Denver Fire Department 2023 Community Risk Assessment/Standards of Cover

Denver Fire Department

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Denver Fire Mission Statement:

The Denver Fire Department is dedicated to:

Our Desire to Serve:

committing to those we serve with integrity, accountability, and inclusivity.

Our Courage to Act:

providing quality, timely and professional emergency services to protect life and property.

Our Ability to Perform:

working together to maintain the highest standards of mitigation, preparedness, prevention, and community engagement.

Denver Fire Vision Statement:

The Denver Fire Department is a nationally accredited organization built on a rich history of tradition, continuously leading through emergency response, community engagement and wellness.

Embracing a caring culture built on a foundation of respect, inclusion, and trust. Continuously leading the fire service through innovative practices with a focused attention to our family and yours.

Executive Summary from Chief Desmond G. Fulton

The Denver Fire Department earned accreditation status through The Center for Accreditation International (CFAI) in August of 2018. This comprehensive self-assessment allows us as an organization to identify and leverage our successes, and more important highlights areas in need of improvement and potential opportunities for growth. Accreditation allows our department to identify specific measurable goals with a focus on community engagement and risk reduction, all while improving response times and the mitigation of emergencies with a focus on professional quality services to those we serve. As a department we strive for excellence, and our internal and external customers deserve nothing less.

The Commission of Fire Accreditation International (CFAI) references the Standards of Cover as policies and procedures developed internally with a focus on resource types, numbers, and static location. These along with data in relation to potential needs, incident frequency, response travel times, and demands based on qualitative data and historical needs in the communities we serve. These standards form the basis from which we measure performance, and strategies for improvement, development, and enhancement. The mission, vision, and values of the Denver Fire Department are incorporated into our Strategic Plan. This plan provides direction and determines initiatives that guides us towards defined goals and specific objectives.

The basis of our Standards of Cover is to develop recommendations and areas in need of improvement with a data driven approach supported by risk classifications. The Standards of Cover must be specific and meaningful to both internal (department personnel) and external customers (citizens), with a focus on opportunities for growth and betterment. What we have gleaned from the accreditation process is that this living document allows us to have a proactive approach that is both outcome and data driven. As a department we must continue to measure and evaluate internally, with specific and measurable goals and desired outcomes. We are honored to have the opportunity to define and address noncompliant areas though the guidance of CFAI and are committed to providing professional quality emergency services to the citizens we are sworn to serve.

Chief Desmond G. Fulton
Denver Fire Department

Land Acknowledgment

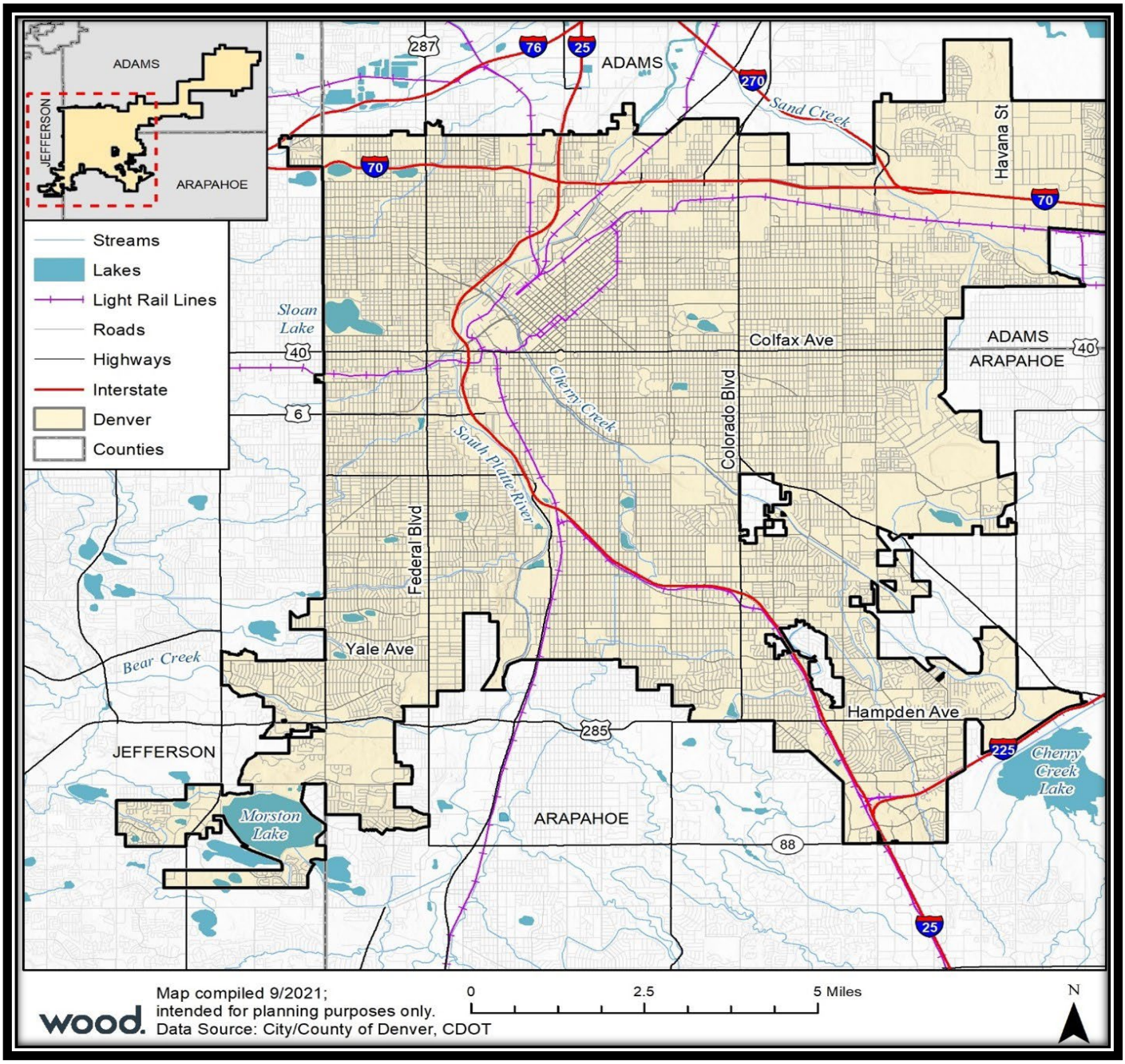
The City of Denver honors and acknowledges that the land on which we reside is the traditional territory of the Ute, Cheyenne, and Arapaho Peoples. We also recognize the 48 contemporary tribal nations that are historically tied to the lands that make up the state of Colorado.

We honor elder's past, present, and future, and those who have stewarded this land throughout generations. We also recognize that government, academic and cultural institutions were founded upon and continue to enact exclusions and erasures of Indigenous Peoples.

May this acknowledgement demonstrate a commitment to working to dismantle ongoing legacies of oppression and inequities and recognize the current and future contributions of Indigenous communities in Denver.

Section 1-Community Served

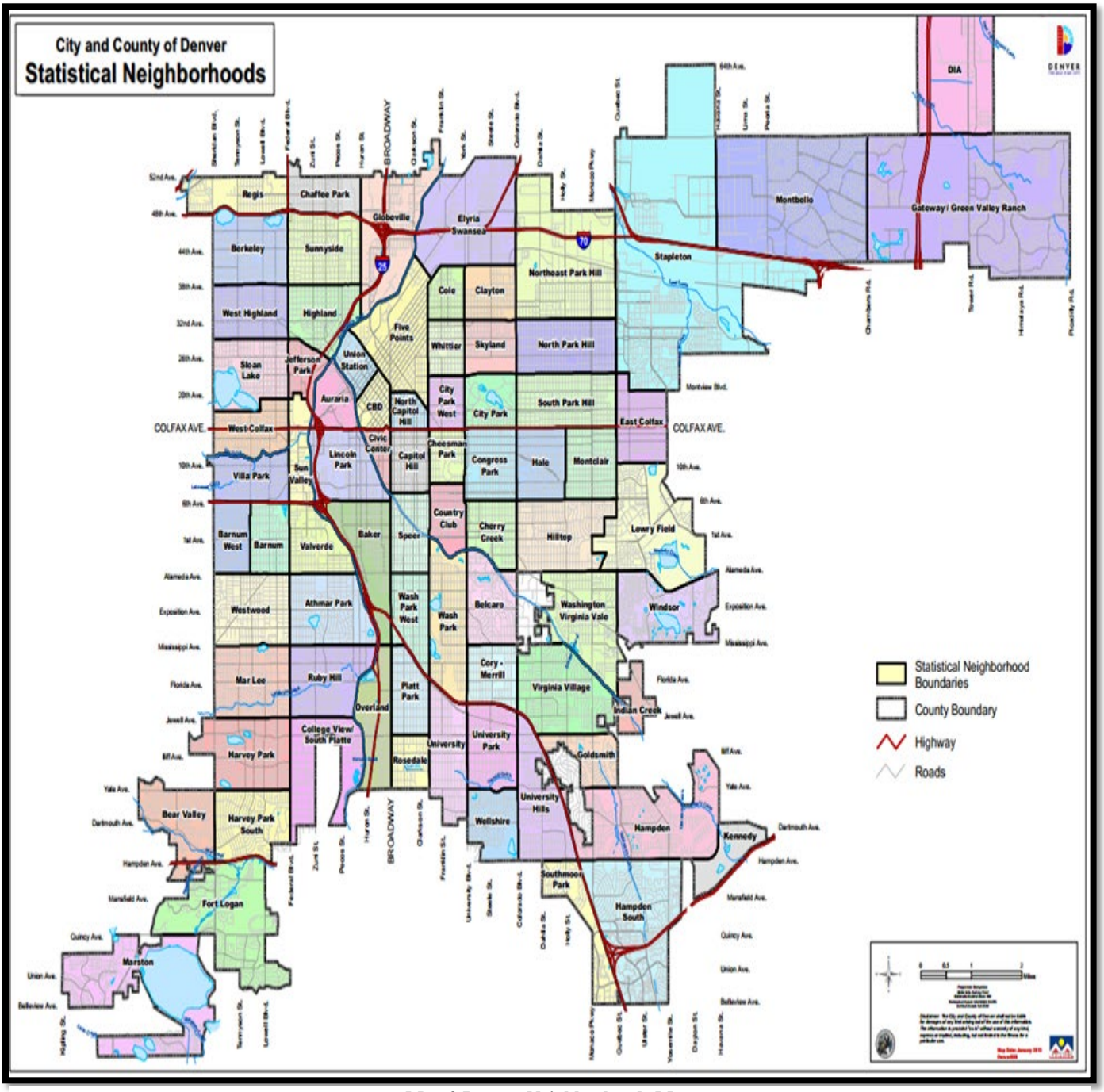
The City and County of Denver (hereafter referred to as "Denver", "the city" or "CCD") is the capital of the State of Colorado as well as the most populous city and second most populous county in the state. It is located just east of the Rocky Mountains foothills and earned its nickname as the "Mile High City" due to its elevation of one mile, or 5,280 feet, above sea level.



Map 1-Map of City and County of Denver Boundaries

Denver Neighborhoods

The City and County of Denver has 78 official neighborhoods. Generally, the neighborhoods closest to the city center are denser and have more brick buildings built around the turn of the twentieth century. Many of the neighborhoods away from the city center have buildings built with more modern materials and style. The neighborhoods farthest away from the city center are generally more recent developments with suburban characteristics or new urban developments that attempt to recreate the feel of legacy neighborhoods. The city center is comprised of a mix of old and new multiple story buildings or skyscrapers.



Map 2 Denver Neighborhoods Map

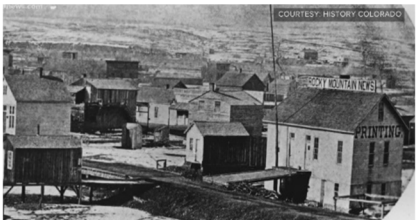
History of Denver

Denver was an early stopping place for Arapaho Indians, fur trappers, and traders. With the discovery of gold in June 1858, the towns of Auraria and St. Charles were founded on opposite sides of Cherry Creek. The claim of St. Charles was soon jumped by William Larimer, Jr., who in November 1858 renamed it Denver City for James W. Denver, governor of the Kansas Territory, of which the city was then a part. The site grew during the 1859 "Pikes Peak or bust" gold rush. Denver City and Auraria consolidated in 1860; the following year Colorado Territory was established, and Denver City became Denver.

May 19, 1864, Denver "Great Flood"

The city was devastated by fire in 1863, and a year later a flash flood swept away many buildings, including the city hall.

Uprisings by Cheyenne and Arapaho Indians on the plains in the 1860s resulted in their forced removal from Colorado. Denver became the territorial capital in 1867. When the transcontinental railway was built through Wyoming, Denver's citizens organized their own railway, completed in 1870, to connect with the Union Pacific at Cheyenne; the Kansas Pacific Railroad reached Denver shortly thereafter. The resulting economic boom increased the population from 4,759 in 1870 to 106,713 in 1890.



Downtown Denver 1890

During the 1870s and '80s, silver became more important economically than gold. Mining fortunes were created almost overnight, and an opera house was built. This period of wealth ended in 1893 with the crash of the silver markets.

Banks failed, smelters shut down, and silver kings became bankrupt. New gold discoveries helped revive the city, and farming, cattle and sheep ranching, and tourism began to provide a more stable economy. Railroads brought in sugar beets, wheat, and livestock, and Denver became a food processing region. This industry was supported by waves of immigrants.

Military activities—defense contractors and other facilities related to the Cold War—contributed to an economic boom after World War II, but most of these activities ended in the 1990s. Another boost came with soaring oil production in the 1970s, and high-rise office buildings were constructed throughout the city. However, Denver's population began declining after reaching a peak in about 1970, and a crash in oil prices in the mid-1980s led to economic bust. Increasing population and the

growth of tourism brought back prosperity in the 1990s, the city's population surpassing its 1970 level by 2000.

The region's rapid growth has increased the strain on its infrastructure, especially water and transportation systems. The bulk of Denver's water supply comes from spring snowmelt in the mountains that is stored in large reservoirs or diverted from the South Platte River and other streams. During periods of drought, it is sometimes necessary to restrict water usage. The vast majority of Denverites rely on cars for transportation, and traffic congestion and pollution from auto emissions are chronic problems; at times, residents' views of the mountains are obscured by smog. One approach to reducing automobile use has been to construct a light-rail transit system, the first line of which opened in 1994.

As the largest city of a vast region between the Missouri River and the Pacific states, Denver serves as a transportation, industrial, and commercial hub and is a center of high-technology industries. Major businesses include telecommunications, aviation and aerospace, software, financial and business services, and health care. Tourism is a primary economic factor.

The Denver branch of the U.S. Mint (opened as a mint in 1906) produces about half of circulating U.S. coinage and is the nation's second largest gold depository.

Denver International Airport, one of the country's largest, opened in 1995 and is located about 23 miles (37 km) northwest of the city.

Denver lies at the junction of Cherry Creek and the South Platte River. Its elevation (5,280 feet [1,609 meters] above sea level at the State Capitol), which gives it the nickname "Mile High City," and a mild, sunny, dry climate are distinctive characteristics.

Governance

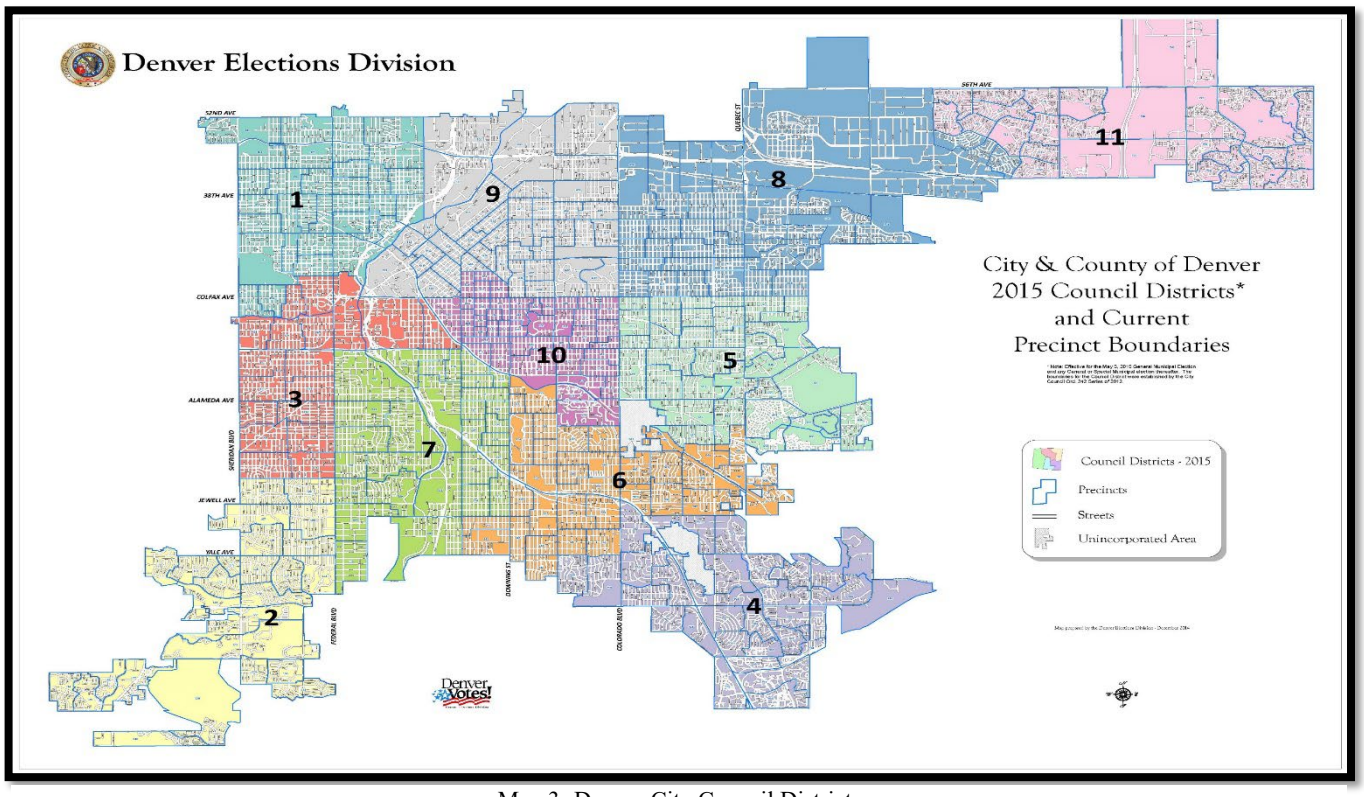
Since 1904, the CCD has operated under a Mayor-Council designed form of government. This Mayor-Council relationship collectively sets the programs and services that the CCD will provide. The fire chief is appointed by the sitting mayor with approval from City Council through a majority vote. The Denver Charter defines the overarching structure, governing rules, and procedures for the Denver Fire Department. All the CCD's safety agencies operate as part of the Department of Public Safety and the Chief of the Department reports to the Executive Director of Safety (EDOS). The EDOS is appointed by the mayor and approved by City Council

The CCD annual budget process allocates financial resources to support the agencies within the city, as well as the approved programs/service determined to be provided by the mayor-Council process.

The voters of Denver elect City Council members to:

- Make laws.
- Budget the city's money.
- Investigate city agencies and employees.

Denver is divided into 11 districts and each district elects one council member to represent it. Two other council members represent the entire city and are called "members at large.



Map 3- Denver City Council Districts

The Denver City Council listened to, and engaged with, people in the city to identify the city's most urgent needs. On May 20, 2022, the council met at a budget retreat where it set six budget priorities,

along with a set of specific items the council believed deserve special attention in the mayor's proposed budget.

These priorities and the highlighted items are below.

- Focus on improving Community Engagement and Customer Service to support residents navigating city services, resources, and accessibility, including language access.
- Increase affordable housing and support those experiencing homelessness throughout our city. Mitigate and reduce the involuntary displacement of community members and businesses.
- Reframe safety in a public health, evidence-based, and anti-racist context with community investment to ensure healthy neighborhoods.

Funding (Financial Basis)

The mayor works with city departments to write a draft proposed budget. The proposed budget is made public and given to the City Council by September 15.

After it gets the proposed budget, the council holds a series of budget hearings with the leaders of various city departments. The hearings help council members understand the needs and the rationale behind budget expansions and changes. After the hearings, the council does its own work on the budget and will make recommendations to the mayor.

The mayor can then modify the budget, considering the council's suggestions. After the mayor returns the modified budget, the City Council will hold a public hearing to get input from Denver residents. The council may still amend the budget before giving it final approval.

The Budget and Management Office (BMO) is responsible for monitoring the implementation of the City's adopted annual budget and will review quarterly actual expenditure and revenue reports compared to the budgeted amounts. BMO will also monitor department and agency progress in completing their work program through regular communication with agencies and review of programmatic performance indicators. Additionally, BMO will notify agencies and the Mayor's Office of any intended variances and develop corrective plans. The Budget and Management Office will work with agencies in approving mid-year budget changes. This includes:

- Budget adjustments moving budget out of the personnel service and capital equipment categories.
- Budget adjustments requiring supplemental appropriations or rescissions.
- Revision of the revenue budget.
- Revision of the work program.

The Director of Budget and Management and the agency manager will present the recommendation to the mayor for approval once a recommendation is developed.
The Denver Fire Department follows the Budget Manual created by the BMO. With the exception of the Airport Division, each Division Chief within the Department submits a budget to be reviewed by the Department Finance Manager and the Chief of the Department. The budget is monitored monthly by the Department Finance Manager with the Chief of the Department.
The Denver Fire Department received $129.5 million in the 2022 budget. This was a $5.3 million increase from 2021 but nearly $20 million down from 2020 and 2019, since Denver's airport revenue reimbursements were separated from the fire department.

Of the funding increase, over 62% would be delegated to personnel. New personnel plans include five fire protection engineers for permit reviews, one mechanical inspector for equipment repairs, and four emergency medical technicians (EMTs).

The four EMTs would establish an additional medical unit in Denver to help respond to emergencies along the southwest corridor of Federal Boulevard which is a hotspot for violent crime that often requires the department's EMTs. City Council members supported the medical unit expansion, but requested additional expansions be considered throughout the city.
The spending plan also includes $1.6 million to hold two recruitment academies in 2022. Each academy had 24 recruits, replacing the average 37 firefighters lost to attrition annually. Other funds

went towards expanding the department's firefighter wellness program, increasing supplies for board-up services, and maintaining personnel agreements with Denver Health and Denver International Airport.

With more than 11,000 employees, the City and County of Denver team members are the heart of Denver. They make a real difference with the work they do every day and have a hand in shaping the future of the city.

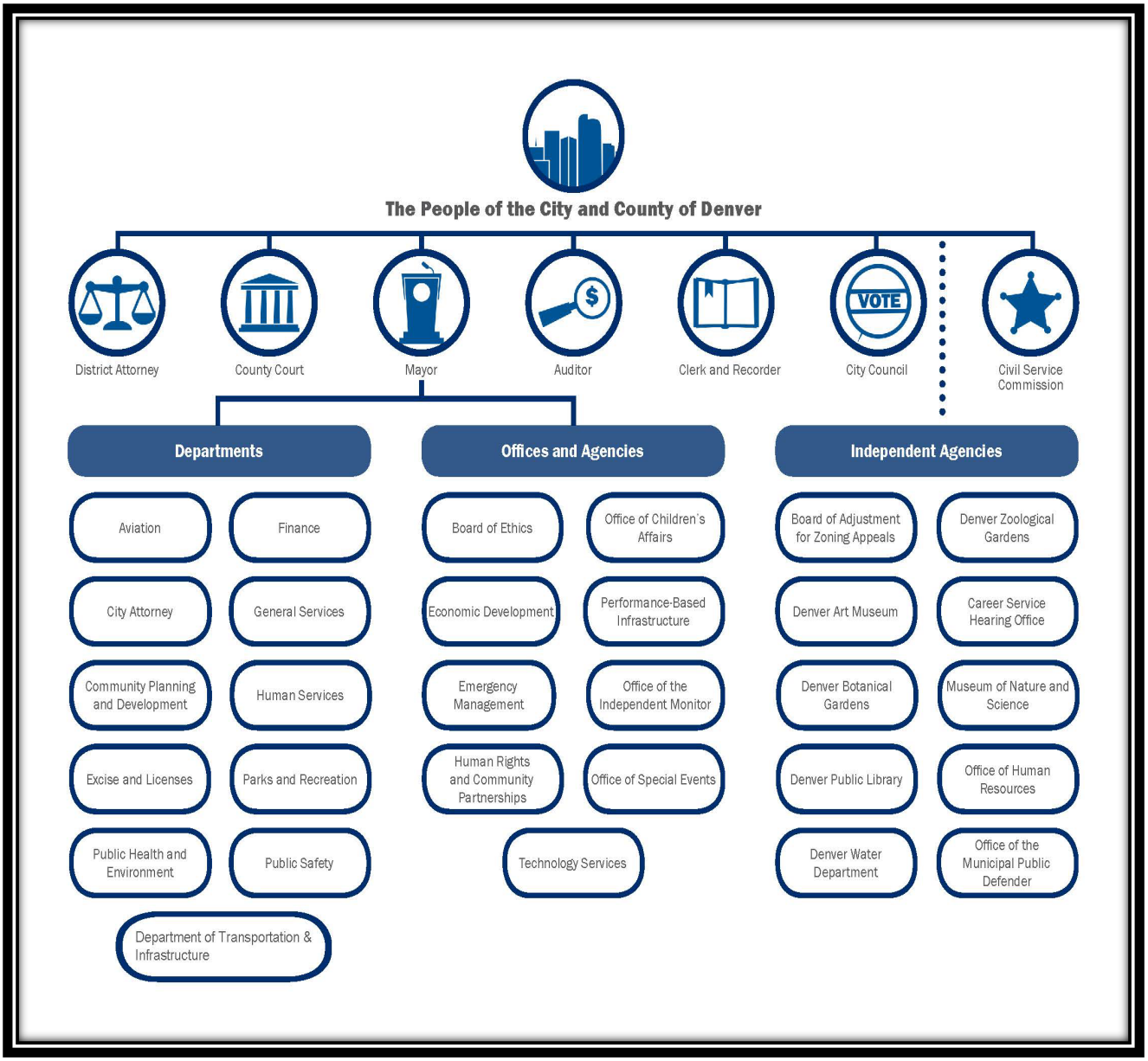


Figure 1 City of Denver Department Organizational Chart

Demographics

Denver is a city that values the strength of its culture, history, and heritage. Denver is proud that nearly half of its population is comprised of minority groups; Denver's population is approximately 49% Caucasian, 34% Hispanic or Latino, 10% Black, 4% Asian, 1% Native American and at least 2% two or more races.

According to the 2020 Census data, the City and County of Denver has an official population of 715,522, a 10.1% increase since 2015. The following tables break down key demographic, economic, and social characteristics based on data from the US Census Bureau. Table 1, Table 2, Table 3, and Table 4, summarize various demographic, economic, and social characteristics of the City of Denver over time with data from the US Census Bureau 2020 American Community Survey (ACS). (Note that in some cases the 2020 ACS estimates may be different from the official 2020 Census numbers; the ACS estimates are used throughout this section for consistency.)

City and County of Denver	2015	2020	% Change
Population	649,654	715,878	10.2%
Median Age	34.1	34.6	1.5%
Total Housing Units	294,191	306,269	4.1%
Housing Occupancy Rate	94.6%	94.00%	-0.6%
% of Housing Units with no Vehicles Available	11.0%	9.60%	-12.7%
Median Home Value	$271,300	$427,600	57.6%
Unemployment Rate	6.3%	4.30%	-31.7%
Mean Travel Time to Work (Minutes)	24.8	25.7	3.6%
Median Household Income	$53,637	$72,661	35.5%
City and County of Denver	**2015**	**2020**	**% Change**
Per Capita Income	$35,218	$45,636	29.6%
% of Individuals Below Poverty Level	17.3%	11.90%	-31.2%
% Without Health Insurance	14.5%	9.60%	-33.8%
# of Households	275,795	287,756	4.3%
Average Household Size	2.30	2.44	6.1%
% of Population Over 25 with High School Diploma or Higher	86.1%	89.10%	3.5%
% of Population Over 25 with Bachelor's Degree or Higher	45.0%	50.30%	11.8%
% with Disability	9.5%	9.70%	2.1%
% Speak English less than "Very Well"	11.1%	8.90%	-19.8%

Source: US Census Bureau, 2020 American Community Survey

Table 1: City and County of Denver Demographic and Social Characteristics 2015-2020

Demographic and Social Characteristics (as of 2020)	City	Colorado	US
Median Age	34.6	36.9	38.2
Housing Occupancy Rate	94.00%	90.50%	88.40%
% of Housing Units with no Vehicles Available	9.60%	5.00%	8.50%
Median Home Value	$427,600	$369,900	$229,800
Unemployment Rate	4.30%	4.60%	5.40%
Mean Travel Time to Work (Minutes)	25.7	25.8	26.9
Median Household Income	$72,661	$75,231	$64,994
Per Capita Income	$45,636	$39,545	$35,384
% of Individuals Below Poverty Level	11.90%	9.80%	12.80%
% Without Health Insurance	9.60%	7.80%	8.70%
Average Household Size	2.44	2.6	2.6
% of Population Over 25 with High School Diploma or Higher	89.10%	92.10%	88.50%
% of Population Over 25 with Bachelor's Degree or Higher	50.30%	41.60%	32.90%
% with Disability	9.70%	10.80%	12.70%
% Speak English less than "Very Well"	8.90%	5.60%	8.20%

Source: US Census Bureau, 2020 American Community Survey

Table 2: Demographic and Social Characteristics Compared to the State and Nation

City and County of Denver	Population	%
Total Population	715,878	100%
Male	358,669	50.1%
Female	357,209	49.9%
White, not Hispanic	387,855	54.2%
Hispanic or Latino	211,409	29.5%
Black	63,132	8.8%
Asian	25,414	3.6%
American Indian and Alaska Native	2,832	0.4%
Native Hawaiian and Other Pacific Islander	868	0.1%
Some Other Race	1,443	0.2%
Two or More Races	22,925	3.2%

Source: US Census Bureau, 2020 American Community Survey

Table 3: Demographics by Race and Sex

Type of housing units	Total	%
Total housing units	306,269	100%
1-unit detached	135,165	44.1%
1-unit attached	25,232	8.2%
2 units	8,165	2.7%
3 or 4 units	9,437	3.1%
5 to 9 units	13,927	4.5%
10 to 19 units	24,733	8.1%
20 or more units	88,243	28.8%
Mobile home	1,212	0.4%
Boat, RV, van, etc.	155	0.1%

Table 4: Types and Total Amounts of Housing Units in the City and County of Denver

Occupations and Industries

According to 2020 American Community Survey data, the planning area's economy is strongly based in the education, health care and social assistance industries (21% of total employment), followed by the professional, scientific, and management, and administrative and waste management services (18%), and arts, entertainment, and recreation, and accommodation and food services (10%). Figure 1 shows the distribution of industry types in City and County of Denver, as a share of total civilian employment.

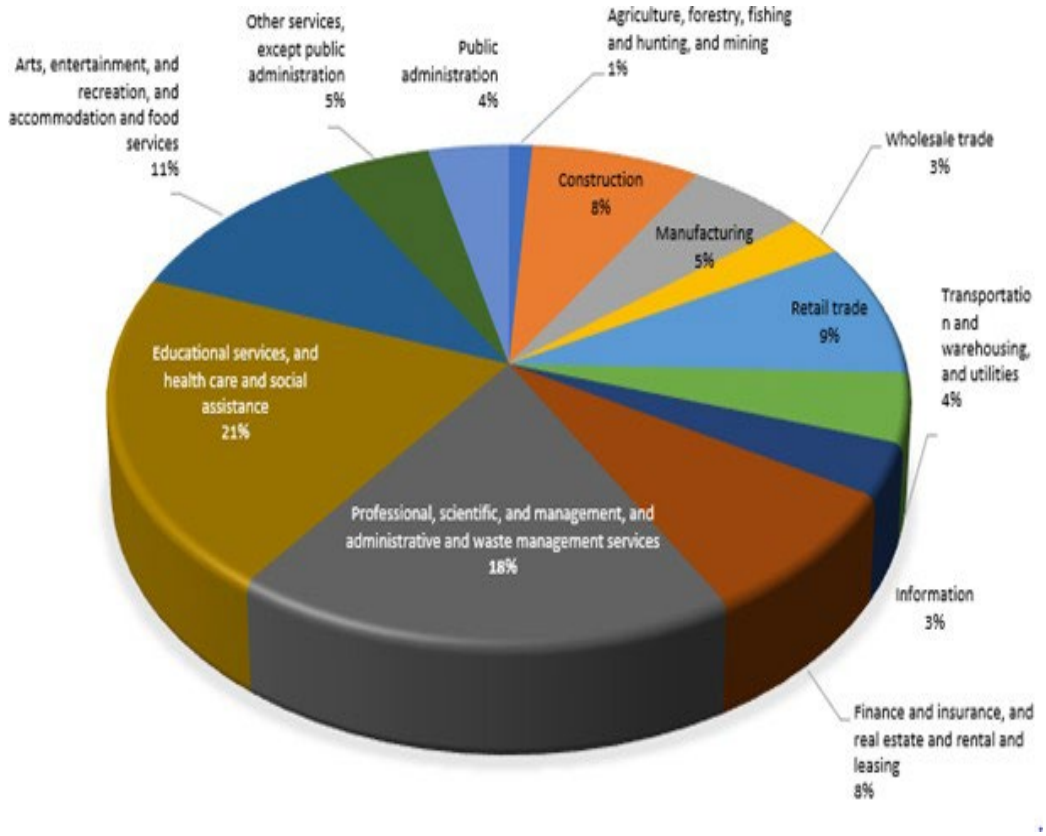


Figure 2 Percent of Total Employment by Industry in the City of Denver

Table 5 below lists the largest private employers in Denver according to the Metro Denver Economic Development Corporation (EDC).

Company	Industry	Employment
United Airlines	Airline	7,000
Southwest Airlines	Airline	4.450
University of Denver	University	3,770
Frontier Airlines	Airline	3,070
HealthONE: Presbyterian/St. Luke's Medical Center and Rose Medical Center	Healthcare	3,000
Saint Joseph Hospital	Healthcare	2,580
Anthem Blue Cross Blue Shield	Insurance	2,310
Kaiser Permanente	Healthcare	2,290
Xcel Energy	Utilities	1,850
National Jewish Health	Healthcare	1,700

Source: Metro Denver EDC, Development Research Partners, June 2020

Table 5 : Largest Private Employers in the City and County of Denver

Geography

Denver sits in-between the Rocky Mountains on the west and the High Plains to the east. The area is identified as the Front Range. The City of Denver is 153.4 square miles of which 151.8 square miles are land, and 1.6 square miles is water. The elevation of the city is 5,278 feet above sea level. Denver has been coined as the "Mile-High City" because it is a mile above sea level. The elevation ranges from 5,130 feet at the lowest point and 5,690 feet at the highest point.

Rivers and Lakes

South Platte River and Cherry Creek are the two major rivers that run through Denver. The South Platte River originates in Park County, Colorado. It flows down from the mountains passing through Waterton Canyon into the foothills southwest of Denver. The South Platte flows into Chatfield Reservoir, which is a major source of drinking water for Denver.

The Cherry Creek River forms in the high plateaus east of the front range in northwestern El Paso County. The Creek runs past Parker and through southeast Denver into Cherry Creek Reservoir. The reservoir provides flood control and irrigation to the surrounding communities.

North Denver has three large bodies of water. Berkeley and Rocky Mountain Lake are located north-west of Denver along I-70. The parks offer fishing, walking paths and open areas for outdoor activities. Sloan's Lake is located on Sheridan Blvd along the border between Edgewater and Denver. The lake is open to water skiing, triathlons, and the annual Dragon Boat races. Fishing and other outdoor activities are available.

Washington Park, one of Denver's most popular parks for recreation has two lakes. The main lake, located on the north side of the park, has a boathouse that was constructed in 1913. The Denver Fire Department uses both lakes for dive and over the ice training.

City Park is a large open area park in central Denver that is 330 acres. The park is home to the Denver Zoo and the Museum of Nature and Science. There is one large body of water and several small ponds within the park.

Marston Reservoir is a body of water located on the south-west side of Denver. This is one of the three water treatment plants, and that provides drinking water to Denver. Thus it is closed to all activities.

Climate

Denver is located within a semi-arid, continental climate zone with four distinct seasons: winter, spring, summer, and fall. July is the hottest month of the year with an average temperature of 88 degrees Fahrenheit with December being the coldest month of the year with an average temperature of 31 degrees Fahrenheit. The annual average overall temperature is 50 degrees Fahrenheit. The dry climate produces 16 inches of rain annually on average.

Winter-like weather can be expected to arrive in late fall and end in early spring with an average snowfall of 54 inches per year. It is common for snow to begin falling in mid-November and end in late April. Winter temperatures can dip down to -10 degrees during the cold spells.

Blizzard conditions can occur as early as November and as late as March. Tornadoes are rare west of the I-25 corridor but do occasionally happen. Other tornadoes, often called landspout tornadoes, have been spotted near DEN and further to the east. Spring can also be host to extreme hail events.

Utilities

In 1918 the residents of the City and County of Denver purchased Union Water Company. To keep local politics, separate from water service Denver Water was created as an independent entity from the City and County of Denver. Denver Water's service area covers 335 square miles and serves roughly 1.4 million consumers.

Denver Water is supplied by multiple reservoirs, rivers, and creeks that flow to three water treatment plants: Marston, Moffat, and Foothills. Denver water treats and distributes 240 million gallons of water per year. Denver Water maintains roughly 5,000 linear miles of water lines not including service lines. Denver Water has 34,597 hydrants they maintain. Repairs on average took 9.2 days to complete.

Denver Water maintains a minimum hydrant flow of 1,500 gallons per minute at 20psi residual pressure for new and existing hydrants and is governed by the IFC Appendix B. The break down for flowing hydrants in Denver is as follows:

Under 500gpm- 0.2%

Between 500gpm/1000gpm- 1.5%

Between 1000gpm/2000gpm- 9.6%

Between 2000gpm/3000gpm- 15.3%

Above 3000gpm- 73.3%

Denver Department of Public Works maintains roads and walkways in parks throughout Denver. This maintenance includes snow removal, re-paving operations, and filling potholes within the the City and County of Denver. The agency takes care of trash and recycling collection, large item trash removal, graffiti cleanup, sewage, stormwater, and the B-Cycle program.

Denver Wastewater Management is a department within public works that oversees the collection, treatment, and disposal of sewage and stormwater. There are more than 1,500 miles of sewer and 800 plus miles of storm drainage lines.

Xcel Energy (which operates in eight states) is Denver's electricity and natural gas provider. Comcast, CenturyLink, Sprint, Verizon, AT&T, and Cricket all offer phone and Internet service in Denver. The City and County of Denver

Wastewater Management Division plans, designs, constructs, operates, and maintains more than 1,500 miles of sanitary sewers and 750 miles of storm drainage facilities.

Roads

The City and County of Denver has roughly 2,592 miles of roads which are maintained by Public Works. Two systems are utilized in Denver. The original grid system was developed when Denver was forming as a city. The grid area includes Downtown and the Auraria Campus. The new or current grid system encompasses the remaining areas of Denver.

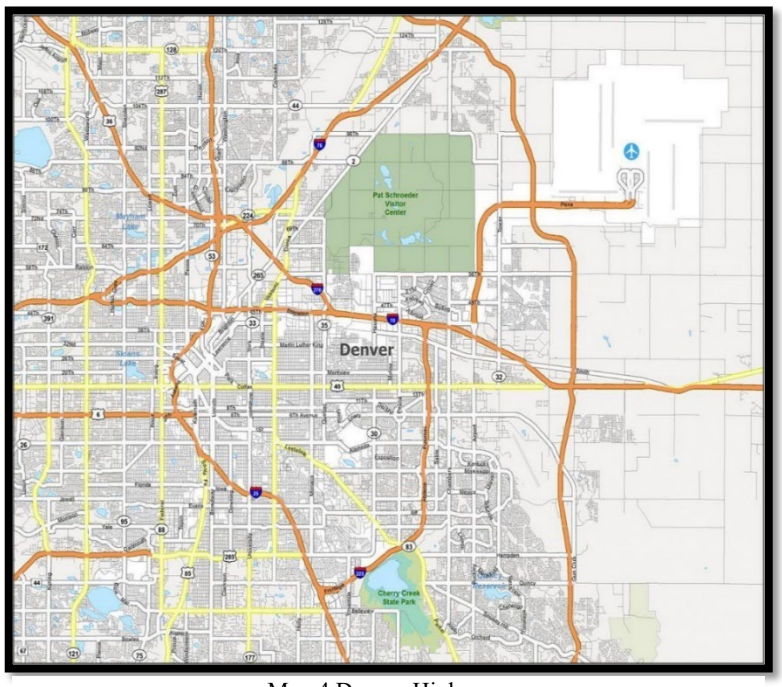
The current grid starts at Broadway and runs north and south. It has a street designation of zero.

Ellsworth runs east and west and has a street designation of zero. North of Ellsworth, the streets are assigned numbers while streets to the south of Ellsworth are names. The only exception to this is the rule is Colfax (1500), Montview (2000), Martin Luther King Drive (3200) and Bruce Randolph (3400). Streets east and west of Broadway are designated with names. The only exception in this grid system is Morrison Road, Speer Boulevard, and Park Avenue which run diagonally within this system.

The original grid system was implemented when Denver was formed and growing quickly as a city. Most of the streets run northeast-southwest and northwest-southeast. The streets were designed to run parallel to the South Platte River and Cherry Creek confluence to aid with the snow melt in the winter months. The NW-SE streets are numbered, while the NE-SW streets are named.

Highways

Two main highways route through Denver. Four additional freeways feed traffic around and into Denver. I-70 runs east to west and is located on the north side of the city. I-25 runs north to south connecting Colorado Springs and Fort Collins traveling through Denver. The two highways intersect on the north side of Denver.



Map 4 Denver Highways

Freeway 6, also known as 6th Avenue, connects Denver to Golden and Lakewood. The freeway runs through Denver from Golden and ends on the east side of Denver. Highway 285 also comes out of the mountains and enters Denver on the south side of the city allowing travel to and from the town of Morrison and other mountain communities. The street/highway terminates on the south-east side of Denver.

I-225 and I-270 travel through the city and connect Aurora, Cherry Creek, and Commerce city of Denver. I-225 connects I-70 to I-25 traveling through the city of Aurora and Cherry Creek. The highway begins on the north-east side of Denver then connects to I-25 in the south-east side of town. I-270 begins and ends at I-70 on the north-east side of town west of I-225 connecting Denver to northern cities.

Airport

Denver International Airport, also known as DEN, is located twenty-three miles from downtown Denver. The airport utilizes 169 gates spanning three independent concourses attached by an underground electric railway system. The airport is accessible by way of Pena Boulevard, E-470, and the RTD A-line.

DEN is ranked the 3rd busiest airport in the United States serving 58.8 million passengers in 2022. DEN serves over 214 destinations including 26 International cities in 13 countries.

Rail Lines

FasTracks operates two types of trains, commuter rail, and the light rail. The commuter rail lines have a capacity of 90 seats with room for 140 standing passengers. There are three lines, The A-Line, services the route from Union Station to DEN. The G Line travels from Union Station to Wheat Ridge and Arvada. The H Line operates from Union Station connecting Westminster to Denver.

Most of the trains that operate within the FasTracks system are light rail lines. The cars are smaller in size, lighter, provide more stops, and travel at speeds not to exceed 55 miles per hour. The trains have 64 seats and room for 80 standing passengers. Currently, five light Rail lines operate in and around the city. The five lines are the B, C, D, E, and F lines. These lines are responsible for connecting Denver to the West, South, and East.

Denver also has a variety of commercial railroad operations within the city limits. Union Pacific is located near the intersection of I-70 and I-25 on the south-east side. Goods are stored and transferred with rail lines in all four directions. Amtrak also makes stops at Union Station as it travels and connects San Francisco to Chicago through Denver.

Arts and Entertainment

The City and County of Denver is home to some of the region's most renowned facilities, including Red Rocks Park and Amphitheatre, Denver Performing Arts Complex, Colorado Convention Center, Denver Coliseum and McNichols Civic Center Building.

Denver celebrates its diverse cultural heritage with several events throughout the year. From the annual March Powwow to the nation's largest Cinco de Mayo celebration in the spring and the Colorado Irish Festival in the summer, Denver is a city of many cultures. The Colorado Gay Rodeo and PrideFest are celebrations of inclusiveness and acceptance. The historically rich African American Five Points neighborhood is home to the Black American West Museum and the Five Points Jazz Festival, while the Museo de las Americas in the Art District on Santa Fe showcases the work of the world's top contemporary artists from Latin America.

Fire Department History

When Denver was founded in 1858, the city's wood-frame buildings and the windy, arid nature of the surrounding plains made fire a continuous concern. Despite the constant threat that fire posed to the ever-growing city, efforts to form an official fire department were futile, with Denver instead relying on its citizens to douse fires. This system of firefighting proved insufficient as Denver quickly grew.

315th Street in Denver 1863

Volunteer citizens using buckets of water to extinguish flames was not the quickest or most effective method to fight fires, and until 1863, the city council made little to no effort to establish a formal fire department. It was only when the so-called Great Fire of April 19, 1863, destroyed the heart of Denver's business district that the city became aware of the pressing need for a formal department.

The Great Fire broke out behind the Cherokee House saloon around two in the morning, which meant that most citizen volunteers were asleep and did not wake to help fight the fire. It raged for about two hours, resulting in $200,000 in damages and reducing 40 percent of the business district between Market and Larimer Streets to ash. The city recovered quickly from the fire, rebuilding new brick structures, and implementing fire regulations in construction codes, yet hundreds had been left homeless and impoverished by the destructive blaze. Even with new construction codes, it was clear that a formal fire department and better firefighting equipment would be crucial to preventing another disaster like the Great Fire.

Protests after the Great Fire of 1863 finally pushed the city council to form a formal fire department. The initial steps to creating a fire department included acquiring equipment to make firefighting more efficient, installing an alarm and water-pumping systems, and recruiting volunteer firefighters. In 1881 firefighting in Denver turned professional when the city established the first paid company of the Denver Fire Department.

In 1866 efforts to establish an official fire department grew increasingly urgent when arsonists set several fires across the city. In early March 1866, after these fires destroyed multiple buildings, Denver citizens called a mass meeting at the People's Theatre to discuss establishing a fire department. The meeting resulted in a vigilance committee to be on the lookout for fires, arsonists, and other criminal activity as well as a resolution asking the city council to organize a fire department and purchase a steam fire engine with at least one-half mile of hose. The next morning, a petition was circulated to gather signatures from any man who wanted to join a firefighting organization. About fifty men signed, but little was done to make the fire department a reality.

At another firefighting meeting at a grocery store on the evening of March 25, 1866, organizers formed the Pioneer Denver Hook and Ladder Company No. 1, also called Volunteer Hook and Ladder Company No. 1. This was the first volunteer fire company in Colorado Territory. The city built a fire station for the company at 1534 Lawrence Street and equipped it with a hand-pumping draft engine as well as pike poles, axes, hose lines, and nozzles. An alarm bell placed in a tower near the station rang whenever a fire was reported to alert the volunteer crew. In 1867 the members of the new Volunteer Hook and Ladder Company No. 1 were primarily white, working-class men. In later years, when other volunteer companies assembled in different neighborhoods across the city, some ethnic and economic diversity emerged. However, immigrant firefighters tended to be clustered in volunteer companies based on neighborhoods, and black volunteer firefighters were segregated into one company. For the next several years, Volunteer Hook and Ladder Company No. 1 was the city's only protection against fire. However, the volunteer company struggled from a lack of staffing and water supplies, which continued to hinder its ability to fight fires. To remedy that problem, the city soon began to establish more volunteer companies and buy new equipment.

January 31, 1872, a livery barn burned to the ground. Several property owners recognized the continuing threat of fire and pushed the city to establish additional volunteer firefighting companies. The first of these was James Archer Hose Company No. 2, established that same year, followed by J. E. Bates Hose Company No. 3 and Woodie Fisher Hose No. 1. This brought the city's volunteer fire department up to one hook-and-ladder company and three hose companies. As the names suggest, hose companies were often smaller and equipped with a fire engine and hose, while hook-and-ladder companies had larger numbers and more equipment to fight fires in taller buildings near the heart of the city.

In addition to the formation of additional companies, 1872 saw the installation of the Holly Pressurized Hydrant System, which pumped water under pressure directly from the city's main water supply lines to the first fire hydrants in the city. This alleviated the water-supply problems that Volunteer Hook and Ladder Company No. 1 had encountered and improved the new companies' ability to fight fires.

In early 1873, Hook and Ladder Company No. 2 and Hose Company No. 4 were added to the department. The expansion of the department led to the construction in 1876 of a new Central Fire Station, a two-story building that replaced the old station on Lawrence Street. On June 6, 1876, the Gamewell Company completed the installation of a fifteen-box fire alarm system in Central Station. The new alarm system allowed for quicker response times to fires, which helped minimize damage across Denver.

The department continued to expand as more people moved to Denver. Tabor Hose Company No. 5, organized in 1879, later became the last volunteer company to disband after a paid department was established. Broadway Hose No. 6 formed to protect the palatial mansions that wealthy Denverites were building in Capitol Hill. In the fall of 1881, the J. W. Richards Hose Company started up to protect the section of the city closest to the South Platte River. In May 1881, a group of stonecutters reorganized James Archer Hose Company No. 4, which occupied Archer House on Curtis Street.

In 1881 a disastrous fire at the Windsor Hotel made it clear that fighting fires at the city's increasingly tall buildings would require more modern equipment and techniques. Chief George Duggan and Assistant Chief William Roberts appeared that year before Mayor Richard Sopris and the fire committee to make that point. The city council soon bought a steam fire engine, which was sent to the Central Fire Station on August 12, 1881.

The city also established the first paid fire companies of the official Denver Fire Department. Hose Company No. 1 started work at the Central Fire Station on September 1, 1881, where it was joined by Hook and Ladder Company No. 1. Firefighters in the new paid department were largely taken from the ranks of the volunteer companies, which gradually dissolved over the next few years (Tabor Hose No. 5 was the last volunteer company to disband in 1885). With paid firefighters and new equipment, Denver finally had a force capable of fighting fires in the growing city.

Section 2-Current Level of Service, Personnel and Staffing

The Denver Fire Department staffs 39 fire stations within a one hundred and 167 square mile area. The Denver Fire Department also provides fire protection to the citizens of Glendale, Sheridan, Skyline and Englewood.

The department maintains and operates 33 engines, nine trucks, eight towers, two heavy rescues, three med units, one Hazmat unit, three wildland rigs, one rescue boat, and one AirLight.

For the purposes of fire service, the City of Denver is divided into seven districts (six districts within the city, the seventh district being DEN). Each district within the city falls under the command of a District Chief (DEN has a Red Chief). The six District Chiefs report to the Shift Commander, who reports to the Division Chief of Operations.

Rank Structure	**Duties**
Chief	The Chief is the Executive Officer of the Fire Department. He/She shall have overall command responsibility of the Department.
Deputy Chief	Deputy Chief is the rank below Chief of the Department. The Deputy Chiefs is responsible for the day-to-day operations of the Department, acting as Chief of the Department when the Chief is unavailable.
Division Chief	Division Chiefs are Next in rank below Deputy Chief. Division Chiefs are appointed by the Chief of the Department and are responsible for the following Divisions: • Division 1 – Operations. Operations directs the management of all emergency response activities. • Division 2 – Fire Prevention. Fire Prevention directs the management of Fire Prevention, building plan reviews, inspections, permitting, Fire Code and Hazardous Material enforcement, as well as Community Risk Reduction. • Division 3 – Technical Services. Technical Services directs the management of the Repair Shop, Warehouse, Line Shop, Fire Communications, research & development and Dispatch operations. • Division 4 – Administration. Administration directs the management of Human Resources, Payroll, Fire Investigations, Internal Affairs, and Recruiting. • Division 5 - Safety and Training. Safety and Training Directs entry-level training, in-service training, officer and engineer promotional development, and safety. • Division 6 – Airport (DEN) directs the management of all aircraft and structural firefighting and training activities at Denver International Airport.
Shift Commander	The Shift Commander reports directly to the Division Chief of Operations. Shift Commanders perform as the Operations Safety Officer, and ensure continuity of operations across the Division

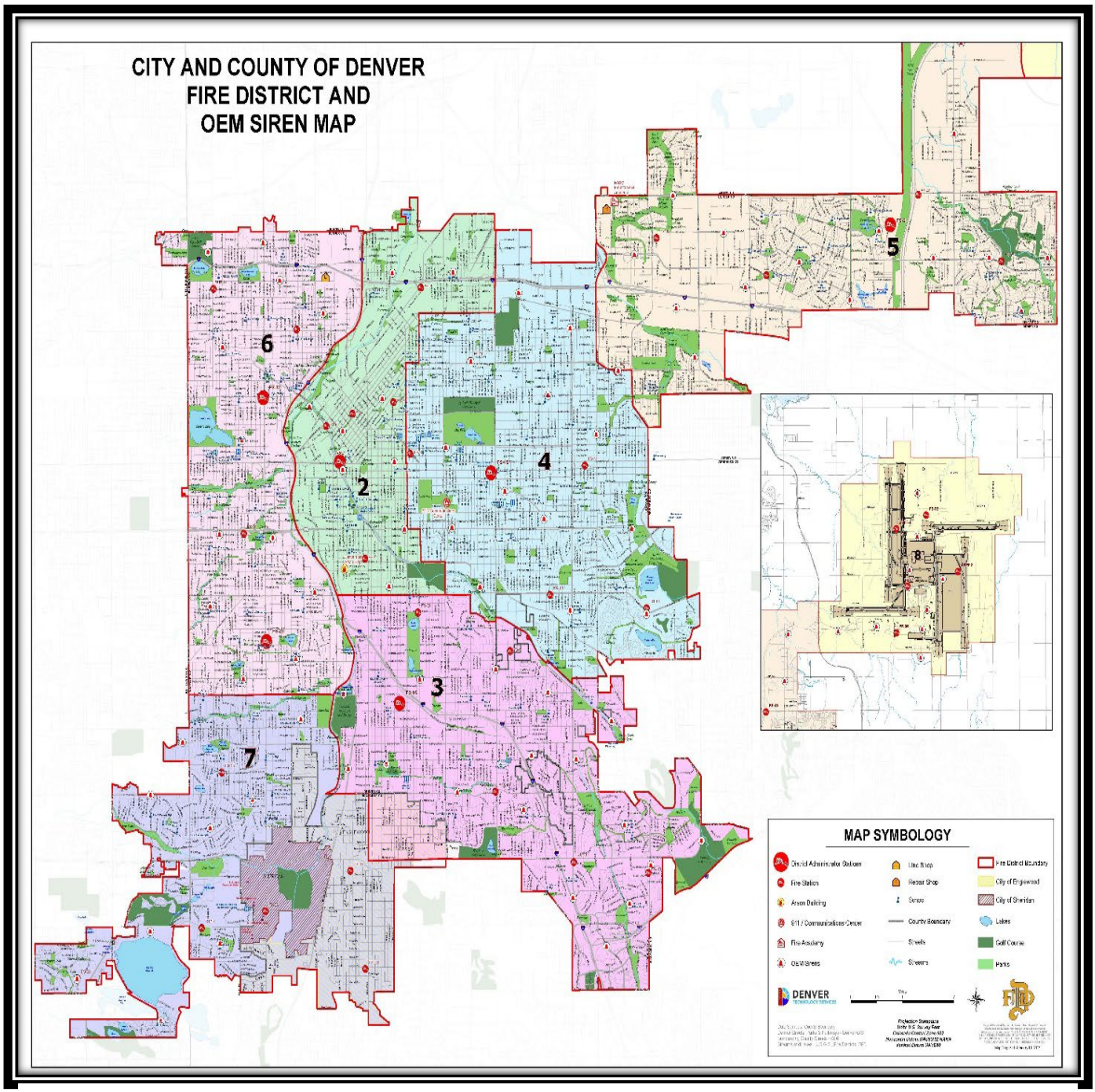
Assistant Chief	Assistant Chief is the rank below Shift Commander. Assistant Chiefs direct rescue and firefighting activities and manage their fire district on their shift. When assigned to support functions, they perform as senior staff members, responsible for managing their unit's activities as assigned.
Captain	Captain is rank below Assistant Chief. When assigned to Suppression, Captains direct the activities of their company on their shift, may act as Assistant Chief in the absence of the assigned Chief, manage or share management of their assigned station, and perform the duties of emergency scene command as appropriate. When assigned to support functions, they perform as senior staff members, responsible for managing their unit's activities as assigned.
Lieutenant	Lieutenant is the rank below Captain. When assigned to Suppression, Lieutenants direct the activities of their company on their shift and perform the duties of emergency scene command as appropriate. When assigned to support functions, Lieutenants serve as line officers who direct and/or complete tasks within the scope of their responsibility.
Engineer	Engineer is the rank below Lieutenant. Non-supervisory position subordinate to a company officer. Engineers are responsible for the operation and assigned routine maintenance of the apparatus to which they are assigned. Engineers also perform firefighting duties as directed by their company officers.
Technician	The Technician is a non-supervisory position in either Suppression or Support Service designated by the Chief of the Department. Prior to being appointed, Technicians demonstrate that they possess special skills, technical expertise, and/or training beyond that attained by other Firefighters.
Firefighter	Firefighters are the rank below Engineer. When assigned to Suppression, firefighters are subordinate to their company officer and perform as team members that mitigate emergency situations as directed.

Apparatus Staffing

The Department has set a minimum staffing level of four firefighters per engine, ladder/tower, and heavy rescue. Staffing levels are maintained with a liberal overtime policy that includes a very flexible and member friendly mandatory overtime policy. Each engine, ladder/tower, and heavy rescue has full BLS capability, including four EMT's and the capability to insert a King Airway and start an IV. The Department participates in Workload Distribution, a concept that has double company fire-stations alternate EMS calls after 10 pm. until 6:30 am every shift to improve firefighter wellness and safety.

Med Units are a two-person apparatus staffed with Department EMT's. The two to three Med Units (dependent on staffing availability) are positioned in the busiest parts of the city which aids in maintaining engines, ladders/towers remaining available to meet the Effective Response Force (ERF).

Denver Fire Department Stations and Apparatus			
Station	**Address**	**District**	**Units**
1	745 W. Colfax	2	Engine, Tower, Collapse, Underwater Rescue, Shift Commander
2	5300 Memphis St	5	Truck, Chief 5, E301 (Type 3 Wildland)
3	2500 Washington	2	Engine
4	1890 Lawrence	2	Truck, Med Unit 1, Chief 2
5	999 S. Clermont St	3	Engine
6	1300 Blake	2	Engine, Decon Unit, Foam Rig
7	2195 W. 38th Ave	6	Engine
8	1616 Park Ave	4	Engine, Truck
9	4400 Brighton Blvd	2	Engine, Tower, Hamer 1
10	3200 Steele	4	Engine, Rescue 2
11	40 W. 2nd Ave	2	Engine, Rescue 1
12	2575 Federal Blvd	6	Engine, Truck, Chief 6
13	3683 S. Yosemite St	3	Engine
14	1426 Oneida	5	Engine
15	1375 Harrison	4	Engine, Tower, Chief 4
16	1601 S. Ogden St	3	Engine, Truck, AirLight
17	4500 Tennyson St	6	Engine
18	8701 E Alameda Ave	4	Engine, HazMat Trailer
19	300 S. Ivy St	4	Engine, Truck
20	501 Knox Ct	6	Engine, Med Unit 2
21	1500 E. Virginia Ave	3	Engine, Hamer 3 (Dump Truck)
22	3530 S. Monaco Pkwy	3	Engine, Tower, BR602 (Type 6 Wildland)
23	850 S. Federal Blvd	6	Engine, Tower
24	2695 S. Colorado Blvd	3	Engine, Chief 3
25	2504 S. Raleigh St	7	Engine
26	7934 Martin Luther King	5	Engine, Truck
27	12927 E. Albrook	5	Engine, Tower
28	4306 S.Wolff St.	7	Engine, Truck, Chief 7
29	4800 Himalaya	5	Engine, BR601 (Type 6 Wildland)
30	4898 S. Dudley St	7	Engine
36	4101 S Federal Blvd	7	Engine
37	555 West Jefferson Ave	7	Engine, Denver Health Ambulance
38	4830 S Acoma Street	7	Truck, Denver Health Ambulance
39	9150 E 50th Ave	5	Engine, Command Van
DEN			
31	8525 New Castle St		Truck (Alpha and Bravo), Red 1, Red, 2, Red 3, DEN Mobile Command
32	10216 Trussville St		Engine (Alpha and Bravo), Red Chief
33	8882 Electra Street		Red 5, Red 6, Red 8
34	9878 Kewaunee St		Red 4
35	25365 E 75th Ave		Engine (Alpha and Bravo), Truck, DGRT, Snowcat

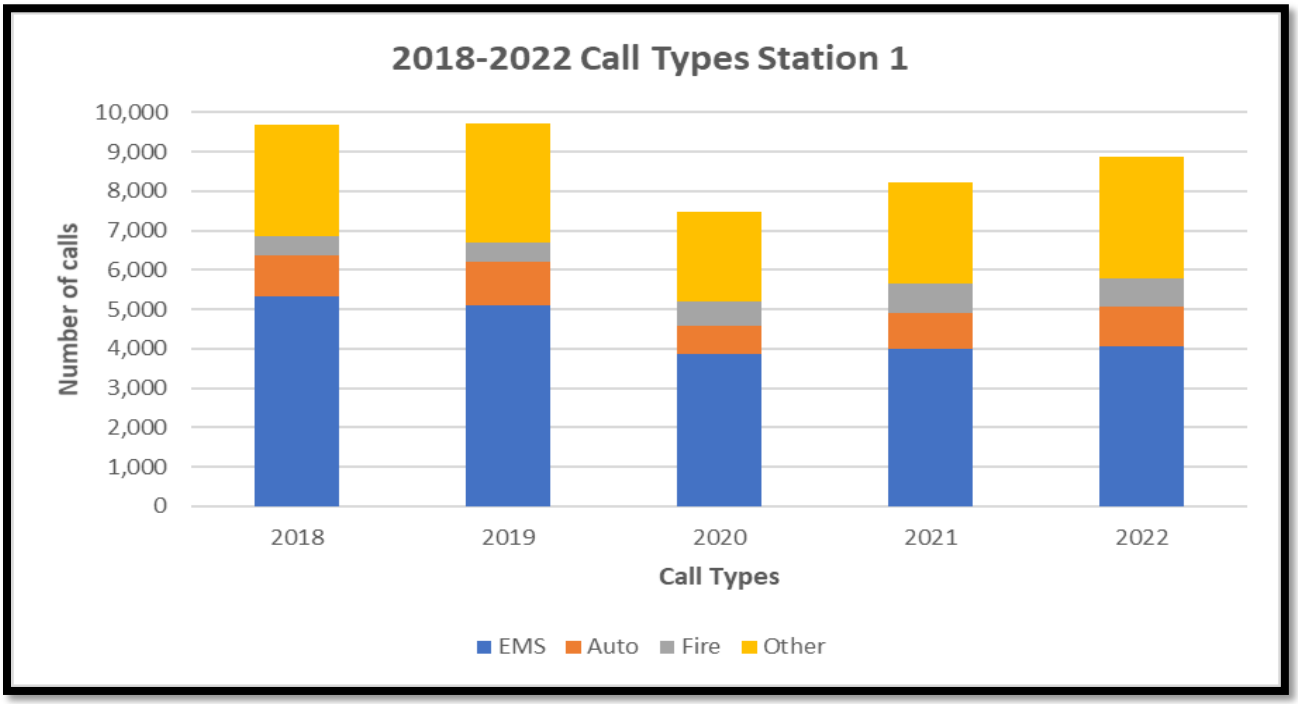


Map 5 Denver Fire District Map

Denver Fire Station Profiles

District 2

Station 1
745 West Colfax Ave.
Engine 1
Tower 1
Collapse Trailer
Underwater Rescue
Shift Commander

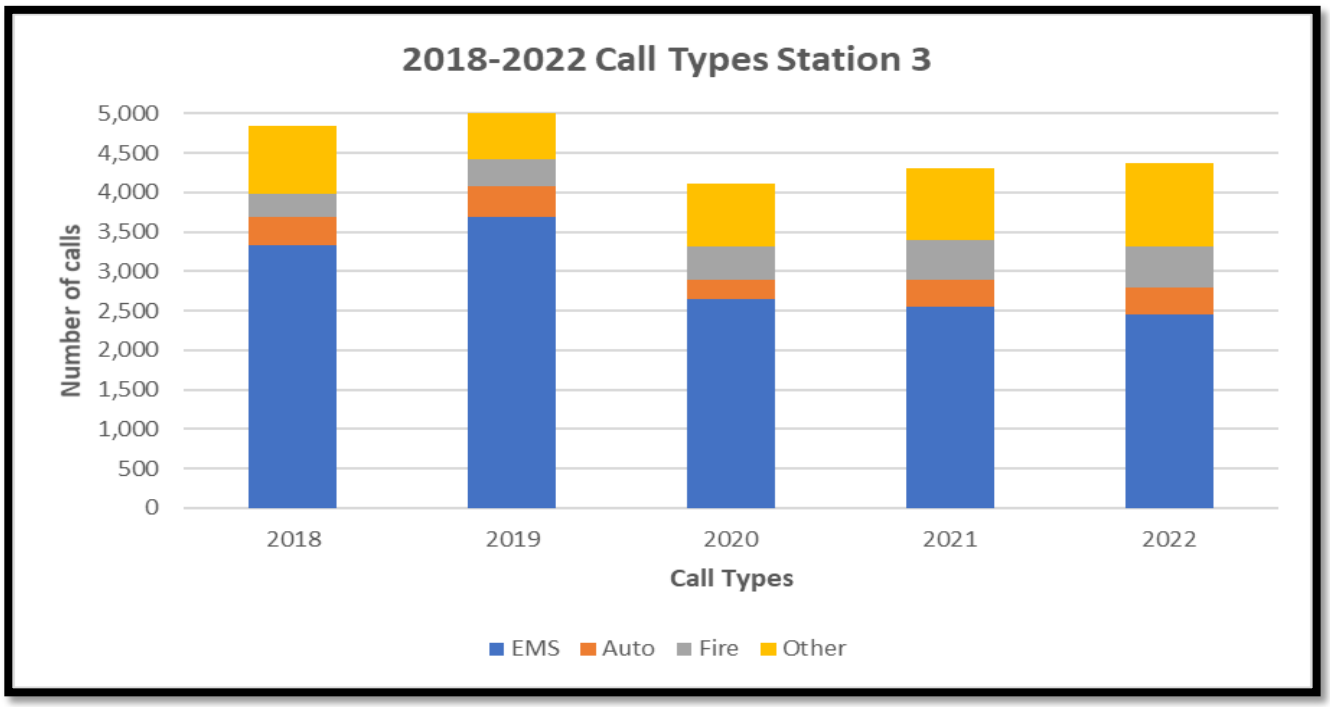


Calls by Unit

Unit	2018	2019	2020	2021	2022
Tower 1	3958	4047	2950	3228	3522
Engine 1	4778	5046	4122	4569	4715
Collapse Trailer	14	39	39	31	39
Underwater Rescue	8	58	30	28	47
Shift Commander	248	268	229	222	230

District 2

Station 3
2500 N. Washington Street
Engine 3

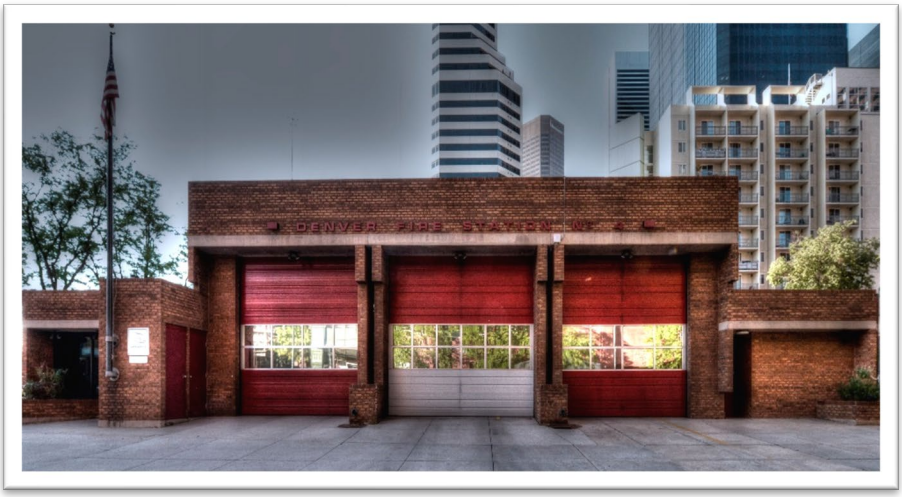


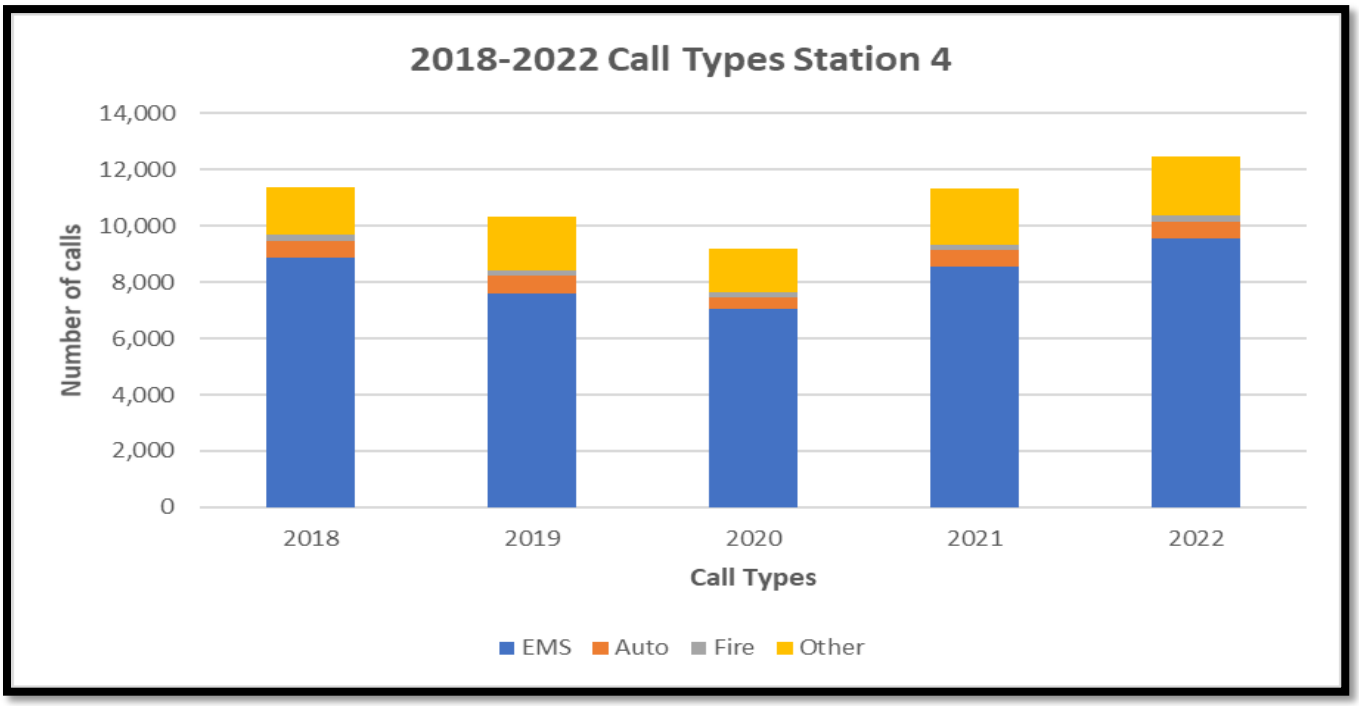
Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 3	4657	5316	4021	4204	4236

District 2

Station 4
1890 Lawrence
Truck 4
Med Unit 1
Chief 2



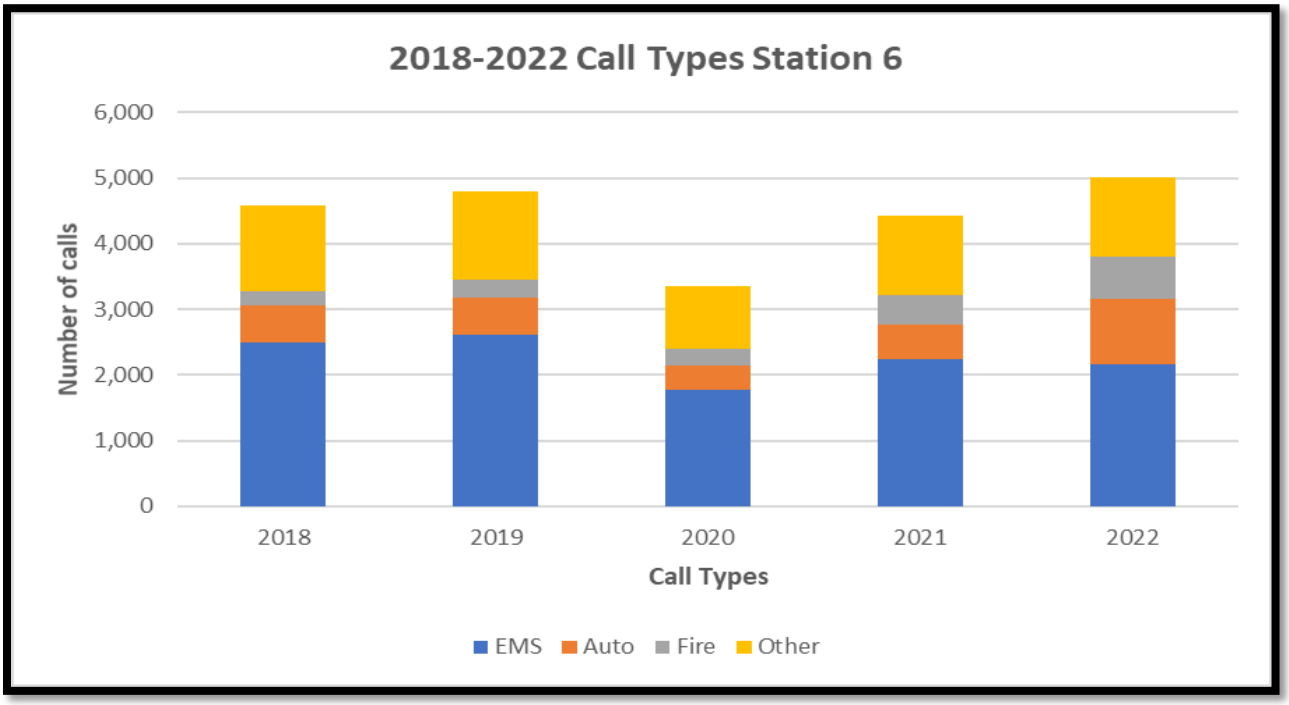


Calls by Unit

Unit	2018	2019	2020	2021	2022
Truck 4	6764	6827	4740	5371	5125
Med Unit 1	1651	3037	3885	5177	5149
Chief 2	2996	3026	2410	2715	2864

District 2

Station 6
1300 Blake
Engine 6
Decon Unit
Foam Unit

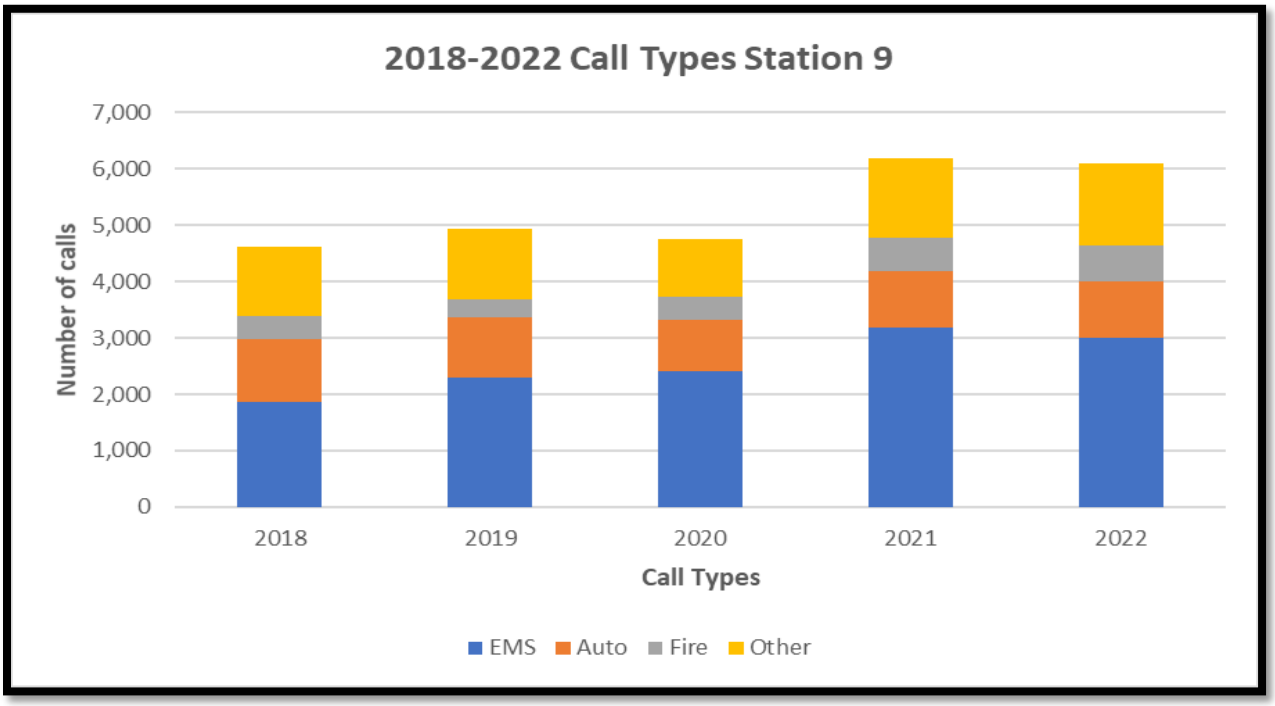


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 6	4322	4659	3293	4342	4199
Decon Unit	15	5	9	9	8

District 2

Station 9
4400 Brighton Blvd.
Engine 9
Tower 9
Hamer 1

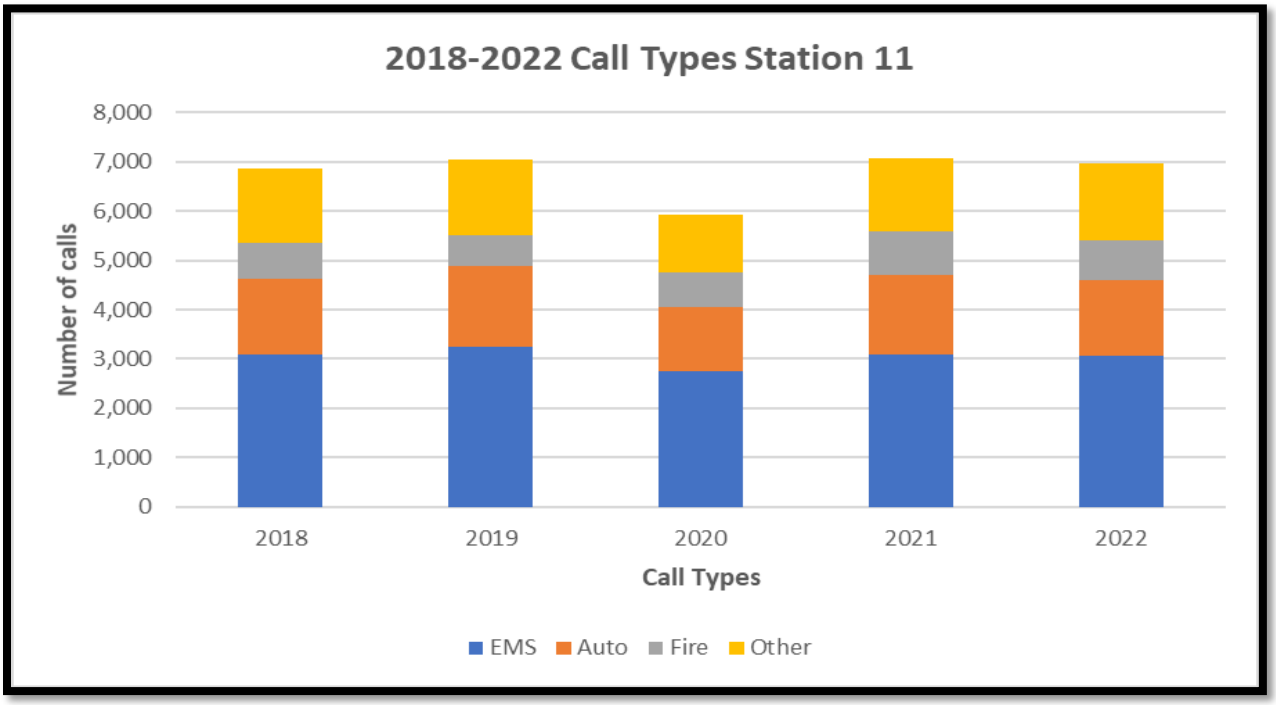


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 9	2696	3002	2852	3475	3532
Tower 9	1559	1700	1709	2246	2093
Hamer 1	119	27	18	235	231

District 2

Station 11
40 West 2nd Ave
Engine 11
Rescue 1

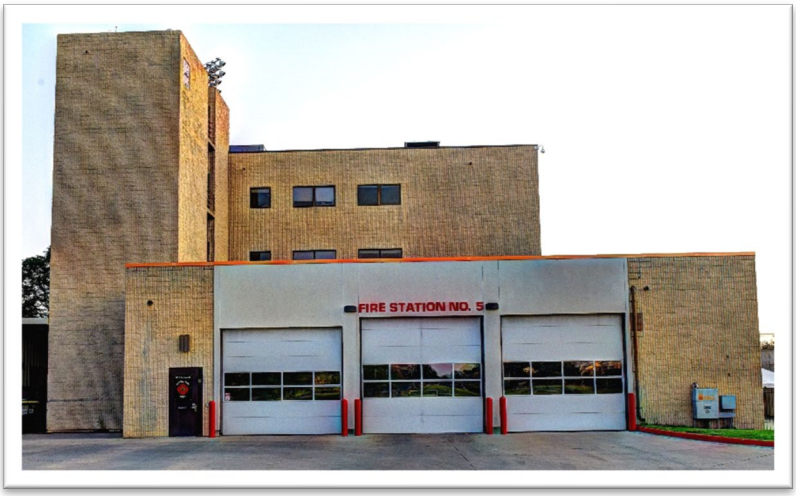


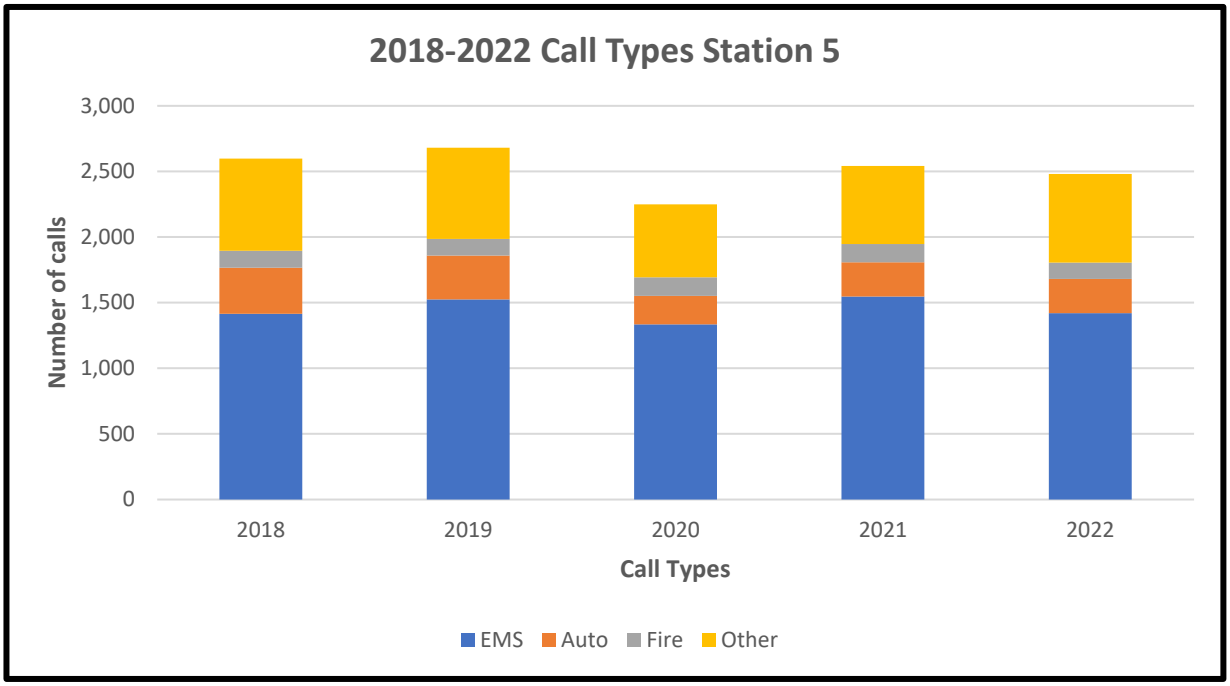
Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 11	3841	4065	3502	4490	4364
Rescue 1	2689	2676	2070	2272	2414

District 3

Station 5
999 S Clermont Street
City of Glendale
Engine 5



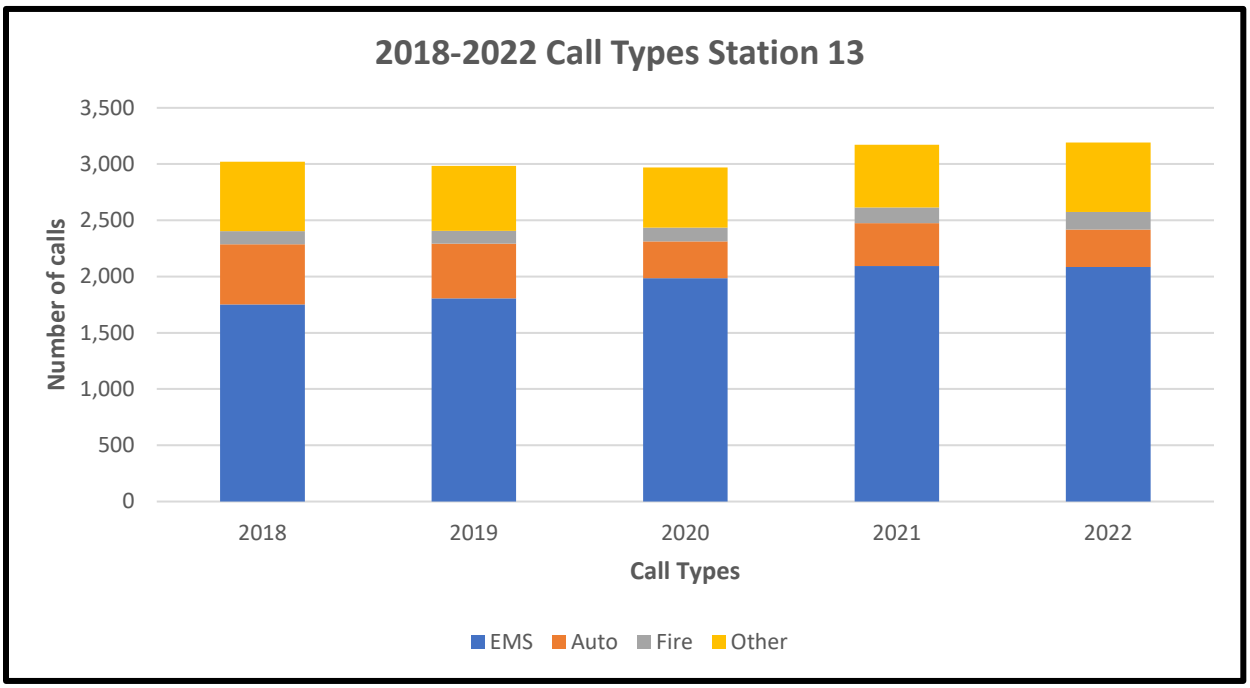


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 5	2484	2591	2481	2448	2387

District 3

Station 13
3683 S Yosemite
Engine 13

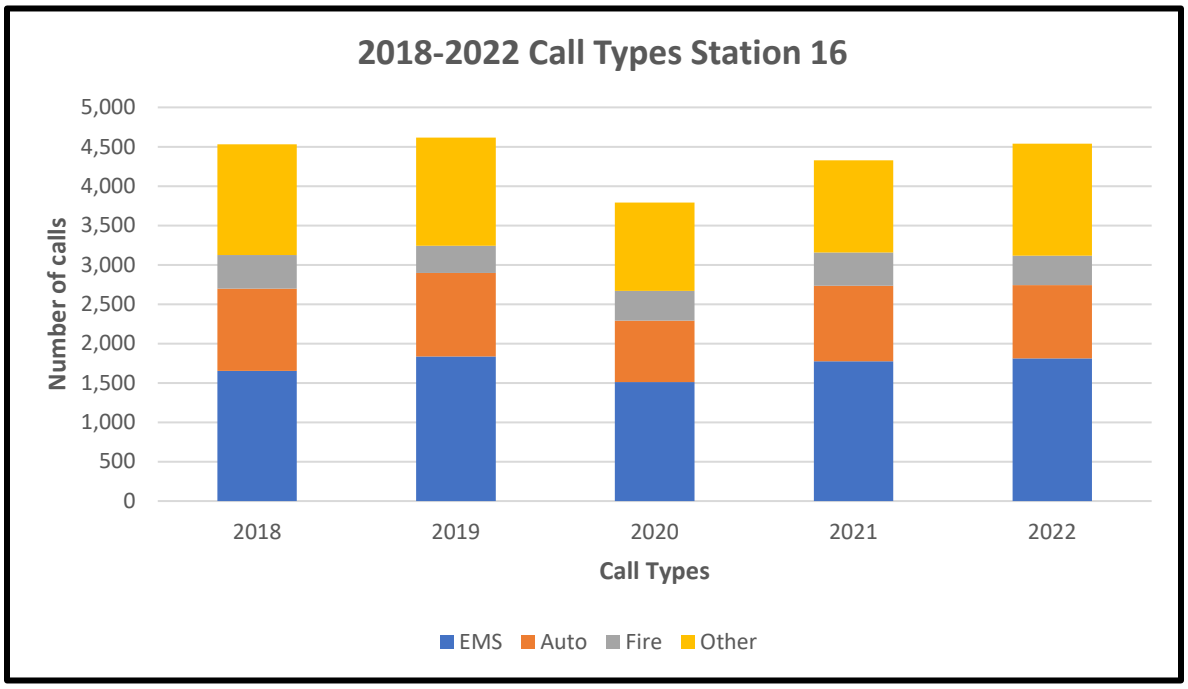


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 13	2918	2868	2835	3071	3081

District 3

Station 16
1601 S Ogden
Engine 16
Truck 16
AirLight

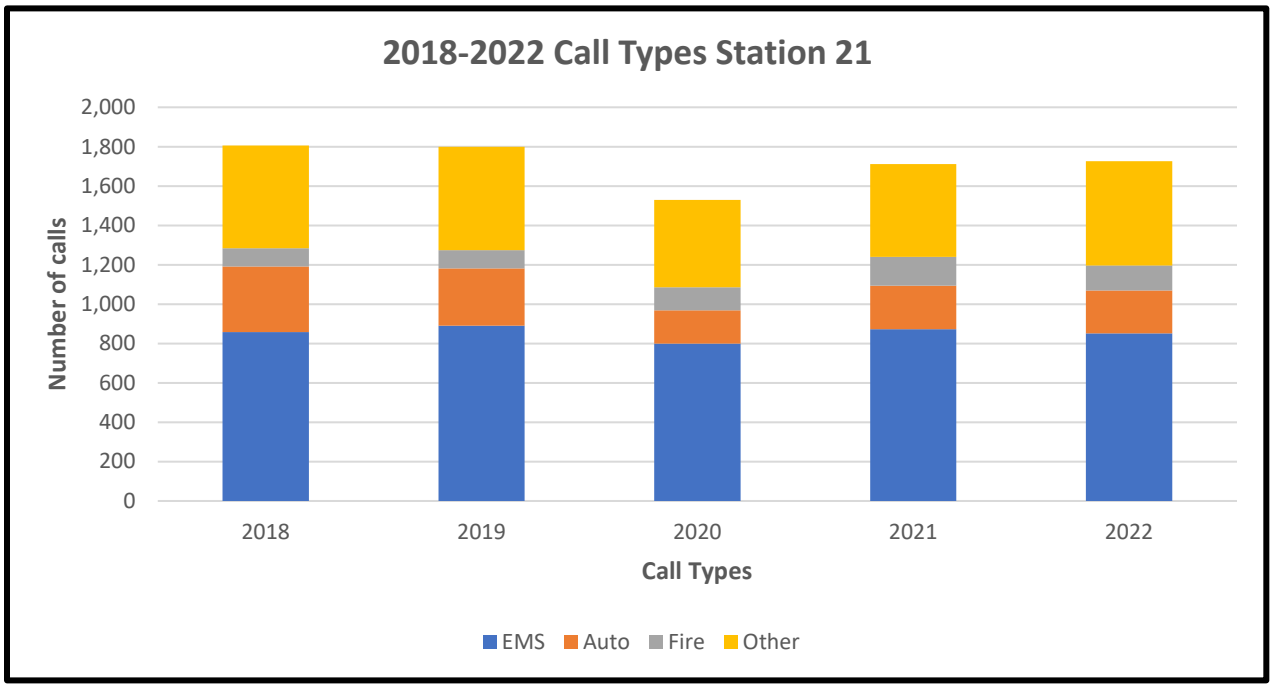


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 16	2535	2578	2144	2433	2517
Truck 16	1828	1841	1469	1719	1835

District 3

Station 21
1500 E Virginia Ave
Engine 21
Hamer 3 (dump truck filled with dirt for Hazmat incidents)

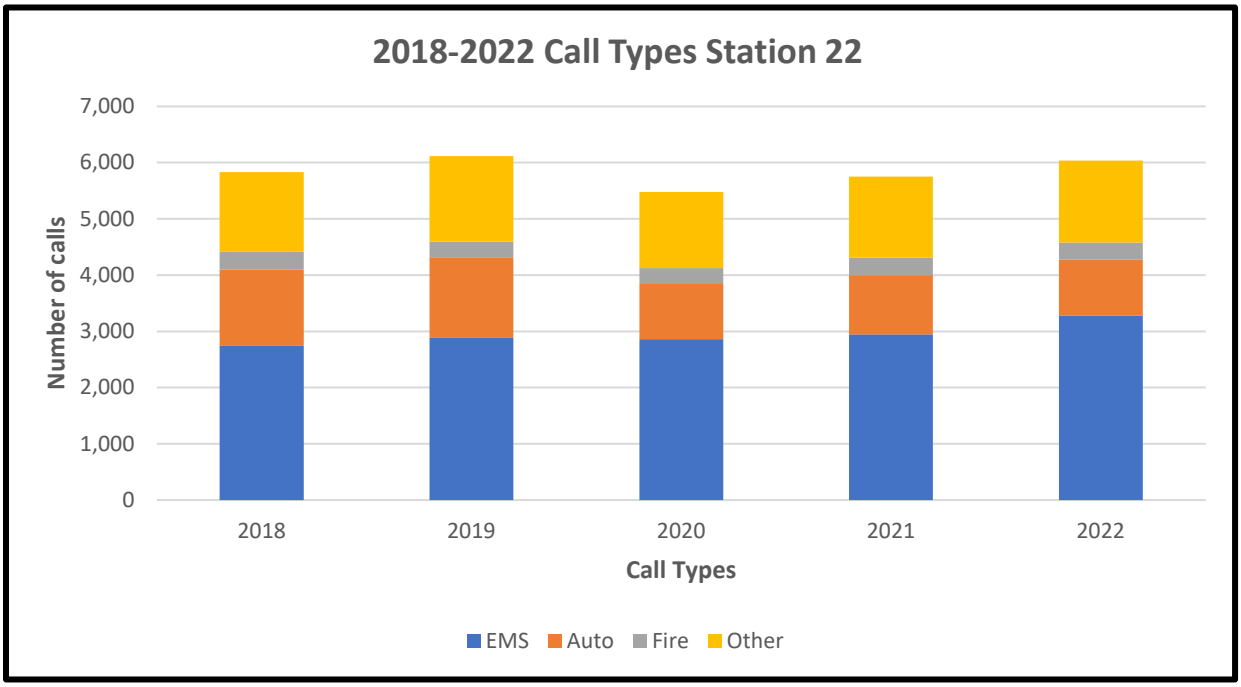


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 21	1733	1713	1469	1661	1684
Hamer 3	14	12	6	9	14

District 3

Station 22
3530 S Monaco
Engine 22
Tower 22
BR602 (Type 6 Wildland)

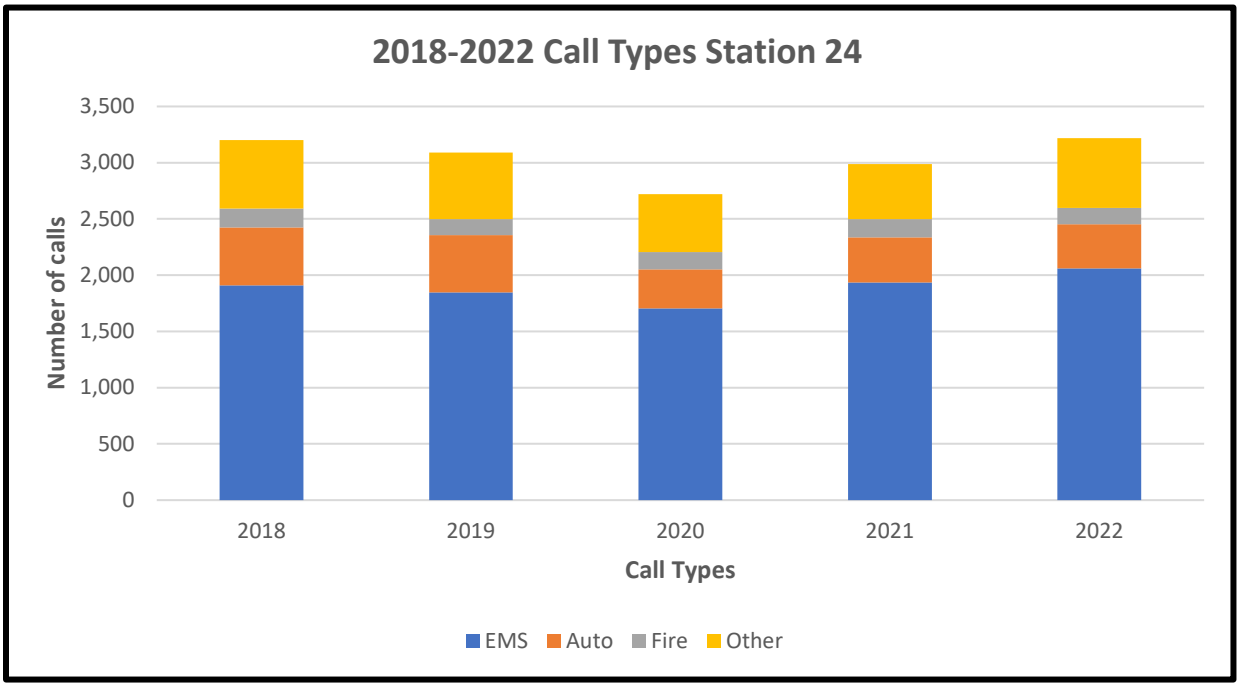


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 22	3236	3464	3107	3185	3348
Tower 22	2354	2425	2167	2359	2461
BR602	5	1	6	4	1

District 3

Station 24
2695 S Colorado Blvd
Engine 24
Chief 3

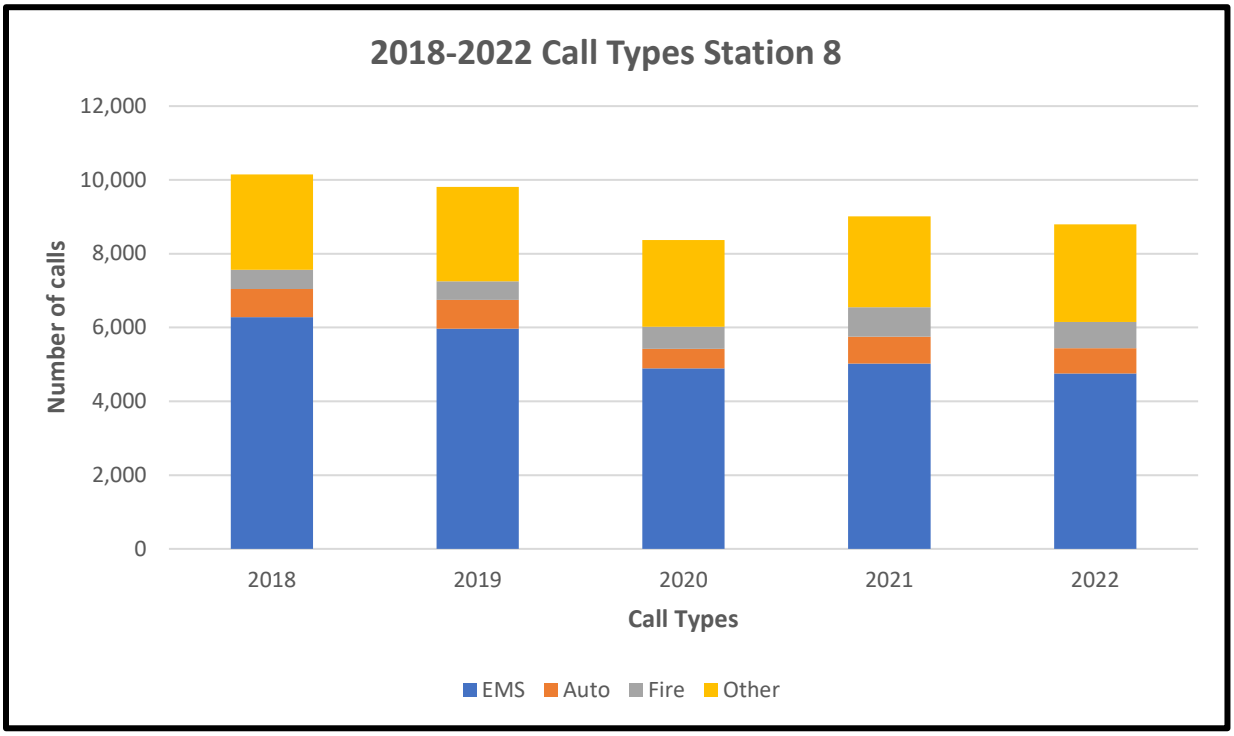


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 24	3094	2968	2619	2878	3112
Chief 3	1691	1671	1378	1590	1760

District 4

Station 8
1616 Park Ave
Engine 8
Truck 8

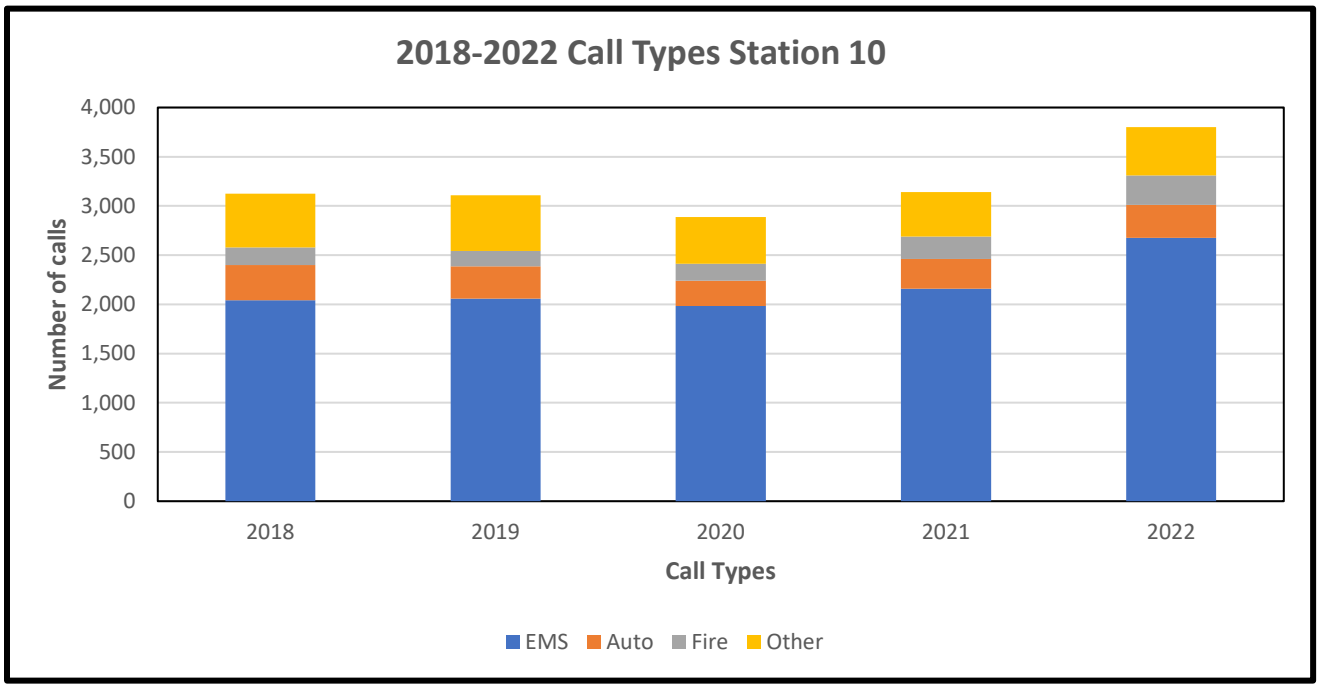


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 8	5850	5716	5005	5325	5147
Truck 8	3913	3722	3048	3366	3318

District 4

Station 10
3200 Steele
Engine 10
Rescue 2

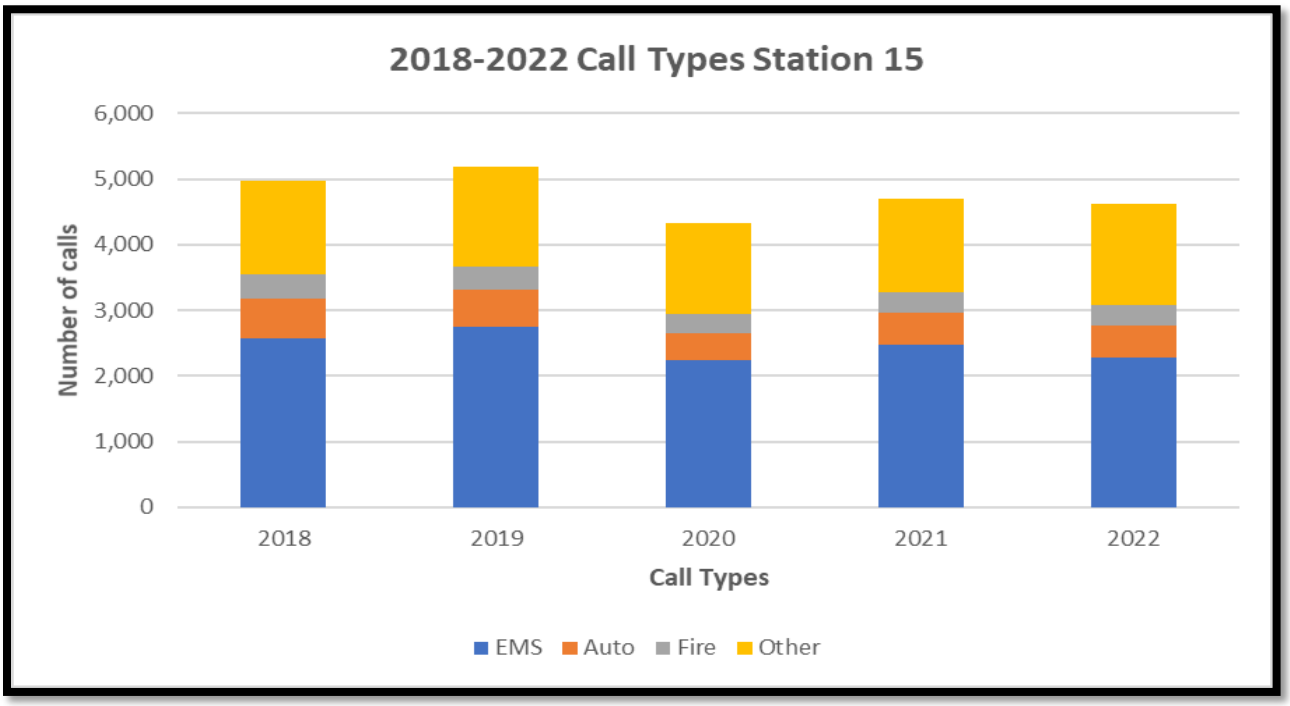


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 10	2963	2986	2774	3033	3648
Rescue 2	1177	1220	1248	1320	1756

District 4

Station 15
1375 Harrison
Engine 15
Tower 15
Chief 4

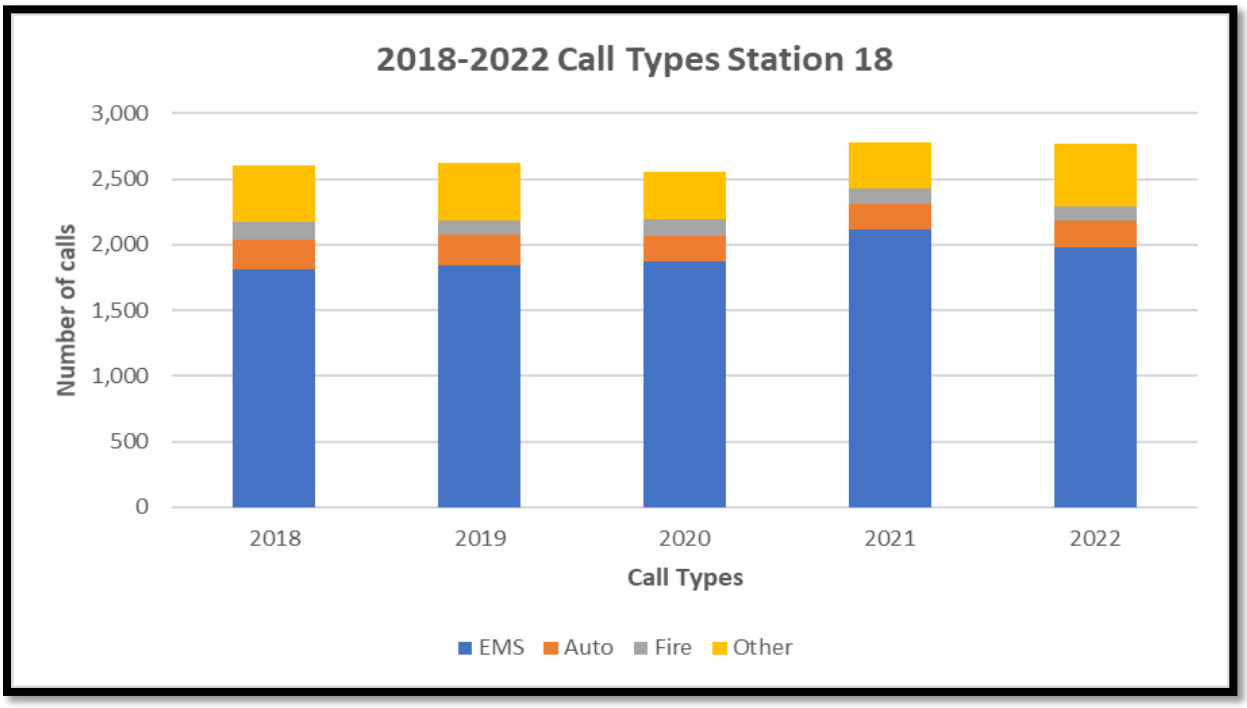


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 15	2907	3094	2571	2705	2658
Tower 15	1839	1933	1594	1875	1832
Chief 4	2026	1997	1744	1817	1960

District 4

Station 18
8701 E Alameda
Engine 18
HazMat Training Trailer

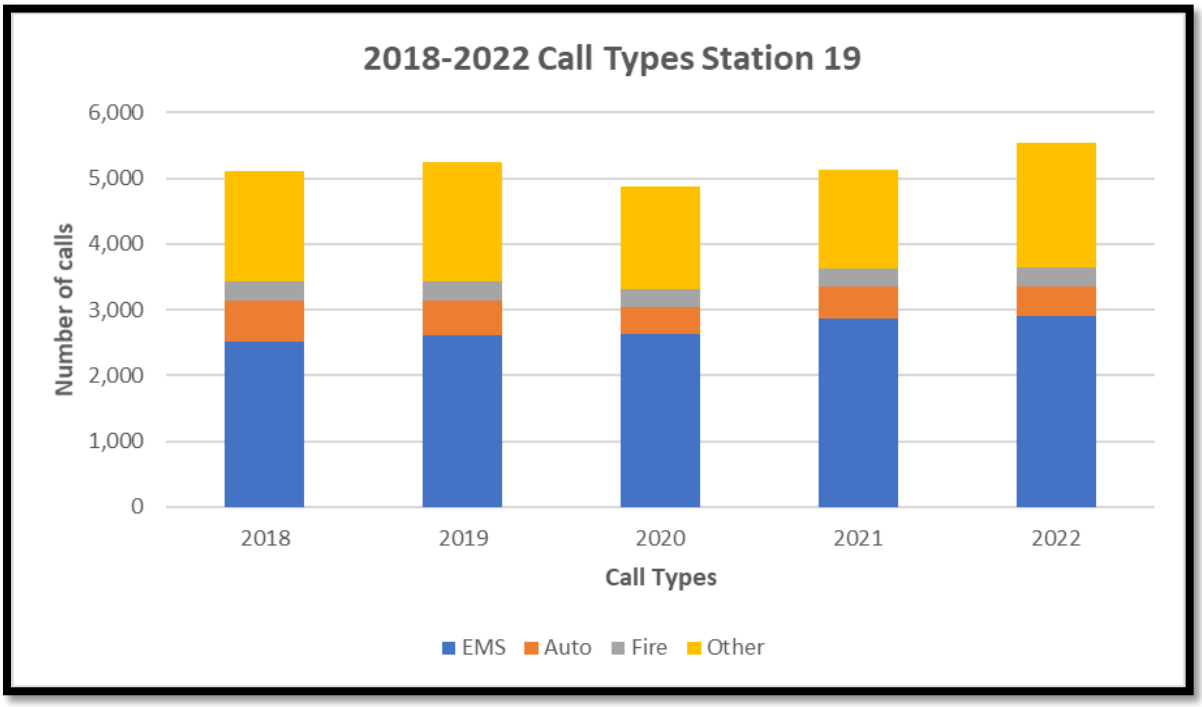


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 18	2493	2521	2494	2685	2676

District 4

Station 19
300 S Ivy
Engine 19
Truck 19

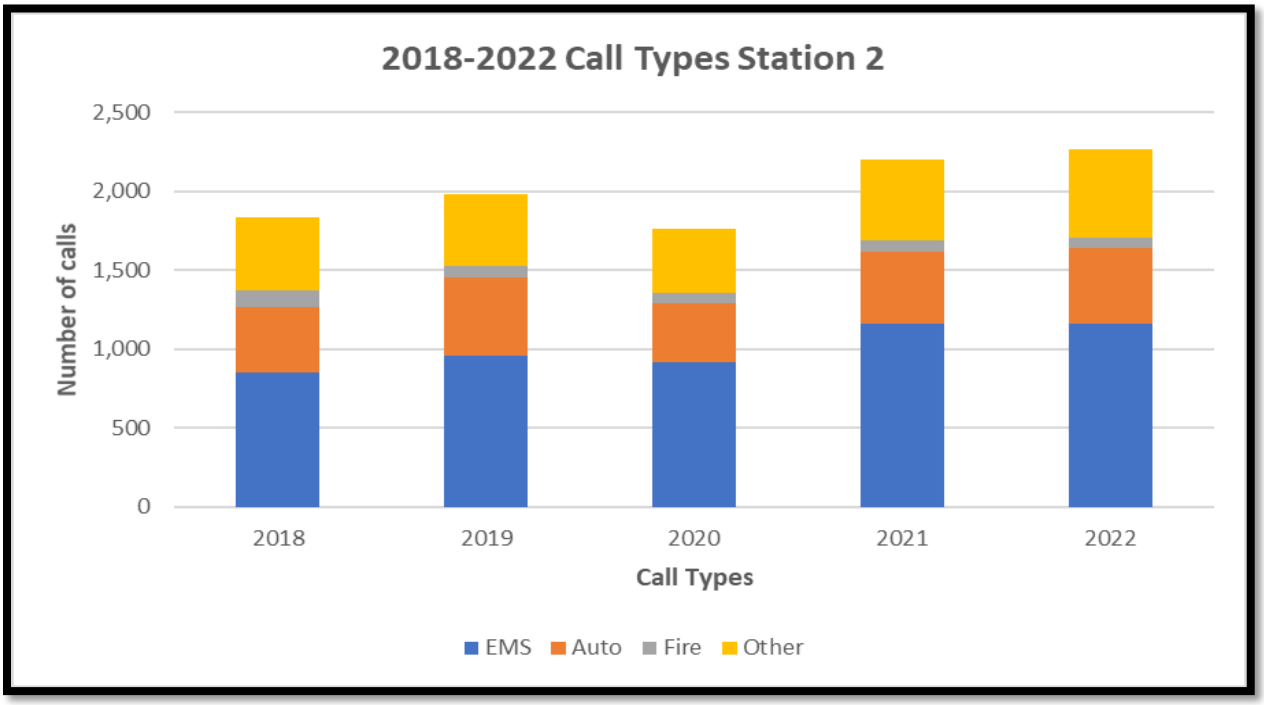


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 19	2839	2930	2857	2925	3013
Truck 19	2060	2120	1846	2085	2333

District 5

Station 2
5300 Memphis
Truck 2
Chief 5
E301 (Type 3 Wildland)

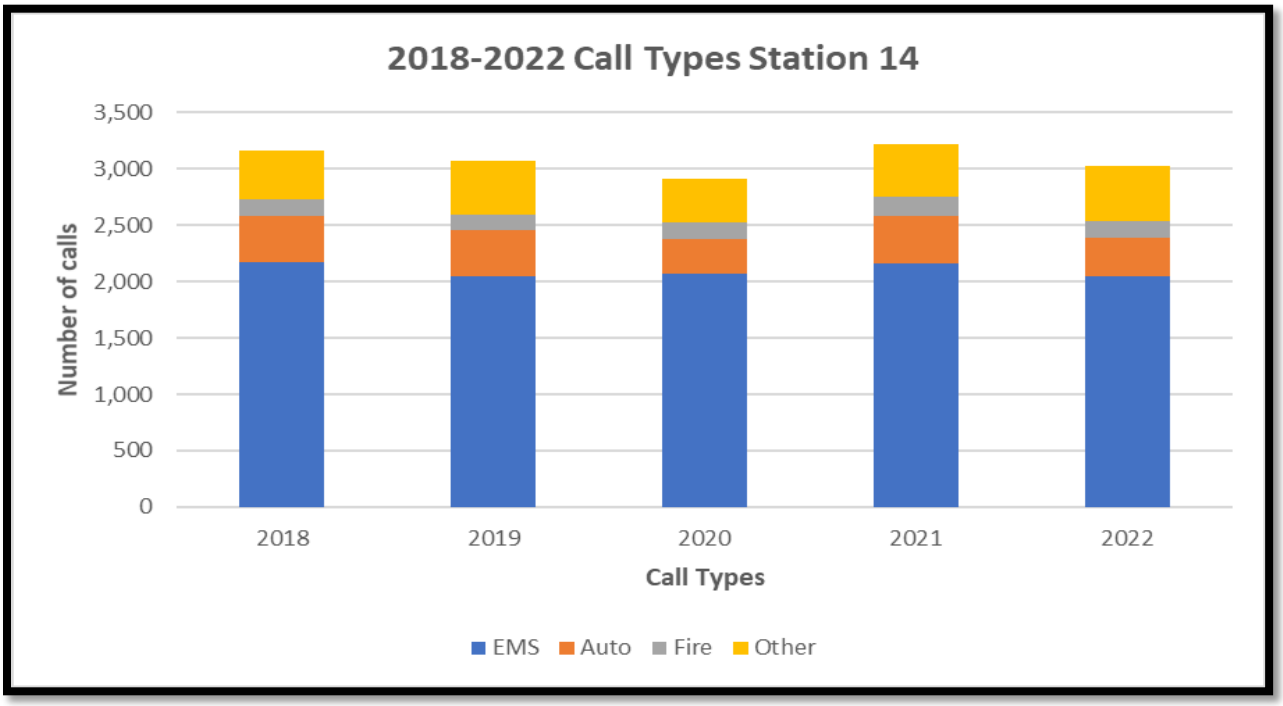


Calls by Unit

Unit	2018	2019	2020	2021	2022
Truck 2	1770	1882	1704	2098	2164
Chief 5	773	740	672	616	657
E301	3	1	21	N/A	3

District 5

Station 14
1426 Oneida
Engine 14

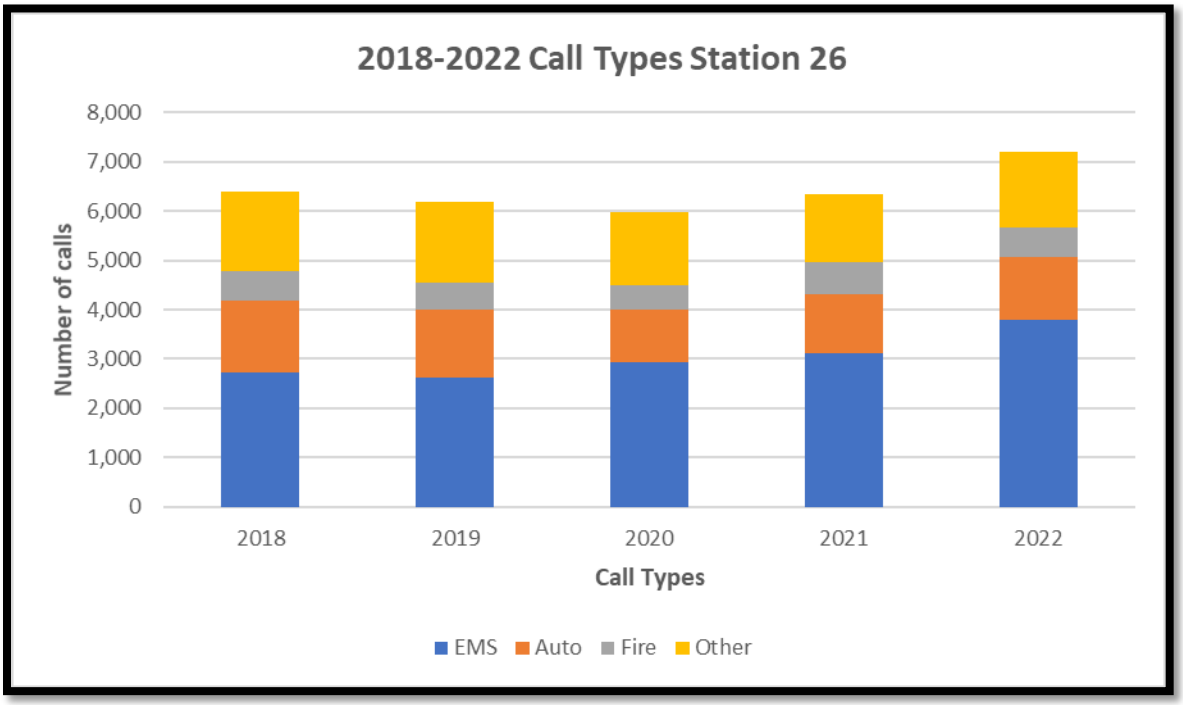


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 14	3052	2947	2803	3094	2932

District 5

Station 26
7934 MLK Blvd
Engine 26
Truck 26

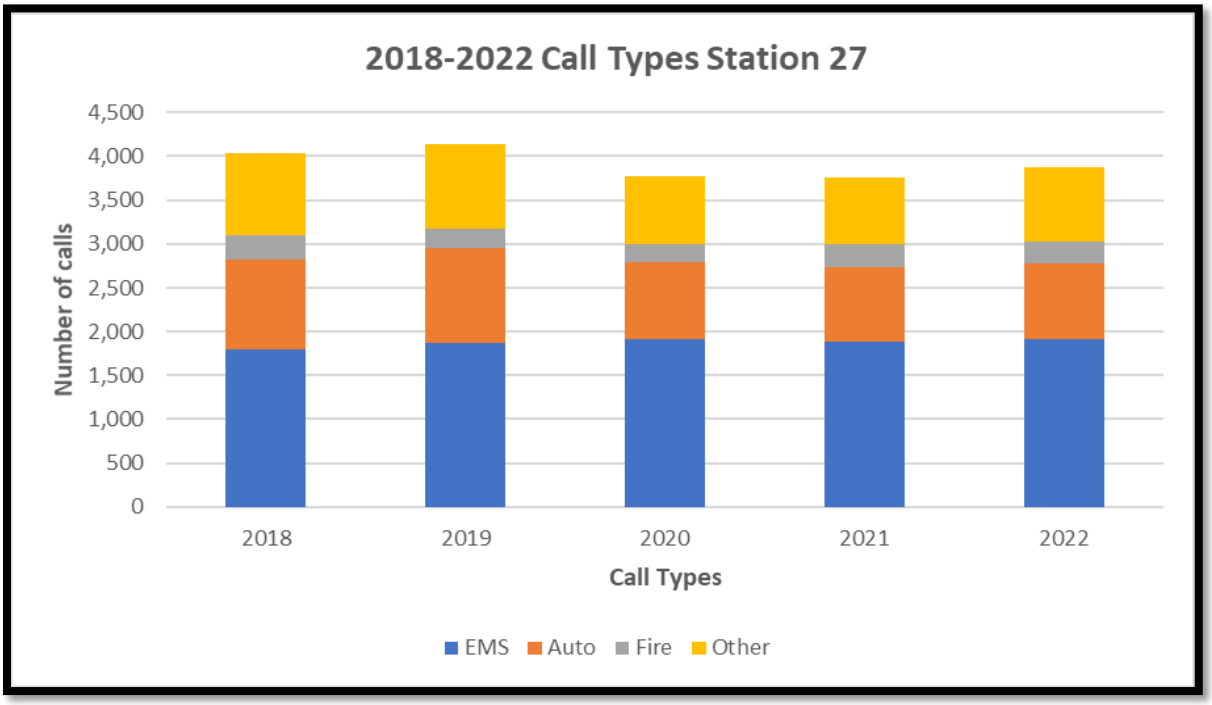


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 26	3063	2814	2779	2907	3316
Truck 26	1891	1862	1683	1843	1890

District 5

Station 27
12924 E Albrook
Engine 27
Tower 27

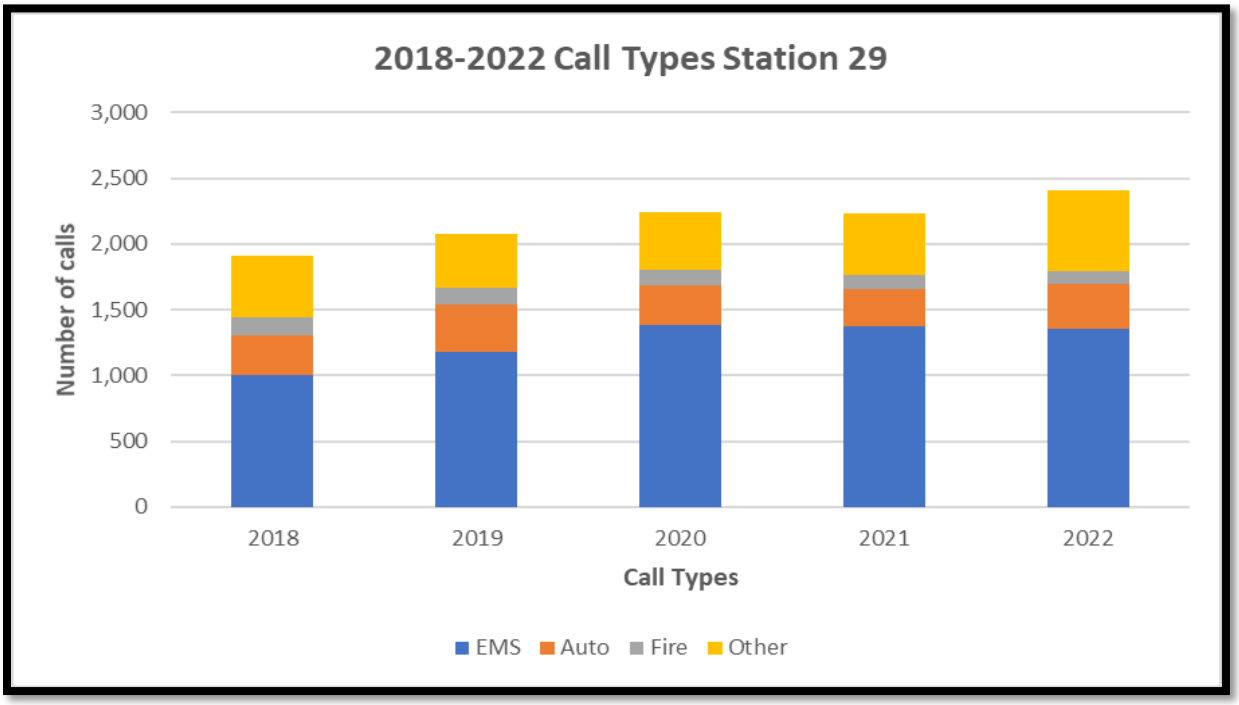


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 27	2443	2471	2301	2338	2400
Tower 27	1405	1466	1313	1299	1350

District 5

Station 29
4800 Himalaya
Engine 29
BR601 (Type 6 Wildland)

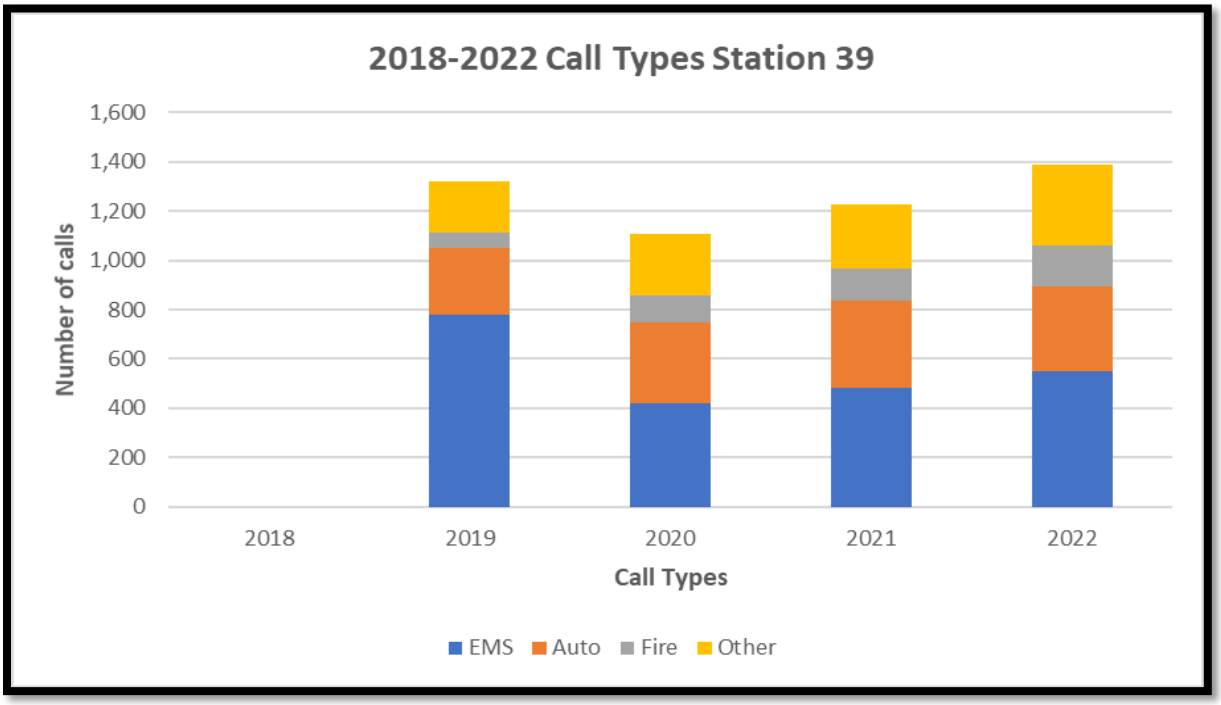


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 29	2696	3002	2852	3475	3532
BR601	11	12	9	4	5

District 5

Station 39
9150 E 50th Ave
Engine 39
Command Van

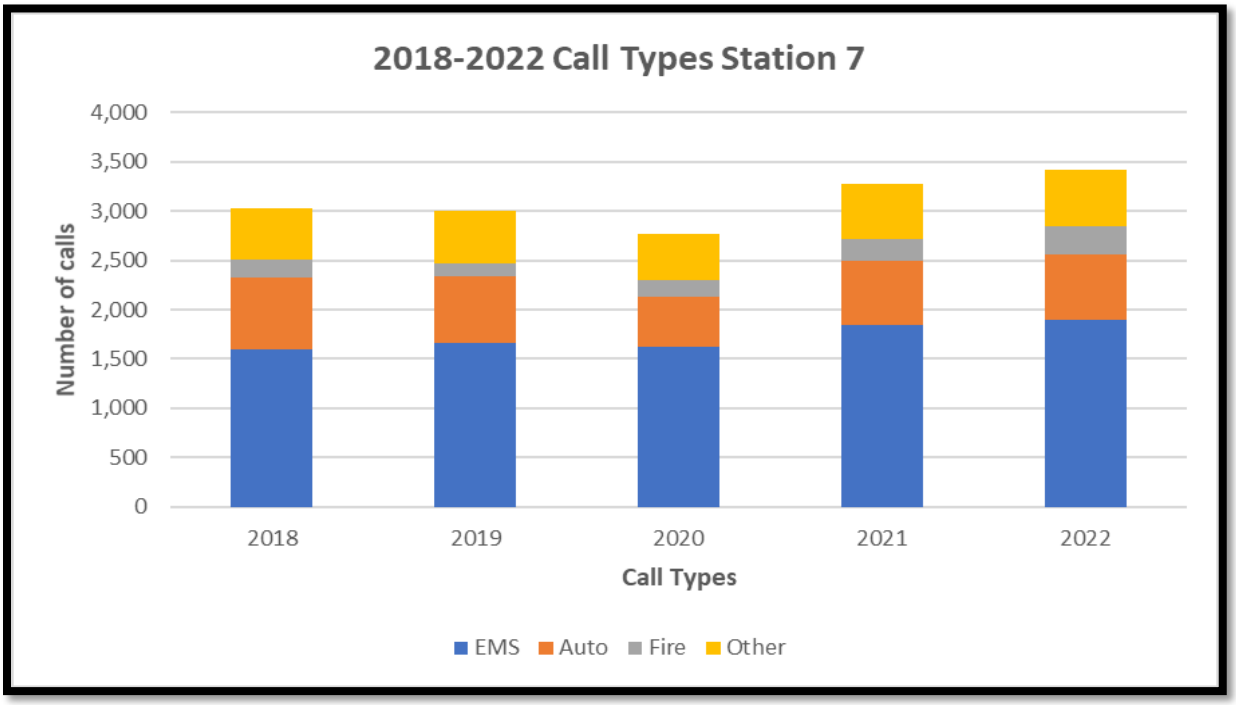


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 39	N/A	762	1075	1203	1366

District 6

Station 7
2195 W 38th Ave
Engine 7

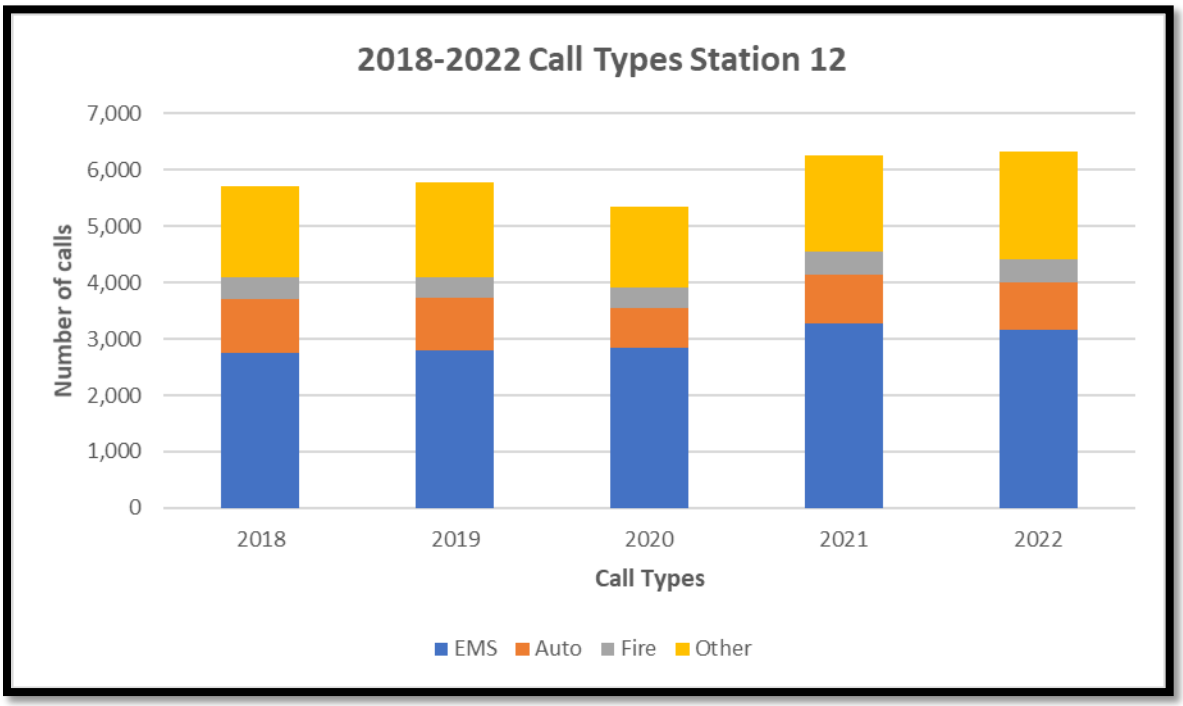


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 7	2924	2924	2704	3209	3341

District 6

Station 12
2475 Federal
Engine 12
Truck 12
Chief 6

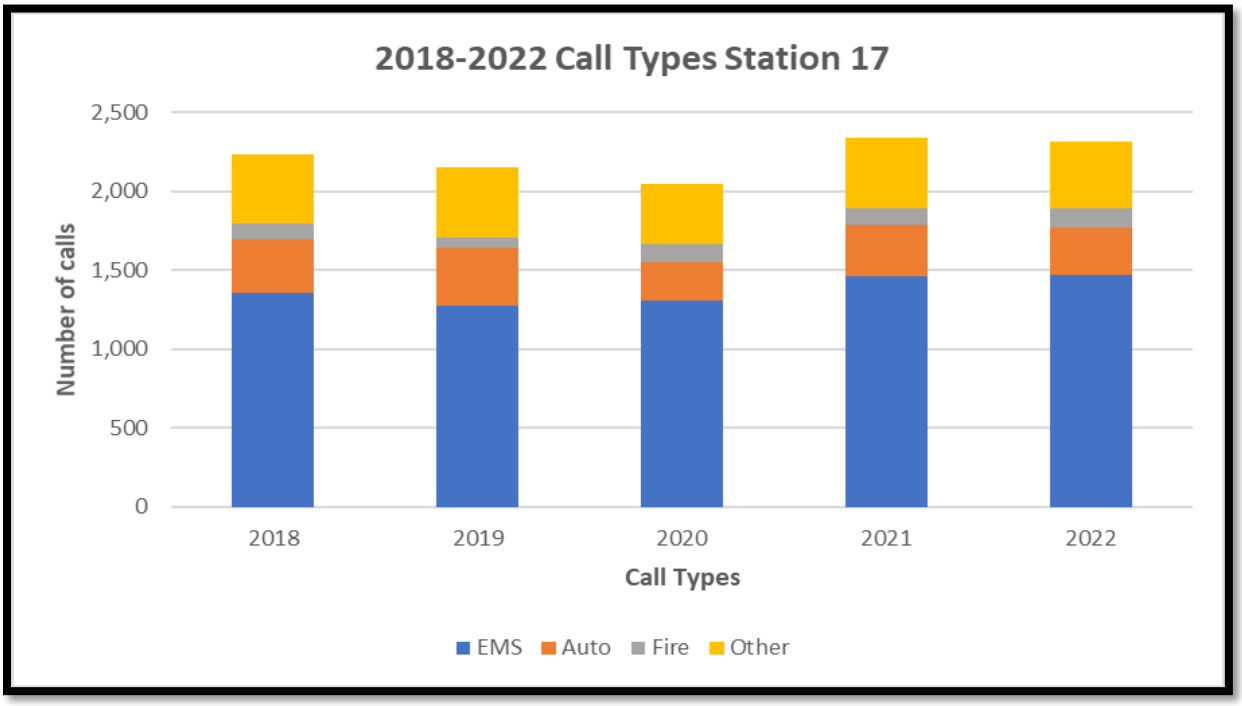


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 12	3313	3296	3088	3483	3531
Truck 12	2205	2208	2070	2586	2624
Chief 6	1376	1370	1145	1403	1358

District 6

Station 17
4500 Tennyson
Engine 17

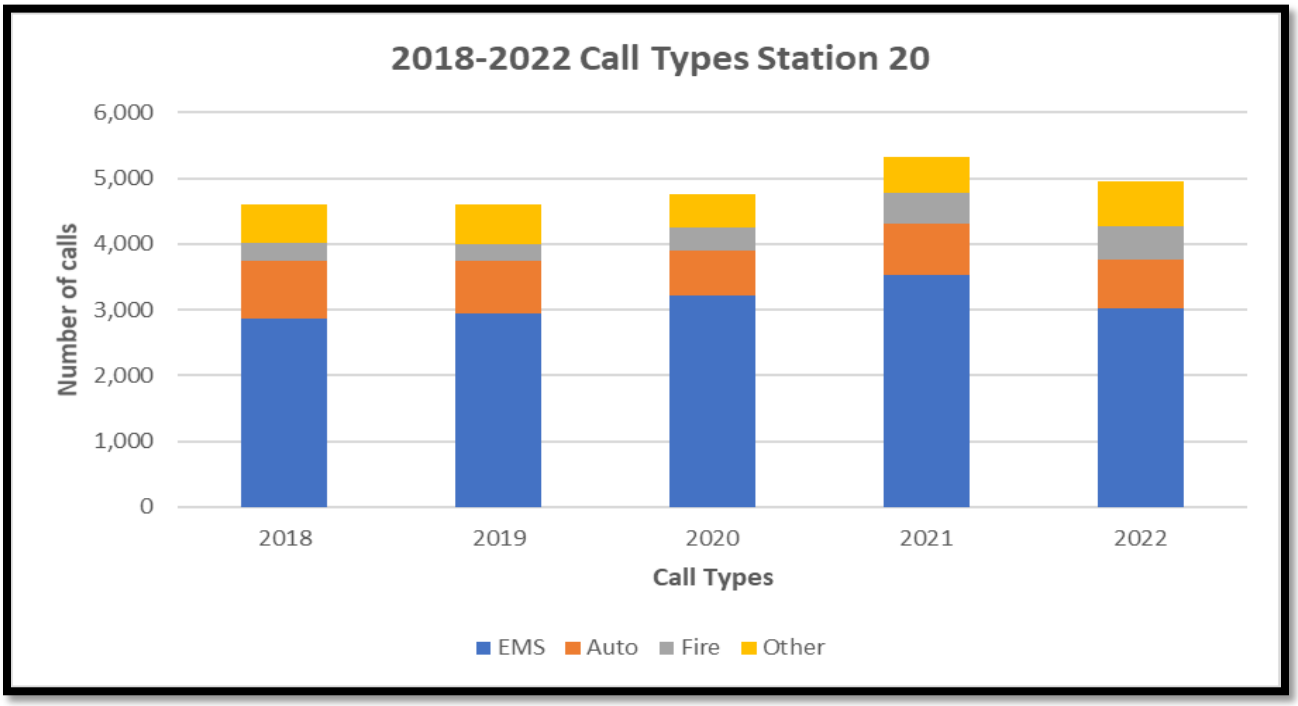


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 17	2152	2069	1984	2276	2276

District 6

Station 20
501 Knox Court
Engine 20
Med Unit 2

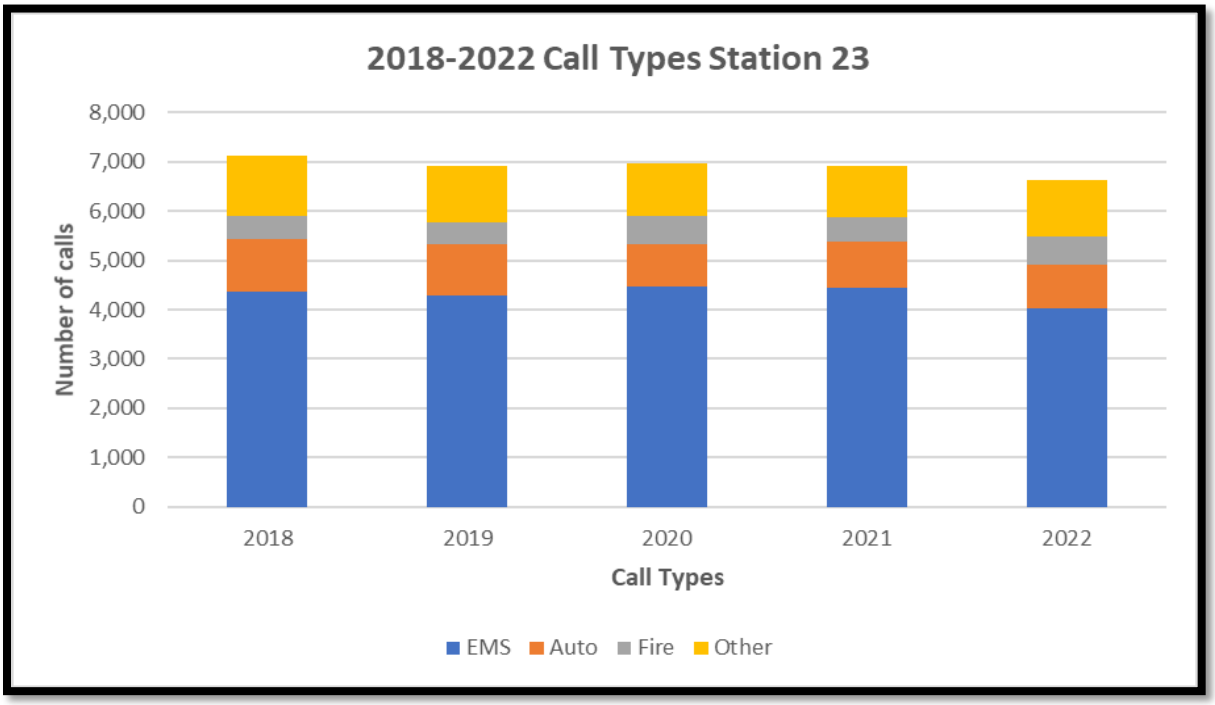


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 20	4359	4401	4627	5156	4842
Med Unit 2	N/A	N/A	244	473	1302

District 6

Station 23
850 S Federal
Engine 23
Tower 23

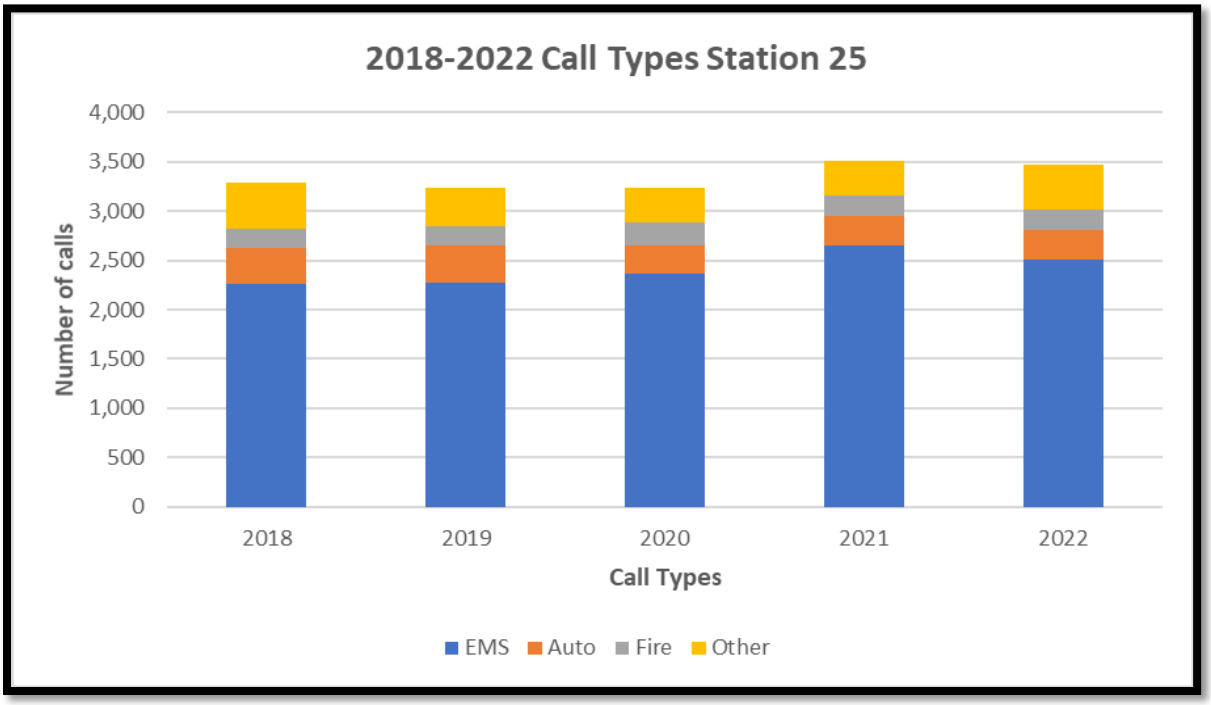


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 23	4156	4037	4226	4191	3975
Tower 23	2683	2645	2505	2542	2425

District 7

Station 25
2504 S Raleigh
Engine 25

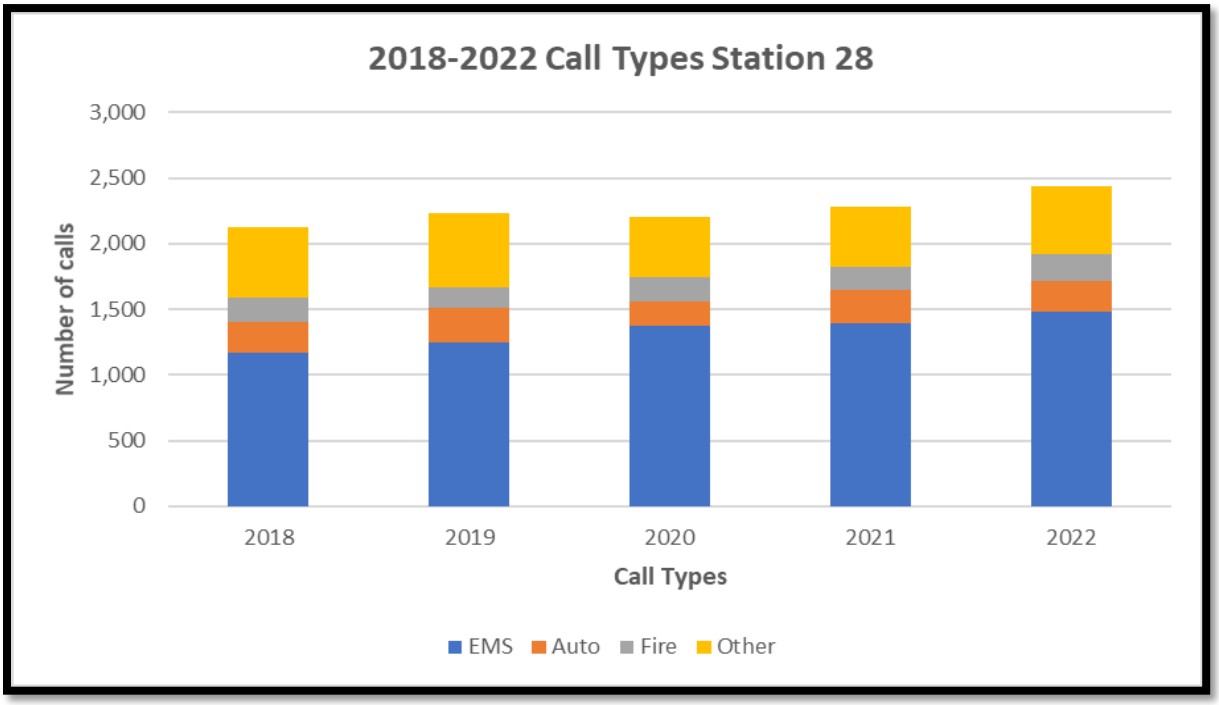


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 25	3184	3127	3120	3400	3341

District 7

Station 28
4306 S Wolff
Engine 28
Truck 28
Chief 7

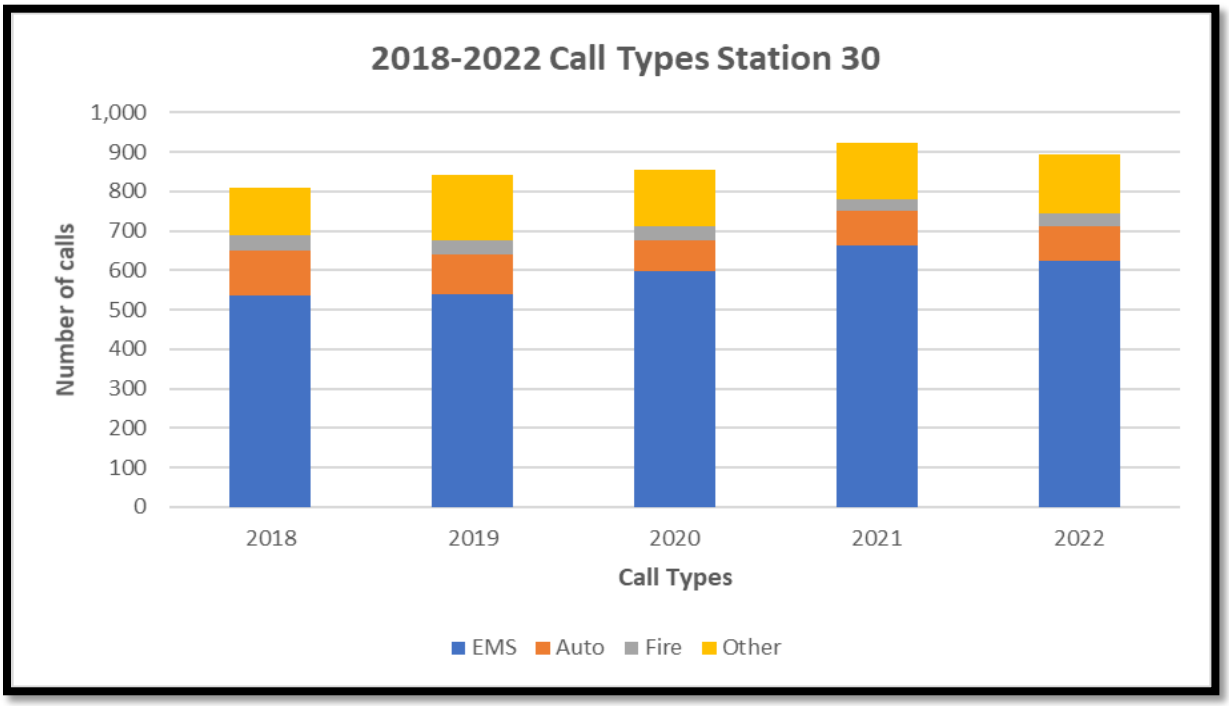


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 28	1314	1370	1413	1363	1453
Truck 28	732	780	721	831	918
Chief 7	992	812	697	613	703

District 7

Station 30
4898 S Dudley
Engine 30

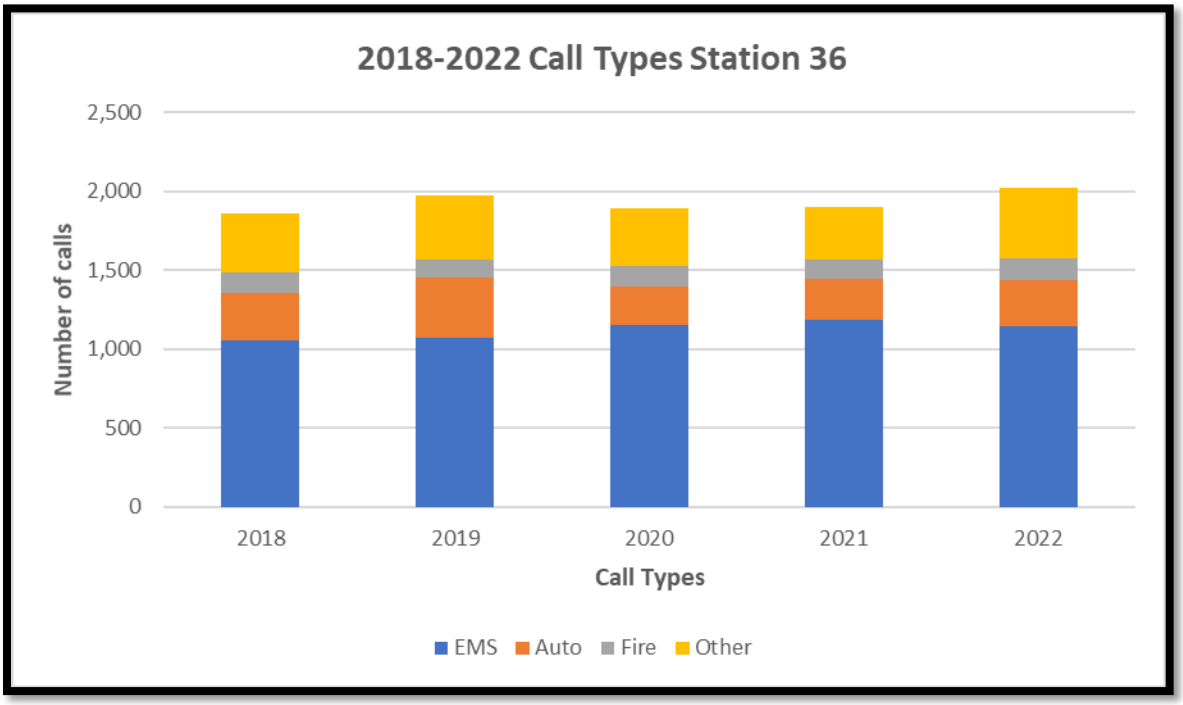


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 30	787	813	826	898	875

District 7

Station 36
4101 S Federal
City of Sheridan
Engine 36

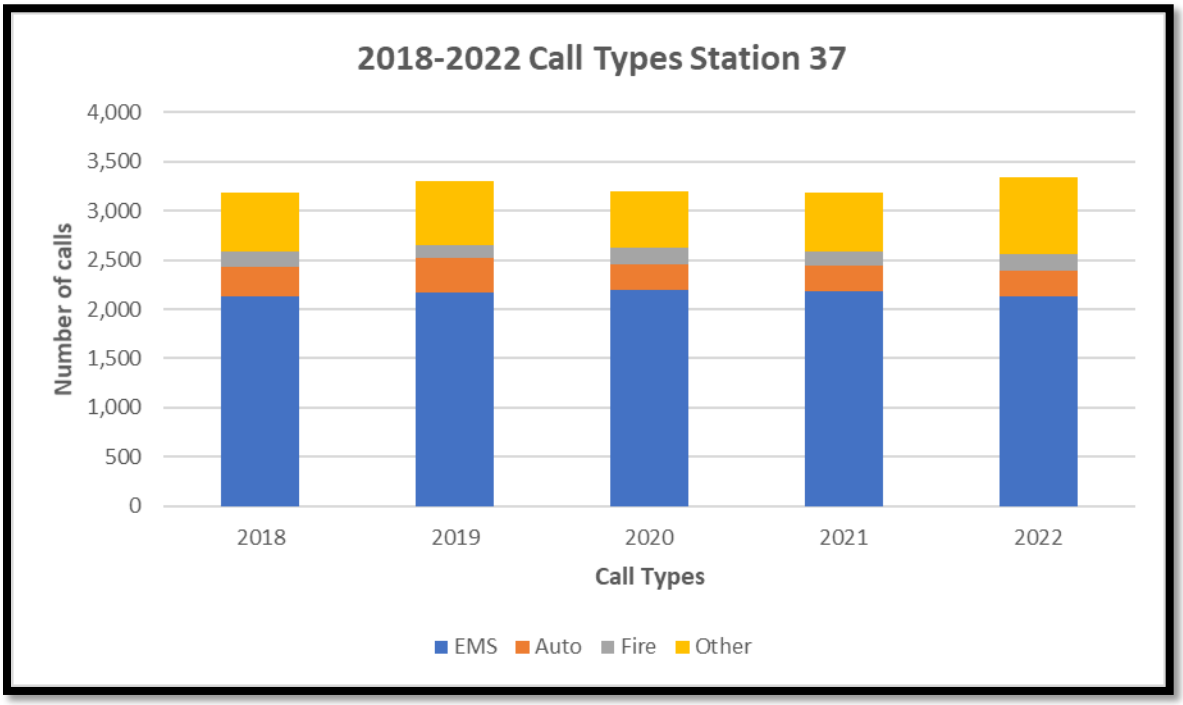


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 36	1793	1901	1854	1823	1949

District 7

Station 37
555 West Jefferson
City of Englewood
Engine 37
Denver Health Ambulance

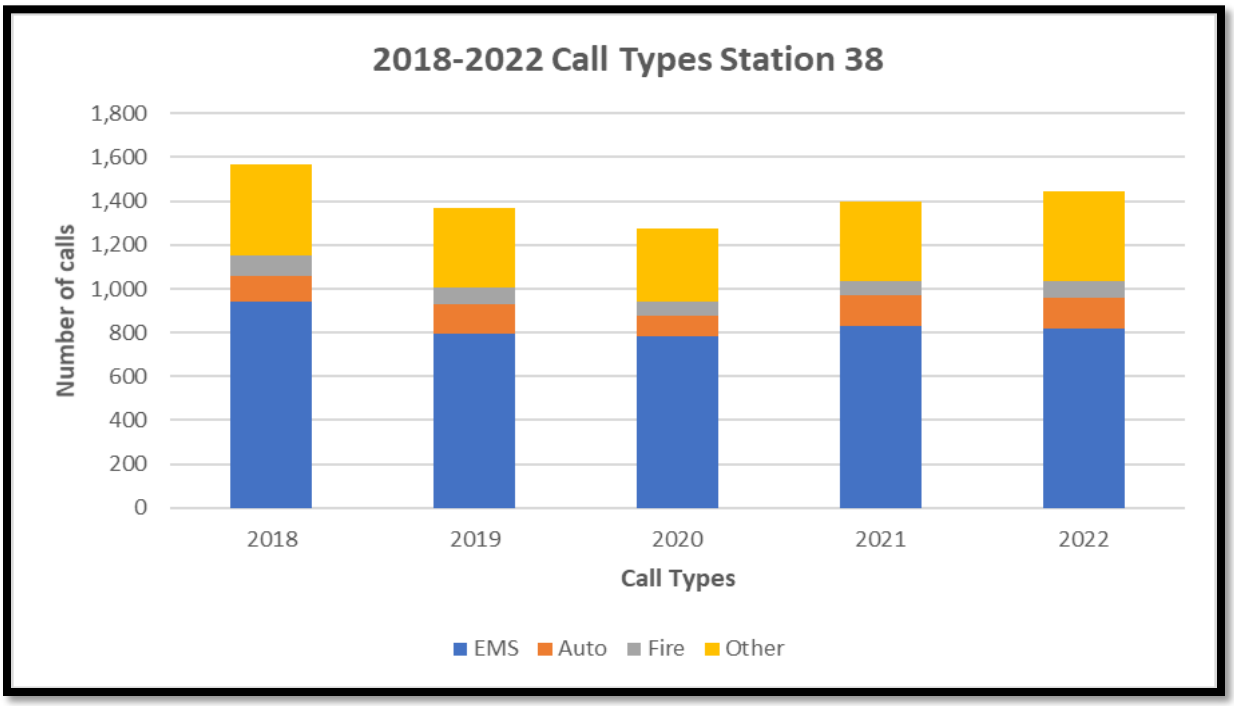


Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 37	3058	3177	3027	3019	3163

District 7

Station 38
4830 S Acoma
City of Englewood
Truck 38
Denver Health Ambulance

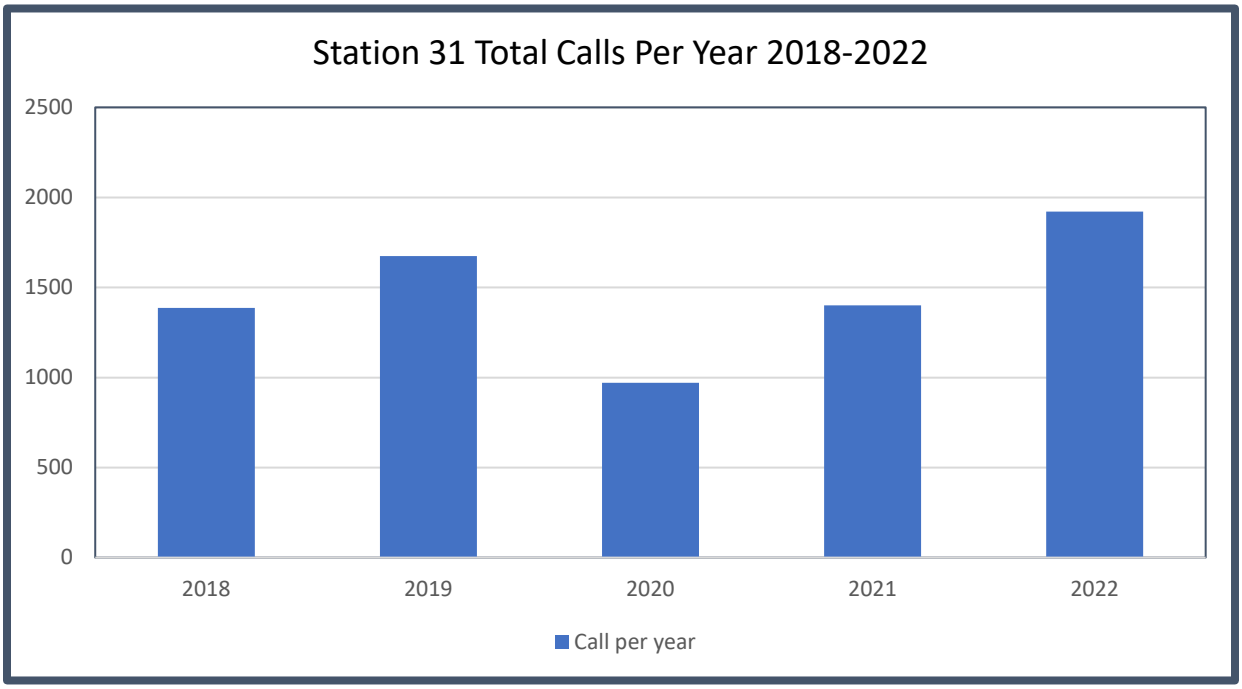


Calls by Unit

Unit	2018	2019	2020	2021	2022
Truck 38	1505	1320	1224	1346	1401

DEN

Station 31
8525 Newcastle St.
Truck 31
Red 1
Red 2
Red 3
DEN Mobile Command

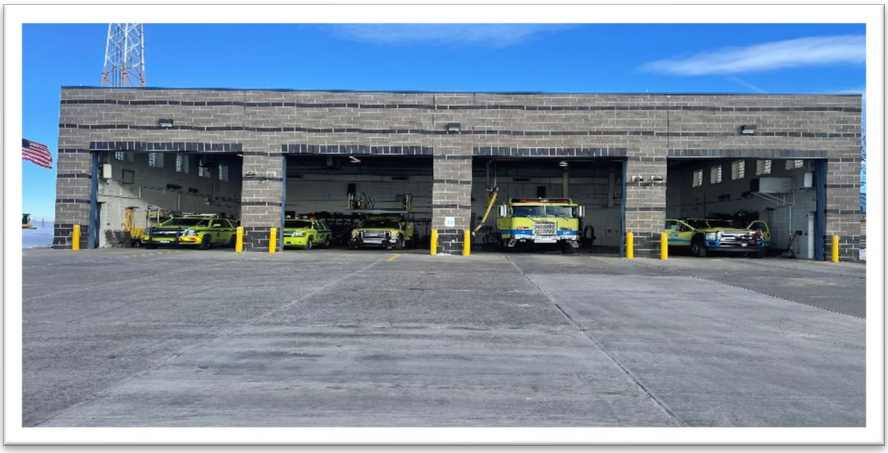


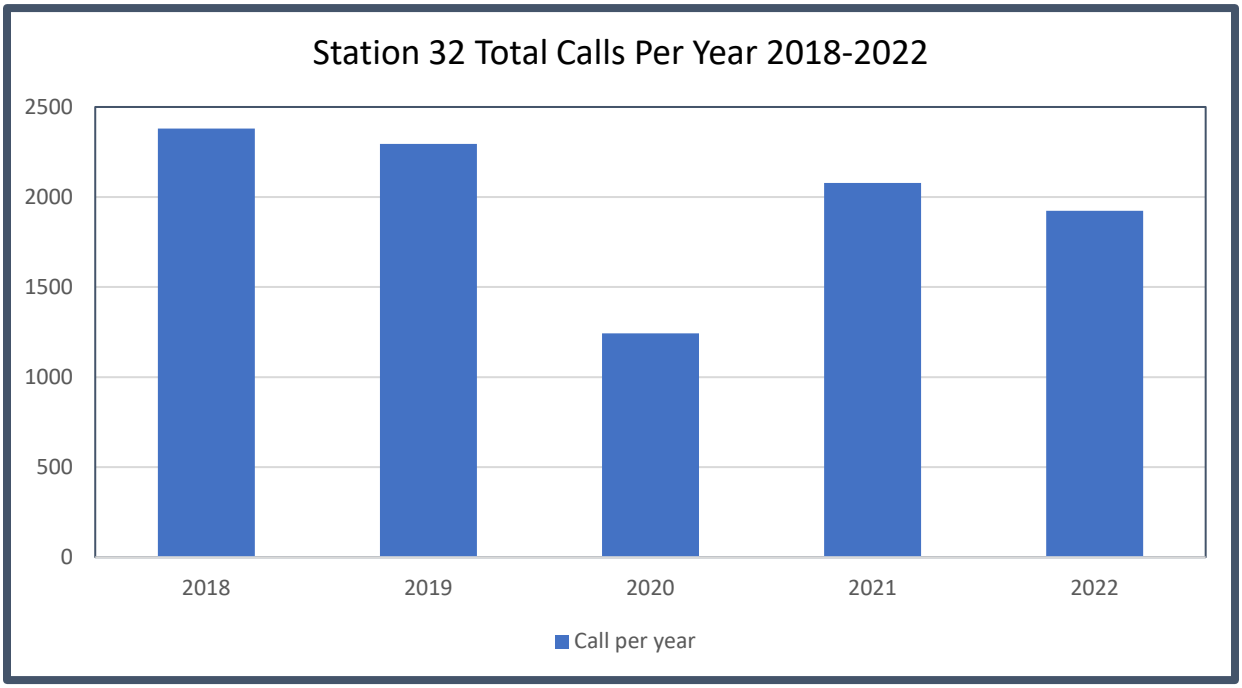
Calls by Unit

Unit	2018	2019	2020	2021	2022
Truck 31	1603	1440	842	1231	1704
*Red 1	217	234	128	169	218
*Red 2	217	234	128	169	218
*Red 3	217	234	128	169	218

*All ARFF units are under the "ARFF" code, which would then allude to the fact that all units will have the same run tally as they all respond to the same incidents. For example, it is very unlikely that Red 4 goes on a call that Red 5 doesn't go on, even though they are on the opposite side of the airfield. All units are dispatched on responses, even if it's to standby at predesignated locations, which are referred to as staging points.

Station 32
10216 Trussville St
Engine 32 (Alpha & Bravo)
Red Chief





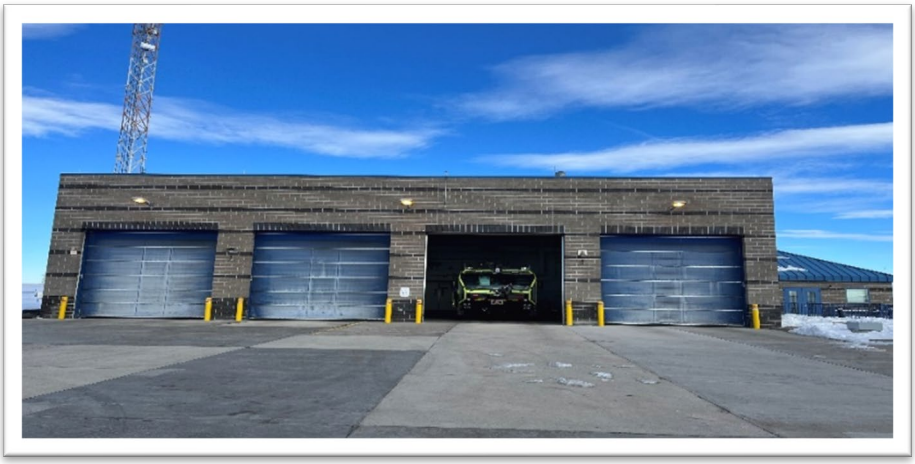
Calls by Unit

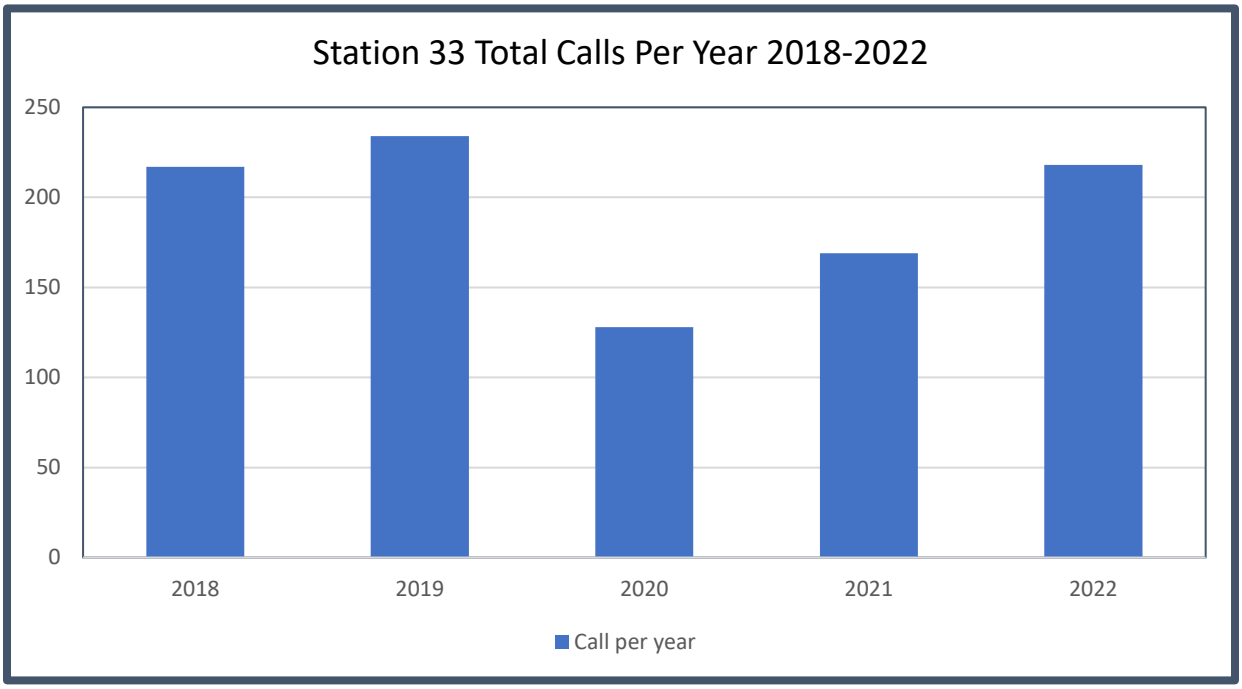
Unit	2018	2019	2020	2021	2022
Engine 32	1821	1793	892	1692	1644
Red Chief	559	502	351	386	279

*All ARFF units are under the "ARFF" code, which would then allude to the fact that all units will have the same run tally as they all respond to the same incidents. For example, it is very unlikely that Red 4 goes on a call that Red 5 doesn't go on, even though they are on the opposite side of the airfield. All units are dispatched on responses, even if it's to standby at predesignated locations, which are referred to as staging points.

Station 33
8882 Electra Street

Red 5
Red 6
Red 7



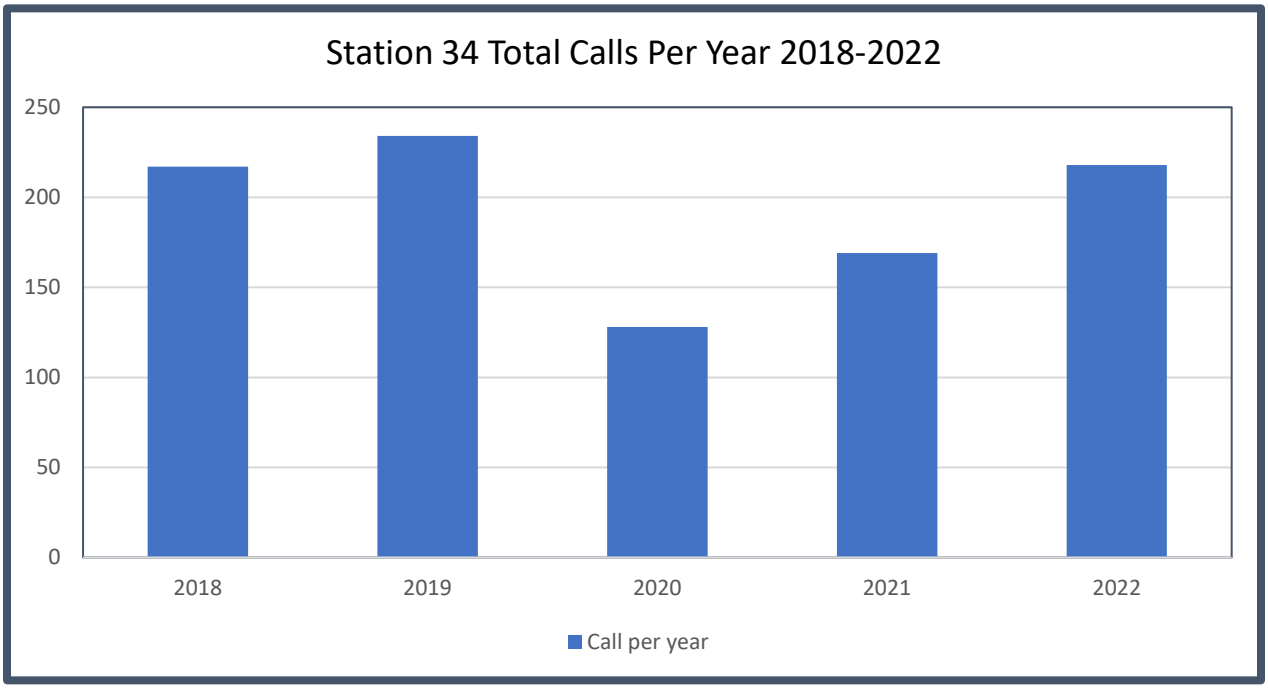


Calls by Unit

Unit	2018	2019	2020	2021	2022
*Red 5	217	234	128	169	218
*Red 6	217	234	128	169	218
*Red 8	217	234	128	169	218

*All ARFF units are under the "ARFF" code, which would then allude to the fact that all units will have the same run tally as they all respond to the same incidents. For example, it is very unlikely that Red 4 goes on a call that Red 5 doesn't go on, even though they are on the opposite side of the airfield. All units are dispatched on responses, even if it's to standby at predesignated locations, which are referred to as staging points.

Station 34
9878 Kewaunee St.
Red 4

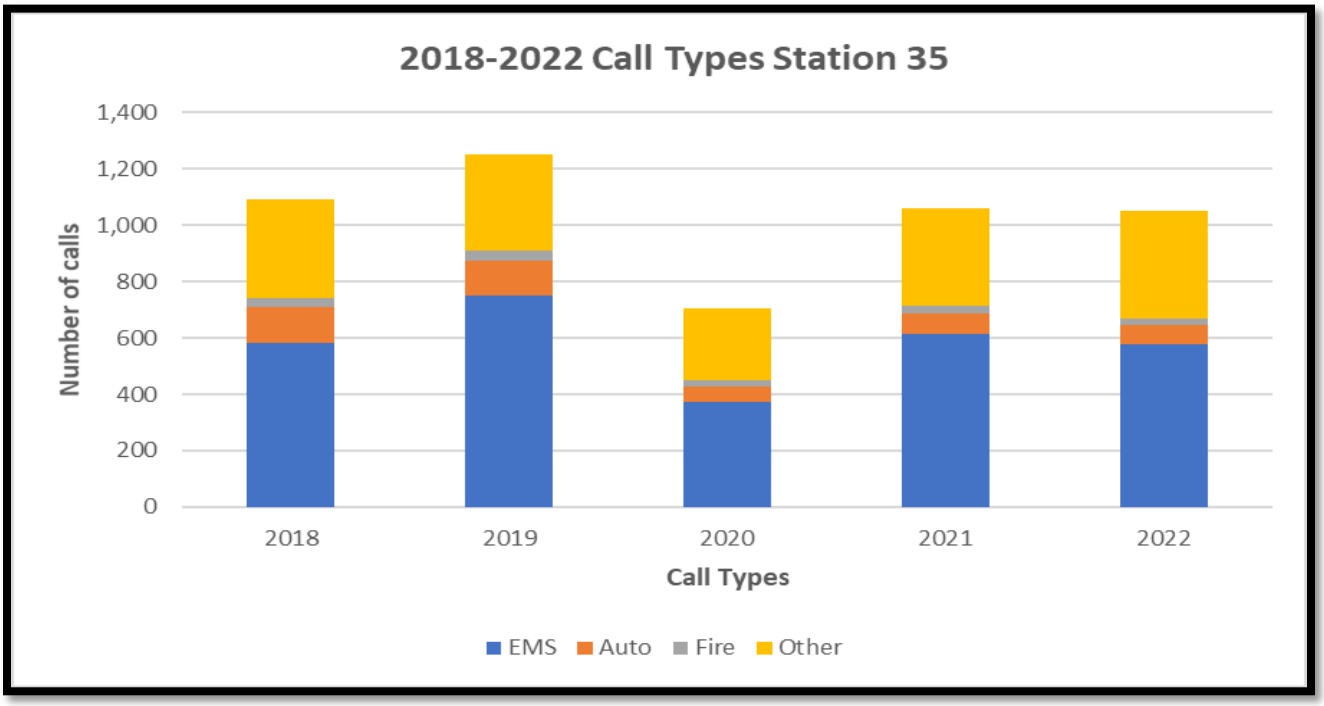


Calls by Unit

Unit	2018	2019	2020	2021	2022
Red 4	217	234	128	169	218

*All ARFF units are under the "ARFF" code, which would then allude to the fact that all units will have the same run tally as they all respond to the same incidents. For example, it is very unlikely that Red 4 goes on a call that Red 5 doesn't go on, even though they are on the opposite side of the airfield. All units are dispatched on responses, even if it's to standby at predesignated locations, which are referred to as staging points.

Station 35
25365 E. 75th Ave
Engine 35 (Alpha & Bravo)
Truck 35
DGRT
Snowcat



Calls by Unit

Unit	2018	2019	2020	2021	2022
Engine 35	999	1106	659	991	984
Truck 35	*N/A	*N/A	*N/A	*N/A	392

*Truck 35 was placed into service April 2022.

Community Risk Assessment

The Denver Fire Department (Department) Community Risk Assessment is an in-depth look at the community's risks in terms of fire, EMS, and other emergencies. Figure 2 shows the total number of incidents per year and Table 6 shows a breakdown of incident types the Department has experienced from 2018 to 2022. Table 7 shows a breakdown of incident types the Department has experienced in 2022.

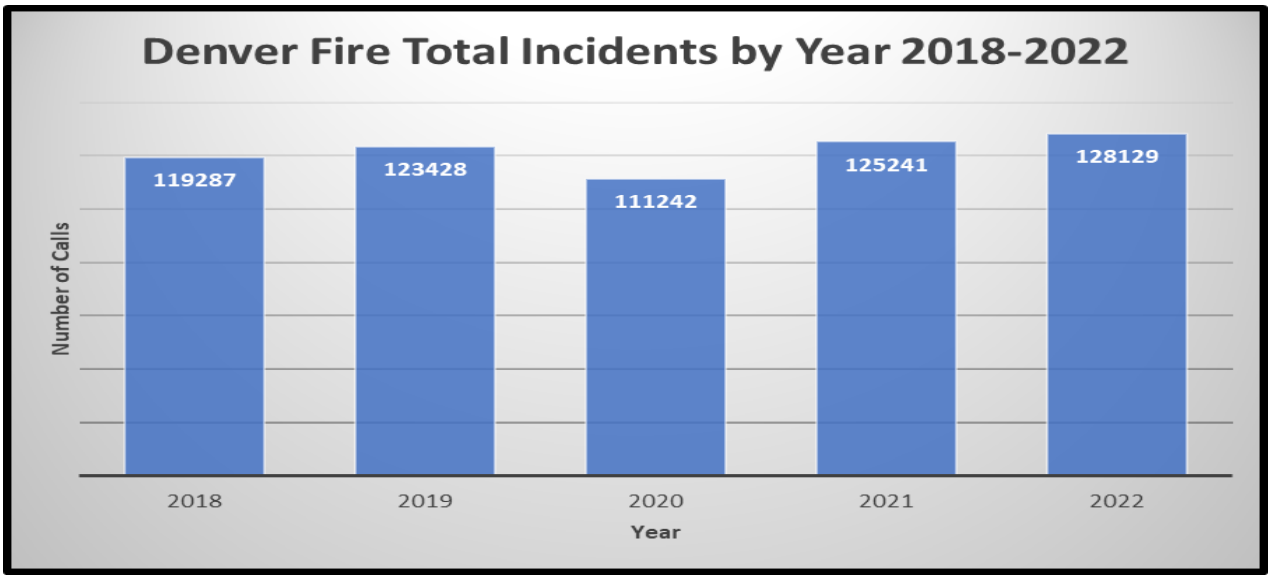


Chart 1 Denver Fire Incidents by Year 2018-2022

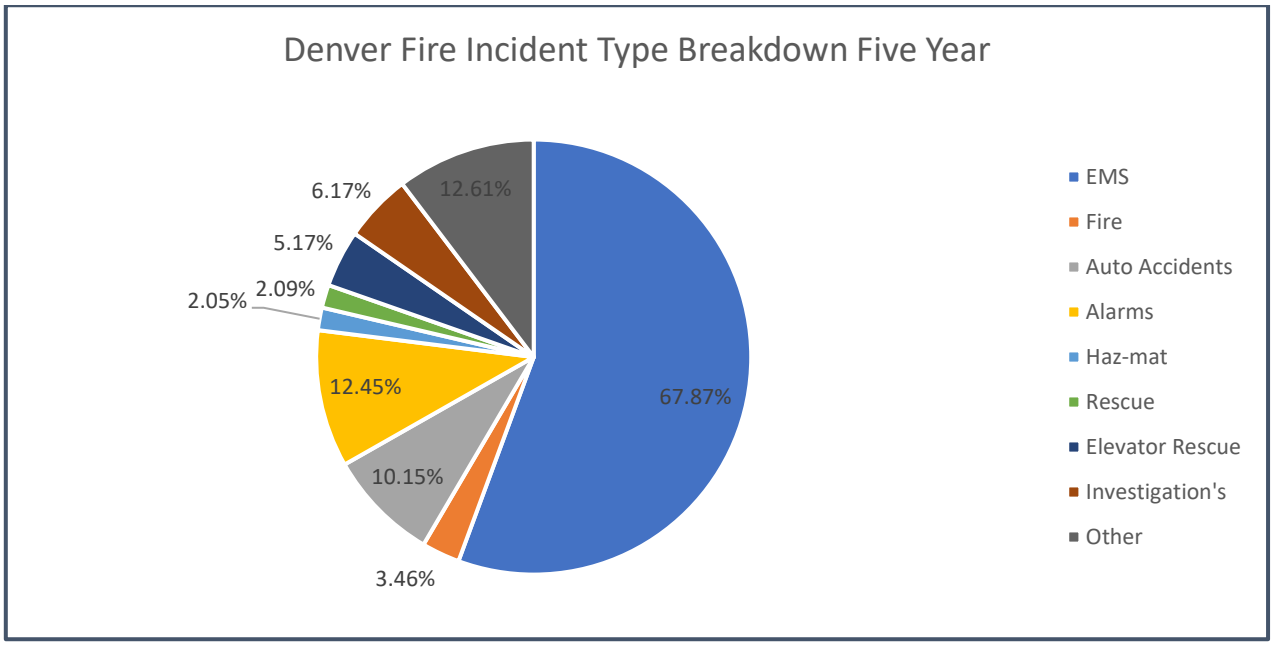


Chart 2 Denver Fire Incident Type Breakdown Five Year 2018-2022

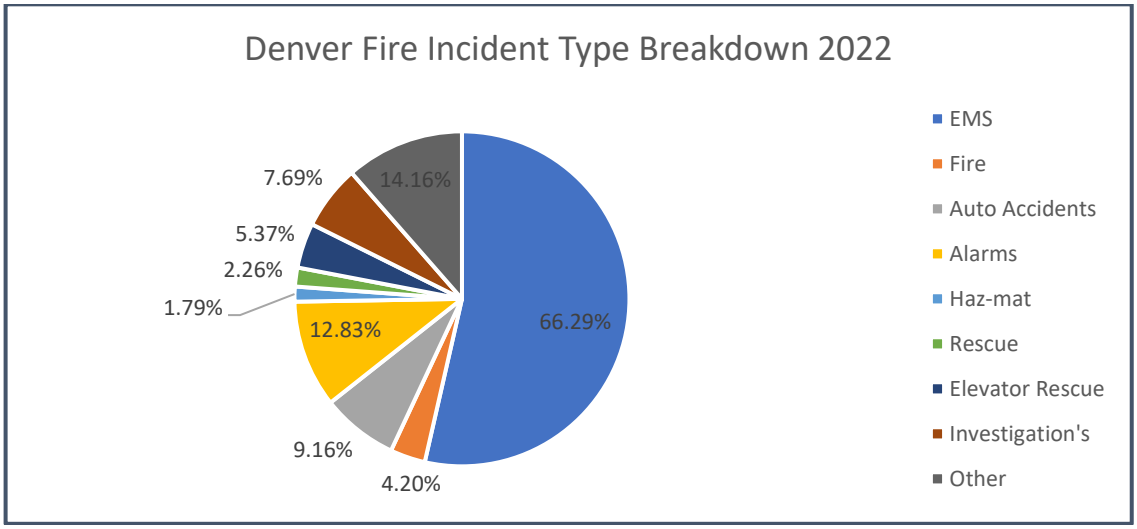


Chart 3 Denver Fire Type Breakdown 2022

CAD Dispatching/Gap Map

Denver Fire units are dispatched by alerting the nearest apparatus. All Denver fire apparatus are equipped with an automatic vehicle locator connected to CAD software, allowing dispatchers to locate and deploy the nearest unit to the event. In the event there are gaps in coverage due to a large working incident or event that takes many rigs out of service such as training or mechanical, the dispatch team, working together with the Shift Commander, will utilize the Denver Gap Map software to effectively move rigs into the compromised areas to sufficiently meet response times.

Effective Response Force

The effective response force (ERF) is the type and number of resources the department determines to be the minimum response necessary to respond to an incident. It is understood that this is a basic response that can manage the bulk of incidents. It is also understood that this force may not be able to suppress every incident, but delivers a response (first-alarm, second alarm, etc.) that provides a modular group designed to layer additional resources to the incident until the resources overcome the emergency.

The ERF is employed for all emergencies including structure fires, wildland fires, medica incidents, extrications, technical rescues, hazardous materials, and special operations. ERFs have been identified through actual operations and have been determined through the experience of the responders.

Emergency Medical Response

The standard emergency medical response for the Denver Fire Department consists of a single resource BLS response; engine, truck, tower, med unit, heavy rescue (depending on closest unit). This response is in conjunction with ALS resources (ambulance) which primarily responds from our partner agency Denver Health. Various private ALS ambulance services also provide overflow response for Denver Health. If the medical response is a vehicle accident with parties trapped, the response is upgraded to include 1 engine, 2 trucks or towers, 1 heavy rescue, ops 2 (safety officer), and 1 district chief.

Emergency Medical Risk Assessment

From 2019 through 2022, emergency medical services (EMS) calls comprised 64.7% of the Department's total call volume. The Denver Fire Department requires all personnel to possess an EMT-Basic certification and beginning in 2022, require all new firefighters to obtain their respective IV/IO certification. In the 1st quarter of 2023, the Department onboarded a dedicated Medical Director to oversee the Department's EMS program. Data analysis continues to show consistently longer response times from ALS resources in various outlying parts of the Department's response Districts, therefore the Department's leadership will be working in conjunction with the Medical Director to evaluate possible expanded EMS scope of practice with our outlying fire resources. The Department also staffs two full time quick response EMS units (Med Units) that primarily target lower acuity calls in busier districts. The Med Units are staffed with two EMT-Basic personnel and quickly respond to calls between the hours of 2000-0600. The intent is to reroute lower acuity calls keeping busier fire companies available for higher acuity calls in their respective response areas. The Department was approved for and plan to add a third med unit in the 2nd quarter of 2023.

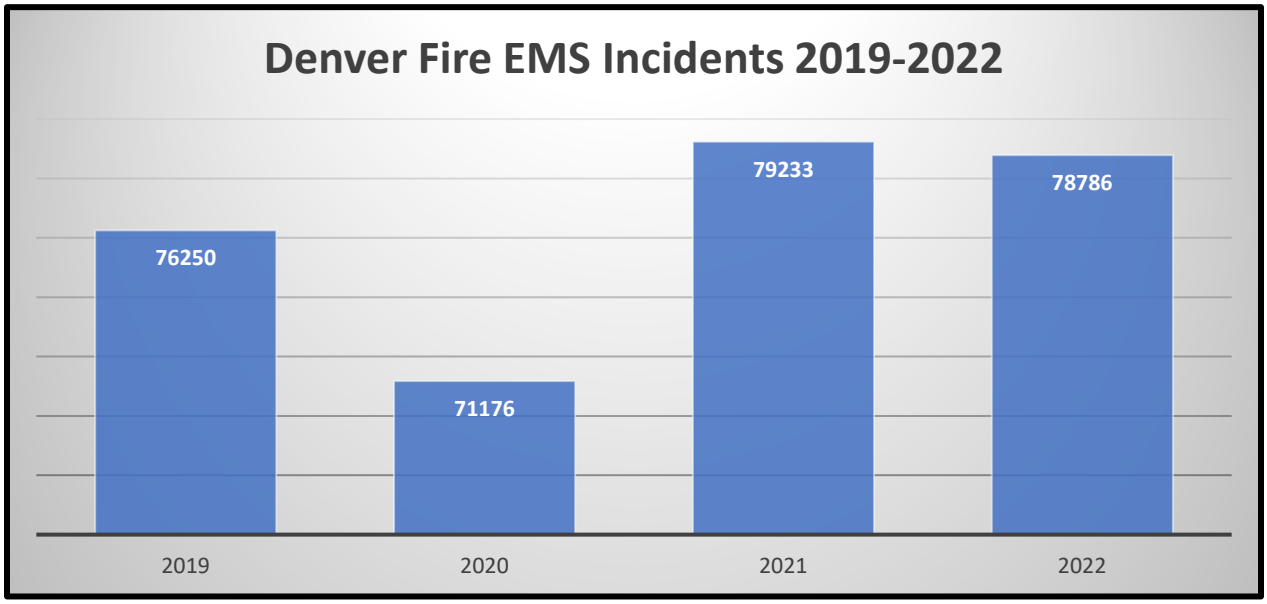


Chart 2 Denver Fire EMS Incidents 2019-2022

Technical Rescue

Fire and medical response are not the only identity of the DFD. In fact, the City and County of Denver and the diverse industrial and commercial landscape, in addition to the continued growth of the city has necessitated an "All Hazards" approach to emergency response. DFD remains diligent to stay current with NFPA 1006 and 1670 regarding response, training, equipment, and standards of competency related to our technical disciplines. The companies responsible for maintaining these certification criteria and response are as follows: Rescue 1, Rescue 2, Tower 1, and Engine 1. This group is accountable for competent, safe, and efficient response in the areas of rope and high angle rescue, trench rescue, structural collapse, confined space rescue, dive rescue, swift water rescue, and heavy machinery extrication. Every member is accountable to maintain a certification standard specific to the apparatus they are assigned. These certifications include Public Safety Diver, Open Water Diver, Public Safety SCUBA Instructor, Dive Rescue Specialist, ERDI I and II, Swiftwater I and II, and Technical Rescue Certification. Each discipline has Job Performance Requirements that

are trained and exercised on a regular basis throughout the year. There are 16 Operations members assigned to the Technical Rescue Group each day.

Hazardous Materials

Over one billion hazmat shipments travel the open road yearly in the United States. The City and County of Denver is not immune to the accidental release of hazardous materials. Denver Fire staffs a full-time Hazardous Materials Emergency Response Team, including a Decontamination Team. The members assigned to the Hazmat Group train and are certified to the NFPA 470 standard of competency for Hazardous Materials Technicians. All members assigned to the group are required to certify and maintain ProBoard Hazardous Materials Technician certification. Denver Fire utilizes the International Association of Fire Fighters (IAFF) training curriculum and employs two Master Instructors from the IAFF, Denver Firefighters, to help offset the costs of instructor-led training. The Hazmat Group consists of HAMER 1, Engine 9, Tower 9, Engine 6, Rescue 1, and Rescue 2. The Hazmat Team covers the 167 square miles of the City and County of Denver, the City of Sheridan, the City of Glendale, the City of Englewood, and the City of Skyline. To alleviate long response times and overuse of assets to investigate a hazmat call, DFD utilizes Rescue 1 and Rescue 2 for the initial recon to incidents indicative of a Level 1 response.

Denver Fire is a participating member of the Securing the Cities Program (STC), a federally funded program through the Department of Homeland Security and Domestic Nuclear Detection Office. The goal of the STC program is to lower the risks associated with successfully deploying a radiological/nuclear weapon in the Denver Metropolitan Area. Denver Fire is trained and equipped to handle an emergency incident of this nature.

In addition to mitigation ability, Denver Fire has a full-time Decontamination Team. This team is housed at Station 6 and can set up for a two-person entry, all the way to an entire Mass Decontamination incident. The strategic placement of the Hazardous Materials Team is near identified critical infrastructure such as Ball Arena, Empower Field at Mile High, Coors Field, Denver Convention Center, and the Denver Coliseum.

The Aerial Support Team (AST)

Denver Fire's Drone Unit flew its first incident at a Structure Collapse in Englewood on 2/24/2021. The Drone Unit provides a sheltered command post at incidents, provides enhanced communications, and provides live aerial video for commanders and crews. The Drone Unit will also provide unique community outreach opportunities for special events.
The Aerial Support Team (drone) has been proving its value and capabilities. At incidents, the unit can help identify hotspots, provide greater situational awareness, and provide critical information to Incident Commanders. After recognizing the value of the Drone Program, other safety agencies are exploring similar capabilities and/or additional DFD Drone Unit tie-ins.

Risk Assessment

The Aerial Support Team unit has been taking photos of the Platte to map the river and its tributaries for swift-water rescue purposes. Using drones for mapping is a quicker and more accurate way to access structures and their surroundings. Drones also take much less time to deploy, which allows fire departments to survey quickly and accurately from the air and assess potential risks and dangers. This provides the Incident Commander with situational awareness and aerial intelligence, allowing them to position firefighters and coordinate rescue efforts safely and efficiently.

Thermal Imaging
Smoke from an active fire and physical obstacles restricting visibility can be a problem for firefighters on the ground. Drones outfitted with high-definition infrared (IR) cameras give the Incident Commander thermal imaging capabilities to see what the naked eye cannot. Drones allow Denver Fire to monitor hotspots, identify deployed personnel, and locate people trapped inside structures.

Remote Monitoring & Coordination
Drones enable the Denver Fire Aerial Support Team to relay high-definition video intelligence of the fire scene to the Incident Commander in real-time. This supports improved management with other agencies and first responders on the scene. The footage and data gathered during emergency response incidents can also be used as evidence, for after-action analysis, and incorporated into future training materials.

AST-01 Vehicle Inventory and Usage
DJI M30T Mapping Drone with RTK (Real Time Kinematic) used for hyper accurate photo and video imaging GPS positioning and interfacing to GIS maps. This drone is also used for firefighting and rescue incidents using 8K resolution cameras and FLIR (Forward Looking Infrared) Aircraft has a 50-minute flight time and can withstand up to 45 mph winds and light rain.

DJI Mavic 2 Enterprise Drone. This light duty drone is also used for firefighting and rescue incidents using 4K resolution cameras and FLIR (Forward Looking Infrared) Aircraft has a 23-minute flight time and can withstand up to 23 mph winds.

DJI Mavic 2 Enterprise Advanced Drone. This light duty drone is also used for firefighting and rescue incidents using 4K resolution cameras and FLIR (Forward Looking Infrared) Aircraft has a 23-minute flight time and can withstand up to 23 mph winds. This drone has advanced video casting and display capabilities for command use.

DJI Mavic 2 Mini Drone. This very light duty drone is also used for indoor use and training purposes. It uses 4K resolution camera and prop guards for indoor use. This aircraft has a 20-minute flight time and can withstand up to 10 mph winds.

All drones but the Mavic Mini are capable of casting live video to the AST-01 on-board 55” Samsung TV or stream live video across the Internet using the application Airdata. These video streams can be viewed on any PC, Tablet, or smart phone and is also embedded into the Tablet Command application.

The ACU1000 is a radio patching system located on AST-01 that can patch any programmed P25, VHF, and UHF radio talk groups together for enhanced communications on mutual aid incidents.

The Futurecom repeater is located on AST-01 for increased radio coverage for incidents when building or subterrain communications become unavailable on the Denver trunked radio system.
There are 12 – APX8000XE portable radios available on AST-01 for spare/additional radios required on Denver / Mutual aid incidents. These radios are also programmed with VHF frequencies for Wildland and surrounding agencies using VHF.

Also, there are 2 – VHF ICOM radios for monitoring aircraft frequencies.
Cisco 829 Router #1 – Provides network connections to on-board MDT (Mobile Data Terminal) and Tablet Command iPad. This router also provides connections for a city Dell All-in-One PC for CCD network services, HP Laser Printer, and a dedicated DFD-FLEX WIFI connection.
Cisco 829 Router #2 – Provides network connections for the DFD Vocalarm dispatching system and a Dell All-in-One computer for dispatch interface. This PC also is used for on-scene radio programming and connection to the ACU1000.

A Cradle Point 5G router is used for all connection and casting of drone video via Airdata to the Internet. This casting of live drone video is also available on all upcoming rig Tablet Command iPads.

The AES re-kindle unit is located on-board AST-01 and OPS-2 Shift commander vehicles for use on-scene of closed structure fire incidents in cases of re-ignition.

AST-01 also serves as an incident command post for DFD command members with a dual head mobile radio located on the front and rear of the vehicle.

ST-02 and AST-03 Vehicle Inventory and Usage
These will be 2 new responses vehicles (Expedition or Explorer) issued to the Superintendent of Fire Alarm and the Assistant Superintendent of Fire Alarm from the DFD Technical Services group. All inventory for these vehicles is purchased and awaiting installation. Both vehicles will carry the equipment identified in the next two paragraphs.

DJI Mavic 3 Enterprise Drones. This light duty drone is also used for firefighting and rescue incidents using 8K resolution cameras and FLIR (Forward Looking Infrared) Aircraft has a 45-minute flight time and can withstand up to 23 mph winds.

The Cisco 5G Router – Provides network connection to the on-board Tablet Command iPad. This router also provides connections for a city Dell All-in-One PC for CCD network services and a dedicated DFD-FLEX WIFI connection. This outer is used for all connection and casting of drone video via Airdata to the Internet.

Aircraft Rescue Fire Fighting

By area, Denver International Airport (DEN) is the second largest land massed airport in the world. DFD staffs a full-time response contingent at DEN. This dedicated contingent is to better serve those who work at DEN, visit or are returning home to the City of Denver. All DFD resources at DEN are strategically positioned to respond. On approach to DEN, at the Jackson Gap exit, outside the secure, fenced area is Station 35. Newly opened in 2016, Station 35 reduces response times on Pena Boulevard, the Jeppesen Terminal and the south corridor of the airport. Inside the secure area, DFD at DEN provides both structural and ARFF firefighting capabilities. There are four stations on the airfield, strategically positioned to make all necessary response times per the Federal Aviation Administration (FAA) to all six airplane runways. DFD at DEN staffs a full-time Dangerous Goods Response Team (DGRT) for incidents that are hazardous material oriented. "Technical" in nature. Except for aircraft rescue response, DFD members assigned to DEN respond to similar calls as the members in Operations.

Wildland Fire Services

Except for California, the DFD staffs and deploys one of the largest wildland teams west of the Mississippi River. Participation in the Wildland Program is not a requirement of employment and is staffed by application each calendar year. Annually, approximately 140 of the DFD's 1080 members participate. Training and certification are at the discretion of the member of the wildland team. An in-house coordinator conducts administration and oversight of the program. Qualifications include EMT and RADO and may be as expansive as Engine Boss. The City of Denver does have multiple areas of Wildland Urban Interface and planning is done each year to address potential fire concerns. This planning and decision-making occur in cooperation with the Parks and Recreation Department to identify hazard areas.

Denver has been a focus of studies for the Wildland Urban Interface in the metropolitan area. As shown previously, Denver has a land mass of 167 Square miles. This number includes the cities of Skyline, Glendale, Sheridan, and Englewood. Most of the land that may cause a hazard is grass and weeds. For this reason, the DFD has acquired resources such as a Type 3 Engine, housed at Station 2. The southern part of the city also presents urban interface target hazards, and for this reason, the DFD has placed a Type 6 Engine or "Brush Truck" at Stations 22 and 37. Members assigned to these stations cross-train on how each apparatus works and will respond, if needed, in the event an urban interface event threatens the cities.

The current response to a grass or weed fire is investigated and handled by a single engine response. The other component of the wildland interface are the mountain parks owned by the City and County of Denver. Two of the most popular parks owned by the City and County of Denver are Red Rocks, home to Red Rocks Amphitheater, and Winter Park, home to the Winter Park Ski Resort. The DFD has no direct response or suppression responsibility to these properties but has wildland fire cooperator agreements with the county having jurisdictional authority for fire rescue.

Denver, along with other Metro Fire Agencies, participates in the "Metro Fire Chief's Agreement." The agreement states that when a neighboring community needs outside support, surrounding agencies will respond. Deployments of this nature typically are coordinated in 20 minutes or less by the DFD Shift Commander and units are forwarded to the rally point for travel within the hour of request.

Section 3 Assessment and Planning

Service area boundaries

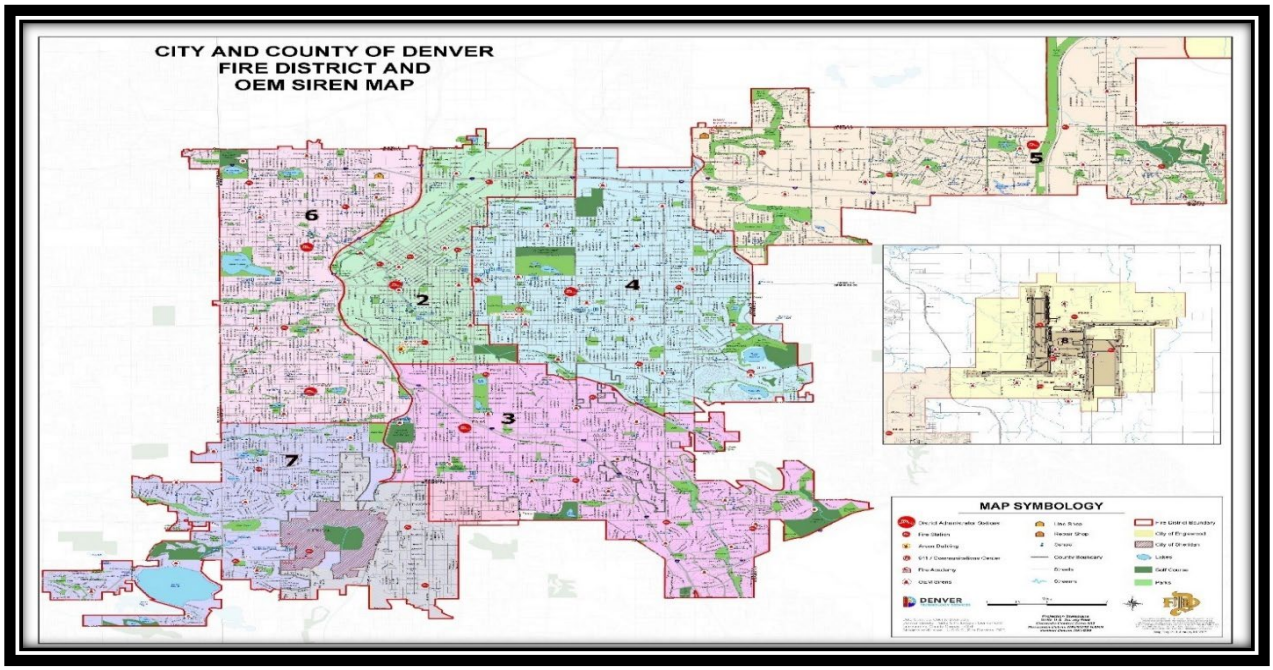
Service area boundaries for the agency are identified, documented, and legally adopted by the authority having jurisdiction. The Department provides service to the City and County of Denver as it is described in the Charter and Denver Revised Municipal Code and is detailed in official city maps provided by Denver Geographic Information Systems.

The Department's service area boundaries were established by the Governing Body as the official map for the City and County of Denver. The map was maintained by the City's Geographic Information Systems (GIS) department and updated as needed and determined by the Governing Body.

The Denver Fire Department currently has Intergovernmental Agreements and Cooperative Agreements with surrounding jurisdictions including Englewood, Glendale, Skyline, Sheridan,

Evergreen, Foothills Fire Protection (Mountain Parks Fire), West Metro Fire Protection, South Metro Fire Rescue, and a Memorandum of Understanding with the Aurora Fire Department for automatic mutual aid in the southeast part of the city. The service responsibility areas are identified and documented as described in the Intergovernmental Agreements and Memorandum of Understanding. These are approved by the authority having jurisdiction. Each agreement has its own conditions and parameters for service and responsibilities related to the Denver Fire Department and the partner entity. Mapping for other service responsibility areas is maintained through the City and County of Denver Geographic Information Systems Department and maps are updated as needed.

Boundaries for other service responsibility areas were identified and documented within each agreement or contract. The service responsibility areas were reviewed and approved upon expiration based on the terms of each document. The City's GIS department updated maps as needed or if other service responsibility areas changed.



Map 6 Denver Fire District Map

Planning Zones

The Denver Fire Department utilizes district maps as the documented and adopted methodology for organizing response areas into geographical planning zones. The Denver Fire Department fire districts are managed by District Chiefs. Within each District there are 5-6 Fire Stations. The planning areas are then subsequently divided into smaller planning areas for each Fire Station. The planning zones are defined by response areas of each Fire Station. Response areas are defined by the shortest distance of travel to an incident response, in accordance with NFPA 1710. The Department planning zones are defined in 6 Districts, 2-7, and Denver International Airport (DEN). Each incident response is expected, following NFPA 1710, to be within a four-minute travel time. Each day, within the DFD Dispatch Run Analysis (daily reports) and the Power BI Dashboard, incident and response information is provided to the Operations Division Chief, Shift Commanders, and District Chiefs. This information can be used to adjust response areas as needed.

The planning zones were defined by response areas of each Fire Station. Response areas were defined by the shortest distance of travel to an incident response, in accordance with NFPA 1710 to be within four minutes. The Department, through the City's Geographic Information Systems (GIS) department, prepared and reviewed citywide coverage maps for detail of the four-minute response citywide. These maps were used for reallocating resources based on call volume and travel times. Additionally, use of the Power BI Dashboard, as well as the DFD Dispatch Run Analysis allowed for daily monitoring of incidents and responses by the Shift Commanders and Division Chief of Operations, and reallocation as needed.

Planning Zone Characteristics

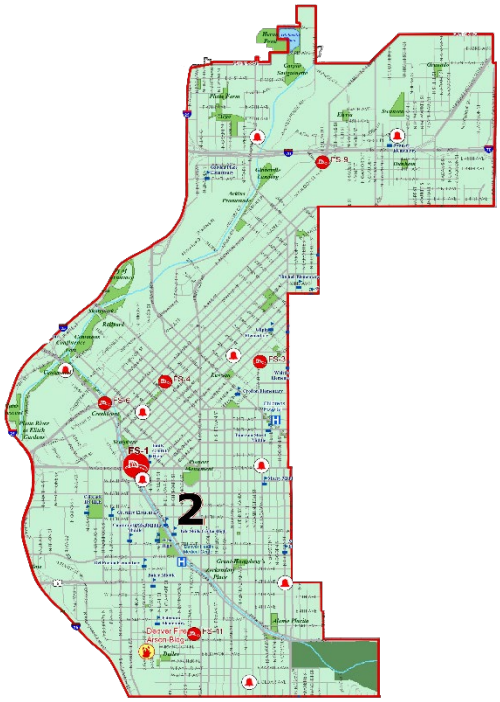
The DFD identifies the response to the above characteristics by strategic placement of fire apparatus. The department also partners with the city's Office of Emergency Management for planning and trainings related to all hazard's emergencies.

The Denver Fire Department will follow the City's Community Planning and Development 20-year comprehensive plan, which includes the City's subsection Blueprint Denver citywide use and transportation plan.

Five districts are divided by major roads in a geographical area. Respective fire stations are in individual districts and follow coverage to meet the NFPA recommendation of a 4-minute response times. The Operations division uses a program called Power-BI, a unified, scalable platform for self-service and enterprise business intelligence (BI) to track the compliance of the 4-minute response. Every month each fire company sends its compliance percentages to their respective district chief. Utilization of call volume data and city-wide four-minute response maps allows the DFD to make evaluations and determine a need for additional resources and stations based on population density. In 2021 the DFD added an additional apparatus to fire station #35. This tower ladder resource was added to assist with the added call volume on the DEN Pena highway corridor.

Due to increasing population density in the North/East section of the city (district 5), fire station 40 is in the design plan and is currently expected to be completed in 2025. In October of 2023 Engine 40 will be staffed at Fire Station # 2 until Station 40 is completed.

Planning Zones Hazards and Risks



District 2 Planning Zone

Description: District 2, located in the central portion of the city and has a total of six Fire Stations (Station 1, 3, 4, 6, 9, 11), consisting of Engine 1, Tower 1, Engine 3, Engine 6, Engine 9, Tower 9, Engine 11, Rescue 1, Chief 2. These stations make up the bulk of the department's special operations companies which include Heavy Rescue, Underwater Rescue, Confined Space Rescue, Decon and Hamer 1(Hazmat). District 2 is the departments oldest and busiest planning zone. Truck 4 is stationed in the heart of downtown Denver, as well as the oldest firehouse in the city, Station 3, which is located in the historic Five Points neighborhood.

Critical Infrastructure and Key Resources:

City of Denver: Residential, Commercial, Large assembly structures

- Residential – single family houses
- Multi-Family apartment buildings
- Multi-Family High-Rise buildings
- High-Rise Hotels
- Commercial High-Rise buildings
- Commercial retail centers
- Colorado State Capital
- The Denver Mint
- Denver Union Station – rail transportation hub for the region
- Colorado Convention Center
- Ball Arena – home to the Denver Nuggets and the 2022 Stanley Cup Hockey Champions, the Colorado Avalanche

- Coors Field – home to Colorado Rockies
- Denver Art Museum
- Denver Performing Arts Complex, located in the lively theater district, musicals, plays, and concerts are staged
- National Western Complex – home the National Western Stock Show
- The 16th street mall, a pedestrian strip lined with gift shops, street food vendors and a al-fresco bars and restaurants
- Denver Health – Level 1 trauma center and Hospital
- Residential care, assisted living, independent living facilities for seniors and impaired persons
- Shelters for persons experiencing homelessness
- Six Flags Amusement Park
- Community College of Denver, Metropolitan State University, and CU Denver
- Denver Justice Center

Main Transportation Infrastructure within District 2

Interstate highways:

- I-70 East/West Corridor
- I-25 (Valley Highway) North/South Corridor

U. S. Highways:

- US 40 / US 287 (Colfax Avenue) East/West Corridor, known as the longest continuous commercial street in America
- US 6 (6th Avenue) East/West Corridor

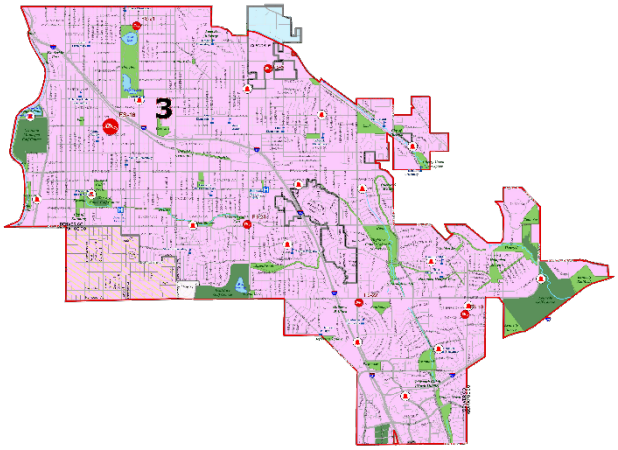
Rail Lines:

- Burlington Northern Santa Fe - Freight and Hazmat
- Union Pacific – Freight and Hazmat
- Amtrak – Passenger rail
- Regional Transportation District (RTD) – Commuter Light Rail system.

Natural Water Ways:

South Platte River – Flows South to North through District 2

Cherry Creek – flowing southeast to northwest until combining with the South Platte River at confluence park



District 3 Planning Zone

Description: District 3, located in the southeast portion of the City and County of Denver, also providing emergency response to the City of Skyline and the City of Glendale. District 3 has a total of six Fire Stations (Station 5, 13, 16, 21, 22, 24) consisting of Engine 13, Engine 16, Truck 16, Engine 21, Engine 22, Tower 22, Engine 24, Chief 3, all in the City of Denver. Engine 5, located in the City of Glendale. Located on the southern portion of District 3 is the Denver Technological Center which is home to several high tech and financial companies.

Critical Infrastructure and Key Resources:

City of Denver: Primarily Residential with Commercial Retail

- Residential – single family houses
- Multi-Family apartment buildings
- Multi-Family High-Rise apartment buildings
- High-Rise senior living centers
- High-Rise commercial office buildings
- High-Rise Hotels
- Commercial retail centers
- Porter Memorial Hospital
- University of Denver – Higher education facility

City of Glendale, located within Arapahoe County: Mixed residential with industrial commerce

- Residential – single family homes
- Multi-Family apartment buildings
- High-Rise commercial office buildings
- Commercial retail centers

City of Skyline, located within Arapahoe County: Residential with commercial retail

- Residential - single family homes
- Commercial retail centers

Main Transportation Infrastructure within District 3

Interstate Highways:

- I-25 (Valley Highway) North/South Corridor
- I-225 North/South Corridor bypass Central Denver to I-70

U. S. Highways:
- US 85(Hampden) East/West Corridor turns into US 30
- US 285 (Santa Fe) North/South Corridor

Colorado Highways:
- CO 2 (Colorado Blvd) North/South Corridor
- CO 30 (Havana) North/South Corridor
- CO 83 (Parker Road) Northwest / Southeast

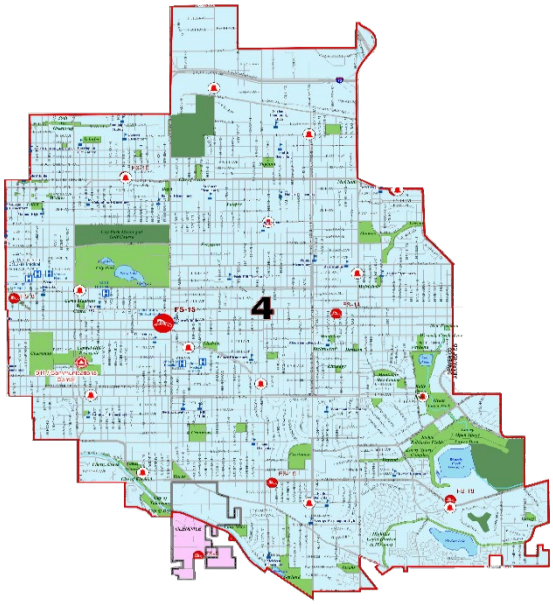
Rail Lines:
- Regional Transportation District (RTD) – Commuter Light Rail system

Natural Water Ways:
Cherry Creek – Flows Southeast to Northwest through District 3

Material
Open-vat chemical plating
Chemical processing
Cryogenic storage and manufacturing
Chemistry labs for DU
Hospitals - Chemical, biological, and radiation hazard

Mechanical (Technological)
Electricity generation
Light and heavy rail lines

Structural
Large area mercantile with basement, no hydrants
Hospitals
Dense housing with long halls and limited access
Apartments with limited access, long hose stretches



District 4 Planning Zone

Description: District 4, located in the central/east portion of the City and County of Denver. District 4 has a total of five Fire Stations (Station 8, 10, 15, 18, 19) consisting of Engine 8, Truck 8, Engine 10, Rescue 2, Engine 15, Tower 15, Engine 18, Engine 19, Truck 19, and Chief 4. District 4 has some of the oldest homes in the city on the west side of the district in the Capital Hill and Park hill neighborhoods, and the transformed Lowry Army Air Force Base which is now a residential community on the east side of the district.

Critical Infrastructure and Key Resources:

City of Denver: Primarily Residential with Commercial Retail

- Residential – single family houses
- Multi-Family apartment buildings
- Multi-Family High-Rise apartment buildings
- High-Rise commercial office buildings
- Senior living care centers
- Commercial retail centers
- St. Joseph Hospital
- Presbyterian St. Luke's Hospital
- National Jewish Hospital
- Rose Medical center
- Denver City Park
- Denver Museum of Nature and Science
- Denver Museum
- Denver Botanic Gardens
- Wings over the Rockies Air and Space Museum
- Mall and shopping district
- Multiple Theaters
- I-70 tunnel system

Main Transportation Infrastructure within District 4

U. S. Highways:

- US 40 / US 287 (Colfax Avenue) East/West Corridor, known as the longest continuous commercial street in America

Colorado Highways:

- CO 2 (Colorado Blvd) North/South Corridor
- CO 83 (Parker Road) Northwest / Southeast

Natural Water Ways

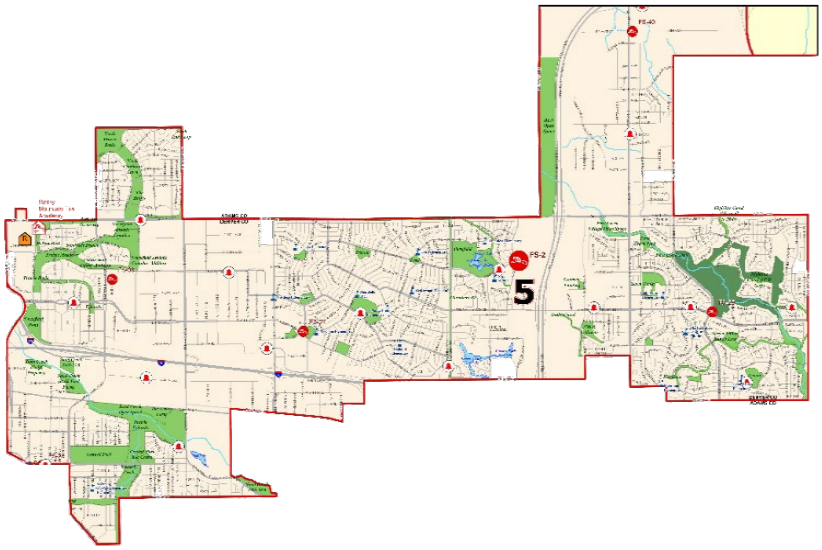
Cherry Creek – Flows Southeast to Northwest through District 4.

Material

Pesticide manufacturing
Hospitals
Warehouses and manufacturing plants - Ammonia and CO2 in large quantities
CDPHE - chemicals onsite
Purina plant

Mechanical (Technological)

Battery electrical building
Heavy and light rail
Water storage cisterns
Large electrical sub-stations



District 5 Planning Zone

Description: District 5, located in the northeast portion of the City and County of Denver. District 5 has a total of five Fire Stations (Station 2, 14, 26, 27, 29, 39) consisting of Truck 2, Engine 14, Engine 26, Truck 26, Engine 27, Tower 27, Engine 29, Engine 39, Chief 5.

Critical Infrastructure and Key Resources:

City of Denver: Primarily Residential with Commercial Retail

- Residential – single family houses
- Multi-Family apartment buildings
- Hotels
- Commercial retail centers
- Industrial Commerce facilities
- Denver County Jail
- Continued development and transitioning of the old Stapleton Airport into the Central Park and Northfield communities
- United Airlines flight training center

Main Transportation Infrastructure within District 5

Interstate Highways:

- I-70 East/West Corridor
- I-225 North/South Corridor bypass of Central Denver to I-25

Freeways:

- Pena Boulevard providing transportation from Interstate 70 to Denver International Airport (DEN)

Rail Lines:

- Union Pacific Railway – Freight and Hazmat
- Regional Transportation District (RTD) – Commuter Light Rail system

Natural Water Ways:
Sand Creek – West to East through District 5

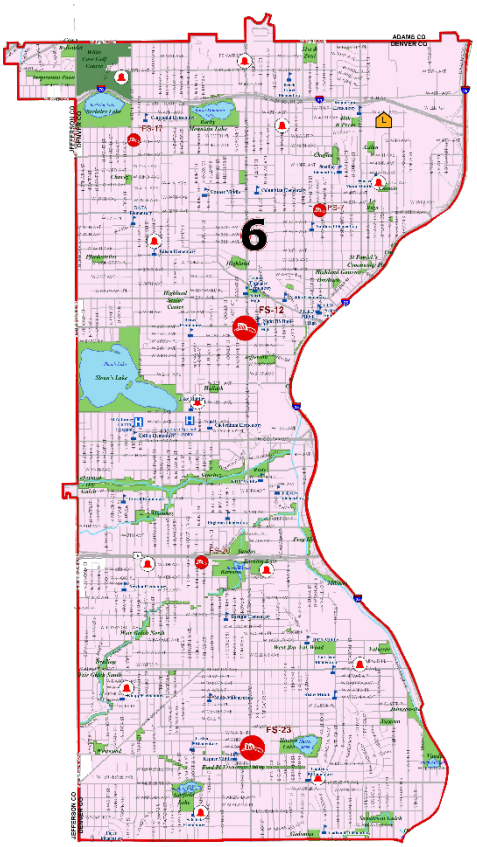
Human
Concentration of homeless transitional housing/shelters
Concentration of individuals and families in lower end of socioeconomic scale
Concentration of high-rise hotels
Multiple educational campuses
High speeds of travel along I-70 and Pena

Material
Warehouses containing hazmat hazards including flammable liquids, LPG, hydrogen, chlorine, cryogen, compressed gases, and battery storage

Mechanical (Technological)
Adjacent to DIA with buffer space

Natural
Large open fields prone to wildland/grass fire
Immediately adjacent to Rocky Mountain Arsenal/Refuge

Structural
Concentration of homeless transitional housing/shelters
Concentration of high-rise hotels
Multiple educational campuses
Homes constructed with concrete over corrugated metal first floor with basement below
Vacant swim club with interior pool and bow string truss roof
School of arts with large difficult to navigate basement full of stage sets and props



District 6 Planning Zone

Description: District 6, located in the northwest portion of the City and County of Denver. District 6 has a total of five Fire Stations (Station 7, 12, 17, 20, 23) consisting of Engine 7, Engine 12, Truck 12, Engine 17, Engine 20, Engine23, Tower 23, Chief 6. District 6 is home to the historic Highlands neighborhood, and the Barnum neighborhood initially purchased as the winter grounds for animals from the P.T. Barnum Circus.

Critical Infrastructure and Key Resources:

City of Denver: Residential, Commercial Retail and Industrial commerce facilities

- Residential – single family houses
- Multi-Family apartment buildings
- Multi-Family High-Rise apartment buildings
- Senior Living High-Rise apartment buildings
- Senior living care centers
- Commercial office buildings
- Commercial retail centers
- Industrial commerce facilities
- Regis University – higher education facility
- Empower Field at Mile High – Home of the Denver Broncos
- Meow Wolf

Main Transportation Infrastructure within District 6

Interstate highways:

- I-70 East/West Corridor

- I-25 (Valley Highway) North/South Corridor

U. S. Highways:

- US 40 / US 287 (Colfax Avenue) East/West Corridor, known as the longest continuous commercial street in America
- US 6 (6th Avenue) East/West Corridor

Colorado Highways:

- CO 88 / CO 287(Federal) North/South Corridor
- CO 95 (Sheridan) North/South Corridor

Rail Lines:

- Burlington Northern Santa Fe - Freight and Hazmat
- Union Pacific – Freight and Hazmat
- Amtrak – Passenger rail
- Regional Transportation District (RTD) – Commuter Light Rail system

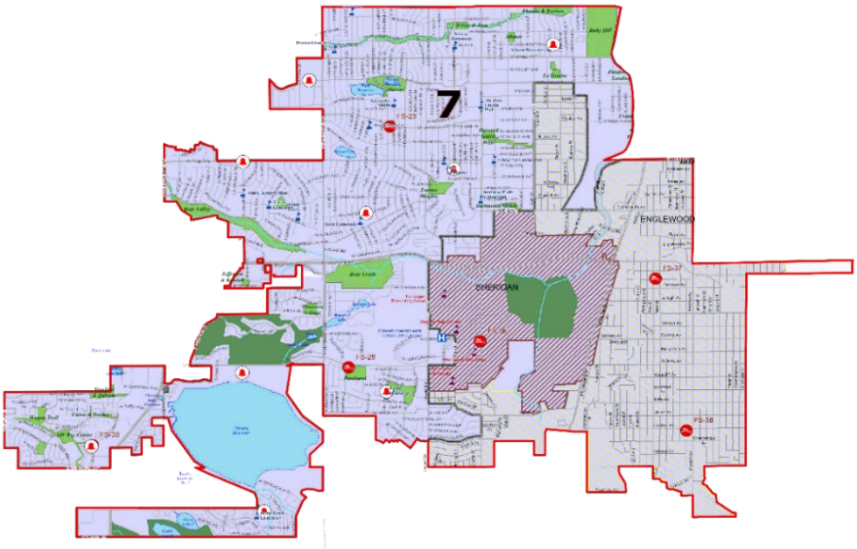
Natural Water Ways
South Platte River – Flows South to North through District 6

Human
Both city sponsored and unauthorized encampments for persons experiencing homelessness

Material
Warehouses that contain hazardous materials and store/utilize equipment

Mechanical (Technological)
Rail yards
Construction material and equipment
Power outages due to aging infrastructure and increased demand

Structural
Slot homes that are 3-4 stories and have limited access for fire apparatus
Rail yards
Intersection of two major highways (the presence of these highways also presents a hazard related to the trafficking of humans, drugs, and other contraband)



District 7 Planning Zone

Description: District 7, located in the southwest portion of the City and County of Denver, also providing emergency response to the City of Sheridan and the City of Englewood. District 7 has a total of six Fire Stations (Station 25, 28, 30, 36, 37, 38) consisting of Engine 25, Engine 28, Truck 28, Engine 30, Chief 7 located in the City of Denver. Engine 36 located in the City of Sheridan. Engine 37, Truck 38 located in the City of Englewood.

Critical Infrastructure and Key Resources:

City of Denver: Primarily Residential

- Residential – single family houses built in the late 1940s, 1950s and 1970s
- Multi-Family apartment buildings
- High-Rise senior living centers
- Commercial retail centers
- Marston Lake, City of Denver main water supply and treatment facility

City of Englewood, within Arapahoe County: Mixed residential with industrial commerce

- Residential – single family homes
- Multi-Family apartment buildings
- High-Rise senior living centers
- Commercial retail centers
- Industrial commerce facilities in Englewood
- South Platte Renew Water treatment center serving the Englewood and southern portions of the Denver Metro area
- Englewood Waste treatment facility
- Swedish Hospital – Level 1 trauma center for Denver and the south metro area
- Craig Rehabilitation Hospital specializing in Brain and Spinal trauma Injuries

City of Sheridan, within Arapahoe County: Mixed residential with industrial commerce

- Residential - single family homes
- Commercial retail centers
- Industrial commerce facilities in Sheridan

- Waste Management Transfer Station – Processing trash and recycling from the Denver Metro area from Evergreen to Parker Colorado

Main Transportation Infrastructure within District 7

U. S. Highways:

- US 85(Hampden) East/West Corridor
- US 285 (Santa Fe) North/South Corridor

Colorado Highways:

- CO 88 (Federal) North/South Corridor
- CO 95 (Sheridan) North/South Corridor
- CO 121 (Wadsworth) North/South Corridor

Rail Lines: Both run parallel with US 285

- Burlington Northern Santa Fe - Freight and Hazmat
- Union Pacific – Freight and Hazmat
- Regional Transportation District (RTD) – Commuter Light Rail system

Natural Water Ways

South Platte River – Flows South to North through District 7
Bear Creek – Flows West to East through District 7 into the South Platter R

Human

- Large homeless population in various states of permanency
- Low rent motels housing transient persons with drug/alcohol related medical issues
- Several trailer/RV parks used as permanent housing especially for aging population
- Multiple health care and hospital facilities with large patient volume and limited resources during full evacuation/natural disasters

Material

- Two water treatment plants
- Chemical gas plant and transfer station
- Power plant
- Regional trash transfer station
- Wastewater treatment plant
- Wood construction materials transfer station from rail to storage to stores, limited water supply
- Ammonia storage
- Methane release due to construction over a trash dump
- Medical facilities/hospitals that utilize oxygen for patients and radiological equipment

Mechanical (Technological)

Multiple automobile savage yards
Multiple metal recycling plants
Multiple materials resource recycling including concrete, rock, dirt
Train rail line hauling chemical, radiological, coal
Mass transit rail line
RTD light rail mechanical shop for mass transit rail vehicles

Natural
Rivers/creeks/gulches

Reservoirs, lakes, and ponds
Street flooding

Structural
Highways including, I-25, US 6th Ave, US 85, US 285
Several medium to large apartment complexes with restricted access for firefighting
Multiple big box stores and warehouses throughout district posing excessive number of firefighters needed due to large area search concerns.

Systemic:
Difficulties among various jurisdictions and agencies, especially with regards to conveying information during initial dispatch.
Convoluted boundary lines create uncertainty about what responsibilities that DFD has for response in these areas.
Routing difficulties, especially in the southern portion of the district, presented by parks, cemeteries, golf courses, schools, shopping complexes, waterways and ponds/lakes, highways, and railroads.

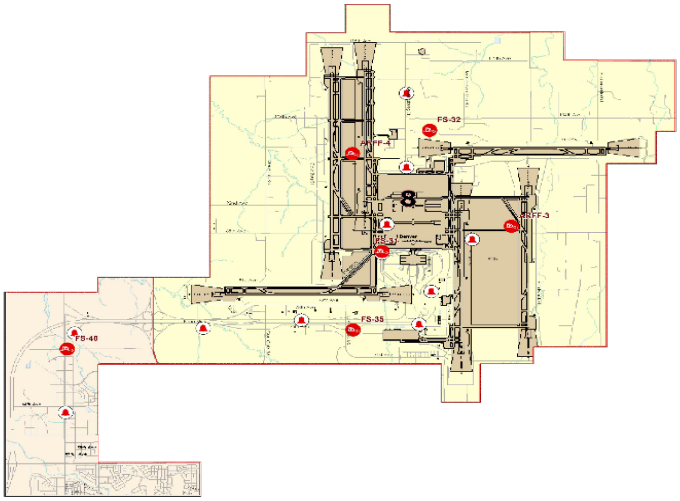
Current Priority Hazard Locations
Waste Management facility - regional trash and waste transfer station located on the western bank of Platte River.

Denver Fire has responded to multiple fires at this facility in the trash piles. The water supply consists of three hydrants on a dead-end water supply loop. This facility poses fire hazards for the community: Use of thousands of gallons of water in drought conditions lowering water levels for Denver and Metro area businesses and residents. Majority of water used for firefighting operations drains directly into the Platte River taking with it pollutants from the burning trash and chemicals contained within.

This facility is located 3.2 miles upstream of the South Platte Water Renewal water treatment plant, which purifies water from river into drinking water in the community.
Recent water contamination in the Englewood water supply system is suspect. Environmental pollution of Platte River and the banks of the river from the facility downstream through the Arapahoe County, City of Englewood, City of Sheridan, and the City and County of Denver. The future cost of the environmental cleanup of the river will be passed on to future generations.

Large areas located in Arapahoe County from Hampden to Union and US 85 to Federal Blvd are heavily occupied by commercial occupancies with inadequate water supply and a lack of hydrants for firefighting needs. This same area has similar concerns in that water from firefighting activities will drain directly into the Platte River posing the same issues from those noted above.

DEN (DIA) Planning Zone



Description: Since opening on Feb. 28, 1995, DEN has become the world's 3rd-busiest airport. With 69.2 million passengers in 2022, DEN is one of the busiest airports in the United States. DEN's Aircraft Rescue and Firefighting (ARFF) currently operates five stations covering 53-square miles, including six runways, 1.5 miles of underground tunnels, parking garages, and a high-speed underground train system.

Critical Infrastructure and Key Resources:

- DEN encompasses approximately one-third of the City and County of Denver's approximate 155 square miles (with a size of 53.09 square miles).
- DEN served 3.3 million international passengers in 2022
- Average daily flights: 1,624 (YE December 2022)
- Average daily passengers: 198,826 (YE December 2022)
- Total number of gates: 148 narrow-body contact gates and 21 apron-load positions for commuter/regional aircraft.
- The Jeppesen Terminal at DEN features 2.6 million square feet of gross space
- The Westin hotel at DEN has 519 guest rooms in addition to multiple dining venues and conference rooms
- The airport has more than 35,000 public parking spaces.
- DEN has six runways:
    - Five are 12,000 feet in length (3,600 meters) and 150 feet wide.
    - One is 16,000 feet in length (4,800 meters) and 200 feet wide and is the longest commercial runway in North America.

- The efficient layout of six non-intersecting runways allows for multiple simultaneous aircraft movements.
- DEN has capacity for six additional runways, another terminal, and two additional concourses.

Denver Fire Department at DEN (DEN/DFD)

- Five fire stations: two dedicated structural response stations, one shared structural and ARFF response station, and two dedicated ARFF stations.

- Seven ARFF response apparatus, four structural response apparatus, and one response chief officer.
- 120 total DFD response personnel: 34 per shift over three shifts.
- Six uniformed administrative support personnel: one division chief, one assistant chief, one captain, two lieutenants, and one technician, along with two civilian administrative and operations support personnel.
- Dedicated fire training center with a full-size ARFF simulator and two training ARFF apparatus.
- Unique hazards at DEN:
    - Large areas of open grass fields creating one of the most high-valued wildland-urban interface conditions in the city of Denver.
    - Hundreds of confined-spaces and below grade vaults supporting aircraft fueling operations, electrical and mechanical services, and deicing and rainwater drainage.
    - Several deicing ponds with depths ranging over 40 feet.
    - Unique vehicles and machinery supporting aircraft operations and maintenance.
    - The largest air cargo terminal in the state, creating the potential for hazardous materials incidents, accidents, or fires.
    - Uniquely configured buildings such as hangars, aircraft maintenance facilities, passenger terminals, baggage sorting facilities, and underground transportation systems.
    - Miles of jet fuel piping and millions of gallons of fuel stored in six above-ground fuel tanks.
    - High-profile transportation hub lending to vulnerability from nefarious acts of violence, targeted attacks, or mass casualty situations.
    - High life hazard resulting from aircraft-related accidents or incidents.

Safety and Remediation

The Denver Fire Department, identifies, develops, implements, and documents safety and remediation programs including fire prevention, community risk reduction, public education, injury prevention, and other similar programs. Fire Prevention is a Division within the Denver Fire Department that conducts inspections, documents violations, and enforces compliance with the fire code. The Denver Fire Department, Fire Prevention Division, is comprised of 14 technical groups that conduct specialized compliance inspections annually based on occupancy type. The Public Education group within Fire Prevention conducts fire drills and provides other educational activities for the community.

Injury prevention and the Denver Fire Department Wellness program are under the direction of the Safety and Training Division. Denver Fire has made significant advancements in injury prevention and wellness. The DFD Wellness Program is comprised of three areas, Design and Overview, Physical Wellness, and Mental Wellness. Each area is managed by a certified, credentialed, uniformed, sworn member. As part of the Public Safety Department, DFD continues to collaborate with City Leadership, Risk Management, and Denver Firefighters Local 858, and all of them have shown support for this program. Quarterly Wellness meetings are conducted to address concerns, issues, and new opportunities in injury prevention and wellness. Additionally, the Denver Fire Department Physical Therapy Program continues to improve firefighter health and save the city money through preventative care, reducing lost time and injuries.

Critical infrastructure

The Denver Fire Department identifies critical infrastructure including water systems, public works utilities, and wastewater facilities, within planning zones. Within each District, at the company level, critical infrastructure is identified through pre plan inspections as well as site visits. Information regarding critical infrastructure is communicated to fire stations in proximity to said infrastructure for incident response preparedness. Incident response is based on the Operational Response Matrix, dictating the proper Effective Response Force, which considers risk and necessary resources for each category of risk, including critical infrastructure.

The Denver Fire Department partnered with the Denver Water, and Public Works Department, both of which are primarily responsible for critical infrastructure within the City and County of Denver. Based on the level of hazard or risk documented in inspections and the existence of critical infrastructure, the Denver Fire Department responded to incidents according to the Operational Response Matrix. Identified hazards from effective preplanning is documented in Accela and entered the Computer Aided Dispatch (CAD) system in the form of “incident notes”. Critical infrastructure has not been sorted by fire districts, but information is communicated regardless of dispatch tactical radio channel.

The inventory of critical infrastructure assets identified in the City and County of Denver includes 2,439 facilities, which are broken down by sector and type of facility in the table below. Specific information on assets, names, and other key details may be accessed with permission of the city or the critical infrastructure asset owner.

Critical Infrastructure Sector	Facility Type	Count
Chemical	Risk Management Plan (RMP) Facility	7
	Tier II*	124
	Total	131
Commercial Facilities	Economic Driver	1
	Staging Site	3
	Tier II*	34
	Total	38
Critical Infrastructure Sector	**Facility Type**	**Count**
Communications	911 Communications Center	1
	911 System	2
	Cellular Tower	2
	Communications	1
	Critical to Communications	1
	FM Towers	2
	Government	1
	Paging Towers	24
	Tier II*	45
	Warning Siren	86
	Total	165
Dams	High Hazard Dam	8
	Significant Hazard Dam	2
	Low Hazard Dam	5
	Not Available Hazard Dam	1
	Low Head Dam	17
	Total	33
Emergency Services	Fire Station	40
	Law Enforcement	31
	Total	71
Energy	Electric Substations	34
	Power Plant	8
	Tier II*	11
	Total	53
Financial	Tier II*	1
	Total	1
Food and Agriculture	Grocery Store	63
	RMP Facility	4
	Small Food Market	118
	Tier II*	13
	Total	198
Critical Infrastructure Sector	**Facility Type**	**Count**
	Child Care	71
	Cultural Resource	16
	Government	69

Government	Homeless Shelter	3
	Library	26
	Park	30
	Public Works	6
	School Private	21
	School Public	272
	State government	1
	Tier II*	6
	Total	521
Healthcare and Public Health	Adult Care	97
	Animal Shelter	1
	Child Care	1
	Government	1
	Health Care Facility	64
	Home Healthcare	159
	Hospital	10
	Tier II*	8
	Total	341
Transportation Systems	Light Rail Station	37
	Non-Scour Bridge Fair	245
	Non-Scour Bridge Good	180
	Non-Scour Bridge Poor	12
	Tier II*	18
	Transfer Station	1
	Total	493
Water and Wastewater Systems	RMP Facility	1
	Tier II*	2
	Total	3
Other Not Categorized	Child Care	280
	Cultural Resource	31
	Park	66
	Parks and Rec	3
	Parks and Rec Maintenance	11
	Total	391
	Grand Total	2,439

Table 6: Denver Critical Infrastructure by Sector and Type

* = 262 total Tier II facilities across all sectors- Tier II reporting is required upon request of local emergency planning committee or state emergency response commissions to include any substance for which a facility must maintain a Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) under the OSHA Hazard Communication Standard (29 CFR 1910)

Section 4- All Hazard Risk and Response

Risk classification

The Denver Fire Department's methodology for identifying, assessing, categorizing, and classifying risks throughout the community is completed and detailed in the Operational Response Matrix. The matrix identifies what resources will be assigned to handle specific responses throughout the community, by identifying the type of incident and level of response.

The level of response is based on general incident types from Computer-Aided Dispatch (CAD), Station first due response area, apparatus capability and equipment, historic data, building construction types and occupancies, and population of the response area. Further the response takes in life hazard, potential property loss, nature, fire ground tactics, number of apparatus and the expected outcome. This function is not at DEN, it is currently in the development stage.

NFPA 1710 is the guiding document for response strategies and assignments and as response matrix changes are implemented, DFD adherence to NFPA 1710 is closely monitored.

The methodology utilized to assess risk of an incident category is based on the probability, consequences to the community and the impact to the organization. This information is outlined in Standard Operating Guideline, 2102.02 Response Matrix. The Matrix addresses and drives the effective response force based on above factors to ensure a proper response.

The Denver Fire Department has evaluated and changed the response matrix multiple times on a continual basis. The process of evaluating incidents based on probability, consequences and impact has led to changes such as the implementation of a second Rescue Company. Although technical rescue calls have a lower probability, they have the potential for high risk. Getting trained special operations responders on scene in the quickest manner was a top priority for this incident type. Through GIS data, the Department was able to identify where the highest risk areas are located and use the historical data of past calls to determine that a second Rescue Company should be placed at Fire Station 10.

Evaluation of the response matrix is also conducted quarterly through the Emergency Medical Response System (EMRS) which includes members of the Denver Fire Department, Denver Health and Hospitals Paramedic Division, the Office of the Executive Director, and the financial lead for the Department of Safety. This group evaluates the call volume, response times, GIS data and heat maps, identifying gaps in response coverage for the EMS agencies of the city and troubleshoots potential solutions for increased service. It was found, through EMRS, that our busiest companies created coverage gaps where the Department could not sufficiently meet response times. This led to the creation of Med Units, positioned in high-volume areas of the city, where the probability is high that a call will be generated within the system, but the risk is low requiring only a single resource. Med Units help ensure that basic life support personnel can arrive on scene as quickly as possible and causes a positive impact to the community by ensuring that the Department meets NFPA 1710 standard for response times. These units allow for fire companies to be available for additional high probability, low risk calls and lower-probability, high-risk calls.

Future Population Growth

The City and County of Denver has grown significantly in the past few decades and is the principal city of one of the fastest growing metropolitan areas in the country over the past decade. Denver grew by 19.22% from 2010 to 2020, and according to the Colorado State Demography Office this rate of growth is generally projected to continue through the year 2040 with a peak population just over 850,000 before starting to level off. **Figure 4** below shows these projected population trends through the year 2050.

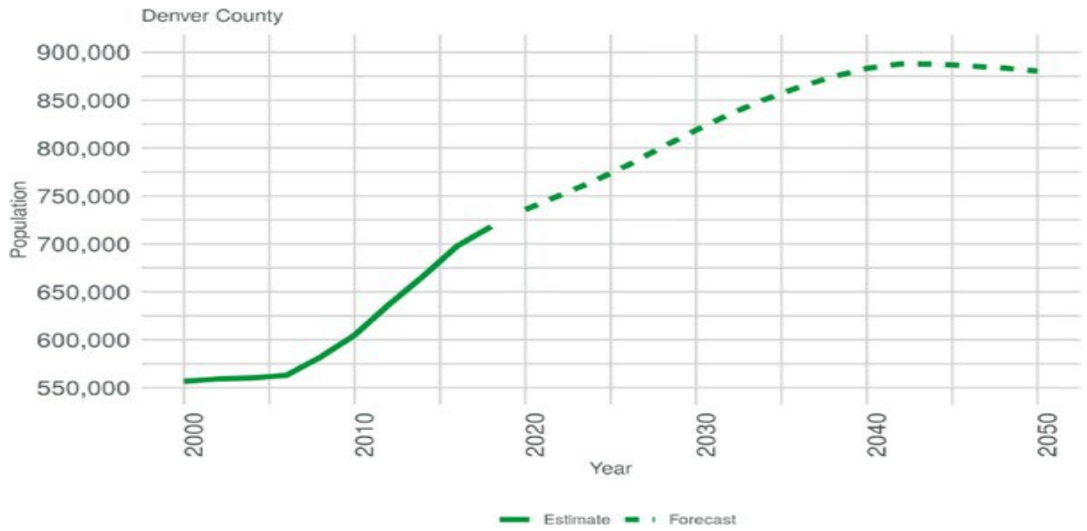


Figure 4 Denver Projected Population Trends

Between 2010 and 2020, Downtown Denver has experienced a historic development cycle, adding 4.4 million square feet of office space, over 10,000 residential units, and 3,700 hotel rooms, resulting in $6.6 billion of total investment in our center city. Several major development and redevelopment projects are planned or already underway, including the National Western Campus, the River Mile, Loretto Heights Campus, and redevelopment of the Emily Griffith School and Downtown Greyhound Station sites.

The City and County of Denver adopted its Comprehensive Plan 2040 in April 2019. Comprehensive Plan 2040 is the 20-year vision for Denver and its citizens. This plan hopes to guide strategies and policies detailed in other city plans for land use and transportation, parks and recreation, transit, pedestrians and trails, and neighborhoods. The Denver Zoning Code was adopted in June 2010 and amended on December 23, 2021. Decisions on future land use, growth, and development will be governed by these programs. These plans and their associated programs will work together to support thoughtful land use in the future by providing vital information on the risk associated with natural hazards.

At the point of the 2019 Comprehensive Plan, most of the land area in Denver was already developed or had an approved development plan. The city is a large urban center, with a high concentration of commercial development and more than half of the housing units in the city constituted of attached or multi-unit development. Due to the lack of available land within the city limits for expansion, future residential development will likely be comprised almost entirely of infill development, redevelopment, and increasing density.

Predicting calls for service

The Denver Fire Department actively tracks emergency and non-emergency incidents by service type (Type of Call), Unit, frequency, and by District across the City through the ESO Suite. The ESO Suite directly communicates with PowerBI to allow the Department to gather historic data which can help predict what needs the Department will have in the future. The goal is to provide the city with the highest level of service and ensure that the Department meets NFPA 1710 Standard for response time.

Based on call types and volume, the Department has recognized several needs over the past five years. Several gaps were identified with in the system that required additional units for response and a change of location for other units.

It was identified that there was a need for a unit to respond to emergency medical calls within the city, which were high volume incident areas. Medical only units known as Med Units were created to respond to these low acuity incidents. The units were initially placed in service on Fridays and Saturdays, as well as days identified as having historically high call volume and was staffed by overtime Firefighter/EMTs. Med Units were placed in the highest call volume areas which helped but it was quickly identified through the historical data from PowerBI that units needed to be staffed 7 days a week. Dedicated Emergency Medical Technicians were hired to staff the EMT only positions covering 10-hour shifts. Med 1 was placed at Station 4, 1890 Lawrence Street and Med 2 was placed at Station 20, 501 Knox Court. As staffing allows Med 3 is placed in service at Station 8, 1616 Park Avenue Med 3 is currently slated to be fully staffed in the 3rd Quarter of 2023. The response districts for the Med Units are closely monitored to help ensure that they are available where the highest potential for incidents is likely to occur.

The Department also recognized through the PowerBI and the Emergency Medical Response System (EMRS), the Denver Fire Department and Denver Health and Hospitals Paramedic Division Communications multi-agency working group, that additional EMS and Fire response was needed in the quickly growing Central Park neighborhood and the Pena Blvd corridor near Denver International Airport. This data allowed the Department to gain funding for Engine 39 at 9150 East 50th Avenue. This has greatly affected the NFPA 1710 standard for response times to the Central Park area and provides the coverage needed for fire response. Denver International Airport also expanded by adding Truck 35, located at Station 35, 25365 E 75th Avenue. This unit can now assist with land side emergencies in the non-secured area, with a response area taking this apparatus off of DEN property to Pena Boulevard and Tower Road. The Green Valley Ranch neighborhood has also been identified with increased call volume. In the 4th Quarter of 2023, the Department will open Engine 2 (with an eventual location of approximately 56th Avenue and Pena Boulevard) to help with the increasing population and call volume.

Additionally, based on call volumes by type, the Operational Response Matrix has been continuously revised to ensure appropriate response. The most recent Matrix change occurred in January 2023 and resulted in greater efficiencies related to resource deployment.

Documentation of categories and risk

The Denver Fire Department utilizes the risk score methodology and Operational Response Matrix for identifying risks, and the pre-plan inspection process to identify hazards within each of the six Fire Districts and planning zones. Each District is comprised of 5-6 stations, each managed by an Assistant Chief, with overall supervision at the direction of the Shift Commander. The Denver Fire Department uses multiple methodologies for defining Districts and planning zones such as city

council districts.

The Denver Fire Department utilized NFPA 1710, as well as the Operational Response Matrix for incident responses and response time standards. The Operational Response Matrix was based on risk identification, analysis, and categorization of risk. The Operational Response Matrix has been revised as needed to ensure appropriate resource deployment. The most recent revision to the Operational Response Matrix included input from surveys that were sent to District Assistant Chiefs, which helped further define new and emerging threats to responders and citizens. Additionally, the Operations Division utilizes media platforms such as Power BI and CAD dashboards to ensure DFD is sending the appropriate ERF.

Preplanning and company-level fire inspections continue to help disseminate up-to-date hazard recognition and that information is uploaded to the Accela database. This information is utilized within the districts to conduct a risk analysis and planning for incident responses. This process is successful in determining and documenting risks within the different categories and planning zones.

The Denver Fire Department will work towards more efficient synchronization of information between the Operations and Fire Prevention Divisions to classify risk and deploy resources effectively, within each planning zone. One example is to continue to expand inspection communication and upload it to the Accela database.

Critical infrastructure

The Denver Fire Department utilizes Districts as planning zones, broken down into response areas for Fire Stations. Planning zones and the population, transportation systems, area land use, topography, geography, geology, physiography, climate, hazards and risks, and service provision capability demands are considered within each response area, by the responding fire station.

The Operational Response Matrix took into consideration major transportation systems and provided for responses based on these characteristics. Response to major highway incidents was greater due to the increased risk. Additionally, the Department partnered with the Office of Emergency Management for the City and County of Denver and planned for and participated in trainings for major issues such as flooding, and other conditions based on the land use, geography, climate, and other hazards which might have been posed.

Methodology

The Denver Fire Department's methodology for identifying, assessing, categorizing, and classifying risks throughout the community is completed and detailed in the Operational Response Matrix. The matrix identifies how to handle specific responses throughout the community, by identifying the type of incident and level of response. This level of response is based on general incident types and Department standardized responses. The methodology utilized to assess a risk score of an incident category is based on the probability, consequences to the community and the impact to the organization. The highest risk score categories are multi-family fire, which has a high-risk score because of the consequence to the community; and EMS/ Auto incidents due to the frequent probability. The Operational Response Matrix addresses these categories of risk with Effective Response Force for multi-family fires. For EMS/ Auto incidents, the Department addresses this category of risk by requiring EMT-B certifications for all members. This methodology drives the Operational Response Matrix based on the overall risk score.

The factors that drive the community's service needs were examined in a precise manner to determine the capabilities necessary to adequately address the risks that are present. The assessment of risk is critical to the determination of the number and placement of resources, and to mitigation efforts. Based upon the risk categories and the establishment of planning zones, the process can begin to build a system that will objectively determine the Department's capacity to provide service at the level the citizens expect. An important part of the risk assessment is determining what the risks are as well as their likelihood and consequences. The Department looked back over the past five years at the types of incidents and the number of times they occur. From this information the probability of an event was determined.

Figure 6 is used to determine the distribution or concentration of the resources throughout the Department to match the risk. The different quadrants require a different commitment of resources. Resources are distributed around the Department (fire stations with individual engine companies) to intervene as individual stand- alone resources in low and moderate risk incidents. Additional resources (e.g., tower, heavy rescue, 5-inch hose company, wildland, and med units) are concentrated around the areas where the risk is higher or are in a position to complement individual engine companies in intervention. For instance, a single engine company can suppress a dumpster fire, but multiple resources are necessary to suppress a structure fire.

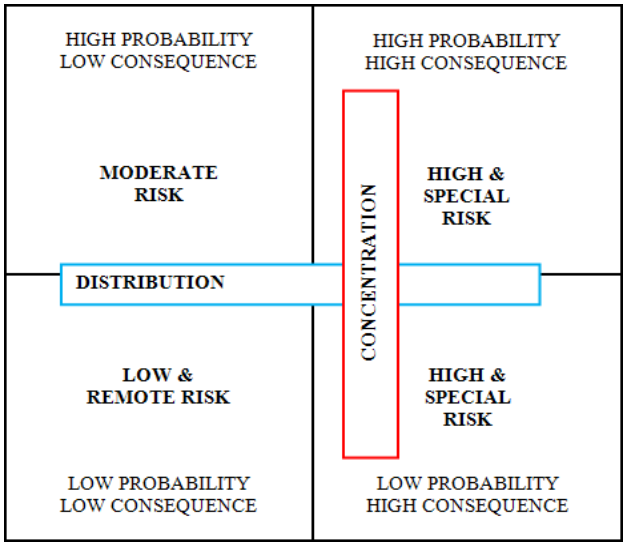


Figure 6

Each type of incident was also evaluated based on life safety (the amount of personnel and equipment required to rescue or protect the public and firefighters from life-threatening situations), economic impact (loss of properties, income or irreplaceable assets), and other impacts to the community (loss of historic buildings or community infrastructure). This evaluation determined the probability of the event. Table 1 is the frequency versus risk assessment for 2018-2022 including the number of incidents per call type. Historical analysis is utilized to determine the most efficient deployment resources, service level trends, and the need for contingent strategies to mitigate or manage community risk.

Frequency - v - Risk 2018-2022 (Number of Incidents)									
	Low Risk			Moderate Risk			High or Special Risk		
	Type	NFIRS Code	Count	Type	NFIRS Code	Count	Type	NFIRS Code	Count
High Frequency	Low Risk EMS	311 320-324	171,712	Moderate Risk EMS	311 320-324	123,371	High Risk EMS	311 320-324	81,970
	Alarms	700-730 733-740 743-799	75,693	Unknown odor or Haz Mat investigation; no Haz Mat found	650 652 671	11,173	Multi-Family Structure Fire	111	14,348
	Outside smoke investigation	651 653	2,085	Natural gas or LPG leak	412	19,395	Commercial Structure Fire	111	7,151
	Carbon monoxide incident	424	7,253	Structure fire involving an enclosed building	111	14,384	Water or ice related rescue	360-365	2,171
	Outside rubbish, trash, waste fire, or grass fire	151	11,091	Electrical hazard, short circuit, overheated motor, ballast, arcing	440 -443 445	3,357			
	Elevator rescue	353	30,374	Gasoline or other flammable liquid spill	411	1,957			
	Passenger vehicle fire, other than motor home	131-135 138	3,611	Vehicle Extrication	352	8,097			
	Cooking fire, confined to container	113	1,943						
	Electrical hazard, lines down	370-372 444	3,210						
	Attempted burning or illegal action other	480-482	6,732						
Low Frequency	Outside rubbish fire, not otherwise classified	150	1,528	Brush, or brush and grass mixture fire	142	551	High angle rescue	356	124
	Accident, potential accident/ Vehicle accident, general clean up	460 463	506	Fire, Light Rail or Train	133	2	Chemical spill or leak	422	162
	Extrication of victims from machinery	357	27	Other hazardous condition or radioactive	400 430 431	333	Toxic condition, other	420	159
	Homeless Encampment/ Tent Fire	1001	571	Chemical hazard (no spill or leak)	421	133	Extrication of victims from a building	351	516
				Flamm/comb gas or liquid condition, other	410	198	Biological hazard, confirmed or suspected	451	34
				Explosive, bomb removal (for bomb scare, use 721)	471	5	Confined space rescue	355	22
							RV, Semi Road or Freight Fire	132	88
							Trench or below grade rescue	354	11

Table 1 Frequency v Risk 2018-2022 (Number of Incidents)

Calculated risk scores ensured the Department had available resources for incidents based on the probability, consequences to the community and impact to the organization.

By calculating a risk score the Department has ensured that resources have been set up for incidents based on the probability, consequences to the community and impact to the organization. The Response Matrix has been updated when new apparatus or fire stations have been put in service as well as when the needs of incident types have demanded more resources for mitigating the incident and/or increasing safety of response personnel.

Monitoring response

The Denver Fire Department documents and reviews the number and type of incidents by District each year. This information is reviewed, along with response time data from the Power BI database for the quality of emergency response performance for each service type within each planning zone. The Denver Fire Department monitors incidents by type of call, per District. This information is monitored utilizing the DFD Dispatch Run Analysis. The community risk assessment and standards of cover (CRA/SOC) also incorporate this data. This information is reviewed for identifying deficiencies; however, the process is not documented in a Standard Operating Guideline. The Department also monitors the call information for the quality of response data for EMS.

The Department utilizes a Power BI dashboard software program, which provides real-time data related to District activity by incident type. The Power BI dashboard has provided data for all response time components and replaces the 911 center for data collection related to turnout and response time, providing more reliable information. By utilizing the dashboard, District Chiefs have been able to update companies weekly and address deficiencies. The Division Chief of Operations reviews the information provided by the Power BI dashboard every month to identify trends or recurring issues. Additionally, the quality of emergency response performance has been evaluated through after-action reports and post-incident analysis. These reports have been prepared by the safety officers and provided to all members for information, and in some cases, utilized for future training opportunities.

EMS responses are monitored by the Quality Assurance and Quality Improvement Administrator (QA/QI) to ensure completeness and quality of data. This was detailed in a Standard Operating Guideline 2119.06. The QA/QI Administrator is responsible for auditing at minimum 20% of monthly medical calls. The QA/QI Administrator is also responsible for creating quarterly reports to check for compliance and present data to Denver Fire Department's EMS Assistant Chief and Denver Fire Department's Operations Division Chief.

Utilizing Alarms/Fire Protection Systems for Response

The Denver Fire Department utilizes several factors determining response strategies in relation to fire protection and detection systems. The Denver Fire Department Operational Response Matrix dictates the level of response necessary based on the life safety systems present. The Operational Response Matrix determines responses for DFD Box Alarm Investigation, DFD Box Alarm Hazmat Detector, DFD Box Alarm, Carbon Monoxide Investigation, PFAS (Private Fire Alarm System) Class I Investigation, PFAS Class I, PFAS Class I – Hazmat Detector, PFAS Class I – CO2 High Alarm, PFAS Class I CO2 Investigation, PFAS Class II, PFAS Refuge Alarm.

The Denver Fire Department has followed the industry standard to reduce apparatus responses on certain life safety system activations. This was implemented in the Response Matrix in 2017 and has been adjusted several times since implementation. The response can range from a single company

response to one truck, one Engine, and one District Chief. These response nature codes can always be upgraded or downgraded by responding officers and District Chiefs depending on dispatch notes, calls, and circumstances.

This model enhances available units to be of service to the community, as well as provides safety to motorists. Reducing the number of units responding allows more units to be available within the city maintaining the strategic deployment of fire resources and giving the Computer Aided Dispatch (CAD) program the best opportunity to meet the needs of incoming calls. This model increases the safety of the public and responding firefighters by not having as many responding apparatuses on the city streets.

Critical Task Analysis

The Operational Response Matrix for the Denver Fire Department is the basis for creating Effective Response Force (ERF). The ERF outlines the amount of apparatus and firefighters needed to effectively mitigate an incident and is aligned with the standards required in NFPA 1710. The ERF charts detailed in the Standards of Cover show the single resource type with the task assigned to each firefighter. Each suppression apparatus in Denver is staffed with 4 firefighters. The Denver Fire Department utilizes Standard Operating Guidelines under Section 2111 which address 24 categories of response. These Standard Operating Guidelines address the operational procedures of specific incident types. These correlate with the Response Matrix and how they determine first due companies' responsibilities and the balance of the ERF. These are based on an analysis of the risk class of each incident type.

Critical task analysis for each risk category and risk class have been determined and outlined for each incident category. The Operations Division is transparent regarding the information on critical tasking and effective response force in the Community Risk Assessment and Standards of Cover (CRA/SOC). The response matrix is evaluated and updated quarterly by the Operations Division, critical tasking and effective response force reflect the current DFD leadership and program leads. Additionally, all incident information has been time-stamped and documented in NFIRS, including tasks for each responding unit. The Department also has documented incident information related to tasks in after-action reports as well as post-incident analysis.

Flooding

On average, Denver experiences about 75 storm events a year. Of these 75 events, about 46 produce less than 0.1 inch of precipitation. About 22 of the remaining 29 runoff-producing average annual events total between 0.1 inches and 0.5 inches of precipitation. Typically, Denver experiences only seven large storm events (greater than 0.5 inches) annually. These significant storm events are characterized by short duration, high-intensity rain showers that overwhelm the existing drainage system for several hours.

There are two types of floods that typically occur in Denver, riverine and urban flooding. Both are defined are:

Riverine flooding occurs when a water exceeds its channel capacity and is usually the most common type of flood event in Colorado. Riverine flooding generally occurs because of heavy rainfall, or rainfall combined with soils already saturated from previous rainstorms. It also occurs because of snowmelt; in which case the extent of flooding depends on the depth of winter snowpack and spring weather patterns. Floodplains are typically lowlands, adjacent to rivers, streams, and creeks that are

subject to recurring floods.

These flood events are typically measured in terms of magnitude and the probability that they will occur. The 1% annual chance flood event is the standard national measurement for flood mitigation, regulation, and insurance. A 1% annual chance flood, also known as the '100-year flood', has a one in 100 chance of being equaled or exceeded in any given year and has an average recurrence interval of 100 years. It is important this recurrence interval is only an average; it does not necessarily mean that a flood of such a magnitude will happen exactly every 100 years. The 0.2% annual chance flood event, or the '500-year flood', is another measurement which represents a 0.2% chance (or one in 500 chance) of occurring in any given year. It should be noted that climate change is expected to change the prevalence of flooding events, and past estimates of flooding probability may not fully predict future events.

Urban flooding, also called local flooding, is the result of development and the ground's decreased ability to absorb excess water without adequate drainage systems in place. Urbanization can increase runoff two to six times more than natural terrain. Urban flooding typically occurs suddenly when intense rain overwhelms the capacity of the City's drainage system. Low-lying areas are the most likely to flood in this scenario.

The Denver Storm Drainage Master Plan has identified some of these areas as Significant Flooding Locations (SFLs) and Potential Inundation Areas (PIAs).

Stormwater Management

Traditionally, drainage in the Denver Metropolitan Area has been managed with a combination of underground storm drains, overland flow conveyance elements (e.g., roads and channels) and regional detention facilities. Within most of the older sections of Denver, existing storm drains provide flood protection for between a 1- and 5-year storm event. Runoff generated from larger storm events is temporarily stored in streets and ultimately conveyed to gulches and streams via the combination of roads and storm drains when capacity becomes available.

In many areas of the city, the existing drainage system does not meet current stormwater drainage criteria, whereby the minor storm event (two-year recurrence for residential areas and five-year recurrence for commercial/industrial areas) cannot be fully conveyed within pipes or dedicated drainage channels. In other words, the current drainage system is generally undersized except for the major drainageways, which have been improved over the years (e.g., South Platte River, Goldsmith Gulch, and Harvard Gulch).

Likelihood of future occurrence

Flooding will continue to occur in Denver, with minor urban flooding on an annual basis. However, Denver has taken measures to reduce the risk presented by historic large magnitude flooding caused by Bear Creek, Cherry Creek, and the South Platte River by building the Cherry Creek Flood Control Reservoir in 1950, the Chatfield Flood Control Reservoir in 1975 and the Bear Creek Flood Control Reservoir in 1982. Additionally, in the 1990's and 2000's, the T-REX drainage structure was built, and Stream Warning Plans were created. There were also numerous warning notifications programs implemented to warn Denver of potential flooding.

Based on this historic rate of occurrence, Denver has effectively a 100% chance of flooding or flash flooding each year. While most of those floods are minor and cause little damage (such as Cherry

Creek overtopping the bike path level) the probability of future damaging floods is still likely.

Flood Emergency Alert and Warning, Evacuation, and Post-Flood Recovery Procedures
Timely emergency public information and warning are one of the most important measures in reducing the risk of flooding to people in at risk areas. The Denver Emergency Operations Plan (EOP) Alert and Warning Annex covers all hazard procedures and methods for communicating timely emergency alerts and warnings to the public, to include residents and visitors, as well as sharing emergency information across departments, agencies, and partners. The annex covers roles and responsibilities, and a concept of operations for notifications, along with several alert and warning tools in use such as Reverse Emergency Notifications, Wireless Emergency Alerts, media releases, website and social media posts, and door-to-door notifications. The Flood Standard Operating Procedures (SOP) maintained by the Department of Transportation and Infrastructure's (DOTI) Wastewater Management Division details additional flood-specific alert and warning methods, particularly the Flash Flood Prediction Program (F2P2) operated by the Mile High Flood District (MHFD), which runs April through September in the Denver metropolitan area.

The Denver EOP also contains procedures for the safe and orderly evacuation of people threatened by flood or other hazards in the city. Evacuations can be initiated by any City public safety agency, typically, Denver Police or Denver Fire. The mayor, or official designee has the overall responsibility and authority for ordering a large-scale evacuation if needed. The Director of Emergency Management is responsible for the overall coordination of a large-scale evacuation within the City and County. Evacuation orders and notifications will be issued in accordance with the Alert and Warning Annex described above. The annex describes the designation of evacuation routes, establishment of evacuation centers, provisions for people unable to self-evacuate, and provisions for large animals and livestock.

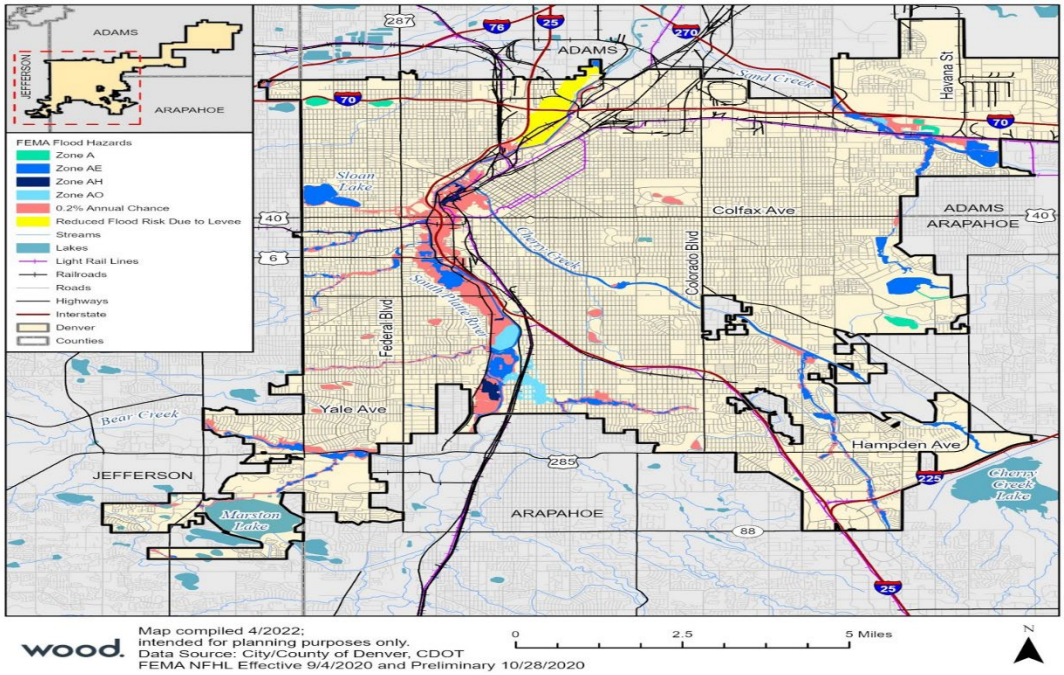
Detailed provisions for controlled re-entry into evacuated areas further help to ensure public health and safety. A separate document, the Cherry Creek Dam Failure Evacuation Plan, details additional policies and procedures for a coordinated evacuation of the area downstream from the Cherry Creek Dam and Reservoir in the event of major flooding due to a failure or significant controlled release of water from the dam. This regional plan focuses on coordination between Denver, Adams County, Arapahoe County, the City of Aurora, the U.S. Army Corps of Engineers, and other critical stakeholders.

The Recovery Annex to the Denver EOP describes a framework to guide the City's efforts to recover from a major flood or other disaster. The annex includes a concept of operations; roles and responsibilities for City agencies, key non-City agencies, and private sector partners; direction and coordination, and financial management, along with procedures for damage assessment and debris removal. The annex also addresses re-entry management to provide for the safe re-entry of the affected area. Post-flood recovery focuses on activities to protect public health and safety, restoration of critical facilities and infrastructure, and cleaning up debris.

Future Land Use and Development

Denver has a floodplain ordinance governing development in the floodplain. The general purpose of the ordinance is to reduce the hazard of floods to life and property, to protect and preserve hydraulic characteristics of water courses for the conveyance of flood waters, and to protect the public from extraordinary financial expenditures for flood control and relief. On a statewide level, the Colorado Water Conservation Board (CWCB) has minimum rules and regulations for regulatory floodplains in

Colorado. All communities in Colorado are subject to these regulations, which include the setting of minimum statewide floodplain management standards, rules on building in a floodplain, critical infrastructure protection and minimum regulation of stream-altering activities. These regulations are superseded by any local regulations considered stronger.



Map 7 City and County of Denver FEMA Floodplains – NE Denver

HAZARDOUS MATERIALS INCIDENT

Substances that because of their chemical or physical characteristics are hazardous to humans and living organisms, property and the environment are regulated by the Environmental Protection Agency (EPA) and when transported, by the US Department of Transportation (DOT). A hazardous material incident is defined as any actual or threatened uncontrolled release of a hazardous material, its hazardous reaction products or the energy released by its reactions that pose a significant risk to human life and health, property and/or the environment.

The EPA regulations address “hazardous substances” and “extremely hazardous substances.” Hazardous substances are generally materials that, if released into the environment, tend to persist

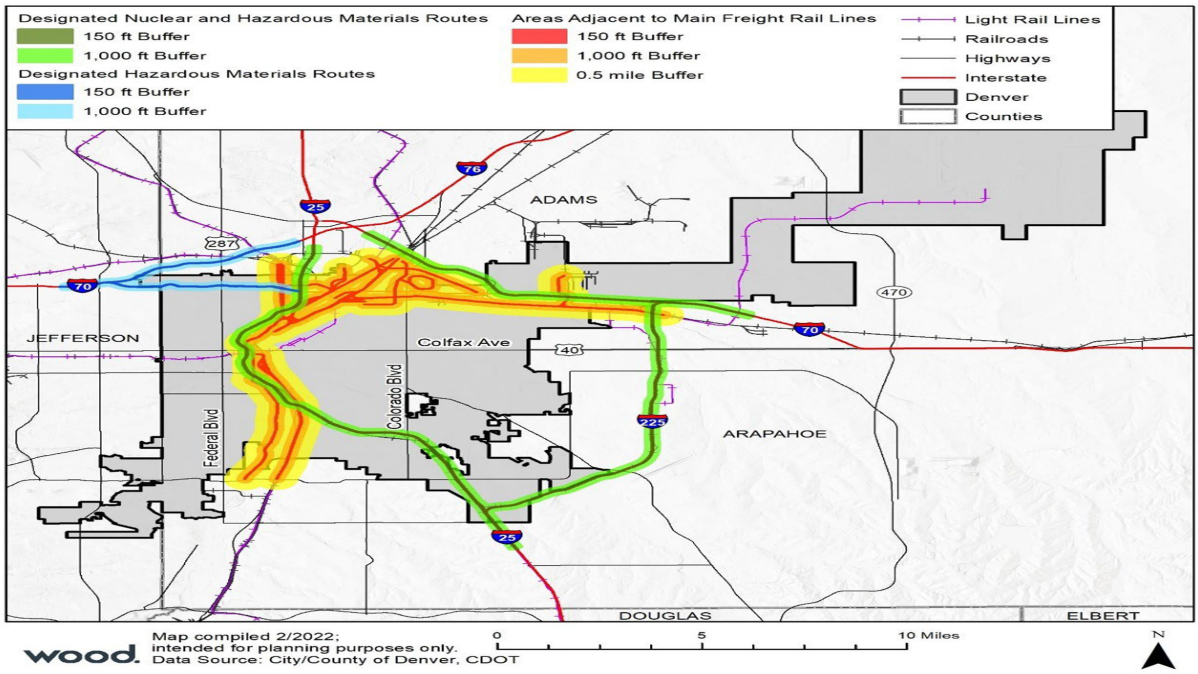
for long periods and pose long-term health hazards for living organisms. They are primarily chronic rather than acute health hazards. Regulations require that spills of these materials into the environment in amounts at or above their individual “reportable quantities” must be reported to the EPA. Extremely hazardous substances are generally toxic materials that are acute health hazards. When these substances are released, they are immediately dangerous to the life of humans and animals and will cause serious damage to the environment. When facilities have these materials in quantities at or above their threshold planning quantities (TPQ), they must submit “Tier II” information to their Local Emergency Planning Committee (LEPC) and local fire department, as well as the State Emergency Planning Committee. The LEPC retains this data and uses it for emergency planning. These reports are available to the public for their review upon request under

the Community Right to Know Act.

The Department of Transportation (DOT) defines hazardous material as a substance that is capable of posing an unreasonable risk to health, safety and property when transported in commerce. When a hazardous material meets the DOT definition of a hazardous material, it must be transported under safety regulations providing for appropriate packaging, communication of hazards and proper shipping controls.

In addition to EPA and DOT regulations, the National Fire Protection Association (NFPA) develops codes and standards for the safe storage and use of hazardous materials. These codes are generally adopted locally and include the use of the NFPA 704 standard for communication of chemical hazards in terms of health, fire, instability, and other special hazards such as water reactivity and oxidizer characteristics. Diamond shaped NFPA 704 signs ranking the health, fire, and instability hazards on a numeric scale from zero (least) to four (greatest) along with any special hazards, are usually required to be posted on chemical storage buildings, tanks, other facilities, and individual containers stored or used inside facilities.

Hazardous materials incidents can occur anywhere hazardous materials are stored or transported. Routes designated for hauling hazardous and nuclear materials through Denver by vehicle are Interstate 225, Interstate 70 and Interstate 25. Hazardous materials are also transported on rail lines that run through the city. **Map 8** highlights these routes.



Map 8 Hazardous Materials Routes in Denver

Likelihood of future occurrence
There are two types of potential incidents with hazardous materials in Denver. First there are fixed sites that store and use chemicals daily within city limits. As of October 2021, there are 300 Tier II facilities in Denver with mandatory reporting requirements. While almost half of the Tier II facilities do not hold chemicals other than those used in batteries, there are several companies that use ammonia and chlorine daily. In addition to these facilities, there are hundreds of other facilities that fall below the mandatory reporting thresholds that may still pose a danger and the likelihood that some facilities are not meeting their reporting obligations. Second, there is hazardous material that is transported throughout the city on a regular basis.

There is always the potential for a release from either the fixed sites or from a train going through the city. Denver averages around 19 hazardous materials incidents a year, including an average of one incident per year that results in injuries or property damage.

Historically, there have been zero instances in Denver's history of major attacks involving chemical, biological, radiological, or nuclear agents.

For planning purposes, buffer zones around hazardous materials transportation routes and fixed facilities, based on the types and quantities of materials most likely to be encountered. For rail lines, buffer zones of 150', 1000' and ½ mile were used in the Denver Mayor's Railroad Safety Working Group's July 2016 report to the mayor. For highway shipping routes, buffers of 150' and 1000' were used, since the quantities involved in highway shipments tend to be smaller than those in rail shipments.

Critical Infrastructure
Hazardous materials are routed through the city on specific hazardous materials routes. Any critical infrastructure assets within a mile on either side of these roads has an increased vulnerability to impacts from a hazardous materials release, dependent on environmental factors. Additionally, hazmat delivery trucks may deviate from designated routes to make deliveries anywhere in Denver. Hazardous materials incidents may disrupt, damage, or destroy critical infrastructure assets and services from physical (chemical) interactions, explosions, and/or shelter-in-place and evacuation orders.

Severe Winter Storms

Severe winter storms include events related to heavy snow, blowing snow, ice, sleet or freezing rain, and extreme cold temperatures (including wind chill). Blizzards are severe winter storms that pack a combination of blowing snow and wind resulting in very low visibilities. Sometimes strong winds pick up snow that has already fallen, creating a ground blizzard. Hazardous winter weather may also result from bitterly cold temperatures and may not involve snow. The National Weather Service generally categorizes winter storms into the following:

- **Winter Storm**: indicates heavy snow or significant ice accumulations
- **Blizzard**: A blizzard means that the following conditions are expected to prevail for a period of three hours or longer: Sustained wind or frequent gusts to 35 miles an hour or greater; and Considerable falling and/or blowing snow (i.e., reducing visibility frequently to less than ¼ mile)
- **Ice Storm**: An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down

trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater

Winter storms occur frequently and can have significant impacts, especially on Denver's vulnerable populations, first responders, and critical infrastructure.
Severe winter storms can include damage caused by extreme cold temperatures, high winds, ice, snowpack, and subsequently melting snow. Vehicles may be damaged by the same factors, or temporarily unusable due to the driving conditions created by severe winter weather. Contents of homes, storage units, warehouses and storefronts may be damaged if the structures are compromised or fail due to the weather, or during potential flooding caused by melting snow.

Exposed infrastructure and utilities are impacted by both accumulated snow and winds; a typical example is power lines brought down by a combination of snowpack and wind, thus causing energy outages. Additionally, severe cold can cause a spike in utilities necessary for heating and warmth.

Extreme cold can freeze water pipes that are either exposed, buried at a shallow depth, or located in poorly insulated buildings, causing pipe breaks and flooding.

The density of very wet snowpack may create strains on structures, causing partial or entire collapses of walls, roofs, or windows; during the 2003 blizzard, the fire department reported approximately 100 homes, businesses and buildings caved in, mostly flat-roofed buildings. Vulnerability to snow loading is influenced both by architecture (flat roofs being more vulnerable), age and type of construction material, and should be assessed on a building-by- building basis.

A frequently overlooked impact of accumulated snow is buried fire hydrants, which could impede fire response if a hydrant needs to be dug out before use.

Critical Infrastructure
Due to the unpredictability of severe winter storm strength and path, most critical infrastructure that is above ground is equally exposed to the storm's impacts. Roads are especially susceptible to the effects of a winter storm, and can impact access to critical services and sites, impairing functionality. Tertiary impacts from winter storms, such as snow and ice damage to electrical systems, or damage from tree limbs falling on power lines, can cause disruptions in electrical service and impact critical infrastructure sector functionality. Critical infrastructure assets can be damaged by the accumulation of snow and ice.

Transportation Incident

Like all major US cities, Denver has unique transportation infrastructure hazards and vulnerabilities contingent upon many variables. In this analysis, the transportation sector includes aviation, automotive, and rail. A marine component will not be analyzed due to the geographical location of Denver and the absence of major seaports and ferry/barge traffic.

Automotive
The greater Denver metropolitan area has a large roadway infrastructure composed of interstates, state highways, municipal surface streets, and private roads. Interstate-25 and Interstate-70 are the two major interstates within the City and County of Denver. Due to rising population levels, there

has been an increase of traffic congestion on most major roadways within the City and County of Denver. Minor traffic accidents are a hazard but occur frequently and generally pose little threat to the city as a whole; however, large multi-vehicle collisions and incidents involving hazardous materials present significantly more hazardous impacts to the city.

Rail

The City and County of Denver has an active railroad system that operates freight, passenger, and local commuter lines. Rail lines are an important component of Denver's transportation infrastructure and are intermeshed throughout the city in proximity to residential areas, commercial areas, places of public assembly, and industrial/ manufacturing centers. While rail incidents are infrequent, when they do occur their impacts can be significant, especially if a major loss of life occurs or hazardous materials are involved.

Aviation

The greater Denver metropolitan area has five airports comprised of: One commercial large hub airport, three general aviation airports, and one Air Force Base. Denver International Airport (DEN) is the third busiest airport in the US and is the Rocky Mountain region's primary commercial service large hub airport serving approximately 53 million passengers annually. Centennial Airport (APA), Rocky Mountain Metropolitan Airport (BJC), and Front Range Airport (FTG) also serve the Denver metropolitan area and primarily support general aviation and private business aviation. Buckley Space Force Base (formerly Buckley Air Force Base) is located east of Denver in the City of Aurora and services military air traffic. The main hazards presented by aircraft are mid-air collisions, crashes, or intentional incidents of terrorism.

Likelihood of future occurrence

Safety is the top priority throughout the transportation and infrastructure industries. Over the years safety features and technologies have continued to evolve, adapt, and become more common features throughout the transportation and infrastructure industries. While incident avoidance and impact reduction systems are increasingly becoming more common in modern transportation and infrastructure, the increasing usage of transportation and infrastructure systems that are older and not equipped with the latest safety features and designs increases the chances of incidents occurring. Large-scale transportation and infrastructure incidents have low probabilities, but high impacts. Small-scale transportation and infrastructure incidents have high probabilities, but low impacts. Denver annually experiences many small-scale transportation and infrastructure incidents, such as automobile crashes and utility malfunctions. However, large-scale incidents are experienced less frequently, but they are possible, and it is important to remain cognizant, trained and prepared for them.

Critical Infrastructure

Incidents involving highway accidents could result in injuries, fatalities, closed roads, rerouted traffic, and a strain on the capacity of emergency service personnel who must respond to the incident. In general, critical infrastructure assets could be vulnerable to transportation incidents. Highway accidents could affect the flow of traffic and ability of individuals and families to travel within and out of the jurisdiction. In terms of railway transportation incidents, large areas of the City could be affected by a train derailment.

Urban Conflagration

An urban conflagration is a large disastrous and destructive fire in an urban area that spreads beyond natural or artificial barriers to threaten lives and property. According to the NFPA, every 24 seconds a fire department responds to a fire somewhere in the US. DFD responds to approximately 400 structure fires in an average year. Nearly all these fires are contained to a single structure, but the risk of fire spreading to multiple structures is ever present.

Due to the urbanized nature of the City and County of Denver and the relatively limited extent of the Wildland Urban Interface (WUI) within the planning area compared to other Colorado counties, the risk presented by structural fires is more present than from wildland fires. The leading cause of home structure fires and non-fatal home fire injuries is cooking equipment, while smoking and the use of smoking materials is the leading cause of home fire deaths. Three out of five home fire deaths resulted from fires in which no smoke alarms were present or in which smoke alarms were present but did not operate. Compared to other age groups, older adults are more likely to be killed in a home fire.

Urban fires can be caused by wildland fires spreading into an urban area, as was seen in the destruction of the Town of Paradise, California in the 2018 Camp Fire and in the 2021 Marshall Fire that destroyed much of the Colorado towns of Louisville and Superior.

Structural fires regularly occur in all developed areas of the City and County of Denver. All buildings and infrastructure have some vulnerability to a structure fire; areas with older buildings or buildings built closer together have a higher risk for fire ignition and fire spread.

Similarly, areas adjacent to hazardous materials facilities and major transportation routes (such as rail lines) may be at greater risk of fires started from a hazardous materials incident.

People who are directly exposed to an urban conflagration are vulnerable to death and injuries from fire and smoke inhalation. Under-resourced neighborhoods may be more susceptible to conflagrations due to older building stock and fewer sprinkler systems. The elderly and people with disabilities may need more assistance evacuating. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation.

Critical Infrastructure

Impacts from larger urban conflagrations can include direct damage and losses to critical infrastructure. Additionally, disruptions can come from closed roads and transportation detours near the fire, and from first responder resources tied up responding to the fire.

Wildland /Urban Interface

The Denver Fire Department knows that wildfire is an ongoing threat in our community. The Denver Fire Department Wildfire Ready website aims to help inform the citizens of Denver to prevent, prepare, plan, and know what to do in a wildfire event.

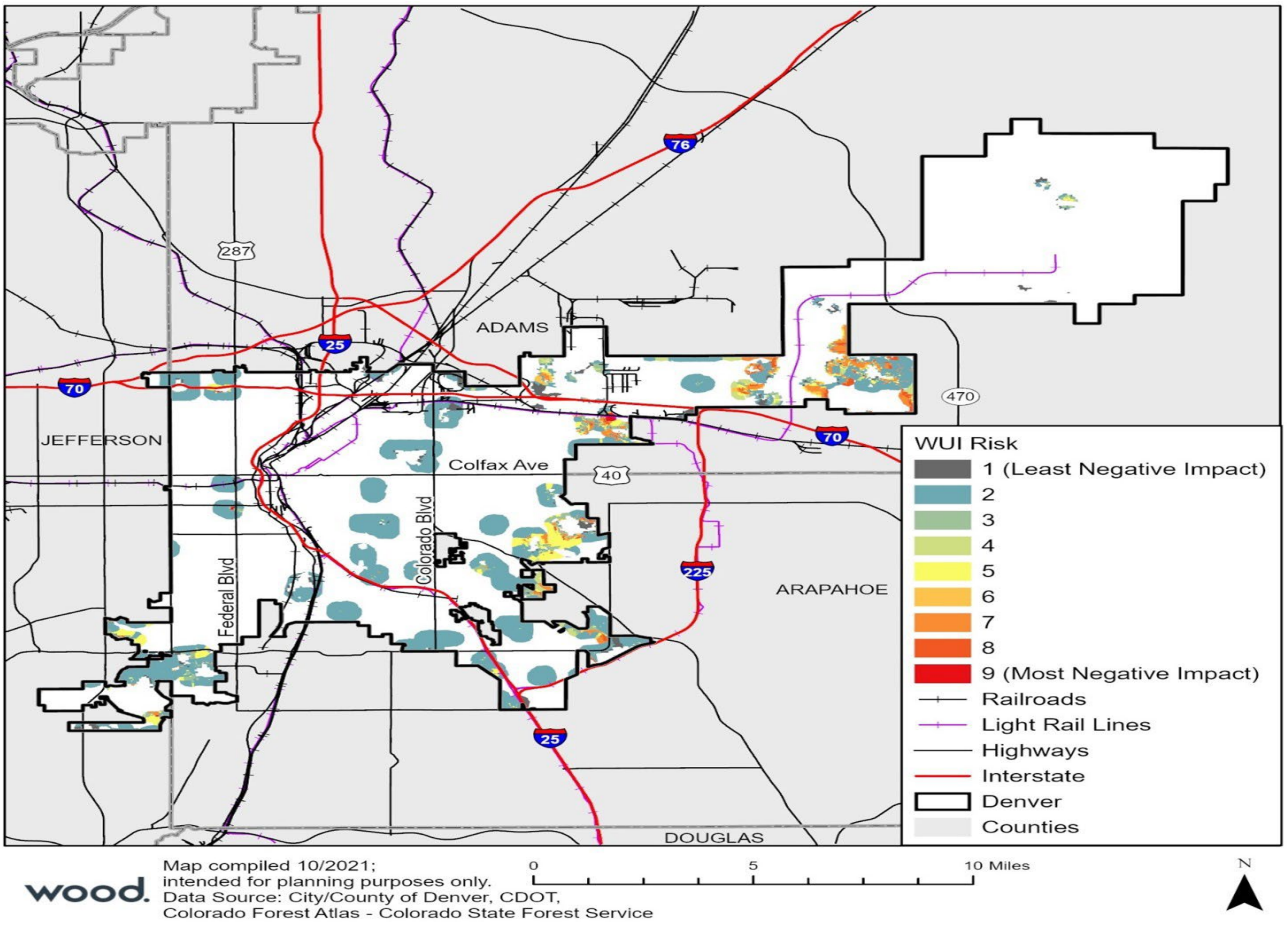
Wildland fire is defined as an unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out. Wildland fires have fuel – living and dead plant material that can be ignited by fire – that consists mainly of natural vegetation. Wildland fires are an

ongoing concern for Denver, most notably in its Mountain Parks. Wildland fires are most likely during the fire season, which extends from mid-spring to late fall, and is most prominent during the driest summer months. However, the fire season's duration is dictated by local fire conditions which are impacted by hot weather, vegetation growth, and low moisture content in air and fuel. These conditions, especially when combined with high winds and years of drought, increase the potential for wildland fire to occur – at any time of year.

Three major factors sustain wildland fires and predict a given area's potential to burn: fuel, topography, and weather. Other factors that may ignite or influence wildland fire behavior include downed power lines and high winds; gas lines cracked by earthquakes; lightning strikes that may create sparks; human negligence such as campfires, smoking, and equipment malfunctions; drought conditions that decrease fuel moisture; and forest insect epidemics and forest parasites that increase fuel loading.

Wildland fires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Wildland fires cause reservoir contamination, destroy transmission lines, and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause failures on slopes such as landslides, which can occur several years after a wildland fire. Most wildland fires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing imperviousness of the soil. This increases the runoff generated by storm events, thus increasing the chance of flooding.

Wildland fires also contribute to poor air quality in Denver, again impacting human health and the environment. In addition, fires can severely damage forested areas and watersheds that are critical to Denver's drinking water supply. Denver Water receives its drinking water supply from watersheds in the mountains and foothills, so healthy ecosystems in these forested areas are imperative to ensure drinking water for people in Denver. Catastrophic wildland fires have a high probability of occurring in certain forest types that are unhealthy due to tree density. In 1996 and 2002, two major wildland fires occurred above Denver Water's reservoirs. Subsequent rain events resulted in significant erosion, transporting large volumes of sediment into these water supply reservoirs. The sediment impacted quality of the water supply that required increased water treatment and management costs, and a reduction in storage capacity.



Map 9 Wildland Urban Interface

Total Response Times for All Service Delivery

The Denver Fire Department utilizes the national standard that is recommended for Career Fire Departments in creating the benchmark statements: The National Fire Protection Association 1710: Standard for the Organizational and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the to the Public by Career Fire Departments. The Denver Fire Department has identified the alarm handling, turnout, response, and travel time for the categories of fire incidents, EMS and auto incidents, technical rescue, and hazmat incidents. Currently the Department uses the 90th percentile times to evaluate whether the Department is meeting the standards of NFPA 1710.

This data is detailed in the Standards of Cover for 90th percentile and historical data. For daily monitoring, the data is provided in the DFD Dispatch Run Analysis and the Power BI Dashboard, available to the Shift Commanders and Division Chief of Operations, for review and evaluation for compliance with standards. All 911 calls are received and dispatched through the Combined Communications Center for the City and County of Denver, managed by multiple agencies within the Department of Safety; which encompasses Denver Fire, Denver Police and Denver Sheriff; which is managed and utilized by all Safety agencies. More specific information related to total response time components is captured and evaluated in the DFD Dispatch Run Analysis and Power BI Dashboard.

The organization has found different pathways to handle emergency calls of its constituents over the 156-year history of service delivery. The equipment and processes for doing so have morphed into using current day technologies to meet the changing demands of the organization from its starting point back in 1866. In recent history, the DFD has worked collaboratively with all Department of Safety agencies in having developed processes for continuous monitoring and enhancement of performance throughout the entirely of the incident, from "the Public Safety Answering Point (PSAP) to the doorbell." The continual utilization of state-of-the-art equipment, software, staffing, and procedures has combined to establish an equation that has been both efficient and effective while also having met the past demands of the community more than ever before, given the allocation of resources the Governing Body has historically allocated for such services.

Section 5-Agency Performance Tracking

Fire Suppression

Benchmark Service Level Goal Statements:
For 90 percent of all fire suppression incidents, the total response time for the arrival of the first due unit, staffed with 2 firefighters, 1 engineer, and 1 officer shall be: 6 minutes and 50 seconds. The first due unit shall be capable of: providing 500 gallons of water and 1,500 gallons per minute (gpm) pumping capacity; initiating command; requesting additional resources; establishing and advancing an attack line flowing a minimum of 150 gpm; establishing an uninterrupted water supply; containing the fire; rescuing at-risk victims; and performing salvage operations. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the public.

For 90 percent of all moderate risk fire suppression incidents, the total response time for the arrival of the effective response force (ERF), staffed with 13 firefighters and officers, shall be: 10 minutes and 50 seconds. For 90 percent of all high risk (multi-family and commercial) fire suppression incidents, the total response time for the arrival of the effective response force (ERF), staffed with 25 firefighters and officers, shall be: 10 minutes and 50 seconds. For 90 percent of all high risk (high-rise) fire suppression incidents, the total response time for the arrival of the effective response force (ERF), staffed with 35 firefighters and officers, shall be: 13 minutes and 10 seconds.

The ERF for moderate risk shall be capable of establishing command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the Occupational Safety and Health Administration (OSHA) requirements of two in-two out; completing forcible entry; searching for and rescuing at-risk victims; ventilating the structure; controlling utilities; and performing salvage and overhaul. These operations shall be done in accordance with departmental standard operating guidelines while providing for the safety of responders and the public.

The ERF for high-risk shall be capable of establishing command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the OSHA requirements of two in and two out; completing forcible entry; searching for and rescuing at-risk victims; ventilating the structure; controlling utilities; and performing salvage and overhaul. The ERF is also capable of placing elevated streams into service from aerial ladders. These operations are done in accordance with departmental standard operating guidelines while providing for the

safety of responders and the public.

Baseline Service Level Performance:
For 90 percent of moderate risk fire suppression incidents, the total response time for the arrival of the first due unit, staffed with 2 firefighters, 1 engineer, and 1 officer is: 9 minutes and 39 seconds. For 90 percent of high risk (multi-family and commercial) fire suppression incidents, the total response time for the arrival of the first due unit, staffed with 2 firefighters, 1 engineer, and 1 officer is: 7 minutes and 28 seconds. For 90 percent of high risk (high-rise) fire suppression incidents, the total response time for the arrival of the first due unit, staffed with 2 firefighters, 1 engineer, and 1 officer is: 6 minutes and 58 seconds. The first due unit is capable of: providing 500 gallons of water and 1,500 gallons per minute (gpm) pumping capacity; initiating command; requesting additional resources; establishing and advancing an attack line flowing a minimum of 150 gpm; establishing an uninterrupted water supply; containing the fire; rescuing at-risk victims; and performing salvage operations. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the public.

For 90 percent of all moderate risk fire suppression incidents, the total response time for the arrival of the effective response force (ERF), staffed with 13 firefighters and officers is: 12 minutes and 5 seconds. For 90 percent of all high risk (multi-family and commercial) fire suppression incidents, the total response time for the arrival of the effective response force (ERF), staffed with 25 firefighters and officers, is: 17 minutes and 9 seconds. For 90 percent of all high risk (high-rise) fire suppression incidents, the total response time for the arrival of the effective response force (ERF), staffed with 35 firefighters and officers, is: 23 minutes and 59 seconds. The ERF for moderate risk can establish command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the Occupational Safety and Health Administration (OSHA) requirements of two in-two out; completing forcible entry; searching for and rescuing at-risk victims; ventilating the structure; controlling utilities; and performing salvage and overhaul. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the public.

The ERF for high-risk fire suppression incidents can establish command; provide an uninterrupted water supply; advance an attack line and a backup line for fire control; comply with the OSHA requirements of two in and two out; complete forcible entry; search for and rescue at-risk victims; ventilate the structure; control utilities; and perform salvage and overhaul. The ERF is also capable of placing elevated streams into service from aerial ladders. These operations are done in accordance with departmental standard operating guidelines while providing for the safety of responders and the public.

(Moderate Risk) Fire Suppression/Single Family - 90th Percentile Times - Baseline Performance			2018-2023	2023	2022	2021	2020	2019	2018
Alarm Handling	Pick-up to Dispatch	Urban	3:16	4:46	3:25	3:17	3:10	3:02	3:23
Turnout Time	Turnout Time 1st Unit	Urban	1:07	1:15	1:11	1:03	1:08	1:08	1:05
Travel Time	Travel Time 1st Unit **Distribution**	Urban	3:53	3:22	3:56	3:49	3:49	3:44	4:06
	Travel Time ERF **Concentration**	Urban	6:54	6:53	7:06	6:47	6:56	6:19	7:24
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:39	8:19	10:05	11:19	10:14	8:59	8:38
			n=1280	n=44	n= 222	n=226	n=236	n=253	n=299
	Total Response Time ERF **Concentration**	Urban	12:05	10:25	12:27	13:01	12:33	11:48	11:16
			n=1164	n=42	n=206	n=214	n=215	n=227	n=260

(Moderate Risk) Fire Suppression/Multi Family - 90th Percentile Times - Baseline Performance			2018-2023	2023	2022	2021	2020	2019	2018
Alarm Handling	Pick-up to Dispatch	Urban	3:30	3:23	4:00	3:31	3:43	3:02	3:20
Turnout Time	Turnout Time 1st Unit	Urban	1:11	:59	1:06	1:14	1:09	1:08	1:13
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:08	5:02	4:03	4:27	4:01	4:25	4:05
	Travel Time ERF **Concentration**	Urban	14:43	14:22	15:12	15:40	16:30	13.38	12:46
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:28	7:45	7:35	7:23	7:38	7:34	7:10
			n=1415	n=54	n=227	n=250	n=230	n=294	n=360
	Total Response Time ERF **Concentration**	Urban	17:09	15:58	17:48	17:57	19:13	15:42	16:19
			n=1080	n=50	n=189	n=199	n=166	n=205	n=271

(Moderate Risk) Fire Suppression/Highrise - 90th Percentile Times - Baseline Performance			2018-2023	2023	2022	2021	2020	2019	2018
Alarm Handling	Pick-up to Dispatch	Urban	3:21	4:51	3:11	3:31	4:08	2:30	3:07
Turnout Time	Turnout Time 1st Unit	Urban	1:02	:38	1:13	1:04	:58	:46	1:05
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:24	2:52	2:54	3:59	3:34	5:04	5:22
	Travel Time ERF **Concentration**	Urban	21:28		19:32	29:23	24:27	21:28	17:11
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:58	8:22	6:25	6:52	6:44	6:29	7:50
			n=126	n=1	n=18	n=27	n=19	n=25	n=36
	Total Response Time ERF **Concentration**	Urban	23:59		23:03	31:17	26:02	25:06	19:20
			n=91		n=16	n=19	n=16	n=14	n=26

EMS/Auto Accidents

Benchmark Service Level Goal Statement:

For 90 percent of all EMS responses, the total response time for the arrival of the first-due unit, staffed with 2 firefighters, 1 engineer, and 1 officer shall be: 6 minutes and 20 seconds for EMS calls and 6 minutes and 50 seconds for auto accidents. The first-due unit shall be capable of: assessing scene safety and establishing command; sizing up the situation; conducting an initial patient assessment; obtaining vitals and patient medical history; initiating mitigation efforts within one minute of arrival; providing BLS medical aid including automatic external defibrillation (AED); and assisting transport personnel with packaging the patient.

The department does not rely upon Denver Health and Hospitals, a third-party provider, to complete the effective response force (ERF) component of its EMS program. The initial arriving fire department company shall have the capabilities of providing BLS medical aid including AED, until the third-party provider arrives on scene. If the third-party provider unit arrives on scene first, its personnel shall initiate care and the staff from the initial fire department company shall provide support as needed.

Baseline Service Level Performance:

For 90 percent of all EMS responses (non-auto accident), the total response time for the arrival of the first-due unit, staffed with 3 firefighters and 1 officer, is: 9 minutes and 29 seconds. For 90 percent of all EMS responses (auto accident), the total response time for the arrival of the first-due unit, staffed with 3 firefighters and 1 officer, is: 9 minutes and 7 seconds. The first-due unit is capable of: assessing scene safety and establishing command; sizing up the situation; conducting an initial patient assessment; obtaining vitals and patient's medical history; initiating mitigation efforts within one minute of arrival; providing first responder medical aid including AED; and assisting transport personnel with packaging the patient.

The department does not rely upon Denver Health and Hospitals, a third-party provider, to complete the effective response force (ERF) component of its EMS program. The initial arriving fire department company has the capabilities of providing BLS medical aid including AED, until the third-party provider arrives on scene. If the third-party provider unit arrives on scene first, its personnel shall initiate care and the staff from the initial fire department company shall provide support as needed.

(Low Risk) EMS - 90th Percentile Times - Baseline Performance			**2018-2023**	**2023**	**2022**	**2021**	**2020**	**2019**	**2018**
Alarm Handling	Pick-up to Dispatch	Urban	4:43	4:44	4:47	4:56	5:03	4:22	4:18
Turnout Time	Turnout Time 1st Unit	Urban	:59	:58	:58	:58	:59	1:01	1:00
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:06	5:37	5:25	5:06	4:49	4:58	4:59
	Travel Time ERF **Concentration**	Urban	5:10	5:43	5:30	5:09	4:53	5:02	5:03
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:29	10:01	9:51	9:41	9:33	9:03	8:58
			n=400176	n=15881	n=80069	n=80102	n=72449	n=77627	n=74048
	Total Response Time ERF **Concentration**	Urban	9:29	10:01	9:51	9:41	9:33	9:03	8:58
			n=400024	n=15874	n=80048	n=80077	n=72428	n=77595	n=74002

(Moderate Risk) Auto Accidents - 90th Percentile Times - Baseline Performance			2018-2023	2023	2022	2021	2020	2019	2018
Alarm Handling	Pick-up to Dispatch	Urban	3:47	4:27	3:56	3:52	3:48	3:34	3:42
Turnout Time	Turnout Time 1st Unit	Urban	:59	:59	1:00	:58	:58	1:00	:59
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:27	5:54	5:31	5:15	5:10	5:38	5:32
	Travel Time ERF **Concentration**	Urban	5:36	5:56	5:41	5:24	5:22	5:47	5:42
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	9:07	9:53	9:16	9:00	8:55	9:06	9:09
			n=62492	n=1091	n=11660	n=12036	n=9976	n=13926	n=13803
	Total Response Time ERF **Concentration**	Urban	9:07	9:53	9:16	9:00	8:55	9:06	9:10
			n=62385	n=1088	n=11643	n=12016	n=9955	n=13905	n=13778

Technical Rescue

Benchmark Service Level Goal Statement:

For 90 percent of all technical rescue incidents, the total response time for the arrival of the first-due unit, staffed with 2 firefighters, 1 engineer, and 1 officer shall be: 6 minutes and 50 seconds. The first-due unit shall be capable of: establishing command; sizing up to determine if a technical rescue response is required; requesting additional resources; and providing BLS to any victim without endangering response personnel.

For 90 percent of all technical rescue incidents, the total response time for the arrival of the effective response force (ERF), staffed with 8 firefighters and officers including the technical response team, shall be: 10 minutes and 38 seconds. The ERF shall be capable of appointing a site safety officer; establishing patient contact; staging and apparatus set up; providing technical expertise, knowledge, skills, and abilities during technical rescue incidents, providing BLS medical support and determining the need for a level 2 response.

Baseline Service Level Performance:

For 90 percent of all technical rescue incidents, the total response time for the arrival of the first-due unit, staffed with one officer, one engineer and two firefighters, is: 8 minutes and 14 seconds. The first-due unit is capable of: establishing command; sizing up to determine if a technical rescue response is required; requesting additional resources; and providing BLS to any victim without endangering response personnel.

For 90 percent of all technical rescue incidents, the total response time for the arrival of the ERF, staffed with 8 firefighters and officers including the technical response team, is: 12 minutes and 56 seconds.

The ERF can appoint a site safety officer; establishing patient contact; staging and apparatus set up; providing technical expertise, knowledge, skills, and abilities during technical rescue incidents, providing BLS medical support and determining the need for a level 2 response.

(Risk Level) Technical Rescue - 90th Percentile Times - Baseline Performance			**2018-2023**	**2023**	**2022**	**2021**	**2020**	**2019**	**2018**
Alarm Handling	Pick-up to Dispatch	Urban	3:52	4:59	3:57	4:00	3:43	3:24	3:52
Turnout Time	Turnout Time 1st Unit	Urban	1:03	1:08	1:06	1:01	1:00	1:04	1:03
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:36	4:52	4:44	4:39	4:29	4:32	4:34
	Travel Time ERF **Concentration**	Urban	12:20	12:29	13:52	11:19	14:21	11:53	11:24
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	8:14	9:10	8:31	8:17	8:00	7:49	8:03
			n=5594	n=227	n=1153	n=1090	n=943	n=1071	n=1110
	Total Response Time ERF **Concentration**	Urban	15:23	15:23	16:03	14:20	16:37	15:14	14:16
			n=2443	n=101	n=498	n=444	n=375	n=514	n=511

Hazardous Materials

Benchmark Service Level Goal Statement:

For 90 percent of all hazardous materials response incidents, the total response time for the arrival of the first-due unit, staffed with two firefighters, one engineer, and one officer, shall be: 6 minutes and 2 seconds in urban areas. The first-due unit shall be capable of: establishing command; sizing up and assessing the situation to determine the presence of a potential hazardous material or explosive device; determining the need for additional resources; estimating the potential harm without intervention; and begin establishing a hot, warm, and cold zone.

For 90 percent of all hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF) including the hazardous materials response team, staffed with 8 firefighters and officers, shall be: 18 minutes and 25 seconds. The ERF shall be capable of appointing a site safety officer, determine the need for a level 2 response and providing the equipment, technical expertise, knowledge, skills, and abilities to mitigate a hazardous materials incident in accordance with department standard operating guidelines.

Baseline Service Level Performance:

For 90 percent of all hazardous materials response incidents, the total response time for the arrival of the first-due unit, staffed with one officer, one engineer and two firefighters, is: 10 minutes and 12 seconds. The first-due unit is capable of: establishing command; sizing up and assessing the situation to determine the presence of a potential hazardous material or explosive device; determining the need

for additional resources; estimating the potential harm without intervention; and begin establishing a hot, warm, and cold zone.

For 90 percent of all hazardous materials response incidents, the total response time for the arrival of the ERF, staffed with 8 firefighters and officers, including the hazardous materials response team, is: 18 minutes and 25 seconds in urban areas. The ERF can appoint a site safety officer, determine the need for a level 2 response and providing the equipment, technical expertise, knowledge, skills, and abilities to mitigate a hazardous materials incident in accordance with department standard operating guidelines.

(Risk Level) Hazmat - 90th Percentile Times - Baseline Performance			**2018-2023**	**2023**	**2022**	**2021**	**2020**	**2019**	**2018**
Alarm Handling	Pick-up to Dispatch	Urban	4:22	4:47	5:21	4:03	4:23	3:49	4:44
Turnout Time	Turnout Time 1st Unit	Urban	1:09	1:31	1:22	1:10	1:01	1:07	1:09
Travel Time	Travel Time 1st Unit **Distribution**	Urban	6:02	6:38	6:23	6:28	5:27	5:42	5:33
	Travel Time ERF **Concentration**	Urban	15:09	10:14	18:09	15:24	13:37	12:51	13:56
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	10:12	12:45	11:48	10:33	9:18	9:19	10:35
			n=1695	n=37	n=235	n=433	n=347	n=374	n=269
	Total Response Time ERF **Concentration**	Urban	18:25	15:14	22:06	19:35	17:37	15:18	18:45
			n=782	n=17	n=98	n=153	n=128	n=212	n=174

Aircraft Rescue and Fire Fighting (ARFF)

Benchmark Service Level Goal Statement:

For 90 percent of all aviation rescue and firefighting response incidents, the response time for the arrival of the first-due ARFF apparatus, staffed with 1 Engineer and 1 Officer or Firefighter, shall be within 3 minutes, under optimum visibility and surface conditions. The first-due unit shall be capable of: assessing the situation; requesting additional resources; controlling the hazards; and if possible, beginning basic life support of victims and hazard mitigation.

For 90 percent of all aviation rescue and firefighting response incidents, the response time for the arrival of the effective response force (ERF) of two additional ARFF apparatus, each staffed with 1 Engineer and 1 Officer or Firefighter shall be 4 minutes. The balance of the Alert ERF shall arrive at their pre-determined staging area, ready for further assignment (suppression, rescue, or EMS), within the same time and in accordance with department policies and directives.

The response required by the Federal Aviation Administration (FAA) Part 139 – Certification of Airports must achieve the following performance criteria:

Within 3 minutes from the time of the alarm, at least one required aircraft rescue and firefighting vehicle must reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post or reach any other specified point of comparable distance on the movement area that is available to air carriers and begin application of extinguishing agent.

Within 4 minutes from the time of alarm, all other required vehicles must reach the specified point as identified for the initial aircraft rescue and firefighting vehicle from this assigned post and begin application of an extinguishing agent.

Baseline Service Level Performance:

The Airport Division of the Denver Fire Department, in coordination and collaboration with DEN-Operations (different than Denver Fire Operations) conducts regularly scheduled runway drills to maintain record of response time for ARFF apparatus responses. The FAA provides oversight of ARFF responses of the runway drills and recorded times are inspected annually by the FAA Aviation Safety Inspectors for adherence to part 139 requirements. Response assignments to aviation incidents in the City and County of Denver, including at DEN, are identified within the emergency response matrices for both Division 1 (Operations) and Division 6 (DEN).

ARFF - 100 Percentile Times - Baseline Performance			**2018-2023**	**2023**	**2022**	**2021**	**2020**	**2019**	**2018**
Travel Time	Travel Time 1st Unit Red 1, 2, 3 & 4	Rural	3:00	3:00	3:00	3:00	3:00	3:00	3:00
	Travel Time 2nd Unit Red 5 & 8	Rural	4:00	4:00	4:00	4:00	4:00	4:00	4:00

Marine/Shipboard – N/A
Wildland- N/A

Program Outcomes

The Denver Fire Department has identified total response time components for delivery of service in each service program area and assessed those services in each planning zone. The Department evaluates total response time components based on information captured in the DFD Dispatch Run Analysis and the Power BI Dashboard which provide information on time components for each call. This information is broken down by call, District, station, and responding units. This information is reviewed by Command Staff and District Chiefs for total response time components and compliance with NFPA 1710.

A Power BI Dashboard was used by the Department to provide real time information for the total response time components. This information provided data for turnout, travel, and total response time

for each incident. Power BI was very useful as the data could be manipulated to report in multiple formats to adjust service delivery. The Dashboard was monitored daily by the Shift Commander as well as the Division Chief of Operations. When inconsistencies were observed within a service delivery area or planning zone, the Power BI Dashboard allowed for immediately adjustment of resources or to make corrections.

Maintaining and Improving Response

Opportunities for improvement

The Denver Fire Department utilizes total response time component data to benchmark compliance with standards. To identify inconsistencies, the Department monitors response time data by type of incident and service program area using the DFD Dispatch Run Analysis Report, the Power BI Dashboard, After Action Reports and Post Incident Analysis. These are reviewed by the Shift Commanders and Division Chief of Operations to identify adequacies, reliabilities, and opportunities for improvement. For EMS related incidents, the Department has implemented a Quality Assurance/ Quality Improvement Administrator position to monitor adequacies, consistencies, reliabilities, resiliencies, and opportunities for improvement. In addition to evaluating turnout times and compiling an Annual Report with data related to incidents and responses, the Denver Fire Department also monitors the DFD Dispatch Run Analysis reports to assess consistencies and opportunities for improvement. The Department also utilizes the Power BI Dashboard to obtain real time information related to response time components and compliance rates. For EMS incidents, EMS Quality Management Department standard guidelines establish the process for documentation review and set expectations for the continuous evaluation and improvement of emergency medical services provided by the Denver Fire Department through the Quality Assurance and Quality Improvement program.

The Department developed a methodology for assessing performance adequacies, consistencies, reliabilities, resiliencies, and opportunities for improvement. The Power BI Dashboard is utilized daily by the Shift Commander and Division Chief of Operations to monitor compliance for response time components. When deficiencies or inadequacies were noted, resources were adjusted. The Live Move Up Module (MUM) was also used for this purpose. Beginning in 2016, after action reports and post incident analysis were implemented to identify opportunities for improvement and adequacies. In 2016, there were 19 after action reports and 2 post incident analysis completed. In 2017, there were 7 after action reports and 1 post incident analysis completed. The Department implemented a Quality Assurance/ Quality Improvement Administrator to monitor the quality of EMS incidents, by auditing a minimum of 20% of monthly reports. When deficiencies or inadequacies were identified, the Department provided justifications and information during the annual budget approval process and requested expansions for personnel, equipment and apparatus as needed. This included capital improvements such as fire stations.

The Department will create a Standard Operating Guideline which details the review and analysis of DFD Dispatch Run Analysis reports and the requirements to do so when deficiencies are identified. Critical incidents will continue to be identified, and after-action reports as well as post incident analysis will continue to be completed as necessary.

Reporting

The Denver Fire Department utilizes Turnout and Response Time Compliance metrics to benchmark compliance with national standards. The Department monitors and evaluates response time data by type

of incident and service program area to identify areas of improvement, gaps in coverage and inconsistencies, using the DFD Dispatch Run Analysis Report, the Power BI Dashboard, After Action Reports, Post Incident Analysis and the DFD Move up Module (DFD-MUM) dashboard. Data is reviewed by the Division Chief of Operations, Shift Commanders, District Chiefs, Company Captains to identify inadequacies, reliabilities, and opportunities for improvement. Fire Station 39 was built in 2019 based on data from these sources and the Med Units (MED 1, MED 2, and soon to be opened MED 3) have been and will be placed in fire stations with the most need for service and coverage for rigs needing to meet ERF benchmarks.

For EMS-related incidents, the Department has implemented a Quality Assurance/ Quality Improvement Administrator position to monitor inadequacies, consistencies, reliabilities, resiliencies, and opportunities for improvement. In addition to evaluating Turnout and Response Time Compliance and compiling an Annual Report with data related to incidents and responses, the Denver Fire Department also monitors the DFD Dispatch Run Analysis reports to assess consistencies and opportunities for improvement. The Department also utilizes the Power BI Dashboard and other dashboards to obtain accurate time information related to response time components and compliance rates. For EMS incidents, EMS Quality Management Department standard guidelines establish the process for documentation review and set expectations for the continuous evaluation and improvement of emergency medical services provided by the Denver Fire Department through the Quality Assurance and Quality Improvement program.

The Department developed a methodology for assessing performance inadequacies, consistencies, reliabilities, resiliencies, and opportunities for improvement. The Shift Commander and Division Chief of Operations utilize the Power BI Dashboard daily to monitor compliance for response time components. When deficiencies or inadequacies occur, resources are adjusted. The DFD Live Move Up Module (DFD-MUM) is also used for this purpose as response gaps created by large incidents or training exercises are quickly filled with supporting fire companies by the Dispatch Team in coordination with the Shift Commander. Supportive documentation in the form of After-Action Reports and Post Incident Analysis reports are used to identify opportunities for improvement and training. The Department implemented a Quality Assurance/ Quality Improvement Administrator to monitor the quality of EMS incidents by auditing at least 20% of monthly reports. When deficiencies or inadequacies were identified, the Department provided justifications and information during the annual budget approval process and requested personnel, equipment, and apparatus expansions. This justification included capital improvements such as stations 39 and 40.

Performance monitoring

The Denver Fire Department utilizes Turnout and Response Time Compliance metrics to benchmark compliance with national standards. The Department monitors and evaluates response time data by type of incident and service program area to identify areas of improvement, gaps in coverage and inconsistencies, using the DFD Dispatch Run Analysis Report, the Power BI Dashboard, After Action Reports, Post Incident Analysis and the DFD Move up Module (DFD-MUM) dashboard. Data is reviewed by the Division Chief of Operations, Shift Commanders, District Chiefs, Company Captains to identify inadequacies, reliabilities, and opportunities for improvement. Fire Station 39 was built in 2019 based on data from these sources and the Med Units (MED 1, MED 2, and soon to be opened MED 3) have been and will be placed in fire stations with the most need for service and coverage for rigs needing to meet ERF benchmarks.

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Programs

The Denver Fire Department posts information regarding community engagement, fire prevention, and educational programs on the City's website and social media platforms. The department has a sworn Public Information Officer (PIO) and a Community Outreach Manager from the professional staff. The Community Outreach program tracks community engagement events in a database. Data collected includes, but is not limited to, Type of event, date of events, location, and age range of participants or target audience. All technical inspections, pre-plans, and company-level inspections are documented and stored in the Accela database. Injury prevention is handled through the Safety and Training Division. Multiple injury prevention programs are maintained through the Department Wellness Initiative. This initiative involves partnerships with the Administration, Denver Firefighters Local 858, and Risk Management. The Department Physical Therapy Program continues to improve firefighter health and save the City money through preventative care. The department now has its own dedicated Physician that manages the Wellness program. Denver Fire does not provide remediation programs related to Public Health. Public Health issues are referred to Denver Environmental Health.

Denver Fire is active in safety and remediation programs and has included program information in the (CRA/SOC). The Accela database has been a challenge for updating inspections, and the city continues working toward a timely and accurate data entry solution. From a Wellness standpoint, the department is dedicated to the safety and welfare of the members of the DFD, and programs continue to grow in this arena. Two full-time physical therapists treat over 200 members monthly for pain and rehabilitation for injuries that occur on or off the job. Mental Health therapy, with multiple outlets for care, is utilized, and department education on all programs offered is continually communicated. The department

maintains a collaborative partnership with the Department of Environmental Health.

Denver Fire is committed to the timely delivery of safety and remediation programs relevant to the Fire Service. The department will continue to be good collaborative partners with all City agencies and will continue to track Type, location, and community impact.

Performance Gaps

The Denver Fire Department utilizes the Annual Report and Power BI data to measure compliance with NFPA 1710. In addition to Power BI, contributing factors such as updated and accurate Geographic Information Systems (GIS) and ESRI information identify response gaps. The Power BI data provided in these reports include total call volume, considerations for response areas within Districts, and reports volume of each incident type for each Fire Station.

Denver Fire continues to evolve and develop new and emerging technology to determine NFPA 1710 compliance. With this technology, monthly Performance Metrics are submitted by every company officer and district chief to the Operations Division Chief for review and revision if needed. Identified performance gaps are managed by Computer Aided Dispatch system adjustments and monitored for effectiveness. Response times on Tower Road are still an issue, but the opening of Station 40 in 2024-2025 will provide better coverage and compliance.

Continuous Improvement Plan

The Denver Fire Department has a continuous improvement plan to address gaps and variations. The Department considers gaps, variations, and the need to request expansions and capital equipment during the annual budget process. Command Staff, in partnership with the Budget Management Office, the Mayor's office, and City Council, also consider long-term improvements for items such as new facilities and fire stations to be included in the annual Capital Improvements Plan.

All programs are reviewed for continuous improvement annually through the budget review process. Operational gaps and variations were identified through the review process, and justifications were provided to address gaps and variations in the form of personnel, equipment, and apparatus expansions. In 2023, an expansion request for Engine 2 addressed a gap in the response time deficiency in the Tower Road/Pena Blvd corridor. This request was approved and will be implemented in 2023.

The Department will continue to work through the annual budget process in partnership with the Budget Management Office, Mayor's office, and City Council to address gaps and variations. Completion of Station 40 and staffing of Engine 2 will address gaps in response time areas and will be monitored to determine effectiveness in addressing deficiencies.