CITY OF

Cedar Rapids

Fire Department Organizational Assessment and Fire Station Location Study

Final Report / May 2023

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RAFTELIS

May 26, 2023

Gregory Smith
Fire Chief
713 1st Ave SE
Cedar Rapids, IA 52401

Subject: Cedar Rapids Fire Department Organizational Assessment and Fire Station Location Study

Dear Chief Smith:

We are pleased to present the Fire Department Organizational Assessment and Fire Station Location Study Final Report for the City of Cedar Rapids (City). The following report includes observations and recommendations intended to improve the effectiveness of the Cedar Rapids Fire Department's (Department or CRFD) current operations, provide the capacity necessary to meet service level expectations, and evaluate existing fire station locations.

The Fire Department staff engaged in this process take pride in their work and strive to offer exceptional service. However, investments and operational changes are needed to allow the Department to improve service delivery and reduce emergency response times. Addressing operational practices, staffing capacity, and facility needs will ensure that the Cedar Rapids Fire Department remains a trusted asset for the entire Cedar Rapids Community.

Thank you for the opportunity to work with the Cedar Rapids Fire Department.

Sincerely,



Michelle Ferguson
Vice President - Organizational Assessment

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Table of Contents

EXECUTIVE SUMMARY 1

INTRODUCTION 3

BACKGROUND AND METHODOLOGY 3

ABOUT CEDAR RAPIDS 3

CEDAR RAPIDS FIRE DEPARTMENT OVERVIEW 4

Core Services Matrix 4

Staffing and Structure 5

Budget 8

OPERATIONAL ANALYSIS & RECOMMENDATIONS 9

Staffing Coverage 9

Training 11

Fire Prevention and Inspections 15

Equipment and Personal protection 18

Technology 21

Organization and Staffing 23

STATION LOCATION AND CONDITION ANALYSIS 28

Analysis by Fire District 30

CONCLUSION 45

List of Tables

Table 1: List of Report Recommendations 2
Table 2: Cedar Rapid's Population 2015-2020 3
Table 3: Cedar Rapid Department Core Services Matrix 4
Table 4: Cedar Rapid Department Staffing History 6
Table 5: Cedar Rapid Department Budget History FY2019-FY2023 8
Table 6: Department Sick Time Usage 10
Table 7: Continuing Education Hours Requirement for EMS Certifications 10
Table 8: Inspection Frequency by Occupancy Types 18

List of Figures

Figure 1: Operations Organizational Structure 6
Figure 2: Administrative and Support Staff Organizational Structure 7
Figure 3: Training Organizational Structure 7
Figure 4: Fire Marshal's Office Organizational Structure 8
Figure 5: Map of Fire Stations within the City of Cedar Rapids 28
Figure 6: Call Density For Emergency Calls for Service from 2017-2022 29
Figure 7: Average Drivetime from all Stations based on City's Road Network 30
Figure 8: Fire Station No. 1 31
Figure 9: Call Density in Fire District 1 32
Figure 10: Fire Station No. 2 33
Figure 11: Call Density in Fire District 2 33
Figure 12: Fire Station No. 3 34
Figure 13: Call Density in Fire District 3 35
Figure 14: Fire Station No. 4 36
Figure 15: Call Density in Fire District 4 36
Figure 16: Fire Station No. 5 37
Figure 17: Call Density in Fire District 5 38
Figure 18: Fire Station No. 6 39
Figure 19: Call Density in Fire District 6 39
Figure 20: Fire Station No. 7 40
Figure 21: Call Density in Fire District 7 41
Figure 22: Fire Station No. 8 42
Figure 23: Call Density in Fire District 8 42
Figure 24: Fire Station No. 9 43
Figure 25: Call Density in Fire District 9 44
Figure 26: Cedar Rapids Fire Department Organization Chart 48

List of Appendices

APPENDIX A: 46

Executive Summary

The City of Cedar Rapids, Iowa was incorporated in 1849 and has since grown into an epicenter for manufacturing, particularly within the bioprocessing and food ingredient industry. The prevalence of food-related manufacturing companies provides a robust economy and jobs for the community, but it also means that public safety services face additional challenges related to hazardous chemicals, such as ethanol, that are used or produced by this work.

The Cedar Rapids Fire Department is a high performing organization that strives to provide exceptional services to protect public health and safety within the community. The Department has received accreditation from the Center for Public Safety Excellence Commission on Fire Accreditation International, which is a significant achievement and an indication of the Department's commitment to operating at a high level. The Department is staffed with intelligent and hardworking individuals and led by a dynamic and committed leadership team that is open to new ideas and operational changes, resulting in an elevated culture throughout.

The Department engaged Raftelis to seek out additional ideas and best practices to continue to evolve the operations, equipment, and culture of the Department as well as review the conditions and locations of the Department's nine fire stations. Throughout this process, staff were engaged and collaborative.

The results of this assessment show that the Department would further benefit from an adjusted approach to training that provides consistent multi-company training to replicate firegrounds and situations firefighters would experience in the field. Additionally, due to the nature of the businesses in Cedar Rapids, the Department should ensure there are comprehensive fire prevention plans in place and that the Department is able to conduct thorough inspections on a regular schedule. The firefighters would also benefit from additional equipment, such as a second set of "bunker gear" or turnout gear (the personal protective equipment used by firefighters) to help protect their health and safety and allow for proper decontamination after use. Furthermore, there are technologies available that, if incorporated, could improve the Department's ability to respond to calls for service.

The stations located throughout the City vary in age and condition, with stations being built in the 1950s, 1980s, 1990s, and 2010s. The oldest stations were found to have structural issues, such as foundation cracks that allow water to leak into the buildings. The City will need to prioritize addressing these issues. The stations from the 1980s have limited storage and workout space. Furthermore, over time, the size of the fire apparatus has changed significantly, meaning older station bays are no longer suitable for the larger equipment, further reducing room within several of the stations. With that said, the locations of the each of the nine stations are such that the Department can adequately and effectively respond to calls for service, with 77% of calls between 2017 and 2022 seeing response times at or below five minutes and 96% of calls responded to within eight minutes.

Overall, this assessment offers a series of recommendations designed to enhance the operations of the Fire Department, increase efficiency and effectiveness in providing services, create staff capacity, and maintain firefighter health and safety. To implement the recommendations, it is vital for the Department to work closely with the City Manager's Office to identify a funding and investment plan for equipment, technology, and facilities.

A full list of the recommendations contained in this report can be found in the following table.

Table 1: List of Report Recommendations

Number	Recommendation
Staffing and Structure	
1	Add up to six firefighters to reduce the overtime incurred by the Department.
Training	
2	Implement a training approach and program to enable consistent multiple company Department-wide training.
3	Secure access to a suitable live fire training facility.
4	Develop an external training plan and budget based on needs assessment.
5	Engage with Human Resources to ensure City-wide training courses are being conducted with all Fire personnel on a regular basis.
Fire Prevention and Inspections	
6	Work with high-risk industries to develop Fire Prevention Plans and specific HAZMAT and technical training programs.
7	Adjust the inspection model to improve the Department's ability to conduct inspections.
Equipment and Personal Protection	
8	Ensure each firefighter has a second set of equipment that is compliant with NFPA standards.
9	Ensure each firefighter is equipped with ballistic personal protection equipment.
10	Develop a comprehensive equipment decontamination policy and protocol.
Technology	
11	Pursue traffic preemption technology to improve response times.
12	Activate Automatic Vehicle Location (AVL) for dispatch purposes to help reduce response times.
13	Implement a fleet fuel card system for apparatus fueling.
Organization and Staffing	
14	Create a rotational Special Projects and Administrative Captain position.
15	Create a Plans Examiner position under the Fire Marshal.
16	Seek opportunities to increase diversity throughout the Department.
Station Location and Condition	
17	Conduct a space needs analysis and develop a funding plan to make necessary renovations/expansions and possible station relocations.

Introduction

Background and Methodology

The Cedar Rapids Fire Department engaged Raftelis to assist with a Fire Department Organizational Assessment and Fire Station Location Study. This study had two primary components. First, the project team was tasked with analyzing the operations of the Department including service levels, organizational structure, and staffing levels to provide recommendations to improve efficiency and effectiveness. Second, the project team evaluated the locations of the Department's nine fire stations against the volume of calls for service and associated response times to provide recommendations to improve station locations or identify improvements that could be made to existing facilities that would optimize the Department's ability to respond to calls for service.

The first step of this process was a kick-off meeting with the Fire Department command staff and staff from the City Manager's Office (CMO) to review the details and expectations of this effort. Next, the project team toured each of the nine fire stations and conducted interviews with staff members throughout the CRFD at all levels of the Department. For additional perspectives, the team also conducted virtual interviews with the City of Cedar Rapids' GIS Specialist, Community Development Director, Finance Director, dispatch center personnel, members of the Human Resources staff, Police Chief, and the City's Real Estate Manager.

The station tours and interviews provided the project team with a better understanding of how the CRFD operates, the geographic and transportation-related issues associated with the current station locations, and the specific challenges pertaining to staff capacity and organizational structure.

The project team also reviewed and analyzed staffing information, budget reports, workload data, facility and equipment information, and other documentation relating to the service delivery approach for the CRFD. This information was compared to best practices from industry organizations to help inform the recommendations in this report.

About Cedar Rapids

The City of Cedar Rapids spans over 72 miles in the eastern portion of the State of Iowa. According to the US Census Bureau, it is the second-largest city in the state, with a population of 133,125. Since 2015, the population has risen, on average, 0.7% annually. The following table details the City's population from 2015-2020.

Table 2: Cedar Rapid's Population 2015-2020[1]

	2015	2016	2017	2018	2019	2020
Total Population	128,829	129,537	130,330	131,360	132,301	133,125
% Change	n/a	0.5%	0.6%	0.8%	0.7%	0.6%

Cedar Rapids is a hub for manufacturing. According to the American Community Survey,[2] 22% of the total full-time employed population over 16 works in the Manufacturing industry. Additionally, Cedar Rapids is heralded as the largest corn-processing city in the world and one of the leading bioprocessing and food ingredient centers in North America. Major industries located in the City include the Archer-Daniels-Midland Company (ADM), Quaker Oats, Collins Aerospace, Nordstrom, General Mills, and Ingredion.

[1] US Census Bureau, 2015-2020 American Community Survey (5yr estimates)
[2] US Census Bureau, 2021 American Community Survey (1yr estimates)

The presence of manufacturing and large bioprocessing companies within the City limits poses unique challenges to the CRFD due to these companies both producing and using hazardous chemicals such as ethanol. These challenges include understanding the types of hazardous materials present within a facility. For example, some chemicals are corrosive and can destroy or damage equipment, some can cause irritation, injury, or even death if touched or inhaled, and some chemicals can react with air, water, or other materials and produce toxic fumes or even an explosion. The types of chemicals present will determine the type of response and fire suppression technique needed.

Cedar Rapids Fire Department Overview

The City of Cedar Rapid's Fire Department is a career municipal fire department providing public safety services to the City's 133,000 plus residents within the 72+ square mile City limits. The Department is an all-hazards response agency, meaning they provide effective and consistent responses to emergency situations.

In 2018, the CRFD received accreditation from the Center for Public Safety Excellence (CPSE) Commission on Fire Accreditation International (CFAI). The CFAI defines accreditation as "an all-hazard, quality improvement model based on risk analysis and self-assessment that promotes the establishment of community-adopted performance targets for fire and emergency service agencies." Accredited agencies can be described with numerous accolades, such as community-focused, data-driven, well-organized, and properly equipped.

To achieve accreditation, CRFD needed to complete three processes ahead of a peer review and presentation to CFAI. The first was a self-assessment that analyzed 262 performance indicators, including 86 core competencies across 10 categories, such as operations, governance/administration, human resources, and finance. Next, a cover document that examined the community of Cedar Rapids, identified fire and non-fire risks, and measured CRFD's performance in responding to the risks was prepared. Finally, a strategic plan was created to serve as the basis for the short-, medium-, and long-term goals of the CRFD. These processes will be repeated every five years for the Department to maintain its accreditation. The Department has consistently reported and has been approved for continual compliance to CFAI through their Annual Compliance Report (ACR). The Department is seeking its second accreditation in 2023.

CRFD is also recognized as a Class 2 Department by the Insurance Service Office (ISO). ISO helps municipalities evaluate public fire protection services and infrastructure by providing an objective, country-wide standard to assist fire departments in planning and budgeting for facilities, equipment, and training. ISO also provides incentives and rewards for communities that choose to improve their firefighting services.

CORE SERVICES MATRIX

The following table summarizes the core functions and services performed by the CRFD. The list reflects the key activities that account for significant portions of staff time. The Department may perform additional activities not currently listed below.

Table 3: Cedar Rapid Department Core Services Matrix

Function	Program Area	Activities
Emergency Response	Fire Suppression	• Mitigating, controlling, and extinguishing fires
	Emergency Medical Services	• Provide urgent pre-hospital treatments
	Hazardous Materials Mitigation	• Actions taken to eliminate risks associated with hazardous materials
	Special Operations Response	• Responding to high-risk, but low-frequency emergency situations

Function	Program Area	Activities
Administration	Budget	• Prepare annual Department operating and capital budgets • Track department expenses and prepare spending reports
	Payroll	• Record staff attendance and leave usage • Manage time reporting and submit payroll to Finance Department
	Personnel	• Work with Human Resources as needed to address personnel issues
	Purchasing	• Identify gear, equipment, and supplies needed by the Department • Review and approve invoices
	Accreditation	• Prepared and submit an annual compliance report • Prepare documentation for accreditation renewal every five years including community risk assessment, community-driven strategic plan, and complete self-assessment manual
Support	Equipment Maintenance	• Collect, clean, and return gear exposed to fire scenes and contaminants • Inspect turnout gear and equipment for defects • Test equipment for safety and functionality
	Fleet Maintenance	• Coordinate maintenance of Department vehicles and apparatuses
	Inventory	• Maintain inventory of all gear, equipment, and supplies
	Procurement	• Procure turnout gear, personal protective equipment (PPE), equipment, and supplies as needed • Procure medical supplies as needed
	Community Education	• Conduct community fire education events at local schools
Employee Training and Preparedness	Academy and Recruitment	• Operate and teach the 8-week Fire Academy
	Training and Professional Development	• Coordinate training activities with six interdepartmental discipline leads (ice/water, rope, trench, confined, HAZMAT, and high angle) • Work with Human Resources to schedule City related training • Perform assessments of training to determine priorities for the next year
Fire Marshal's Office	Plan Review	• Examining design plans of new construction and renovation projects to ensure the plans meet applicable fire codes
	Fire Inspections	• Inspect multifamily residential and commercial buildings to ensure they meet applicable fire codes
	Fire Investigations	• Examine scenes of fires to determine origin and cause

STAFFING AND STRUCTURE

The agency has authorized staffing of 148.5 full-time equivalents (FTE) including the Fire Chief, three Assistant Fire Chiefs, eight Battalion Chiefs / Administrative District Chiefs, 33 Shift Captains, eight Day Captains, 91 Firefighters, three Administrative Assistants, and 1.5 Public Education Specialists. A full detailed organizational chart is included with this report as Appendix A; however, the table below shows the staffing history from FY2019 to FY2023.

Table 4: Cedar Rapid Department Staffing History

Category	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023 Budget	% Change 2019-2023
Fire Department	148.54	148.48	148.48	148.48	148.48	0.0%

The staff is deployed in nine separate fire stations throughout the City. The Central Fire Station also serves as the headquarters building and is the only multi-unit fire station in the City. It houses a staffed engine company, ladder company, heavy rescue company, and two (2) Battalion Chiefs. The other eight (8) fire stations house a single-staffed apparatus. Seven of the eight remaining stations house an engine. Fire Station 7 is equipped with a 107' Quint Ladder company. A Quint is a fire apparatus that includes an aerial ladder and has the water-pumping capability of a non-ladder engine.

Emergency Response

The Department runs emergency response with three shifts (A, B, and C) with a schedule of 24 hours on and 48 hours off with a "Kelly Day" every 54 days. A Kelly Day is an unpaid day off given to a firefighter at routine intervals when they would normally be scheduled to work. The Department's utilization of a Kelly Day alleviates the need to pay firefighters Fair Labor Standards Act overtime for scheduled work shifts. It also provides an additional recovery period for firefighters' physical and mental well-being.

The following figure shows the Operations organizational structure.

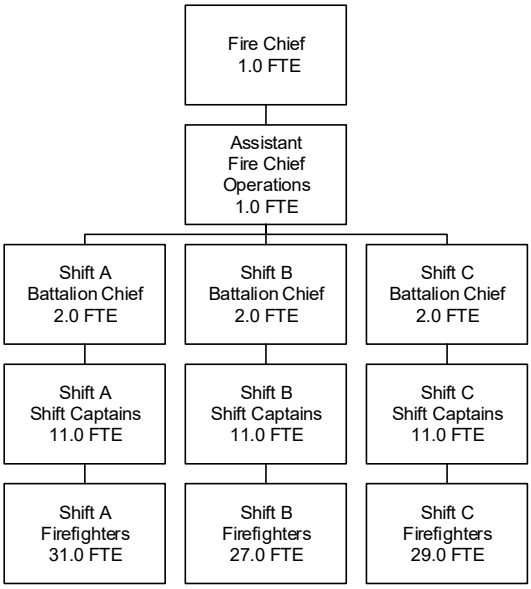


Figure 1: Operations Organizational Structure

The Department's daily minimum staffing is 33, with two Battalion Chiefs (BC). One BC is responsible for the western portion of the City, the other the east. To meet minimum staffing by covering various compensated leave, there are typically 40-41 personnel assigned on each shift's roster.

The minimum staffing for the engine companies, Truck 1, and Ladder 7 is three personnel, including a Captain who serves as the company's officer and two firefighters. At least one of these three is certified as a paramedic. The Rescue company has a minimum staffing level of two, a Captain and a firefighter. The minimum staffing for Battalion Chief is one per shift.

Administrative and Support Services

The administrative services provided by the Department include all planning, organizing, and directing Department operations including personnel administration, customer feedback, performance measures, budget, organization management, procurement, and asset management. The support staff are responsible for emergency management, public education on fire and life safety programs, and the coordination of facility maintenance.

The following figure shows the organizational structure of the administrative and support staff within the CRFD.

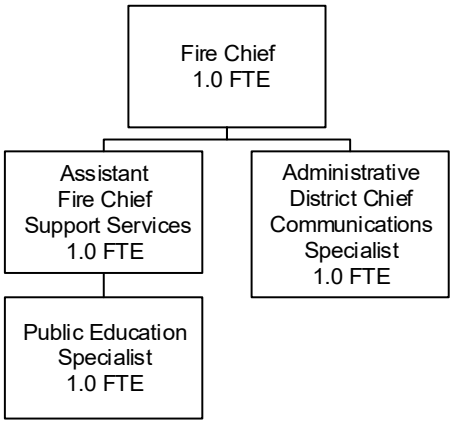


Figure 2: Administrative and Support Staff Organizational Structure

Training

The training team within the CRFD consists of the Training Chief and two Captains. They are responsible for ensuring all department employees have adequate training and certifications.

The organizational structure of the training team is as follows:

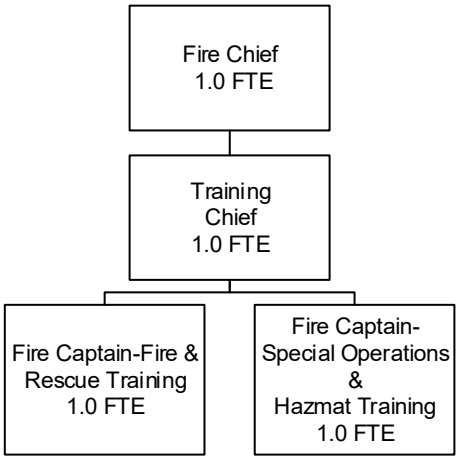


Figure 3: Training Organizational Structure

Fire Marshal's Office

The Fire Marshal's office is supervised by the Fire Marshal and consists of the Administrative District Chief (Assistant Fire Marshal) and six Day Captains, three of whom are inspectors and three of whom are investigators. The office is responsible for the following activities:

- **Plan review** – Staff review proposed plans to verify new developments will meet applicable City, State, and Federal fire codes.
- **Inspections** – Staff visit properties to ensure existing structures throughout the City of Cedar Rapids are in compliance with safety regulations.
- **Fire Investigations** – Staff investigate the cause of fires and, if the cause is criminal, they work closely with law enforcement agencies to identify and apprehend offenders.

The following figure illustrates the organizational structure of the Fire Marshal's Office.

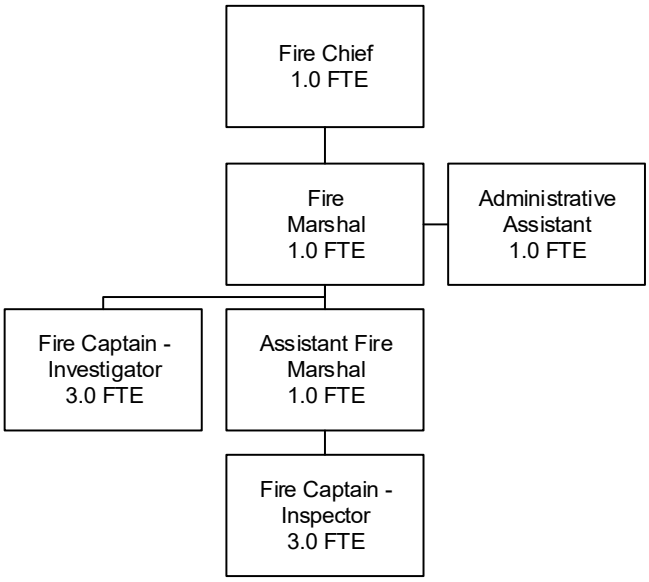


Figure 4: Fire Marshal's Office Organizational Structure

BUDGET

The CRFD's total budget is approximately $21.6 million. The total budget has remained nearly the same since FY 2019, having decreased by 1.1%. Within the total budget, personnel expenses have increased by 9.0%. Meanwhile, discretionary and other expenses have each decreased by over 30% since FY 2019, as seen in the table below.

Table 5: Cedar Rapid Department Budget History FY2019-FY2023

Category	FY 2019	FY 2020	FY 2021	FY 2022 Budget	FY 2023 Budget	% Change 2019 - 2023
Personnel Expenses	$17,137,059	$16,851,827	$17,699,213	$18,439,088	$18,677,863	9.0%
Discretionary Expenses	$1,587,293	$1,841,031	$1,152,932	$1,007,254	$1,096,298	-30.9%
Other Expenses	$2,571,823	$2,387,702	$2,515,224	$1,325,980	$1,382,750	-46.2%
Capital Outlay	$106,960	$38,543	$73,020	$0	$0	-100.0%
Transfers Out	$0	$5,000	$7,051	$5,000	$5,000	N/A
Total	**$21,403,135**	**$21,124,103**	**$21,447,440**	**$20,777,322**	**$21,161,911**	**-1.1%**

Operational Analysis & Recommendations

The CRFD is staffed with a highly skilled and well-educated workforce throughout its ranks. Over the past several years, the current command staff have implemented changes at the operations level that have improved the overall culture of the Department and the interactions between the firefighting crews and shifts. The strong culture combined with the highly skilled and well-educated workforce means there is a solid foundation for the Department to build upon and strengthen its service delivery to the community.

The following recommendations address opportunities to improve the efficiency and effectiveness of the CRFD. They represent changes to the organizational structure, process and policy improvements, enhancements to training and planning, and upgrades to equipment and technology. The recommendations were informed by the project field work, staff and stakeholder interviews, and through the incorporation of best practices research and analysis. The recommendations, when viewed comprehensively, provide a pathway to enhancing the Department's already robust service delivery to the community and will help sustain operations long term.

The analysis and recommendations have been categorized in the following manner:

- Staffing Coverage
- Training
- Fire Prevention and Inspections
- Equipment and Personal Protection
- Technology
- Organization and Staffing
- Station Location and Condition

STAFFING COVERAGE

Recommendation 1: Add up to six firefighters to reduce the overtime incurred by the Department.

The shift schedule for each firefighter is 24 hours on and 48 hours off. Based on this schedule and the number of shifts deployed (three), each firefighter can work approximately 2,920 hours per calendar year. However, every 54 days, each firefighter receives a "Kelly Day," an unpaid day of leave given to a firefighter at routine intervals when they would usually be scheduled to work to alleviate the need to pay Fair Labor Standards Act overtime for scheduled work shifts. After accounting for Kelly Days, each firefighter can work approximately 2,756 hours before using any additional leave time.

To meet the Department's minimum staffing standard of 33, the Department typically schedules 40-41 firefighters per shift. This means the Department is utilizing a staffing factor of 1.2. A staffing factor represents the number of employees needed to cover each position on a shift after accounting for leave. In other words, the Department is scheduling 1.2 employees to fill each position on a shift to provide adequate minimum staffing coverage. The total amount of leave/Kelly Day time accounted for annually using a 1.2 staffing factor is 487. However, despite this practice, the Department is incurring significant overtime annually.

To further analyze Department staffing, the Department provided sick leave usage from 2018-2022. This information is summarized in the following table.

Table 6: Department Sick Time Usage

Category	2018	2019	2020[3]	2021	2022	Average
Sick Time Usage (Hours)	22,719	21,859	12,252	23,764	23,505	20,820
Total Employees	148.5	148.5	148.5	148.5	148.5	148.5
Average Sick Time Usage per Employee	153	147	83	160	158	140

The average amount of sick time usage per employee between 2018 and 2022 was 140 hours. However, the data shows that sick leave usage in 2020 was approximately half a typical year, which is directly connected to the onset of the COVID-19 pandemic and, therefore, can be considered an outlier. During the period firefighters were unable to take leave for medical procedures such as surgery because hospitals were closed to those services. Eliminating the 2020 data from the calculation shows that the average sick time usage from 2018, 2019, 2021, and 2022 was approximately 155 hours.

In addition to sick leave usage, Department staff use variable amounts of vacation time based on tenure in the Department. According to the "Agreement between the City of Cedar Rapids and Cedar Rapids Association of Firefighters, Local No. 11" all full-time employees are entitled to the following vacation time[4]:

- After one year – one week
- After two years – two weeks
- After seven years – three weeks
- After 12 years – four weeks
- After 17 years – five weeks

Furthermore, each firefighter has variable continuing education requirements based on their respective Fire and EMS certifications. For example, the State of Iowa requires a minimum of 24 hours of continuing education for all fire department members each year[5], which does not include any additional requirements for Special Operations/Urban Search and Rescue certificates. The State also requires the following continuing education requirements to renew differing types of EMS certifications:

Table 7: Continuing Education Hours Requirement for EMS Certifications [6]

Core Topic	EMR/FR	EMT/EMT-D	AEMT	Paramedic
Airway/Respirations, Ventilations	1	1	2	3
Cardiology	2	6	7	9
Trauma	1	2	3	3
Medical	3	6	8	9
Operations	1	5	5	6
Total	**8**	**20**	**25**	**30**

Combined, the average sick time usage (155), hours associated with Kelly Days (164), and minimum continuing education requirement for fire (24) equals 343 hours annually. This means the Department's total annual leave using

[3] Impacted by the Covid-19 Pandemic
[4] A week of vacation time is three 24-hr days for shift personnel and 40hrs for day personnel.
[5] Iowa Administrative Code Chapter 251 Firefighter Training and Certification
[6] "Iowa EMS Certification Renewal Guidance," State of Iowa Department of Health and Human Services

a 1.2 staffing factor only leaves 159 hours to account for vacation usage and the variable amount of continuing education for EMS, Special Operations, and/or Urban Search and Rescue certifications.

To reduce the amount of overtime the Department is currently incurring, the Department should schedule 43 employees per shift, raising the Department's staffing factor to 1.3. This would raise the annual leave hours/Kelly Day time accounted for to 676 per firefighter. To achieve this revised shift schedule, the Department should seek to hire between three and six additional firefighters, allowing them to schedule 1-2 additional firefighters per shift.

TRAINING

Recommendation 2: Implement a training approach and program to enable consistent multiple company Department-wide training.

Firefighters require ample training to maintain skills and knowledge. As mentioned previously, the team that oversees the Department's approach to training consists of the Training Chief and two Captains. This group oversees fire suppression and EMS training as well as the shift leads for the six special operations training disciplines the Department focuses on.

Each October, the training team uses an annual assessment to establish the training approach and priorities for the following 12 months. This training approach includes a mix of apparatus related to training, fireground/emergency scenario training, EMS, and the following six special operations training disciples:

- **Ice and water** – rescue and recovery operations in, on, and around ice and water
- **Rope** – rescue and recovery operations using ropes
- **Trench** – specialized form of confined space rescue that involves digging out and shoring up sides of trenches
- **Confined space** – hazard identification as well as rescue and recovery operations involving confined spaces
- **HAZMAT** – hazard identification and handling of hazardous chemicals and materials
- **High angle** – rescue and recovery operations involving slopes of 60 degrees or greater

To plan and implement this training approach, the team faces several challenges. First, the City does not have an adequate and readily available training location. The City-owned training ground cannot be utilized extensively due to the burn tower being located too close to a highway and the training ground itself being situated on land earmarked to become part of a flood mitigation project the City is moving forward on. Instead, training is conducted at a variety of different locations as available. This involves using training facilities of neighboring jurisdictions, parking lots, forfeited structures that are scheduled for demolition, and any other structures they can find to use. Previously, the Department has partnered with Kirkwood Community College to conduct some training on their campus as well, which includes a training ground for its Fire Science Technology program.

Second, to help contain overtime costs, the Department has sought to conduct the majority of training courses on Tuesdays, Wednesdays, and Thursdays when employees are on duty. To maintain response times throughout the City, the agency trains with three units at a time. This is less than the effect response force (ERF) needed to mitigate a building fire.

Overall, the location and scheduling challenges faced by the Department have resulted in a reduction of total training hours over time. According to data provided by CRFD, the total annual training hours completed in 2021 were approximately 9% lower when compared to 2020 and, while the data at the time it was analyzed did not include the entire year, the trend for 2022 showed the total training hours was again likely to fall short of previous years.

While the total training hours has declined in recent years, it was clear to the project team during the project field work that the culture around and desire to train has not diminished. The Department can capitalize on this by implementing a new training approach that adds (ERF) scene management and operations training to the single company and special operations training courses already occurring. While the skills taught within the single company and special operations training are critical to focus on, it is equally important to expose the firefighters and officers to scene management and practical scenario-based fire ground operations. Therefore, there needs to be a balance. Furthermore, the addition of the multiple company training would bring back a significant number of training hours in a way that is credible and beneficial to both the Department and the community.

Fire incidents are complex and typically require several fire companies to conduct all necessary tasks in a safe and timely manner. ERF training exercises provide opportunities for fire companies to participate and practice together in realistic simulations. For the CRFD, utilizing multiple company training can enable crews to train with the actual crews from other stations they would likely see in the field when responding to a call for service. Additionally, multiple company training is an evaluative measure for the Insurance Services Office. ISO is an independent organization that rates fire departments against industry standards to determine the costs of property insurance. In total, ISO recommends 18 hours per firefighter for full ISO credit for multiple company training.

To enhance the current training approach, the CRFD would benefit from implementing a program to enable consistent quarterly or biannual multiple company Department-wide training. To do so would require addressing the scheduling challenges through the utilization of periods of overtime to generate coverage. The overtime coverage would not need to be full shifts. Instead, it could be done with eight-hour blocks wherein one or two crews of firefighters cover stations that are due to be involved in training exercises.

The cost for the proposed overtime coverage is approximately $2,000 per day. If each shift used two days to complete the multiple-company exercise, the total cost would be approximately $12,000. If this training is done quarterly, then the annual cost to the Department would be $48,000. If done bi-annually, the cost to the Department would be $24,000.

Recommendation 3: Secure access to a suitable live fire training facility.

As stated previously, one of the challenges to developing and implementing a consistent training program for the CRFD is the lack of facilities in a suitable location. The City-owned training ground is only able to be used on a limited basis due to its proximity to the highway, which also prohibits using the site's tower for live burn events. However, the training ground may be demolished in the near future to make way for the City's new flood mitigation system, meaning the limited amount of training happening there may longer be an option.

Without its own grounds as an option, the Department must be creative and find locations such as facilities in other municipalities, acquired structures scheduled to be demolished, or Kirkwood Community College to conduct training exercises. Each of those options comes with its own challenges. First, facilities in other municipalities are challenging from a logistical perspective. Acquired structures are terrific options for various types of training activities such as some limited live fires; however, there is not a consistent pipeline of acquired structures available to the Department, which makes it hard to have consistency. Kirkwood Community College is in the southern portion of Cedar Rapids. The school has a total enrollment of approximately 12,000 students. As a part of its course offerings, Kirkwood has a Fire Science Technology program where students can develop skills sought by entry-level firefighters. The school facilitates this program through both classroom work and hands-on work at its on-campus training facility. This facility has a burn room and pad capable of conducting small-scale live burns, as well as other amenities that would be useful to the CRFD.

The use of the Kirkwood training grounds by the Department has been limited for a variety of reasons. These include:

- Limited availability during the day due to usage by the school, other municipalities, and industries in the surrounding area.
- There is a cost associated with the use of the grounds.
- The inability to use CRFD staff to lead Department training.

With that said, moving forward, the Department would benefit greatly from securing access to a suitable training facility that would enable them to conduct a variety of pieces of training such as live fire. This can be done either through expanding its current relationship with Kirkwood or the City could pursue the development of a new training ground on an available piece of real estate.

Option 1: Expand Partnership with Kirkwood Community College.

The existing facility at Kirkwood Community College provides a suitable starting point for developing a consistent training approach. However, to address the challenges related to availability, costs, and instructors, the City would need to engage Kirkwood leadership to develop a mutually beneficial partnership/standing agreement between the two entities. This partnership would seek to expand the functionality of the grounds to ensure the Department and the school have all the necessary amenities, structures, etc., to facilitate a wide variety of training and ensure that these grounds meet all applicable National Fire Protection Association (NFPA) standards. Expanded access to Kirkwood Community College would also allow the Department to use its pipeline of acquired structures to focus specifically on search and rescue training, structural breaching exercises, ventilation training, victim removal, and much more as they become available.

The City could help fund a portion of any additions to the existing grounds to offset the costs the Department would incur using it moving forward. In this agreement, the Department would also need to have unfettered, consistent, and reliable access to the training grounds, including at night, and to use its own staff to serve as lead trainers and educators.

Option 2: Develop a City-owned multi-department training facility.

The second option would be for the City to pursue the construction of a new training facility. This option offers the ability for the Department to customize the grounds to meet their specific needs, ensures the Department has access to training grounds at any time, and creates opportunities to lease the facility out to other municipalities/industries to recover some costs. Additionally, this facility could be a multi-departmental facility that accounts for the needs of not only the Fire Department, but also the Police Department, Emergency Communications, Public Works, and any other City Department that would benefit from such a facility.

Fire-specific amenities that should be included should the City pursue the development of a multidepartment training facility:

- A Class A or B burn building constructed in accordance with NFPA 1402 Standard on Facilities for Fire Training and Associated Props.
- Classroom space for didactic portions of training that could be converted into space for command-and-control training and exercises.
- Office space for training officers.

- Special operations props that include confined space, high-angle rescue, trench rescue, vehicle and machinery extrication, and more.

In addition to these elements, a new training center could incorporate a used modular home that could be modified and hardened to enable firefighters to conduct elements of training that are currently being done in acquired structures. This would eliminate a heavy reliance on acquired structures, the availability of which is inconsistent. The modified/hardened modular home would work for search and victim removal, horizontal ventilation, firefighter escape, and other safety drills, and more.

To pursue the development of a City-owned multi-department training facility, the City would need to perform a space needs analysis to determine the various elements desired by not only the Fire Department but other City Departments that would benefit from such a facility. Once the space needs analysis is complete, the City can estimate costs and identify funding sources and a suitable location for the project.

Recommendation 4: Develop an external training plan and budget based on needs assessment.

Outside conferences and training seminars can be a great way to empower staff and develop their knowledge and skills around certain topic areas. Additionally, utilizing outside training in this manner allows organizations to send a variety of staff to external training courses and those employees can, in turn, share what they learned to the rest of staff members who were unable to attend.

Enabling staff to access training outside of the Department and City is a strength of the CRFD. However, there is no formal process in place that defines who is eligible to attend, what training aligns with Department goals, objects, and culture, and that identifies an annual budget allocation to fund employees attending outside training. The Department should correct this by developing an external training plan and budget based on the annual needs assessment the training team uses to plan for the upcoming year.

Guided by the needs assessment, this external plan should identify topic areas and conferences that align with the training priorities for the following year and meet the goals and objectives of the Department. Through identifying which outside training courses are the most applicable, the training team will be able to estimate a budget and determine which staff members are the most suitable to attend. The staff selection process should be intentional and based upon an attendee's ability and desire to absorb the information presented and facilitate what was learned to the rest of the Department. In the development of this plan, caution should also be exercised around training classes and seminars that are "trendy" in fire service but would have little benefit to the Department.

Recommendation 5: Engage with Human Resources to ensure City-wide training courses are being conducted with all Fire personnel on a regular basis.

The Human Resources Department at the City of Cedar Rapids is responsible for overseeing several training courses for the Fire Department such as anti-harassment and Family Medical Leave Act (FMLA) training. To ensure these City-wide pieces of training are being conducted with all Fire personnel regularly, the Department should engage with Human Resources.

Currently, the City's personnel policy manual governs harassment, and there is mandatory anti-harassment training for all personnel. During the project team's fieldwork, staff reported that anti-harassment training was done on-line through the City's training video series and conducted with Battalion Chief level employees and higher in person; however, the time to repeat this training is upcoming. In conducting this training again, it will be important to ensure

that it is done with all personnel and not just those at the Battalion Chief level or higher. This is because a strong anti-harassment policy, along with proper and mandatory training, helps to protect employees and prevent harassment incidents from occurring. Additionally, harassment training is an important tool for organizations and local governments to improve workplace culture and protect the organization from legal claims.

Target Solutions, a digital training tracking and delivery product, which is already used by CRFD, has products that can be delivered online to each employee on a regularly scheduled basis. These tutorials can be made mandatory for the entire Department on a schedule that meets the demands of the CRFD. These tutorials should be used in conjunction with live anti-harassment training on at least a bi-annual basis in lieu of the City's online platform, which does not align with Target Solutions

In addition to anti-harassment training, the Fire Department should engage with the Human Resources Department to conduct FMLA training for all employees. FMLA can provide eligible employees up to 12 weeks of unpaid, job-protected leave per year for a variety of reasons, including[7]:

- The birth and care of the newborn child.
- Placement with the employee of a child for adoption or foster care.
- To care for an immediate family member (i.e., spouse, child, or parent) with a serious health condition.
- Medical leave when the employee is unable to work because of a serious health condition.

Firefighting is a dangerous occupation with various health and safety risks, such as injuries, cardiac illness, and a higher risk of cancer. For this reason, regular and comprehensive FMLA training can be a significant benefit to the CRFD to ensure all personnel know their options if they experience a qualifying situation that would afford them FMLA protection.

FIRE PREVENTION AND INSPECTIONS

Recommendation 6: Work with high-risk industries to develop Fire Prevention Plans and specific HAZMAT and technical training programs.

Currently, the CRFD does not develop or maintain comprehensive fire prevention plans and specific HAZMAT and technical training programs with the various major industries in the City of Cedar Rapids. Instead, the Department relies on industry-driven safety programs and reports.

Cedar Rapids is home to numerous industries that utilize or produce as a byproduct a wide range of hazardous chemicals such as ethanol, acetic acid, suspended grain dust, ethylene oxide, and more. These industries are an important asset to the City, employing thousands of people, but the hazardous chemicals within pose a real threat to the surrounding community. For example, in 1919, the Douglas Starch Works plant in Cedar Rapids experienced an explosion that resulted in the death of 43 workers, with another 30 being injured. While industry-driven safety programs and inspections have come a long way since 1919, the Department still needs to be prepared both from a planning and training perspective to react to an emergency, and this preparation needs to go above and beyond the industry-driven safety programs through the development of Fire Prevention Plans and specific HAZMAT and technical training programs.
The reliance on industry-driven safety programs is understandable in the sense that the industries have a level of expertise around the chemicals and hazards that firefighters simply do not have. However, the challenge with this approach is, while the industries may provide detailed information on how to deal with certain chemicals, there could be structural issues and safety concerns that the industries may inadvertently overlook that would put first

[7] Family and Medical Leave (FMLA), U.S. Department of Labor

responders at greater risk. Additionally, it is unclear from the fieldwork whether the industry-driven safety plans are accessible and used to train firefighters to respond to an incident. At a minimum, once developed, the fire prevention plans should guide training activities and be available to company officers arriving on the scene to facilitate coordinating an emergency response.

The development of Fire Prevention Plans and specific HAZMAT and technical training programs will create opportunities for firefighters to build rapport with employers and increase firefighter safety. To maximize the effectiveness of its Pre-Fire Plan program, the Department should identify all the industries that utilize hazardous chemicals and processes that pose the greatest risk to firefighters and occupants. After identification, they should prioritize planning efforts based on the level of risk and work with employers to develop the pre-fire plans for those structures. Next, a protocol should be established for regularly updating pre-fire plans based on risk; for example, pre-fire plans for high-risk structures should be updated annually, while pre-fire plans for lower-risk structures could be updated after several years.

The primary purpose of a pre-plan inspection for firefighting crews is to become familiarized with building layouts and features in the event of an emergency. During a pre-plan visit, Fire Department staff identifies the most appropriate initial actions and procedures that should occur in the event of an emergency and develops a written plan to document this information. The pre-plan usually includes a physical drawing and description of key structural features such as an address, floor, and roof assembly construction, live and dead loads, as well as obvious signs of deterioration or structural weakening. It is important to note that pre-plan inspections are not enforcement operations and therefore do not evaluate a structure's compliance with applicable fire codes. If, during the pre-plan inspection, staff notice obvious infractions of the fire code, they are expected to notify Fire Inspectors of the violations, and a follow-up inspection/enforcement action will occur at a different date.

Additionally, it is important to ensure that first responders can reliably access pre-plans in the field. Without this information, a primary benefit of pre-planning is lost, and the Department is at greater risk of encountering unknown circumstances in a structure fire. Ensuring that pre-plans are readily accessible, and that staff understands how to use these documents by using the documents to inform training efforts will help preserve firefighter safety and maximize the Department's response to structure fires.

To assist with the development of the plans, there are software and online programs such as First Due™ that interact with most computer-aided dispatch (CAD) systems and use data previously acquired by building permits, assessors' data, and more without having to input that data. Programs such as these allow firefighters to focus on entering only pertinent data important to them related to the plan. Preparing pre-fire plans in this manner could significantly improve their reliability during emergency response and demonstrate program validity to firefighters conducting the pre-plans. This software provides significant ease in accessing data while responding or on the scene of incidents. No matter the method used to develop the plans, the NFPA 1620 Standard for Pre-Incident Planning recommends several key data points to be included in them. These include:

- Size
- Construction type
- Utility systems
- A contact person for the property
- Location of transformers and electric utility rooms
- Water and gas shutoffs
- Any available emergency power
- Location of compressed gasses, boilers and steam lines, and fuels

- Access points and obstacles
- Location of key/lock box
- Security features, including animals
- Other structures or people who could be exposed in an incident
- Any potential environmental contaminants
- GPS coordinates
- Occupancy and hours of operation
- On-site emergency response capabilities and emergency plans
- Means of egress
- Water supply systems
- Location of vents
- Any hazardous materials on-site

Recommendation 7: Adjust the inspection model to improve the Department's ability to conduct inspections.

Inspectors serve an important role within the CRFD. They are responsible for examining buildings to find hazards and ensuring the buildings are kept up to date regarding specific state, local, and national fire codes and standards. Within the CRFD, there are three dedicated inspectors who report to the Assistant Fire Marshal. In total, they are responsible for inspecting approximately 4,500 existing occupancies on an annual inspection cycle. The total number of occupancies in the City is on the rise, with a high volume of new building permits coming through in recent years.

Currently, the Department has been unable to meet the annual inspection schedule for all occupancies. Anecdotally, staff reported the ability of an inspector to complete roughly 660 inspections a piece per year, which results in an estimated total of almost 2,000 annual inspections, or less than half of the total occupancies in the City. As a result of this shortfall, using a risk-based approach, the fire investigators should continue to inspect the lower risk occupancies potentially at increased inspection intervals.

With that said, an effective approach utilized by cities across the country is to prioritize inspections by classifying occupancies based on risk profiles created by considering criteria such as:

- Number of occupants
- Square footage
- Nature of work conducted on-site
- Presence of hazardous materials

This approach should be replicated by the CRFD and entails reviewing occupancies and assessing the risks associated with each one. Higher-risk occupancies should continue to be inspected annually, whereas lower-risk occupancies could be inspected once every two to three years. To develop the risk profiles for each type of occupancy, the Department should utilize existing interactions and utilize the revised fire prevention plan process as discussed in the previous recommendation. An example of the prioritization of occupancies and revised inspection frequency is illustrated in the table below.

Table 8: Inspection Frequency by Occupancy Types

Occupancy Type	Description	Inspection Frequency	Risk Profile
Assembly	Places where groups of people gather for worship, entertainment, dining, drinking, civic purposes, etc.	Annual	High
Office	Buildings used for professional, service, or office-based businesses including banks, government offices, etc.	Once every three years	Low
Education	Schools and daycare facilities	Annual	High
Fabrication or Factory	Buildings used for manufacturing, repair, fabricating, processing, finishing, etc.	Bi-annual (unless they store or utilize hazardous chemicals)	Moderate
High Hazard	Businesses that manufacture, process, generate, or store materials that constitute a physical or health hazard	Annual	High
Institutional	Businesses that care for people in a supervised environment such as hospitals, assisted living facilities, etc.	Annual or bi-annual	High
Mercantile	Retail and wholesale stores, department stores, drug stores motor fuel dispensing stations, etc.	Once every three years	Low
Residential	Two-family and multifamily housing	Annual	Moderate
Storage	Business that store non-hazardous materials such as self-storage facilities, warehouses, etc.	Once every three years	Moderate to Low
Utility and Miscellaneous	Accessory structures not otherwise classified	Once every three years	Low

Adjusting the inspection frequency through risk evaluation and prioritization would help align the inspection process with the Department's fire prevention activities, particularly for Cedar Rapids' high-risk industries. It also helps the Department fully evaluate how to staff inspection activities. The Department should seek to develop an approach wherein the existing resources can achieve annual inspection goals under a revised approach. However, if the total number of properties is still too significant for existing staff to inspect accordingly, Department leadership can explore options and costs related to adding staff, utilizing shift inspectors, or other options to create additional staff capacity related to inspections.

In addition to adjusting the inspection frequency based on occupancy and risk, the Department should ensure staff is using their time efficiently to maximize the number of inspections they can complete. For example, the Assistant Fire Marshal should ensure each inspector is recording and tracking completed inspections while in the field instead of waiting until they are back in the station to enter the information into the Department's database.

EQUIPMENT AND PERSONAL PROTECTION

Recommendation 8: Ensure each firefighter has a second set of equipment that is compliant with NFPA standards.

In terms of personal protective equipment, most of the firefighters in the Department are not equipped with a second set of structural fire-fighting PPE, also known as "bunker gear." If a firefighter does have a second set of bunker gear, it is more than likely to be piecemealed together from spare gear found in storage and to be ill-fitting, damaged, or

beyond its useful lifespan. Without a proper second set of bunker gear, crews may be wearing contaminated equipment for extended periods of time.

Firefighters are routinely exposed to various harmful, highly toxic substances in response to fires, HAZMAT, and other incidents. This exposure intensifies through firefighting gear that becomes contaminated with products of combustion, polycyclic aromatic hydrocarbons, and other cancer-causing agents embedding and even saturating PPE. Exposure to this dirty, soiled, and contaminated PPE is an increasing concern for the entire fire service.[8] In fact, firefighters have a 9% greater chance of being diagnosed with cancer and a 14% greater chance of dying of cancer.[9] Furthermore, the need for a proper second set of bunker gear is compounded by there being only three extractors across the City for equipment decontamination. Extractors are specialized commercial washing machines designed specifically for cleaning firefighter gear. With the limited number of exactors, crews may not be able to get their primary set of gear clean before needing it again. In those instances, a second set of bunker gear would give them a clean set to wear to keep them from being unnecessarily exposed to harmful substances and contaminants. It is essential that this second set also fit properly and be in good working order to provide an adequate amount of protection regarding not only harmful contaminants, but also high temperatures and other hazards faced by the wearer.

The Department should develop a funding plan to equip each firefighter with a second set of bunker gear. The total cost to equip the entire Department with a proper second set of bunker gear would be approximately $650,000 or $4,000 per set of gear. This cost should be broken down over the course of three years, bringing the annual cost to approximately $225,000. Spreading the procurement period over three years aligns it with the current Department's replacement cycle for equipment. To offset costs, the CRFD should also apply for grant funding through the Federal Emergency Management Agency's (FEMA) Assistance to Firefighters Grant program. This program funds equipment and resources needed to equip and train emergency personnel, support community resilience, and enhance efficiencies.[10]

Recommendation 9: Ensure each firefighter is equipped with ballistic personal protection equipment.

In addition to fighting fires, the CRFD responds to numerous types of emergency situations, including shootings, stabbings, and other violent crimes, that could put a firefighter in harm's way by means of a flying projectile or blunt-force instrument. A recent and tragic example of this can be found with the mass shooting event that took place in April 2022 at the Taboo Nightclub and Lounge in downtown Cedar Rapids, which left three people deceased and another nine injured.[11] While no firefighters were harmed during this specific incident, it stresses the need for emergency responders to have appropriate ballistic protective equipment (BPE) in addition to their standard bunker gear.

The Department should develop a funding plan to equip each firefighter with appropriate PPE and BPE that meets appropriate standards, such as the National Institute of Justice Standard 0101.06 and NFPA 3000 Standard, for an Active Shooter/Hostile Event Response (ASHER) Program to protect personnel exposed to ballistic risk or other hostile threats in accordance with expected duties. The Department will be providing ballistic gear for each seated

[8] Calvillo, A., Haynes, E., Burkle, J., Schroeder, K., Calvillo, A., Reese, J., & Reponen, T. (2019). Pilot study on the efficiency of water-only decontamination for firefighters' turnout gear. Journal of occupational and environmental hygiene, 16(3), 199–205.
[9] "Fire Cancer Study," National Institute for Occupational Safety and Health (NIOSH), 2010
[10] "Assistance to Firefighters Grants Program," FEMA.gov
[11] KCRG Staff, "Third Person Dies Following April Taboo Nightclub Shooting, Charges to be Updated," KCRG-TV, published July 29, 2022, accessed February 22, 2023

position, which is the first step of complete protection. This will take a phased approach beginning in fiscal year 2024. However, research supports that each firefighter should be properly fitted for ballistic gear to provide the highest level of safety.[12]

Like the second set of bunker gear, the Department should plan for the expenses of the new equipment over a three-year period and align it with the current Department's replacement cycle for equipment. The Department may also be eligible for grant funding to offset some of the expenses related to purchasing PPE and BPE.

Recommendation 10: Develop a comprehensive equipment decontamination policy and protocol.

The CRFD currently does not have a formal comprehensive policy or procedure for decontamination and inspection of the firefighter protective ensemble that is worn on fire and other hazardous responses. Instead, the Department has loosely defined/followed decontamination protocols for the fireground immediately following exposure, including separating contaminated gear for transportation back to the station and cleaning the highest-risk skin areas with wipes. Upon return to the station, some firefighters indicated showering and placing their second set of bunker gear into service so the first set can be decontaminated. However, as stated in Recommendation 8, few firefighters have an adequate second set of gear, meaning the contaminated set is being worn for extended periods of time and putting the health and safety of the firefighters at risk.

Laundering for bunker gear is not readily available for all stations, as extractors are only located in three of the nine stations across the City. The frequency and times in which firefighters reported taking their gear to an extractor varied and included the occasional use of their private vehicles on off days, which is not in compliance with NFPA 1851, which states, "Soiled or potentially contaminated ensembles or ensemble elements shall not be brought into the home, taken to public facilities, or transported in private vehicles.[13]" Additionally, several of the CRFD stations do not have an ample amount of separation between the living areas and areas used for showering and decontaminating equipment. Any additions to these structures or future station design should include a clean area separation for personal and gear decontamination and living areas compliant with Chapter 5 of NFPA 1581 (Fire Department Facilities).

NFPA 1851 states:

> *The organization shall develop and implement a program for the selection, care, and maintenance of structural firefighting ensembles and ensemble elements and proximity firefighting ensembles and ensemble elements used by the members of the organization in the performance of their assigned functions. This program shall have the goal of providing structural firefighting ensembles and ensemble elements and proximity firefighting ensembles and ensemble elements that are suitable and appropriate for the intended use; maintaining such protective ensembles and ensemble elements in a safe, usable condition to provide the intended protection to the user; removing from use such protective ensembles and ensemble elements that could cause or contribute to user injury, illness, or death because of their condition; and reconditioning, repairing, or retiring such protective ensembles and ensemble elements.*

Using this as a guide, the CRFD should develop a revised comprehensive equipment decontamination policy and protocol starting from the incident and ending with fully cleaned and inspected gear. The plan should ensure the consistent execution of the decontamination process and account for the packaging and transportation of

[12] "National Institute of Justice Body Armor Guide: Selection & Application Guide 0101.06 to Ballistic-Resistant Body Armor," U.S. Department of Justice, Office of Justice Programs, December 2014.
[13] NFPA 1851

contaminated gear to be picked up in non-personal vehicles and delivered to an extractor station where qualified personnel would inspect and wash the gear. If necessary, the Department could also identify regional vendors where the gear could be shipped to a cleaning facility and returned to the stations in a timely manner.

The Command Staff should ensure the revised process and protocols are being followed particularly in combination with the implementation of Recommendation 8, which accounts for each firefighter being issued an adequate second set of bunker gear.

TECHNOLOGY

Recommendation 11: Pursue traffic preemption technology to improve response times.

The City of Cedar Rapids does not currently have Emergency Vehicle Preemption (EVP) within its traffic system. EVP operates in coordination with the traffic signal system in a municipality. It is designed to send a signal to the traffic system that gives an emergency response vehicle a green light on their approach to a signalized intersection while giving a red light to all other conflicting approaches. There are several types of EVPs on the market. More simple versions include having an infrared emitter positioned on an emergency vehicle, such as a police cruiser, fire apparatus, ambulance, etc., that sends a signal to a receiver installed on a traffic signal to change the signal and clear traffic for the emergency vehicle to pass safely and quickly. More complex EVPs can be combined with GPS systems that track vehicle location and predict routing to an emergency. The more complex systems can also account for multiple emergency vehicles coming from different directions to safely clear intersections.

The utilization of an EVP to provide emergency vehicles a green light at intersections throughout the City of Cedar Rapids can reduce driver confusion, reduce conflicts in intersections, and improve emergency response times on average 20% when the entire response route is covered by an EVP.[14]

Additionally, although the CRFD does not have a high accident rate for emergency response vehicles, communities that utilize EVPs generally see a reduction in the number and risk of emergency response vehicle accidents at intersections. Furthermore, the technology can also be applied to City departments outside of Police and Fire, such as Public Works, which could utilize the technology on snowplows.

The CRFD should develop a funding plan to incorporate EVP technology into its traffic system. The cost of the system is estimated to be approximately $1,500 per vehicle and approximately $5,000 per intersection. However, it benefits not only the Fire Department, but also the Cedar Rapids Police Department and the Public Works Department, meaning the cost could be split among the users. The City could also negotiate with Area Ambulance to offset a portion of the costs of the systems. The City should also consider emergency preemption as a part of deploying a local Intelligent Transport System (ITS) architecture. The City could leverage grant and program funding related to ITS-based emergency response, congestion management, public works, and clean air by doing so.

To minimize the annual budget implications of implementing the EVP, the installation could be done incrementally, starting with identifying key/critical/dangerous intersections for installation and installation near fire stations. Future installation of the EVP at intersections could then occur as a part of new developments throughout the City. Additionally, training for all staff utilizing the system will be paramount and policies will need to be put in place to avoid the abuse of the system.

[14] "Traffic Signal Preemption for Emergency Vehicles: A Cross-Cutting Study," U.S. Department of Transportation, January 2006

Recommendation 12: Activate Automatic Vehicle Location (AVL) for dispatch purposes to help reduce response times.

Currently, Cedar Rapids dispatch personnel can see the location of apparatuses on a computer screen through the City of Cedar Rapids; however, in most cases when a call for service comes in, dispatchers are assigning the calls based on the station assigned to that call's territory and not by the vehicle located closest to the call.

Automatic Vehicle Location uses GPS to pinpoint the exact location of an emergency vehicle and therefore allows the Computer Aided Dispatch system to accurately track vehicle location and coordinate emergency efforts to ensure the fastest possible response times. Vehicles are automatically assigned calls based on their location and not based on station assignments. AVL can also be combined with CAD programs to be a data source for analyzing Department operations and agency performance.[15]

Activating AVL will require the City of Cedar Rapids to engage with its CAD vendor to build new priorities and algorithms, as well as perform some reprogramming of the CAD program. Additionally, using AVL can cause units to be relocated far from their original station area periodically. However, AVL would benefit not only the Fire Department, but also the Police Department and potentially the City's ambulance service, allowing for a coordinated emergency response that has the fastest possible response times to protect public health and safety.

Recommendation 13: Implement a fleet fuel card system for apparatus fueling.

When it comes to the refueling of apparatuses, firefighters for the CRFD currently must drive to the City of Cedar Rapids City Services Center. The City Services Center is located within the service area of Station 5, meaning some crews, particularly Station 9 crews, are driving a significant distance to refuel, leading to a significant amount of out-of-response area time.

Taking an apparatus out of the service area for refueling can impact the response time should a call for service come in during that trip, as the responding crew will be coming from a different station. To limit this and remove the need for crews to drive apparatuses to the City Services Center for refueling, the Department should implement a fleet fuel card system.

Fleet fuel cards are commonplace tools used by many fire departments to alleviate the need to relocate fire apparatuses from their designated response area to refuel. These cards can account for the tax-exempt status of the fire service and can be incorporated into the Department's fleet tracking system to allow for easy tracking of fuel use and expenses for each vehicle. Fleet fuel cards are accepted at almost any fuel station anywhere and are used just as a credit card would be at a fuel pump, apart from the pump asking for vehicle mileage, driver number, and unit number for tracking purposes.

ORGANIZATION AND STAFFING

Recommendation 14: Create a rotational Special Projects and Administrative Captain position.

The command staff within the CRFD includes the Fire Chief, Assistant Fire Chief-Operations, Assistant Fire Chief-Support Services, and the Fire Marshal. Within this structure, the Fire Marshal oversees the fire prevention activities of the Department, the Assistant Fire Chief-Support Services oversees the community engagement and education

[15] "Automatic Vehicle Location Capabilities for Emergency Services," U.S. Department of Transportation

efforts, and the Assistant Fire Chief-Operations essentially oversees all day-to-day operations. This arrangement empowers the Chief to be able to strategically manage, organize, and evaluate the Department.

While the current structure of the Department's top-level leadership is effective, the oversight of the day-to-day operations represents a significant administrative workload, limiting the Assistant Fire Chief-Operations' capacity to focus attention on any special administrative projects the Department may wish to pursue, including the implementation of the recommendations contained within this report. Additionally, the Department has limited career advancement opportunities with broad administrative and operational responsibilities. Without these opportunities, the Department risks losing institutional knowledge and management expertise should any of the top leadership positions become vacant.

To create additional capacity and open a career advancement opportunity, the Department should create a 5-year rotational Special Projects and Administrative Captain Position. This position would be responsible for taking on some of the workload demands being placed on the Assistant Fire Chief-Operations and be dedicated to special projects for the Department such as:

- Program Appraisal Process
- Overseeing the reaccreditation process
- Equipment and gear procurement, maintenance, and replacement
- Pursuit of additional grant opportunities
- Annual physical scheduling and health assessments
- Diversity, Equity, and Inclusion initiatives

Fire personnel wishing to take on the rotation would gain firsthand experience with administrative and operations related duties, providing the Department fertile grounds to identify its future leaders and creating succession planning for Assistant Chief opportunities that may arise.

The salary for this position should be determined by the City Human Resources Department and Department leadership based on the City's latest salary ordinance, employer taxes, employee retirement contributions, health insurance/other benefits, and union contract. While the creation of this position does require some investment, it will improve the overall leadership capacity of the Department, focus attention on special administrative projects, and create a key career advancement opportunity.

Recommendation 15: Create a Plans Examiner position under the Fire Marshal.

Plan review is a critical part of the development process and a key fire prevention activity. For a Fire Department it involves reviewing building plans for proper egress and ingress for any necessary emergency response activities, ensuring buildings have the proper fire detection and suppression systems, fire walls, etc., based on the type of occupancy and building size, checking for hazardous storage, and more. The process involves coordination and working with City zoning personnel, architects, engineers, and residents.

For the CRFD, plan review is primarily handled by the Assistant Fire Marshal, with some assistance from the Fire Marshal and line staff. In recent years, the number of new building permits in the City of Cedar Rapids has hit all-time highs, meaning the number of plans needing review is rising. The amount of plan review required has strained available capacity within the Fire Prevention staff and affected the Assistant Fire Marshal's ability to assist with inspections and other responsibilities of his office.

Furthermore, as discussed previously in this report, the City of Cedar Rapids has several industries that have unique hazardous materials and operations within their facilities that require specialized knowledge and training. Currently, the Department relies on these industries to ensure that their practices are compliant with any applicable codes. However, the Department should be more knowledgeable about the risks these industries pose and be able to have a level of expertise in-house when performing any plan review associated with these industries.

To create both capacity for plan review activities and gain that in-house expertise regarding hazards, the Department should create a Plans Examiner position that reports to the Fire Marshal. In addition to plan review, this position should also coordinate the relationship with local industries, assist in the creation and evaluation of pre-incident plans, and lend expertise to other areas of the Department, such as training, as necessary.

To fill this position, the Department should first seek to add an experienced plans examiner with hazardous materials and special manufacturing hazards experience. Such an individual would most likely be certified from the International Code Council, NFPA, and/or the National Fire Academy and have additional qualifications from the NFPA and National Institute for Certification in Engineering Technologies (NICET). Also, adding an experienced person would mean they could begin their duties immediately and would not require extensive education and on-the-job experience. The salary for the position would need to be competitive with other fire service positions comparable to this position and based on the experience level of the individual hired.

In the future, the position of Plans Examiner position could serve as a career development opportunity for a line firefighter. Line firefighters know what to expect during a call and have valuable insights to response issues during plan review. However, a promotion would require the firefighter to receive additional training through the International Code Council, NFPA, and the National Fire Academy.

Recommendation 16: Seek opportunities to increase diversity throughout the Department.

At the City of Cedar Rapids, there is a commitment to being an inclusive and equitable City that strives to promote and enhance diversity, equity, and inclusion throughout each City department, including the CRFD.[16] Governments with a diverse and inclusive workforce promote trust by being reflective of the communities that they serve.

Fire service across the country has historically been challenged from a diversity perspective. However, according to the Guide for Creating a Diverse and Inclusive Department, a publication of the International Association of Fire Chiefs, "A successful fire-rescue organization is determined by its overall culture and environment. Leaders who create a culture of diversity with inclusion not only improve their department but also their community. It is not enough to just have policies and procedures in place. It takes a commitment to diversity strategies and inclusive actions through education, leadership, accountability, and ownership by membership throughout every level of the organization."[17]

One of the most important methods the Department can leverage to shape its workforce to be more reflective of the Greater Cedar Rapids Community involves creating a plan to increase diversity at all levels of the Department. The creation of the plan should be led by the Assistant Fire Chief for Operations, the Training Chief, and the Special Projects and Administrative Captain and it should include strategies to address recruitment, retention, and promotion.

[16] "City Manager's Office," City of Cedar Rapids
[17] "Guide for Creating a Diverse and Inclusive Department," International Association of Fire Chiefs, August 2020

In terms of recruitment, the International Association of Fire Fighters has a "Recruiting Diverse Responders Toolkit." This toolkit presents several strategies the CRFD can pursue, including:[18]

- Working with local news outlets to promote diverse recruitment efforts.
- Increasing the use of imagery of diverse staff and community members on public-facing communications (websites, social media, etc.).
- Utilizing word of mouth to spread information about recruitment efforts.
- Increasing visibility and participation in community events and in areas of town with diverse populations that are not currently represented in the Department.
- Working with local community leaders, organizers, churches, schools, and more to promote recruitment efforts.
- Consider adding programs to assist recruitment efforts such as a mentorship program, fire camps to introduce non-traditional recruit candidates to the fire service, and/or candidate preparation workshops to assist with test taking.

In addition to expanded recruitment efforts, the Department should reevaluate the existing requirements for firefighter candidates. The current civil service process for new hires includes a list of approximately 100 candidates. These candidates complete a written examination and a Candidate Physical Ability Test (CPAT). Outside of the testing, the CRFD requires candidates to be certified and possess a State of Iowa or National Registry Emergency Medical Technician (EMT) card, as well as have a current Cardiopulmonary Resuscitation (CPR) certification card prior to being hired.[19] The EMT certification can be a barrier to having a diverse candidate pool to select new firefighters. To open the candidate pool and increase the number of diverse candidates the Department can choose from, the EMT requirement should be eliminated and a focus placed on bringing in candidates with applicable backgrounds such as military service or who have achieved a desired level of education that are trainable. The Department could then provide EMT training to those hired.

Expanding recruitment efforts and eliminating barriers to entering the Department will help diversify the lower ranks within the Department. Once that is done, the Department should nurture that diversity through training and retention of staff as well as identify opportunities for promotion that ultimately diversify the command staff.

[18] "Recruiting Diverse First Responders Toolkit," International Association of Fire Fighters
[19] "Employment," Cedar Rapids Fire Department

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Station Location and Condition Analysis

The CRFD has divided the City of Cedar Rapids into nine different fire districts, each with a station, as seen on the following map.

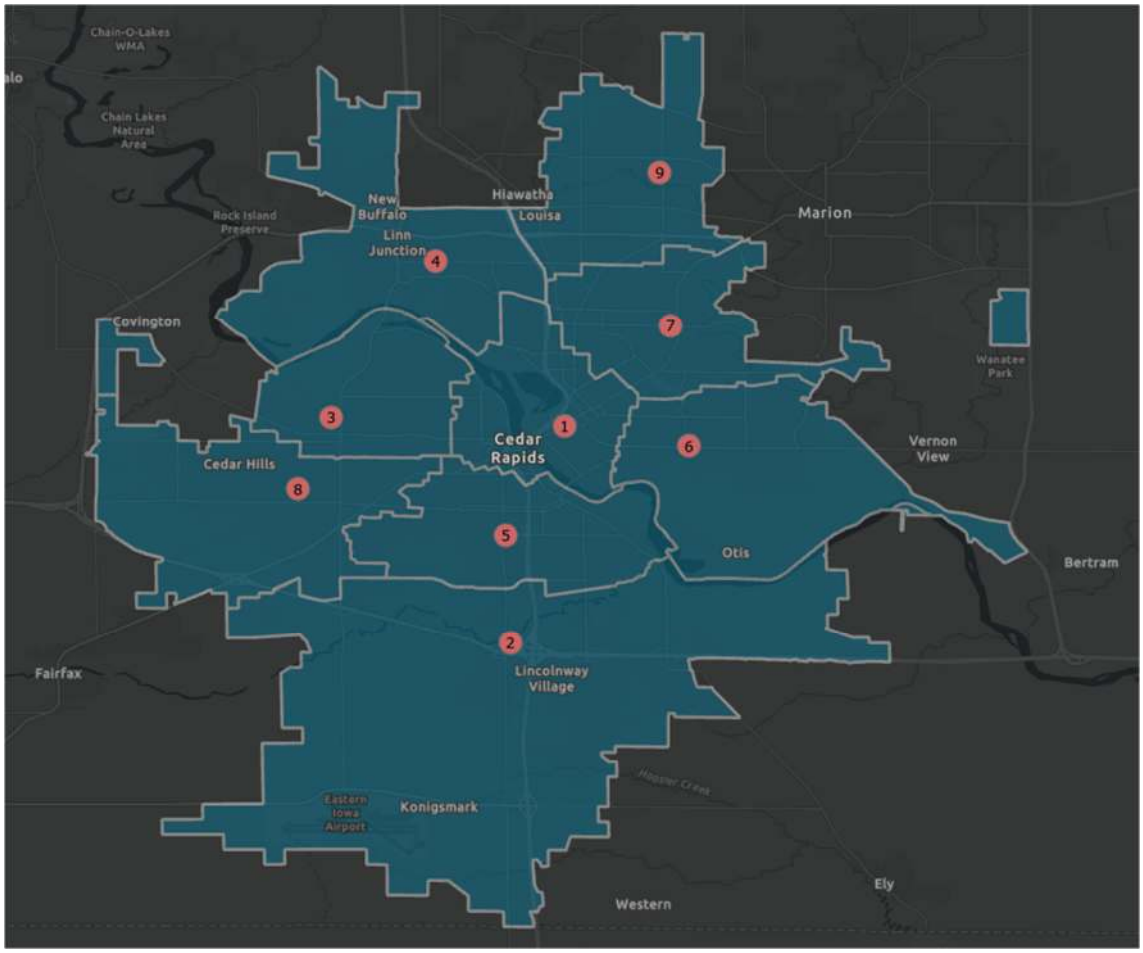


Figure 5: Map of Fire Stations within the City of Cedar Rapids

To analyze the location of each station within these districts, the City provided the project team with emergency call data from 2017-2022 that included over 53,600 calls for service. The following figure shows the density of these calls throughout the City.

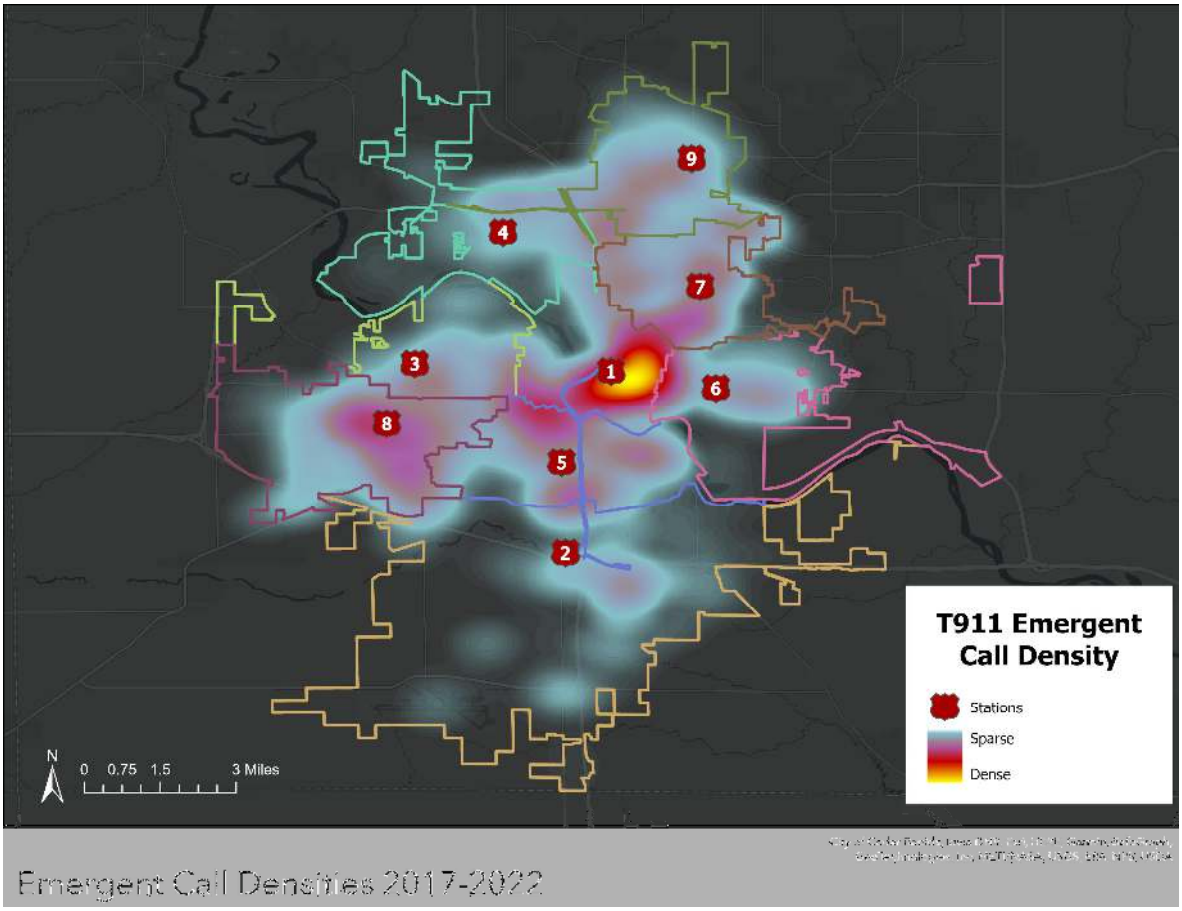


Figure 6: Call Density For Emergency Calls for Service from 2017-2022

The brighter colors of red and gold indicate the largest concentration of calls. Unsurprisingly, the largest concentration is centered in District 1, the urban core of the City of Cedar Rapids, and the location of the Fire Department's Station 1 and headquarters facility.

The project team used the call data to examine how the Department is currently responding to calls, given the location of each of the City's nine fire stations. This analysis aimed to determine a baseline to measure how response times would be impacted if one or more stations were relocated and help inform future station planning. The results were broken down using five-minute, eight-minute, and 12-minute benchmark times from when the call is dispatched to arrival of all units on site to measure the Fire Department's performance. The analysis found that the Department responded to 77% of all calls within five minutes, 96% within eight minutes, and 99% within 12 minutes between 2017 and 2022. Furthermore, additional analysis of the current Cedar Rapids roadway system revealed that current stations are allocated so that all calls within the service area limits are within reach in a 12-minute drive time. This is illustrated in the figure below.

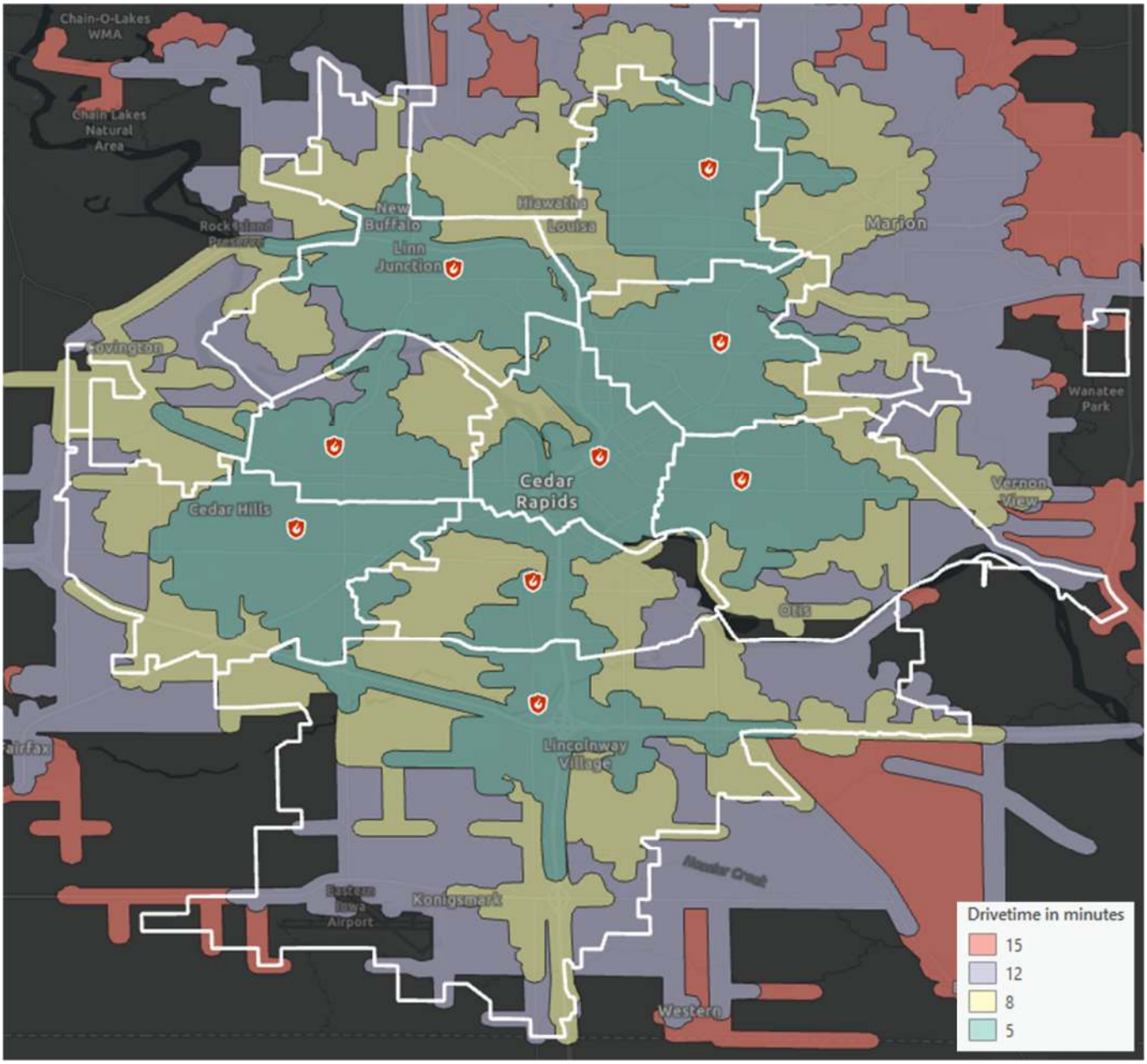


Figure 7: Average Drivetime from all Stations based on City's Road Network

The result of this analysis shows that the stations throughout the City are currently located in areas that allow the Department to respond effectively to calls for services. Additionally, pursuing implementation of the traffic preemption technology, as discussed in Recommendation 11, and Automatic Vehicle Location technology, as discussed in Recommendation 12, could also further reduce response times.

ANALYSIS BY FIRE DISTRICT

The City of Cedar Rapids Fire Stations vary by both age and condition. During the fieldwork, the project team visited each of the nine stations to gather anecdotal information and in-person observations regarding both the structural condition of each station as well as the location relative to activity centers, businesses, schools, and more. This information was combined with the spatial analysis from the call data received from the City.

The following analysis will provide additional detail on the location of each station within their respective district and some observations regarding the structural condition of each station. These observations will be helpful to the

Department and City Leadership to prioritize facility investments. However, the City should also perform a condition assessment starting with Stations 5 and 6, both of which were constructed in 1957 and were observed to have structural issues to be addressed, to fully understand the deficiencies within each station and develop a funding plan to either make facility repairs or plan any necessary new development.

Station 1

Station 1 (Central Station) is one of the newest in the City of Cedar Rapids, constructed in 2013. It serves as the headquarters for the CRFD, with offices for the administrative and Fire Marshal staff. The Station also houses three units: Engine 1, Rescue 1, and Truck 1. Rescue 1 responds to all structure fires, special operations incidents, and auto extrication calls. Truck 1 is a 100 ft platform truck that responds to all structure fires.

In addition to the units, the Battalion Chief shift commanders that oversee all fire suppression and EMS operations are assigned to this station and it is one of the three stations in the City with a gear extractor, as discussed previously in this report. Finally, Station 1 is where the Department stores all of its specialized equipment, including but not limited to:

- Water Rescue Boats
- Brush Truck 1
- Special Operations Equipment
- Haz Mat Equipment
- Reserve Engine
- Reserve Rescue



Figure 8: Fire Station No. 1

Station 1 is centrally located within the City's Central Business District. This portion of the City features several historic structures built in the early 1900s. The station's location enables the Department to respond quickly and effectively to these and the other structures downtown to protect both public safety and properties. This can be seen in the map below, which shows the concentration of emergency calls in District 1 from 2017 to 2022.

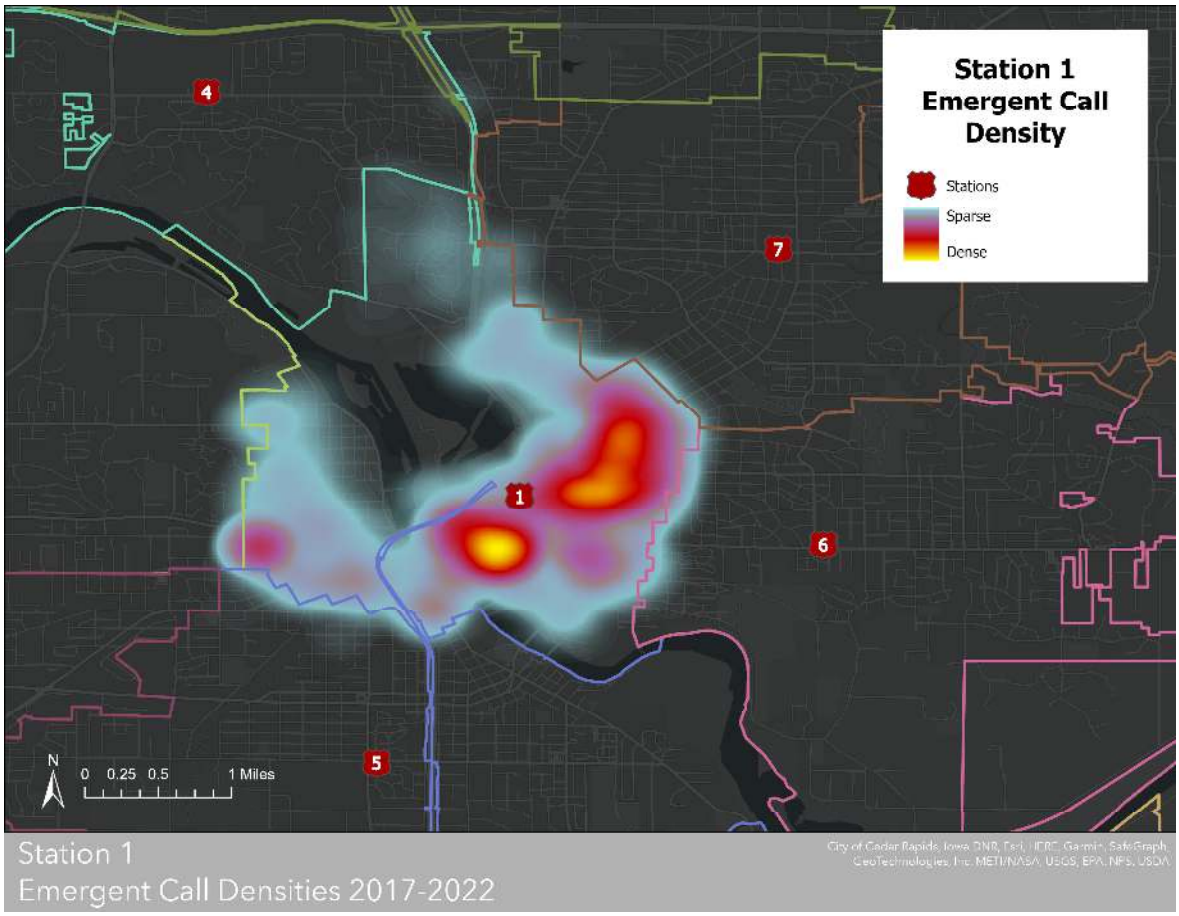


Figure 9: Call Density in Fire District 1

The call data clearly indicates that the Station is ideally located when considering where the calls for emergency services are coming from within the district.

In terms of overall condition, the Station does not have any noticeable structural issues the project team felt needed to be addressed.

Station 2

Station 2 was built in 1986 and is in the southwest quadrant of Cedar Rapids. It houses the paramedic engine unit, Engine 2, the first engine company to respond to incidents at the Eastern Iowa Airport, Kirkwood Community College, and the ADM ethanol plant.



Figure 10: Fire Station No. 2

The call density data illustrated in the map below shows that the Station is located toward the northern district boundary. However, the portion of the City the station is in is one of the City's growth areas. Relocating the station to the south or southeast should be considered to center the station within the district, capture future development, and balance coverage with District 5, which is in relatively close proximity to Station 2, as seen on the map.

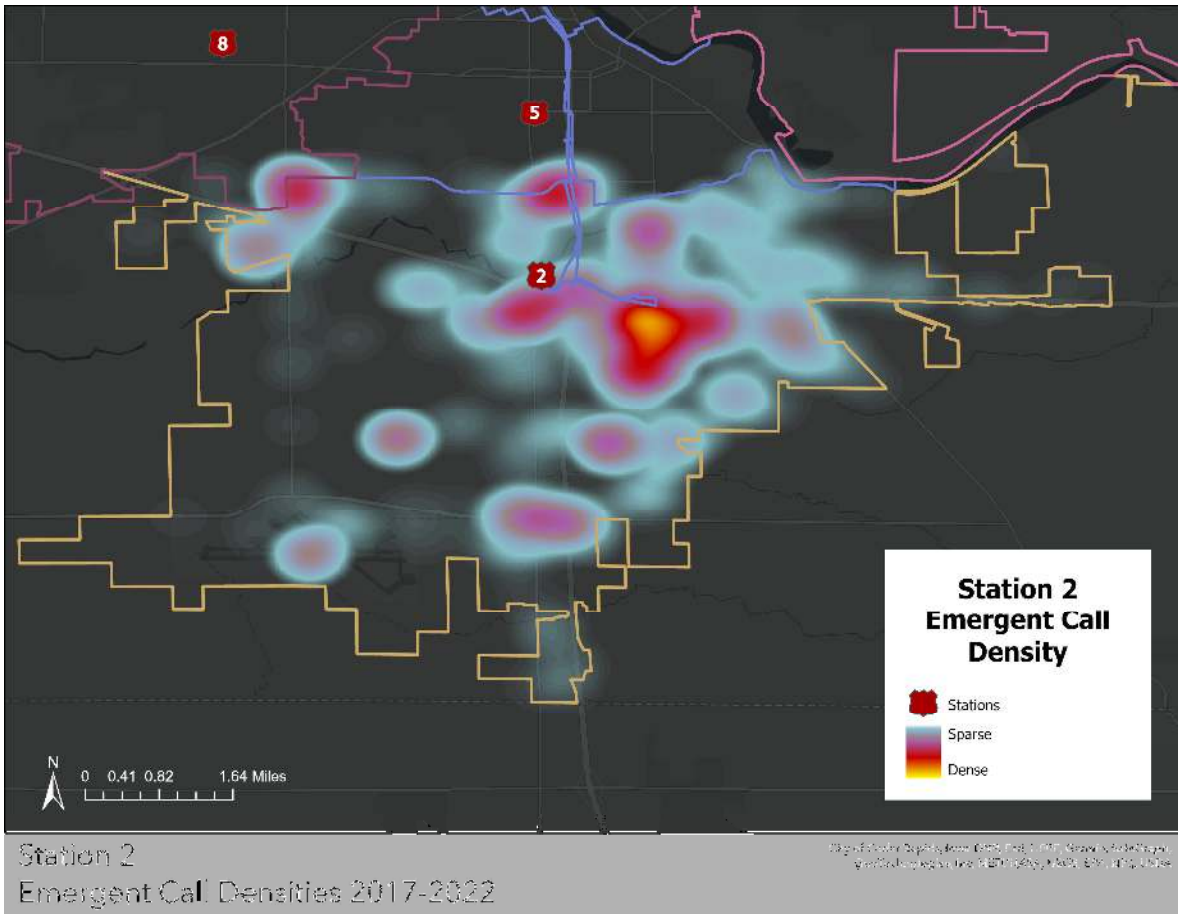


Figure 11: Call Density in Fire District 2

During the project team's fieldwork, it was reported that the fire stations built in the 1980s, which includes Station 2, were only intended to be 20–25-year buildings, meaning Station 2 is at or near its useful life. However, while the current floor plan constrains free movement throughout the station and limits the storage available, including space for additional or reserve apparatus, the building had no major structural defects. Additionally, the firefighters manage

to make do with the available space as best they can. Looking forward, increasing the footprint of the building would make more space for storage and a workout area and allow the station to accommodate an extractor. Since the Station was built, the size of apparatuses has also increased, meaning bay space in this station has been further reduced over time.

Station 3

By 2013, the western portion of Cedar Rapids had grown significantly, adding over 20,000 residents in the previous 15 years. This growth led the Department to prioritize the construction of a new fire station, Station 3. Station 3 is in the northwest quadrant of the City and was completed at the end of 2013, joining Station 1 as one of the newest stations in the City.



Figure 12: Fire Station No. 3

Despite being located just 1.6 miles from Station 8, nearly 20% of all calls for service originate in District 3,[20] the highest concentration being from the district's southern and southeastern borders as shown in the following map.

[20] "Northwest Fire Stations," City of Cedar Rapids Website

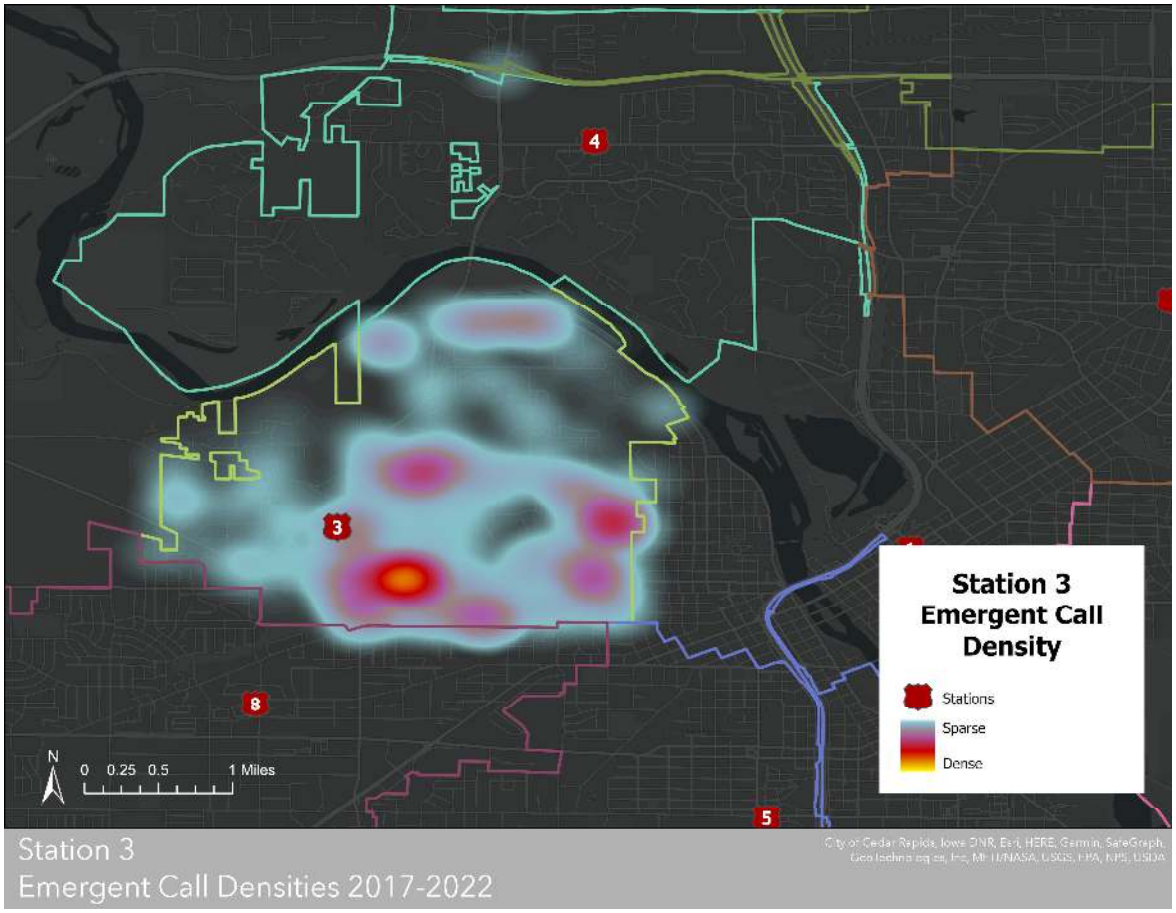


Figure 13: Call Density in Fire District 3

Based on the call density data, the station is located well to respond to the vast majority of calls in the area. Furthermore, having been constructed in 2013, the station is in excellent condition with no major structural issues to note.

Station 4

Station 4, like Station 2, was built in 1986 and houses a paramedic engine. It is in the northeast quadrant of the City adjacent to the Twin Pines Golf Course.



Figure 14: Fire Station No. 4

Station 4 is located at the center of its District and, although the majority of the calls in the district come from the eastern border (as seen in the map below), the location is appropriate given the district's shape and potential for growth to the northwest, west, and southwest of the station.

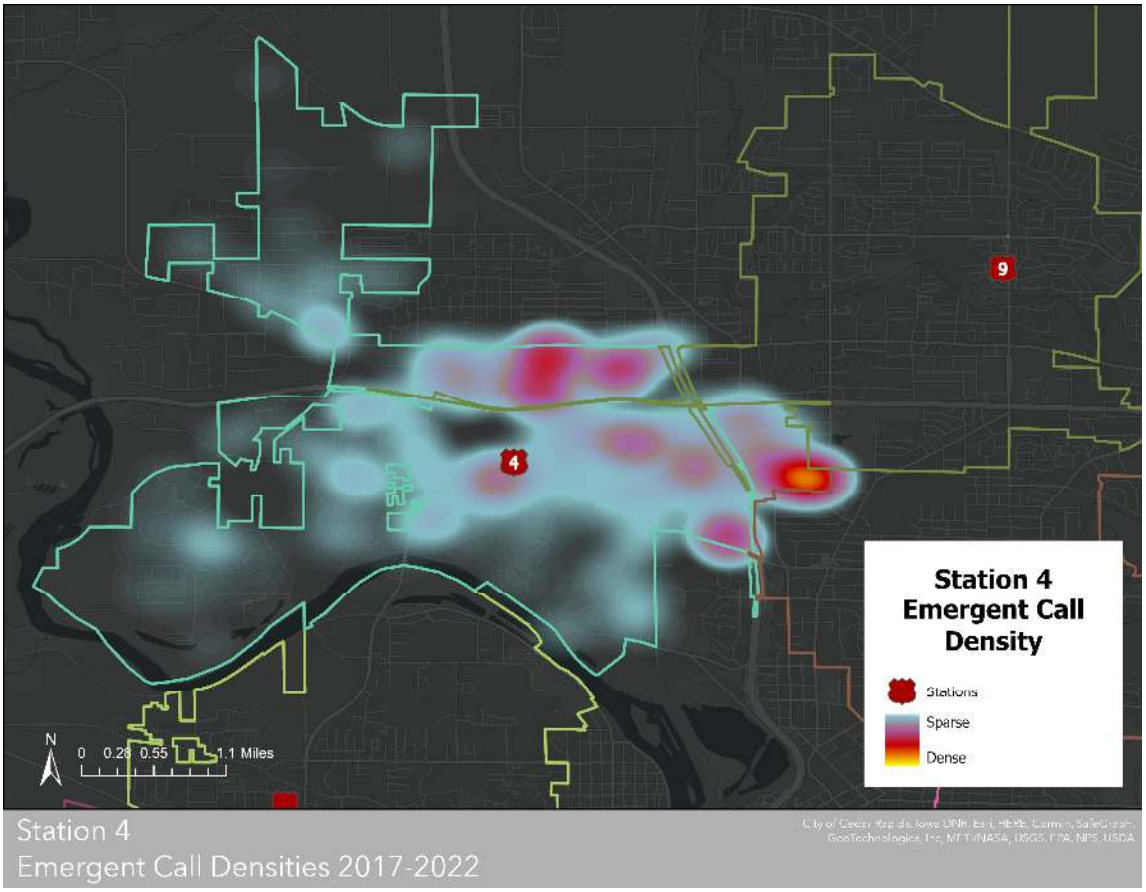


Figure 15: Call Density in Fire District 4

Like the other stations built in the 1980s, the size of Station 4's floorplan results in some restrictions to free movement, limited storage/workout space, including additional or reserve apparatus, bay size constraints based on growing apparatuses, and a lack of a suitable area to add an extractor. Should the City decide to pursue expanding this station in the future, there is ample land available adjacent to the existing structure to do so without interfering with golf course operations.

Station 5

Station 5 is in the Southwest quadrant of the City along with Station 2 and Station 8. It houses the paramedic unit, Engine 5.



Figure 16: Fire Station No. 5

The station is located at the center of the District which, according to the provided call data shown below, is the best possible location for the station as the District sees a relatively even spread of calls throughout its geography.

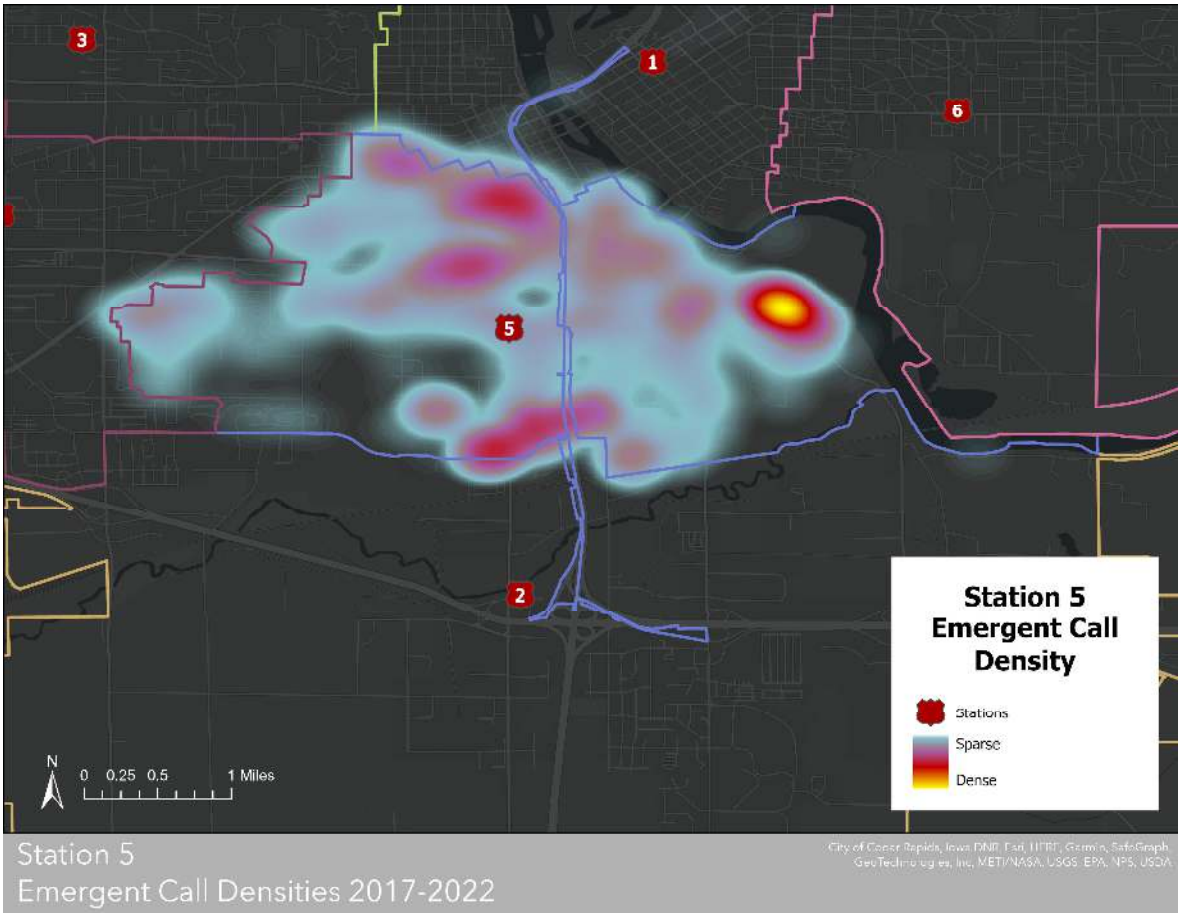


Figure 17: Call Density in Fire District 5

In terms of facility condition, Station 5 is one of the oldest fire stations in Cedar Rapids having been built in 1957. The station is a two-story construction, which can impact turnout times (the amount of time between the call coming into the station and the fire apparatus departing the station). Additionally, there are foundational cracks that allow water to leak into the basement area, which is currently utilized as the workout space. The hose tower was also damaged in the derecho event of 2020 and is no longer able to be utilized. The City should prioritize either making facility improvements or replacing this fire station due to the structural issues with the property.

Station 6

Station 6 is in the Southeast quadrant of the City and was built in 1957 along with Station 5. The station houses a paramedic engine. It is the first station due to Cargill, which processes agricultural products.



Figure 18: Fire Station No. 6

Based on the call density data from 2017 to 2022, the Station is ideally located to respond effectively to calls for service. The Station is also situated to quickly respond to and assist with calls emanating from the Central Business District and District 1. The concentration of calls within the district is illustrated in the following figure.

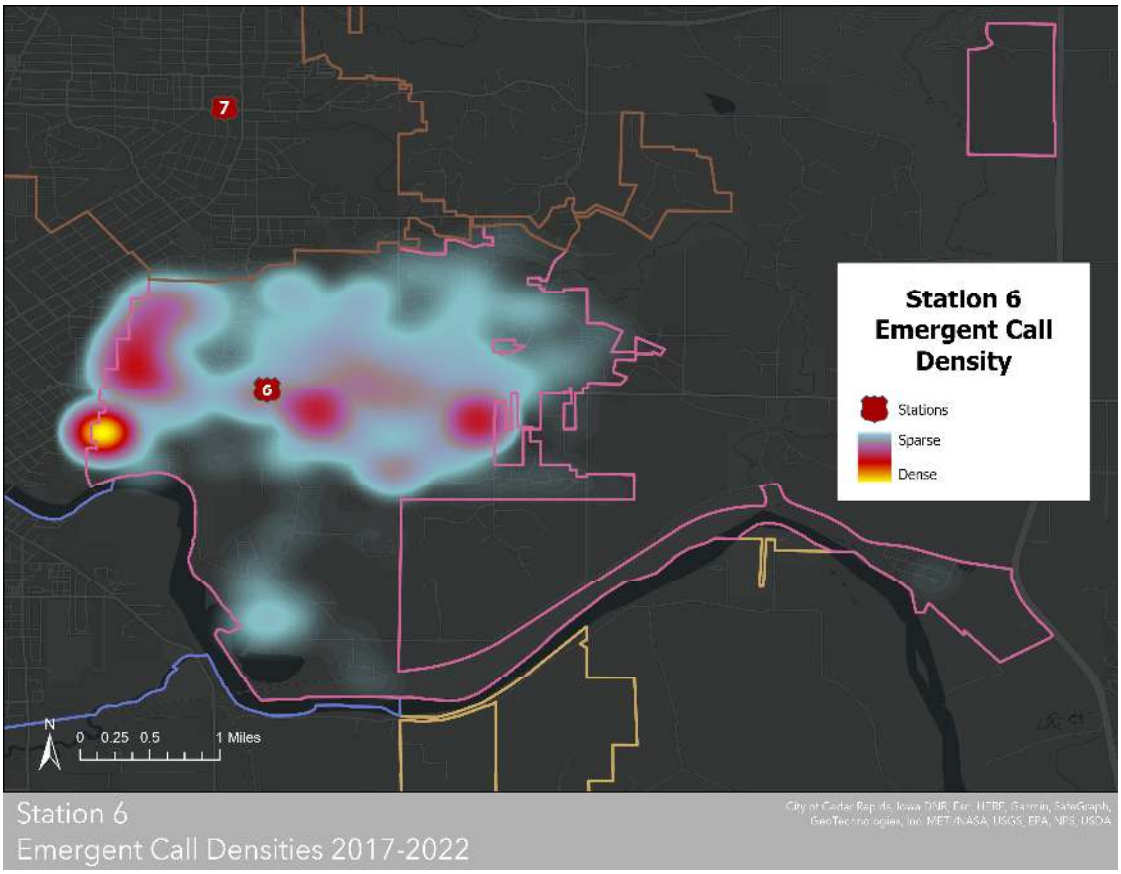


Figure 19: Call Density in Fire District 6

Like Station 5, Station 6 was built in 1957 and also has foundational cracks that allow water leakage into the building. In addition to the foundation issues, a stairwell in the back of the building leading to a parking space needs to be replaced, and the parking space itself has deteriorated over time. Finally, the station's bay size is not sufficient to accommodate both the size of the apparatus and an efficient process for the firefighters to put on their bunker gear, impacting the turn out time for this station.

Based on these structural deficiencies, the City should prioritize pursuing either building improvements or replacing this station over time. However, unlike many of the Stations which are located on moderately sized parcels that would enable building expansions, Station 6 is located on just 0.191 acres; therefore, if the City chooses to pursue a complete replacement of this Station, a suitable parcel of land would need to be identified or acquired to facilitate the construction.

Station 7

Station 7 is in the northeast quadrant of the City and houses a paramedic Ladder company as well as the reserve quint ladder truck as discussed previously in this report. It is the first station called upon to respond to the Lindale Mall as well as some of the Rockwell Collins facilities in the City, which produce aerospace technology.



Figure 20: Fire Station No. 7

According to the call density information, the Station is situated in a prime location to effectively respond to calls within the district, as seen in the following figure.

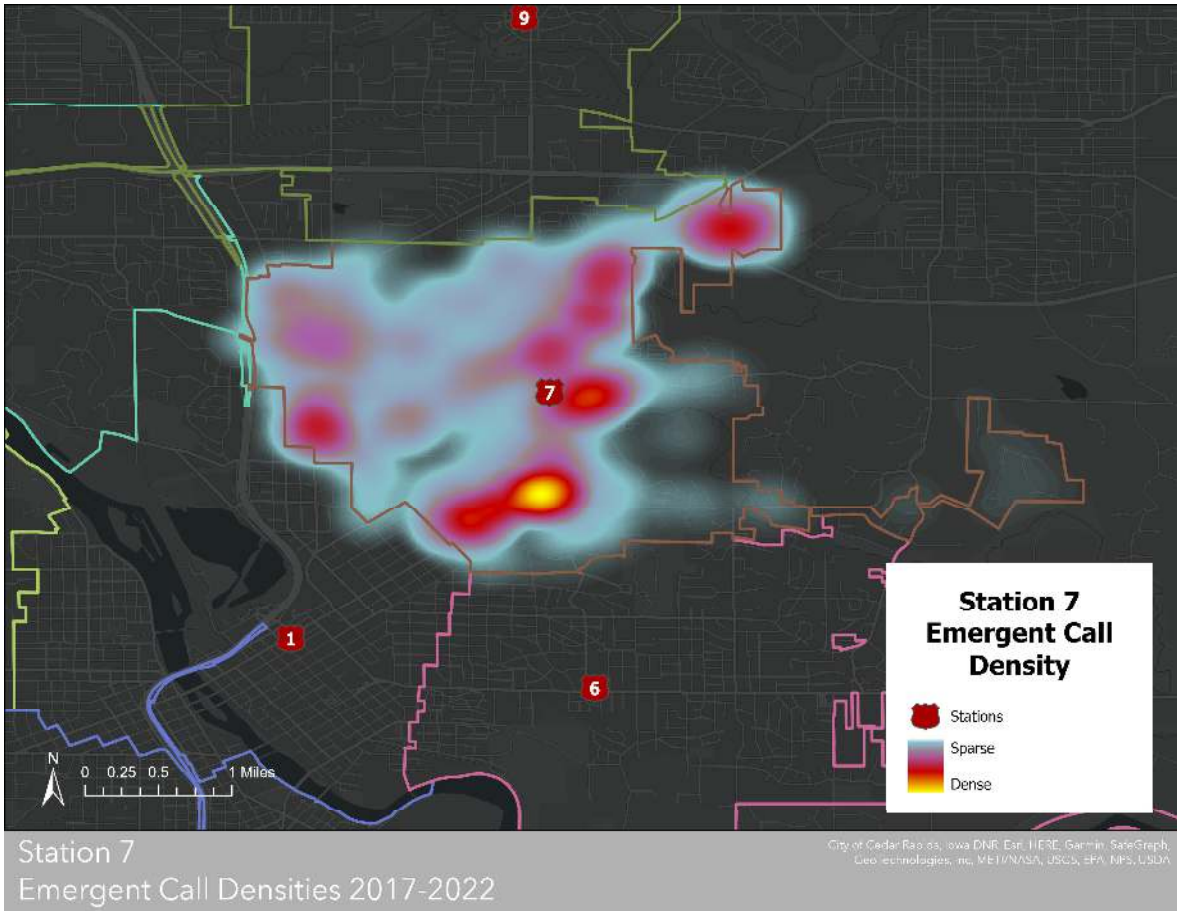


Figure 21: Call Density in Fire District 7

In terms of facility condition, Station 7 was constructed in 1999 and there were no structural deficiencies witnessed by the project team or noted throughout the fieldwork for this project.

Station 8

Station 8 is in the City's southwest quadrant and houses a paramedic engine company.



Figure 22: Fire Station No. 8

As mentioned previously, Station 8 is located 1.6 miles from Station 3. However, these two districts receive a high volume of calls. Therefore, the close proximity of the two stations is currently effective, particularly with the concentration of calls surrounding Station 8, as illustrated in the map below. With that said, the southwest portion of the District is an area of growth for the City and could further increase call volumes. The Department should closely monitor how this growth impacts calls for service over time, as it could impact future station location/investment decisions.

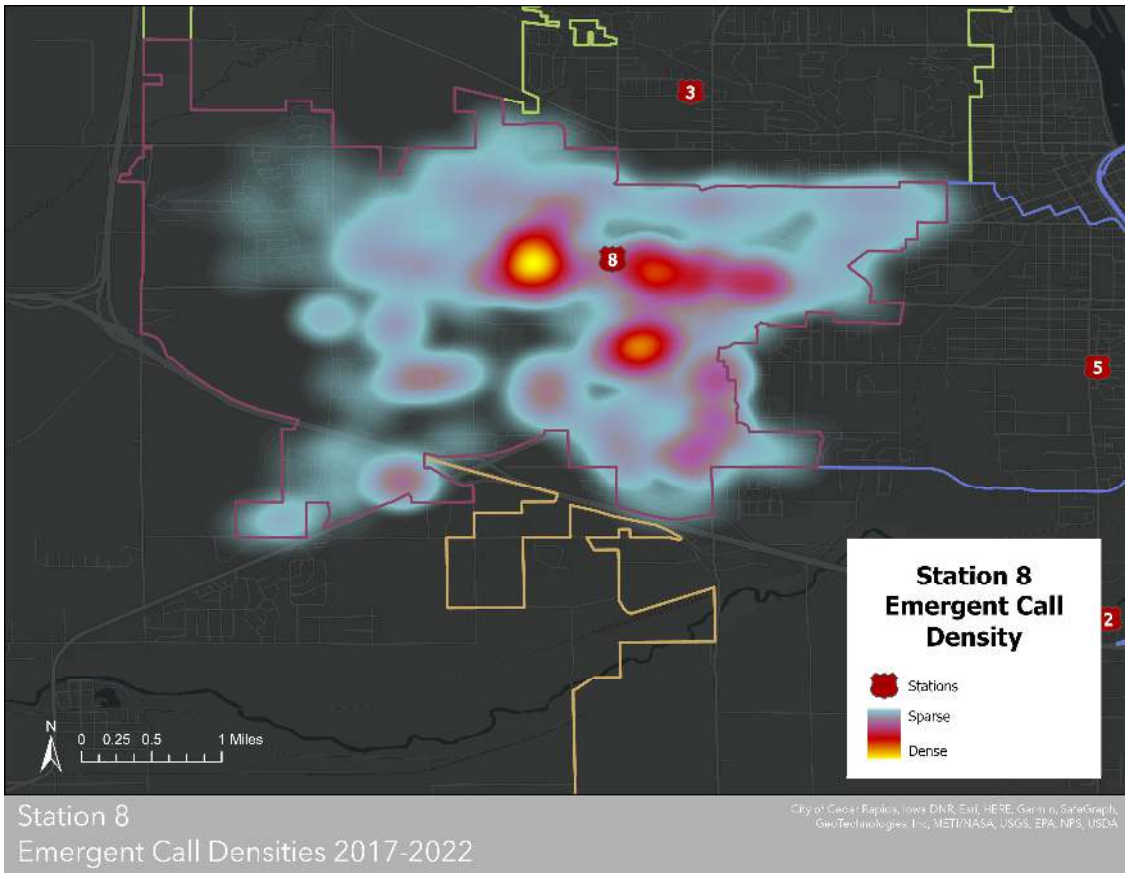


Figure 23: Call Density in Fire District 8

Station 8 was built in 1986, similar to the previously mentioned 1980's era stations, and therefore the floorplan has its restrictions; however, there were no major structural issues observed. The station is located on a 1-acre parcel, meaning there could be ample space should the City pursue expanding the building footprint.

Station 9

Station 9 is commonly referred to as being on an island as it is in the far reaches of the northeast quadrant of the City wedged between the neighboring communities of Hiawatha, Robins, and Marion. It, like Station 7, is one of the first stations called to portions of the Collins Aerospace campus.



Figure 24: Fire Station No. 9

According to the provided call data, Station 9 is located appropriately within in the district and is able to effectively respond to calls for service. The call density within District 9 is show below.

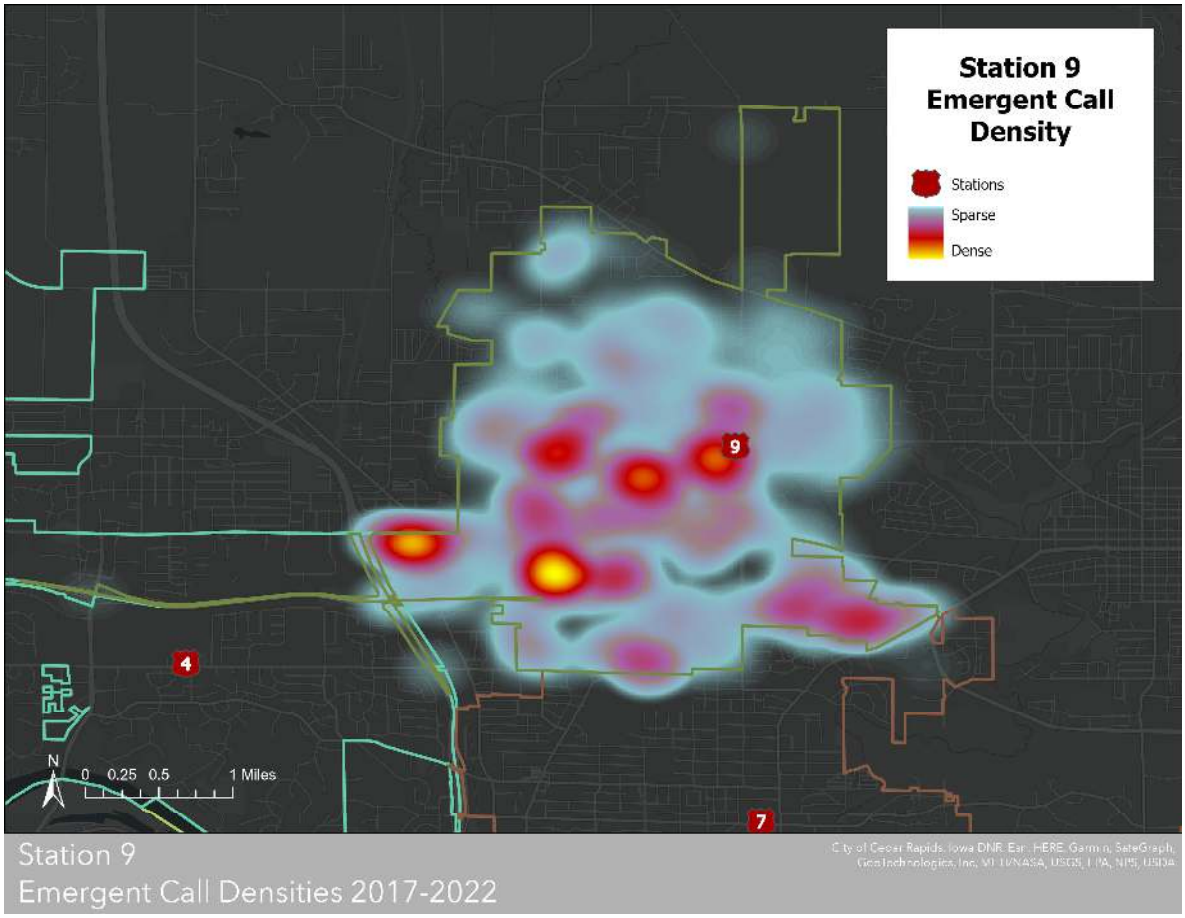


Figure 25: Call Density in Fire District 9

Station 9 is the final station built in 1986, giving it the same floor plan that provides limited storage and workout areas previously detailed. However, there were no major structural issues observed by the project team. The Station is located on 0.59 acres, which may be enough land to expand the station in the future should the City choose to do so. If not, the City will need to pursue the identification or acquisition of a new site more suitable for an expanded building footprint for the station.

Recommendation 177: Conduct a space needs analysis and develop a funding plan to make necessary renovations/expansions and possible station relocations.

Based on the Station Location and Condition Analysis Stations 2,4,5, 6, 8, and 9 need building renovations to provide crews with appropriate living space for eating, sleeping, and gathering, facility space for storage and apparatus, physical fitness space, and space to decontaminate turnout gear and medical equipment.

To understand the entire scope of the work needed for each facility, the Department should conduct a space needs analysis. A space needs analysis examines how existing facilities can be optimized for staff use and identifies the specific renovations needed to meet the operational needs of the Department. This process involves systematically studying existing space usage, condition assessments of each station, a discussion of key qualitative attributes, and a quantitative analysis to calculate the actual space needs of the Department. It also estimates the costs to make the necessary renovations.

The space needs analysis should investigate opportunities to relocate Stations 2 and 8 to meet the growth of the Cedar Rapids community and relocate Station 6 based on the deteriorating condition of the station and lack of available land to expand the facility at its current location.

After the space needs analysis estimates costs, the Department should work with the City Manager's office and Finance Department to develop a funding plan that will provide the level of investment needed to make the necessary facility improvements.

Conclusion

The primary goal of this organizational assessment and station location study was to analyze operations, service demands, organizational structure, processes, and the fire stations' conditions and locations to provide recommendations for improving efficiency and effectiveness. The fact that the City of Cedar Rapids chose to pursue this study shows a commitment to change and improvement. Staff throughout the Fire Department were very forthcoming and helpful to the project team throughout the process.

The Department's leadership team and workforce are a solid foundation by which to implement process improvements. The recommendations included in this report are meant to build upon that foundation. Implementation of the recommendations will take investment, time, and hard work in order to be successful. Given the City's limited resources, implementation will likely need to take place over the next several years with the Department prioritizing them in a thoughtful and planned manner to ensure the limited resources are utilized to have the greatest impact to the Department.

APPENDIX A:

Cedar Rapids Fire Department Full Organizational Chart

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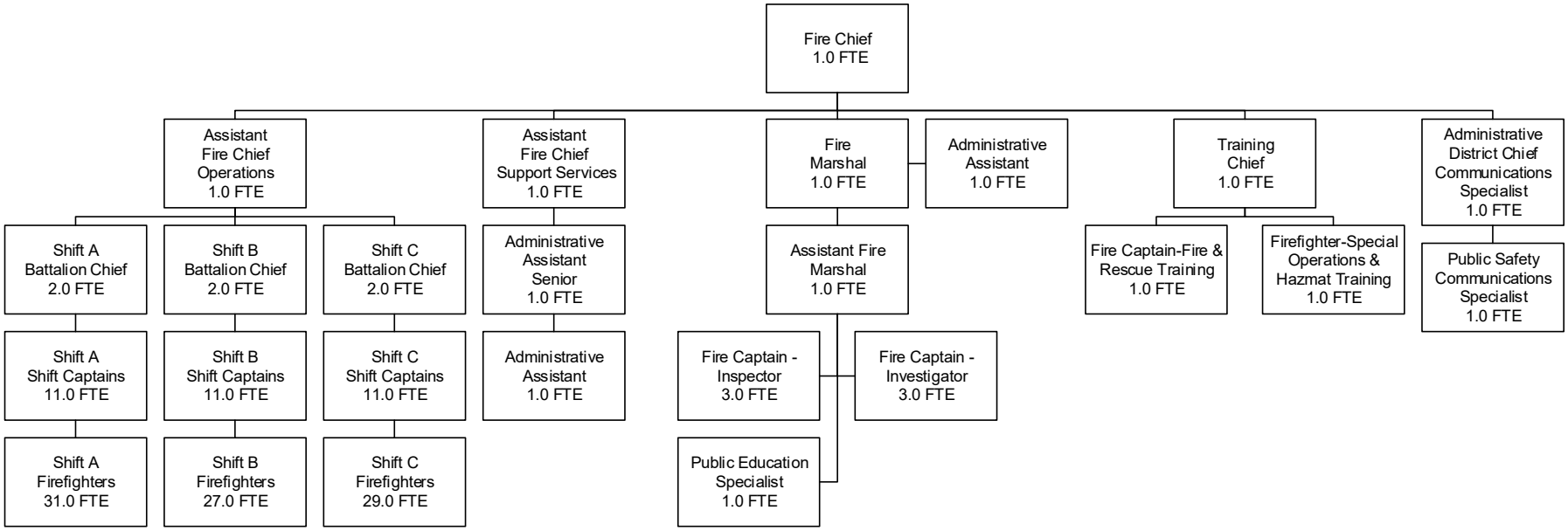


Figure 26: Cedar Rapids Fire Department Organization Chart