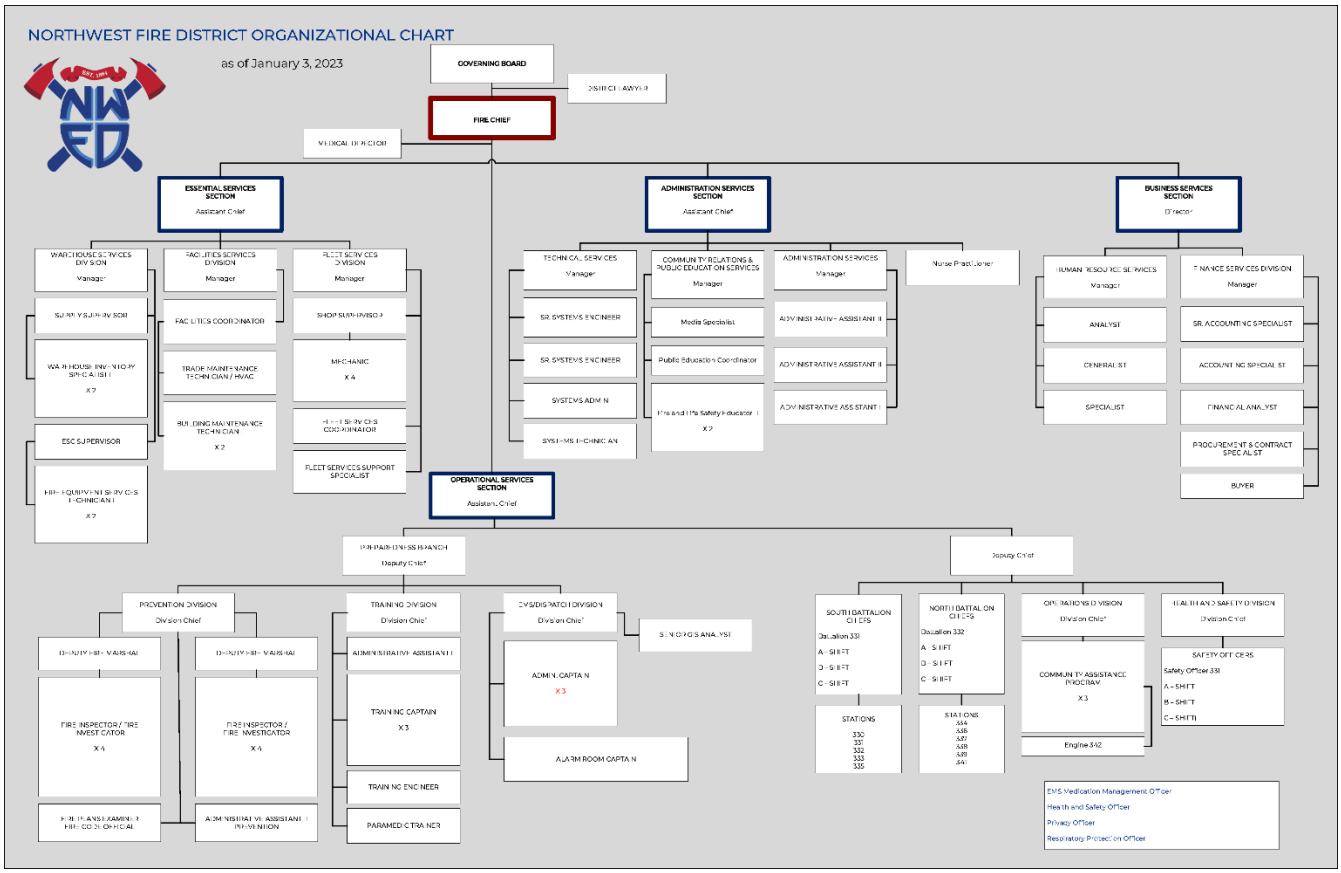
Trust
We firmly believe in each other to care for our community.

Respect
We understand that being held in high regard by our community is something we earn every day.

Humility
We serve selflessly to achieve our mission.

Inclusivity
We value individual uniqueness.

Appendix 1.C



Appendix 3.A - PRI Scoring Matrix

Priority Risk Index Scoring Guide

Score	Probability	Severity	Spatial Extent	Onset / Warning	Duration
1	Rare	Negligible	Small	Day or more	1-4 hours
2	Unlikely	Minor			Up to 12 hours
3	Occasional	Moderate	Moderate	Hours	12 to 24 hours
4	Likely	Serious			1-2 days
5	Almost certain	Catastrophic	Large	None	> 2 Days

Large Scale Event Risk Assessment 2022	Probability[1] (30%)	Severity[2] (30%)	Spatial Extent (20%)	Speed of Onset / Warning (10%)	Duration (10%)	TOTAL SCORE
Major Hazmat						
Weighted Score	0.91875	0.95625	0.55	0.49375	0.33125	3.25
Wildland Urban Interface						
Weighted Score	0.9375	0.7875	0.7875	0.21875	0.45	3.18125
Weapons of Mass Distruction						
Weighted score	0.3	1.40625	0.95	0.5	0.5	3.65625

Extended Power Outage						
Weighted score	0.58125	0.9	0.6125	0.5	0.35625	2.95
IT Cyber Attack						
Weighted score	1.35	1.2375	0.625	0.5	0.5	4.2125
Santa Cruz Flood Event						
Weighted score	0.73125	0.9	0.625	0.13125	0.3625	2.75
Pandemic						
Weighted score	1.18	1.26	0.8	0.1	0.5	3.84
Mass Casuality Incidnet						
Weighted score	1.06	0.96	0.57333333	0.5	0.173333333	3.266666667
Microburst						
Weighted score	0.72	0.64	0.226666667	0.473333333	0.1	2.16

Greater than 4.0 = high risk, 3.0-3.9 = moderate risk, <3.0 = low risk

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1 The probability of event occurring within five years.
2 Severity includes injuries/fatalities, property environmental considerations.
3 A power outage that is region-wide likely due to a grid failure, and longer than approximately 12 hours.

Appendix 3.B - ORAP

Northwest Fire District
Occupancy Risk Assessment Profile

SCORE: 0

NO SCORE

Yellow = Required

SAVE FILE

RESET FORM

Business / Building Name | REPORT BY

ADDRESS (DIR/NAME) | CITY BLDG/SUITE

DATE | FH OCC ID | PLAT (no "/" or ".") | PREPLAN | STATION | SHIFT

LIST ANY SPECIAL HAZARDS OR TACTICAL PLANNING INFORMATION HERE

CONSTRUCTION TYPE	Type - I	Type - II	Type IV	Type III	Type - V	Unusual Construction Features	Abandoned or Under Construction
	☐ 0	☐ 2	☐ 4	☐ 6	☐ 8	☐ 10	☐ 15
TOTAL SQUARE FOOTAGE	<1,000 Sq Ft	1,001 - 2,500 Sq Ft		2,501 - 7,500 Sq Ft	7,500 - 25,000 Sq Ft	25,000 - 100,000 Sq Ft	> 100,000 Sq Ft
	☐ 0	☐ 2		☐ 5	☐ 10	☐ 20	☐ 40
NUMBER OF FLOORS ABOVE GRADE	1 Floor Above Grade		Mezzanine	2 - 3 Floors Above Grade	4 Floors Above Grade		> 5 Floors Above Grade
	☐ 0		☐ 4	☐ 8	☐ 10		☐ 15
NUMBER OF FLOORS BELOW GRADE	No Floors Below Grade						1 or More Floors Below Grade
	☐ 0						☐ 15
GROUND LADDER/AERIAL ACCESS TO ROOF	Ground Ladder & Aerial Access				24 - 35' Ground Ladder Access Only		
	☐ 0				☐ 8		
TYPICAL BUILDING OCCUPANCY	No Occupants	1 - 10 Occupants	11 - 25 Occupants	26 - 100 Occupants	100 - 300 Occupants		>300 Occupants
	☐ 0	☐ 2	☐ 4	☐ 8	☐ 15		☐ 30
MOBILITY OF OCCUPANTS	Not Regularly Occupied	Ambulatory			Ambulatory With Assistance	Mix of Ambulatory and Non-Ambulatory	Non Ambulatory/ Diminished Mental Capacity
	☐ 0	☐ 2			☐ 10	☐ 15	☐ 20
APPARATUS ACCESS	All Sides of Structure	3 Sides of Structure		2 Sides of Structure		1 Side Of Structure	No Side of Structure/ No Access
	☐ 0	☐ 2		☐ 5		☐ 10	☐ 20
HYDRANT WATER SUPPLY	Within 300 Ft	301 - 800 Ft	801 - 1,000 Ft		1,001 - 2,000 Ft	2,001 - 3,000 Ft	> 3,000 Ft
	☐ 0	☐ 2	☐ 4		☐ 10	☐ 15	☐ 20
TRAVEL TIME	0 - 3 Minutes		4 - 7 Minutes			8-12 Minutes	> 12 Minutes
	☐ 0		☐ 5			☐ 10	☐ 15
AUTOMATIC SPRINKLER SYSTEM	Fully Sprinklered (Total Risk Number Reduced by 50 %)						
	☐ 0						
FIRE ALARM SYSTEM	Monitored Fire Alarm System		Local Fire Alarm System				No Fire Alarm System
	☐ 0		☐ 5				☐ 10
EXPOSURES WITHIN 30' (Includes floor above/below)	No Exposures		1-Exposure	2-Exposures	3-Exposures		
	☐ 0		☐ 5	☐ 10	☐ 20		
NFPA 704 (HIGHEST # IN THE DIAMOND)	NONE	1		2	3	4 or Special Hazard	More than 1 x #4 Value in Diamond
	☐ 0	☐ 2		☐ 5	☐ 10	☐ 20	☐ 40
FIRE LOAD - (The amount of combustible content in the occupancy)	Low/No Load			Medium Load		High Load	
	☐ 0			☐ 5		☐ 15	
SPECIFIC FIREFIGHTER SAFETY CONSIDERATIONS	Minimal Impact			Moderate Impact		High Impact	Severe Impact
	☐ 0			☐ 5		☐ 15	☐ 30

Appendix 4.A - Rules of Engagement

RULES OF ENGAGEMENT FOR FIREFIGHTER SURVIVAL

1. Size up your tactical area of operation.
2. Determine the occupant survival profile.
3. DO NOT risk your life for lives or property that cannot be saved.
4. Extend LIMITED risk to protect SAVABLE property.
5. Extend VIGILANT and MEASURED risk to protect and rescue SAVABLE lives.
6. Go in together, stay together, come out together.
7. Maintain continuous awareness of your air supply, situation, location and fire conditions.
8. Constantly monitor fireground communications for critical radio reports.
9. You are required to report unsafe practices or conditions that can harm you. Stop, evaluate and decide.
10. You are required to abandon your position and retreat before deteriorating conditions can harm you.
11. Declare a Mayday as soon as you THINK you are in danger.

THE INCIDENT COMMANDER'S RULES OF ENGAGEMENT FOR FIREFIGHTER SAFETY

1. Rapidly conduct, or obtain, a 360-degree situational size-up of the incident.
2. Determine the occupant survival profile.
3. Conduct an initial risk assessment and implement a SAFE ACTION PLAN.
4. If you do not have the resources to safely support and protect firefighters, seriously consider a defensive strategy.
5. DO NOT risk firefighter lives for lives or property that cannot be saved. Seriously consider a defensive strategy.
6. Extend LIMITED risk to protect SAVABLE property.
7. Extend VIGILANT and MEASURED risk to protect and rescue SAVABLE lives.
8. Act upon reported unsafe practices and conditions that can harm firefighters. Stop, evaluate and decide.
9. Maintain frequent two-way communications, and keep interior crews informed of changing conditions.
10. Obtain frequent progress reports and revise the action plan.
11. Ensure accurate accountability of every firefighter's location and status.
12. If after completing the primary search, little or no progress toward fire control has been achieved, seriously consider a defensive strategy.
13. Always have a rapid intervention team in place at all working fires.
14. Always have firefighter rehab services in place at all working fires.

The Rules of Engagement© are a product of the IAFC Safety, Health and Survival Section
Sponsored by Honeywell First Responder Products In The Interest Of All Firefighters Returning To Quarters Safely ...After Every Run

Honeywell
First Responder Products

FIRERESCUE

Appendix 4.B - ISO Letter

1000 Bishops Gate Blvd. Ste 300
Mt. Laurel, NJ 08054-5404

t1.800.444.4554 Opt.2
f1.800.777.3929

March 25, 2019

Mr. Jamsheed Mehta, City Manager
Northwest FPSA
11555 W. Civic Center Drive
Marana, Arizona, 85653

RE: Northwest FPSA, Pima County, Arizona
Public Protection Classification: 01/1Y
Effective Date: July 01, 2019

Dear Mr. Jamsheed Mehta,

We wish to thank you Mr. Steve Shepard, Mr. David Ruiz, Chief Norman K "Brad" Bradley III, Mr. David Crockett, Mr. Paul Martinez and Ms. Sandy Elder for your cooperation during our recent Public Protection Classification (PPC) survey. ISO has completed its analysis of the structural fire suppression delivery system provided in your community. The resulting classification is indicated above.

If you would like to know more about your community's PPC classification, or if you would like to learn about the potential effect of proposed changes to your fire suppression delivery system, please call us at the phone number listed below.

ISO's Public Protection Classification Program (PPC) plays an important role in the underwriting process at insurance companies. In fact, most U.S. insurers – including the largest ones – use PPC information as part of their decision- making when deciding what business to write, coverage's to offer or prices to charge for personal or commercial property insurance.

Each insurance company independently determines the premiums it charges its policyholders. The way an insurer uses ISO's information on public fire protection may depend on several things – the company's fire-loss experience, ratemaking methodology, underwriting guidelines, and its marketing strategy.

Through ongoing research and loss experience analysis, we identified additional differentiation in fire loss experience within our PPC program, which resulted in the revised classifications. We based the differing fire loss experience on the fire suppression capabilities of each community. The new classifications will improve the predictive value for insurers while benefiting both commercial and residential property owners. We've published the new classifications as "X" and "Y" — formerly the "9" and "8B" portion of the split classification, respectively. For example:

- A community currently graded as a split 6/9 classification will now be a split

6/6Xclassification; with the “6X” denoting what was formerly classified as “9.”

- Similarly, a community currently graded as a split 6/8B classification will now be a split 6/6Y classification, the “6Y” denoting what was formerly classified as “8B.”
- Communities graded with single “9” or “8B” classifications will remain intact.
- Properties over 5 road miles from a recognized fire station would receive a class 10.

PPC is important to communities and fire departments as well. Communities whose PPC improves may get lower insurance prices. PPC also provides fire departments with a valuable benchmark, andis used by many departments as a valuable tool when planning, budgeting and justifying fire protection improvements.

ISO appreciates the high level of cooperation extended by local officials during the entire PPC survey process. The community protection baseline information gathered by ISO is an essential foundation upon which determination of the relative level of fire protection is made using the Fire Suppression Rating Schedule.

The classification is a direct result of the information gathered, and is dependent on the resource levels devoted to fire protection in existence at the time of survey. Material changes in those resources that occur after the survey is completed may affect the classification. Although ISO maintains a pro-active process to keep baseline information as current as possible, in the event ofchanges please call us at 1-800-444-4554, option 2 to expedite the update activity.

ISO is the leading supplier of data and analytics for the property/casualty insurance industry. Most insurers use PPC classifications for underwriting and calculating premiums for residential, commercial and industrial properties. The PPC program is not intended to analyze all aspects of a comprehensive structural fire suppression delivery system program. It is not for purposes of determining compliance with any state or local law, nor is it for making loss prevention or life safetyrecommendations.

If you have any questions about your classification, please let us know.

Sincerely,

Alex Shubert

Alex Shubert
Manager -National Processing Center

cc: Mr. Chuck Huckleberry, Administrator
Chief Mike Garcia, Deputy Director, Tucson Fire Regional PSAP Dispatch
Mr. Steve Shepard, Superintendent, Metropolitan Water District
Mr. David Ruiz, Water Supervisor, Oro Valley Water Utility
Fire Chief Norman K “Brad” Bradley III, Northwest Fire Department
Mr. David Crockett, Water Superintendent, Flowing Wells Irrigation District
Mr. Paul Martinez, Public Works Director, Marana Water Department
Ms. Sandy Elder, Director, Tucson Water Department