

Columbia Fire Department



2018 Community Risk Analysis: Standards of Cover



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VISION STATEMENT

We are committed to providing highly trained professionals who are well equipped to respond effectively to the needs of our customers.

MISSION STATEMENT

We will uphold the Columbia Fire Department's proud tradition of delivering the highest level of customer service through exceptional emergency response, education, planning and prevention.

VALUES

Stewardship

Respect and honor our community's investment in us, through responsible resource management.

Teamwork

The cornerstone of our ability to adapt to, and overcome, any challenge with a positive attitude.

Integrity

Do the right thing at all times.

Continuous Improvement

Continuously train, plan, and innovate at all levels for professional development and success.

Customer Service

Take pride in delivering the highest level of service to our customers.

Communication

Provide effective and responsive communication throughout the organization and community.

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Executive Summary

The Columbia Fire Department (CFD) is committed to providing highly trained, well equipped professionals, responding effectively to the needs of it's customers. The department responds to all Fire, Hazardous Materials, and Technical Rescue incidents as well as providing EMS response to calls within the city limits. In addition to emergency responses the Columbia Fire Department also provides additional professional customer service in public education, fire inspection, fire investigation, and building plan review.

The department covers all areas within the city limits. The city's estimated population of 118,966 residents live in an area which covers 65.78 square miles. Coverage is provided from nine fire stations, with a total of 12 staffed front-line apparatus and two chief officers each day. The department has a total of 141 uniformed members and four civilian staff divided over three divisions. Emergency Services division, covers all emergency responses and staffs the apparatus 365 days a year, 24 hours per day. The Fire Marshal's division covers fire investigations, public education, building plan review, and the building inspection program. The Administrative division supports all other divisions, including fire and EMS training.

During the development of the Standards of Cover, the department has completed a detailed look at the data from the past three years, 2015-2017. This analysis has provided the department with several areas which can be improved. This document also provides a detailed process which allows for repeatable analysis year after year, providing consistent reporting.

The Columbia Fire Department will utilize this document to ensure that the mission statement is continually attained.

We will uphold the Columbia Fire Department's proud tradition of delivering the highest level of customer service through exceptional emergency response, education, planning and prevention.

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Introduction

The City of Columbia is located in Boone County, Missouri. Columbia is approximately 100 miles West of St. Louis and 100 miles East of Kansas City. It is the cross roads for U.S. Highway 63 and Interstate 70. The population of Boone County, Missouri was estimated at 178,271 in 2017, and the City of Columbia's population was estimated at 118,966 in 2017, making Columbia the fourth largest city in the state.

This Community Risk Assessment and Standards of Cover (CRA/SOC) document has been prepared for The Columbia Fire Department. The information contained in this document was assembled to identify risks to the community, while providing insight into the coverage the fire department provides for each given risk category and classification. The Columbia Fire Department is an all hazards department committed to providing highly trained professionals, who are well equipped, to respond effectively to the needs of the customers. The services provided are: emergency medical services (EMS), fire suppression response, technical rescue response, and hazardous materials response. In addition, the department provides public education and fire prevention. The Columbia Fire Department operates from nine strategically placed fire stations in the city.

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A. Area Characteristics

Description and History of Columbia

In 1818, the Smithton Land Company purchased 2,000 acres and established the village of Smithton near the current center of Columbia. In 1821, they moved closer to the water supply of Flat Branch and Hinkson creek, the settlement was renamed Columbia with an approximate population of 200. The City of Columbia currently covers approximately 65.78 square miles and is home to approximately 118,966 residents. It is the state's fourth most populous metropolitan area. It is the county seat for Boone County and home to several institutes of higher learning, notably the University of Missouri (1839), Stephens College (1833), and Columbia College (1851).

Steadily growing in population, the City of Columbia became a city known for its educational, insurance, and medical prominence in the region. It is currently the home of two hospital systems, Boone Hospital Center and the University of Missouri Hospital. Four large insurance companies: State Farm, Shelter, Missouri Employers Mutual, and Veterans United which are all primary employers in the area.

The University of Missouri's flagship campus is an economic driver in the area, employing large numbers of residents as well as those employed in the businesses that service and support the University. It is also home to one of the largest research nuclear reactors in the nation.

Recent strides have been made to make Columbia a tourism destination. Festivals such as Roots-and-Blues, True/False Film Festival, the Citizen Jane Film Festival, as well as many other small venues have helped establish Columbia as a cultural event city.

Financial Basis

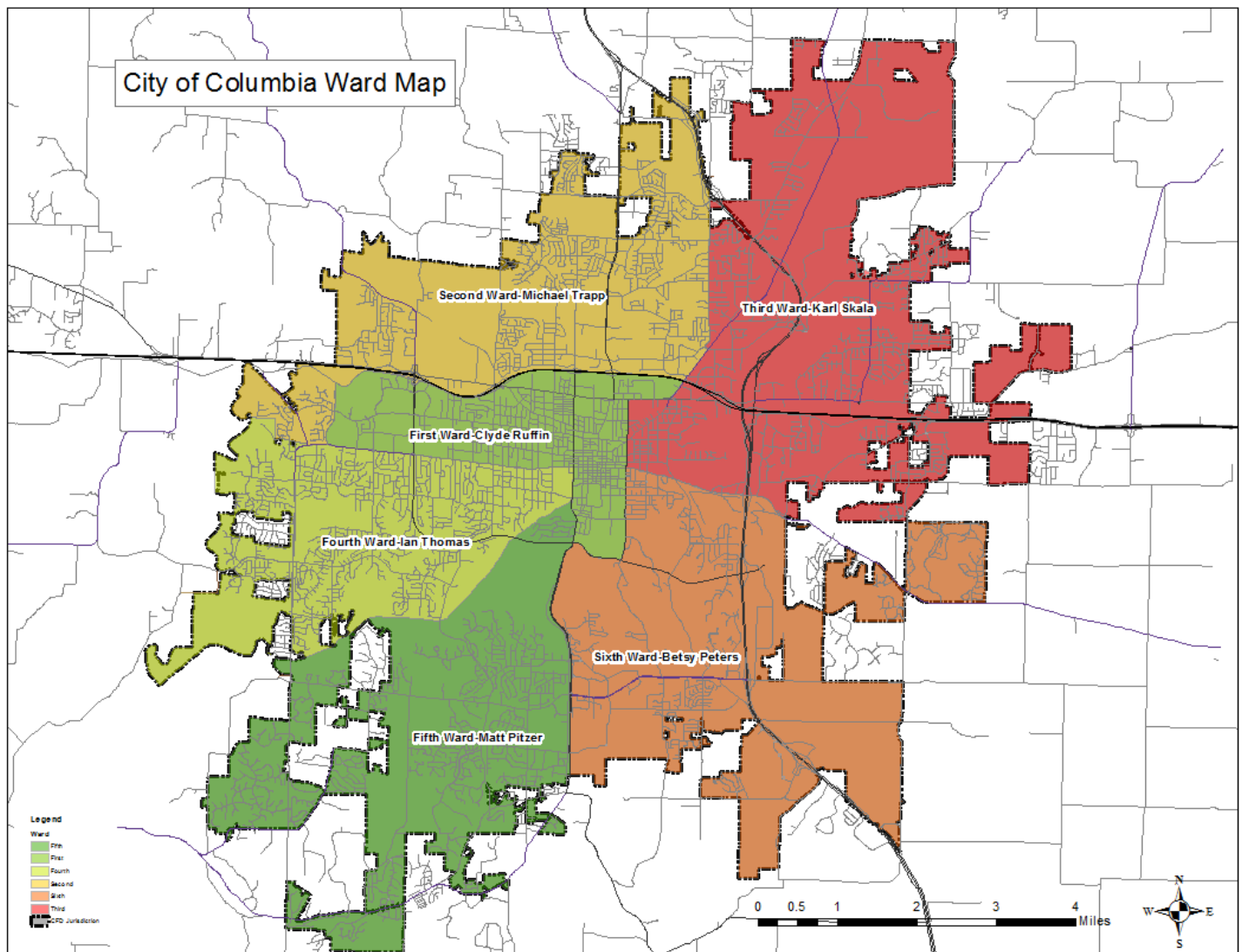
The Department is funded primarily from the City's General Revenue Fund. The Department participates in the budgeting process, requesting fixed funds, operating expenses, and personnel costs as well as supplemental expense requests. In 1991, a one-fourth cent sales tax proposal was passed by the citizens of Columbia for overall capital improvements. For the Fire Department, this money funds fleet replacement and the acquisition of new fire station sites. The tax was renewed by voters in 1995, 1999, 2005, and 2015.

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Governance

Columbia was incorporated in November of 1826 and was governed by an elected five-member board of trustees. In 1892, the Mayor/Council form of government was adopted. The City of Columbia currently operates under a City Council/City Manager form of government (adopted in 1949), with the City Council developing and adopting policies and legislation. They employ a City Manager to oversee city operations. The city is divided into six wards, each represented by an elected council person. The Mayor is at large and is also an elected official. The City Manager appoints the Fire Chief, who is responsible for the operation and administration of the Fire Department.



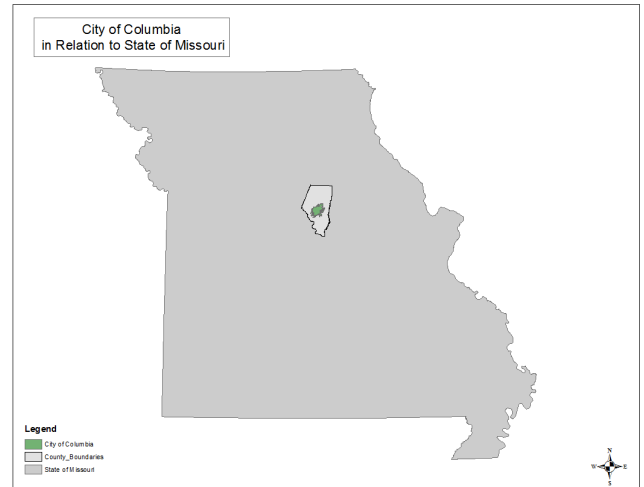
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Community Description

Major Geographical Features

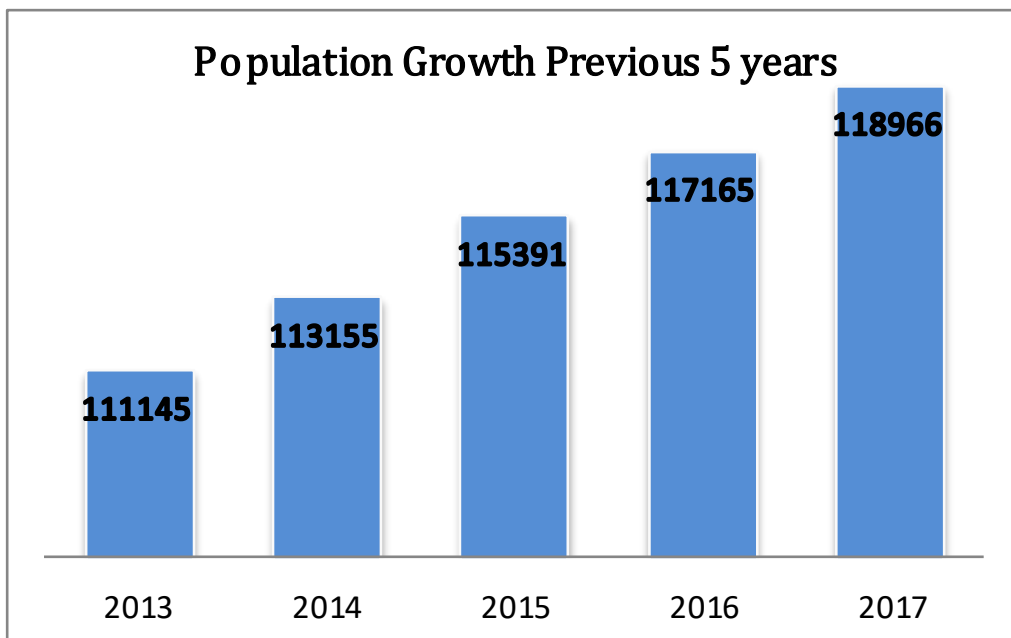
The City of Columbia is located in northern mid-Missouri almost equidistant from the two large metropolitan areas of St. Louis (to the east) and Kansas City (to the west). The city is the largest metropolitan area in the center of the state and fourth largest in the State of Missouri, with a total area of 65.78 square miles. It serves as the county seat of government and economic center of Boone County. Approximately 68% of the Boone County population resides in the City of Columbia.



Population

Population Growth

The City of Columbia has seen an estimated increase in population of 24.21% in the past ten years. Columbia's annual average growth in the past ten years has been approximately 2.5%.



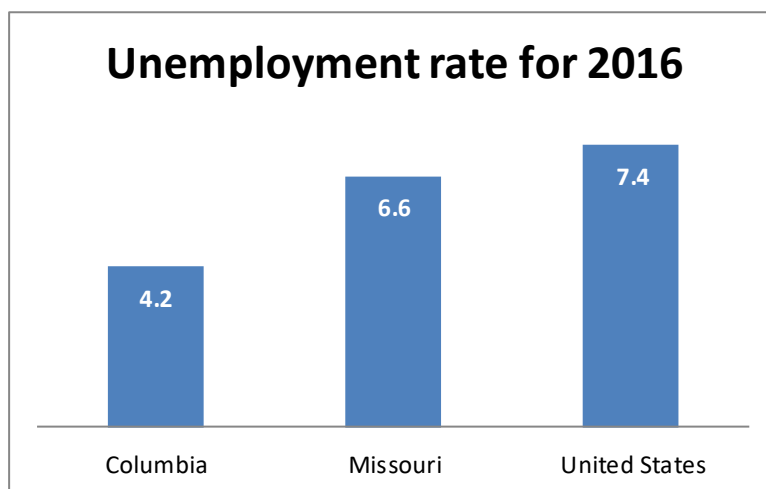
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Population concentrations tend to be heaviest in the suburban/residential areas, with the exception of the area surrounding the University of Missouri. Large numbers of residential dorms, fraternity and sorority houses, and off-campus housing are concentrated around the campus. This area lies in the south-center portion of the city and results in a younger, more active average population than seen in other areas of the city.

While there are numerous small areas of “at-risk” populations, such as assisted-living, elderly, and high-rise residences, no large concentration exists in any one area. The city has three large hospital complexes, but they are for the most part geographically dispersed.

Socio-economically, Columbia continues to be in a stable position with a lower average unemployment rate than both federal and state averages. The top five employers were the University of Missouri, University Hospital and Clinics, Columbia Public Schools, Boone Hospital Center, and the City of Columbia itself. The most common occupations indicated are in the management, professional, and related areas.



Columbia has an educated base, with 94.2% of people having at least graduated from high school and 54.8% having a bachelor’s degree or higher. (Source: American Community Survey 2016).

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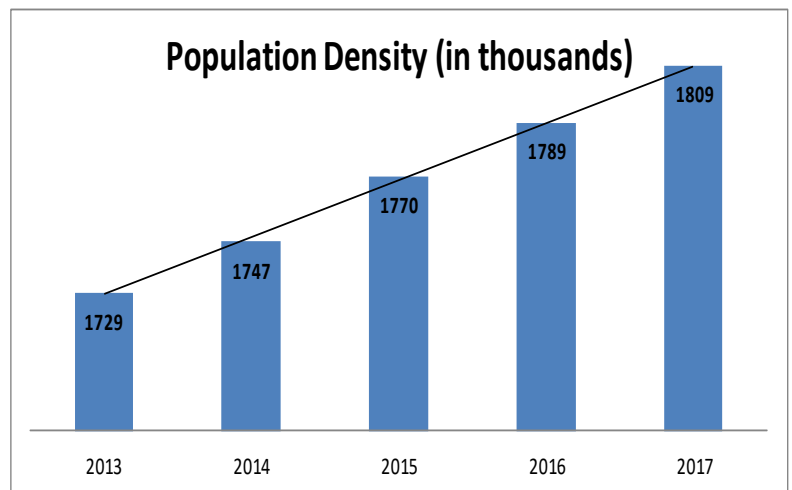


Population Density

The City of Columbia has had a continuous upward trend in population density. In the past ten years the population density has increased by 18.84%.

Formula:

$$\frac{\text{Population}}{\text{Area in square miles}}$$



Demographic features

Age -According to the U.S. Census Bureau, 2017 estimates, the age breakdown in Columbia is as follows:

- 17 and under – 18.5%
- 18 to 64 – 72.1%
- 65 and older - 9.4%

Race -According to the U.S. Census Bureau, 2017 estimates, race in Columbia, MO is as follows:

- 78.3% White
- 9.7% Black or African American
- 3.3% Hispanic/Latino
- 0.3% Native American
- 6.0% Asian
- 4.8% 2 or more races

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Development

Columbia's industrial base consists primarily of light industry, concentrated primarily along the Route B and Highway 63 corridors. Development of heavy industry in the area is unlikely. However, growth in the business/commercial area has been robust over the past decade and with Columbia approaching the 125,000 population mark, it should continue into the future. Several large businesses have home offices or major facilities in the city including State Farm Insurance, Shelter Insurance, EAG Laboratories, and Missouri Book Services (MBS). Recent development of the Discovery Ridge Business Park, in conjunction with the University of Missouri, may spur high-tech research and development in that area.

Retail areas are spread geographically throughout the city. Historically, the City of Columbia had an older, central "down town" business/retail area and a "newer" indoor mall area in the west portion of the city (Columbia Mall). Both of which continue to do well. The past decade has seen a dispersion of the retail areas, with new concentrations occurring throughout the city. Many large retailers (Lowes, Home Depot, Wal-Mart Superstores, Bass Pro Shop, and Menards) have anchored new areas.

Columbia is the home to the University of Missouri's home campus and as a result has large recreational venues. The football, basketball, and other sports arenas are within close proximity to each other. They are in the south-central area of the city and draw large crowds to the service area.

Buildings within the City of Columbia range from over one hundred years of age (predominately in the downtown/central portion of the city and the University of Missouri Campus area) to newly constructed. The Demographic Profile Trend Report for 2000 shows that 15.8% of housing units were less than five years of age and the average age for all housing units was 26.5 years, reflecting the relatively recent growth of the city. Buildings in the area are primarily of frame construction in the residential area with commercial buildings of concrete block or concrete tilt-up construction. Most are single-story to mid-rise with only a few building surpassing four-stories in height.

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Schools and Educational Facilities

Columbia Public Schools

The Columbia Public School district encompasses all of the City of Columbia, and surrounding areas. They currently have a K-12 student enrollment of just over 18,000. The system has 21 elementary, 6 middle school, and 4 high school facilities. Columbia also has the Columbia Independent School and several faith-based elementary and high schools.

The University of Missouri's main campus is located within the city. Fall 2017 enrollment was 30,870 students. Columbia College and Stephens College are also both located in Columbia, fall 2017 enrollment was 16,962 and 1,123 students respectively. There are also several satellite college operations located here.



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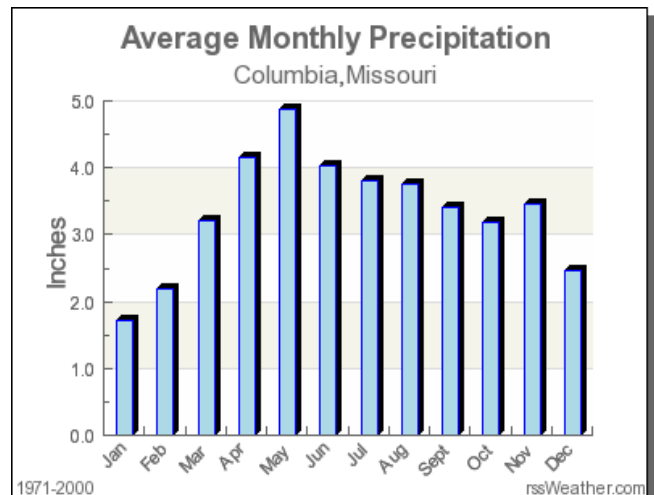
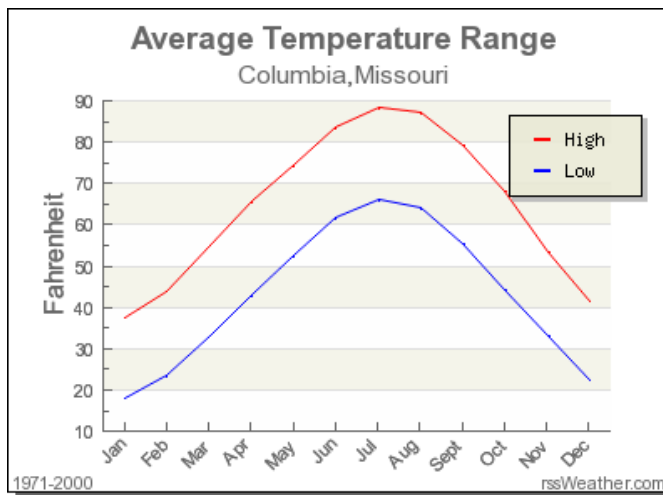


Climate

The Columbia area incurs a normal change of seasons, with the weather conditions that correspond. Spring and summer can bring occasional flash flooding to certain roadways. Annual rainfall is approximately 43 inches per year, with May typically being the highest month in average precipitation.

Fall and winter can bring freezing rain, ice, and snow. While typical snows result in less than five inches, rare snow events can exceed fifteen inches or substantial icing events can potentially result in delayed responses. Annual snowfall is approximately 19 inches per year.

Highest and lowest average temperatures occur in July (88 degrees) and January (21 degrees) respectively.



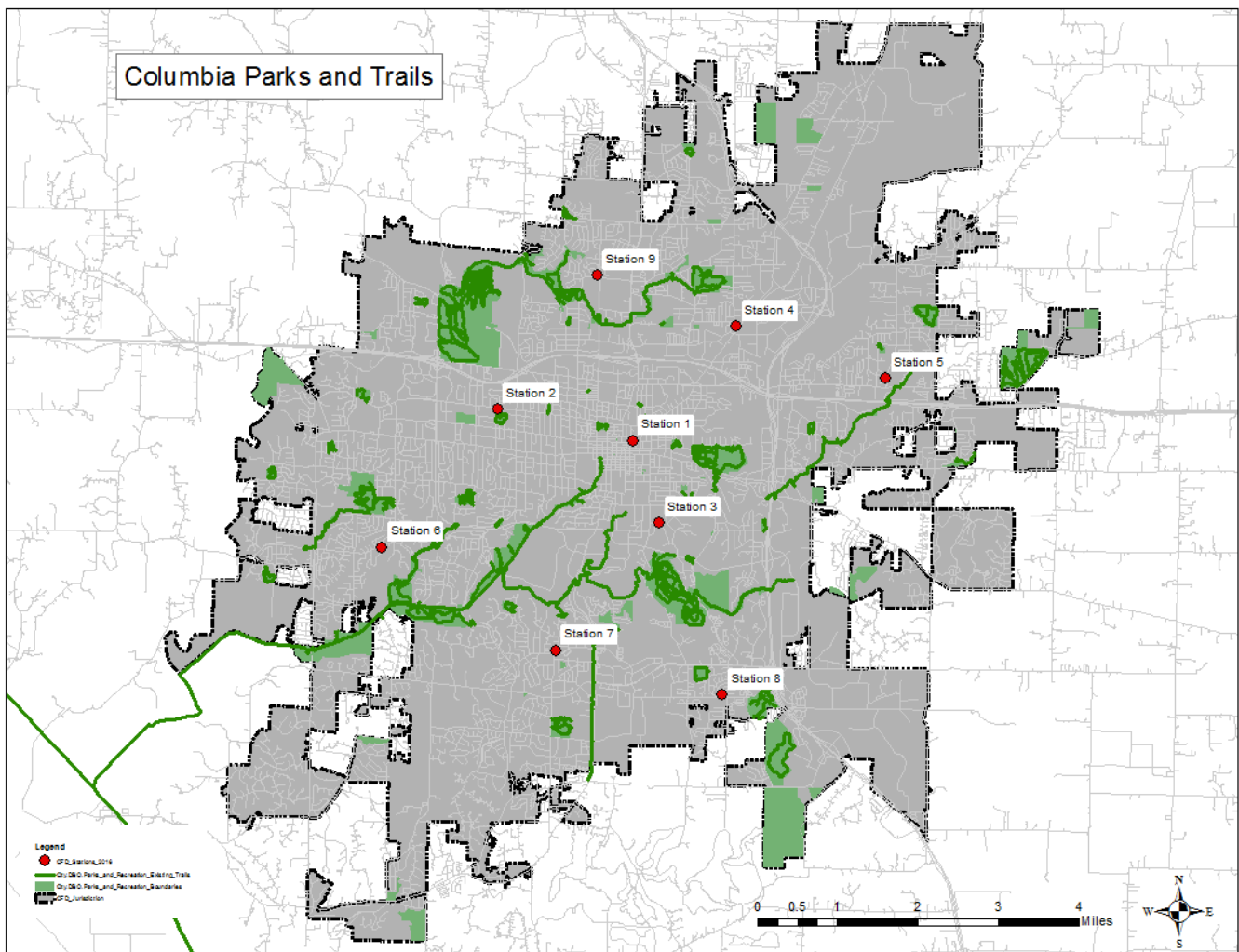
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Topography

The City of Columbia consists mainly of grass and lightly wooded rolling hills. Several small streams and creeks traverse the city, posing little restriction to travel. There are numerous small bodies of water, consisting of small to medium sized ponds and lakes.

Columbia has over 3,350 acres of parks and trails. Various old railroad right-of-ways and other available land have been converted into an extensive network of over 58 miles of developed trails.



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Transportation Network

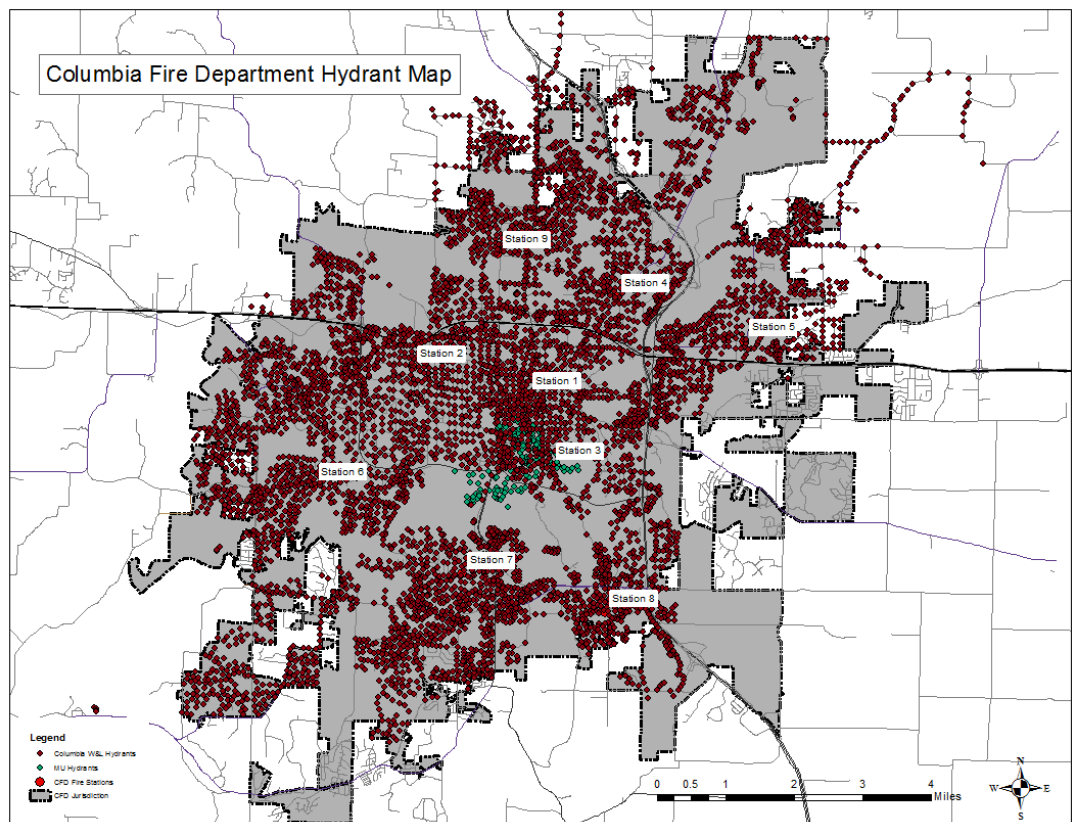
The City of Columbia is transected by two major highways. Interstate 70 is the state's primary east and west artery and U.S. Highway 63 is one of the state's primary north and south highways. The intersection of I-70 and US Highway 63, is an influencing factor in the growth of the city. In addition, the city maintains an infrastructure of over 1,351 paved lane miles of roads and streets.

The City has a full-service short line rail system that connects to the Norfolk Southern main line, giving access for local light industry, as well as the city's Transload Facility

The City also operates the Columbia Regional Airport, a FAA primary commercial service airport. It is located on approximately 1,500 acres, about 12 miles southeast of central Columbia.

Water Distribution

Columbia Water and Light Department is the main water supplier for the city. In addition, the University of Missouri, Public Water District #9, and Consolidated Water District each have hydrants and lines within the city limits. The University having water supply on campus, the districts in annexed areas around the periphery of the city.



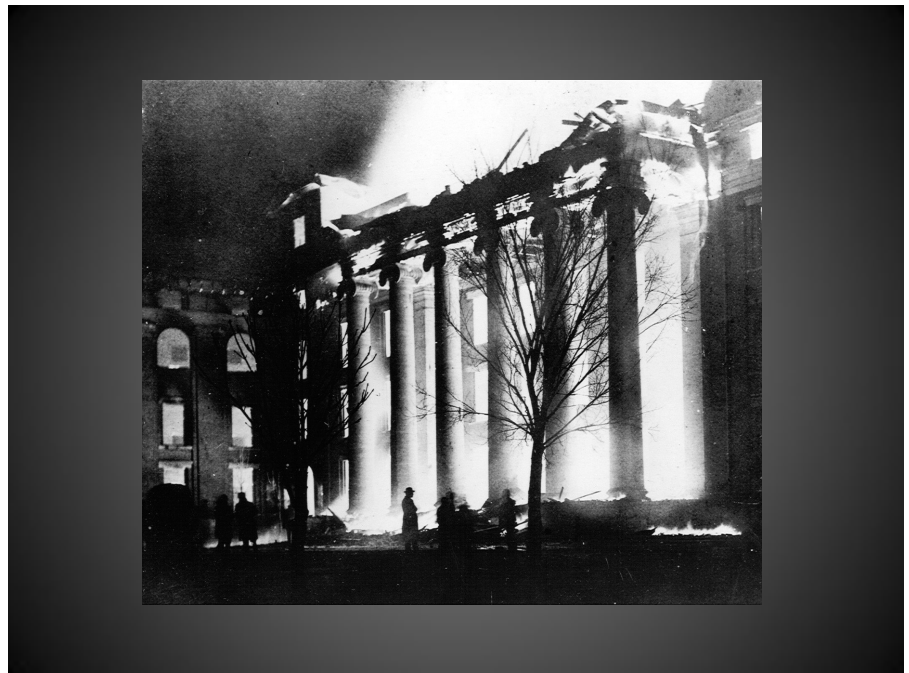
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History of the Columbia Fire Department

The first known milestone in the Columbia Fire Department history, occurred in 1853. This is when one dozen buckets, two ladders, and one fire hook were purchased to help defend the City of Columbia from the threat of fire. By 1875, the city had grown to about 2,500 people and the first fire department in the city was organized. A group of forty-eight citizens joined together forming the Columbia Fire Company. The Columbia Fire Company was a voluntary group, choosing their own leaders and operating under a constitution. Equipment was again purchased by the city, and consisted of a hand pumper, 250 feet of leather 2-inch hose, 4 dozen buckets, a 10-foot ladder and a 35-foot ladder. Total cost of the equipment was \$469.30.

Large and costly fires occurred in the 1890's culminating with the loss of the University of Missouri's Academic Hall (prompting calls for the University to be relocated to the nearby city of Sedalia). This spurred action to both improve water supply and for a professional fire department. In April of 1901, Columbia's first professional fire company was formed. While a paid department since April of 1901, it wasn't until 1964, that Code 1964, Ordinance No. 9.150 was adopted by the City of Columbia formally creating the Columbia Fire Department as a paid department.

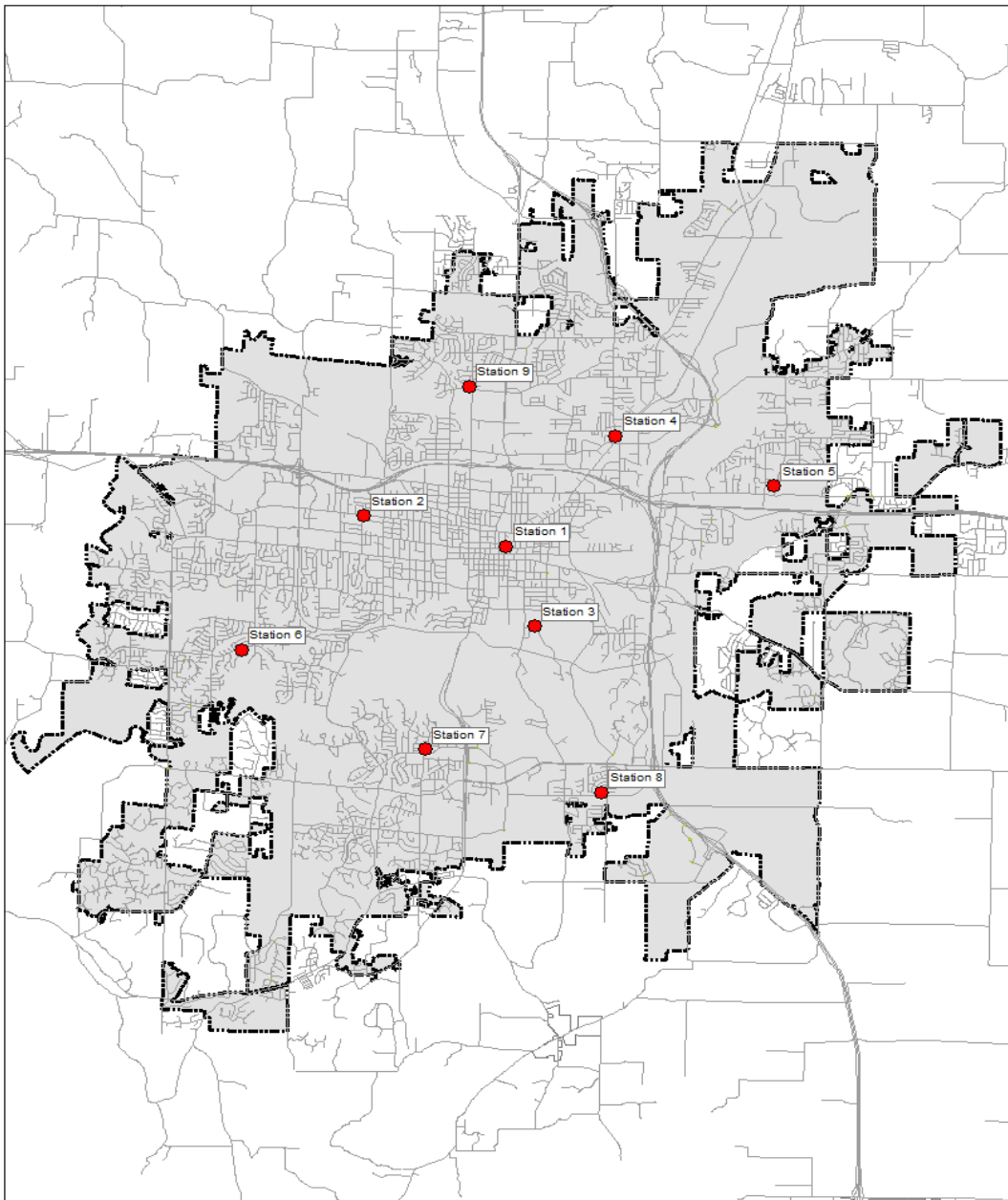


More recent historical milestones of the department include; the first modern air packs were put into service in 1971, the first rescue squad joined the fleet in 1975, Emergency Medical Services were added in 1977, and Special Operations Response Teams (Hazardous Materials and Technical Rescue) were added in 1995.

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Since 2000, the CFD has seen the addition of Fire Station Eight (2001) and Fire Station Nine (2009). During 2008, the department underwent an Insurance Services Office (ISO) review. The ISO scale is from a nine to a one, with a one being the best rating possible. In 2009 was awarded an ISO rating of a two, down from a three. The department was again reviewed by ISO in 2017 and again awarded a rating of two. Currently there are 305 class-one departments and 1,482 class two departments in the U.S. out of 43,094 rated fire departments. In Missouri there are three class one departments and 37 class two departments out of 1,608 rated fire departments.



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B. Fire Department Services

Emergency Services Division:

The Emergency Services Division operates out of nine strategically located fire stations within the city limits of Columbia. Emergency services is responsible for the response to all fire suppression, EMS, technical rescue, and hazardous materials incidents. This division is managed by the Assistant Chief of Emergency Services and Training. The ranks in this division include:

3 Division Chiefs	27 Lieutenants
3 Battalion Chiefs	36 Engineers
9 Captains	51 Fire fighters

The 129 personnel are divided among three shifts, which operate the following apparatus:

- 2 Engine companies with 500 gallon water tanks and 1,500 gpm pumps (3 personnel each)
- 7 Quint companies with 500 gallon water tanks, 75' aerials, and 1,750 gpm pumps (3 personnel each)
- 2 Ladder companies with a minimum of 300 gallon water tank, 95' aerial, and 1,750 gpm pump (3 personnel each)
- 1 Heavy Rescue company (2 personnel)
- 1 Division Chief (shift commander)
- 1 Battalion Chief (Assistant shift commander)

Fire Marshal Division:

The Fire Marshal Division operates out of Fire Administration. They are responsible for all fire investigations, fire prevention and public education program development, fire inspection program, and enforcement of the adopted fire code. The division maintains a relationship with the University of Missouri by sharing in the cost of one of the Assistant Fire Marshal positions. This position splits time for both agencies, yet is uniformed with CFD. This division is managed by the Fire Marshal. This division includes:

- 1 Battalion Chief
- 4 Assistant Fire Marshals
- 1 Administrative Assistant

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Fire Training:

Fire Training operates a fire training facility within the city. The training staff is responsible for all departmental training needs for fire, EMS, hazardous materials, and technical rescue. Training operates out of the training facility and conducts a recruit firefighter academy, which is a 15 week academy. Training is managed by the Assistant Chief of Emergency Services and Training and consists of:

2 Training Chiefs

Fire Administration:

The department's fire administration staff work a normal 40 hour weekday schedule. This staff provide direction and support for all operations within the fire department. Administration staff consist of:

Fire Chief

Deputy Fire Chief

Assistant Fire Chief Emergency Services/Training

Assistant Fire Chief/Fire Marshal

Administrative Budget Officer

Payroll Clerk

Administrative Assistant

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C. Programs

Fire Suppression

CFD conducts fire suppression from all nine stations. There are 129 uniformed personnel assigned to operations in three shifts, which work a 24 hour shift schedule. Each works approximately 10 days per month. The department continually evaluates response data to ensure the needs of the citizens are being met.

Emergency Medical Service (EMS)

The department is a first responder agency within the jurisdiction, CFD does not conduct transport services. All uniformed members of the department are, at a minimum, trained to the Emergency Medical Technician-Basic (EMT-B) level. Currently, there are 112 EMT-B's on the department. Every apparatus and staff vehicle is equipped with an AED and a medical kit, which contains BLS equipment. Currently, there are 29 Emergency Medical Technician-Paramedic (EMT-P) on staff. They are allowed to operate as Paramedics assisting the ambulance crew once they arrive on the scene.

Technical Rescue

The department provides rescue services throughout the jurisdiction. These call types include vehicle extrication, high angle and low angle, trench, confined space, water, and ice rescues. Within the department all front line apparatus have, at a minimum, a Hurst combi-tool and cribbing for auto extrication. The squad carries heavy rescue equipment and is dispatched to all technical rescue calls. Depending upon the nature of the call, the technical rescue truck will also be dispatched. This apparatus is housed at Fire Station 8 and is cross staffed with personnel from Quint 8. It is equipped to handle longer duration incidents, with additional equipment and materials. Within the department there is a Technical Rescue Team, made up of members with specialized training. Currently, there are 45 members on the rescue team. All uniformed members of the department serve in an awareness or operations level. All emergency services personnel receive ongoing semi-annual, shift wide training in technical rescue. Technical Rescue Team members train quarterly.

Hazardous Materials

CFD serves as a regional hazardous material response team for the Central Missouri area. The Hazmat Truck is housed at Fire Station 9 and is cross staffed with personnel from Quint 9. Staff assigned to station 9 are primarily all certified Hazardous Materials Technicians. The Hazardous Materials team currently consists of 33 Hazardous Materials Technicians. All members of the department are trained to the Hazardous Materials Operations level. All personnel train monthly on hazardous materials at the company level and conduct exercises a minimum of two times per year. Hazmat Team members train quarterly.

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Fire Investigations

Fire investigations are performed by Assistant Fire Marshals, who are all certified as fire investigators through the Missouri Division of Fire Safety. All fires in a building are investigated to determine the origin and cause. Any other fire type which is suspicious in nature, is also investigated to determine the origin, cause and circumstances surrounding the event.

CFD is also home to Izzo, one of only two accelerant detection canines in the State of Missouri. The CFD accelerant detection canine and his handler provide mutual aid assistance to a seven county area in central Missouri and state wide through the State Fire Marshals Office.

Fire Prevention and Education

All members and divisions of the CFD are actively involved in public education. The CFD public education program is structured to target four high risk areas in the community: third and seventh grade students, off campus housing, assisted living communities and the business community. The programs created for these areas employ research-based educational concepts, information developed from local emergency statistics, interactive displays and hands-on training. In addition to these areas, CFD is a participant in the Safe Kids Coalition and installs many car seats each year. Through these safety education programs and services, the department works to build a safer community.

Fire Training

CFD training coordinates all training for the department. Through the use of an online training platform, each month training is assigned throughout the department to all members. This monthly training includes online, as well as hands on training evolutions. Several times annually the division hosts live fire and scenario based exercises. The training staff also conduct a basic recruit school when new firefighters are hired. This school is 15 weeks in duration and includes full certification for Firefighter I and Firefighter II through the Missouri Division of Fire Safety.

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D. Apparatus



Engines:

CFD operates two engine companies. These companies are staffed with a lieutenant, an engineer, and a firefighter. Both engines were manufactured by the Sutphen Corporation. Each truck is equipped with a 1,500gpm pump and a minimum of 500 gallons of tank water. Each also carry 1,800' feet of 4 inch supply hose, two 1 3/4 crosslays, one 2 1/2 crosslay, and 600 feet of 2 1/2 inch hose.

Quints:

CFD operates seven quint companies. All of the quints are manufactured by the Sutphen Corporation. Each company is staffed with a lieutenant, an engineer, and a firefighter. Each quint is equipped with a 75' straight stick, a 1,750 gpm pump, and 500 gallons of water. They also carry 1,800' feet of 4 inch supply hose, two 1 3/4 crosslays, one 2 1/2 crosslay, and 500 feet of 2 1/2 inch hose.



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Ladder Trucks:

CFD operates two ladder companies. These companies are staffed with a captain, an engineer, and a firefighter. Both ladders were manufactured by the Sutphen Corporation. One ladder company is a 100' aerial platform and carries 300 gallons of water. The other ladder is a 95' aerial platform and carries 400 gallons of water. Each ladder is equipped with a minimum of 800' feet of 4 inch supply hose, two 1 3/4 crosslays, one 2 1/2 crosslay, and 400 feet of 2 1/2 inch hose.



Squad:



CFD has one squad company. This apparatus serves as a heavy rescue truck. This company is staffed with a captain and an engineer. It was manufactured by SVI. It is equipped with a variety of rescue equipment as well as a full SCBA cascade system for breathing air resupply.

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Command Vehicles:

CFD utilizes two command vehicles. Both vehicles are Chevrolet Suburbans, equipped with multiple radios to allow for incident operations. Each vehicle is staffed with a Division Chief or a Battalion Chief.



Hazmat Truck:



The Hazmat truck was custom built by SVI. It serves as the hazardous materials response vehicle. This apparatus carries level A - C protective suits, decon equipment, detection and material identification equipment, as well as containment and mitigation supplies. The cab also serves as a command/research center during incidents. This truck is a special call apparatus, that is cross staffed with Quint 9 personnel.

Technical Rescue Truck:

The Rescue truck, manufactured by Precision Fire Apparatus, is equipped with a wide variety of specialized rescue equipment and tools, including lumber and other shoring materials. This truck is cross staffed with Quint 8 personnel. This truck is a special call apparatus.



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Air Truck:

CFD has an air resupply truck manufactured by Precision Fire Apparatus. This truck is equipped with an SCBA air compressor with 12, 6000 psi H-tanks, a Revolve Air two bottle fill station, light tower, extra SCBA cylinders, and extra SCBA packs. This apparatus is stationed at Fire Station 8 and is a cross staffed truck with Quint 8 personnel. This truck is a special call apparatus.

Foam Truck:

The Foam truck is stationed at Fire Station 1 and is cross staffed with Ladder 1 personnel. This truck was manufactured by Precision Fire Apparatus. It carries 975 gallons of Universal Gold foam concentrate, 750 gallons in bulk and 45 five gallon buckets. It is also equipped with two pre-plumbed master stream PC-31 foam monitors, a light tower, and generator. This truck is a special call apparatus.



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CAFS skid unit (Foam 3):



CFD operates a compressed air foam system (CAFS) skid unit out of Fire Station 3. This unit is on a 3/4 ton Chevrolet pickup and is equipped with a Danko CAFS skid unit. This unit holds 100 gallons of water, two 6000 psi H-tanks, and six gallons of foam concentrate. The finished foam is delivered via a pre-plumbed booster hose. This apparatus also carries a variety of tools utilized on grass fires. The truck is cross staffed with Quint 3 personnel and is a special call apparatus.

Fire Department Bus:

The department also has a bus which can be utilized for a rehab station for personnel, provide shelter for residents during an incident, or utilized to transport non-injured citizens from highway incidents. This bus has the capacity to carry 30 passengers, is equipped with a handicap lift, and has a variety of blankets and rehab equipment. The bus is cross staffed with Quint 7 personnel and is a special call apparatus.



Reserve Apparatus:

CFD maintains one reserve engine, one reserve ladder, one reserve squad, and two reserve quints. Each apparatus is equipped with all the necessary equipment, allowing the truck to be placed in service in the event it is needed.

Additional vehicles:

The department utilizes six smaller SUV's in the Fire Marshal's Division, two SUV's and a 15 passenger van in the Training Division. A 15 passenger Customer Service van and a 3/4 ton pickup are utilized by all divisions.

2018 Standards of Cover



Apparatus Deployment

- **Fire Station 1: 201 Orr Street**
 - Engine 1 2017 Sutphen (Engine)
 - Ladder 1 2012 Sutphen (95' Platform)
 - Division Chief 2015 Chevrolet Suburban (command vehicle)
 - Battalion Chief 2011 Chevrolet Suburban (command vehicle)
 - Foam Truck 1999 International (Foam Truck)

- **Fire Station 2: 1212 West Worley**
 - Engine 2 2009 Sutphen (Engine)
 - Ladder 2 2018 Sutphen (100' Platform)

- **Fire Station 3: 1000 Ashland Road**
 - Quint 3 2017 Sutphen (75' straight stick)
 - Squad 3 2015 SVI (Heavy Rescue)
 - Foam 3 2002 Chevrolet Pickup (CAFS truck)

- **Fire Station 4: 2300 Oakland Gravel Road**
 - Quint 4 2015 Sutphen (75' straight stick)

- **Fire Station 5: 1400 Ballenger Lane**
 - Quint 5 2010 Sutphen (75' straight stick)

- **Fire Station 6: 3112 Chapel Hill Road**
 - Quint 6 2013 Sutphen (75' straight stick)

- **Fire Station 7: 400 Green Meadows Circle**
 - Quint 7 2016 Sutphen (75' straight stick)
 - Bus 76 1993 Gillig Phantom (Bus)

- **Fire Station 8: 2301 East Nifong**
 - Quint 8 2013 Sutphen (75' straight stick)
 - Air Truck 2009 Precision (Air and Light)
 - Tech Rescue Trk 2003 Precision (Tech Rescue)

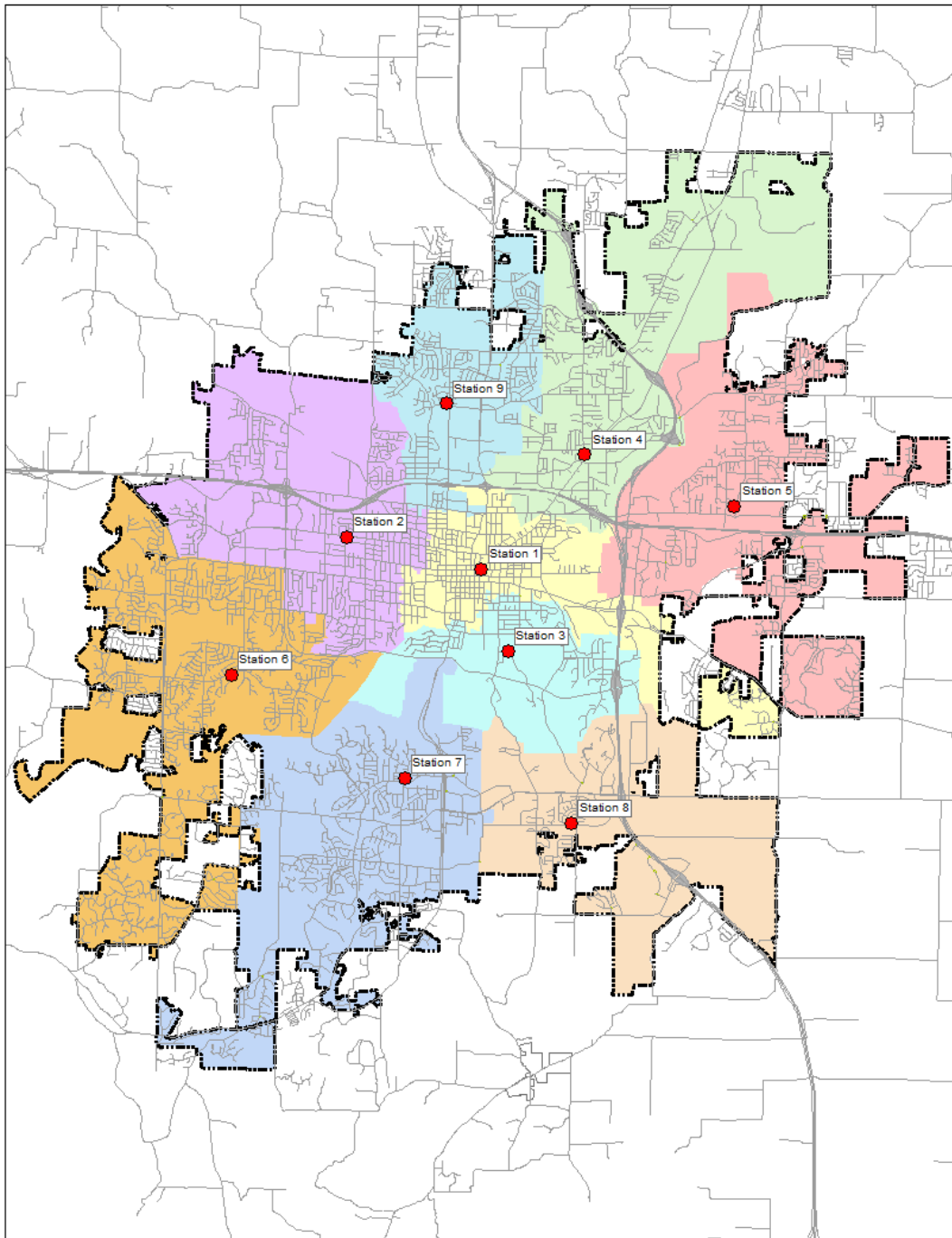
- **Fire Station 9: 201 Blue Ridge Road**
 - Quint 9 2009 Sutphen (75' straight stick)
 - Hazmat Truck 2011 SVI (Hazmat)

2018 Standards of Cover



E: Fire Station Primary Response Areas and Planning Areas

The map below shows the station response areas for the entire city. Over the history of Columbia, planning and evaluation for response has been conducted by each Fire Station's primary response area. The primary station response areas will be utilized in this document to study and assess each area and their differences. They will serve as the planning areas for the city.

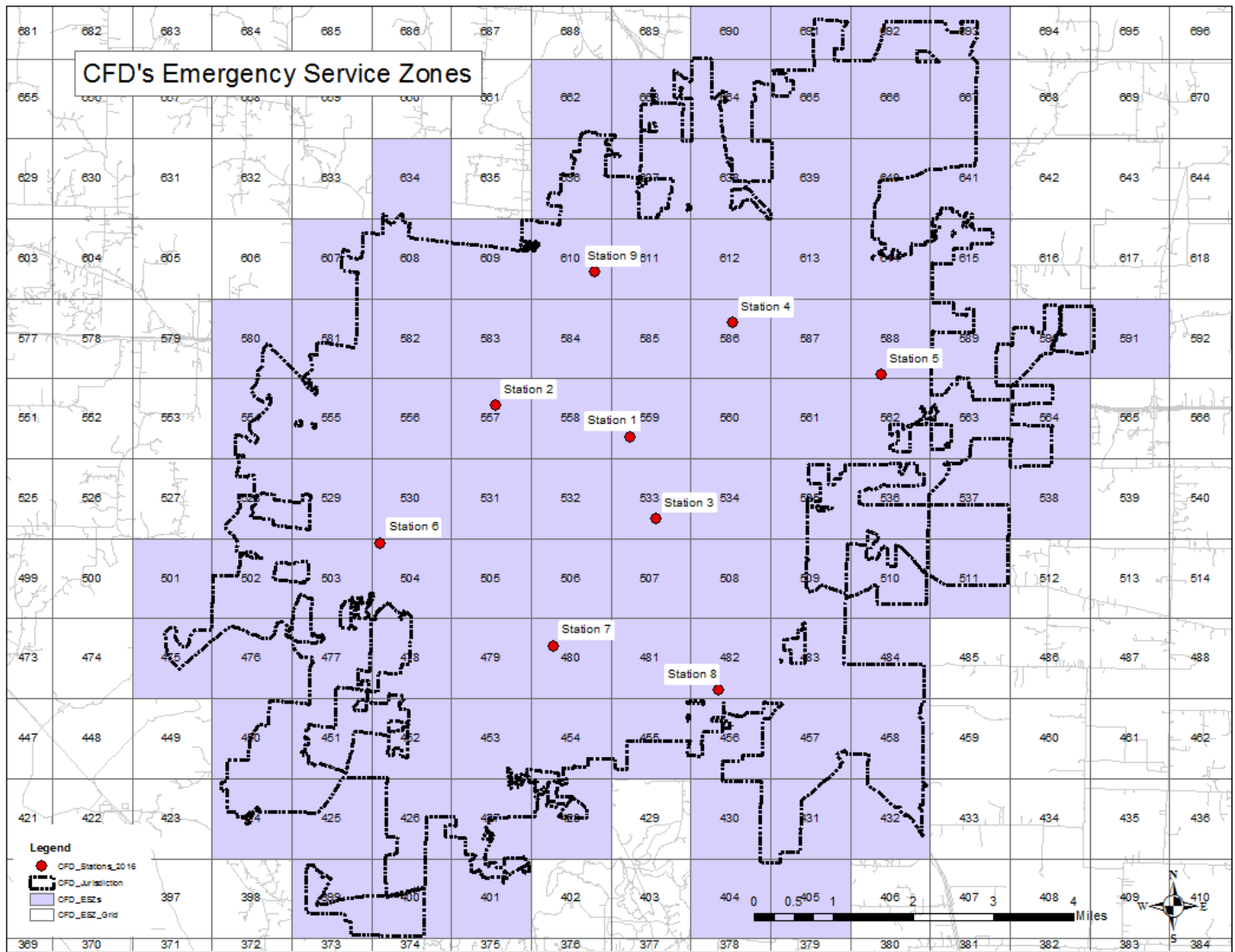


2018 Standards of Cover



Geographical Planning Zones

Although planning areas utilizing existing Fire Station primary response areas are useful, they can sometimes be larger and more irregular than is desired for a closer and more in-depth evaluation. The department has also subdivided the city into one square mile grid segments designated as Geographical Planning Zones (GPZs). These zones will be utilized if a deeper analysis is required.



2018 Standards of Cover



F: Facilities

Fire Station 1 and Fire Administration:

This facility was built in 1997. In 2006, the station had an additional bay added to allow for apparatus placement. It houses Station 1 apparatus as well as Fire Administration and the Fire Marshal's Division. This building also includes a training room.

This station houses Engine 1, Ladder 1, Division Chief, Battalion Chief, Reserve Engine 1, Reserve Ladder 1, Foam Truck, the Utility Truck.



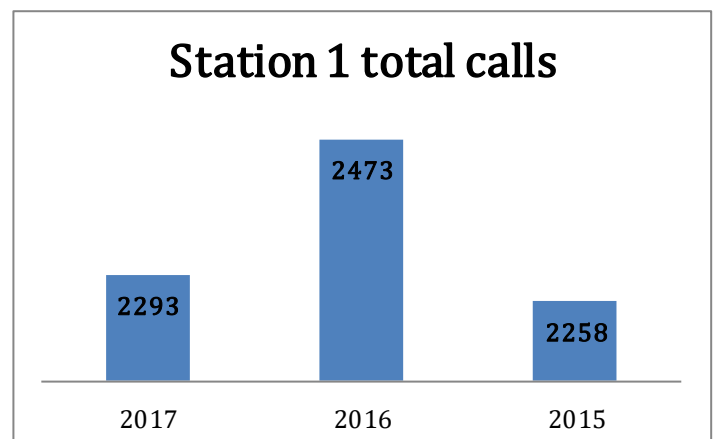
Station 1 daily staffing:

Division Chief (shift commander)	1
Battalion Chief (asst. shift commander)	1
Ladder 1	
Captain	1
Engineer	1
Fire Fighter	1
Engine 1	
Lieutenant	1
Engineer	1
Fire Fighter	1
Minimum daily staff	8

2017 Statistics for Station 1

Percentage of calls: 19.38%
 Fire calls: 81
 EMS calls: 1674
 Tech Rescue calls: 20
 Hazmat calls: 90

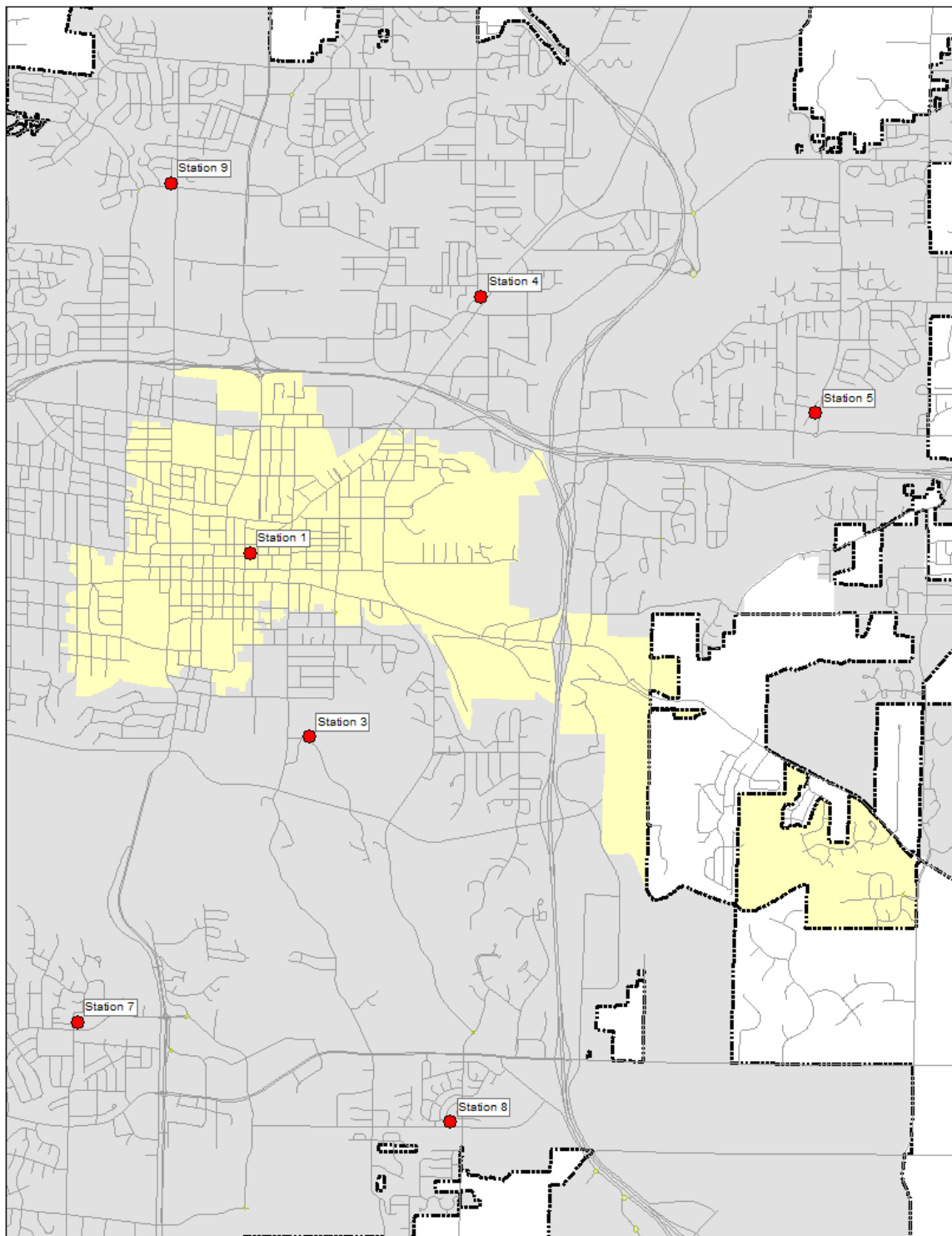
Total Square Miles: 5.31
 Population Density: 2365



2018 Standards of Cover



Fire Station 1 : Primary Response Area



2018 Standards of Cover



Fire Station 2

This facility was built in 1957. In 2006 the station was remodeled to make the apparatus bay's longer and taller to accommodate future apparatus.

This station houses Engine 2 and Ladder 2.



Station 2 daily staffing:

Ladder 2

Captain	1
Engineer	1
Fire Fighter	1

Engine 2

Lieutenant	1
Engineer	1
Fire Fighter	1

Minimum daily staff 6

2017 Statistics for Station 2

Percentage of calls: 15.38%

Fire calls: 114

EMS calls: 1394

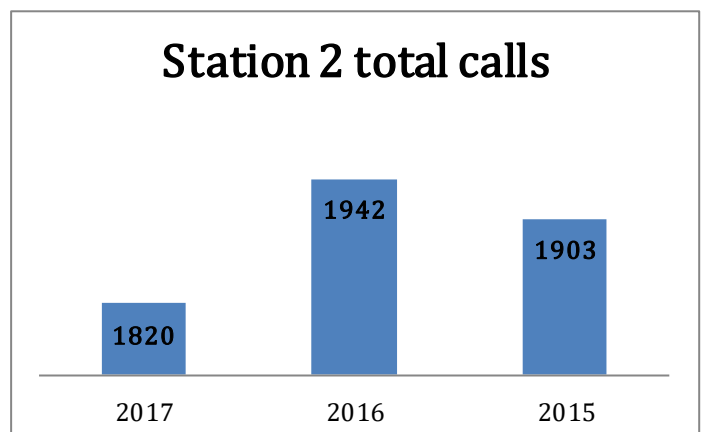
Tech Rescue calls: 14

Hazmat calls: 28

Total Square Miles: 7.89

Population Density: 2147

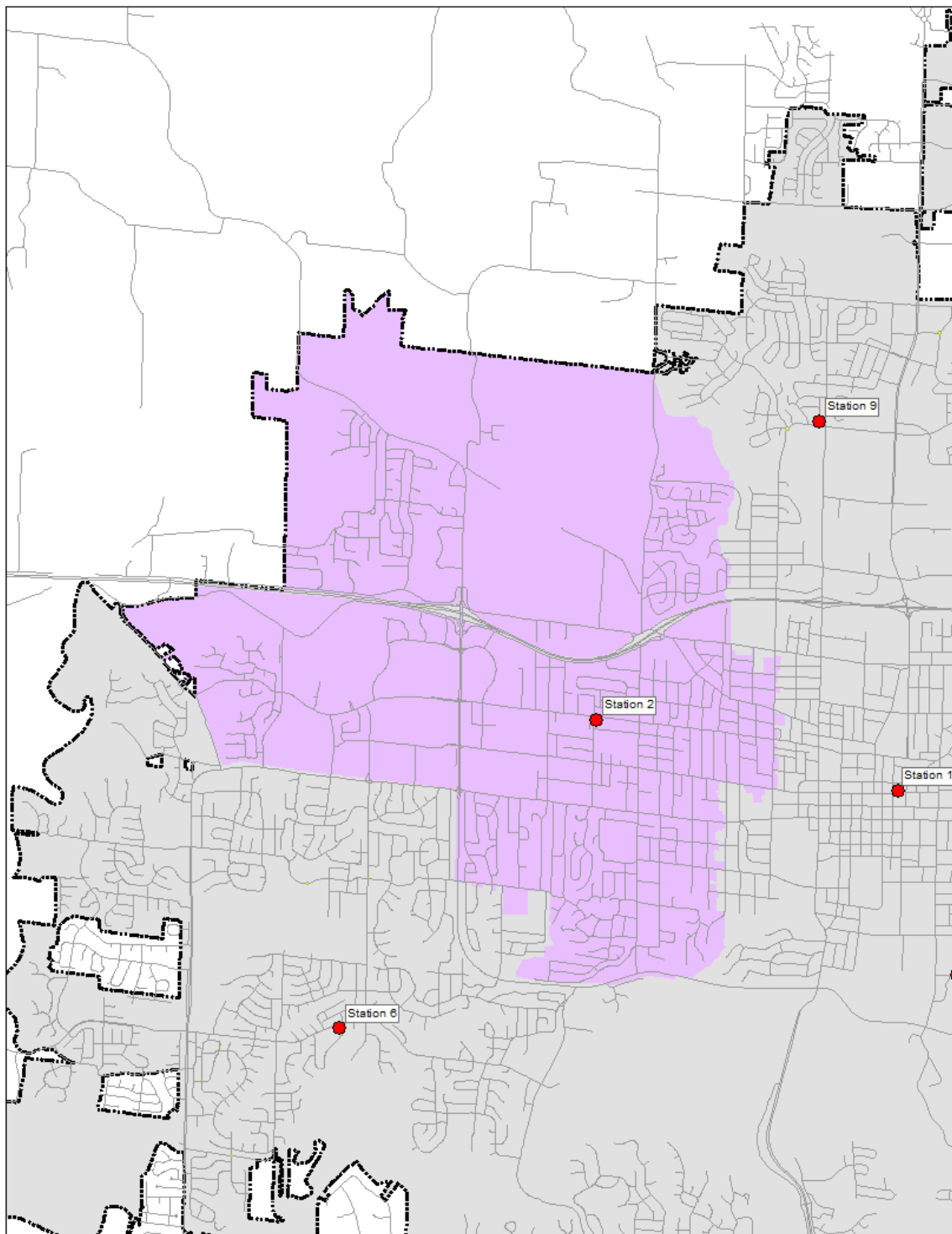
Station 2 total calls



2018 Standards of Cover



Fire Station 2: Primary Response Area



2018 Standards of Cover



Fire Station 3:

This facility is owned and maintained by the University of Missouri. This facility underwent a complete remodel in 2012, which created the pull through design it has today. The Columbia Fire Department provides the equipment and staff to cover the station response area.

This station houses Quint 3, Squad 3, and Foam 3.

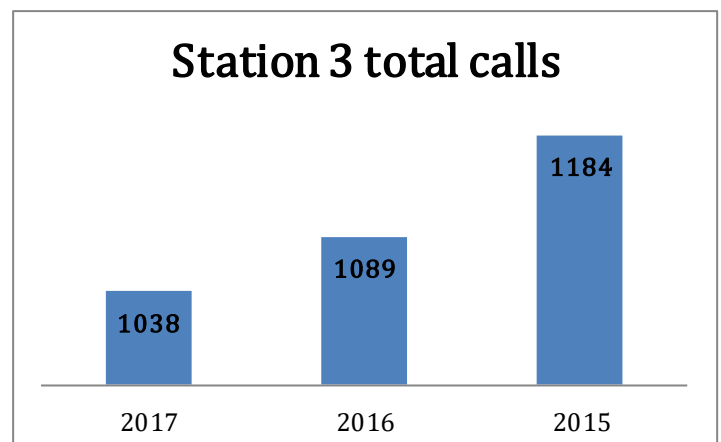


Station 3 daily staffing:

Squad 3		
Captain		1
Engineer		1
Quint 3		
Lieutenant		1
Engineer		1
Fire Fighter		1
Minimum daily staff		5

2017 Statistics for Station 3

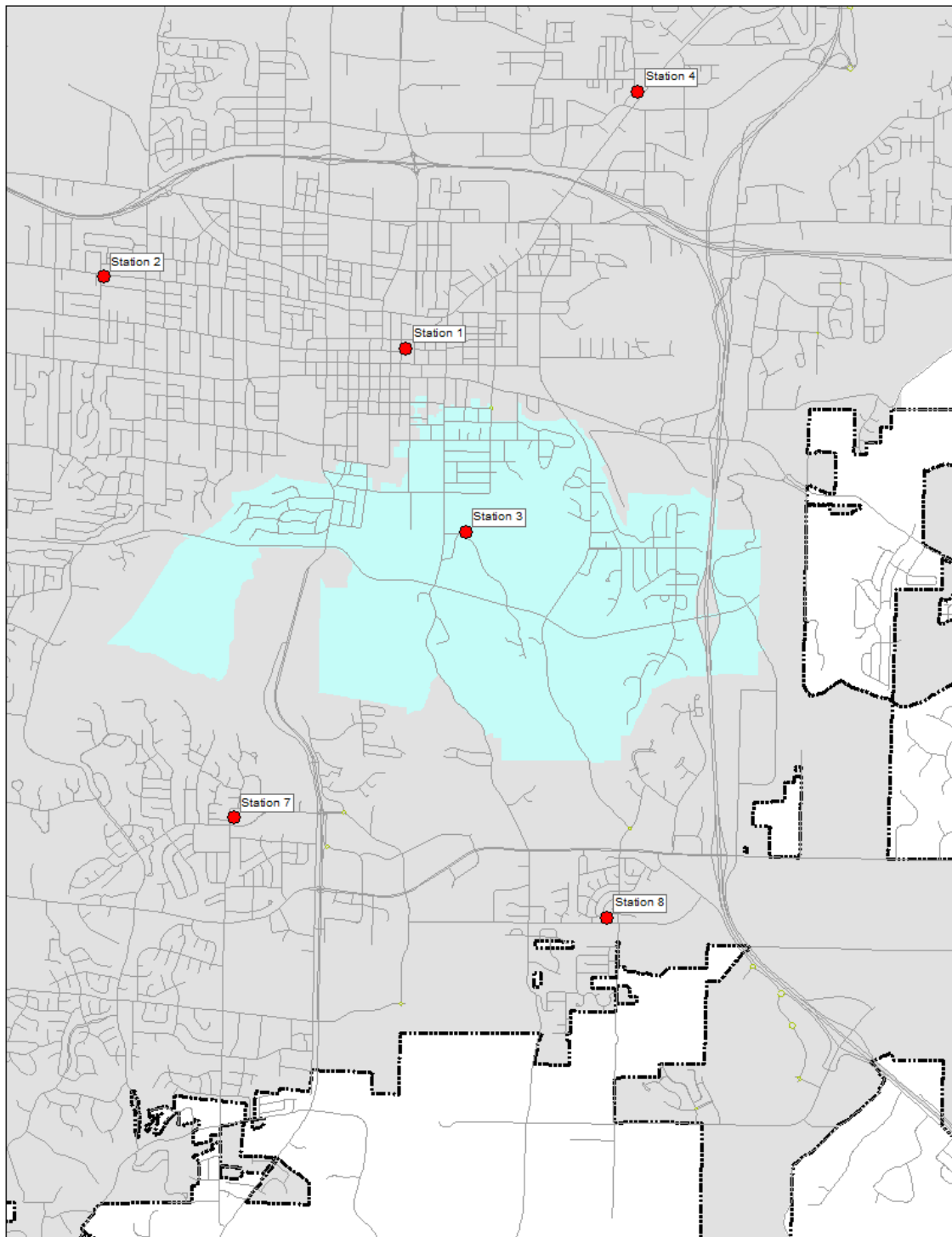
Percentage of calls: 8.77%
 Fire calls: 42
 EMS calls: 639
 Tech Rescue calls: 12
 Hazmat calls: 22
 Total Square Miles: 3.97
 Population Density: 4687



2018 Standards of Cover



Fire Station 3: Primary Response Area



2018 Standards of Cover



Fire Station 4:

This facility was built in 1970. It is scheduled to undergo a remodel in the spring of 2018. This remodel project will update the restroom facilities, the mechanical systems, install a new roof, and add the terminations for a bunker gear extractor.

This station houses Quint 4 and Reserve Squad 4.



Station 4 daily staffing:

Quint 4

Lieutenant	1
Engineer	1
Fire Fighter	1
Minimum daily staff	3

2017 Statistics for Station 4

Percentage of calls: 9.94%

Fire calls: 64

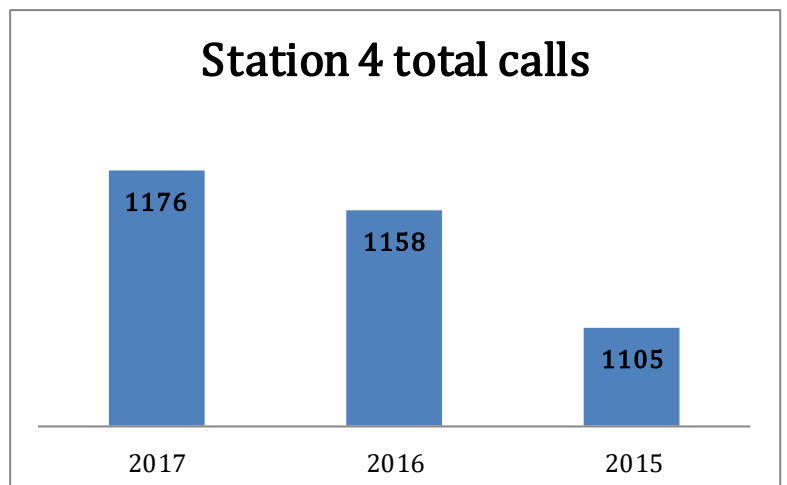
EMS calls: 942

Tech Rescue calls: 36

Hazmat calls: 13

Total Square Miles: 9.30

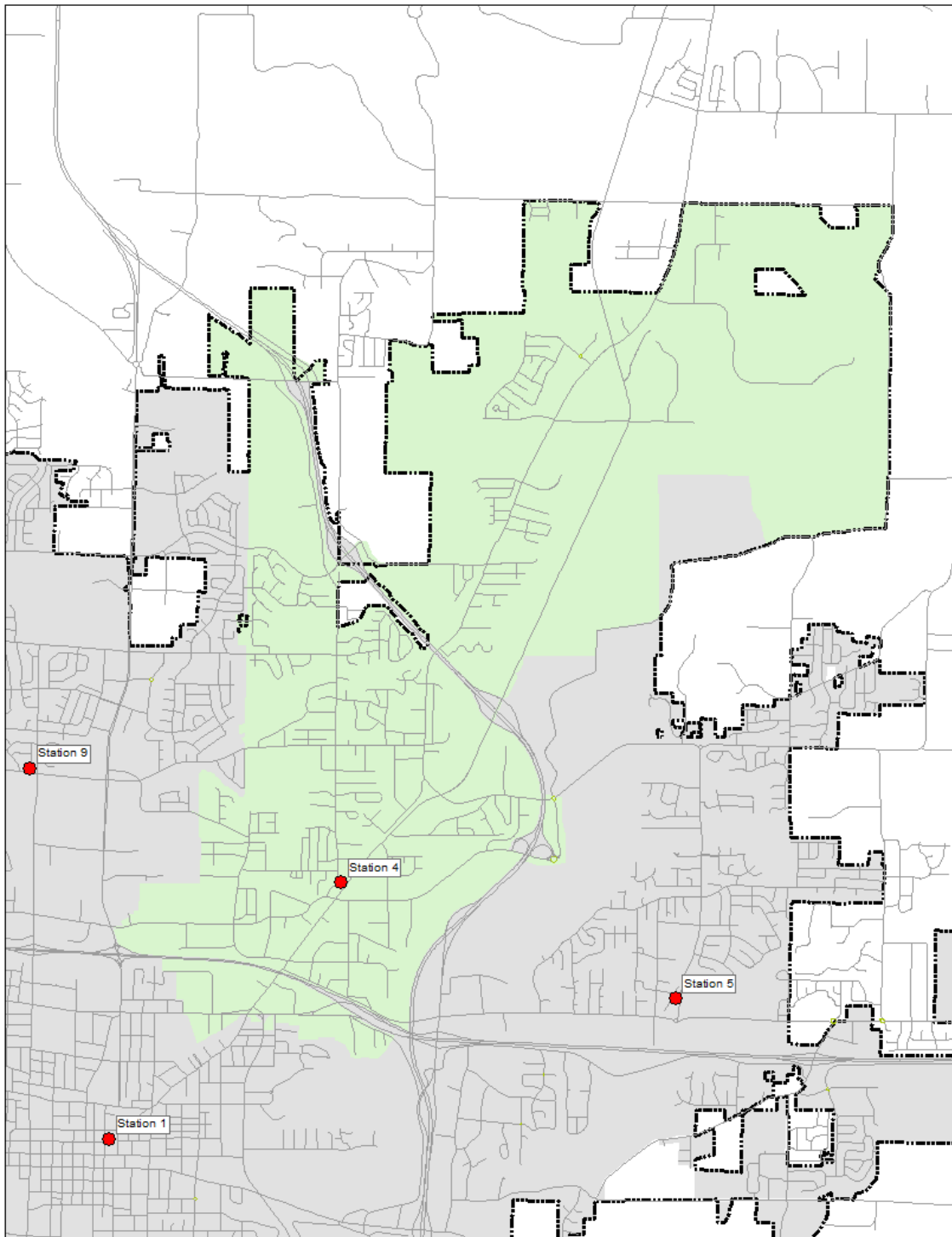
Population Density: 1110



2018 Standards of Cover



Fire Station 4: Primary Response Area



2018 Standards of Cover



Fire Station 5:

This facility was built in 1971. It is scheduled to undergo a remodel in the early summer of 2018. This remodel project will update the restroom facilities, the mechanical systems, install a new roof, and add the terminations for a bunker gear extractor.

This station houses Quint 5 and Reserve Quint 1

Station 5 daily staffing:

Quint 5

Lieutenant	1
Engineer	1
<u>Fire Fighter</u>	<u>1</u>
Minimum daily staff	3



2017 Statistics for Station 5

Percentage of calls: 12.39%

Fire calls: 51

EMS calls: 1139

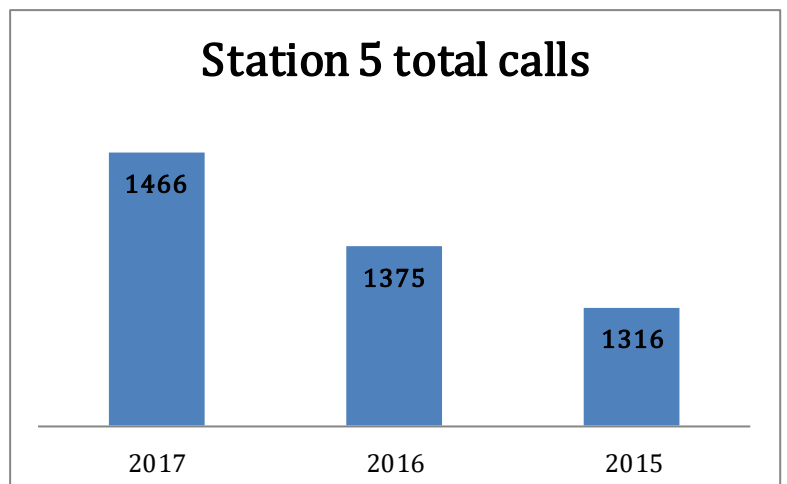
Tech Rescue calls: 80

Hazmat calls: 23

Total Square Miles: 8.30

Population Density: 1457

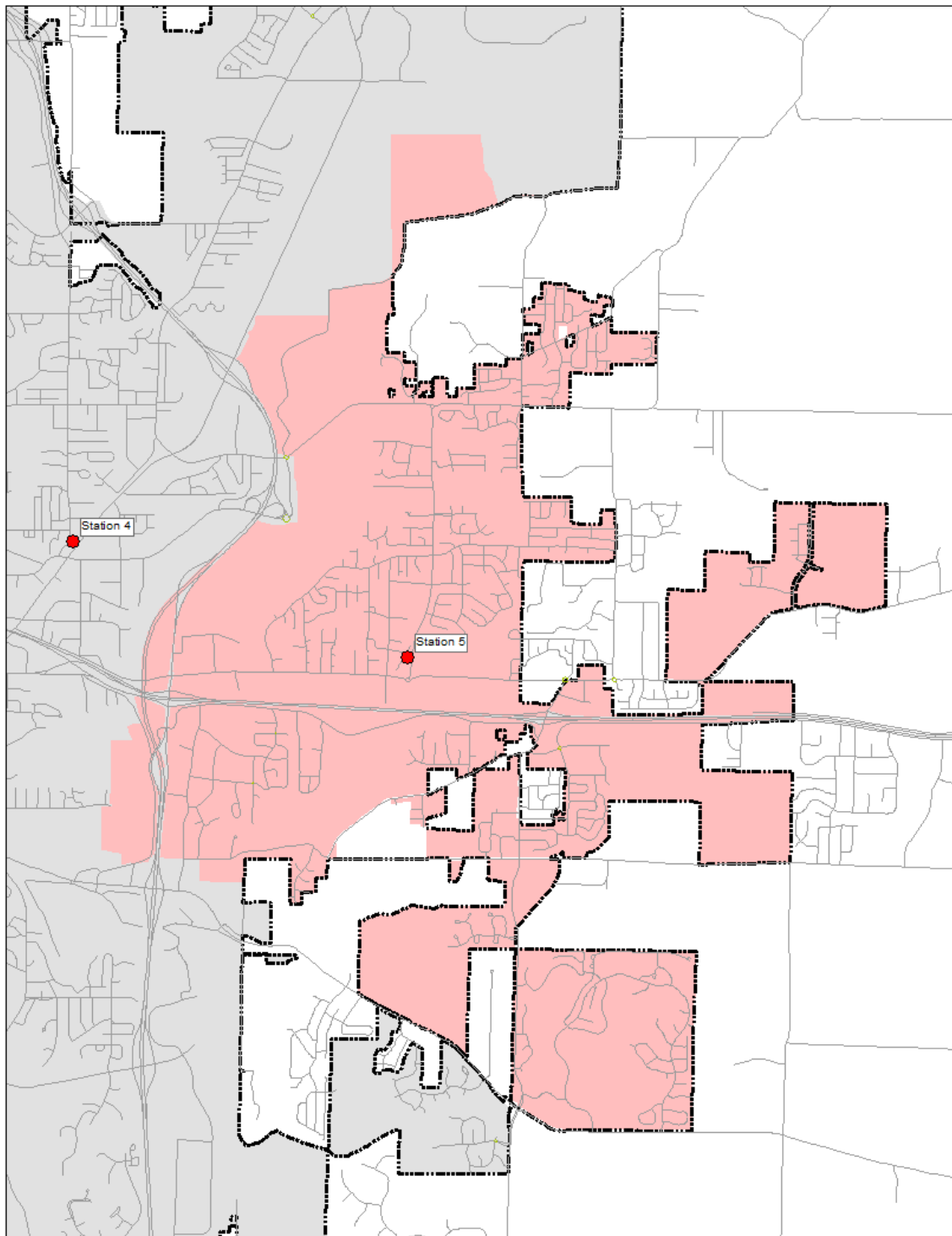
Station 5 total calls



2018 Standards of Cover



Fire Station 5: Primary Response Area



2018 Standards of Cover



Fire Station 6:

This facility was built in 1973. It is scheduled to undergo a remodel in the late summer of 2018. This remodel project will update the restroom facilities, the mechanical systems, install a new roof, and add the terminations for a bunker gear extractor.

This station houses Quint 6 and Reserve Quint 3.



Station 6 daily staffing:

Quint 6

Lieutenant	1
Engineer	1
<u>Fire Fighter</u>	<u>1</u>
Minimum daily staff	3

2017 Statistics for Station 6

Percentage of calls: 7.87%

Fire calls: 38

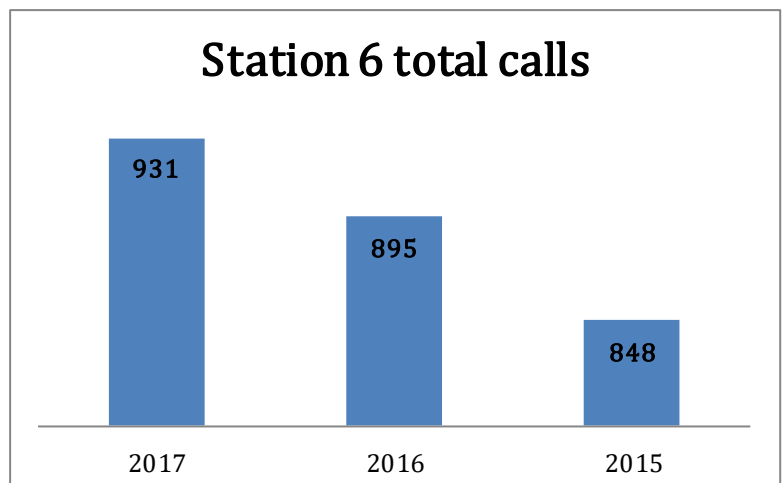
EMS calls: 688

Tech Rescue calls: 12

Hazmat calls: 18

Total Square Miles: 9.88

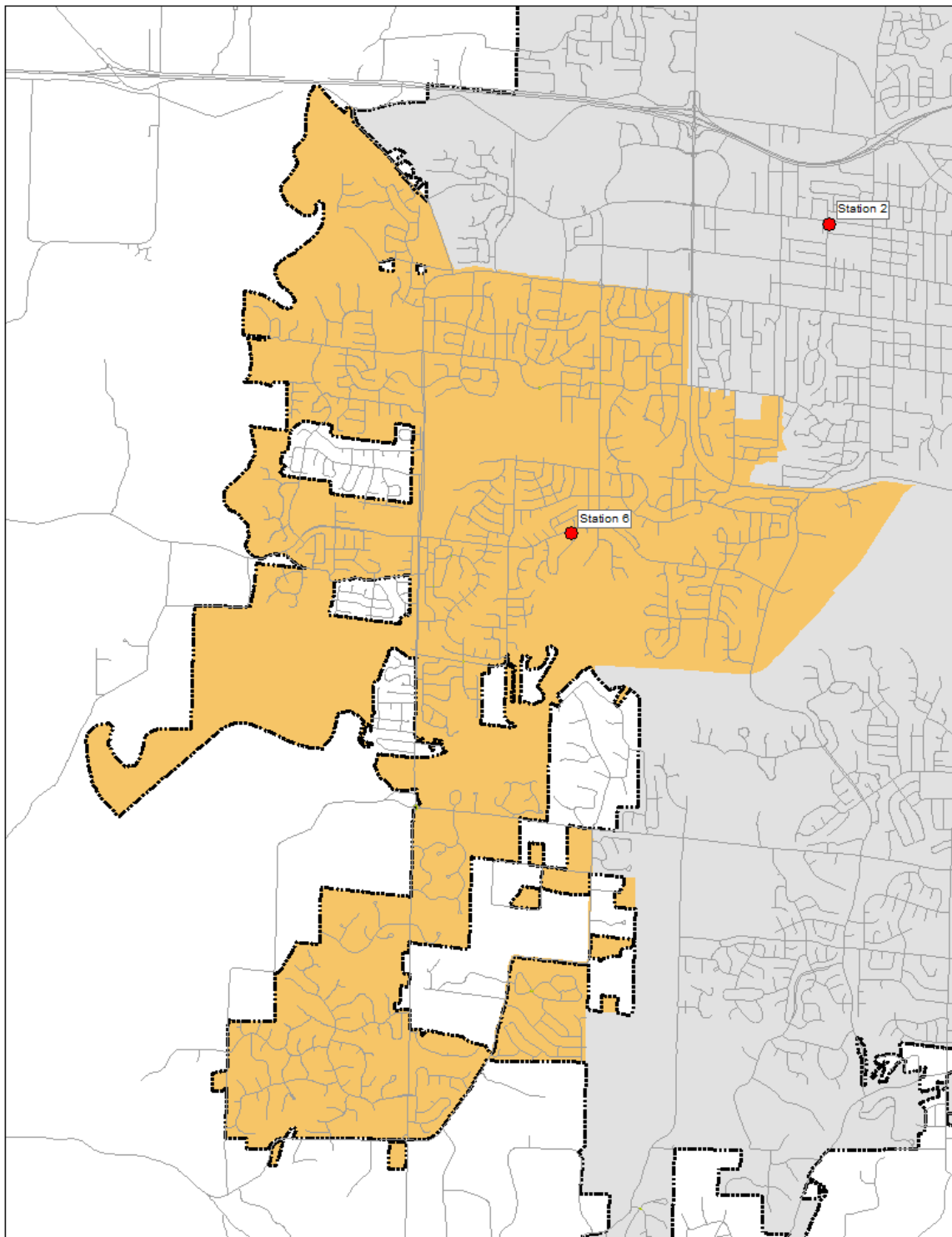
Population Density: 2073



2018 Standards of Cover



Fire Station 6: Primary Response Area



2018 Standards of Cover



Fire Station 7:

This facility was relocated to its current location in 2009. The station was relocated due to its old location's proximity to Station 8 and the need for a major remodel. The decision was made to relocate, which has improved area coverage.

This station houses Quint 7, Bus 76, and a parade truck (1940 Hercules engine).



Station 7 daily staffing:

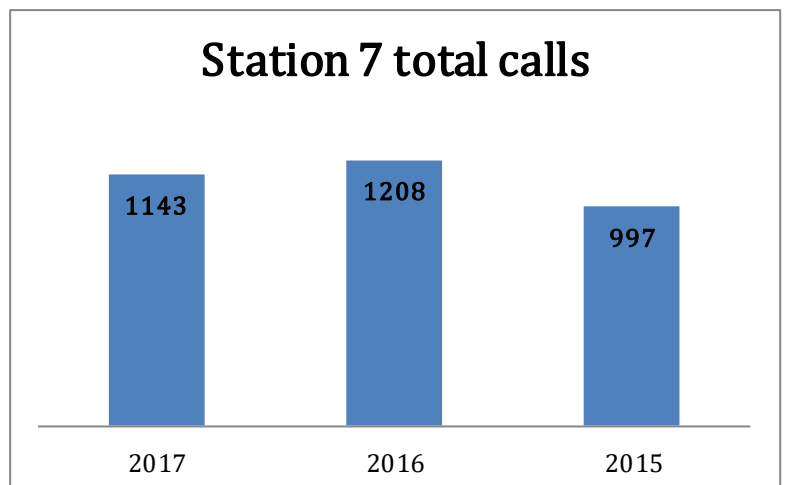
Quint 7

Lieutenant	1
Engineer	1
Fire Fighter	1
Minimum daily staff	3

2017 Statistics for Station 7

Percentage of calls: 9.66%
 Fire calls: 36
 EMS calls: 741
 Tech Rescue calls: 21
 Hazmat calls: 27

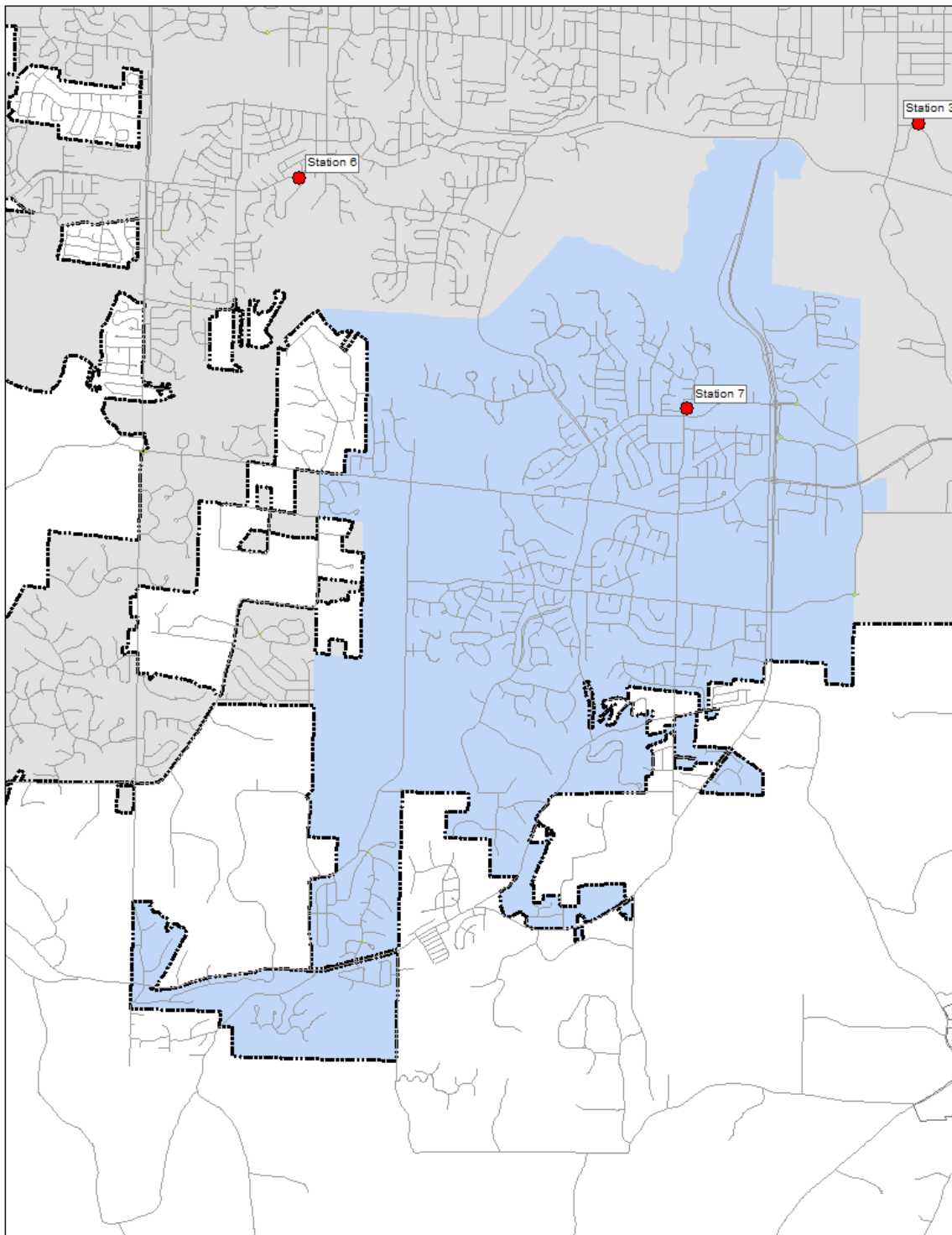
Total Square Miles: 9.29
 Population Density: 1776



2018 Standards of Cover



Fire Station 7: Primary Response Area



2018 Standards of Cover



Fire Station 8:

This facility was added in 2001. Due to the growth of the city, this station was added to increase coverage in the southern portion of the city.

This station houses Quint 8, Air Truck, and the Tech Rescue Truck.

Station 8 daily staffing:

Quint 8

Lieutenant	1
Engineer	1
Fire Fighter	1
Minimum daily staff	3



2017 Statistics for Station 8

Percentage of calls: 6.83%

Fire calls: 41

EMS calls: 584

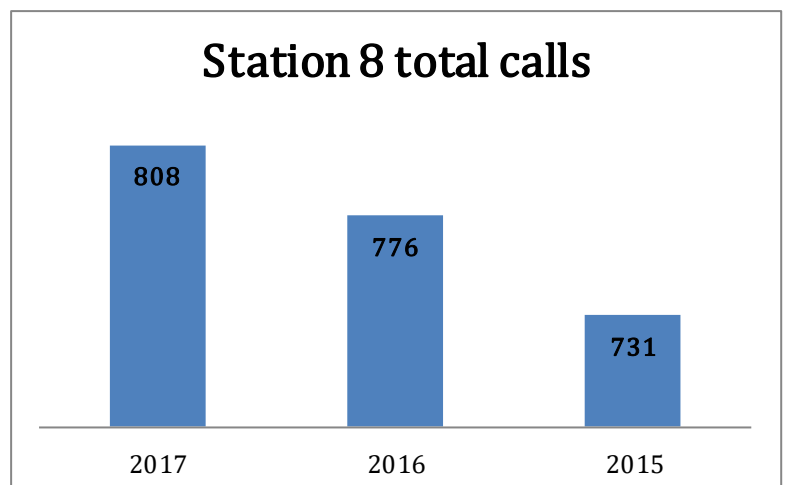
Tech Rescue calls: 0

Hazmat calls: 15

Total Square Miles: 7.29

Population Density: 971

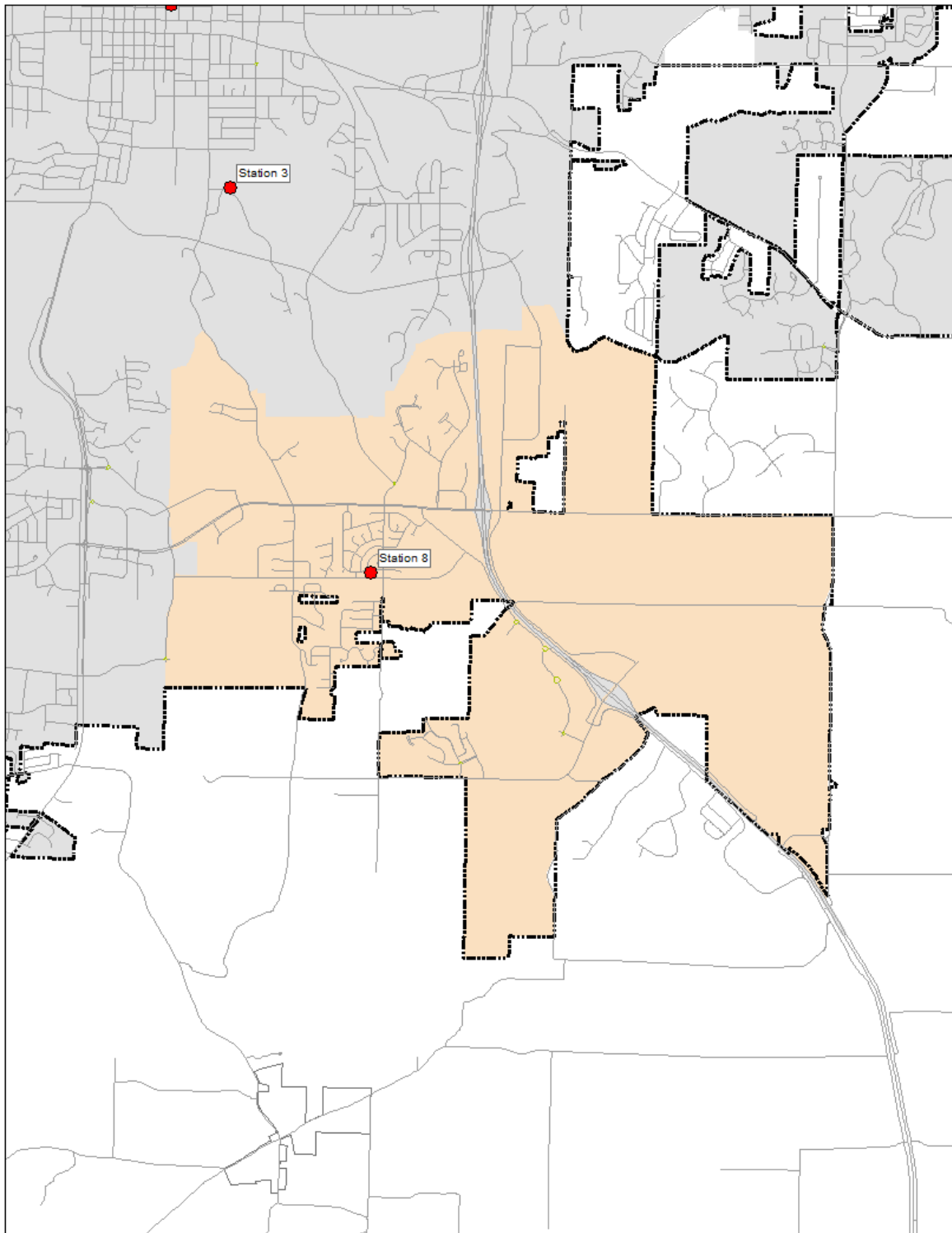
Station 8 total calls



2018 Standards of Cover



Fire Station 8: Primary Response Area



2018 Standards of Cover



Fire Station 9:

This facility was added in 2010. Due to the growth of the city, this station was added to increase coverage in the north central portion of the city.

This station houses Quint 9 and the Hazmat truck.

Station 9 daily staffing:

Quint 9

Lieutenant	1
Engineer	1
Fire Fighter	1

Minimum daily staff 3



2017 Statistics for Station 9

Percentage of calls: 9.79%

Fire calls: 56

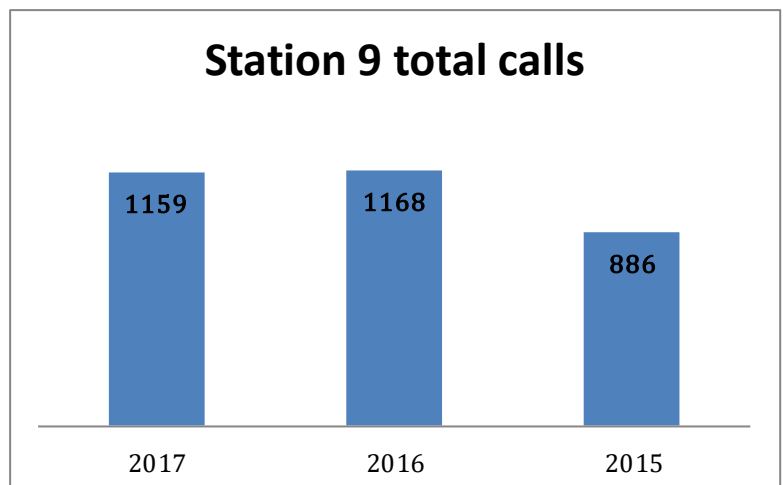
EMS calls: 917

Tech Rescue calls: 36

Hazmat calls: 20

Total Square Miles: 4.43

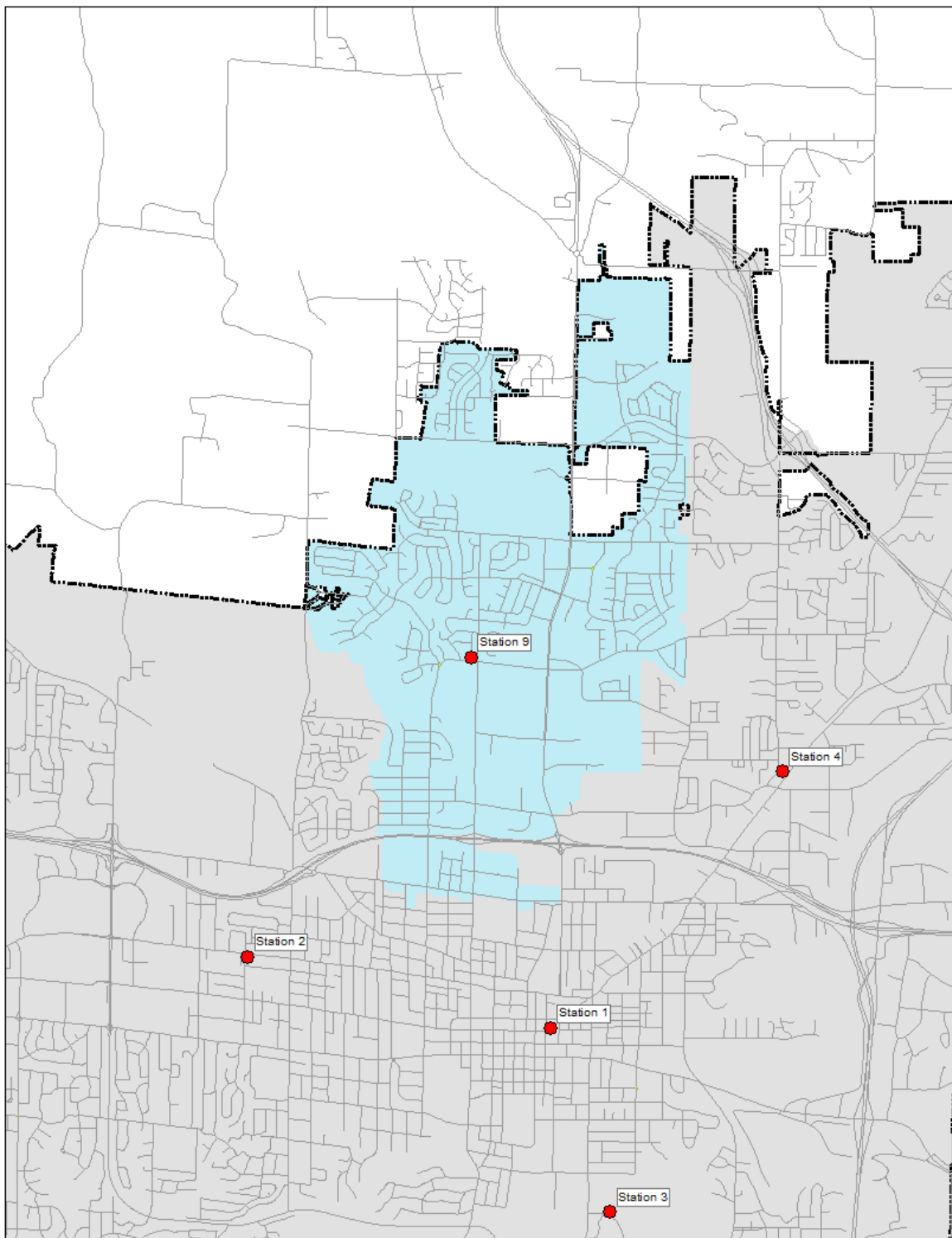
Population Density: 1652



2018 Standards of Cover



Fire Station 9: Primary Response Area



2018 Standards of Cover



G: Risk Assessment

All Hazard Risk Assessment

CFD utilizes a three axis risk analysis tool. In this analysis, consideration is given to each of these three elements: probability, consequence, and impact.

Probability is the frequency or number of times an incident of this nature takes place in a given period of time.

Consequence is the effect an incident would have on the citizens and/or the community. This is based on the number of citizens impacted.

Impact is the effect an incident would have on the fire department. This is based on the number of units that would be impacted.

Utilizing the department's records management system (RMS), incident data was pulled by NFIRS code for each call in 2015, 2016, and 2017. This information was placed in a spreadsheet and the probability was calculated for each code. Based on the number of calls which occurred in that period of time, a numerical value was calculated for each NFIRS code. The probability scale below was utilized to determine what value would be used when determining the overall risk score.

Probability
2=Quarterly/Yearly
4=Monthly
6=Weekly
8=Daily

2018 Standards of Cover



Based on the NFIRS code, department command staff analyzed each code to determine the effect of an incident on the citizens and community. There was then a numerical value given for each NFIRS code.

Consequence
2=Individual/Business
4=Multiple People/ Businesses
6=Multiple People/ Businesses/Financial Impact
8=City/Community/Region

Finally the impact was determined by the number of personnel required to complete the critical tasks for a given NFIRS code.

Impact
2=Three or Less
4=Four to Seven
6=Eight to Fourteen
8=Fifteen Plus

2018 Standards of Cover



Based on the application of Heron's formula, a numerical risk value is calculated. Using this numerical value, a risk level was assigned; Low, Moderate, High, Special.

$$\sqrt{((PC)^2/2) + ((CI)^2/2) + ((IP)^2/2)}$$

Risk Category
Fire
Hazardous Material
Technical Rescue

Risk Classification
Low= 0 -12.33
Moderate= 12.34 - 19.80
High= 19.81 - 47.99

Risk Category
EMS

Risk Classification
Low= 0 -16.25
Moderate= 16.26 - 19.80
High= 19.81 - 47.99

2018 Standards of Cover

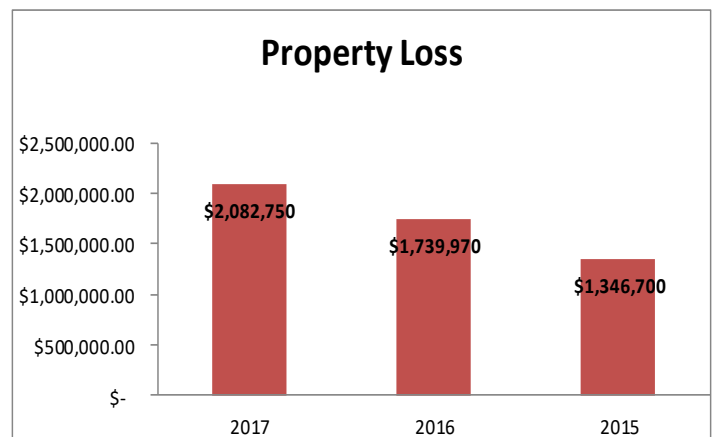
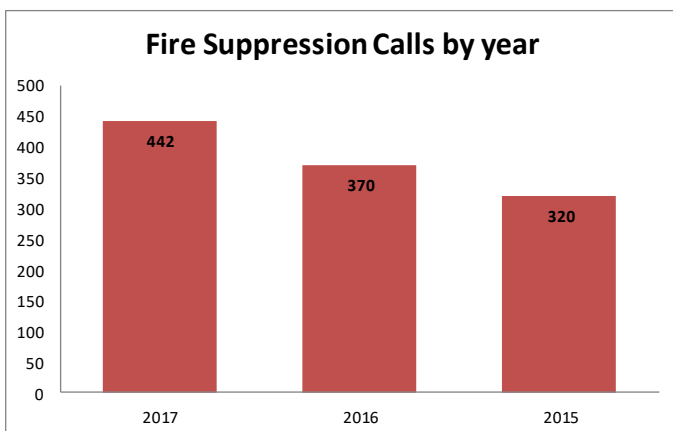


Fire Suppression

The City of Columbia is a continually growing city. The analysis of the fire call data revealed fire calls make up 3.2% of all calls the department runs. Further analysis indicates that building fires make up 16% of all fire calls and 1.0% of all calls. The City of Columbia has taken a very proactive approach to fire code adoption. The city has adopted the latest code version as soon as reasonable after it is released. Generally, it has been adopted approximately one year later. Through this approach, the number of fire incidents in a building have remained very low.

During the analysis it was discovered that only the value loss was being captured accurately, the overall value of the property was very inaccurately captured. Due to this short coming, steps have been taken to capture this data for outcome tracking abilities. During the report writing, the investigating assistant fire marshal is entering the appraised value of the property into the records management system (RMS). This will allow tracking of property saved. This data is also being analyzed on a monthly basis.

Below is a chart of all the fire suppression responses and the property loss for the past three years.

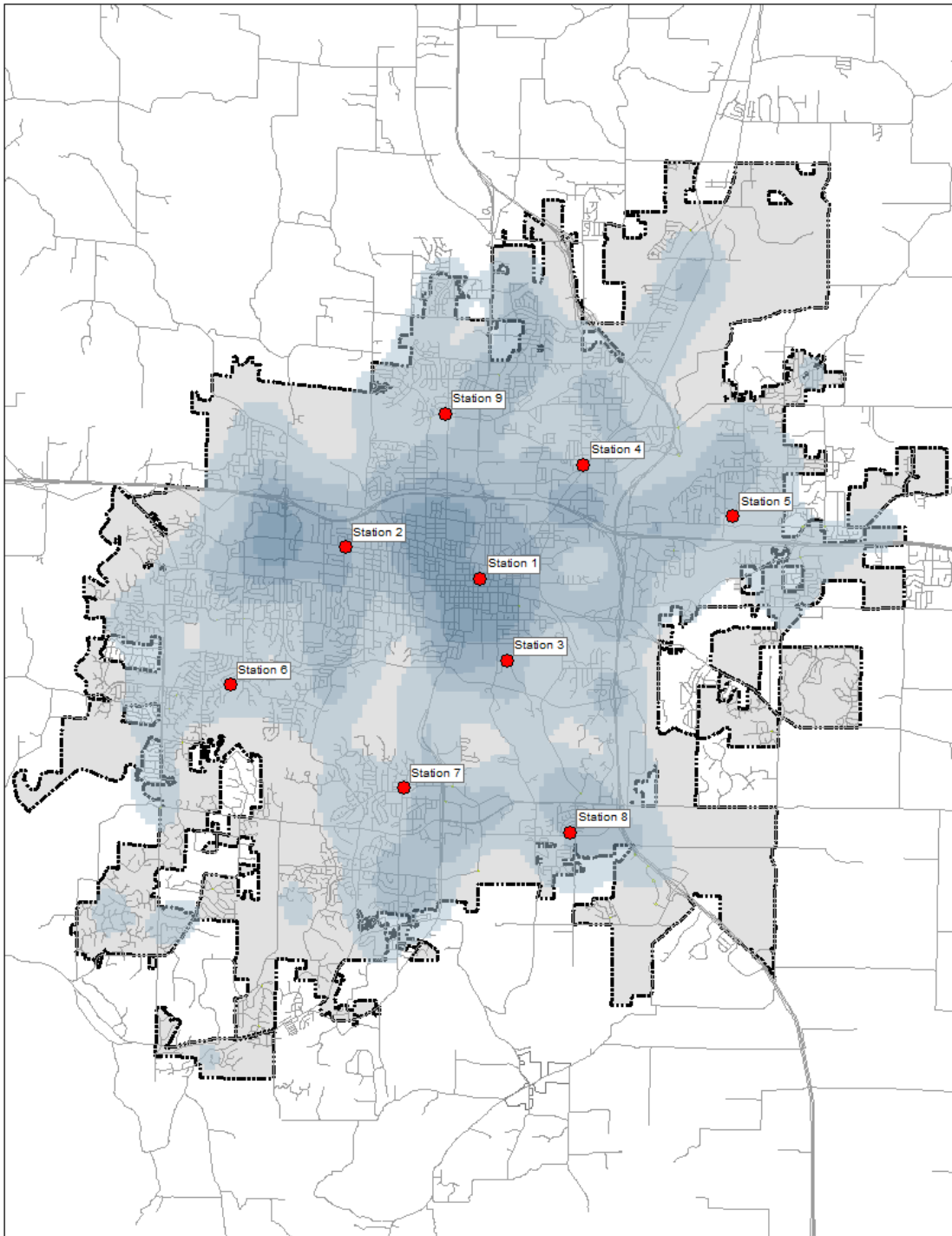


During the departments data analysis, it was determined there were no moderate or special risk categories at this time. Continual analysis of responses and community needs could change this in the future.

2018 Standards of Cover



Fire Incident Heat Map 2015 - 2017



2018 Standards of Cover



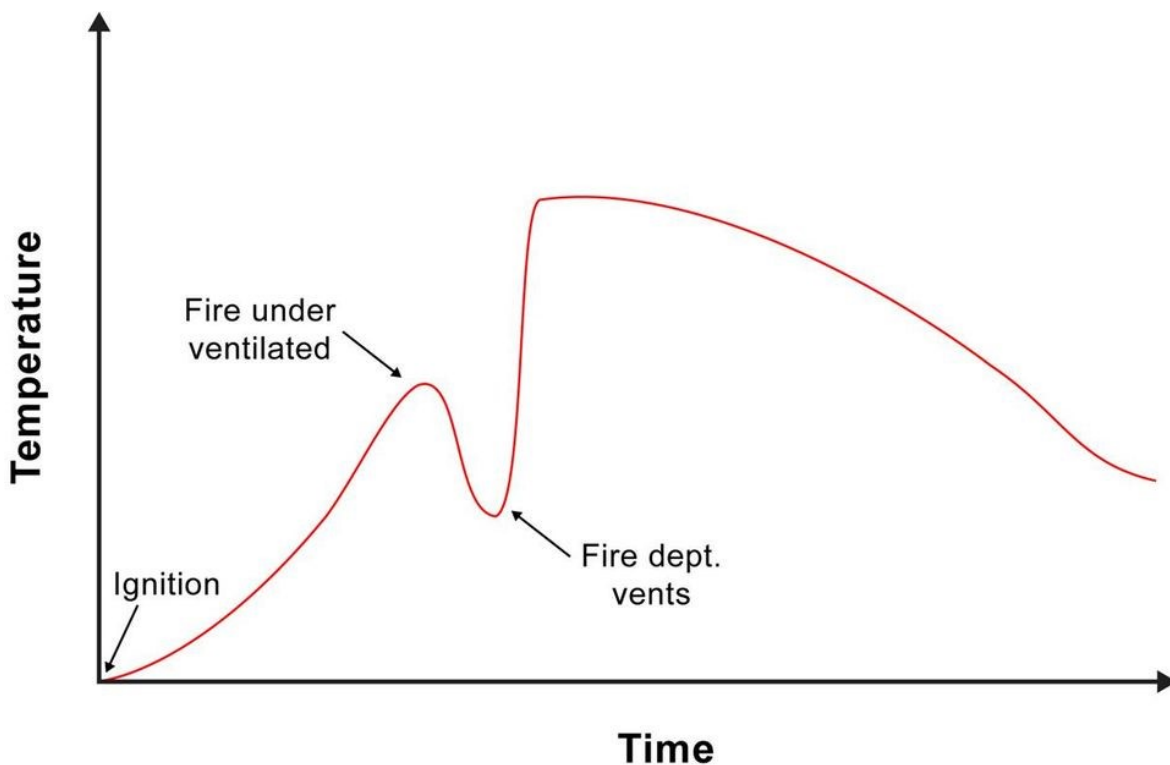
Stages of a Fire:

Incipient – This first stage begins when heat, oxygen and a fuel source combine creating a chemical reaction resulting in fire. This is also known as “ignition” and is usually represented by a very small fire. Recognizing a fire in this stage provides the best chance at suppression or escape.

Growth – The *growth stage* is where the building’s fire load and oxygen are used as fuel for the fire. There are numerous factors affecting the growth stage including where the fire started, what combustibles are near it, and ceiling height . It is during this shortest of the 4 stages when a deadly “flashover” may occur.

Fully Developed – When the growth stage has reached its max and all combustible materials have been ignited, a fire is considered *fully developed*. This is the hottest phase of a fire .

Decay – Usually the longest stage of a fire, the *decay stage* is characterized by a significant decrease in oxygen or fuel, putting an end to the fire.



This graph from National Institute of Standards and Technology

2018 Standards of Cover



Critical Tasking

Based on historical data, national testing and local needs, the department command staff determined the critical tasking for each risk classification and risk category. Below are the scales used for each risk category.

Low Risk Fire Suppression - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Transformer fire
- Outside fire
- Trash/Rubbish/Dumpster fire
- Vehicle fire

Risk Classification
Low= 0 -12.33

This includes the following NFIRS codes: 100, 118, 130, 131, 132, 133, 134, 135, 136, 138, 140, 141, 142, 143, 151, 153, 154, 155, 160, 161, 162, 163, 164, 170, 171, 172, 173.

Low Risk Fire Suppression		
Task (s)	Personnel	Unit Support
IC/Safety	1	1st Arriving Co.
Water supply/pump	1	1st Arriving Co.
Fire Attack	1	1st Arriving Co.
Total ERF	3	

The incident types included for this risk category can be handled by a single company response of the closest Engine, Quint, or Ladder. If upon arrival the incident has escalated or the situation dictates, the company officer has the ability to request additional resources.

2018 Standards of Cover



High Risk Fire Suppression - Based on the department's risk assessment it was determined that the following incident types meet this category.

- Structure fire
- Visible Smoke inside a structure
- Hospital, nursing home, school fire
- Chimney fire

Risk Classification
High = 19.81—47.99

The NFIRS codes for High Risk include: 111, 112, 113, 114 115, 116, 117, 120, 121, 122, 123.

High Risk Fire Suppression		
Task (s)	Personnel	Unit Support
IC	1	1st Arriving Chief
Pump/Aerial Operator	1	1st Arriving Co.
Fire Attack	3	2nd Arriving Co.
Search and Rescue	2	3rd Arriving Co.
RIC	3	4th Arriving Co.
Ventilation	2	1st and 2nd Arriving Co.
Back up line	2	5th Arriving Co.
Water supply	1	1st Arriving Co.
Safety	1	2nd Arriving Chief
Total ERF	16	

The incident types included for these risk categories are currently handled by a full box assignment. This includes the closest three Engines/Quints, one Ladder, one Squad, and two Chief Officers. An incident of this type poses a greater threat to life safety. If upon arrival the incident has escalated, deescalated, or the situation dictates, the incident commander has the ability to request or return resources.

2018 Standards of Cover

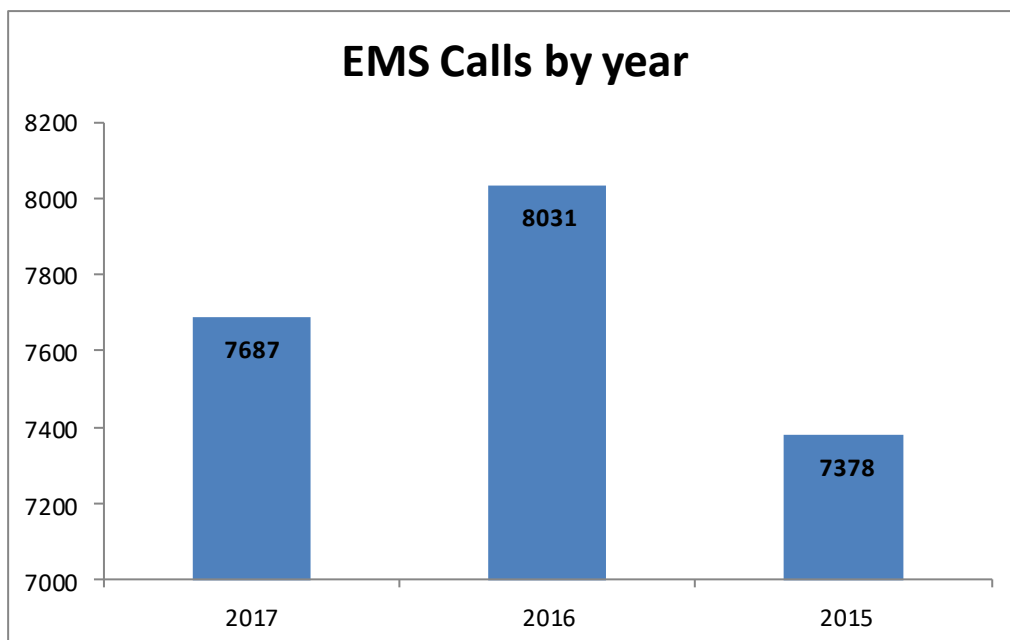


Emergency Medical Services (EMS)

EMS risks are dramatically different than those of fire suppression. Generally, this risk involves a very limited number of people and doesn't present a great impact on the community. The analysis of the EMS call data shows that EMS calls account for 63.8% of all calls in the past three years. Further analysis show that medical calls make up 85.7% and injury accidents make up 4.3% of all call types in the EMS risk category.

The Columbia Fire Department responds to all EMS calls within its jurisdictional boundaries. Each member of the department is trained to a minimum of Emergency Medical Technician - Basic. All apparatus are outfitted with an AED and a complete medical kit. Early intervention is the key for good patient outcomes. Upon arrival, the department initiates BLS medical care and interventions until a ALS transport agency arrives and assumes patient care. Columbia Fire personnel continue to assist until such time the medic unit personnel no longer need assistance.

Below is a chart of all the EMS responses for the past three years.

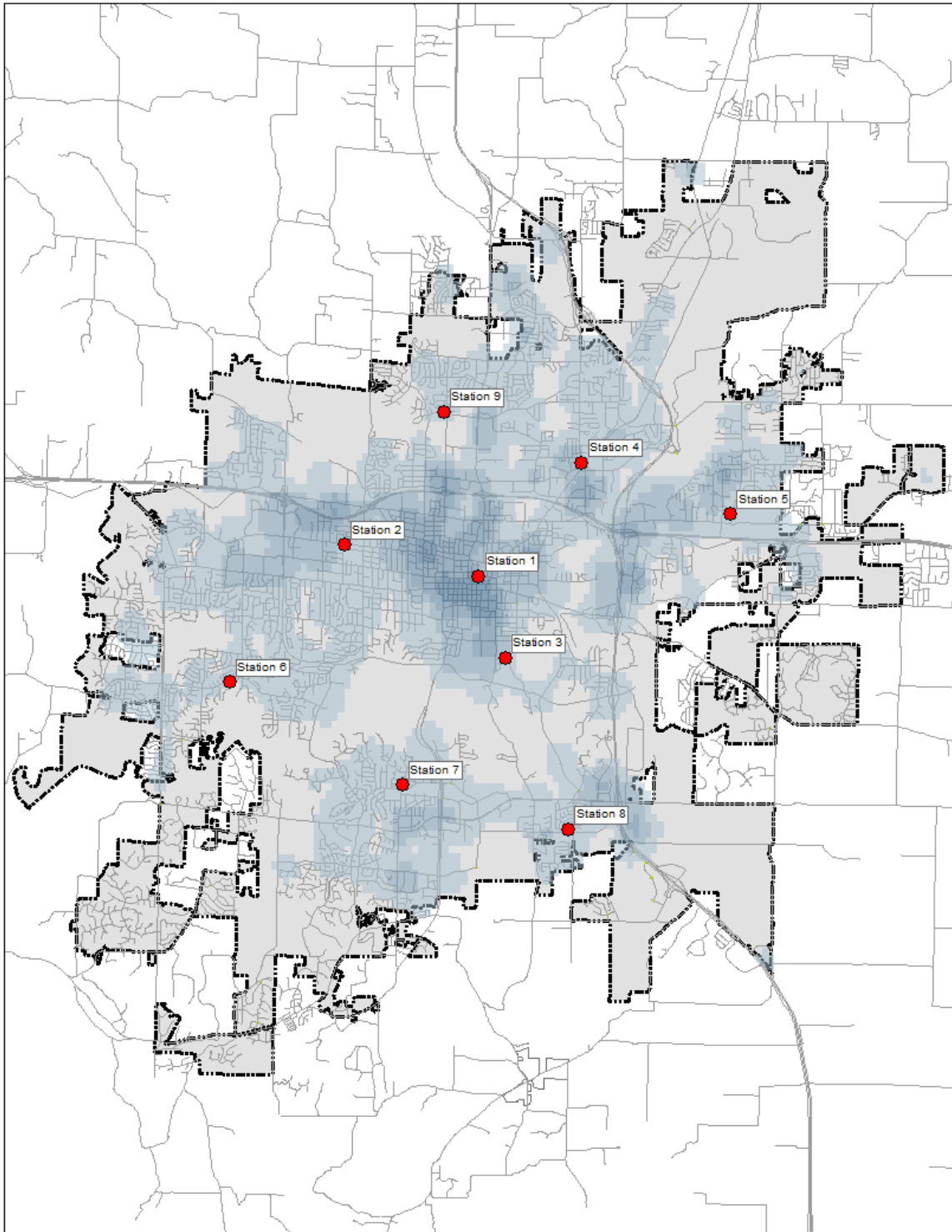


During the departments data analysis, it was determined there were no moderate or special risk categories at this time. Continual analysis of responses and community needs could change this in the future.

2018 Standards of Cover



Emergency Medical Services Heat Map 2015 - 2017



2018 Standards of Cover



Low Risk EMS - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Medical emergency
- Medical assists

Risk Classification
Low= 0 -16.25

This includes the following NFIRS codes: 300, 311, 320, 321, 324, 331, 340, 341, 381.

Low Risk EMS		
Task (s)	Personnel	Unit Support
IC/Safety	1	1st Arriving Co.
Patient care	1	1st Arriving Co.
Total ERF	2	

The incident types included for this risk category can be handled by a single company response of the closest Engine, Quint, Squad, or Ladder. If upon arrival the incident has escalated or the situation dictates, the company officer has the ability to request additional resources.

2018 Standards of Cover



High Risk EMS - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Vehicle accident w/injuries
- Vehicle accident involving a pedestrian

Risk Classification
High = 19.81 - 47.99

This includes the following NFIRS codes: 322, 323.

High Risk EMS		
Task (s)	Personnel	Unit Support
IC/Safety	1	1st Arriving Co.
Patient care	3	1st and 2nd Arriving Co.
Hazard mitigation	1	1st Arriving Co.
Total ERF	5	

The incident types included for these risk categories are currently handled with a multi-company response. This includes the closest two companies in any combination; Engines/Quints, Ladder, or Squad. An incident of this type is potentially more complex and requires additional resources over low risk EMS. If upon arrival the incident has escalated, deescalated, or the situation dictates, the incident commander has the ability to request or return resources.

2018 Standards of Cover

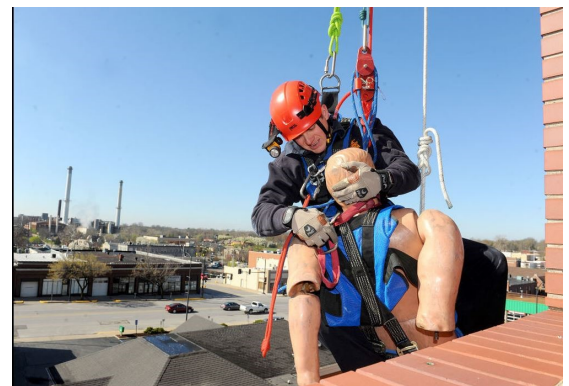
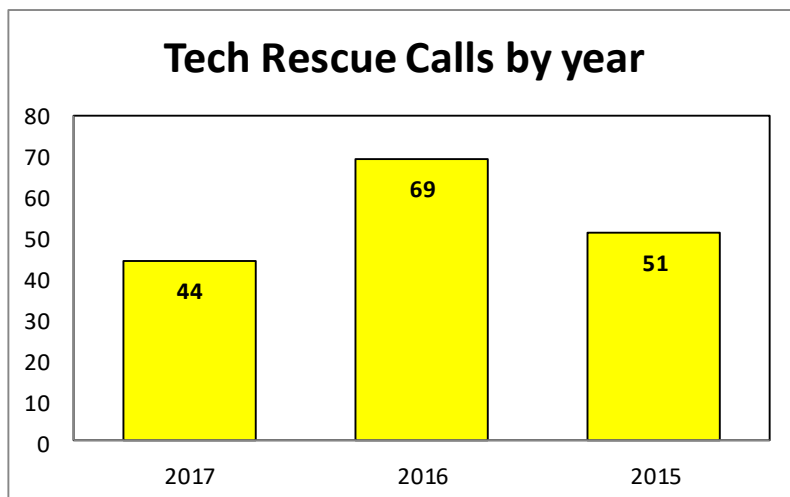


Technical Rescue

The analysis of the technical rescue call data revealed technical rescue calls make up 0.46% of all calls the department runs. While the number of incidents of this nature are low, the department is continually working to be prepared for them. This program includes vehicle extrications, which make up 32% of the technical rescue calls in the past three years and elevator rescue calls which make up 45% of the calls. The potential for this type of incident occurring is high due to the crossroads of two major roadways. Interstate 70 and U.S. Hwy 63 cross inside the city limits.

The department does have the equipment and personnel to handle all forms of technical rescues. Continual training and situational awareness have proven valuable in preparation of an incident. The department has a dedicated rescue team, who specialize in technical rescue and have the required training for the more detailed rescue calls. Team members train at a minimum of quarterly and incorporate all department members at two training sessions annually.

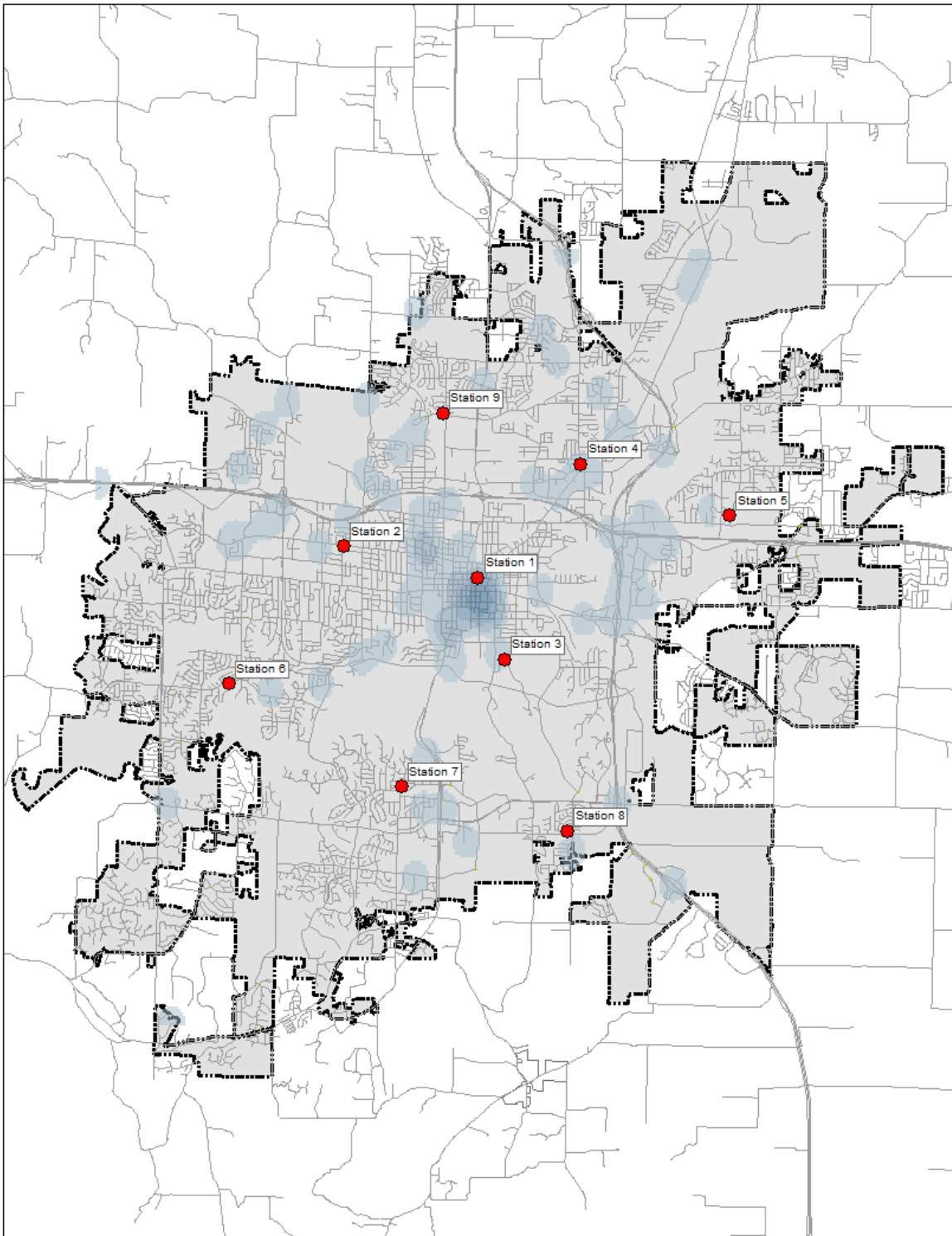
Below is a chart of all the technical rescue responses for the past three years.



Technical rescue team training, on high angle rescue

During data analysis the department determined that there were no special risk classification responses in the time period. Continual analysis of responses and community needs could change this in the future.

2018 Standards of Cover



2018 Standards of Cover



Low Risk Technical Rescue - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Elevator entrapment

Risk Classification
Low= 0 -12.33

This includes the following NFIRS codes: 342, 343, 350, 353, 361, 364, 365, 370, 371, 372.

Low Risk Technical Rescue		
Task (s)	Personnel	Unit Support
IC/Safety	1	1st Arriving Co.
Technical Rescue	1	1st Arriving Co.
Total ERF	2	

The incident types included for this risk category can be handled by a single company response of the closest Engine, Quint, Squad, or Ladder. If upon arrival the incident has escalated or the situation dictates, the company officer has the ability to request additional resources.

2018 Standards of Cover



Moderate Risk Technical Rescue - Based on the department’s risk assessment it was determined that the following incident types meet this category:

- Extrication accidents
- Water rescue
- Ice rescue
- Low angle rescue

Risk Classification
Moderate = 12.34—19.80

This includes the following NFIRS codes: 352, 357, 360, 362, 363.

Moderate Risk Technical Rescue		
Task (s)	Personnel	Unit Support
IC	1	1st Arriving Chief
Medical	2	1st Arriving Co.
Technical rescue	6	1st-3rd Arriving Co.
Safety	1	2nd Arriving Chief
Total ERF	10	

The incident types included for these risk categories are currently handled by a multi-company response. This includes: the closest two Engines/Quints/Ladder, one Squad, and two Chief Officers. An incident of this type poses a greater threat to life safety and a greater requirement of equipment to mitigate the incident. If upon arrival the incident has escalated, deescalated, or the situation dictates, the incident commander has the ability to request or return resources.

2018 Standards of Cover



High Risk Technical Rescue - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Trench rescue
- High angle rescue
- Confined space rescue

Risk Classification

High = 19.81 - 47.99

This includes the following NFIRS codes: 351, 354, 355, 356.

High Technical Rescue		
Task (s)	Personnel	Unit Support
IC	1	1st Arriving Chief
Medical	2	1st Arriving Co.
Technical rescue	10	2nd-5th Arriving Co.
Safety	1	2nd Arriving Chief
Operations	1	1st Arriving Co.
Total ERF	15	

The incident types included for these risk categories are currently handled by a full box assignment. This includes the closest three Engines/Quints, one Ladder, one Squad, the Tech Rescue Truck and two Chief Officers. An incident of this type poses a greater threat to life safety and a greater requirement of equipment to mitigate the incident. If upon arrival the incident has escalated, deescalated, or the situation dictates, the incident commander has the ability to request or return resources.

2018 Standards of Cover

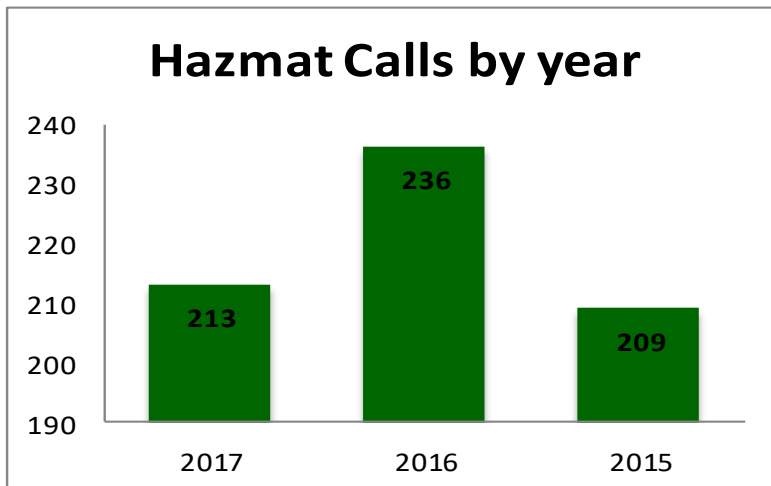


Hazardous Materials

The analysis of the hazardous materials call data has been revealed hazmat calls make up 1.8% of all calls the department runs. While the number of incidents of this nature are low, the department is continually working to be prepared for them. This program includes gas leaks (natural gas or LP) which makes up 53% of the hazmat calls in the past three years, and carbon monoxide incidents which makes up 20% of the calls.

The department does have the equipment and personnel to handle all forms of hazardous materials incidents. The department has a dedicated hazardous materials team, who specialize in hazmat response and have the required training for the more detailed hazmat calls. Team members train by shift, together at a minimum of quarterly and incorporate all department members at two training sessions annually. Every department member also is involved in some form of hazardous materials training each month at the company level.

Below is a chart of all the hazmat responses for the past three years.



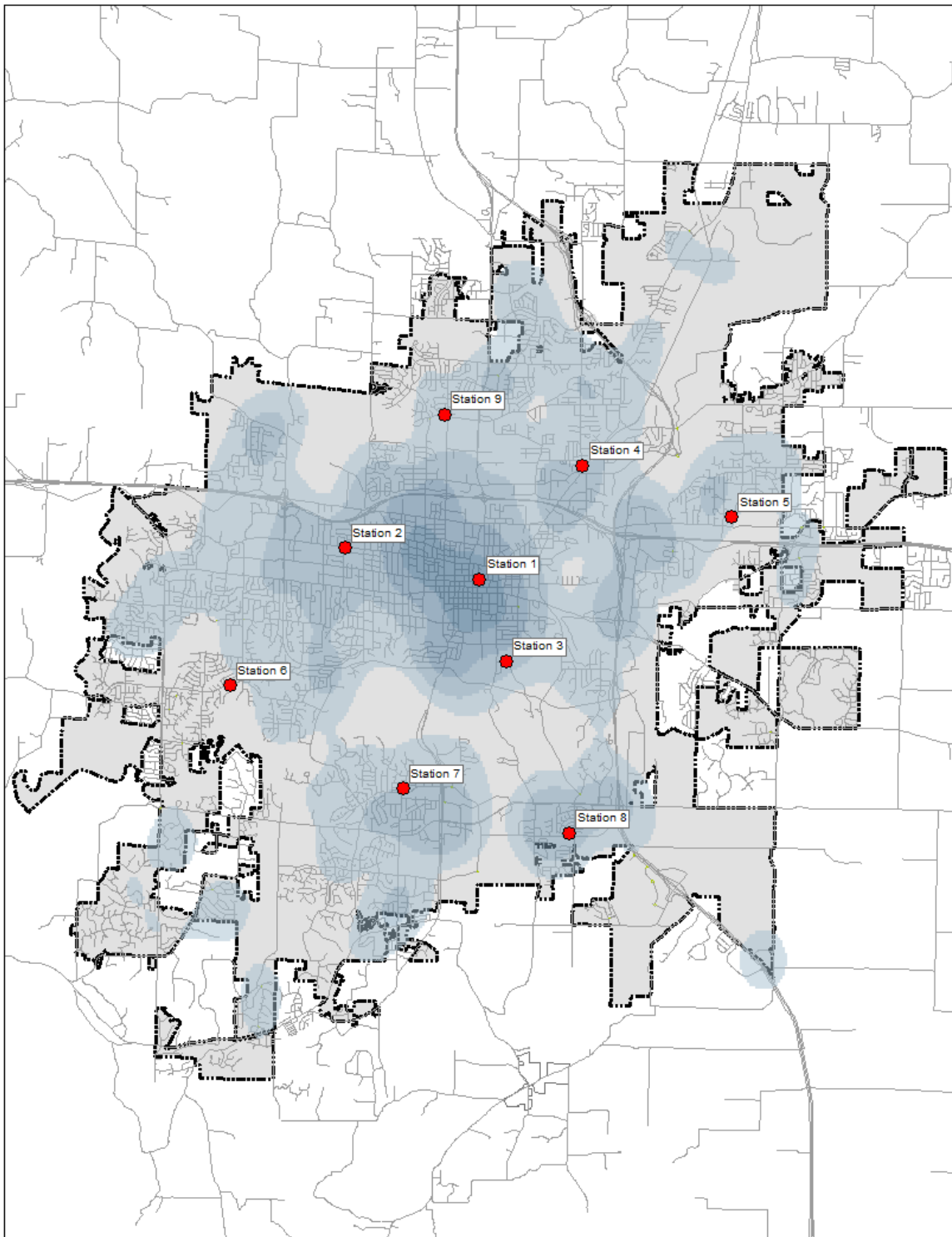
Hazardous Materials team level A suit training

During the departments data analysis, it was determined there were no moderate or special risk categories at this time. Continual analysis of responses and community needs could change this in the future.

2018 Standards of Cover



Hazardous Materials Heat Map 2015 - 2017



2018 Standards of Cover



Low Risk Hazardous Materials - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Fuel Spill
- Gas Odor
- Gas Leak
- Carbon Monoxide investigations

Risk Classification
Low= 0 -12.33

This includes the following NFIRS codes: 400, 410, 411, 412, 413, 421, 424, 430.

Low Risk Hazardous Materials		
Task (s)	Personnel	Unit Support
IC/Safety	1	1st Arriving Co.
Hazard Investigation/control	2	1st Arriving Co.
Total ERF	3	

The incident types included for this risk category can be handled by a single company response of the closest Engine, Quint, or Ladder. If upon arrival the incident has escalated or the situation dictates, the company officer has the ability to request additional resources.

2018 Standards of Cover



High Risk Hazardous Materials - Based on the department's risk assessment it was determined that the following incident types meet this category:

- Transportation accident w/release
- Explosion w/release
- Uncontained chemical leak (industrial/lab)

Risk Classification

High = 19.81 - 47.99

This includes the following NFIRS codes: 420, 422, 423, 431, 451.

High Risk Hazardous Materials		
Task (s)	Personnel	Unit Support
IC	1	1st Arriving Chief
Hazard Investigation/control	7	1st - 5th Arriving Co.
Evacuation	3	2nd - Arriving Co.
Safety	1	2nd Arriving Chief
Operations	1	1st Arriving Co.
Total ERF	13	

The incident types included for these risk categories are currently handled by a full box assignment. This includes the closest: three Engines/Quints, one Ladder, one Squad, the Hazmat Truck, and two Chief Officers. An incident of this type poses a greater threat to life safety and the requirement of additional specialized equipment to mitigate the incident. If upon arrival the incident has escalated, deescalated, or the situation dictates, the incident commander has the ability to request or return resources.

2018 Standards of Cover



H: Building Fire Risk Assessment

The Columbia Fire Department in conjunction with the City GIS department and an ESRI white paper called Target Hazard, have developed a GIS based tool that is utilized to determine buildings or occupancies that could cause a greater degree of risk within the city.

This system allows the department to set thresholds and weighting to assist in identifying the risk of occupancies. This program utilizes five key factors in determining risk:

Building Occupancy Type

Life Safety

Building Area

Needed Fire Flow

Building Height

Economic impact

The department has run the program and identified the buildings which currently are identified as high risk. The next step in this process is evaluating the buildings which were denoted in the high ranges. This step is used as a validation of the risk and ensures that the automated scoring accurately reflects the buildings noted. The building then has a preplan completed, which further identifies information on them. Once the verification and preplan has been completed the Fire Marshal reviews the preplan and accepts it. As the department moves forward and construction continues, this system will be continually applied on an ongoing basis by the Fire Marshal's division during the construction plan review process and final walk through inspection. The department is in the process of working on a way to link a plan review map layer to the Computer Aided Dispatch (CAD) system. This will enhance the usage of the information by the responders and incident commanders.

2018 Standards of Cover

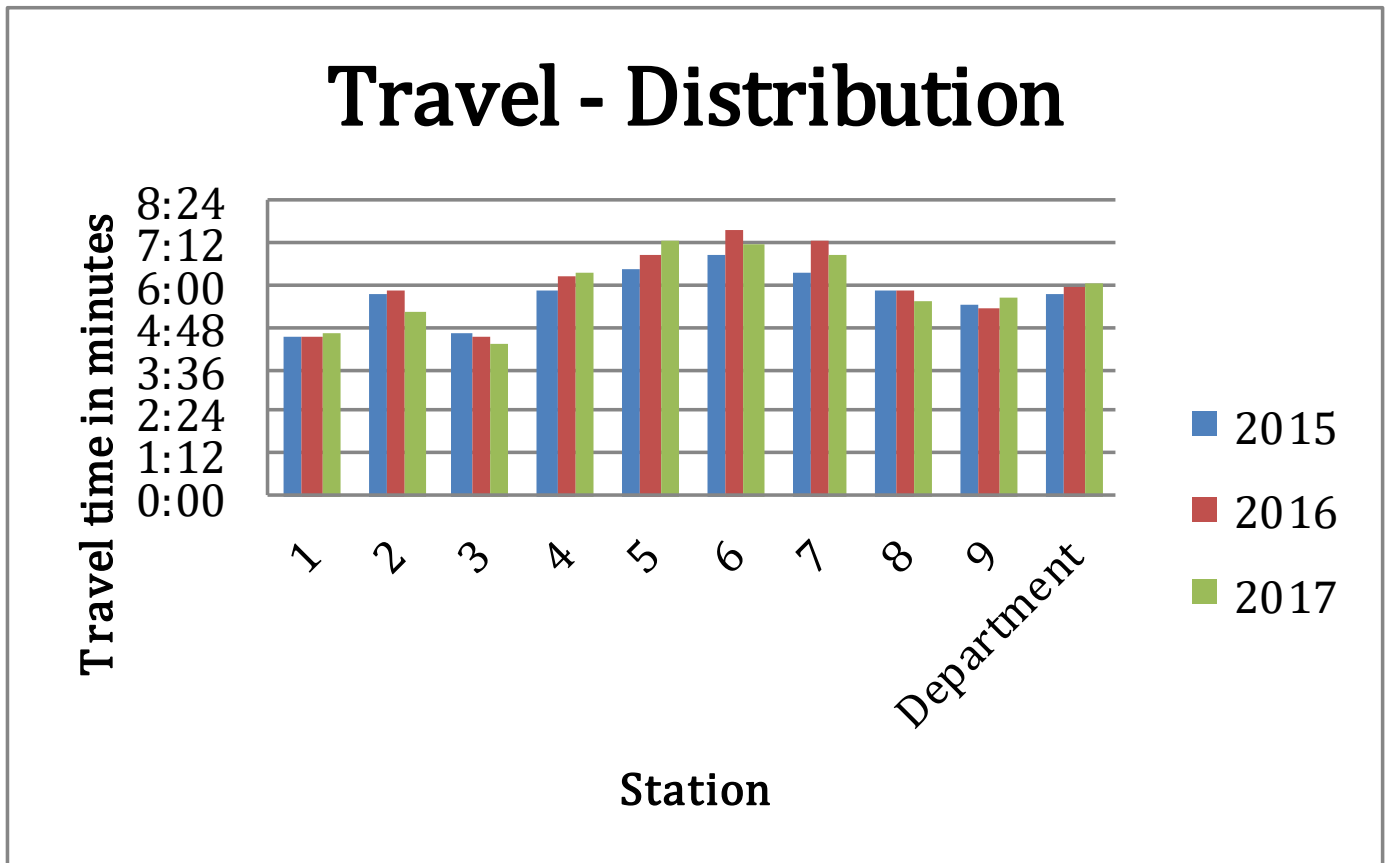


I: Performance Summary

Distribution Factors

The Columbia Fire Department defines distribution as the ability for the first unit to arrive on the scene with the ability to begin incident mitigation. This is based on the geographic areas within the city that are called the fire station primary response areas. Evaluating the current distribution provides historical baselines for performance.

Below is a chart showing the travel time for each station at the 90th percentile to all risk categories and classifications.



2018 Standards of Cover



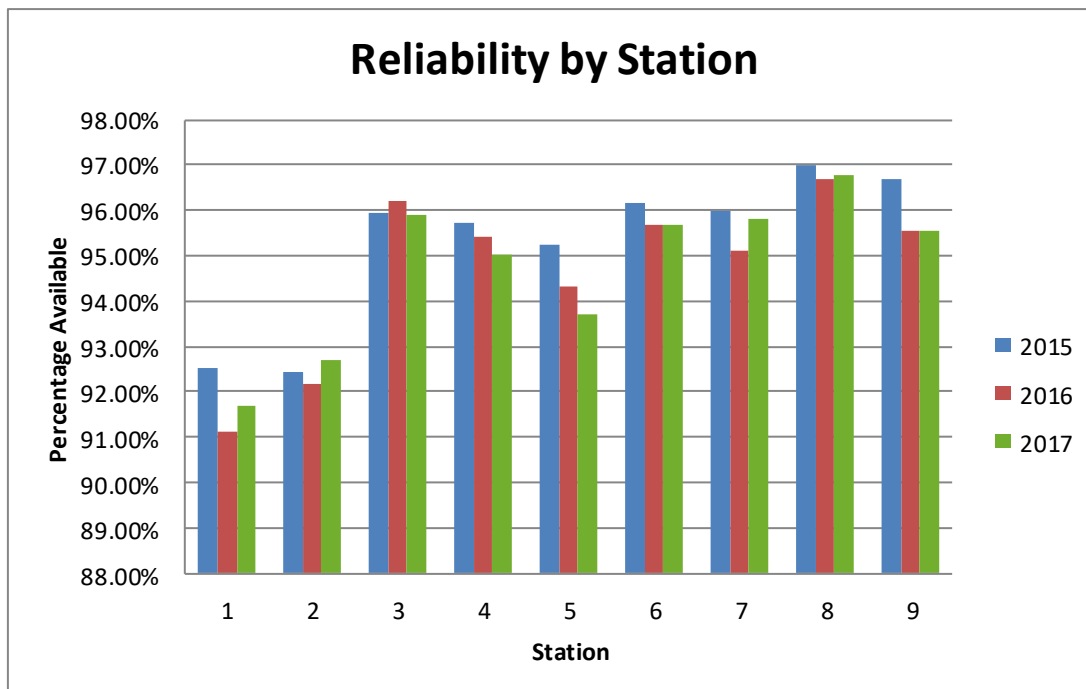
Concentration Factors

The Columbia Fire Department defines concentration as the ability of the department to get enough resources on the scene to mitigate the incident. This is based on the assembly of the effective response force (ERF) sufficient to accomplish all the tasks identified in the critical task analysis for each risk category. Evaluating the current distribution provides historical baselines for performance.

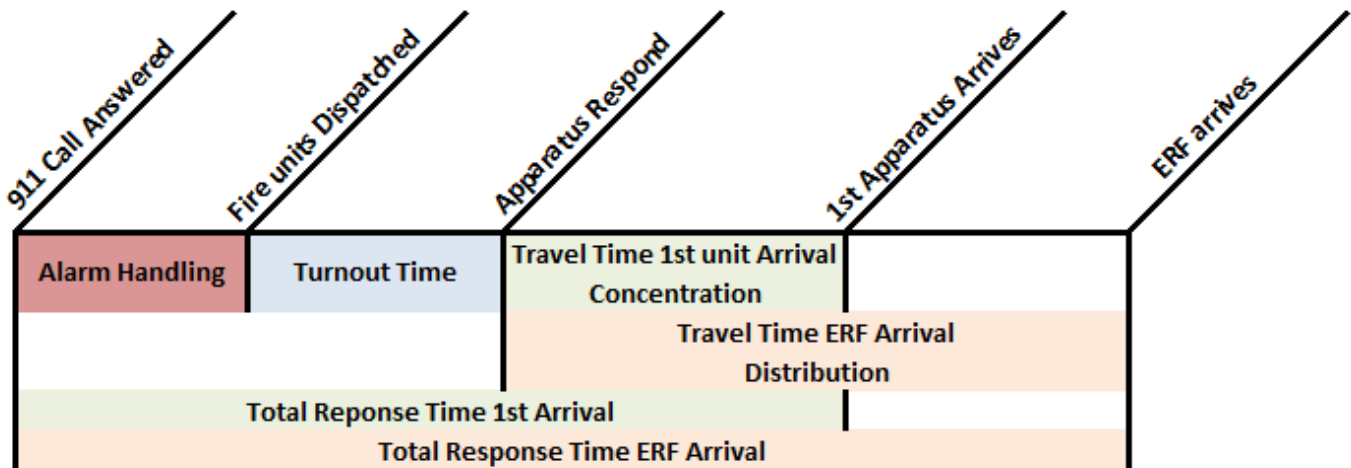
Reliability Factors

The Columbia Fire Department defines reliability as the percentage of time in which the primary response station is available for a response. Measuring reliability assists the department with determining if a station needs to be a multi company station or if a single company is sufficient to cover the area. Evaluating the current reliability provides the ability to see developing trends as population density increases and areas of the city continue to grow.

The chart below shows the reliability by year and station.



2018 Standards of Cover



Components of call times

Alarm Handling: The time from the call being answered by a 911 operator located at Boone County Joint Communications (BCJC) until the fire department is notified (dispatched).

Turnout Time: The time from the fire department being notified until the apparatus begins traveling to the incident. This include the firefighters getting to the apparatus and donning the proper protective clothing for the incident.

Travel Time First Arrival (Concentration): The time fire apparatus begins traveling to the incident until the first fire unit arrives on the scene of the incident.

Travel Time ERF (Distribution): The time fire apparatus begins traveling to the incident until all the required fire units for that call have arrived on the scene.

Total Response Time First Arrival: The time from the call being answered by a 911 operator at BCJC, until the first fire unit arrives on the scene.

Total Response Time ERF: The time from the call being answered by a 911 operator at BCJC, until the all the required fire units for the call have arrived on the scene.

Effective Response Force (ERF): The total number of personnel initially dispatched to effectively mitigating an emergency incident. This number was determined by a critical task analysis, as part of the community risk assessment.

2018 Standards of Cover



Data Analysis and Statistical Limits

Through data analysis the department has established a methodology for determining statistical outliers. Elimination of statistical outliers help validate the true data. This reduces the ability of a few abnormal time entries from skewing times to make them unrealistic. This applies to both ends of the spectrum, addressing high and low outliers.

- All non-emergency responses are excluded from calculations.
- Any alarm handling time that is less than 0:01 (one second)
- Any alarm handling time that is greater than 5:00 (five minutes)
- Any dispatch delay that is greater than 1:30 (one minute and 30 seconds)
 - * This is in place to eliminate those incidents that start as one call type and are upgraded later in the incident.
- Any turnout time that is less than 0:01 (one second)
- Any turnout time that is greater than 5:00 (five minutes)
- Any travel time that is less than 0:01 (one second)
- Any 1st unit travel time that is greater than 15:00 (15 minutes)
- Any ERF travel time that is greater than 25:00 (25 minutes)
- Any dispatch to arrival time that is less than 0:01 (one second)
- Any 1st unit dispatch to arrival time that is greater than 20:00 (20 minutes)
- Any ERF dispatch to arrival time that is greater than 30:00 (30 minutes)
- Any call to arrival time that is less than 0:01 (one second)
- Any 1st unit call to arrival that is greater then 20:00 (20 minutes)
- Any ERF call to arrival time that is greater than 30:00 (30 minutes)

2018 Standards of Cover



Baseline Performance tables

Fire Suppression Performance Tables

(Low Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:59	3:00	2:55	2:57	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:08	3:11	3:12	2:55	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	5:50	5:50	6:00	5:12	4:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	10:30	10:27	10:30	10:27	8:00
			n=414	n=198	n=127	n=89	

2018 Standards of Cover



Baseline Performance tables

(High Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	2:57	3:04	2:54	2:40	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:22	3:22	3:22	3:22	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	4:32	4:30	4:32	4:24	4:00
	Travel Time ERF Concentration	Urban	10:02	10:16	9:31	10:13	8:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	8:55	9:01	8:33	8:57	8:00
			n=330	n=130	n=109	n=91	
	Total Response Time ERF Concentration	Urban	13:51	13:51	12:51	14:05	12:00
			n=75	n=35	n=23	n=17	

2018 Standards of Cover



Baseline Performance tables

EMS Performance Tables

(Low Risk) EMS - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	3:40	3:43	3:39	3:35	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:04	3:05	3:01	3:05	1:30
Travel Time	Travel Time 1st Unit Distribution	Urban	5:25	5:30	5:22	5:25	4:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	10:34	10:44	10:33	10:19	7:30
			n=19073	n=6627	n=6698	n=5748	

2018 Standards of Cover



Baseline Performance tables

(High Risk) EMS - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	3:39	3:39	3:35	3:45	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:02	3:01	3:00	3:02	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	4:51	4:35	5:07	4:29	4:00
	Travel Time ERF Concentration	Urban	7:00	7:01	6:22	7:00	6:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	10:04	9:55	10:14	9:58	8:00
			n=1196	n=416	n=435	n=345	
	Total Response Time ERF Concentration	Urban	11:29	12:25	11:19	11:11	10:00
			n=355	n=127	n=143	n=85	

2018 Standards of Cover



Baseline Performance tables

Technical Rescue Performance Tables

(Low Risk) Tech Rescue - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	4:06	3:19	4:06	3:52	2:00
Turnout Time	Turnout Time 1st Unit	Urban	2:49	2:32	2:07	3:16	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	5:12	7:39	4:04	5:54	4:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	9:53	13:30	10:08	9:47	8:00
			n=31	n=4	n=13	n=14	

2018 Standards of Cover



Baseline Performance tables

(Moderate Risk) Tech Rescue - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	3:55	4:29	3:55	3:28	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:13	3:07	3:00	3:13	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	5:05	6:17	4:11	6:31	4:00
	Travel Time ERF Concentration	Urban	8:47	9:53	8:35	3:55	8:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	9:52	9:52	8:45	12:08	8:00
			n=51	n=15	n=21	n=15	
	Total Response Time ERF Concentration	Urban	13:11	13:11	13:56	7:54	12:00
			n=10	n=4	n=5	n=1	

2018 Standards of Cover



Baseline Performance tables

(High Risk) Tech Rescue - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	4:06	NA	2:16	4:06	2:00
Turnout Time	Turnout Time 1st Unit	Urban	2:08	NA	2:08	NA	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	3:32	NA	3:32	0:05	4:00
	Travel Time ERF Concentration	Urban	NA	NA	NA	NA	8:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:56	NA	7:56	4:11	8:00
			n=3	NA	n=2	n=1	
	Total Response Time ERF Concentration	Urban	NA	NA	NA	NA	12:00
			NA	NA	NA	NA	

2018 Standards of Cover



Baseline Performance tables

Hazardous Materials Performance Tables

(Low Risk) Hazardous Materials - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	3:23	3:23	3:19	3:23	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:19	3:37	3:08	3:02	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	6:27	6:27	6:27	6:12	4:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	11:28	11:27	10:55	11:46	8:00
			n=315	n=96	n=119	n=100	

2018 Standards of Cover



Baseline Performance tables

(High Risk) Hazardous Materials - 90th Percentile Times - Baseline Performance			2015-2017	2017	2016	2015	Benchmark
Alarm Handling	Pick-up to Dispatch	Urban	4:20	4:28	3:34	3:58	2:00
Turnout Time	Turnout Time 1st Unit	Urban	3:31	3:57	3:29	3:31	2:00
Travel Time	Travel Time 1st Unit Distribution	Urban	8:08	8:56	4:28	8:08	4:00
	Travel Time ERF Concentration	Urban	4:36	3:24	na	4:36	8:00
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	13:40	14:12	10:12	13:40	8:00
			n=19	n=5	n=7	n=7	
	Total Response Time ERF Concentration	Urban	10:25	10:25	na	7:10	12:00
			n=2	n=1	na	n=1	

2018 Standards of Cover



J: Benchmark Statements

Fire Suppression Performance Objectives Benchmark :

Fire Suppression (low risk)

For 90% of low risk fire suppression incident responses, alarm handling shall be 2 minutes and 0 seconds.

For 90% of low risk fire suppression incident responses, turnout time shall be 2 minutes and 0 seconds.

For 90% of low risk fire suppression incident response, the travel time of the first due unit shall be 4 minutes.

For 90% of low risk fire suppression incident response, the total response time shall be 8 minutes. The first arriving unit is to be capable of providing a minimum of 300 gallons of water, pumping 1500gpm, conducting a scene size up, initiating command/safety, initiating a primary fire attack line, determining the need for additional resources, and is staffed with a minimum of three personnel.

Fire Suppression (high risk)

For 90% of high risk fire suppression incident responses, alarm handling shall be 2 minutes and 0 seconds.

For 90% of high risk fire suppression incident responses, turnout time shall be 2 minutes and 0 seconds.

For 90% of high risk fire suppression incident response, the travel time of the first due unit shall be 4 minutes.

For 90% of high risk fire suppression incident response, the effective response force (ERF) travel time shall be 8 minutes.

For 90% of high risk fire suppression incident response, the total response time for the first due unit shall be 8 minutes. The first due unit is to be capable of providing a minimum of 300 gallons of water, pumping 1500gpm, conducting a scene size up, initiating command/safety, initiating a primary fire attack line, determining the need for additional resources, and is staffed with a minimum of three personnel (1 officer, 1 engineer, and 1 firefighter).

2018 Standards of Cover



For 90% of high risk fire suppression incident response, the total response time for the ERF shall be 12 minutes. The ERF is to be capable of: pumping 1500gpm, conducting command/safety, advancing primary fire attack line, establishing a backup line, establishing a sustainable water supply, conducting primary search and rescue, providing ventilation, and establishing a rapid intervention crew (RIC). The ERF will include a minimum of 16 personnel.

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EMS Performance Objectives Benchmark :

EMS (low risk)

For 90% of low risk EMS incident responses, alarm handling shall be 2 minutes.

For 90% of low risk EMS incident responses, turnout time shall be 1 minute and 30 seconds.

For 90% of low risk EMS incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of low risk EMS incident responses, the total response time of the first due unit shall be 7 minutes and 30 seconds. The first due unit shall be capable of: establishing incident command, providing a minimum of basic life support medical care, conducting patient assessment, history, and include a minimum of two personnel.

EMS (high risk)

For 90% of high risk EMS incident responses, alarm handling shall be 2 minutes.

For 90% of high risk EMS incident responses, turnout time shall be 2 minutes.

For 90% of high risk EMS incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of high risk EMS incident responses, the effective response force (ERF) travel time shall be 6 minutes.

For 90% of high risk EMS incident responses, the total response time of the first due unit shall be 8 minutes . The first due unit shall be capable of: establishing incident command/safety, providing a minimum of basic life support medical care, conducting patient assessment, history, and include a minimum of two personnel.

For 90% of high risk EMS incident responses, the total response time of the ERF shall be 10 minutes . The ERF shall be capable of: conducting command/safety, providing a minimum of basic life support medical care, conducting patient assessment, history, and include a minimum of five personnel.

2018 Standards of Cover



Technical Rescue Performance Objectives Benchmark :

Technical Rescue (low risk)

For 90% of low risk Technical Rescue incident responses, alarm handling shall be 2 minutes.

For 90% of low risk Technical Rescue incident responses, turnout time shall be 2 minutes.

For 90% of low risk Technical Rescue incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of low risk Technical Rescue incident responses, the total response time of the first due unit shall be 8 minutes. The first due unit shall be capable of: establishing incident command/safety, incident size up, providing a minimum of basic life support medical care if needed, stabilizing the incident, determining the need for additional resources, and include a minimum of two personnel.

Technical Rescue (moderate risk)

For 90% of moderate risk Technical Rescue incident responses, alarm handling shall be 2 minutes.

For 90% of moderate risk Technical Rescue incident responses, turnout time shall be 2 minutes.

For 90% of moderate risk Technical Rescue incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of moderate risk Technical Rescue incident responses, the effective response force (ERF) travel time shall be 8 minutes.

For 90% of moderate risk Technical Rescue incident responses, the total response time of the first due unit shall be 8 minutes. The first due unit shall be capable of: establishing incident command/safety, incident size up, providing a minimum of basic life support medical care if needed, stabilizing the incident, determining the need for additional resources, and include a minimum of two personnel.

For 90% of moderate risk Technical Rescue incident responses, the total response time of the ERF shall be 12 minutes. The ERF shall be capable of: maintain incident command/safety, gain access to the patient, providing a minimum of basic life support medical care if needed, stabilizing the incident, determining the need for additional resources, and include a minimum of ten personnel.

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Technical Rescue (high risk)

For 90% of high risk Technical Rescue incident responses, alarm handling shall be 2 minutes.

For 90% of high risk Technical Rescue incident responses, turnout time shall be 2 minutes.

For 90% of high risk Technical Rescue incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of high risk Technical Rescue incident responses, the effective response force (ERF) travel time shall be 8 minutes.

For 90% of high risk Technical Rescue incident responses, the total response time of the first due unit shall be 8 minutes. The first due unit shall be capable of: establishing incident command/safety, incident size up, providing a minimum of basic life support medical care if needed, stabilizing the incident, determining the need for additional resources, and include a minimum of two personnel.

For 90% of high risk Technical Rescue incident responses, the total response time of the ERF shall be 12 minutes. The ERF shall be capable of: maintain incident command/safety, gain access to the patient, providing a minimum of basic life support medical care if needed, stabilizing the incident, determining the need for additional resources, and include a minimum of fifteen personnel.

2018 Standards of Cover



Hazardous Materials Performance Objectives Benchmark :

Hazardous Materials (low risk)

For 90% of low risk Hazardous Materials incident responses, alarm handling shall be 2 minutes.

For 90% of low risk Hazardous Materials incident responses, turnout time shall be 2 minutes.

For 90% of low risk Hazardous Materials incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of low risk Hazardous Materials incident responses, the total response time of the first due unit shall be 8 minutes. The first due unit shall be capable of: establishing incident command/safety, incident size up, stabilizing the incident, determining the need for additional resources, and include a minimum of three personnel.

Hazardous Materials (high risk)

For 90% of high risk Hazardous Materials incident responses, alarm handling shall be 2 minutes.

For 90% of high risk Hazardous Materials incident responses, turnout time shall be 2 minutes.

For 90% of high risk Hazardous Materials incident responses, the travel time of the first due unit shall be 4 minutes.

For 90% of high risk Hazardous Materials incident responses, the effective response force (ERF) travel time shall be 8 minutes.

For 90% of low risk Hazardous Materials incident responses, the total response time of the first due unit shall be 8 minutes. The first due unit shall be capable of: establishing incident command/safety, incident size up, stabilizing the incident, determining the need for additional resources, and include a minimum of three personnel.

For 90% of high risk Hazardous Materials incident responses, the total response time of the ERF shall be 12 minutes. The ERF shall be capable of: maintain incident command/safety, mitigate the incident, stabilizing the incident, determining the need for additional resources, and include a minimum of 13 personnel.

2018 Standards of Cover

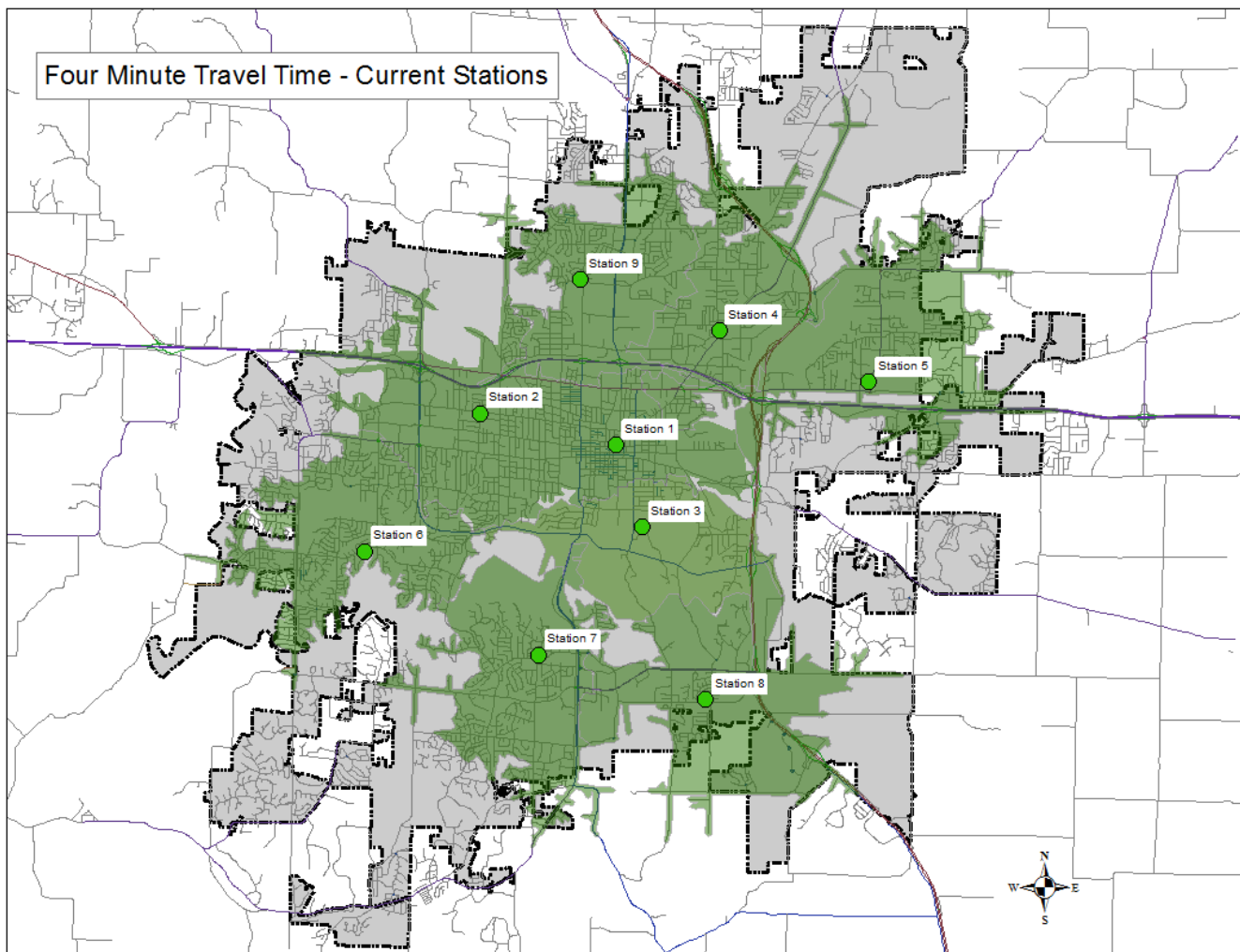


K: Evaluation of Current Deployment and Performance

Summary:

The Columbia Fire Department has analyzed the data presented in this Standards of Cover/Community Risk Assessment (SOC/CRA) and determined the following conclusions:

- Over the past several years the department has been watching several developing areas within the city which have shown substantial growth. Below shows a map of the theoretical four minute travel time, utilizing the existing road network, from the current city stations.

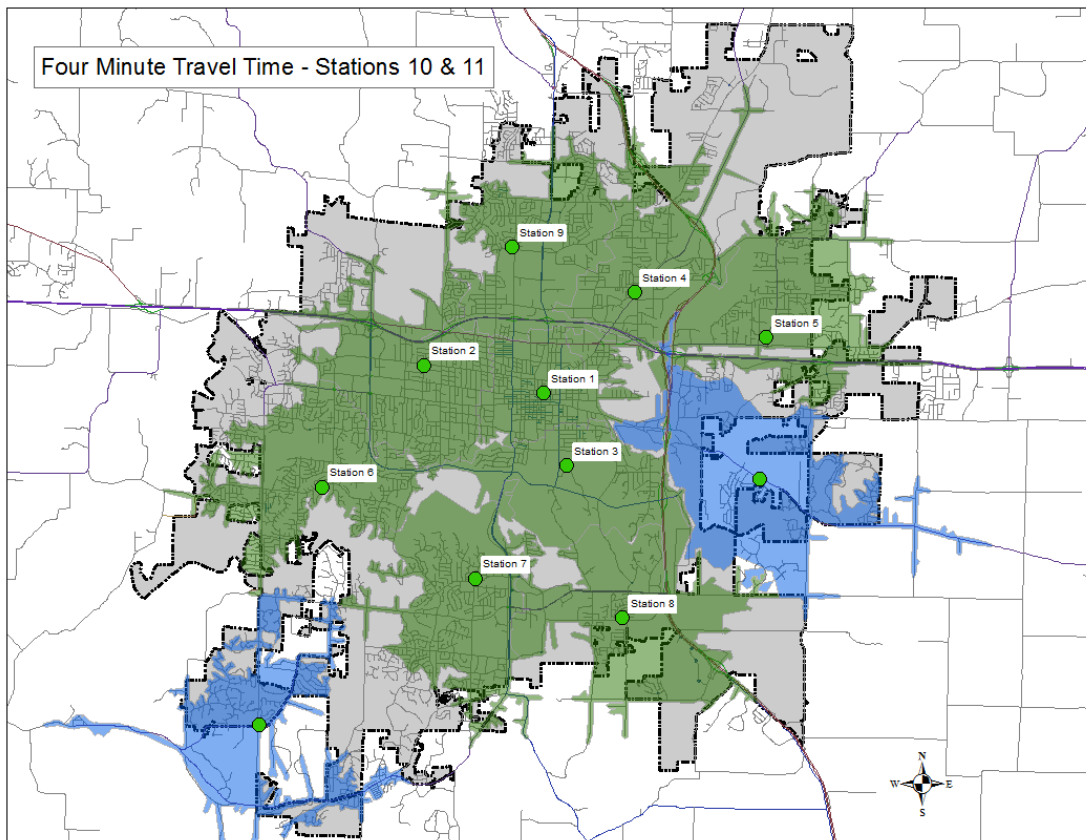


2018 Standards of Cover



- Through data analysis as well as development trends, several areas of need have been identified.
 - ⇒ The Central East portion of the city. In the FY2019 budget proposal there is an additional fire station. This station will be Station 10. The department and city are actively looking for property in the area.
 - ⇒ The Southwest portion of the city. The department and city are actively looking for property in this area, with intentions to construct that station in the next few years. This station will be Station 11.

Below is a map showing the theoretical four minute travel times, utilizing the existing road network, from each current station as well as the addition of the two new stations. The addition of stations should greatly impact the baseline response times. Using 2017 data, a new station in the East would have had a direct impact on 613 calls in the new primary response area. It would also have a greater impact on ERF responses in the city. The proposed station in the Southwest would have had a direct impact on 182 calls in the new primary response area. It would also have a greater impact on ERF responses in the city.



2018 Standards of Cover



- With a recent CAD upgrade, the department is exploring the ability to utilize GIS based dispatching for specific structures. During the community risk assessment it was determined there are certain high or special risk occupancies that would require a higher ERF response. Likewise, this would allow the reduction in ERF for some responses with minimal risk. The department is working on the critical tasking and the CAD system limitations, hoping for implementation in 2019.
- The department is making a priority to analyze turn out times continually. This is a time in which personnel can directly impact the outcome. This priority is outlined in the 2018-2021 Strategic Plan as well as during each monthly staff meeting.
- The department is addressing the issue of longer than desired alarm handling times. Currently these longer times are attributed to the use of ProQa. The department and dispatch agency, are working to find options to reduce this time component.

2018 Standards of Cover



L: Plan for Maintaining

The Columbia Fire Department command staff meet on a monthly basis for a staff meeting. Each month the following items will be analyzed:

- Call processing time
- Turnout time
- Incident response by incident type
- Fire and EMS emergency response times
- Strategic plan update
- Fire property saved vs. property lost
- Fire stop report
- EMS incident date (AED, CPR and Naloxone use)

Quarterly, the senior command staff meet to analyze data further, as well as incident reviews. This includes:

- Monthly analysis data (listed above)
- Emergency responses by risk category and classification
- Incident review
- Incident trends

2018 Standards of Cover



Annually, in February the department holds an annual review staff meeting. This includes:

- Monthly analysis data (listed above)
- Emergency responses by risk category and classification
- Review the department annual report
- Review all program appraisals
- Review and update the Strategic Plan
- Develop goals for the year