Campbell County

Wyoming

January 2023

Fire Department

Long Range Master Plan

Community Risk Assessment:

Standards of Cover

Emergency Services Consulting International

Providing Expertise & Guidance that Enhances Community Safety

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ACKNOWLEDGMENTS

Emergency Services Consulting International (ESCI) would like to acknowledge the dedication, helpfulness, and seriousness with which this study was undertaken. Without the assistance and support of the Campbell County Commission, the City of Gillette, the Town of Wright, the Fire Chief, the Joint Powers Fire Board (JPFB), and the personnel of Campbell County Fire Department (CCFD), this project could not have been successfully completed.

Joint Powers Fire Board

ill Sims, Secretary/Treasurer - Wright Appointed

Tim Carsrud - City Appointed

Tricia Simonson - City Appointed

Nathan McLeland - City Appointed

Trent Jones - County Appointed

Jeff Boardman - County Appointed

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Doug Schrader

Justin Robb

Michael Phipps

Joel Morgan

The men and women of the Campbell County Fire Department, who sacrifice daily to tirelessly serve their community.

METHODOLOGY

In January of 2023, Campbell County Fire Department (CCFD), retained Emergency Services Consulting International (ESCI) to conduct a Long-Range Master Plan with a Community Risk Assessment/Standards of Cover (Master Plan with CRA/SOC) component. The Long-Range Master Plan provides the agency with a detailed, high altitude, understanding of future needs and includes a host of findings and recommendations for moving forward. As such, it is designed to assist communities with quantifying current service delivery, evaluating service delivery and response performance, identifying forecast growth and emergent conditions, and developing strategies to meet anticipated needs and resultant future service demand.

Project Initiation & Development of the Work Plan

In the initial phase of the Campbell County Long-Range Master Plan with Community Risk Assessment/Standards of Cover process Emergency Services Consulting International (ESCI) developed a project work plan based on the approved scope of work. ESCI conversed with the Campbell County Fire Department's project team to gain a comprehensive understanding of the organization's background, goals, and expectations for this project. The work plan included identifying the primary tasks to be performed, the method for evaluating the results, and possible obstacles that may arise during the project.

Acquisition & Review of Background Information

ESCI requested pertinent information and data from the Campbell County Fire Department's Project Team. The requested data included information about the fire department service area, National Fire Incident Reporting System (NFIRS) data, automatic and mutual aid agreements, geographic planning zones and station/apparatus locations, staffing plans, financial data, relevant community comprehensive plans, land use studies, climate action plans, and the hazard mitigation plan. Further consideration was given to ISO reports and previous studies. ESCI used the collected data in the analysis and development of the Long-Range Master Plan with Community Risk Assessment/Standards of Cover.

Key Concepts & National Trends

This report includes best practices based on nationally recognized guidelines and criteria, including concepts from the National Fire Protection Association (NFPA), the Insurance Services Office (ISO), the Center for Public Safety Excellence (CPSE), laws and regulations of the State of Wyoming, and other generally accepted practices for emergency services. Where applicable, the report is written and organized in a style that is consistent with:

- Community Risk Assessment: Standards of Cover, 10th Edition, Quality Improvement for Fire and Emergency Services, Center for Public Safety Excellence, Chantilly, VA, 2021.
- NFPA 470: Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders
- NFPA 921, Guide for Fire and Explosion Investigations
- NFPA 1006: Standard for Technical Rescuer Professional Qualifications

- NFPA 1061: Standard for Public Safety Telecommunications Personnel Professional Standards Qualifications
- NFPA 1201: Standard for Providing Fire and Emergency Services to the Public
- NFPA 1225, Standard for Emergency Services Communications
- NFPA 1402, Standard on Facilities for Fire Training and Associated Props
- NFPA 1403, Standard on Live Fire Training Evolutions
- NFPA 1500, Standard on Fire Department Occupational Safety, Health, and Wellness Programs
- NFPA 1581, Standard on Fire Department Infection Control Program
- NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments
- NFPA 1660: Standard for Emergency, Continuity, and Crisis Management: Preparedness, Response, and Recovery
- NFPA 1620: Standard for Pre-Incident Planning
- NFPA 1670: Standard on Operations and Training for Technical Search and Rescue Incidents
- NFPA 1710, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments.
- NFPA 1720, Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments.
- NFPA 1851, Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting
- NFPA 1901, Standard for Automotive Apparatus
- NFPA 1911, Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles
- NFPA 1912, Standard for Fire Apparatus Refurbishing

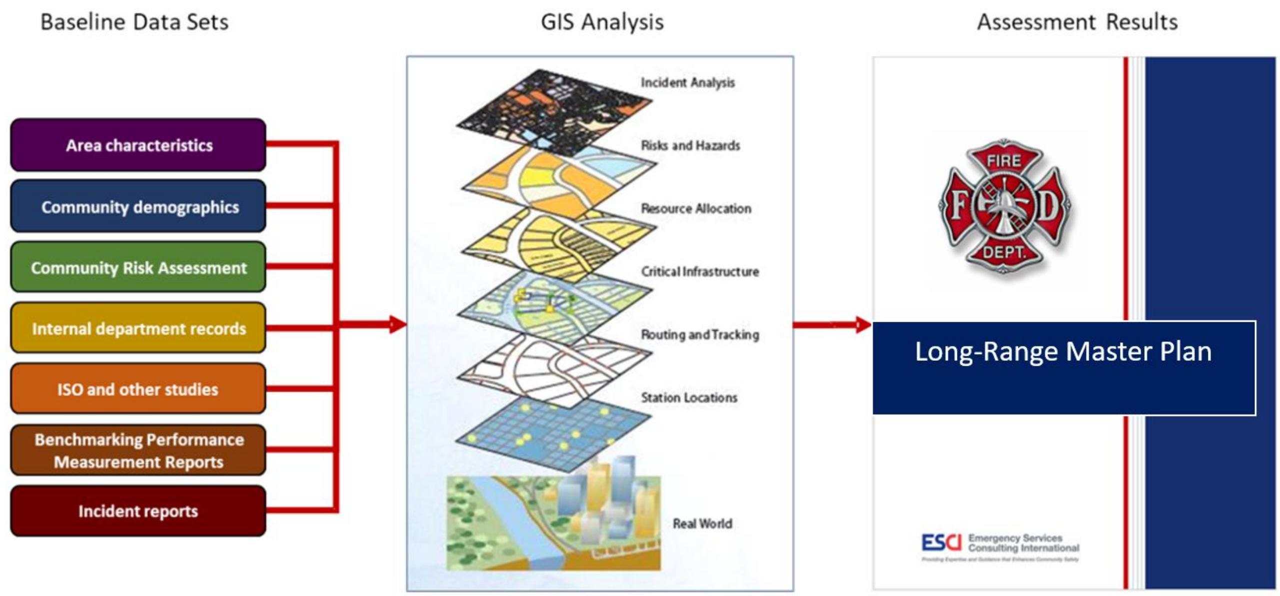
Baseline Assessment & GIS Technology

From the information provided by Campbell County, ESCI was able to establish a baseline assessment of current community risks and service delivery needs centered around the specialized and technical services provided by the Campbell County Fire Department. The purpose of this assessment was to identify risks, hazards, vulnerabilities, and threats in comparison to industry standards and best practices to determine current and future emergency service delivery needs.

The ESCI Planning Team also collected information, reviewed population, and other community growth patterns, and then analyzed trends and expectations. This was done to provide a glimpse into future community conditions, land use, and fire protection risks to interpret their potential impact on emergency service planning and delivery.

ESCI then used Geographic Information Systems (GIS) technology and analysis tools to visualize the data and provide additional information for the Department. The following figure illustrates the conceptual GIS methodology as applied to this assessment.

Figure 1: GIS Methodology



Performance Analysis and Development of Recommended Strategies

From the time the first fire station is built, there is an expectation that the facility can and will provide a timely response to calls for service within a given area surrounding that facility. When the original criterion was set for response time from that facility, there was an immediate location – allocation created by that fire station. The fire station provides a response to a given area within a reasonable time in a pattern that essentially is an overlay on the streets and highways that radiate outward from that location. Even before any incidents occur in a community, the geographic road-network and topographical attributes of a community create a dynamic segmentation that results in the ability of fire professionals to reasonably predict what areas can be, and those that will not be, adequately covered.

Over time the area of coverage changes and evolves based on community growth. The concept of using actual travel time today is based upon a more accurate representation of the level of service for an all-risk approach. It is more performance-based. Today, most fire agencies set a time standard that includes three elements, two of which were missing from the strict use of mileage from a fire station – specifically, alarm processing time and turnout time. Actual time of road travel has often been used in combination with the other two time increment components to set the community's expectation of performance.

Using this approach, fire stations are seldom located in a linear fashion. This concept is based on the time intervals identified in the Standards of Response Coverage section of the Self-Assessment Manual published by the Commission on Fire Accreditation International. This process leads to the development of a standard of response coverage, or a time and level of staffing decision designed to control an emergency with a minimum level of loss. The process is, however, a policy choice based on risk and local conditions.

The basic performance standards with time goals are based on the rapid speed of fire growth and consequences of emergency medical situations over a short time frame. It has been determined that both fires and medical emergencies can gain a foothold resulting in higher losses when the times are excessive.

Based on this concept CCFD performance was evaluated and recommendations for improvement offered.

EXECUTIVE SUMMARY

The Campbell County Fire Department (CCFD) has enlisted the services of Emergency Services Consulting International (ESCI) to conduct a comprehensive Long-Range Master Plan accompanied by a Community Risk Assessment/Standards of Cover (CRA/SOC) study. ESCI is a reputable international firm specializing in providing professional consulting services for fire, EMS, police, and communications organizations across the United States and Canada. As the consulting arm of the International Association of Fire Chiefs (IAFC), ESCI has been meeting the diverse needs of emergency services providers since 1976. ESCI has consistently delivered innovative and sustainable recommendations that are easily understood by the public and valuable to elected officials in shaping effective public safety policies. With a team of over 30 accomplished consultants who are leaders in their respective fields, ESCI offers consulting services to municipalities, districts, non-profit organizations, as well as the industrial and commercial sectors.

The purpose of completing such a document is to assist the agency in ensuring a safe and effective response force for fire suppression, emergency medical services, and specialty response situations in addition to homeland security issues. This document describes the CCFD's current deployment plan, community risks, response resources, deployment strategies, and service levels that have been evaluated in this study. The document identifies and discusses response time objectives and standards for measuring the effectiveness of fire department services and the deployment of its resources. The document is divided into components based on the format recommended by the Center for Public Safety Excellence.

The foundation of any service provided by a governmental agency relies on the governance structure and policies that grant the agency the responsibility and authority to take action. In the case of the CCFD, its governance is established through the Joint Powers Fire Board (JPFB), which is a distinct component unit of the county government and was established in 1975. As per the Joint Powers Agreement (JPA), the JPFB consists of seven members, with four of them previously appointed by the county. However, during a partners' meeting on April 20, 2022, a verbal agreement was reached to modify the composition of the JPFB. According to the new arrangement, Campbell County and the City of Gillette would each appoint three members, while the Town of Wright would maintain its representation with one member. Campbell County has population of 47,026 and covers a geographic area of 4,802.71 square miles.

The department employs a total of 42 (31 operations, 11 administrative and support) personnel involved in delivering services. Staffing coverage for emergency response is through career personnel assigned to 24-hour rotating shifts and supplemented by dedicated part-time staff. Administrative staff and chief officers provide administration, incident support and oversight, and fire prevention services.

The Insurance Services Office (ISO) reviews the fire protection resources within communities and provides a Community Fire Protection Rating system from which insurance rates are often based. The rating system evaluates three primary areas: the emergency communication and dispatch system, the fire department, and the community's water supply. The overall rating is then expressed as a number between 1 and 10, with "1" the highest level of protection and "10" unprotected or nearly so. As of the latest survey, ISO rated CCFD as a Class 4/4Y.

In the SOC process, potential service area classifications are broken down into five categories according to Federal Emergency Management Agency (FEMA):

- **Metropolitan**: a population density of over 3,000 people per square mile. These areas are distinguished by mid-rise and high-rise buildings, often interspersed with smaller structures.
- **Urban**: geography with a population of over 30,000 people and/or a population density of over 2,000 people per square mile.
- **Suburban**: geography with a population of 10,000 to 29,999 and/or a population density of between 1,000 and 2,000 people per square mile.
- **Rural**: geography with a total population of fewer than 10,000 people or with a population density of fewer than 1,000 people per square mile.
- **Wilderness/Frontier/Undeveloped**: geography that is both rural and not readily accessible by a publicly or privately maintained road.

The study area exhibits a diverse range of population densities, encompassing urban, suburban, rural, and wilderness/frontier/undeveloped regions. While the Federal Emergency Management Agency (FEMA) designates the City of Gillette as urban, the reality is that the majority of the city and the surrounding county fall under the suburban/rural categories. To streamline efficiency and avoid redundancy, the CCFD has established a unified set of response goals focused on the suburban classification, rather than creating separate goals for urban, suburban, and rural classifications.

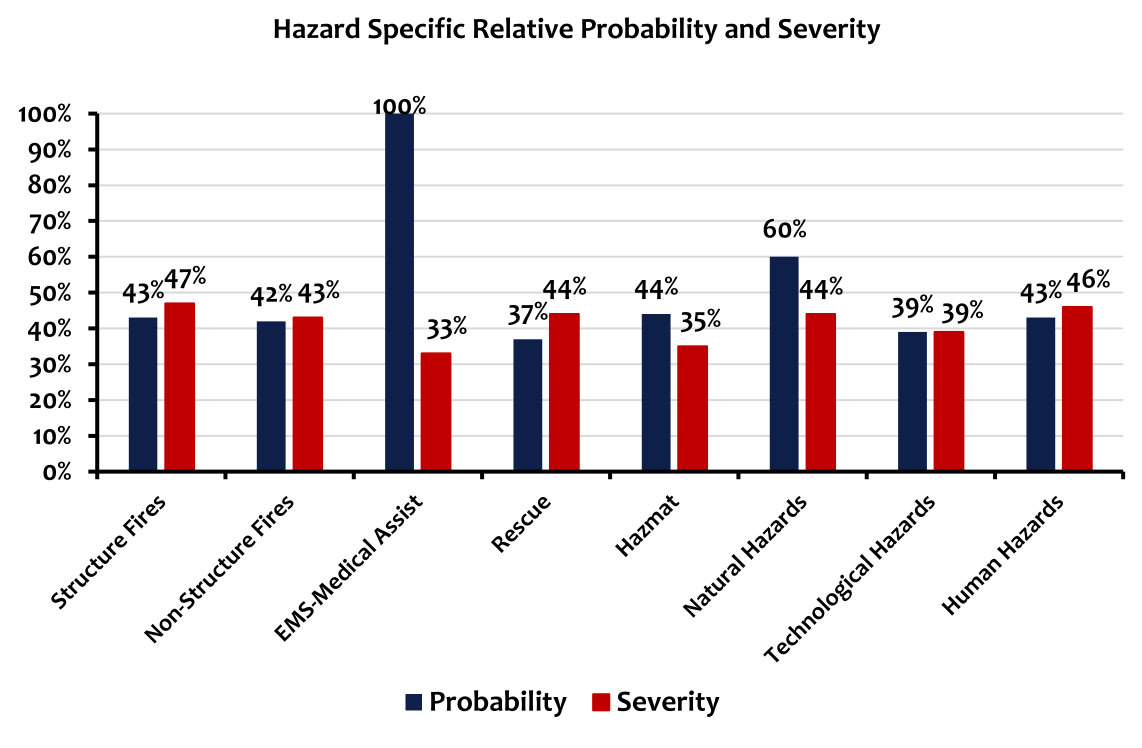
To address the unique characteristics of the urban, suburban, and rural areas within the response area, ESCI has developed sample service-delivery outcome goals based on the criteria provided by the National Fire Protection Association (NFPA). These goals are outlined in the Recommendations and Improvements section of the Long-Range Master Plan with CRA/SOC. By synthesizing community expectations, ESCI aims to provide the CCFD with a comprehensive understanding of the specific needs and expectations of the communities within each service area. This approach ensures that the plan accommodates the varying requirements of the urban, suburban, and rural area.

Overview of the Community Risk Assessment

The Community Risk Assessment provides an assessment of community risk and potential risks present in the service area. Physical, economic, and demographic data is utilized to assess the hazards and risks threatening the community. This includes exposure to natural and man-made disasters.

Hazard Vulnerability Analysis

Campbell County is susceptible to hazards, both natural and technological/human-caused. Of the potential hazards that pose risk to the County, this risk assessment identifies several because of the likelihood of everyday occurrence and/or potential consequences. EMS is ranked the highest community risk because of two primary factors—first, the human impact, and second, the probability. CCFD may also have extended response times to rural medical calls. In addition, risk is defined as the probability compared to the impact of an event; the following figure illustrates the comparison of those two factors across the eight event categories.

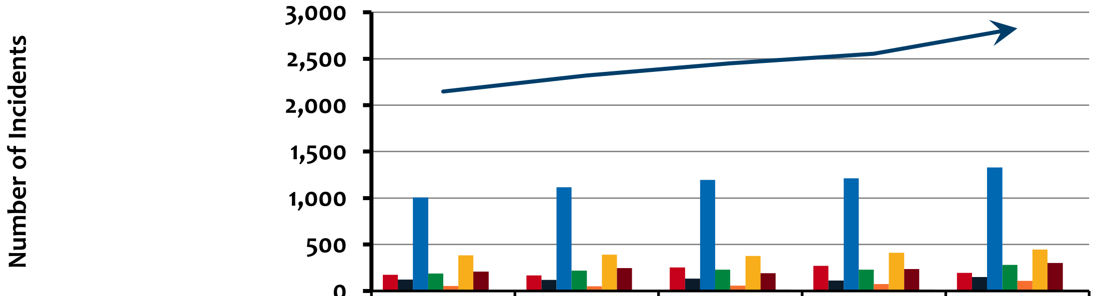


Emergency Response Demand Type and Frequency

The service demand analysis reviews current and historical service demand by incident type and temporal variation. GIS software provides a geographic display of demand. Data for the service delivery and performance analysis was provided from the department's Record Management System (RMS), specifically the National Fire Incident Reporting System (NFIRS) records and the CAD system. The dataset that was best suited for each analysis was utilized. It should be noted that the total between analyses may differ from figure to figure due to some cases of unreported or misreported data.

The following figure displays historical CCFD service demand for the previous five calendar years.

Service Demand by NFIRS Incident Type, 2018–2022



	2018	2019	2020	2021	2022
Fire (100)	174	168	254	271	196
Hazardous Condition (200, 400)	123	121	134	111	149
EMS (300 except 322-324)	1,007	1,117	1,195	1,213	1,331
MVC (322-324)	188	218	228	228	282
Service Call (500)	53	49	56	74	110
Canceled, Good Intent (600)	384	392	378	410	447
Alarm (700)	208	248	193	235	302
Other (800, 900)	10	6	14	13	10
Total	2,147	2,319	2,452	2,555	2,827

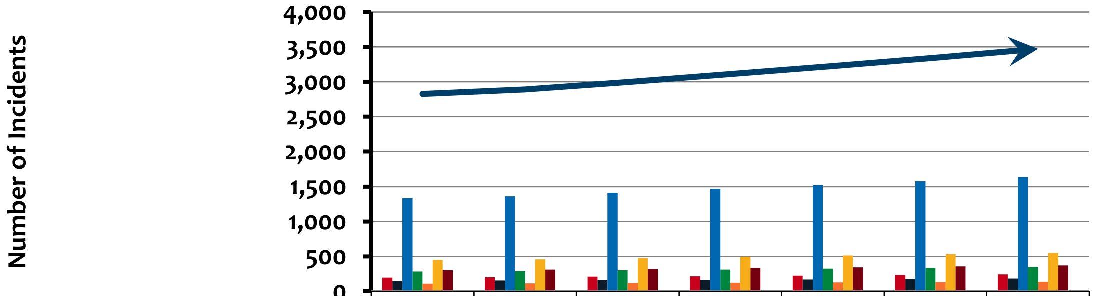
CCFD has experienced a 31.7% increase in overall requests for service. This overall change includes an 8% increase from 2018 to 2019, a 5.7% increase from 2019 to 2020, a 10.6% increase from 2020 to 2021, and a 7.1% increase from 2021 to 2022.

Future Service-Demand Projections

Examination of CCFD incident data reveals that service demand increased by nearly 31.7% from 2018 to 2022, or an average of about 7.1% each year. Based on that, ESCI was able to develop a range of projected increase in service demand—calls for service—from 2022 to 2050. This range was then compared to the historical records to determine a projected increase in service demand, based on a comparison of population-based and historically-based service projections, as shown in the following figure.

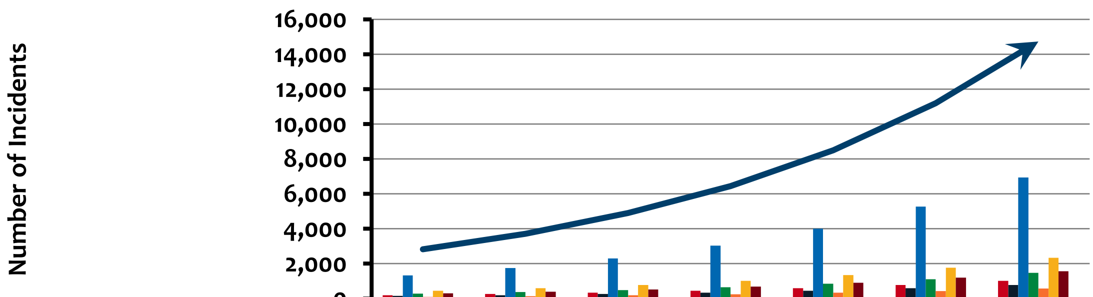
The potential service demand predictions are listed in the following figures.

CCFD Projected Service Demand by Population



	2022	2025	2030	2035	2040	2045	2050
Fire (100)	196	200	208	216	224	232	241
Hazardous Condition (200, 400)	149	152	158	164	170	176	183
EMS (300 except 322-324)	1,331	1,361	1,412	1,464	1,519	1,576	1,635
MVC (322-324)	282	288	299	310	322	334	346
Service Call (500)	110	112	117	121	126	130	135
Canceled, Good Intent (600)	447	457	474	492	510	529	549
Alarm (700)	302	309	320	332	345	358	371
Other (800, 900)	10	10	11	11	11	12	12
Total	2,827	2,890	2,998	3,110	3,227	3,348	3,473

CCFD Projected Service Demand by Historical Change



	2022	2025	2030	2035	2040	2045	2050
Fire (100)	196	258	340	447	589	776	1,021
Hazardous Condition (200, 400)	149	196	258	340	448	590	777
EMS (300 except 322-324)	1,331	1,753	2,308	3,039	4,001	5,268	6,937
MVC (322-324)	282	371	489	644	848	1,116	1,470
Service Call (500)	110	145	191	251	331	435	573
Canceled, Good Intent (600)	447	589	775	1,020	1,344	1,769	2,330
Alarm (700)	302	398	524	689	908	1,195	1,574
Other (800, 900)	10	13	17	23	30	40	52
Total	2,827	3,722	4,901	6,454	8,498	11,189	14,733

There is some disparity between the two projections, per capita and historical. In the CCFD service area, the number of actual calls has increased significantly higher than the rate estimated from population growth alone. This suggests that call volume will increase faster than population growth as fire department response models are asked to adopt an "all risks, all hazards" approach to emergency service delivery. This trend is not unique to CCFD; it is occurring across the country and is expected to continue.

Based on these comparisons, the "best case" demand for fire department services in the CCFD service area is projected to increase by 646 responses (23%) by the year 2050. This represents an increase of approximately 4.6% every five years.

Recommendations and Improvement Goals

This Comprehensive Master Plan, incorporating Community Risk Assessment and Standards of Cover, concludes with a set of recommendations and improvement objectives derived from the earlier discussed observations and analysis. To address these recommendations effectively, a pragmatic approach is necessary. To aid in this process, ESCI has categorized them into recommended time frames.

Implementing many of these recommendations and fostering their adoption will require substantial commitment, time, and resources, including financial investments. The suggested timeframes aim to provide a practical roadmap for implementation. However, it's important to acknowledge that environmental conditions and circumstances may present challenges or opportunities that could lead to addressing certain recommendations outside the initially identified time frames.

The analysis unequivocally validates that the existing fire stations are suitably placed in accordance with population density and call demand. Nevertheless, the evaluation highlights the future construction of a new fire station on the west side of the city. Additionally, there is a need to replace or shutter deteriorated and end-of-life stations while bolstering Fire Station 7 with more firefighters and response units.

ESCI has grouped the recommendations into three implementation timeline categories: Short-Term Recommendations (6 months–1 year), Mid-Term Improvement Goals (1–3 years), and Long-Term Improvement Goals (3–5 years).

Short-Term and Mid-Term goals are centered around processes and performance improvements that can generally be implemented by staff and leadership within CCFD. These Short-Term or Mid-Term recommendations could be as simple as continuing best practices that are already in place or the addition of best practices not yet implemented. As such they are not listed here but are outlined in detail as part of the *Recommendations and Improvement Goals* section of the report.

The Long-Term improvement goals require high levels of support from governing and supporting agencies and are presented in a user-friendly figure below, providing a concise summary on the subsequent pages. For a more comprehensive understanding, detailed elaboration can be found in the *Recommendations and Improvement Goals* section of this study.

Long-Term Improvement Goals	Adopted	Completed	Target Date
Improvement Goal 1			
Develop an Appropriate Funding Model.			
Improvement Goal 2			
Develop and Fund an Appropriate Fire Station Optimization Plan.			
Improvement Goal 3			
Improve Upon Response Deployment and NFPA 1720 Effective Response Force Assembly.			
Improvement Goal 4			
Develop and Fund an Appropriate Apparatus Purchasing and Replacement Plan.			
Improvement Goal 5			
Establish Funding to Construct a New Training Tower.			

Conclusion

Based on information obtained throughout this process, our assessment is that CCFD has strong leadership and an innovative vision. The department is functioning at a high level commensurate with community expectations. While there is always room for improvement, the department is serving the citizens of Campbell County, Gillette, and Wright very well. The fire department is commended for undertaking this project to initiate a formal plan for future service delivery.

The report referenced in this executive summary provides a considerable amount of technical data, much of which was provided by the Campbell County Fire Department and allows the reader to gain a clear understanding of the services provided by CCFD as well as an indication of how those services may be provided in the future. This document is intended to provide department personnel and policymakers with information from which to make informed, data-driven decisions about the future deployment of resources and services in the CCFD service area.

ESCI is confident that the analysis, findings, and recommendations in the report will provide the policy makers and the CCFD with a successful road map for the future. As these goals and enhancements are realized, and the city continues to grow in size and stature, the citizens of the area will continue to receive an exceptional level of service and protection from the dedicated professionals of the Campbell County Fire Department.

DESCRIPTION OF COMMUNITY SERVED

COMMUNITY OVERVIEW

An assessment of the Campbell County Fire Department's existing composition and service delivery was conducted by ESCI. ESCI based this evaluation on data provided by the agency and collected during subsequent fieldwork. Where applicable, the information is compared to a combination of applicable state laws and regulations, National Fire Protection Association (NFPA) standards, Commission on Fire Accreditation International (CFAI) self-assessment criteria, the Center for Public Safety Excellence (CPSE), health and safety requirements, federal and state mandates relative to emergency services, and generally accepted best practices within the emergency services community, as well as the experience of ESCI's consultants.

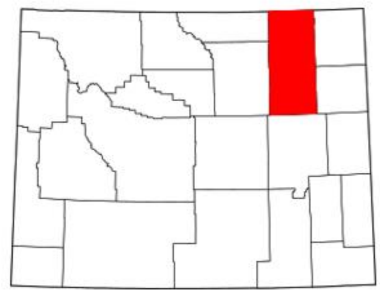
The following section provides a general overview of Campbell County, the City of Gillette, the Town of Wright, and the Campbell County Fire Department (CCFD).

Campbell County

Campbell County (County) is a rural county located in Northeastern Wyoming. The county covers an area of 4,802.71 square miles. This is roughly three million acres. Because of its elevation, Wyoming has a relatively cool climate and ranks 41st in the U.S. with an annual average of 45.6°F. Above the 6,000-foot level, the temperature rarely exceeds 100°F. The warmest parts of the state are the lower portions of the Bighorn Basin, the lower elevations of the central and northeast, and along the eastern border. The highest recorded temperature was 116°F on July 12, 1900 at Bitter Creek in Sweetwater County. The lowest spot in the county is 3,400 feet above sea level at the Little Powder River in the northern end of the county. The highest point is 6,060 feet and is located at the top of North Pumpkin Butte on the western border. The average maximum temperature at Bighorn Basin in July is 92°F.

The County incorporates the City of Gillette and the Town of Wright. The County is in the northeast corner of the state and is bordered to the west by Sheridan and Johnson Counties and to the east by Crook and Weston Counties. Converse County lies to the south. The capital of Wyoming is Cheyenne. The following figure displays the location of Campbell County, Wyoming.

Figure 2: Campbell County, Wyoming

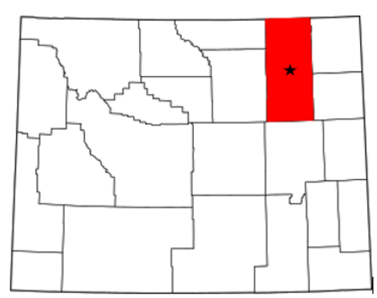


City of Gillette

Gillette is the county seat of Campbell County, Wyoming. The city covers 23.17 square miles of land. The city was founded in 1891 as a major railway town on the Chicago, Burlington, and Quincy Railroad. The population was estimated at 33,403 as of the 2020 census. Gillette's population increased 48% in the ten years after the 2000 census, which counted 19,646 residents after a boom in its local fossil fuel industries.

Gillette is centrally located in an area involved with the development of vast quantities of American coal, oil, and coalbed methane gas. The city calls itself the "Energy Capital of the Nation". Wyoming provides over 30% of the nation's coal. However, a decline in coal use in the U.S. and tighter industry regulations has led to a decline in the local economy at times, leading some local officials to look for other industries or employment opportunities to sustain the city into the future. As a major economic hub for the county, the city is also a regional center for media, education, health, and arts. The following figure displays the location of Gillette, Wyoming

Figure 3: City of Gillette, Wyoming



Town of Wright

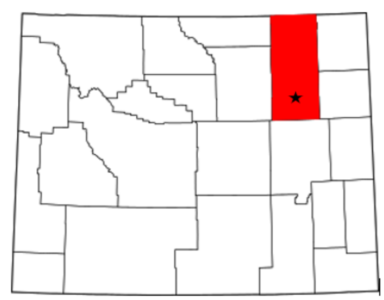
Over ten thousand years ago the highland plains were hunted for antelope and buffalo. The area was claimed as the Sioux and Crow Indian hunting grounds. Around the 1880's the area became a ranching community for long-horn cattle and sheep on the open ranges. During the times of free land, homesteaders entered the area and began to set up their claims. These activities are traced back to around the 1900's and in the 1970's things really began to boom and take off with new settlements as a result of the creation of the Black Thunder Coal Mine, the largest mine in the Powder River Basin and most productive mine in the United States. The Town of Wright was a result. The Town covers 2.85 square miles of land.

The Wright family homesteaded the area in 1911 creating the Wright Community. Shortly after moving to the area, R. A. Wright opened Wright's first Post Office providing mail service to area ranchers. The community became known as Wright, Wyoming. In 1976, during the economic boom lead by Amax Coal, Black Thunder coal mine was developed near the town. As with all energy towns, housing, schools, and essential services were needed. And like other coal mining regions, the Atlantic Richfield coal company stepped up and built the newly organized community, developing housing and a company store.

The Town of Wright was incorporated in 1985, making it one of Wyoming's newest municipalities with a rich history. The following figure displays the location of the Town of Wright, Wyoming.

Figure 4: Town of Wright, Wyoming

Wright
Wyoming
Energy, Community, Opportunity



Jurisdiction Demographics

Demographics is the statistical study of human populations and characteristics. Demographic data can include information on population size, density, growth, and organizational groupings such as race, gender, or age. Institutions like the U.S. Census Bureau conduct surveys to gather information about the nation's citizens on a regular basis. The population of the United States tends to be ethnically diverse due to the country's history of immigration which made it a cultural melting pot.

In the 2020 U.S. Census, the permanent population of Campbell County was 47,026. According to Environmental Systems Research Institute (Esri) the current estimated population of the county has grown to 47,238 residents.

Campbell County is considered a rural area by the U.S. Census Bureau. The Census Bureau's urban-rural classification is a delineation of geographical areas, identifying both individual urban areas and rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses. The Census Bureau delineates urban areas after each decennial census by applying specified criteria to decennial census and other data. Rural areas encompass all population, housing, and territory not included within an urban area. Campbell County is defined as rural according to the Census Bureau. The importance of this rural designation is useful when applying the specific National Fire Protection Agency (NFPA) consensus standards to Campbell County Fire Department operations for demand zones.

The following figure breaks down the five demand zones depicted by NFPA for population per square mile.

Figure 5: NFPA Population Breakdown

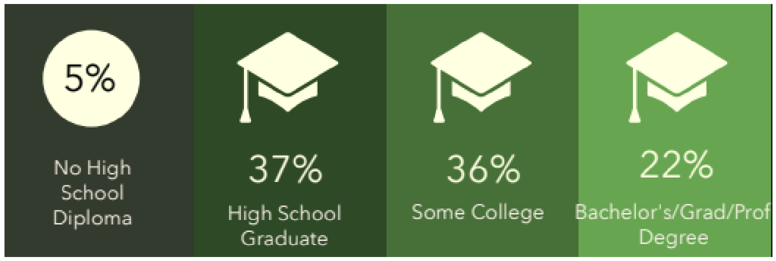
Demand Zone	Demographics/Population
Urban Area	>1000 People/Square Mile
Suburban Area	500-1000 People/Square Mile
Rural Area	<500 People/Square Mile
Remote Area	Travel Distance > 8 Miles from a Fire Station
Special Risks	Determined by the Authority Having Jurisdiction

A jurisdiction can have multiple demand zones outlined at one time and each demand zone can have a respective response criterion established. For instance, the Town of Wright and Campbell County both are considered rural areas while the City of Gillette meets the urban area designation because it has 1,444 people per square mile in the city limits. It is important to note that CCFD services a Rural Area demand zone in almost all of the jurisdiction but has a concentrated urban population in the City of Gillette.

Education

The population within Campbell County is educated, with 95% of the community having graduated from high school while 58% have some post-secondary education with 36% having some college, and 22% having graduated college. Only 5% of the population does not have a high school diploma.

Figure 6: Campbell County Education



Business

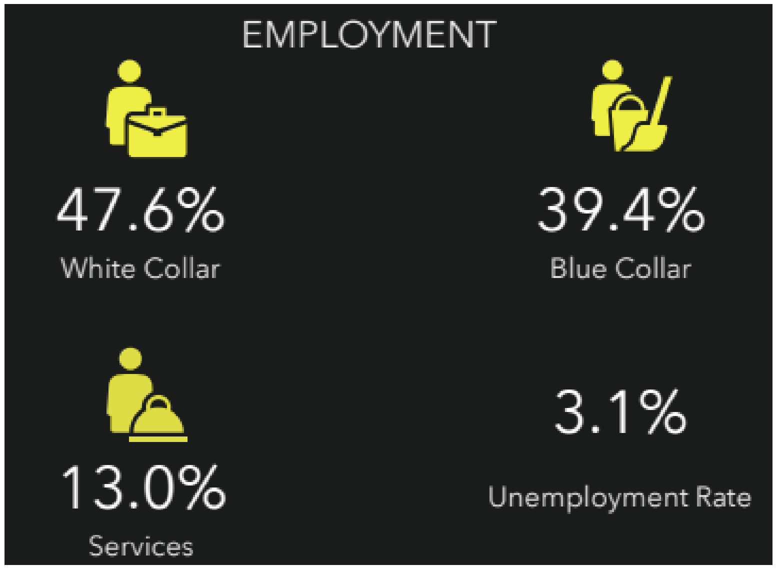
Campbell County houses 1,958 total businesses that employ 33,358 employees. Of those businesses 1,325 lie within the City of Gillette and 67 are located in the Town of Wright.

Figure 7: Campbell County Businesses and Employees

Workforce

The educational level of Campbell County's population has translated to a predominately white-collar workforce. About 47.6% of the workforce is employed in white-collar positions, while 39.4% work in blue-collar positions, and 13% are employed in the Service Industry. This leaves roughly a 3.1% unemployment rate. Interestingly, the Town of Wright is predominantly blue-collar workers at 52.5% of their population.

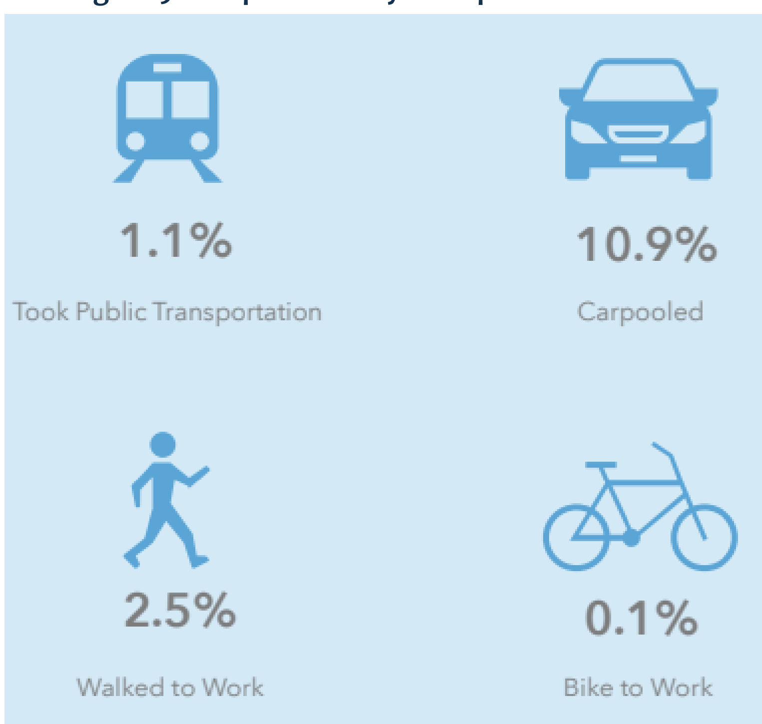
Figure 8: Campbell County Workforce by Job Classification



Transportation

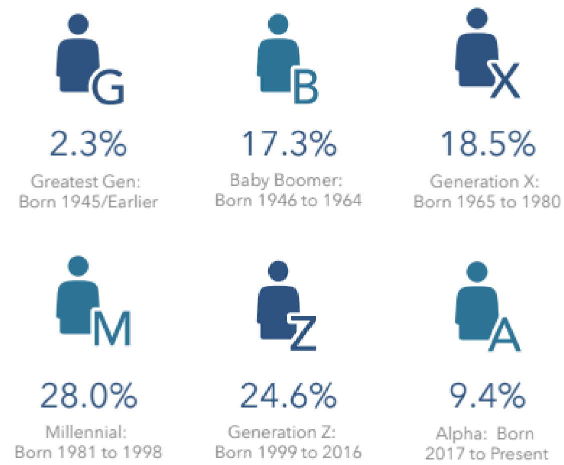
Driving to work alone in a private vehicle is the most common commuting option and is used by 80% of the workforce. Just over 10% of the workforce carpooled. Regardless of transportation methods, a majority of the self-reported commute times in the county are greater than 15 minutes. Transportation in the city is roughly 20 minutes or less for more than half the commuters.

Figure 9: Campbell County Transportation to Work



Age

The population in Campbell County is young. The median age in the jurisdiction is 34.4 years old. Only 11% of the Campbell County population is over the age of 65, and the majority—63% of the residents—are between the ages of 18 and 64.



More than a quarter—28%—of the county's residents are "Millennials." Born between 1981 and 1998, today, Millennials are between the ages of 25–42 years old and raising families. The Center for Disease Control states this group has the highest risk of death caused by unintentional injury; however, Millennials are difficult to target for prevention programs because of occupational obligations and a decline in community participation.

The at-risk populations in the town include 11% who are over the age of 65, 27% who are under the age of 18, and 6.9% who qualify as disabled. Additionally, 6.3% of households speak a language other than English in the home. Analysis of the at-risk population provides valuable insight for planning purposes, particularly for public safety considerations. This insight is discussed in detail in the *Community Risk Assessment* section of the report.

As the demographics are evaluated during the planning process the most important consideration is the density of the population at large. As the jurisdictions served by the Campbell County Fire Department plan for services, population density will provide insight as to where these services will be needed most. The different aspects of population density and population projections for service demand will be discussed in the *Service Delivery and Performance, Future Service Demand,* and *Community Risk Assessment* sections of the report.

Campbell County Fire Department Governance

The basis of any service provided by governmental or quasi-governmental agencies lies within the policies that give that agency the responsibility and authority upon which to act. In most governmental agencies, including Campbell County, those policies lie within the charters, ordinances, and other governing documents adopted by the agency. Pursuant to Wyoming Statutes 16-1-104 (b) A county may enter into and operate under a joint powers agreement with one (1) or more counties, cities, school districts or community college districts for the performance of any function that the county, city, school district or community college district is authorized to perform.

The CCFD is governed by a Joint Powers Fire Board (JPFB). Very few of these exist in Wyoming. The Fire Protection Joint Powers Board of Directors (Fire Board) is comprised of seven members who are appointed by and represent the Campbell County Commissioners, the Town of Wright, and the City of Gillette. Each term lasts four years. Fire Board meetings are scheduled monthly with additional special meetings conducted on an as-needed basis. The power and authority of the organization are detailed in the JPFB bylaws.

Campbell County Commissioners

The Board of County Commissioners is comprised of 5 members elected to alternating four-year terms. The Campbell County Board of Commissioners is the executive, legislative and judicial governing body for Campbell County. The general powers and duties vested in the Board of Commissioners can be found in W.S. 18-3-504. The Commissioners have the authority to approve the budget. The budgeting procedure for counties is administered through the Uniform Municipal Fiscal Procedures Act (W.S. 16-4-101 through 124).

Commissioners are authorized to regulate and restrict the location and the use of buildings and structures and the use, condition of use or occupancy of lands for residence, recreation, agriculture, industry, commerce, public use, and other purposes in the unincorporated area of the county. The purpose of planning and zoning is as stated in the statutes: "to promote the public health, safety, morals and general welfare of the county" (W.S. 18-5-201 through 208). Three members of the County Commission are appointed to the JPFB.

Gillette City Council

The governing body of the City of Gillette is comprised of a mayor elected at-large and six Council Members who are elected from three wards (two from each ward). The Mayor and Council Members serve four-year terms. City Council meetings are held the first, second and third Tuesdays of the month, at 6:00 p.m. in the Council Chambers of City Hall. Agenda meetings are held on the Tuesday preceding the regular meeting. Three members of the council are appointed to the JPFB.

Wright Town Council

The governing body of the Town of Wright is comprised of a mayor elected at-large and five Council Members who are elected at large. The Mayor and Council Members serve four-year terms. The Wright Town Council meets at 7:30 p.m. the second and fourth Mondays of each month in the Council Chambers of Town Hall. One member of the Town Council is appointed to the JPFB.

REVIEW OF SERVICES PROVIDED

ORGANIZATIONAL OVERVIEW

The Organizational Overview provides a summary of CCFD's composition, discussing its configuration and the services it provides. The purpose of this section is two-fold. First, it verifies the accuracy of baseline information along with ESCI's understanding of CCFD's composition. This provides the foundation from which the Long-Range Master Plan with Community Risk Assessment/Standards of Cover is developed.

Second, the overview serves as a reference for the reader who may not be fully familiar with the details of the CCFD's operations. Where appropriate, ESCI includes recommended modifications to current conditions based on industry standards and best practices.

The History of the Campbell County Fire Department

As a small railroad community, Gillette was officially founded in 1892. During the period of its existence there were little to no fire suppression efforts. Despite several large fires in town there continued to be little effort to establish a fire department. This lasted until 1904 when James Morgan decided to donate the fire bell now currently on display at the Alan Mickelson Training Center. This began the first organized efforts to provide fire suppression activities for the community. The "bucket brigade" cart was stored under the bell and available citizens would come when the bell tolled to fight the fires.

The official start of the Gillette Fire department is credited in 1906 with its first Fire Marshal followed by the installation of fire hydrants in 1908. The Gillette Fire Department was able to purchase a hose cart to significantly increase firefighting capabilities. A traditional horse-drawn hook and ladder truck was purchased in 1910 for $350. Throughout the 1900's the department continued to grow and expand its capabilities. This included a modern fire alarm system in 1933. The county fire department was battling grass and brush fires during this time with wet gunny sacks and shovels.

As a result of the depression and World War II, funding for the department was nearly nonexistent. This caused growth to slow until 1949 when a new fire engine was purchased. This was in conjunction with construction of the first fire hall located on 4th street and Gillette Avenue. After the Fiesta Theatre burned a large amount of old firefighting gear, the city decided to purchase bunker gear and air packs for the first time. This enhanced the firefighter's ability to aggressively fight fires.

On November 5, 1972, when a house fire occurred along the border of the two jurisdictions on the county side of the line the county only had grass and brush trucks to fight the blaze. Because the county didn't have the appropriate apparatus to fight the blaze, their structural firefighting capability was not sufficient and created a large disparity between the jurisdictions. This sparked a push for a combined city/county fire department.

In 1974, the city and county began to make some headway on combining forces when the two jurisdictions purchased a new fire hall located at 200 Rohan Avenue. At this time, the city department had 27 members and the county had 20 members. Finally, in 1975, the Joint Powers Fire Board (JPFB), consisting of both city and county officials, was created. With three new career firefighters, the new governing agency was able to allow both city and county units to meld into one mutually-beneficial department. The JPFB continues to govern the Campbell County Fire Department (CCFD) to this day.

One major event that helped to strengthen and form the CCFD was the line of duty death of Alan Mickelson. On January 31, 1989 the CCFD was dispatched to a structure fire at the Antelope Valley Baptist Church. Alan Mickelson fell through the roof of the church and perished. This incident sparked another major change in CCFD's development. The firefighters and citizens of Campbell County raised funds to build a large training facility to both honor Alan and prevent future, similar incidents. On August 18, 1990, the Alan Mickelson Fire Training Center was opened.

Figure 11: CCFD Fire Station 1, Headquarters

Now under the leadership of Fire Chief Jeff Bender, the Department has a service area of roughly 4,802.71 square miles and a staff of almost 42 employees. The CCFD has adopted the following mission statement and works tirelessly to achieve it.

To provide excellence in all interactions through professionalism.

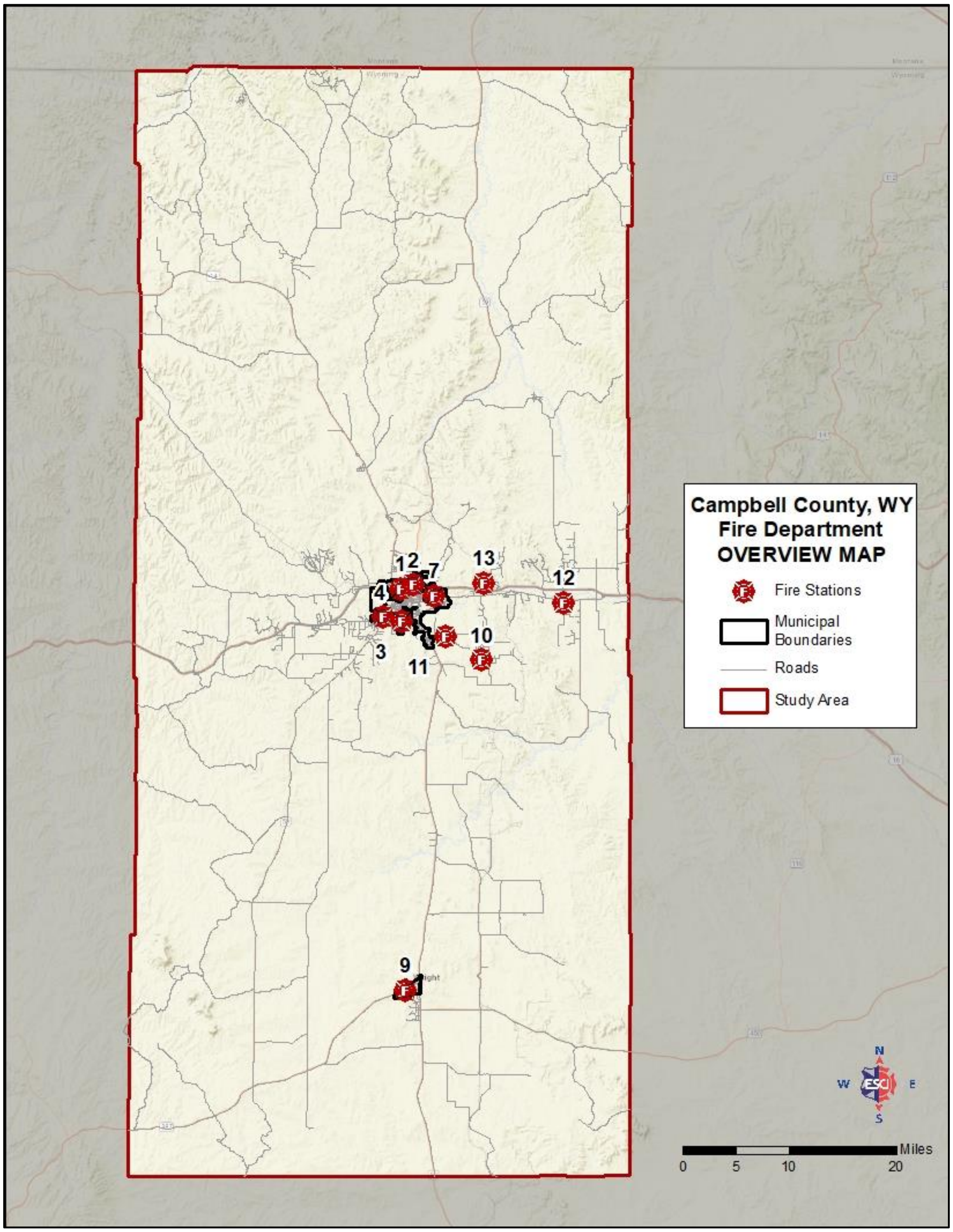
CCFD responds immediately when any member of the community needs help by providing professional, effective, and compassionate service. The CCFD currently operates from 10 fire stations strategically placed throughout the county. CCFD Headquarters is housed in Fire Station 1 and contains the main administrative components of the Department. The combination, part-time and career staff work together to provide these services. Career staff work 24-hour shifts and provide primary fire suppression and EMS first response with support from the part-time staff as needed and available. The department provides career staffing at three stations per day.

Services Provided

The Campbell County Fire Department provides Fire Prevention and Public Education, as well as quick and effective response for Fire Suppression, Hazmat, Technical Rescue, Emergency Medical Response, and Disaster Management.

Campbell County Fire Department's service area and fire station locations are depicted in the following figure.

Figure 12: Campbell County Fire Department Service Area



Public Protection Classification: Insurance Services Office—Rating Bureau

The Insurance Services Office, Inc. (ISO©) is an independent company that collects and analyzes data about municipal fire suppression efforts in communities throughout the United States. According to a recent report, the ISO's Public Protection Classification program, or PPC, "is a proven and reliable predictor of future fire losses."[1] All other factors being equal, commercial property insurance rates are expected to be lower in areas with lower (better) ISO PPC Class ratings.

At the time of the most recent ISO survey, the ISO Fire Suppression Rating Schedule (FSRS) measured four primary elements of a community's fire protection system: Emergency Communications (max 10 points); Fire Department (max 50 points); Water Supply (max 40 points); and Community Risk Reduction (max 5.5 points); for a maximum possible total of 105.5 points.[2] The ISO then assigns a grade using a scale of 1 to 10, with Class 1 representing the highest degree of fire protection, and Class 10 designating a fire suppression program that does not meet ISO's minimum criteria.

As of 2021, CCFD has a Public Protection Classification (PPC) rating of Class 4/10[3] from the Insurance Services Office (ISO). This rating is what many insurance companies base annual premiums on for privately insured properties. The higher the PPC class, the greater the likelihood that individual property insurance premiums will increase, especially for commercial properties. PPC also provides fire departments with a valuable benchmark and is used by many departments as a valuable tool when planning, budgeting, and justifying protection improvements.

As a result of the latest reclassification, Campbell County is one of 35 communities out of 152 communities surveyed across the State of Wyoming to achieve a Class 4 rating and ranks in the top 23% of all communities surveyed in the state, as shown in the following figure.[4]

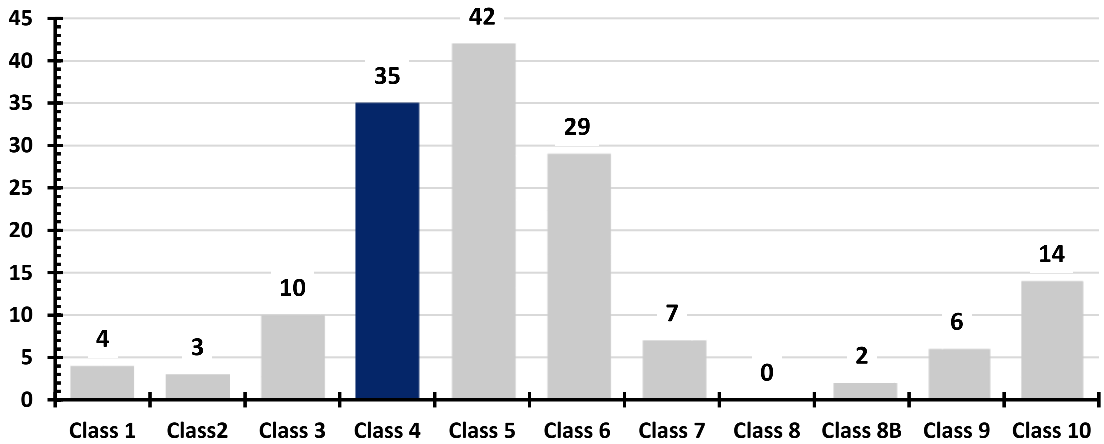
[1] *Public Protection Classification, (PPC™) Summary Report, Prepared by Insurance Services Office, Inc., Mt. Laurel, New Jersey.*

[2] *The fourth category, community risk reduction, was added by ISO in 2012.*

[3] *For the split classification, 4/10:*
The first class (4) applies to properties within 5 road miles of a recognized fire station and less than 1,000 feet from a fire hydrant or recognized alternate water supply.
The second class (10) applies to properties outside 5 road miles of a recognized fire station.

[4] *Distribution of Communities by PPC Class Number within Classification: Facts and Figures about PPC™ Codes around the Country; Insurance Services Office, Inc., Mt. Laurel, New Jersey; retrieved from https://www.isomitigation.com/ppc/program-works/facts-and-figures-about-ppc-codes-around-the-country/*

Figure 13: Comparison of ISO Class Ratings, State of Wyoming



ISO Element Summary

- **Emergency Communications.** CCFD scored 9.55 points of a possible 10 points.
- **Fire Department.** CCFD scored 25.85 points out of a possible 50 points.
- **Water System.** CCFD scored 33.86 points out of a possible 40 points.
- **Community Risk Reduction.** CCFD scored 5.39 points out of a possible 5.50 points.
- **CAFS Credit.** CCFD scored 0.00 out of a possible 1 point.
- **Divergence.** CCFD had a divergence score of -6.59 points.
- **Total Score.** CCFD had a total score of 88.24 points out of a possible 106.5.

The adjacent figure shows the grading for each of the four categories, plus divergence, from the most recent ISO audit. As shown, the highest scores for the CCFD were Communications (9.55 points out of a possible 10 points) and Water Supply (33.86 points out of a possible 40.00 points).

Figure 14: ISO Classification Scores

Category	Dec 2021
Communications **Max score = 10.00**	9.55
Percent max score	95.5%
Fire Department **Max score = 50.00**	25.85
Percent max score	51.7%
Water Supply **Max score = 40.00**	33.86
Percent max score	84.65%
Risk Reduction **Max score = 5.50**	4.22
Percent max score	76.7%
CAFS Credit **Max score = 1.00**	0
Percent max score	0%
Divergence factor	-6.59
Total Score	**66.89**
ISO Classification	**4/10**

Divergence

A note about "divergence." According to ISO, divergence "recognizes any disparity in the relative level of effectiveness of your fire department and water supply."[5] A divergence score is always negative, and ISO will reduce the overall PPC score if the relative scores for the fire department and water supply are different. In fact, the divergence factor may be high enough to result in a poorer ISO PPC classification. Thus, it is important to consider both the water supply and fire department when seeking to improve a PPC classification; investing in one without the other will be less effective over time. Areas of divergence to be considered by the CCFD, along with the resultant impact, are quantified in the ISO report.

Possible Corrective Actions

Areas of deficiencies within the Community Risk Reduction that would have the greatest impact are shown in the next figure. ESCI recommends that CCFD confirm the overall potential impact on service delivery and implementation cost, its ISO rating, and potential discounts on property insurance premiums before investing in any improvements.

Figure 15: Areas of ISO Divergence

Factor	Score	Max Score	% Max Score	Impact
561. Credit for Deployment Analysis	3.30	10	**33%**	**HIGH**
571. Credit for Company Personnel	2.43	15	**16%**	**HIGH**
581. Credit for Training	6.54	9	**72.66%**	**MODERATE**
631. Credit for Inspection and Flow Testing	3.69	7	**52.7%**	**MODERATE**
1033. Credit for Public Safety Education (CFSE)	1.51	2.2	**68.6%**	**MODERATE**

CCFD scored 66.89 points out of 105.5 total available points during the ISO PPC evaluation. Based on the above recommended divergence factors CCFD is within 3.11 points from the next lower PPC classification.

[5] *Divergence Factor, Insurance Services Office, Inc., Mt. Laurel, New Jersey; 1996, 2017; retrieved from https://www.isomitigation.com/technical/divergence-factor.html.*

PLANNING FOR FIRE PROTECTION SERVICES

Emergency services continually contend with a rapidly changing environment. Improved tools, technologies, increased regulation of activities, and changing risk profiles, are all challenges that, if not planned for, create reactionary management instead of proactive management. Departments can avoid service complications through continuous evaluations of the internal and external environment and aligning the organization around the needs of these environments. By analyzing data and trends and implementing course corrections, an organization will stay on the leading edge of service delivery.

Without effective planning, it is impossible for an organization to know when it is reaching milestones or providing exceptional services to its constituency. The National Fire Protection Association has established NFPA 1660, *Standard for Emergency, Continuity, and Crisis Management: Preparedness, Response, and Recovery* and NFPA 1201: *Standard for Providing Fire and Emergency Services to the Public,* as standards to assist fire and EMS departments in establishing and maintaining planning documents and conducting planning activities.

The Current Planning Process

As a result of the data-driven decision-making processes that are in effect throughout CCFD, the organization has produced and instituted a series of plans for the operations of the organization, consistently moving the fire department forward and ensuring that it is positioned to respond to the dynamic service demands of the community. Understanding and identifying the critical issues facing any organization is the first step in moving toward resolution.

Internal Assessment of Critical Issues and Future Challenges

Similar to the need for guiding documents in the rapidly changing environment of emergency services, analysis and understanding of critical issues and emerging challenges facing the department is critical for organizational leaders and their success. No single leader should address these issues and challenges alone and must engage and involve the numerous talented and capable members of their organization at all levels. CCFD's Fire Chief has identified the five most critical issues that are currently faced by the organization. This is illustrated in the following figure.

Figure 16: Identified Critical Issues

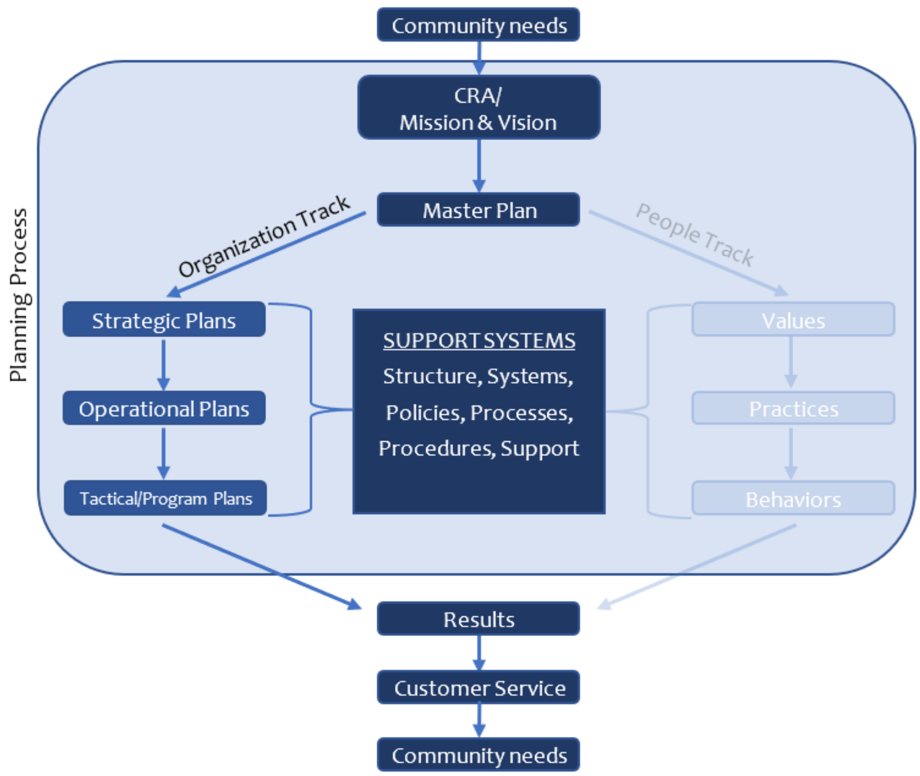
Priority	Fire Chief's Perspective
First	Ensure adequate staffing levels in accordance with NFPA 1710 and NFPA 1720 through enhanced recruitment and retention of experienced staff.
Second	Determine the appropriate resource footprint to provide essential services and maintain the achieved ISO rating.
Third	Secure an appropriate funding model to address rising costs for infrastructure and apparatus.
Fourth	Adapting the purpose and use of part-time staff to achieve efficient support of the department mission.
Fifth	Developing an appropriate future succession plan for employee growth and development.

Organizational Planning

In order to do the best job possible with available resources, organizations must focus on improving services while identifying programs or activities that may no longer serve their changing needs. Through planning, a fire and EMS department can establish a vision, create a framework within which decisions are made, and chart its course to the future. The quality and accuracy of the planning function determine the success of the organization. To be truly effective, an emergency services agency must consider planning on four distinct levels.

These planning levels are depicted in the following figure.

Figure 17: Organizational Alignment



To remain highly effective and improve service delivery, an organization must identify programs and activities that may no longer serve the community's changing needs. The process illustrated above is called organizational alignment, adapted from the Vector Group to meet the fire service's needs.[6] This process aligns the entire organization by examining the community needs and cascading those needs down through the community risk assessment (CRA), mission and vision. After the community risk assessment, a master plan is created outlining the service delivery needed to mitigate the vulnerabilities from the community risk assessment. There are separate processes that mirror each other for both the organization and the people planning.

[6] *Group, Vector. MODEL: Strategic Alignment. PDF. Denver: Vector Group, 2016.*

The organizational track looks at strategic, operational, and tactical/program plans. The people track details of the individuals' values, practices, and behaviors. Both pathways come back together to measure results. Keep in mind that these processes are not exclusive of each other, and many times come together into a single plan. Finally, we compare service delivery to the community needs to measure results. A fire department can stay true to its core mission and competencies through proper planning while sculpting its vision to serve the new environment. The quality and accuracy of the planning processes determine the organization's success.

To be truly effective, an emergency services agency must consider planning on many distinct levels:

- Master planning
- Strategic and values planning
- Operational and practices planning, including emergency preparedness
- Tactical/project and behavioral planning
- Infrastructure support for these plans

Master-level planning is the formulation of a long-term outlook bringing together the CRA, and the stated mission to create the organization’s vision establishing the organization’s long-term effectiveness as its operating environments change over time. Considering the current and future needs of the community and the organization is vital to a successful planning process. The master plan lays out a comprehensive roadmap that will take the organization to its desired future state from its current form.

Strategic and values level planning establish the direction for the organization, determining its operational objectives and cultural values and formulating the strategies required to achieve its mission and vision in the master plan. In addition, strategic planning involves creating guidelines for the department management to follow to accomplish the objectives of the organization formulated in the master plan.

On the other hand, operational and practices planning guide the organization in the routine undertaking and emergency preparedness to mitigate potentially damaging events that could compromise an organization's or constituents' ability to function. It involves short-term activities to be achieved by employees, integrates the agency into other local, regional, or national response networks, and lays out how the organization demonstrates its values. These activities directly accomplish the operational objectives and indirectly support the master plan vision.

Tactical/program and behavioral planning involve the development of strategies for potential emergency incident response and program projects like SCBA maintenance or facilities construction. Finally, the behavioral level takes the people practices and translates these practices into behaviors that demonstrate the identified values of the organization. All of which support the operational plans, strategic plan, master plan, and in turn, the organization’s mission.

The departmental survey illustrates that CCFD is undertaking efforts for planning by engaging ESCI to assist in its long-range planning efforts. Therefore, previous planning efforts have been limited with the exception of some tactical planning is accomplished through special hazard plans and hazmat planning.

Master Planning

Master planning, also called long-range planning, is a process that seeks to answer several questions:

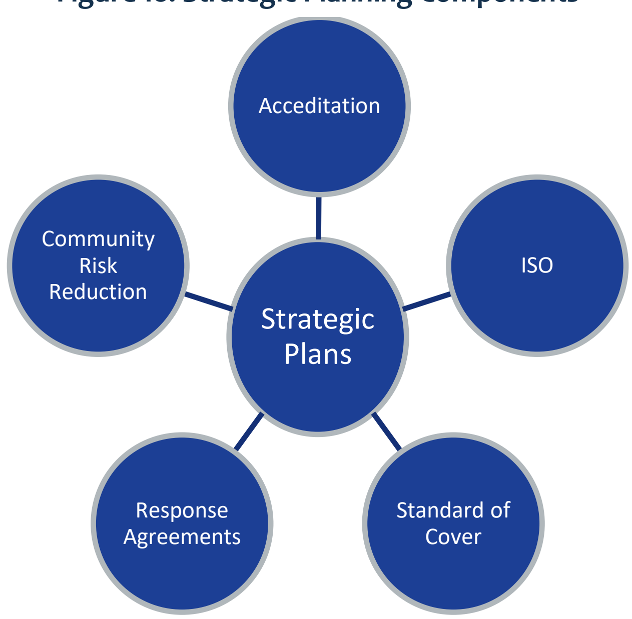
- Where is our organization today (mission)?
- Where will we need to be in the future (vision)?
- What service do we need to provide (service)?
- How do we affect the risks our community faces (CRA)?
- How do we get there (plan)?

CCFD has recognized the need for a long-range planning effort by undertaking this master planning process. This study gives the department a clear understanding of today based on evaluating current conditions. Then it contemplates the department's future requirements and builds strategies to meet them. These strategies are detailed in the report's Future System Recommendations sections. The design of this Master Plan study is to provide a view of the organization for a ten-year time frame.

Strategic Planning

A strategic plan considers a three-to-five-year planning horizon and establishes prioritized goals and objectives for the organization. The strategic plan evaluates, prioritizes, and implements the recommendations of the master plan. Strategic planning involves creating guidelines for the department management to follow to accomplish the objectives of the organization formulated in the master plan. The following figure represents examples of different organizational inputs that might be considered when creating a strategic plan.

Figure 18: Strategic Planning Components



Strategic plans should ensure that the speed, strength, and depth of response by a department are adequate when deployed to an emergency. This requires the creation of a standards of cover (SOC) document. Creating this standard involves:

- Identification of potential risk types,
- Identifications of critical tasks for objectives for each risk type,
- Calculation of the number of resources needed to perform each essential task,
- A methodology assuring adequate resources are dispatched to an incident via 911 center protocols.

Operational plans stemming from the strategic planning process need to address the timely implementation of mutual and automatic aid to meet the requirements of the SOC. In addition, mutual aid agreements should incorporate resource needs and responsibilities. One of the most critical aspects is integrating these agreements into the 911 center's Computer Aided Dispatch (CAD) systems for the seamless automatic activation of mutual aid deployment.

Establishing a customer-oriented strategic plan accomplishes the following:

- Identification of the strengths, weaknesses, opportunities, and challenges of the agency
- Determination of the community's service priorities
- Understanding the community's expectations of the agency
- Establishment of realistic goals and objectives for the future
- Definition of service outcomes in the form of measurable performance objectives and targets

The CCFD began working on a planning process in 2019 with a staffing evaluation. This has led to the commissioning of a master plan that contains a community risk assessment and a standard of cover. CCFD should continue the strategic planning process by completing a strategic plan to help implement the recommendations from the master plan. This strategic plan should also include a three- to five-year financial plan. It was noted that a capital account is being created for 2023. It is recommended that this finance plan include a strategic replacement schedule (see more in the financial review section).

Operational Planning

Operational planning includes establishing guides for the organization about routine undertakings such as divisional plans, response plans, staffing policies, mutual and automatic aid (locally and regionally), and specialty resource identification.

The following figure represents the organization's primary divisions that should be considered when an organization is in the planning process.

Figure 19: Operational Planning Components

Divisional plans such as training, EMS, support services, administration, etc., should have operational plans instituted. These divisional plans outline responsibilities, staffing, schedules, goals, objectives, and other needs specific to the division. Many of these plans are broken down into smaller groups that require specialized needs, i.e., special teams, apparatus maintenance, etc. The following figure demonstrates how a divisional plan like wildland operations can be separated to build more detail.

These plans allow the organization to understand the duties of each division and how the divisions support the master plan, mission and vision, and the fire department's strategic plan.

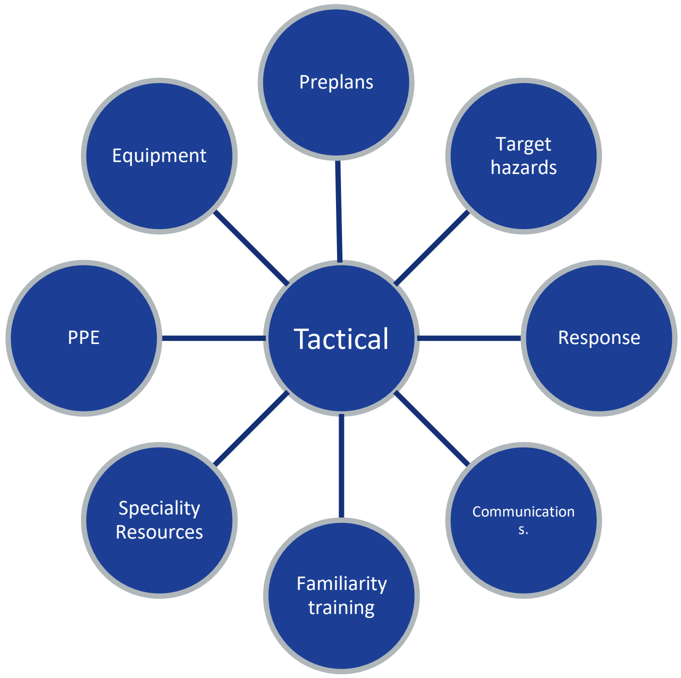
Tactical /Program Planning

This area of planning is where the rubber meets the road. These plans are detailed and task-driven. This planning section has two main areas, tactical response and program areas. Tactical planning is the pre-incident, target hazard, response, and emergency planning.

Tactical

When responding to a building or property during an emergency, there is limited time to sort out the special hazards, location, and treatment of critical components. A lack of familiarity with buildings and property can easily lead an emergency crew to use valuable time planning the incident, become disoriented, or, even worse, suffer an injury. The following figure shows the different parts of the tactical plans that need to be considered when formulating them.

Figure 20: Tactical Planning Components



It is critical that firefighters and command staff have information readily at hand to identify hazards, direct tactical operations, and use built-in fire-resistive features to their advantage. This situational awareness can only be accomplished by building familiarization tours, developing pre-incident plans, conducting tactical exercises, and identifying needed specialty resources.

Currently, CCFD is waiting for recently purchased technology to be implemented to begin using electronic pre-incident plans; however, there are hazard-specific plans. This information is not integrated into response resources or dispatch protocols; therefore, the hazard information is unavailable nor communicated to responders during an incident. CCFD is encouraged to develop and maintain effective pre-incident and special hazard plans and incorporate the plans routinely into dispatch communications following NFPA 1660. A defined list of "target hazards" should be developed, and focused effort should be given to ensuring response personnel have ready access to pre-incident plans. FEMA defines target hazards as: "facilities in either the public or private sector that provide essential products and services to the general public, are otherwise necessary to preserve the welfare and quality of life in the community, or fulfill important public safety, emergency response, and disaster recovery functions." Many fire departments will define target hazards by:

- Facilities that can have a substantial economic impact on the community
- Buildings with large potential occupant loads
- Buildings with populations who are partially or entirely non-ambulatory
- Buildings of considerable size (greater than 12,000 square feet)
- Buildings that contain process hazards, such as hazardous materials or equipment

Pre-incident and target hazard planning should be regularly updated, easy to use, and quickly accessible for company officers and command staff. NFPA 1660 provides excellent information on the development and use of pre-incident plans and is a vital reference. Once pre-plans are established, training personnel who may respond to an incident at those locations is essential. In addition, copies of pre-incident plans and drawings should be available on each response vehicle and incorporated into dispatch procedures.

Emergency Management

Once a low priority, emergency management has increased importance in assisting emergency response, incident support, and recovery after the incident. By developing and maintaining emergency action plans and regularly exercising and updating the plans, local governments help limit and manage the consequences of a disaster. The common term for governmental disaster preparedness is emergency management.

The Superfund Amendment and Reauthorization Act, found in Title III of the Federal Code (SARA Title III), defines requirements for tracking hazardous materials used in fixed facilities and establishes requirements for emergency response planning. Therefore, CCFD is involved with the Local Emergency Planning Committee (LEPC) at the county level. The LEPC is responsible for identifying and collecting information on the use of hazardous materials by private and public entities. Information collected includes the type of material, quantity, and the location at each site. Additionally, the LEPC ensures adequate local response plans based on the potential risk.

SARA Title III requires industries that use over a threshold limit of certain highly hazardous materials (extremely hazardous substance facilities – EHS) to develop comprehensive emergency plans for their facility. In addition, the Act requires that local fire departments coordinate with the involved industry to ensure a quality response to the emergency.

CCFD is a member of the Campbell County Public Safety Committee and the Local Emergency Planning Committee and works in partnership with the Campbell County Emergency Managers on a joint Hazard Mitigation Plan. It is paramount that CCFD staff remain updated on plan content and understand the department's role in their execution.

Planning efforts are generally limited in the organization based on staff size and administrative support. The department has contracted professional services to assist with developing these guiding documents. CCFD has done a good job of working with Campbell County on hazard mitigation planning. In addition, comprehensive long-range planning that contemplates a holistic view of the customer needs through results analysis, including the need for a standard of cover, capital improvement planning, and operational planning, was identified and ESCI was contracted to provide those services.

People Planning

As part of the planning process, fire departments typically publish core values that set the foundation for culture. These core values support the mission and vision of the department and are vital to the planning for personnel management in the fire department. The core values are examined in an alternate section of the master plan.

MANAGEMENT COMPONENTS

Effective fire and EMS organizational management is a complicated and expanding challenge for fire service leaders and planning alone will not suffice. With increasing complexity comes increased cost. Today's organization must address management complexities that include an effective organizational structure, setting and measuring levels of service, staying abreast of new technologies and methods, evaluation and maintenance of a qualified workforce, staff development for effective succession planning, and financial sustainability for the future. The establishment of department mission statements, vision statements, and guiding principles ensures the employees are aware of the expected behaviors and attitude required for the success of CCFD. While this section will discuss the various components of personnel management, it should be noted that good management alone will not guarantee an efficient and effective organization.

Mission, Vision, Goals, and Objectives

To be an efficient and effective organization, management must be based on several components. These include a clearly stated *mission* (the fundamental purpose of an organization); a *vision* for the future (where is the organization going); and the *core values* or *guiding principles* (how will the organization treats its members as it navigates from its current state to its desired future). These fundamental elements allow organizations to evaluate the current environment in which they operate and establish strategic initiatives, goals, and objectives necessary to move forward progressively. CCFD has established and communicated the following fundamental elements.

Mission Statement

Through the following mission statement, the CCFD and its members are:

To provide excellence in all interactions through professionalism.

This broad mission statement allows CCFD the flexibility to utilize a wide range of tactics in responding to the needs of the citizens and visitors of Campbell County. The development of a mission statement is only one component of ensuring success. The mission statement must be communicated to internal and external stakeholders, which CCFD accomplishes by placing the statement in the lobby of all fire stations and fire administration areas, and on all fire rescue buildings.

Vision Statement

Vision statements are commonly a declaration of an organization's objectives to achieve a state of continuous improvement. This is an important foundational component because it shows that an organization recognizes that they are not necessarily where they would like to be and are willing to set goals to reach their objectives. It should be noted that adopting a vision does not necessarily indicate that an organization is broken but rather a declaration that they could be better and refuse to settle for the status quo.

CCFD has developed and adopted the following vision statement.

The Campbell County Fire Department will provide professional emergency services through education and training while adhering to the highest levels of safety, integrity, and superior customer service.

Core Values

The core values of CCFD are:

Safety – Integrity –Professionalism – Loyalty

The rationale for adopting organizational core values is to support the vision and shape the culture in a manner that accurately reflects what an organization values, which should be aligned with community values and expectations. CCFD's core values are simple, easy to understand, and accomplish the overall objectives of the department. CCFD takes this one step further and explains each of the identified values and the impacts that each one makes on internal and external stakeholders.

CCFD has identified the need for a strategic plan and has budgeted for this in the next fiscal year's budget. In general, a current strategic plan should be available, establishing timelines to accomplish goals and objectives and assigning appropriate personnel to each. This process allows for goals and objectives to be prioritized, ensures that timelines stay on track, and holds personnel accountable to complete respective assigned tasks while consistently working towards the organizational mission, vision, and core values. Follow-up is critical, as with any project, to ensure boxes are not just being checked but that truly meaningful improvements are being obtained.

Internal and External Communication Processes

Communication within an organization and the external environment is a critical factor in achieving an effective and efficient organization. Organizations that lack effective communication can have difficulty in reaching their ultimate potential. The following describes both internal and external communications within CCFD.

Internal

CCFD utilizes multiple avenues of internal communication. Fire department administrative staff meetings are held on a regular schedule. All department members have email addresses and access to a department intranet site, which can be utilized to disseminate information to all personnel in addition to the use of written memos. While member newsletters are not utilized, member forums (all-hands meetings) are conducted, and the Fire Chief has an open-door policy for informal conversations with personnel. There is a vertical communications path clearly identified through a chain-of-command.

External

CCFD also accomplishes external communications through multiple avenues. The primary source of external communication is provided by the department's website and social media accounts. The CCFD Facebook® account has approximately 8,486 followers, 1,034 followers on Instagram® and its Twitter® account has approximately 77 followers but has been inactive since 2019. No community newsletter is utilized, nor is there a community advisory committee in place; however, the department does have a formal complaint process in place.

STAFFING

The most valuable assets of any organization are its people. The effective management of human resources requires optimizing the balance between maximum utilization of the workforce and a high level of job satisfaction for individual workers. The size and structure of an organization's staffing are dependent upon the specific needs of the organization. These needs must directly correlate to the needs of the community, and a structure that works for one entity may not necessarily work for another agency. To achieve this goal of job satisfaction consistently, management must combine reliability and consistency with a safe working environment, fair treatment, the opportunity to provide input, and recognition of individual commitment and job performance.

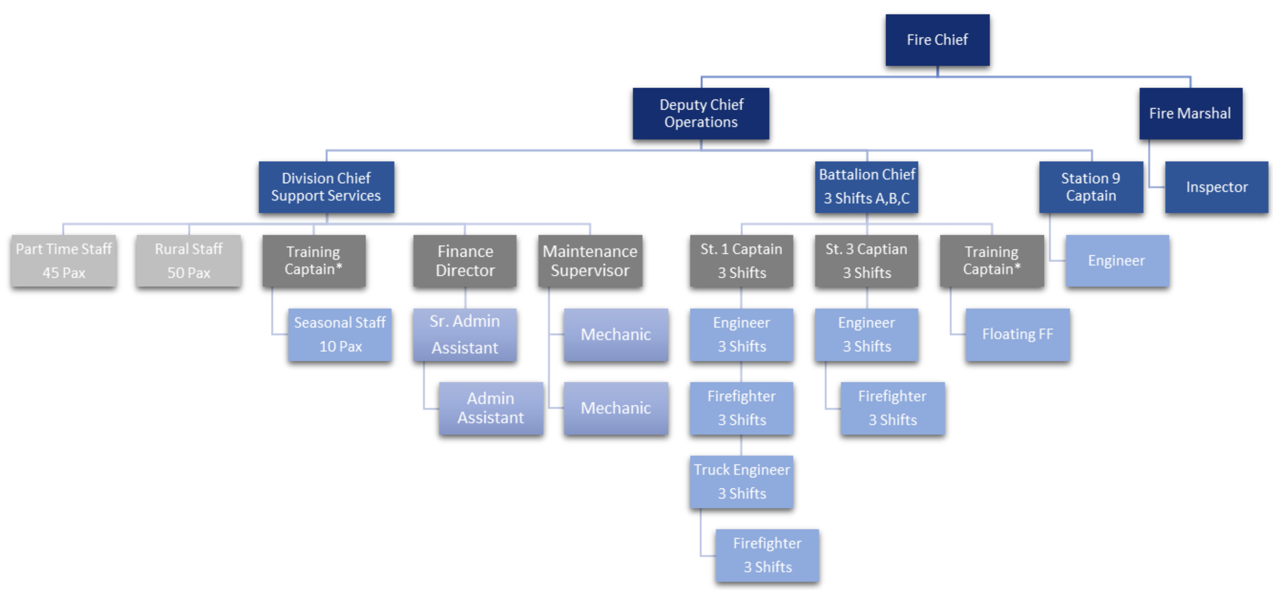
Organizational Structure

The structural design of an organization is important to successful service delivery. Campbell County Fire Department mimics a paramilitary organization. This structure is similar to those found in many fire and EMS agencies across the country. The uniformed professionals filling the various operational positions within the CCFD have the skills and equipment to respond to structure and vehicle fires; medical emergencies involving cardiac arrest, respiratory distress, and trauma; vehicle accidents requiring extrication; hazardous materials incidents; some technical rescue; natural disasters; and many other fire or emergency medical calls for service.

When not responding to 9-1-1 calls, CCFD firefighters train for the worst-case scenarios; they perform other duties such as hose testing and conduct pre-incident planning, conduct public education activities, and give back to the community by supporting charitable projects.

The CCFD organization chart is reflected in the following figure.

Figure 21: Campbell County Fire Department Organizational Chart



The chain of command is important as it provides a clear source of direction, lines of communication, and accountability. The organizational design does not have any conflicting pathways and each operating unit has only one supervisor which provides a unity of command for the organization.

Span of control is an important element in the effective and efficient mitigation of emergency incidents, and management of administrative responsibilities. While the effective span of control will vary based on administrative demands and operational complexity, it is widely accepted that a single person's span of control should not be greater than seven subordinates. The maximum administrative span of control in the current organizational structure is 1:4 under the station Captain.

Historical Staffing Perspective

CCFD has worked extremely hard to achieve staffing recommendations suggested in the *Campbell County Fire Department Staffing Study* conducted in 2018 by ESCI. In the study industry best practices were identified and recommendations made to achieve those industry best practices.

The following figure shows the historical trend for department staffing.

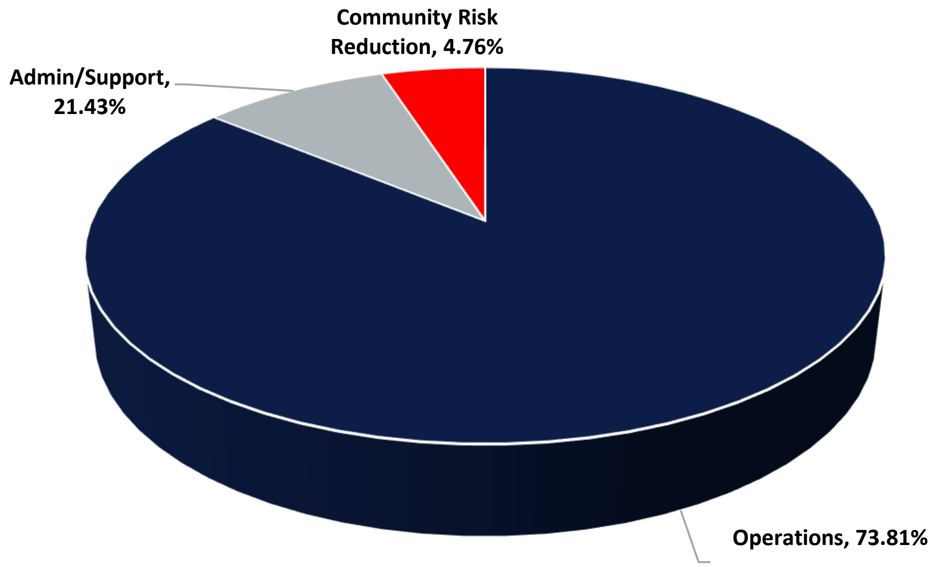
Figure 22: CCFD Historical Staffing FTE Counts 2018-2023

Position Title	Number of Positions FY18-19	Number of Positions FY19-20	Number of Positions FY20-21	Number of Positions FY21-22	Number of Positions FY22-23
Fire Chief	1	1	1	1	1
Deputy Chief	0	0	0	1	1
Division Chief	2	2	2	1	1
Battalion Chief/Fire Marshal	1	1	1	1	1
Fire Inspector	1	1	1	1	1
Equipment Maintenance Supervisor	1	1	1	1	1
Mechanic III/Sr. Mechanic	1	1	1	1.75	2
Comptroller/Director of Finance	1	1	1	1	1
Administrative Assistant III/Sr. Admin	2	1	1	1	1
Administrative Assistant II	0	1	1	1	1
Shift Commander (Battalion Chief)	1	3	3	3	3
Captain	3	4	4	7	8
Firefighter III/Engineer	6	5	5	7	10
Firefighters	7	9	9	9	10
Total Department FTE's	**27**	**31**	**31**	**36.75**	**42**

In this section, ESCI explores each of the CCFD's current staffing levels and evaluates them against the mission, identifying potential gaps and efficiencies that might be gained with their current operations. For simplicity, personnel are grouped as follows; the ratio of each staff group is shown in the following figure.

- **Administrative/Support Staff**- Individuals considered full-time or part-time staff primarily assigned to manage, plan, or support the activities of the agency and its programs.
- **Community Risk Reduction Staff**- Individuals considered full-time or part-time staff primarily assigned to fire prevention, fire inspection, fire/arson investigation, public education, and other community risk reduction (CRR) programs.
- **Operational Staff**- Individuals considered full-time or part-time employees, primarily assigned to provide emergency services at the operational level.

Figure 23: Ratio of CCFD Staff Assignments



Administrative and Support Staffing

One of the primary responsibilities of the response team's administration is to ensure that the operations segment of the organization has the ability and means to respond to and mitigate emergencies in a safe, efficient, and timely manner. An effective administration and support services system is critical to the success of CCFD.

Like any other part of a fire protection jurisdiction, administration and support functions need appropriate resources to function properly. By analyzing the administrative and support positions within an organization, an agency can achieve a common understanding of the relative resources committed to this function compared to industry best practices and similar organizations. The appropriate balance of administration and support compared to operational resources and service levels is critical to the success of the department in accomplishing its mission and responsibilities.

Typical responsibilities of administration and support staff include planning, organizing, directing, coordinating, and evaluating the various programs within a jurisdiction. This list of functions is not exhaustive, and other functions may be added. It is also important to understand these functions do not occur linearly and, more often, coincide. For CCFD, this requires the Fire Chief to focus on many different areas at the same time.

The following figure reviews the administration, CRR, and organizational support staff of CCFD.

Figure 24: CCFD Administrative, Community Risk Reduction, and Support Staff

Position Title	Number of Positions	Hours Worked/Week	Work Schedule
Career Admin/Support Staff (full-time & part-time)	*Individuals considered full-time or part-time staff primarily assigned to manage, plan, or support the activities of the agency and its programs.*		
Fire Chief	1	40	M–F
Deputy Chief	1	40	M–F
Division Chief	1	40	M–F
Battalion Chief/Fire Marshal	1	40	M–F
Fire Inspector	1	40	M–F
Equipment Maintenance Supervisor	1	40	M–F
Mechanic III/Sr. Mechanic	2	40	M–F
Comptroller/Director of Finance	1	40	M–F
Administrative Assistant III/Sr. Admin	1	40	M–F
Administrative Assistant II	1	40	M–F
Total Administrative, CRR and Support Staff FTE's	**11**		
Total Department FTE's	**42**		
Admin/Support Percentage	**21.43%**		
CRR Percentage	**4.76%**		
Operations Percentage	**73.81%**		

ESCI notes that the current level of administrative and support staffing represents roughly 21.43% of the overall department staffing. Currently staff assigned to operational shift functions are also given administrative tasks.

Administration

The main administrative function within CCFD is established with the position of Fire Chief. Some of the typical responsibilities of the Fire Chief include planning, organizing, directing, and budgeting for all aspects of the department's operations. CCFD has a Deputy Chief and a Division Chief to assist the Fire Chief with performing these functions and to provide additional oversight to the operations of the department. In addition to these two uniformed administrative staff there are three civilian staff members who provide administrative functions. These positions are titled Director of Finance, Administrative Assistant III/Sr. Administrative Assistant and Administrative Assistant.

Support Staffing

CCFD has additional uniformed staff for organizational support staffing. There are 2 FTEs assigned to the functions of fire prevention, fire inspections, fire investigations, and life-safety education. Other support functions are achieved with civilian fleet maintenance. Some additional support functions are assigned to operational staff who perform double duty when they are available for training, EMS administration, quality improvement, Hazmat, technical rescue, and logistics.

Emergency Response Staffing

Every 23 seconds, a fire department in the United States responds to a fire somewhere in the nation.[7] It takes an adequate and properly trained staff of emergency responders to put the appropriate emergency apparatus and equipment to its best use in mitigating incidents. Overall, local fire departments across the nation responded to an estimated 1,388,500 fires in 2020, resulting in 3,500 civilian deaths, 15,200 civilian injuries and $21.9 billion in direct property damage.[8]

Insufficient staffing at an emergency scene decreases the effectiveness of the response and increases the risk of injury to all individuals involved. A fire occurs in a structure at the rate of one every 64 seconds, and a home fire occurs every 89 seconds.[9] Tasks that must be performed at a fire can also be broken down into three key components: life safety, incident stabilization, and property conservation. Responder's base life safety tasks on the number of building occupants and their location, status, and ability to take self-preservation action. Life safety-related tasks involve search, rescue, and evacuation of victims. The incident stabilization element involves delivering enough water to extinguish the fire and create an environment within the building that allows entry by firefighters. Property conservation comes from efficient confinement and extinguishment.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program* was developed in 1987due to the high number of line-of duty deaths being documented and reported and the growing concern with the number of firefighters who were suffering disabling injuries or developing occupational diseases. Several revisions to this consensus standard ensued over the years that continue to address changes in the fire industry regarding firefighter health and safety. Chapter 8 of this standard specifically addresses emergency operations as it pertains to all hazards that may be faced by firefighters. Section 6 of this chapter provides the following requirements:

- 8.6.1 The fire department shall provide an adequate number of personnel to safely conduct emergency scene operations.
- 8.6.1.3 Operations shall be limited to those that can be safely performed by the personnel available at the scene.
- 8.6.3 When inexperienced members are working at an incident, direct supervision shall be provided by more experienced officers or members.
- 8.6.4 Members operating in hazardous areas at emergency incidents shall operate in crews of two or more.

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[7] *2021 National Fire Protection Agency, Fire Loss in the United States During 2020*
[8] *Ibid.*
[9] *Ibid.*

Furthermore, the annex (A.8.6.1.3) states "the limitation of emergency scene operations to those that can be safely conducted by the number of personnel on the scene is intended to reduce the risk of fire fighter death or injury due to understaffing" (NFPA, 2021, p. 48). In this statement, NFPA 1500 strongly recommends that:

"Interior fire-fighting operations not be conducted without an adequate number of qualified fire fighters operating in companies under the supervision of company officers. It is recommended that a minimum acceptable fire company staffing level should be four members responding on or arriving with each engine and each ladder company responding to any type of fire. The minimum acceptable staffing level for companies responding in high-risk areas should be five members responding or arriving with each engine company and six members responding or arriving with each ladder company. These recommendations are based on experience derived from actual fires and in-depth fire simulations and are the result of critical and objective evaluation of fire company effectiveness. These studies indicate significant reductions in performance and safety where crews have fewer members than the above recommendations. Overall, five member crews were found to provide a more coordinated approach for search and rescue and fire-suppression tasks. During actual emergencies, the effectiveness of companies can become critical to the safety and health of fire fighters. Potentially fatal work environments can be created very rapidly in many fire situations. The training and skills of companies can make a difference in the need for additional personnel and in reducing the exposure to safety and health risks"[10]

The number and types of tasks needing simultaneous action will dictate the minimum number of firefighters required to combat different types and magnitudes of fire. In the absence of adequate personnel to perform concurrent action, the commanding officer must prioritize the tasks and complete some in sequential order, rather than concurrently. These tasks include:

- Command
- Scene safety
- Search and rescue
- Fire attack
- Water supply
- Pump operation
- Ventilation
- Backup/rapid intervention

The first 15 minutes are the most crucial period in the suppression of a fire. The timing of these 15 minutes does not start when the firefighters arrive at the scene but begin when the fire initially starts. How effectively and efficiently firefighters perform during this period has a significant impact on the overall outcome of the event. This general concept is applicable to fire, rescue, and medical situations. Responders must perform critical tasks promptly to control a fire or to treat a patient. CCFD is responsible for assuring that responding companies are capable of performing all of the described tasks in a prompt, efficient, and safe manner.

[10] *NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, Chapter 8.6.1.3, 2021*

Considerable ongoing local, regional, and national discussion and debate draws a strong focus and attention to the matter of firefighter staffing. Frequently, this discussion is set in the context of firefighter safety. The 2020 edition of NFPA 1710: *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* has updated the definition of career fire department to include departments that utilize full-time or full-time equivalent station-based personnel immediately available to comprise 50% of an initial full alarm assignment. CCFD falls into this new definition and should model their response based on these new guidelines regarding response practices when possible.

The jurisdiction may choose to establish response demand zones and use criteria outlined in the National Fire Protection Association (NFPA) standards. NFPA 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* establishes demand zones for use. A demand zone can be a single building or group of buildings. It is usually a geographical boundary called fire management area or fire management zone. Campbell County has significant geographical setbacks that limit the ability to assemble resources and the use of NFPA 1720 to establish demand zones allows the CCFD an opportunity to establish performance metrics based on industry best practices.

The NFPA 1720 demand zone deployment model is listed in the following figure.

Figure 25: NFPA 1720 Deployment Model

Demand Zone	Demographics	Minimum Staff to Respond	Response Time (minutes)	Meets Objective (%)
Urban Area	> 1,000 people/mi^2	15	9	90
Suburban Area	500–1,000 people/mi^2	10	10	80
Rural Area	< 500 people/mi^2	6	14	80
Remote Area	Travel distance ≥ 8 miles	4	Directly dependent of travel distance	90
Special Risks	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90

* A jurisdiction can have more than one demand zone.

* Minimum staffing includes members responding from AHJ's department and automatic aid.

* Response time begins upon completion of the dispatch notification and ends at the time interval shown in the figure.

NFPA 1710: *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* specifies the number of firefighters assigned to a particular response apparatus, often characterized as a "minimum of four personnel per engine company." ESCI notes that the more critical issue is the number of firefighters assembled at the scene of an incident in conjunction with the scope and magnitude of the job tasks expected of them, regardless of the type or number of vehicles upon which they arrive. The community should set staffing levels based on risk, capability, and citizen expectations. This ultimately becomes a policy decision set by the governing body. There is not a mandated requirement that fits all situations, although NFPA 1710 has objectives to meet regarding the number required for some typical scenarios.

Some terms are interchangeable, such as assembly of firefighters on an incident, which may also be referred to as "Initial Full Alarm Assignment," "Effective Firefighting Force" (EFF), or "Effective Response Force" (ERF). In the figures below, ESCI describes the NFPA 1710 level of staffing comprising this effective response force for three different scenarios[11].

Figure 26: Initial Full Alarm Assignment for Residential Structure Fire

Initial Full Alarm Assignment—2,000 SF Residential Structure Fire	
Incident Commander	1
Water Supply Operator	1
2 Application Hose Lines	4
1 Support Member per line	2
Victim Search and Rescue Team	2
Ground Ladder Deployment	2
Aerial Device Operator	1
Incident Rapid Intervention Crew (4 FF)	4
Total	**17**

Figure 26~~Figure 26~~ shows the staffing needed to safely and effectively mitigate a single-family, 2,000-square-foot two-story residential structure without a basement and no exposures. The following figure describes an initial full alarm assignment for an open-air strip-type shopping center. Note that as the risk and difficulty become greater, the staffing levels needed for effective mitigation increase.

[11] *NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (National Fire Protection Association 2020 ed.) Article 5.2.4 Deployment.*

Figure 27: Initial Full Alarm Assignment for Strip Shopping Center

Initial Full Alarm Assignment Open Air Strip Shopping Center (13,000 SF to 196,000 SF)	
Incident Commander	2
Water Supply Operators	2
3 Application Hose Lines	6
1 Support Member per line	3
Victim Search and Rescue team	4
Ground Ladder Deployment	4
Aerial Device Operator	1
Rapid Intervention Crew (4 FF)	4
EMS Care	2
Total	**28**

The following is an initial full alarm assignment for a three-story apartment building with a single 1,200-square-foot apartment fire.

Figure 28: Initial Full Alarm Assignment in a Three-Story Apartment Building

Initial Full Alarm Assignment 1,200 SF Apartment (3-story garden apartment)	
Incident Commander	2
Water Supply Operators	2
3 Application Hose Lines	6
1 Support Member per line	3
Victim Search and Rescue Team	4
Ground Ladder Deployment	4
Aerial Device Operator	1
Rapid Intervention Crew (4 FF)	4
EMS Care (1 crew)	2
Total	**28**

These are generalizations representative of different types of structures and their associated risks. Each authority may handle these types of fires with fewer or more personnel; however, this describes the work functions that must take place, generally concurrently and, for safe and effective fire handling, promptly.

Additional crews are necessary when a fire escalates beyond the capability of the initial assignment, or the fire has unusual characteristics such as a wind-driven fire, or when involving an accelerant with a highly flammable compound. There are also types of scenarios that may not be fires, but mass casualty incidents, explosions, tornadoes, and so forth that may need additional staffing. It is difficult or impossible to staff for these worst-case incidents. These incidents require a strong mutual aid or automatic aid plan for assistance and/or call-back policies.

Emergency Response Staff Allocation

CCFD uses a three-platoon (shift) system working 24 hours per shift rotations that yields a 53-hour workweek for shift operations. Each shift is led by one Battalion Chief Shift Commander (3 total) that serves as the senior officer on the shift. These individuals are responsible for all aspects of the shift operations and serve as the Fire Chief's representative at significant incidents.

The following figure depicts the career emergency staffing employed by CCFD.

Figure 29: CCFD Career Emergency Response Staffing

Position Title	Number of Positions	Hours Worked/Week	Work Schedule
Career Operational Staff (full-time & part-time)	*Individuals considered full-time or part-time employees, primarily assigned to provide emergency services at the operational level.*		
Battalion Chief	3	53	0700-0700
Captain	8	53	0700-0700
Firefighter III/Engineer	10	53	0700-0700
Firefighters	10	53	0700-0700
Total Emergency Operations Staff	**31**		
Total Emergency Operations Staff per shift (max)	**11**		
Total Emergency Operations Staff per shift (min)	**11**		

A baseline overview of the staffing model, staffing levels, and relief factors provides an opportunity to review and analyze the current staffing patterns, shifts, and options to increase efficiency, effectiveness, and capabilities. The current CCFD shift leadership roles of Battalion Chief (3 FTEs) and Captains (8 FTEs) to Engineers and FF/EMTs (20 FTEs) ratio for full-time positions within CCFD operations is at 55%. The organizational structure for span of control is appropriate and provides the necessary leadership for emergency responses.

CCFD operates with a company officer assigned to each fire station daily. CCFD uses promoted apparatus operators called engineers to serve as the individual responsible for all aspects of maintaining and operating fire engines and aerial units. This position fills as needed and is usually the senior firefighter on shift for the day. The role of the driver engineer or fire apparatus operator whether promoted or not is a very important role in the safe delivery and accomplishment of fire ground activities and should be maintained to ensure accountability of these tasks.

Several career firefighters staff each fire station daily. When fully staffed, one Battalion Chief, two Captains, four engineers, and three firefighters staff the stations daily. This staffing across the three stations is rarely the case due to vacancies created by scheduled or unscheduled leave, and more likely, CCFD can normally expect a mixture of eleven total staff for the day. This combination of suppression units across the three career stations represents a total shift staffing of eleven FTEs not including the Fire Chief and his administrative staff.

CCFD guidelines direct the following first alarm assignment for structure fires.

Figure 30: CCFD Initial 1st Alarm

Initial Full Alarm Assignment—2,000 ft² Residential Structure Fire	
Battalion Chief	1
2 Engines	6
1 Rescue or Ladder or Hazmat	2
Volunteer Companies	Varies
Total Minimum Personnel	**9**

The on-duty minimum staffing for a first alarm does not meet the need for a routine house fire in accordance with NFPA 1710. An initial 1st Alarm Assignment is not sufficient for a strip shopping mall or an apartment building unless there is fire protection built into these structures and even then the available staff will be strained. This is a type of fire that is likely within the jurisdiction and represents a higher level of risk than the typical medium-size residential dwelling. However, the daily staffing and initial alarm assignment satisfies the demand zones identified in NFPA 1720 and prevalent throughout the CCFD response jurisdiction.

Because of the CCFD staffing model, an initial full alarm force for this level of hazard would commit all on-duty staffing to one fire. Furthermore, due to the geographical size of the jurisdiction, it is not reasonable to expect or plan on this as a means of providing coverage for such an event and still provide required services to the remainder of the service area.

Similar to a volunteer fire department, CCFD's part-time/paid-on-call structure utilizes department personnel who are not currently working a shift to respond when "paged" from their places of residence or work. Unlike a volunteer fire department, the paid-on-call employees become paid personnel when they respond and remain paid during the time they are committed to the incident. Once the call is complete, these individuals return to their place of residence or work and are no longer paid.

This system has worked well for CCFD but has not been without its challenges. As with volunteer fire departments, the life demands (i.e., careers, family functions) of paid-on-call staff have negatively impacted their abilities to consistently respond in support of the CCFD needs.

With such a lean career staff, part-time/paid-on-call staff are a critical element of the response system for CCFD. This is not an unusual situation for fire departments that rely heavily on part-time/paid-on-call. However, with such a large service area and such a lean organization, it is necessary to redouble efforts to recruit and retain part-time/paid-on-call staff.

One of the challenges facing CCFD is the ability to recruit and retain individuals willing to commit to be a part-time/paid-on-call firefighter. While CCFD has been working diligently to recruit and train individuals to bring staffing levels to a maximum level, the efforts have been unsuccessful in achieving maximum authorized operational staffing levels and participation. One concern expressed by the part-time/paid-on-call staff was the ability to abbreviate the roles they perform to be more useful and maybe attract new members.

The following figure depicts the part-time/paid-on-call emergency staffing employed by CCFD.

Figure 31: CCFD Part-Time/Paid-On-Call Emergency Response Staffing

Position Title	Number of Positions	Hours Worked/Week	Work Schedule
Career Operational Staff (full-time & part-time)	*Individuals considered full-time or part-time employees, primarily assigned to provide emergency services at the operational level.*		
Battalion Chief	0	Varies As Needed	Varies As Needed
Captain	2	Varies As Needed	Varies As Needed
Lieutenant	4	Varies As Needed	Varies As Needed
Firefighters	30	Varies As Needed	Varies As Needed
Support Firefighter	10	Varies As Needed	Varies As Needed
Rural Wildland Firefighters Only	37	Varies As Needed	Varies As Needed
Total Part-Time/ Paid-On-Call Operations Staff	**84**		

In addition to the part-time/paid-on-call staff the CCFD uses seasonal wildland firefighters to augment emergency operations during wildfire season. Without these staff members the department would seriously struggle to meet the demand of daily operations. CCFD also uses a rural firefighting program that places apparatus in strategically placed positions throughout the jurisdiction, with wildland trained part-time employees on property in the outer reaches of the jurisdiction to provide initial response in remote locations.

Deployment Methods and Staffing Performance for Incidents

Typical fire department responses across the nation include structure fires, vehicle fires, wildland fires, vehicle accidents, hazardous materials responses, technical rescue responses, general calls for service, and emergency medical calls. The latter is the most frequent reason for activating the 911 system.

The prompt, initial arrival of at least four personnel is critical for structure fires. Federal Occupational Safety and Health Administration (OSHA) Safety regulations (CFR 1910.120) require that personnel entering a building involved in fire must do so in groups of two. Further, before personnel can enter a building to extinguish a fire, at least two personnel must be on the scene and assigned to conduct search and rescue in case the fire attack crew becomes trapped. This is referred to as the two-in, two-out rule.[12]

The following figure outlines the response staffing and capability CCFD uses to address the various service call types they encounter.

Figure 32: Resource Staffing and Capability

Service Type	General Resource/Asset Capability	Basic Staffing Capability per Shift
Emergency Medical Services	2 staffed Engines – BLS Equipment 1 cross-staffed Rescue or Ladder - St.9 – Cross staffed engine or rescue	9 EMTs staffed 24/7 2 EMTs staffed at St. 9 Mon-Fri 0800-1600
Fire Suppression	2 staffed Engines 1 cross-staffed Rescue or Ladder 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 suppression personnel 24/7 2 suppression personnel at St. 9 Mon-Fri 0800-1600
HazMat Response	2 staffed Engines 1 cross- staffed Rescue, Ladder, or HAZMAT 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 suppression personnel 24/7 2 suppression personnel at St. 9 Mon-Fri 0800-1600 All HAZMAT Technicians
Tech. Rescue-Confined Space	2 staffed Engines 1 cross-staffed Rescue, Ladder, or HAZMAT 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 suppression personnel 24/7 2 suppression personnel at St. 9 Mon-Fri 0800-1600 At least three technicians per shift
Tech. Rescue-High Angle	2 staffed Engines 1 cross-staffed Rescue, Ladder, or HAZMAT 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 suppression personnel 24/7 2 suppression personnel at St. 9 Mon-Fri 0800-1600 At least three rescue technicians per shift
Tech. Rescue- Other	2 staffed Engines 1 cross-staffed Rescue, Ladder, or HAZMAT 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 suppression personnel 24/7 2 suppression personnel at St. 9 Mon-Fri 0800-1600 At least three rescue technicians per shift
Tech. Rescue-Trench & Collapse	2 staffed Engines 1 cross-staffed Rescue, Ladder, or HAZMAT 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 suppression personnel 24/7 2 suppression personnel at St. 9 Mon-Fri 0800-1600 At least three rescue technicians per shift

[12] *OSHA CFR 1910.120, Two-in, Two-out Regulation*

Service Type	General Resource/Asset Capability	Basic Staffing Capability per Shift
Vehicle Extrication	2 staffed Engines 1 staffed Rescue or 1 Command unit with BC St.9 – Cross staffed engine or rescue	9 EMTs staffed 24/7 2 EMTs staffed at St. 9 Mon-Fri 0800-1600 All vehicle rescue/extrication trained
Other:	Additionally, there are other units that are not staffed but available for response from call-backs or part time staff arriving to station: 9 engines 1 squad (air light support) 9 command units 9 tenders 31 wildland engines 1 quick response vehicle (SQ80)	Rescue technicians on each shift split between (some are same person): A- 3 confined, 2 high-angle, 4 trench B- 3 confined, 2 high-angle, 2 trench C- 2 confined, 2 high-angle, 3 trench

A continuing test for CCFD will be making the most prudent staffing and facility placement decisions based on weighing multiple considerations, including risk exposure, response times, access challenges, deployment, community expectations, and response capacity. Those decisions are difficult with financial constraints and service demand increases.

PERSONNEL MANAGEMENT

Although the delivery of emergency services to the citizens and visitors of a community is critical, effective management and organization of an emergency services agency are just as critical to its success. The personnel that deliver those services are the backbone of the system. However, without the proper administrative and support personnel to handle supervision, command, and control, operational personnel may not be able to perform satisfactorily.

Regulatory, Policy, and Guidance Documents

The rapidly changing environment and circumstances typically associated with emergency services require a standardized set of rules, regulations, and policies to guide appropriate behavior and accountability. These guiding documents are vital for success in all phases of fire department operations and are critical for an effective and efficient organization.

CCFD has established a set of regulatory documents, including Standard Operating Procedures (SOPs). Once established, training should be provided to all personnel, which CCFD incorporates into the annual fire and EMS training requirements. CCFD updates and reviews SOPs for consistency and legal mandates but lacks a defined timetable to review and make changes. CCFD should ensure that SOPs are fully reviewed and revised at least every three years, leading to a goal of one-third of the department's SOPs reviewed annually. SOPs are utilized during all training evolutions, with several specific examples referenced in other sections of this report.

The CCFD Policy Manual provides guidance for personnel issues and requires board approval for changes. The policy manual should be updated periodically. This is a difficult task for most organizations to complete amongst the other daily tasks required by staff. CCFD uses Vector Solutions® for employee access and management. Changes are communicated through departmental memoranda.

CCFD does not have a standard process for review or periodic updates. ESCI recommends development of a guideline that directs the process of periodic review and changes. A good way to ensure this review will occur is to have a committee of members review one-third of the guidelines each year and recommend changes. There should also be a process to trigger changes to a guideline that has been modified due to a new method or a technology change. CCFD has plans to assign the new Division Chief of Administration to this process.

Job Descriptions

CCFD employs several different positions with job descriptions that are not unlike other agencies of similar size and organization. CCFD currently employs the uniformed positions of Firefighter, Firefighter/EMT, Engineer, Captain, Battalion Chief, Fire Inspector, Fire Marshal, Division Chief, Deputy Chief, and Fire Chief. Job descriptions should receive periodic review and revision. CCFD has not reviewed the job descriptions in the last 3 years. CCFD should begin that process.

Compensation

CCFD ability to attract, hire, and retain employees has a direct impact on its ability to provide the desired services effectively and efficiently. Agencies should provide periodic reviews of current compensation structures, market competitiveness, and department compensation philosophies. These internal and external comparisons of equitable positions and workloads ensure the agency can attract and maintain an effective workforce. CCFD evaluates their pay and benefits as needed. Pay structures are reviewed and provide roughly a 65% spread for all positions between minimum and maximum pay grades. In the last compensation analysis CCFD used 100% of the average of comparable departments surveyed.

Disciplinary Process

Under the existing organizational configuration, personnel-related decisions are made at different levels. The Fire Chief is able to hire, discharge, and promote. Discipline can be issued at several levels of the organization based on the severity of the infraction. Discipline policies are defined in the policy manual. In most cases the ability to issue and carry out discipline is done through the chain of command starting at the company officer level. Personnel-related decisions can, and often do, subject an organization to potentially extensive liability exposure. Risk can result from a hiring mistake, improperly processed disciplinary process, wrongful termination claims, and more. Access to legal counsel can reduce this liability. The employees are afforded a grievance policy that is non-binding.

Counseling Services

Our nation's firefighters face emotional needs that are very different and unique to the occupation. The percentage of firefighters struggling with career-related stress is very high, with suicide rates climbing each year. These issues manifest themselves through higher divorce rates and addictions such as alcohol, drugs, or gambling. Frequently seen in recent studies, another major concern is Post-Traumatic Stress Disorder (PTSD). As these symptoms occur, employees need support systems that are readily accessible and provide access to someone who is qualified and genuinely understands the employee's circumstances.

Several programs can assist including critical incident stress management, employee assistance programs, and intervention programs, to name a few. CCFD offers an Employee Assistance Program and a Critical Incident Stress Management PEER support team through Curalink. Awareness level training is also offered to all members to communicate and make each member aware of the availability of resources.

Application, Recruitment, and Retention Process

CCFD periodically advertises through the local paper, word of mouth, social media and through their website. CCFD also completes background checks on potential part-time/paid-on-call and career candidates for hire. CCFD uses the "Combat Challenge" as their preemployment physical agility test. The Federal Arduous Pack Test is a job-related work capacity test.

The arduous version consists of a 3-mile hike with a 45-pound pack over level terrain in less than 45 minutes. This test is the standard for wildland firefighters. Because the wildland fire risk is so high in the CCFD service area, this is the test used for periodic fitness testing. CCFD then requires a medical exam. CCFD should implement NFPA 1582: *Standard on Comprehensive Occupational Medical Program for Fire Departments* medical exam and a psychological evaluation.

Performance Reviews, Testing, Measurement, and Promotion Process

CCFD provides annual performance reviews for full-time employees that include a comprehensive analysis of employee performance goals and objectives. CCFD conducts periodic physical competency testing and performance reviews of knowledge, skills, and abilities. Promotional testing is completed on an as-needed basis to fill open Engineer, Captain, and Battalion Chief positions.

Health and Safety

NFPA 1500: *Standard on Fire Department Occupational Safety and Health Program* is the industry standard for the development and administration of a fire department safety program. At the time of this report, CCFD participates in the Countywide Safety Committee. It has regular meetings monthly. CCFD is currently working with OSHA to submit its new OSHA Safety Plan and as part of that will re-form a department specific committee. Currently, safety issues (accidents and injuries) are presented to the Chiefs at their monthly meetings. The establishment and empowerment of a safety committee can be one of the best tools to increase the safety of firefighters. ESCI strongly encourages CCFD to ensure all activities of the safety committee are in alignment with Chapter 4 of NFPA 1500. To be effective, safety committees must be diverse in their representation from across the department, ensuring representation by shift, rank, function, and interest, and including representation from non-uniformed and staff members as well. The committee should meet monthly and include in its mission raising awareness and modifying member behaviors that will result in a safe work environment. Additionally, the committee should review all accidents, injuries, near-miss incidents, and workplace safety suggestions. The committee should analyze the information before them and continue to report the findings to the Fire Chief.

Rather than taking a reactionary approach through the development of additional rules, ESCI recommends that the committee work proactively to implement member safety education programs and encourage a climate of member safety self-awareness. The committee should maintain regular and open meeting times and locations; minutes of the meetings should be recorded and posted for all members of the authority to review. A diverse representation of command staff and labor representatives should constitute the committee. ESCI underscores the importance of maintaining a functioning safety committee.

One practice beginning to emerge is the importance of separating the safety committee to form sub-committees for peer support, fitness, health, and wellness. These sub-committees allow for a more focused effort to address firefighter needs regarding health and wellness.

Reporting and Recordkeeping

Documentation of activities is of paramount concern in any organization. Quality data is required to ensure that sound management decisions are made to support the effective and efficient operation of the organization.

CCFD currently utilizes Emergency Reporting® software for documenting both fire and EMS incident response data. Computers are available in all fire stations to access the software. In addition to incident response data, records are maintained for personnel exposures. Self-contained breathing apparatus (SCBA), hose, ladder, and pump testing records are maintained by CCFD. Vehicle maintenance records are retained by the maintenance department. Gas monitors are calibrated internally by the department's HazMat technicians, and records are maintained.

CCFD has implemented processes for documentation control. A process for public records access is in place. Hard copy files are protected by a secured entry in locked cabinets. All computer files are backed up and secured on-site and off-site via the Campbell County's Information Technologies Department (IT).

Reports are generated for elected officials relating to finance, management, and operations. An annual report is also generated, including an analysis of incident data, and distributed electronically with a limited number of hard copy versions available.

Document Control and Security

Facilities, equipment, and records are all critical elements to any fire and EMS organization, representing a significant investment of public dollars. Due to these factors and many others, securing these elements through proper precautions is critically important. CCFD secures all buildings and facilities with electronic locks, combination locks, or key locks. Staff vehicles and apparatus are secured with typical key locks. In addition, all department computers are secured by multiple firewalls, and servers are managed by K2, a private contractor.

FINANCIAL ANALYSIS

Financial analysis is an important part of determining long-term sustainability of the CCFD and its ability to achieve and maintain an acceptable level of service. To this end, a financial model was developed for the department which was designed to fairly represent monetary policies and practices in a consistent manner. Modeling is designed to neutralize the normal differences usually found in unilateral fiscal practices and to account for any financial peculiarities. This approach allows an estimation of the total public cost of the department's operation and provides a means for financial evaluation of sustainability under status quo conditions and various service level modifications.

The modeled status quo budget which follows the historical analysis yields a baseline estimate of the total cost of external and internal services provided by the department. In addition, the methodology facilitates projection of various service level changes into the future based upon the cost of adding various decision units from individual resources, engine and/or ladder companies, up to fully staffed fire stations. The cost, on an annual basis, of any major service level change including the cost of building new fire stations is presented in the main body of this study under the section titled, "Financial Basis for Cost Projections".

The following discussion provides information on the historical and current financial condition of the CCFD. Understanding of fire service financial resources and costs begins with an overview of the various revenues and expenditures which support the fire department and its operations across all programs. This includes a multi-year historical review of fire department-specific revenues and expenses followed by a status quo financial forecast from FY 24 through FY 28 utilizing historical trend data and key assumptions about future trajectory to the extent known or projected from historical trends. It should also be noted that the status quo projection uses the proposed FY 24 budget as a basis and that this includes the addition of eight new positions. The status quo projection then assumes no additional future growth. This analysis relies on extensive financial documentation provided by the department, including the actual and adopted budget documents from FY 17-22 and both Campbell County's and the City of Gillette's comprehensive annual financial reports (CAFRs) and budget documents through FY 23 as adopted.

Background and Historical Review

The CCFD is governed by the Joint Powers Fire Board (JPFB), a discretely presented component unit of county government[13] which was created in 1975. Under the terms of the Joint Powers Agreement (JPA)[14], the JPFB consists of seven members, four of whom were previously appointed by the county. At a meeting of the partners on April 20, 2022, a verbal agreement was reached to alter the JPFB make-up such that Campbell County and the City of Gillette would each appoint three members while the Town of Wright would continue to provide one member[15].

[13] *As defined in the Campbell County, Wyoming Financial and Compliance Report for the Fiscal Year Ended June 30, 2021; p. 18.*
[14] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022*
[15] *Campbell County, Gillette, Wright agree to equal CCFD funding split, board representation | County 17*

The JPFB operates on a July 1-June 30 fiscal year and, as a discretely presented component unit of county government, is included in Campbell County's annual comprehensive financial audit. As with county governmental funds, the JPFB uses a current financial resources measurement focus and the modified accrual basis of accounting. Although the county currently includes the JPFB in its annual financial audit with all revenue, expense and fund balances compiled in one place, the JPFB dba the Campbell County Fire Department (CCFD), will in future fiscal years conduct its own annual financial audit[16].

Each year, CCFD staff prepares separate operational and capital budgets which are presented to and voted upon by the JPFB directors. Upon approval of the annual budgets, the elected bodies of the three partners then review and ultimately authorize final, adopted JPFB operating and capital budgets. CCFD staff then execute the budgets under guidance of the CCFD Fire Chief and Director of Finance. The CCFD invoices each partner at the beginning of each quarter for one-fourth of the partners approved annual operating allocation.

The CCFD participates in four state-wide cost-sharing multiple employer--defined benefit pension plans which are administered by the Wyoming Retirement System: Public Employees' Pension Plan, Volunteer Firemen's Pension Plan, Paid Firemen's Pension Plan A and Paid Firemen's Pension Plan B.

Historical Revenue and Expense

Revenue

The CCFD is funded jointly through annual operating and capital appropriations by Campbell County, the City of Gillette, and the Town of Wright and is responsible for fire protection and prevention throughout the county. In the amended JPA, the partners also agreed to adjust the operational budget funding split, based upon five years of fire service calls, from a 58-40-2 model to a 49-49-2 model. The figure below shows how the annual operating and capital appropriations have increased from FY 17 actual through FY 23 as adopted along with the percentage of the operating appropriation. As of FY 23, Campbell County and the City of Gillette will each provide 49% of the annual operating budget for each of the next two years with the Town of Wright funding 2%, while the capital funding split will remain at 49.5% for Campbell County and the City of Gillette, respectively, with the Town of Wright paying 1% of capital needs.[17]

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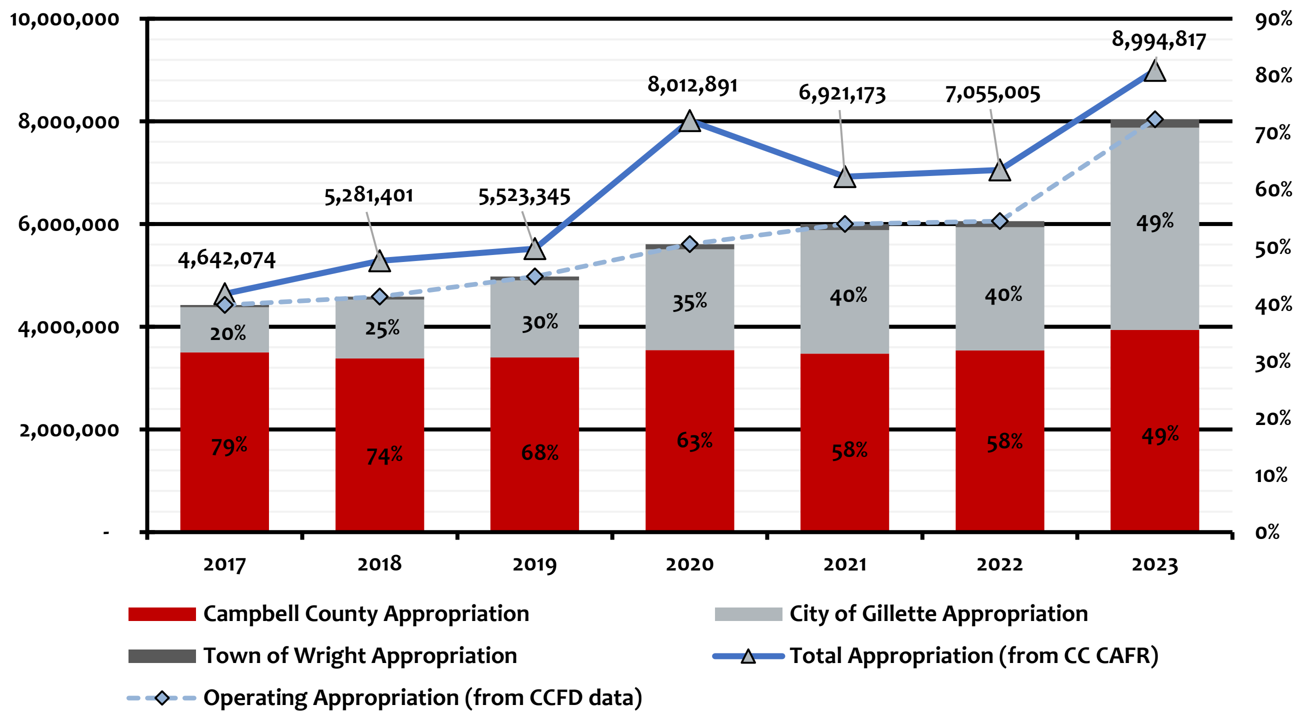
[16] *Personal Communication CCFD Finance Director 4/17/23*

[17] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022 D.B.A. Campbell County Fire Department; Article IV – Financing.*

Campbell County and the Town of Wright generally forward their agreed upon annual capital allocation directly to the City of Gillette within the first few months of each fiscal year. CCFD staff fund both recurring and non-recurring budgeted expenditures from operating allocation and other direct revenue sources. Capital expenditures, with occasional exceptions, must be funded through annual operating allocation/direct revenue funding or unallocated reserve funds. Once capital expenditures are made by the department, finance staff then submit appropriate documentation to the City of Gillette which then "reimburses" CCFD from the appropriate capital reserve accounts.

Figure 33: Partner Annual Operating and Total Appropriations[18] FY 17-22 Actual and FY 23 Projected



While the CCFD maintains its operating funds and associated unassigned reserves (contingency), the City of Gillette maintains three capital reserve accounts (reported as "restricted reserves" in the annual Campbell County audit) on behalf of the CCFD in the city General Fund although the JPA states[19] that funds in this account [specifically the vehicle depreciation account], "… shall be the property of the Board [JPFB]."[20] The funds in these accounts are not reported as part of the annual city audit. There are three separate city accounts; a long-established vehicle replacement account and separate equipment and facilities accounts which were only just established in FY 2020. The three JPA partners approve both annual operating and capital budgets.

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[18] *Total appropriation data from Campbell County, Wyoming Financial and Compliance Report for the Fiscal Year Ended June 30, 2020. Operating appropriation data from CCFD finance staff.*

[19] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022 D.B.A. Campbell County Fire Department; Article IV – Financing.*

[20] *Presumably this statement holds for the other two capital accounts as referred to elsewhere in the JPA.*

The Equipment Replacement Account was originally started in FY 20 to accumulate sufficient funding due to the need to replace Self-Contained Breathing Apparatus (SCBA). The funding entities initially began this account by contributing $250,000 to it. CCFD expects to soon begin replacing all capital equipment using this account. The FY 23 beginning balance in this account was $197,161.09. With interest and the FY 23 contribution, the account now stands at $450,237.10. Similarly, the Facilities Account was begun based upon the need to replace fire station boilers. The FY 23 beginning balance for this account was $151,530.26. With interest the account now stands at $152,853.34 and the partners have not appropriated any additional funding in FY 23.

As part of the capital budget approval process, the partners also decide on how much funding to add to the vehicle replacement, equipment and facilities accounts each year[21]. Proceeds from any surplus vehicle sales are also added to the vehicle replacement account. Campbell County and the City of Gillette each contribute 49.5% to the capital funding needs of these reserve accounts while the Town of Wright contributes 1%. At the beginning of FY 23, the Vehicle account balance was $3,437,602.38. In the FY 23 adopted budget, the partners added $505,050 and surplus vehicle sales added another $61,042 for a total of $4,003,694.38. Planned expenditures of $860,000 are expected to bring the balance to $3,180,700. The City of Gillette collects and holds these funds on behalf of the CCFD.

Maintenance and use of these capital funds appears to be an overly complex process. Greater transparency and ease of use might be achieved by having the CCFD maintain all funds, including the three capital reserve accounts since it already maintains its unassigned reserve funds. Further, the CCFD should develop and adopt a long-range capital replacement plan identifying appropriate funding needs similarly to local government Capital Improvement Plan (CIP) processes. The partners would then be better able to budget long-term annual capital funding as well as operational funding and at a more consistent and predictable level.

The following figure shows fire-related revenues as well as operating and capital allocations from the three partner jurisdictions which are divided into recurring and non-recurring revenues. Recurring revenues are partner operating allocations (derived from various sources depending upon the jurisdiction such as voter-approved sales tax, property taxes and other general revenues), fees for service (inspection and other related fees), contracts, permit fees and other income streams that are reasonably predictable in many cases and expected to continue, on a year-to-year basis. Non-recurring revenues on the other hand are more sporadic in nature, related to one-time expenditures, and may be more difficult to predict such as grant funds, penalties, donations, sales of surplus property and equipment and other one-time sources. In this case, the partner capital allocations to both annually budgeted capital and reserve accounts are considered non-recurring since they are based upon capital expenditures budgeted on an annual basis. Funding allocated and based upon an adopted long-range capital replacement plan could in the future be considered a recurring funding stream.

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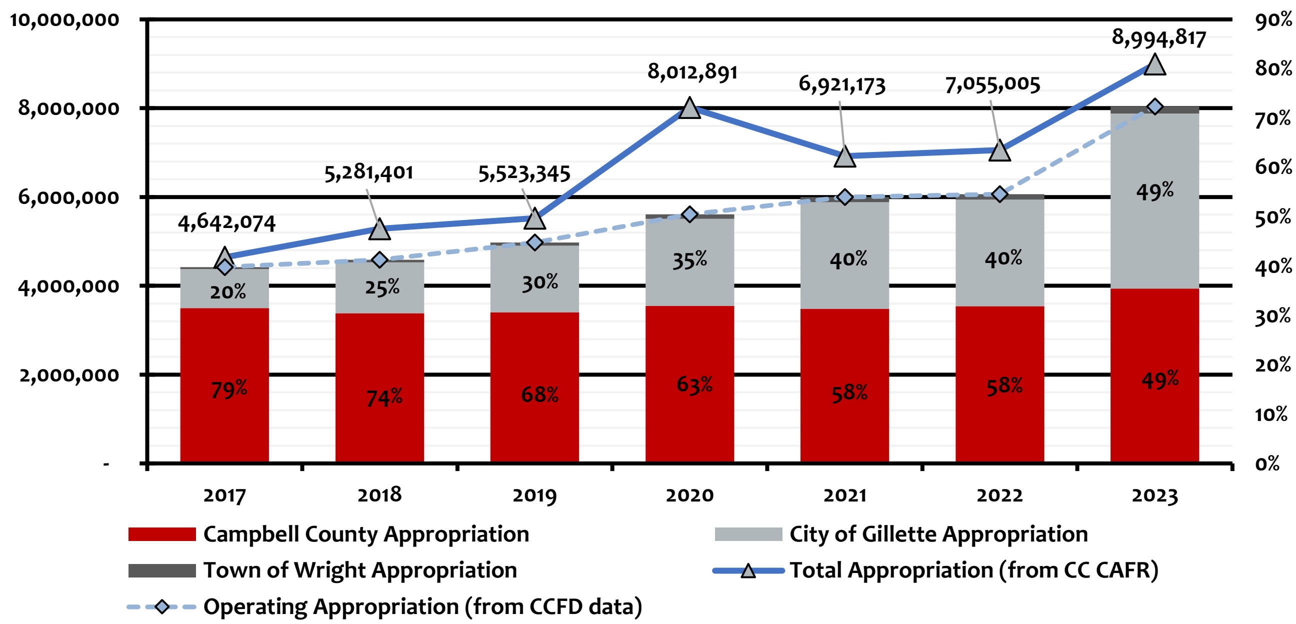
[21] *These are shown as Restricted Fund Balance in the annual Campbell County audit with reserves identified separately for Vehicle replacement, Equipment replacement and Facilities maintenance.*

Figure 34: Campbell County Fire Department Revenues (FY 17–FY 22 Actual; FY 23 Adopted)

Revenue	2017 Actual	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Actual	2023 Adopted
Campbell County	3,498,973	3,381,675	3,401,596	3,547,406	3,480,000	3,540,446	3,939,486
City of Gillette	880,305	1,146,331	1,500,307	1,962,991	2,400,000	2,400,000	3,939,486
Town of Wright	44,291	55,875	75,929	98,150	120,000	120,000	160,795
Rentals/Leases	8,760	6,021	8,955	3,600	11,280	14,180	16,000
Interest	391	588	131,007	124,647	4,387	(29,432)	6,500
CCH Maintenance Agreement	-	-	-	-	-	80,000	80,000
Recurring Revenue	**4,432,720**	**4,590,489**	**5,117,794**	**5,736,794**	**6,015,667**	**6,125,194**	**8,142,267**
Partner Capex	82,378	48,097	40,464	16,337	116,123	189,509	200,000
Campbell County	*81,554*	*23,808*	*20,030*	*8,087*	*57,481*	*93,807*	*99,000*
City of Gillette	*-*	*23,808*	*20,030*	*8,087*	*57,481*	*93,807*	*99,000*
Town of Wright	*824*	*481*	*405*	*164*	*1,161*	*1,895*	*2,000*
Partner Capex Res	136,127	649,424	505,050	805,050	805,050	805,050	755,050
Apparatus Reserve	*136,127*	*649,424*	*505,050*	*505,050*	*505,050*	*505,050*	*505,050*
Equipment Reserve	*-*	*-*	*-*	*250,000*	*250,000*	*250,000*	*250,000*
Facilities Reserve	*-*	*-*	*-*	*50,000*	*50,000*	*50,000*	*-*
Wildland/Response	14,135	4,851	7,264	-	226,570	169,710	75,000
Other Reimbursement	18,181	3,317	-	288,645	5,060	-	-
Sale of Assets	-	-	-	-	22,658	-	-
Miscellaneous	2,415	1,448	4,790	43,460	17,160	15,774	-
Grants	32,735	174,738	156,461	169,161	907,170	68,178	829,219
Non-Recur Rev	**285,970**	**881,874**	**714,030**	**1,322,653**	**2,099,792**	**1,248,221**	**1,859,269**
TOTAL REVENUE	**4,718,690**	**5,472,363**	**5,831,823**	**7,059,447**	**8,115,459**	**7,373,415**	**10,001,536**

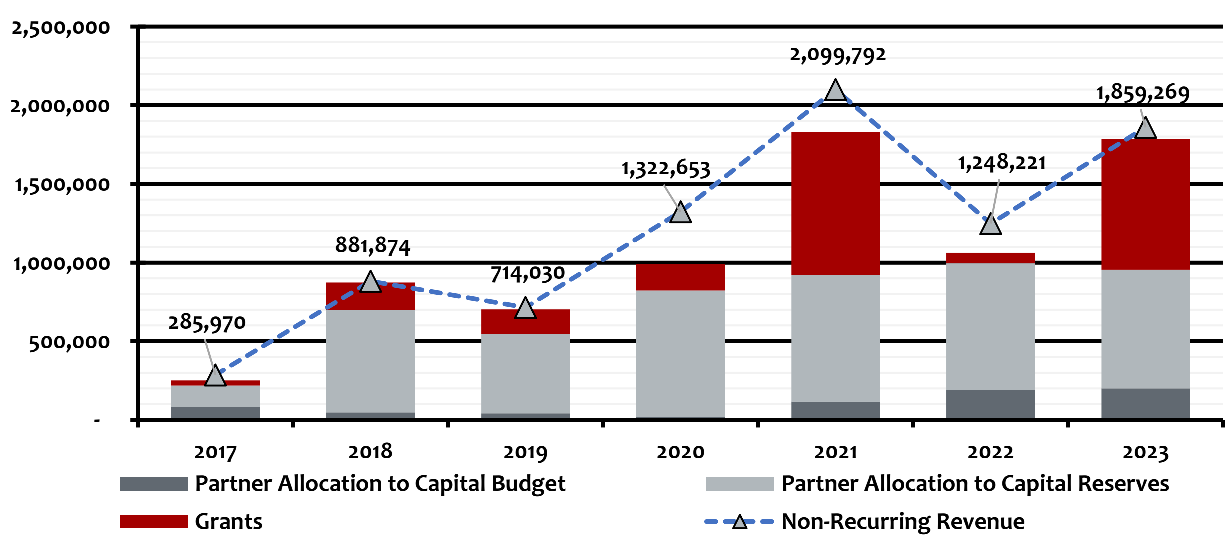
Recurring fire-specific revenues supporting the department are relatively minor. Most of the department's recurring funding, shown in the figure below, comes from partner allocations which have increased 37% between FY 17 and FY 22 from $4.42 million to $6.06 million which represents an average annual rate of increase of approximately 6.5%. The total operating contribution in FY 23 as adopted is $8.04 million representing an increase from FY 22 of 32.65% driven primarily by increased staffing costs as more career fire suppression personnel were added (four firefighters and one captain).

Figure 35: CCFD Recurring Revenues (FY 17–FY 22 Actual; FY 23 Adopted)



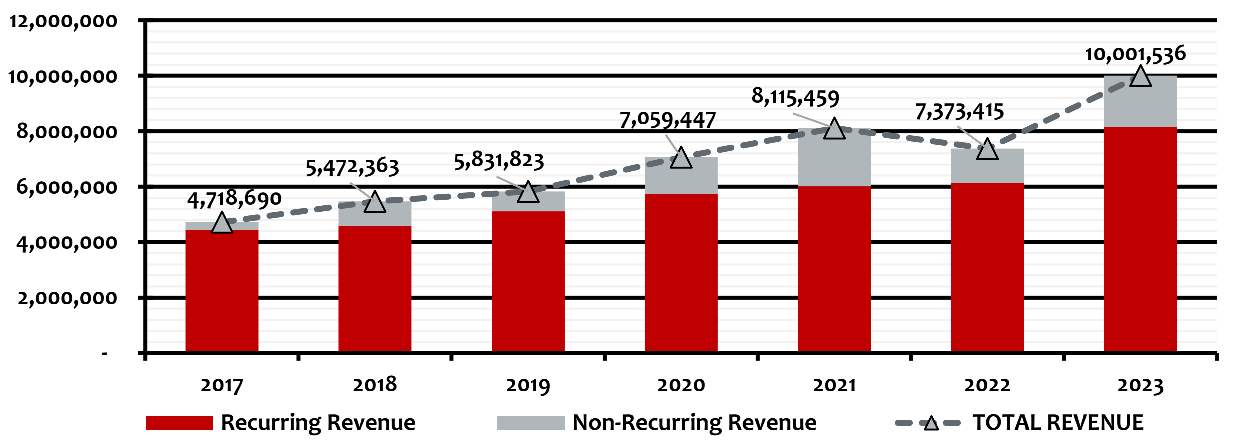
Non-recurring revenues supporting the department, as expected, have varied considerably from a low of $0.29 million in FY 17 to a high of $2.1 million in FY 21 as shown in the figure below. Partner allocation to the capital reserve increased significantly between FY 17 and FY 18 and has since risen from an average of near $570,000 in FY 18 and FY 19 to almost $800,000 from FY 20 actual through FY 23 adopted. As the department continues to develop its long-range CIP and the JPFB adopts it, this funding stream will become more stable and could be considered a recurring source. Grant funding has been a highly variable source of funding with significant grants received in FY 21 and FY 23. Other non-recurring sources have been relatively minor.

Figure 36: CCFD Non-Recurring Revenues (FY 17–FY 22 Actual; FY 23 Adopted)



The following figure compares recurring to non-recurring and total revenue for the department and clearly shows the impact of the increased capital reserve allocation and variable grant funding on total annual revenue. Further, the impact of the increased partner operating allocations on recurring revenue is quite clear.

Figure 37: Relationship of Recurring to Non-Recurring Revenues (FY 17–FY 22 Actual; FY 23 Adopted)



Expense

This historical review is not intended as an in-depth study of individual line items. Therefore, all operating expenses have been grouped into one of five categories for simplification, as shown in the following figure. The operating expense categories (as distinguished from Personnel Services costs) used by ESCI include Personnel which are items directly related to firefighter support such as testing, training, and uniforms/PPE; Facilities whose items are directly related to repair, maintenance, and operation of fire stations; Fleet/Equipment which includes items such as fuel and Fleet charges; Operations and Administrative.

Figure 38: ESCI Grouping of CCFD Operating Line Items

CCFD Line Item/Description		ESCI Opex Category
62000	Postage and Freight	Administrative
62020	Telephone	
62030	Cellular Services	
62080	Public Relations/Promotions	
62100	Legal Notices	
62180	Media, Subscriptions/Periodicals	
62200	Assoc, Comm, Dues, & Fees	
62260	Other Professional Services	
62280	Legal Counsel	
62320	Lab Processing - Investigations/Fees	
62700	Computer Contract & Maintenance Fees	
62720	Software Yearly Fees	
62800-62860	Insurance / General Liability	
63040	Office Equipment Lease	
63060	Board Expenses	
64050	Office/Computer Supplies	
64140	Intern Program	
64950	EFSA	
65030	Office Furniture/Equip Repairs & Maintenance	
Don't use	Covid-19	
Don't use	Vendor Account Expenses	
64150	Gasoline/Fuel	Fleet/Equipment
64160	Shop Supplies	
65020	Vehicle Maintenance & Repairs	
65020	Equipment Repairs & Maintenance	
62325	Dispatch Fees	Operations
64000	Supplies	
64900	Fire Suppression	
Don't use	RRT Response Reimbursement Expenditures	
62220	Utilities	Facilities
64120	Cleaning Supplies	
65050	Building Insurance Repairs	
65060	Building Maintenance-CCFD	
65080	Building Maintenance-CC	
62240	Medical Physicals	Personnel
62400	Prof Dev/Courses/Lodging	
62450	Meetings/Travel/Meals/Lodging	
62600	Employment Testing/& Hiring Fees	
63340	Recognition, Appreciation Awards	
64100	Meeting Supplies/Food	
64110	Uniforms	
64130	Personal Protective Gear	
Don't use	Honor Guard	

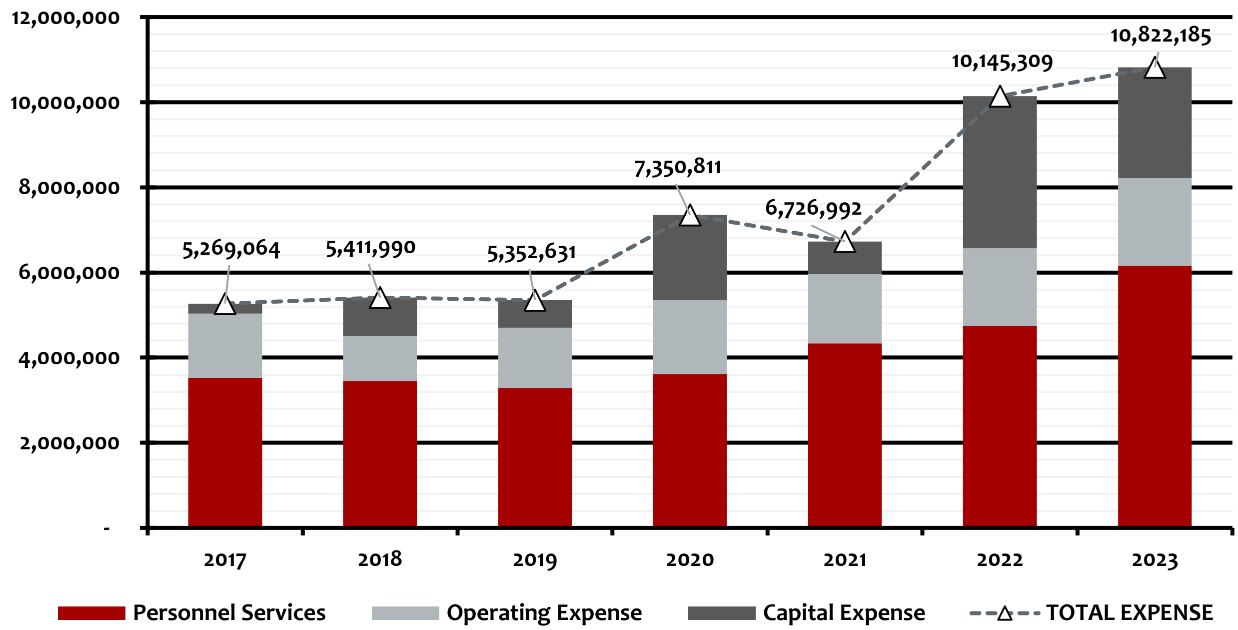
The following figure shows actual fire department expenditures for the period FY 17-22 and FY 23 as adopted which are divided into recurring and non-recurring expenses. Recurring expenses are those such as employee wages and benefits, materials and services costs that are reasonably predictable and expected to continue from year-to-year.

Figure 39: CCFD Expenditures (FY 17–FY 22 Actual; FY 23 Adopted)

Expense	2017 Actual	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Actual	2023 Adopted
Personnel Services	**3,525,469**	**3,446,550**	**3,286,218**	**3,612,110**	**4,333,614**	**4,744,114**	**6,162,331**
Salaries & Wages	2,524,607	2,405,041	2,220,682	2,347,348	2,787,884	2,993,908	3,845,701
Regular - F/T	*2,063,020*	*1,755,141*	*1,808,413*	*1,988,101*	*2,240,968*	*2,550,558*	*3,263,701*
Regular - P/T	*314,247*	*478,687*	*208,449*	*190,064*	*229,835*	*194,554*	*295,000*
Overtime	*147,339*	*171,213*	*203,820*	*169,183*	*317,081*	*248,796*	*287,000*
Benefits	1,000,863	1,041,509	1,065,536	1,264,762	1,545,731	1,750,206	2,316,630
Operating Expense	**1,507,304**	**1,058,857**	**1,415,334**	**1,734,859**	**1,636,708**	**1,826,777**	**2,054,936**
Administrative	387,118	367,897	425,930	714,794	567,069	521,096	728,812
Facilities	341,678	231,281	337,275	403,282	372,731	629,560	460,000
Fleet/Equipment	257,873	207,861	258,840	265,286	283,244	269,555	293,000
Personnel	274,784	130,149	254,186	243,191	220,031	255,302	351,374
Operations	245,851	121,668	139,103	108,306	193,634	151,265	221,750
Recurring Exp	**5,032,773**	**4,505,406**	**4,701,552**	**5,346,969**	**5,970,322**	**6,570,891**	**8,217,267**
Grants	32,744	207,555	145,916	644,135	120,789	65,970	829,219
Land	-	-	-	-	-	-	-
Buildings/Improvements	-	-	-	-	107,152	129,642	817,338
Equipment	82,378	49,606	41,062	16,376	9,900	869,728	40,000
Other	-	-	-	-	-	-	64,583
Apparatus	121,169	649,424	464,101	1,343,331	518,829	2,509,078	853,778
Non-Recurring Exp	**236,291**	**906,584**	**651,079**	**2,003,842**	**756,670**	**3,574,418**	**2,604,918**
TOTAL EXPENSE	**5,269,064**	**5,411,990**	**5,352,631**	**7,350,811**	**6,726,992**	**10,145,309**	**10,822,185**

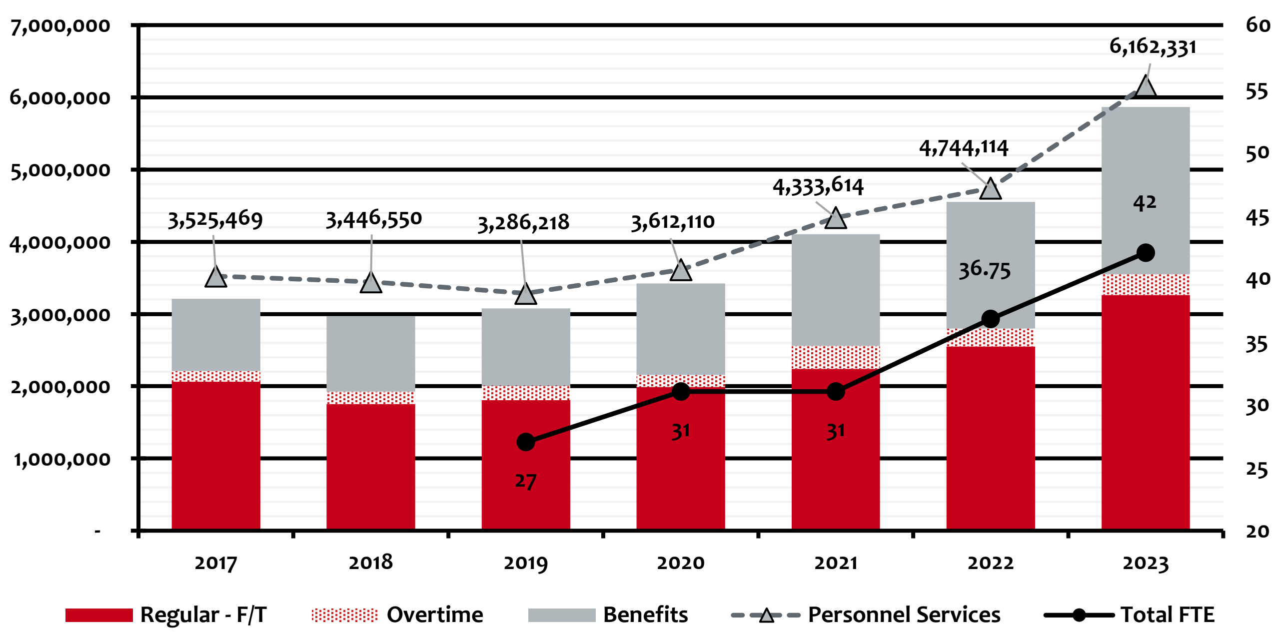
The following figure illustrates CCFD expenditures by major category for the period FY 17 actual through FY 23 adopted. Expenses increased from $5.27 million FY 17 to $10.15 million in FY 22, driven largely by increased capital expenditures and higher personnel costs.

Figure 40: CCFD Expense by Major Category, FY 17 Actual–FY 23 Adopted



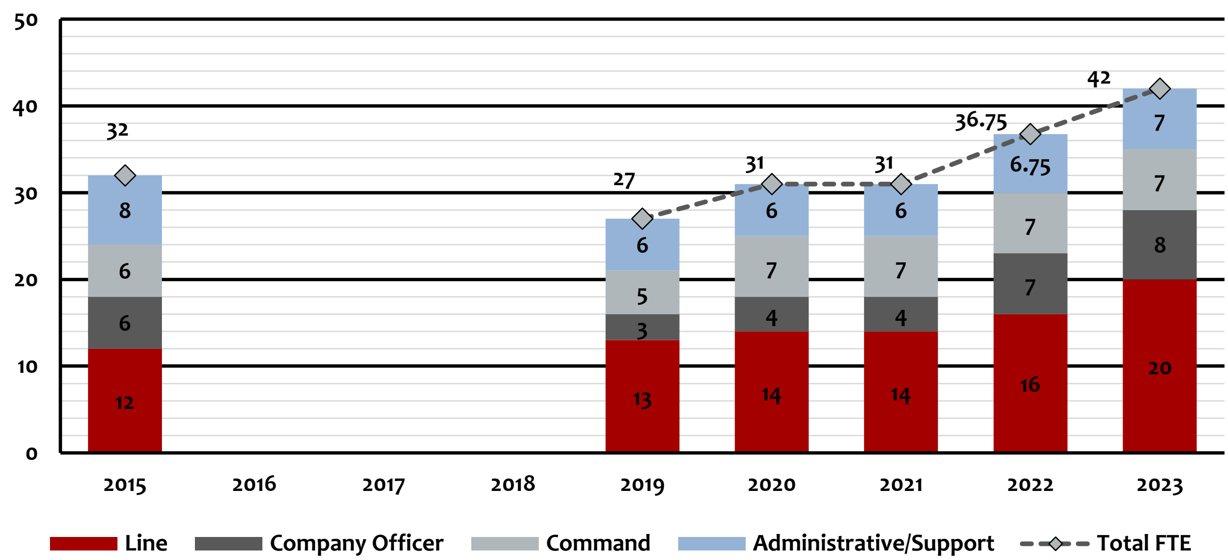
The following figure shows Personnel Services costs in detail, which have increased from $3.53 million in FY 17 to $4.74 million in FY 22, an increase of $1.22 million or 34.6% over the period. This represents an average annual increase of approximately 6.1%, which has been driven primarily by the addition of staff, as shown by the total annual FTE count in black in the following figure.

Figure 41: CCFD Personnel Services Expenses, FY 17 Actual–FY 23 Adopted



Despite a higher staff count in FY 15 overall personnel costs were relatively flat through FY 19 until the total FTE count increased from 27 in FY 19 to 36.75 in FY 22, an increase of 9.75 or 36.1%. The bulk of the increase has resulted from the addition of suppression positions, including seven line and two command officer positions as shown in the figure below. Benefits have increased from an average of just under 30% of total compensation from FY 17-19 to an average of 36% of total compensation from FY 20-22, while total overtime as a percentage of wages has averaged 10% for the entire period.

Figure 42: CCFD FTE by Category, FY 15 Actual and FY 17 –FY 23 Adopted



A major reason to examine historical expenses is to assess trends that, absent other knowledge, can then be used to project future costs of various categories of expense. Personnel costs are a major component of any career or combination department. Therefore, it is important to understand how costs have changed over time. ESCI examined actual career staffing costs by position in FY 15 and FY 22. To determine trends in wages and benefits over the period, the net effect of positions added, deleted, and reclassified must be considered which is shown in the figure below. The FY 22 average salary and benefits for each position are used to determine the net impact of the gain or loss since FY 15.

Figure 43: CCFD Net Change in Positions Between FY 15 and FY 22 Actual Showing FY 22 Average Position Costs

Position	Delta	Unit Cost		Total Cost	
UNIFORMED ADMIN & SUPPORT STAFF		Salary	Benefits	Salary	Benefits
Deputy Chief	1	103,789	62,017	103,789	62,017
Division Chief	-2	94,100	57,294	(188,199)	(114,587)
Fire Inspector	-1	62,765	41,700	(62,765)	(41,700)
OPERATIONS STAFF					
Battalion Chief	2	76,750	56,077	153,501	112,154
Captain	1	67,702	58,056	67,702	58,056
Engineer	2	53,994	44,389	107,989	88,778
Firefighter	2	36,805	31,702	73,609	63,405
NON-UNIFORMED ADMIN & SUPPORT STAFF					
Financial Specialist	-1	49,153	3,064	(49,153)	(3,064)
Sr Mechanic	0.75	54,551	32,652	40,913	24,489
Sub-Total:					
	Net Positions			Net Salary/Benefits	
	4.75			247,385	249,546

Total wages and benefits are compared between FY 15 and FY 22 and the net impact shown above is applied to the FY 22 actual totals for an adjusted FY 22 budget (figure below) which removes the impact of the position changes. The average annual rate of increase is then computed between FY 15 and FY 22 using the FY 22 revised totals. Overtime as a percentage of regular wages has increased from 6.7% in FY 15 to 8.3% in FY 22. The computed average annual increase in wages is 1.48% while the average annual increase in benefits is 6.8%. The computed average annual benefit increase is highly skewed due to a major increase in benefits provided by the CCFD to its personnel between FY 15 and FY 22. In FY 15, benefits as a percent of total compensation were only 2.4% which increased to 35.9% in FY 22 and is expected to be 38.4% in FY 23. It is unlikely that the rate of benefit increase will continue to rise at historical rates. The future annual rate of increase for benefits will more likely average 1.5%, while annual salary increases are expected to likely range from 3.5-4% (a combination of a 2.5% COLA and merit increases of 1-3%)[22].

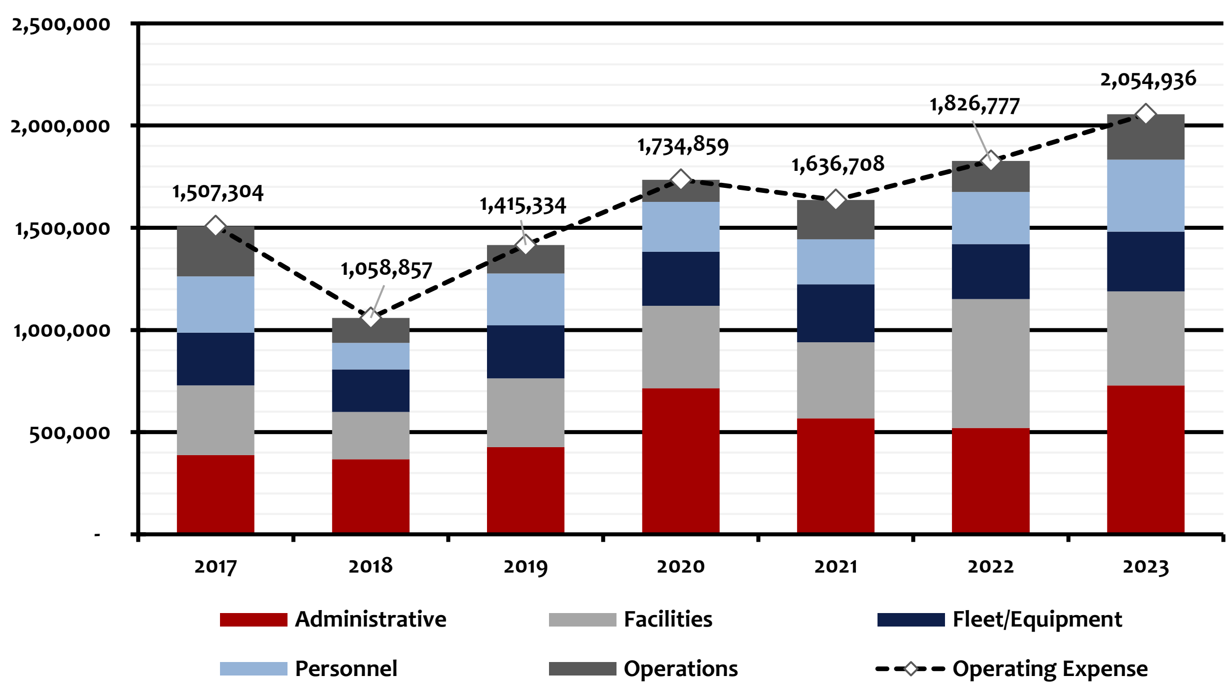
[22] *Personal Communication with CCFD Finance Director 4/17/23*

Figure 44: Average Annual Increase in Regular Wages and Benefits from FY 15 to FY 22 Actual

Expense	2015 Actual	2022 Actual	New Position Adjustment	2022 Revised	Avg Annual Increase
Personnel Services	**3,369,143**	**4,744,114**	**-517,465**	**4,226,649**	
Salaries & Wages	2,416,884	2,993,908	-267,918	2,725,990	
Regular	2,253,828	2,745,111	-247,385	2,497,726	1.48%
Overtime	163,056	248,796	-20,533	228,263	
Benefits	952,259	1,750,206	-249,546	1,500,660	6.80%

Operating expenses dipped from $1.5 million in FY 17 to $1.06 million in FY 18 before climbing slowly to $1.83 million by FY 22. Fleet, Personnel, and Operational expenses have remained relatively unchanged from FY 17 through FY 22. The significant fluctuations in overall operating expenses occurred within the Facilities and Administrative areas of the budget. Administrative costs increased significantly in FY 20 with the addition of EFSA expenses[23]. Except for a low in FY 18, Facilities costs generally increased between FY 17 and FY 21 before spiking in FY 22 with almost $300,000 in insurance related repair work.

Figure 45: CCFD Operating Expenses, FY 17 Actual–FY 23 Adopted



[23] *This is the Emergency Fire Suppression Account (EFSA) with the State of Wyoming which the JPFB joined in FY 20, paying for the current fiscal year and two prior years. The annual payment is based upon assessed value of the service area. EFSA funding is used by the State on behalf of participating jurisdictions when wildland fires occur on private lands and suppression exceeds local jurisdictional capabilities. The EFSA reimburses all suppression costs above $12,000 in a given fiscal year to participating agencies.*

Net Impact on Fund Balance

Annual CCFD revenue and expense both impact ending fund balance which has historically been shown as part of the annual county financial audit since the JPFB is a discretely reported component unit. It is important to understand this interaction to estimate CCFD financial trajectory. Under Article III(A)(j) of the integrated, amended Joint Powers Agreement, the JPFB is required to adopt, and operate the CCFD consistent with, "…the fiscal policies and compensation system adopted by Campbell County."[24] GASB 54, followed by Campbell County, outlines how fund balances are defined and reported[25].

The JPFB currently has no adopted policy on use and maintenance of fund balance. For the purposes of this discussion, fund balance falls into two major categories, non-spendable and spendable. Spendable fund balance can be further sub-divided depending upon various external and internal requirements. The figure below shows historical ending fund balance by category for the period FY 17 through FY 21 as derived from annual Campbell County audits, unaudited period 13 CCFD staff estimates for FY 22 since the Campbell County audit for FY 22 is not yet available and CCFD staff estimates for FY 23 as adopted.

CCFD had very minimal un-spendable fund balance during the historical period beginning in FY 21 which are amounts that are either not in spendable form, or which legally or contractually are required to be maintained intact. This category generally includes those items not expected to be converted to cash, for example: inventories, deposits, and prepaid items. On the other hand, spendable fund balance falls into several categories as shown in the figure below, only two of which are used by CCFD. Restricted reserves are those used for a specific purpose and in this case, there are three separate reserves classified as restricted as discussed above. One is for vehicle replacement; one is for equipment replacement, and one is for facility expenditures. Restricted fund balance has fluctuated around an average of close to $5 million since FY 19, ranging from a low of $3.7 million in FY 22 to a high of $6.3 million in FY 21.

The only other active reserve is the Unassigned Reserve, which fluctuated considerably from negative values in FY 17-18 to a high of just over $1.69 million in FY 21. The unassigned reserve acts as a contingency or operating reserve from which CCFD covers capital and other expenses for which it is reimbursed from capital accounts held by the City of Gillette during the fiscal year. This reimbursement process will work so long as the CCFD retains an appropriate level in this reserve category.

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[24] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022 D.B.A. Campbell County Fire Department; Article III – Powers of the Board.*

[25] *Summary - Statement No. 54 (gasb.org)*

Figure 46: CCFD Ending Fund Balance by Category (FY 17–FY 22 Actual; FY 23 Adopted)

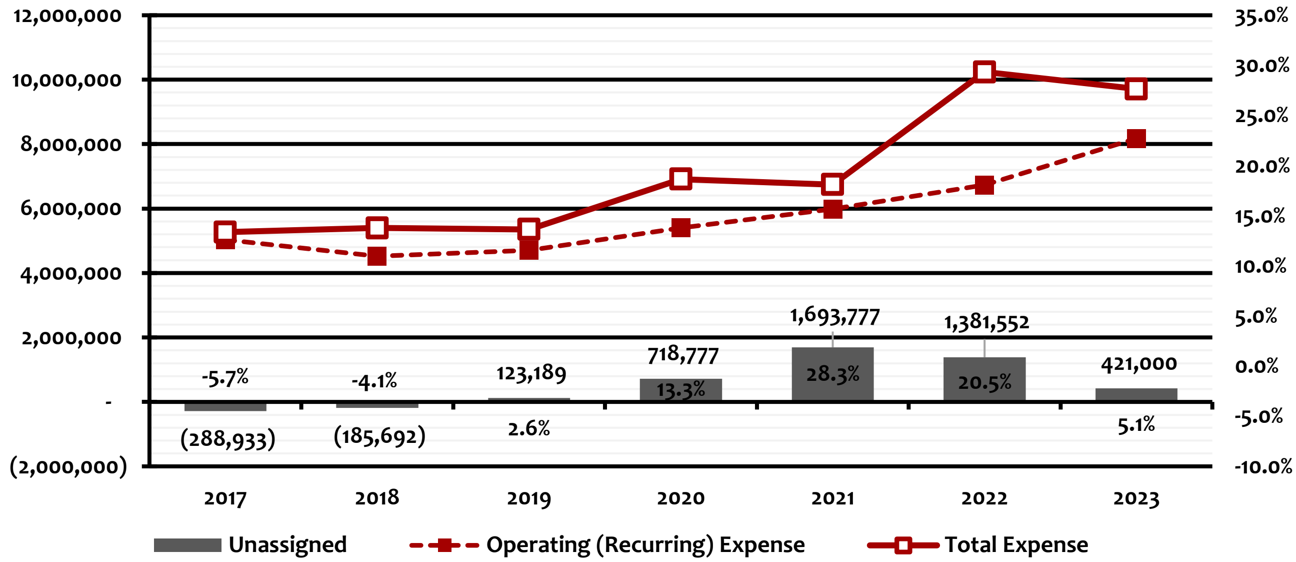
Fund Balance Category	2017 Actual	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Actual[1]	2023 Projected[1]
Non-spendable	-	-	-	-	30,850	32,755	34,000
Restricted	-	-	4,678,374	5,895,625	6,306,181	3,749,681	4,296,787
Vehicles	-	-	4,678,374	5,339,150	5,448,277	3,404,361	3,722,730
Equipment	-	-	-	505,527	756,715	195,255	418,236
Facilities	-	-	-	50,948	101,189	150,065	155,821
Committed	-	-	-	-	-	-	-
Assigned	-	-	-	-	-	-	-
Unassigned	(288,933)	(185,692)	123,189	718,777	1,693,777	1,381,552	421,000
Total Ending Fund Balance	**(288,933)**	**(185,692)**	**4,801,563**	**6,614,402**	**8,030,808**	**5,163,988**	**4,751,787**

[1]County Audit for FY 22 not yet completed; figures from CCFD staff

The following figure shows Operating (recurring) expense as well as total expense for the department and the unassigned reserve amounts along with their respective percentage of recurring expense. It is good financial practice to maintain a cash reserve equal to, or in excess of, 2-2.5 months (17-21%) of recurring expenses. The Government Financial Officers Association (GFOA) provides guidance on how to account for fund balance and how much is recommended for various purposes.[26] Specifically, GFOA recommends that governments maintain at least two months or just under 17% of operating revenues or expenditures at a minimum depending upon fiscal year and timing of tax revenue collection and cash flow. The CCFD has maintained its unassigned reserve at well less than the GFOA recommendation except in fiscal years 21-22 and has used this reserve to purchase capital which costs are then reimbursed from appropriate restricted reserve accounts held by the City of Gillette.

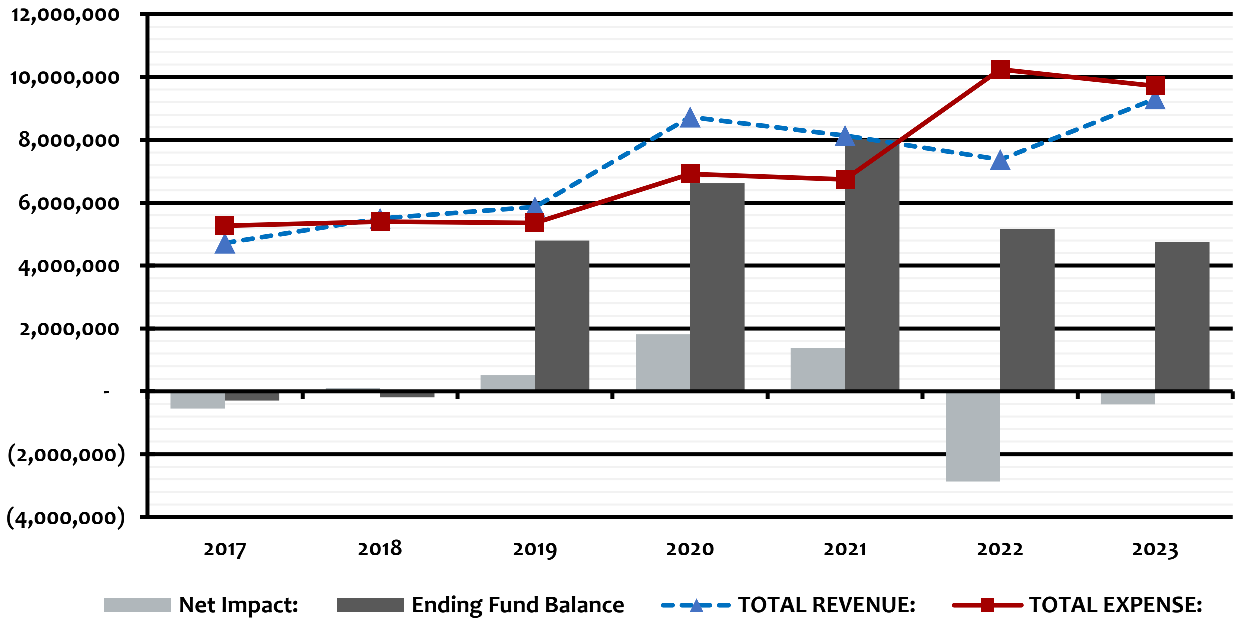
[26] *http://www.gfoa.org/fund-balance-guidelines-general-fund*

Figure 47: CCFD Operating (Recurring) Expense vs Unassigned Fund Balance (FY 17–FY 22 Actual; FY 23 Adopted)



The JPFB should at least consider halting this practice until the unassigned reserve exceeds the GFOA recommended operating reserve of at least two months. The following figure shows total revenue (dashed blue line) and total expense (red line) from FY 17 through FY 22 actual, and FY 23 as adopted. The net impact is shown as light grey bars. Ending fund balance is shown in dark grey bars. This includes both restricted and unassigned reserves. When total expense exceeds total revenue in any given year, then the net loss is covered using reserve funds and ending fund balance decreases. The FY 20 amended audit shows the addition of $4.48 million in restricted reserves held by the City of Gillette on behalf of the CCFD. Total revenue exceeded total expense from FY 19-21 and fund balance increased. In FY 22 total expenses exceeded revenue, driven by large capital expenditures and fund balance decreased. This is expected to occur again in FY 23. The JPFB should adopt consistent policies for use and replenishment of the various fund balances and should build the unassigned reserve to at least a two-month operating reserve which is subsequently maintained. A formal CIP process should then be funded through the restricted reserve rather than using the unassigned reserve.

Figure 48: Net Impact of CCFD Total Revenue and Total Expense on Ending Fund Balance (FY 17–FY 22 Actual; FY 23 Adopted)



CURRENT FACILITIES & APPARATUS

Regardless of an emergency service agency's financing, if appropriate capital equipment is not available for use by responders, it is impossible for a fire department to deliver services effectively. Two primary capital assets essential to the provision of emergency response are facilities and apparatus (response vehicles). In this section of the report, ESCI provides a review and analysis of Campbell County Fire Department's capital assets and infrastructure. Because of the expense of these assets, planning must be developed to address replacement, refurbishment (when appropriate), and maintenance. The funding of these elements is difficult to absorb for most agencies in a single year; thus, a multi-year funding strategy or funding source must be identified through an adopted CIP process. The replacement must be planned far enough ahead of the actual expense to allow an agency time to acquire the funds necessary to implement the plan and accommodate the lead time between placement of the order and receipt of the final product.

Fire Stations & Other Facilities

Fire stations and their locations play an integral role in the delivery of emergency services for several reasons. A station's location will dictate, to a large degree, response times to emergencies. A poorly located station can mean the difference between confining a fire to a single room and losing the structure. Fire stations also need to be designed to adequately house equipment and apparatus, as well as meet the needs of the organization and its personnel. It is important to identify needs based on service-demand, response times, types of emergencies, and projected population growth prior to making a station placement commitment.

Consideration should be given to a fire station's ability to support the department's mission as it exists currently and into the future. The activities that take place within a fire station should be closely examined to ensure the structure is adequate in both size and function. Below are some typical functions provided in the fire station:

- Isolation of potential hazardous substances from living areas
- The housing and cleaning of apparatus and equipment, including decontamination and disposal of biohazards.
- Residential living space and separate non-communal sleeping quarters for on-duty personnel (all genders).
- Kitchen facilities, appliances, and storage.
- Bathrooms and showers (all genders).
- Nursing rooms and quiet rooms.
- Administrative and management offices; computer stations and office facilities for personnel.
- Training, classroom, and library areas.
- Firefighter fitness area.
- Public meeting space for community functions and public education events.

- Areas designed to provide an Emergency Operations Center

Appropriately designed, maintained, and properly located facilities are critical to a fire department's ability to provide services in a timely manner. ESCI evaluated the fire stations and associated facilities operated by the CCFD. In gathering information from the Campbell County Fire Department, ESCI asked the department to rate the condition of each of its fire stations using the criteria in the following figure.

Figure 49: Criteria Utilized to Determine Fire Station Condition

Condition	Description
Excellent	Like new condition. No visible structural defects. The facility is clean and well maintained. Interior layout is conducive to function with no unnecessary impediments to the apparatus bays or offices. No significant defect history. Building design and construction match the building's purposes. Age is typically less than 10 years.
Good	The exterior has a good appearance with minor or no defects. Clean lines, good work flow design, and only minor wear of the building interior. Roof and apparatus apron are in good working order, absent any significant full-thickness cracks or crumbling of apron surface or visible roof patches or leaks. Building design and construction match the building's purposes. Age is typically less than 20 years.
Fair	The building appears to be structurally sound with a weathered appearance and minor to moderate non-structural defects. The interior condition shows normal wear and tear, but flows effectively to the apparatus bay or offices. Mechanical systems are in working order. Building design and construction may not match the building's purposes well. Showing increasing age-related maintenance, but with no critical defects. Age is typically 30 years or more.
Poor	The building appears to be cosmetically weathered and worn with potentially structural defects, although not imminently dangerous or unsafe. Large, multiple full-thickness cracks and crumbling of concrete on apron may exist. The roof has evidence of leaking and/or multiple repairs. The interior is poorly maintained or showing signs of advanced deterioration with moderate to significant non-structural defects. Problematic age-related maintenance and/or major defects are evident. May not be well suited to its intended purpose. Age is typically greater than 40 years.

ESCI toured each of the Campbell County fire stations. These visits combined with the information provided, produced the observations listed in Appendix B.

Fire Station Facilities

The site visit/assessment included building reviews with a focus on construction, building condition, building amenities, and visible problems or concerns. Each fire station visited varied broadly from relatively new (built in 2017) and in excellent condition to others that are aging and in fair condition. Several need repair and/or renovations if not total replacement. Most of the part-time stations observed are nearing or have already reached their maximum capacity in terms of room for future expansion as workload and service demand increases. Stations range in age from 6 to 45 years. As a result, CCFD has significant facility sustainment and refurbishment costs that will need to be addressed.

The following figure lists some of the findings and basic features of each CCFD Fire Stations.

Figure 50: Summary of the CCFD Fire Stations

CCFD Station	Age	Rated Condition	Number of Apparatus	No. of Apparatus Bays	Minimum Staffing
Fire Station 1	15 Years	Good	12	7 Drive Through	3
Fire Station 2	45 Years	Fair	2	2 Back-in	0
Fire Station 3	6 Years	Excellent	3	2 Drive-through	3
Fire Station 4	22 Years	Fair	2	2 Back-in	0
Fire Station 7	12 Years	Excellent	3	2 Drive-through	3
Fire Station 9	13 Years	Good	6	4 Drive-through	2
Fire Station 10	36 Years	Fair	2	2 Back-in	0
Fire Station 11	38 Years	Fair	2	2 Back-in	0
Fire Station 12	22 Years	Good	3	4 Back-in	0
Fire Station 13	36 Years	Fair	3	2 Back-in	0

Common Facility Issues

Some of the current fire stations were only designed for single company crews and have had additional staff added over time and out of necessity. As such they were updated to accommodate around-the-clock coverage, though never designed to house the number of full-time firefighters assigned. This is evident in the current configurations of many of the fire stations, which have very little room for crews and apparatus. Many of the buildings are not in compliance with recommendations from the National Fire Protection Association's (NFPA) *Standard for Life Safety Initiatives*. Some examples are a lack of smoke detection and sprinkler systems, ice machines exposed to vehicle exhaust, a lack of emergency exits and lighting. Another concern is the ability to properly decontaminate employees and their equipment in accordance with NFPA 1581, *Standard on Fire Department Infection Control Program*. Current configurations do not provide adequately for the decontamination of equipment and clothing separately from other living spaces.

A majority of CCFD stations were identified as not being compliant with the American Disabilities Act (ADA). These non-compliance issues range from stations not being entirely accessible or areas only being partially accessible. The public does not have easy access to these public facilities which is an issue leadership must address.

Many of the stations are not staffed and are utilized for apparatus storage only. The decreasing number of part-time/volunteer staff has made it increasingly difficult to staff these stations. Ice machines should be indoors and not in apparatus bays. Fire station surfaces should lend to easy cleaning and decontamination.

Over the past few years, the fire service has had an increased awareness and resulting concern with the issue of firefighter cancer, and cancer-prevention practices. Specific to reducing exposure, there are (at least) three primary industry "best practices" to be considered revolving around fire stations. One such practice is to limit firefighter exposure to products of combustion, as well as minimizing/eliminating exposure to diesel fumes/soot (from fire apparatus). Another preventative measure is to limit/reduce firefighter exposure to toxic products of combustion which occur after the fire (aka, off-gassing). PPE, especially turnout pants, must be prohibited in areas outside the apparatus floor (i.e., kitchen, sleeping areas, etc.) and should never be in the living quarters. A third best practice is gear separation and extractors to clean gear which is not fully available in all of the CCFD fire stations. To this end, it is recommended that CCFD continue to enact cancer prevention measures and consider incorporating cancer prevention strategies in future fire station renovation projects. Additionally, personal protective equipment (PPE) must also be stored in an environment protecting the gear from exposure to ultraviolet (UV) lighting. UV lighting can break down the fabric of firefighting protective ensembles.

ESCI noted that the configuration of most of the stations requires that fire apparatus back into the apparatus bays. Most of these bays are at older facilities, which were constructed during a time when this was considered an acceptable practice. A significant number of accidents involve emergency response vehicles when backing. It is considered an "industry best practice" to construct fire stations with drive-through bays to avoid the opportunities for firefighters to back into a station and reduce the opportunities for backing accidents to occur.

While not a consensus standard, many in the industry consider that fire stations should be built to last about 50 years. However, the age of a fire station should not be the only consideration for replacement, upgrade, or remodeling. Many components and functions of the facility must be evaluated and considered—especially firefighter health and safety.

Administrative Facilities

Administrative functions for the CCFD are collocated within Fire Station 1. This arrangement has proven to be beneficial and a very efficient utilization of space for offices and conference rooms. The ability of the Fire Chief to remain in direct communication with his senior and executive staff makes for a very efficient workplace. Office space is very well arranged and is easy to find. Conference rooms are limited, which requires relocating to the training classroom or community meeting room out in the foyer of the building. The main administrative functional unit for the CCFD is an ADA compliant office and citizens can utilize the ADA approved ramps to access the building.

Training Facilities

ESCI learned that hands-on training facilities are located offsite from the fire stations and need updating or replacing to meet industry standards. Classroom instruction is an essential component of preparing emergency responders with appropriate knowledge and skills. CCFD uses a classroom for new recruits and department didactic learning sessions. A training facility or drill ground is a second indispensable element. Training facilities provide a controlled and safe environment to simulate emergencies, by developing and testing the skills of emergency workers. The site used by CCFD is dated and in some cases has been restricted for use. For instance, live fire training is a major concern inside the designated burn building due to age and building damage, however, there are other props on the training ground that can be utilized. Live fire training is important to ensure firefighters understand fire behavior and are ready to encounter it when responding to calls for service.

NFPA 1402: *Standard on Facilities for Fire Training and Associated Props*, is a standard that addresses the design and construction of facilities for fire training. The document covers the features that should be considered when planning a fire training facility. Absent the availability of suitable training facilities, some fire departments may forego essential training. As enhancements and renovations are made to the training site this standard can provide the necessary guidance.

Proficient emergency responders have confidence in their own abilities to handle the emergencies they encounter. Best practices suggest that emergency workers have regular access to training grounds for repetitive drills and to develop new skills. An effective and continuous training program results in safer, more efficient, and effective emergency operations.

Fire Station Apparatus/Vehicles

The size, age, and deployment of a fire department's fleet of vehicles (emergency response and support) have a significant impact upon the service capabilities of an organization. It is critical that a fire department establish an appropriate inventory level of its emergency and non-emergency vehicles that allows it to effectively serve its community and constituents well. Fire suppression apparatus, aerial apparatus, special operations and support units, and some command vehicles are unique and expensive pieces of equipment customized to operate for a specific community and defined mission. Other than its firefighters, officers, and support staff, emergency apparatus and vehicles are the next most important resource in a fire department that has a direct impact on service delivery.

Apparatus must be in good condition, regularly maintained, and configured in a way that ensures reliable, safe, and effective deployment and operations at emergency incidents. As a result, most fire apparatus are very expensive to purchase and maintain and offer little flexibility in use and reassignment to other missions. Additionally, older vehicles tend to increase maintenance costs and can potentially have a negative impact upon response reliability as units experience increased breakdowns and longer out-of-service times.

A complete list of CCFD apparatus and vehicles is listed in Appendix C.

CCFD has a significant number of fire apparatus to maintain and replace, roughly 62 pieces. Various factors can have either a positive or negative impact on the life expectancy of an emergency response apparatus. Fire trucks, rescue trucks and aerial ladder trucks located in "busy" portions of a jurisdiction can realize an even shorter lifespan as the units are exposed to more harsh operations. These units often experience increased breakdowns due to wear and tear, which reduces apparatus availability and increase maintenance costs.

CCFD fleet provides service on their vehicles but also provides service to several of the ambulance services in the area. The fleet department is currently providing service on 17 ambulances for Campbell County Health, Weston County, Newcastle, and Sheridan County Memorial Hospital. These services are provided with three FTEs.

As with any mechanical device, a fire apparatus possesses a finite life. Often, when a frontline apparatus reaches a certain threshold regarding age or wear and tear, or begins to require increasing maintenance costs, it is moved to reserve status or decommissioned. The decision to move an apparatus to reserve status or to decommission it is a local decision. Typically, apparatus replacement is based on multiple factors such as age, mileage, engine hours, increased need for maintenance, or financial considerations. Annex D of NFPA 1901: *Standard for Automotive Apparatus* (2016) suggests the following:

> *The safety improvements addressed in the most recent edition of NFPA 1901 are so significant that the standard suggests that apparatus more than 15 years old should be refurbished to meet current standards or removed from service; however, the standard acknowledges that apparatus can continue to be serviceable far beyond the 15-year threshold, depending on maintenance, wear and tear, service demands, and driver training programs. Finally, 1901 recommends that apparatus over 25 years in age should be replaced.*

Apparatus replacement within the CCFD is primarily based on the age of apparatus, with apparatus being moved to reserve status on a case-by-case basis. Engines (pumpers) and ladder trucks are scheduled for front-line replacement when they reach 20 years of age. The high use engines (E1 & E3) will typically move to a slower station after 6-8 years and when newer apparatus are purchased. CCFD maintains at least one reserve pumper. Heavy Rescues are retired at 20 years or 100,000 miles. Typical CCFD Wildland engines can reach 30 years of service before needing replacement. All new wildland engines spend the first 10-15 years of service life at a structural station where use is high, after which they are rotated out to "rural" ranches where use is minimal until they reach end-of-life. CCFD has strategically placed reserve wildland units in remote areas at local ranches and farms in an attempt to reduce response times. Fleet/command vehicles are sold at approximately 100,000 miles or when reliability becomes an issue.

SUPPORT PROGRAMS

Fire department support programs can encompass a wide range of initiatives and resources aimed at assisting fire departments in carrying out their mission to protect life and property from fire and other hazards. Some examples of fire department support programs are training programs, communication services and dispatch, and life safety services.

Training

A comprehensive training program is one of the most critical factors to ensuring safe and effective delivery of emergency services. This is especially true of smaller departments where staffing is limited but the types of incidents they respond to can be the same as larger departments. Maintaining a sufficient initial and on-going fire, rescue, and hazardous materials training program as well as continuing medical education is essential to ensure maximum effectiveness and safety in the complex environment firefighters must work. Failure to provide necessary and effective training on a continual basis endangers firefighters and the citizens they serve, and at the same time exposes the fire department to liabilities that can have severe consequences.

In this section, ESCI reviews the department's training practices and compares them to national standards and best practices. Recommendations for strategic changes or opportunities for improvement are noted where appropriate.

The Department uses Emergency Reporting (ERS) to document firefighter training and the Battalion Chief is responsible for overall training delivery and data entry on each respective shift. Having a dedicated training staff as well as clerical staff support could reduce some of the administrative workload and allow the Battalion Chief's to focus more time directly training firefighters and working on live drills.

General Training Competencies

Newly hired firefighters must participate in probationary firefighting recruit training. The National Fire Protection Association (NFPA)—in its standard NFPA 1001 (Firefighter I and II)—identifies the minimum training requirements that can serve as the basis for entry-level firefighters. The NFPA recommends other standards that address initial and ongoing training for firefighters and officers in a variety of specific topics.

In its Fire & Emergency Service Self-Assessment Manual, the Commission on Fire Accreditation International (CFAI) addresses "Training and Competency," and lists performance indicators under the headings of training and education program requirements, performance, and resources. Some of these competencies include the following:

- The organization has a process in place to identify training needs. The process identifies the tasks, activities, knowledge, skills, and abilities required to deal with anticipated emergency conditions.

- The agency's training program is consistent with the mission statement, goals and objectives and meets its needs.
- The training program is consistent with legal requirements for performing mandatory training.
- The agency identifies minimum levels of training required for all positions in the organization.
- A command and staff development program is in place that encourages pursuit of professional credentialing.
- A process is in place to ensure that personnel are appropriately trained.
- The agency provides a training schedule that meets the organization's needs.
- The agency evaluates individual and crew performance through validated and documented performance-based measurements.
- The agency analyzes student evaluations to determine the reliability of training conducted.
- The agency maintains a training records management system that meets recognized standards.
- Facilities and apparatus are provided to support the agency's all hazards training needs. The agency has plans addressing any facilities and apparatus not available internally to complete training activities.
- The agency has instructional personnel with teaching qualifications and expertise to meet its needs.
- Instructional materials are current, support the training program, and are easily accessible.
- The agency has a process for purchasing, developing, or modifying existing curriculum to meet its needs.
- Equipment utilized for training is properly maintained in accordance with the agency's operational procedures. The agency makes training equipment readily accessible to instructional personnel.
- The agency maintains a current inventory of all training equipment and resources.
- A selection process is in place for training and educational resource materials.
- Training materials are evaluated at least annually, to reflect current practices and meet the needs of the agency.

Furthermore, the Insurance Service Organization (ISO) requires detailed hours of specific training as part of their fire department ranking. Below is a summary of the annual ISO required training hours for each firefighter.

- Facilities Training: 18 Hours
- Company Training: 192 Hours
- Officer Development Training: 12 Hours
- New Driver Training: 60 Hours
- Driver Continuing Education: 12 Hours
- Hazardous Materials Training: 6 Hours

- New Recruit Training: 240 Hours
- Pre-fire Planning: Annual Review

Even though the Insurance Services Office (ISO) requires specific detailed training for department personnel, training programs must go beyond simply fulfilling mandatory hours. Emergency services training administrators and instructors must ensure that firefighters, EMS personnel, and officers are not only competent, but also self-confident in the variety of skills necessary to perform effectively in high-stress situations.

Training Administration and Delivery

To function effectively, a training program must be managed. An additional element of effective administration is the development of program guidance in the form of training planning, goals, and defined objectives. CCFD has established goals and objectives. CCFD management supports training and it shows by the amount of training being conducted and coordinated throughout the year. This provides for a busy calendar of events as the size of the department's service area can create challenges arranging for training evolutions outside of first due territories. Interviews with staff highlighted concerns suggesting the need for additional support to ensure operational units get the required and needed training. This concern is echoed in the 2021 ISO review where CCFD earned only 6.54 of the 9 available credits for company training.

Currently CCFD manages their training program with one training officer. Based on the span of control in the department training program and the sheer number of required training hours, CCFD should consider operational shift officers designated as training liaisons to assist with consistent training delivery across the shifts. This approach is used across the country to accomplish training program goals and objectives when staff is limited. However, operational members tasked with additional administrative support functions must prioritize their daily, weekly, monthly, and yearly assignments. Operational emergency functions and daily responses can interrupt or delay the accomplishment of these scheduled tasks.

Training Schedules

As with many fire departments, CCFD is challenged with balancing on-duty training sessions and the necessity to maintain sufficient personnel and apparatus to ensure adequate emergency response. Furthermore, providing training for part-time staff is challenging based on their schedules and availability. Competency-based training sessions occur frequently at the agency despite these challenges. In addition to ensuring personnel have the quality knowledge, skills, and abilities necessary to deliver effective and efficient emergency services, training programs have an added effect of improving employee morale. CCFD utilizes a variety of on-duty and off-duty training schedules to try and accomplish the required training hours set by ISO. CCFD also has a variety of night and weekend training opportunities for part-time members to attend and achieve their training requirements.

The CCFD training program should be balanced between three areas: statistically driven training evolutions and skills reflecting current call volume, special team training, and re-certification course requirements. The use of heat maps and actual service demand listed in the Service Delivery and Performance Section of the report can aid in tailoring the training program specifically to the types and frequency of incidents experienced by CCFD. Furthermore, the required ISO training requirements can be broken down and scheduled across the entire year to ensure compliance.

Training Record Keeping

Training records are maintained utilizing the CCFD's records management system, Emergency Reporting (ERS). The system is working well and allows the department to easily track and achieve required ISO training documentation. CCFD currently uses task books for each rank outlining required ISO training in addition to ERS for training recordkeeping and guidance. The use of task books for record keeping is very beneficial to the advancement and training of members. Task books not only outline the necessary steps to advance through the ranks but also provide members with more education than required by ISO.

There are better training records management software platforms available and CCFD should look to upgrade their program with one of these available alternatives. These platforms allows for ease of scheduling, assignment, and tracking of required training. It also allows the end user, both career and part-time, the ability to seek out additional training through a variety of already programmed available training as part of the platform. A more useful training software package would likely enhance the department's availability to meet ISO training requirements.

Training Program Goals and Objectives

Each facet of the department requires established goals and objectives to ensure success. The CCFD training program is no different. Without a dedicated functioning facility to provide training drills daily, monthly, and annually in both simulated and live fire training, CCFD will struggle to ensure firefighters remain proficient with operating inside an Immediately Dangerous to Life and Health (IDLH) environment. NFPA 1403, *Standard on Live Fire Training Evolutions* and NFPA 1402, *Standard on Facilities for Fire Training and Associated Props* provide guidance and direction for establishing ways to meet these needs.

Goals and objectives provide the foundation for an effective training program. These goals and objectives can be determined by creating a training committee of dedicated employees who are passionate about department training. An analysis of the CCFD's ability to complete tasks and evolutions outlined in NFPA 1410, *Standard on Training for Emergency Scene Operations* will provide guidance on where to begin. Furthermore, Post Incident Analysis (PIA) review can also provide much needed information as to weaknesses and gaps in service ability. Often gaps can be identified by outlining the high-risk, low frequency events that may occur or have occurred in the service area. Once these gaps are identified, the training program can be tailored to address the deficiencies.

CCFD will continue to have challenges providing adequate training as long as staff is limited, and the records management software is unable to provide the needed flexibility and guidance to achieve the goals. The required staff to accomplish the training mission is determined by the department. This affects the goals and objectives established as well as meeting required ISO training requirements.

Fire and Life Safety Services

Fire Prevention

In today's fire service, the many competing interests for limited funding make establishing priorities very difficult. Often the mission of fire prevention and public education becomes a combined effort between the department and their municipality. Outreach and education combined with identifying and emphasizing Community Risk Reduction (CRR) should become part of the everyday mission of the fire department.

It is far more effective to prevent fires and other emergencies than it is to respond to them. The financial impact of a fire or injury goes far beyond the cost of extinguishment or treatment. According to the Federal Emergency Management Agency (FEMA), 40% of businesses do not reopen following a disaster. Additionally, another 25% fail within one year. The United States Small Business Administration found that more than 90% of companies fail within two years of being struck by a disaster.[27]

The fiscal impacts of injuries, while not as immediately evident, can be equally devastating. Individuals experiencing an injury may lose the ability to earn an income during the recovery time, and businesses lose productivity of that individual until they return to work. Beyond the fiscal impacts associated with lost work time, injured persons and families often experience significant emotional trauma.

A strong fire prevention and life safety program, based on effective application of relevant codes and ordinances, reduces the loss of property, life, and the personal disruption that accompanies catastrophic fires and accidents.

The fundamental components of an effective fire prevention program are listed in the following figure, accompanied by the elements needed to address each component.

[27] *https://www.accesscorp.com/press-coverage/study-40-percent-businesses-fail-reopen-disaster/*

Figure 51: Fire Prevention Program Components

Fire Prevention Program	Elements Needed to Address Program
Fire Code Enforcement	Proposed construction and plans review New construction inspections Existing structure/occupancy inspections Internal protection systems design review Storage and handling of hazardous materials
Public Fire and Life Safety Education	Public education Specialized education Youth Firesetter intervention Prevention information dissemination
Fire Cause Investigation	Fire cause and origin determination Fire death investigation Arson investigation and prosecution

Fire Code Enforcement

The review of planned construction is a critical component of fire prevention. Working in conjunction with the local, county, city and/or regional building officials ensures that planned construction will be built to applicable fire codes and standards that make for a safe environment for those that will occupy/use it.

Plan Reviews and Inspection Activities

A comprehensive fire inspection and construction plan review program ensures that the business/occupancy continues to meet the codes and standards to which it was built, and provides an opportunity for fire personnel to develop a plan of action (pre-plan) in the event of a fire or other emergency. The recommended frequency for business/occupancy inspection may vary based on the type of property and degree of hazard. NFPA 1730, *Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations* is the recommended standard for fire safety inspections by hazard class and is noted in the following figure.

Figure 52: Recommended Fire Inspection Frequencies per NFPA 1730

Hazard Classification	Example Facilities	Recommended Inspection Frequency
Low	Apartment common areas, small stores, and offices, medical offices, storage of other than flammable or hazardous materials.	Annual
Moderate	Gas stations, large (> 12,000 square feet) stores and offices, restaurants, schools, hospitals, manufacturing (moderate hazardous materials use), industrial (moderate hazardous materials use), auto repair shops, storage of large quantities of combustible or flammable material.	Semi-Annual
High	Nursing homes, large quantity users of hazardous materials, industrial facilities with high process hazards, bulk flammable liquid storage facilities, facilities classified as an "extremely hazardous substance" facility by federal regulations (SARA Title III).	Quarterly

The CCFD has adopted and follows the 2021 Edition of the International Fire Code (IFC) developed by the International Code Council. CCFD requires an annual/biannual inspection for various occupancies. Data provided by the department pertaining to life safety and building fire code inspections reveals that the frequency of inspections performed annually does not meet the NFPA 1730 annual inspection requirements due to the workload associated with new construction inspections and plan reviews and the limited number of qualified Fire Inspectors. As a result, the department prioritizes inspections towards new construction and high-hazard facilities.

CCFD Fire Prevention staff were only able to complete 800 of 2,600 required (NFPA 1730) annual inspections in 2022. To identify potential options for ensuring completion of the required inspections noted in the preceding figure, ESCI calculated a theoretical daily inspection workload if all inspections were assigned and scheduled uniformly throughout the year, resulting in the following calculation:

- Number of annual inspections required = 2,600
- Number of workdays (M–F) in 2022 = 250
- Number of Federal Holidays in 2022 = 10
- 2,600 ÷ 240 workdays = 10.8 inspections required per day

Evaluation of current Fire Prevention staffing compared to the required daily inspection workload quickly reveals that there is not enough staff to conduct 10.8 inspections every weekday. Recordkeeping, code consultations, leave time, training, code enforcement follow-up, and other administrative duties are staff activities required above and beyond physically visiting and inspecting occupancies.

Fire departments across the United States utilize civilian or sworn operations personnel to perform occupancy inspections. The use of civilian personnel typically results in cheaper personnel costs as opposed to using sworn firefighters. In addition, sworn firefighters have many competing priorities during any given shift, besides responding to emergencies. Using retired firefighter annuitants or part-time staff may be another cost-effective option for adding inspection capacity to bolster the fire inspection program.

Fire and Life Safety Public Education Program

The prevention of fires and other emergency incidents is one of the most critical functions of any community's service to its citizens and visitors. This activity cannot be accomplished in a haphazard approach by simply "talking to people" during the normal course of business. Delivering fire and life safety messages must be accomplished through an intentional process resulting from a strategic fire protection campaign. A comprehensive fire and life safety education program involves teaching the public methods and techniques used to minimize the occurrence of fire and other accidents. The reality is that it is more cost effective to prevent a fire or emergency than it is to respond to a fire or emergency. A well-educated and trained public becomes a force multiplier in maintaining a safe community.

CCFD does not have a public information/public education officer assigned and relies on various staff to co-manage and assist with delivery of these programs and functions in addition to regular fire suppression responsibilities.

Providing fire and life safety education to the public to minimize the number of emergencies while training the community to take appropriate actions when an emergency occurs is essential. Life and fire safety education provides the best chance for minimizing the effects of fire, injury, and illness to the community. Fire and Life Safety Education Programs offered within CCFD include smoke alarms, carbon monoxide alarms, scheduled school programs and classes that are offered by request to the community. Topics presented within the schools include Calling 911, Exit Drills in the Home (EDITH), and Injury Prevention. Programs offered to the community by request include Fire Brigade training to coal mines, Senior Citizen Fire Safety Training, Fire Extinguisher Training, and a Youth Firesetter Program.

ESCI recommends that CCFD develop and implement a formal Community Risk Reduction (CRR) plan that is updated annually. The plan should evaluate the risks most commonly faced by the residents of the CCFD and establish strategies for reducing those risks. A formal risk evaluation will evaluate the need for additional programming. ESCI further recommends that the CCFD consider the long-term establishment of the position of Community Outreach Coordinator. This position may be volunteer or paid and assigned to the Fire Marshal's Office. The role of the Community Outreach Coordinator would be to ensure that development, delivery, and enhancement of CCFD's Community Risk Reduction Program.

Fire Origin and Cause Determination

Accurately determining the cause of a fire is an essential element of a fire prevention program. When fires are set intentionally, identification and/or prosecution of the responsible offender is critical in preventing additional fires and potential loss of life. Further, if the cause of fires is accidental, it is also of great importance because knowing and understanding how accidental fires start is the most effective way to identify appropriate fire prevention and public education measures to prevent a reoccurrence.

According to NFPA 921, *Guide for Fire and Explosion Investigations* there are four determinations when investigating the cause of a fire.

- Accidental fire cause
- Natural fire cause
- Incendiary fire cause
- Undetermined fire cause

Accurately determining the cause of fires often provides clues to preventing future incidents. Identifying fires that are set intentionally (incendiary), along with the identification and/or prosecution of the responsible parties, can prevent additional fires. If the cause of a fire is natural or accidental, it is also of great value to know and understand its origin. It is of value in identifying where to direct fire prevention and public education efforts to reduce or prevent re-occurrences.

CCFD provides fire origin and cause determination and works in partnership with local law enforcement as necessary for arson investigations and prosecution. The department currently has 7 Trainees (after minimum 40-hr training), 3 Wyoming Origin & Cause Technician or International Association of Arson Investigator (IAAI)- Fire Investigator Technicians (FIT), and 2 IAAI-Certified Fire Investigators (CFI). Each investigator is also a photographer. The duty officers perform these investigative functions and will call in the Fire Inspector or Fire Marshal as needed.

Data Collection and Analysis

Finally, one aspect that is critical to the entire CCFD operation is the collection of data and statistical analysis of that information. Therein lies the primary reason for maintaining an accurate record of emergency responses, fire inspections and code enforcement, fire investigations, and public education programs. Complete, accurate, and thorough data collection is absolutely necessary for planning purposes.

It is recommended that the Fire Marshal’s Office and the CCFD’s leadership utilize this data to develop a monthly report to allow for the regular review of incident data and response performance. The information contained within a common records management system provides valuable information that can assist the department in identifying areas of concern needing to be addressed through its fire prevention programs.

Pre-Incident Planning

Pre-incident plans give firefighters information on specific structures and processes and are a tool for firefighters to engage in strategic and tactical discussions before an emergency occurs. Pre-incident planning involves evaluating protection systems, building construction, contents, and operating procedures that may influence emergency operations.

A firefighter typically works in an alien environment of heat, darkness, confusion, and extreme danger. Often, a firefighter's first visit to a building is when he or she is summoned to an emergency at the facility; the very time that the internal environment of the structure may be at its worst. Contrary to Hollywood's portrayal of the inside of a building on fire, visibility is likely to be zero due to smoke. A lack of familiarity with the layout of a structure can easily cause a firefighter to become disoriented and subsequently suffer injury.

It is important that firefighters and command staff have accurate information readily at hand to identify hazards, direct tactical operations, and understand the proper use of built-in fire-resistive features of structures. This is accomplished by routinely touring structures, developing pre-incident plans, and conducting tactical exercises—either on-site or tabletop. The standards set forth in NFPA 1620: *Standard for Pre-Incident Planning*, guide the development of pre-incident plans. To have value, pre-incident plans need to be current. Pre-plans should be distributed to all mutual/automatic aid partners.

CCFD utilizes a key-box entry program by Knox®.

An ideal pre-incident planning system uses standardized forms and protocols. Data is collected in a consistent format and presented in a manner that permits commanders and emergency workers to retrieve data quickly and easily. All require consistent methods for collection, verification, storage, presentation, and update of emergency plans.

Pre-incident plans are performed by CCFD operations personnel for occupancies assigned in their zones. There have been technological issues with these plans, and they are outdated. CCFD should invest in adequate software that allows company level inspections and pre-planning with easy updates and retrieval when needed. Currently, CCFD has not completed a community risk assessment nor a community risk reduction plan. This document provides the foundation for those assessments and plans moving forward.

Communications/Dispatch Services

Communications center operations represent one of the most critical support functions of any fire department; the system is relied upon as the first link in the emergency services process for a community. A dedicated dispatch center's performance directly impacts critical emergency response times, service level, overall service delivery, and customer satisfaction. Given the direct correlation between response times, survivability, mitigating property damage, and overall outcomes, a properly staffed and functioning dispatch center ensures fire department resources can respond promptly while providing pre-arrival information that enhances first responder safety and effectiveness.

The Campbell County Sheriff's Office (CCSO) serves as the primary Public Safety Answering Point (PSAP) for all emergency services (police, fire, and medical) in Campbell County. The Gillette Police Department serves at the secondary PSAP. CCSO Communications Center provides dispatch services for the Campbell County Fire Department as well as for police and EMS. They are staffed with one Dispatch Manager and 12 call takers/dispatchers who work ten hour shifts weekly. The minimum daily staffing is two but can be as low as one from 0200-1000 hours. The power supply for the system and the building has an emergency back-up generator and an uninterruptible power supply (UPS) battery back-up that ensures continued service to the community during power outages.

Limited staffing requires call takers to both dispatch units and monitor the radio for calls or requests for resources. The National Fire Protection Association has established NFPA 1061: *Standard for Public Safety Telecommunications Personnel Professional Standards Qualifications* and NFPA 1225: *Standard for Emergency Services Communications* as a guiding document for agencies' operating communications centers relative to facilities, call processing times, staffing, testing, and data security. It is important to understand that NFPA 1225 is not a standard specific to fire department operations but applies to all emergency communications centers. NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* also identifies emergency communication performance standards.

CCFD should review and explore the establishment of a dedicated dispatcher for fire department services. There are several reasons why a dedicated fire department dispatching component is beneficial:

- **Efficient Communication:** A dedicated dispatching component allows for efficient communication between firefighters and the dispatcher, ensuring that emergency calls are responded to quickly and accurately. This can help reduce response times and improve the overall effectiveness of emergency response efforts as outlined in NFPA 1225 standards.
- **Specialized Staff:** A dedicated dispatching component can employ specialized staff who are trained to handle emergency calls and dispatch resources in a timely and effective manner. These dispatchers have specialized knowledge of fire department operations and can help ensure that the appropriate resources are dispatched to the right location.
- **Advanced Technology:** A dedicated dispatcher using state of the art CAD resources can help identify the closest available resources, track response times, and provide real-time updates to firefighters in the field.
- **Centralized Management:** A dedicated dispatcher can provide centralized management of fire department operations, allowing for better coordination and communication between different units and departments. This can help ensure that emergency response efforts are carried out in a cohesive and efficient manner.
- **Improved Safety:** A dedicated dispatcher can help improve the safety of firefighters and the public by providing real-time information about the location and status of emergency incidents. This can help ensure that firefighters have the information they need to respond to emergencies safely and effectively.

HAZARDOUS MATERIALS RESPONSE CAPABILITIES

Hazardous materials incidents are a part of most every fire department's call volume. While this type of emergency response does not occur as often as some other emergency incidents, they can pose a very high risk due to the challenges and dangers of this type of incident. CCFD has the capability to respond to hazardous material incidents. Hazardous materials (Hazmat) are defined as any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to people or the environment. In a location like CCFD, hazardous materials may be present in various locations throughout the County. The County contains industrial and agricultural environments with significant hazardous materials release potential.

CCFD responds to and mitigates hazardous materials incidents throughout the region. Department training and training with other in-and-out of county fire departments happens periodically during the year. Sheridan Fire and Rescue is part of the Regional Emergency Response Team (RERT) 1. The next closest RERT is in Casper. Most organizations utilize the NFPA 472: *Standard for Competence of Hazardous Materials/Weapons of Mass Destruction Incidents* Job Performance Requirements (JPRs) that relate to hazardous materials to meet the continual education requirements for certification purposes.

As part of the Emergency Response and Responder Safety Document Consolidation Plan (consolidation plan) as approved by the NFPA Standards Council, this Standard has been combined into new consolidated NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders*. As a result of this action, the "current edition" of NFPA 472 is the last published edition of the standard's content as a stand-alone standard. CCFD should begin referring to the new consolidated standard moving forward. The 2022 edition of NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders* combines NFPS 472, NFPA 473, and NFPA 1072 into a single standard.

After reviewing CCFD's incident responses during the year, the number of hazardous material incidents CCFD responds to is quite small compared to the total number of calls for service. However, these calls usually have a higher potential for civil disturbance based on their nature. When a hazardous materials incident occurs either in the county or anywhere in the region, and one of the hazardous materials units is requested, CCFD is responsible for staffing the unit so it can respond to the scene. This negatively affects the department's internal staffing capabilities to respond to other incidents that occur within the jurisdiction.

Given the significant risk hazardous materials incidents pose, CCFD has highly prioritized its response readiness to manage an incident of this nature. The volume of hazardous materials transiting the county via aircraft, rail, pipeline, and highway is substantial. However, the transportation routes are not the only risk the community faces. Industrial warehousing activities increase risk due to the handling of these raw materials. CCFD operates a Special Operations response Hazmat Unit out of Fire Station 1. This is a "level A" resource, the highest level of Hazmat response capability.

To achieve level A capability, a combination of highly technical equipment is necessary, along with appropriately trained, technician-certified personnel and can take as long as an hour to assemble. The department has additional personnel throughout the rest of the county as well available on call-back. This gives a total of approximately 11 personnel available on shift.

Hazmat certification levels are defined by NFPA 472: *Standard for Competence of Hazardous Materials/ Weapons of Mass Destruction Incidents* and the Occupational Safety and Health Administration (OSHA) in CFR 1920.120. The highest level of certification for responders is the "Technician" level according to NFPA. Of the personnel in CCFD, 27 are certified at the Technician level. All other employees are trained to the Operations level resulting in considerable response capability. In addition, there are 3 personnel certified as Hazardous Materials Incident Commanders. Chapter 13 of NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders* outlines the professional qualifications required for performing the duties of the incident commander at hazardous materials incidents.

The National Fire Protection Association (NFPA) defines a Hazardous Materials Safety Officer certification level in Chapter 18 of NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders*. CCFD should seek to add additional training to this certification level, which is an industry best practice. CCFD currently does not have any members with Hazardous Materials Safety Officer certification.

ESCI staff performed a comprehensive assessment based on industry standard practice and consistent with the Occupational Safety and Health Administration (OSHA), NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders,* NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*, NFPA 473: *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents*, NFPA 1710: *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, the Wyoming State Emergency Response Commission for Hazardous Materials and the International Fire Service Training Association. The assessment was not a hazard-based risk analysis of the community, but instead, is based on a minimum level of capability regardless of hazardous materials incident type. The assessment measured four major areas. These four areas were:

- Standard Operating Procedures, Policies, and Guidelines
- Human Resources
- Training
- Equipment

Standard Operating Procedures, Policies, and Guidelines

The first area of evaluation involves the established standard operating procedures, policies, and guidelines used to manage the team. CCFD does not have a written Emergency Response Plan for Hazardous Materials incidents. The existence of CCFD's Emergency Response Plan (ERP) is required and is related to the mandate from the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (q)(1), which requires that employers establish emergency procedures to be followed when responding to emergencies involving hazardous materials. This plan should be available online to all employees and reflect pre-planning and coordination with outside shareholders.

The Incident Command System is a standard on-site command and control system used to manage emergency incidents and planned events. CCFD has adopted and uses the NIMS system to manage its incidents. This system defines the lines of authority, roles, and responsibilities for managing large scale incidents. Furthermore, it designates a single incident commander as well as recognizes the "Unified Command" concept. Passing of command to senior officials is recognized and the safety officer is identified.

During hazardous materials responses, CCFD maintains available advanced life support services on-scene for responders during actual and potential immediately dangerous to life and health (IDLH) atmospheres inside the county. When responding outside the county to the region, the requesting or local jurisdiction will provide those services. These advanced life support personnel are specifically trained in the medical aspects of hazardous materials through local protocols and are not part of CCFD. CCFD team leaders believe they need more personnel trained to perform these functions. The roles of the emergency medical support personnel are clearly defined. Medical treatment protocols for handling medical emergencies involving hazardous materials have been approved by the organization's Medical Director.

The procedures used by CCFD address safe distances and areas of refuge for responders who may require it. They do not address or identify the required personal protective equipment to be employed along with emergency equipment. This is something the department should add when establishing the ERP. The standard operating procedures identify site security and control as well as establish the usage of a personal accountability system. The department procedures detail the use of emergency evacuation procedures and decontamination procedures to include collection and disposal of runoff. Finally, the absence of a response plan leads to a lack of after-action reports and critiques. CCFD procedures and guidelines provide for deployment of resources outside of the jurisdiction for local, regional, and state assistance. These procedures should be incorporated into a formal ERP.

The CCFD hazardous materials team does not have a formal personal protective equipment plan or program. The team follows manufacture's guidelines to address hazard-based selection of protective ensembles, their use and limitations, work mission duration, maintenance and storage, decontamination and disposal, training, and fitting, donning, and doffing, and inspection procedures. Occupational Safety and Health Administration (OSHA) in CFR 1910.120 requires the employer to implement safe work procedures for the use of personal protective equipment in the workplace as well as train workers in its use. The regulation continues to require the employer to ensure that employees are complying with the regulations. CCFD has policies in place to ensure this happens. All personnel are required to use a minimum of positive pressure, self-contained breathing apparatus until the atmosphere has been quantified.

CCFD has policies and procedures that reference the usage of air monitors during the emergency response. These policies include documented maintenance procedures and calibration of its air monitors. CCFD's procedures require the establishment of a site-specific safety plan. CCFD does not have policies that reference a standardized methodology for assigning incident levels to hazardous materials emergencies. CCFD does not outline the specific procedures for various tasks that team members may be required to perform, such as spill or leak control.

Human Resources

The Occupational Safety and Health Administration (OSHA) in CFR 1910.120 requires that employers ensure that firefighters establish teams of two or more when working and that a rescue team suitably equipped is readily available. Listed specifically in the regulations are incidents involving hazardous materials. One accepted industry standard practice requires seven hazardous materials technicians to facilitate a minimal entry during a hazardous materials response. These seven people must be dispatched on the initial hazardous materials emergency response once it is determined that an emergency does exist. Of these seven, one should be the designated hazardous materials safety officer trained in accordance with NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders*, and another the incident commander. CCFD has a minimum staffing requirement of 9 hazardous materials personnel assigned for the day between Fire Stations 1 and 3 with two others assigned to Fire Station 9 during daytime hours. Ensuring that the initial alarm assignment contains the industry best practice should continue to be a goal for the organization.

One concern from team leaders was the geographical size of the service area requiring protection. Currently two stations are providing all special operations support for the county. If the Hazardous Materials Team members from Fire Station 1 are busy, then services are delayed. Furthermore, geographical size of the response area can delay arrival of units.

CCFD has a written medical surveillance plan for personnel assigned to the hazardous materials response team. This policy requires an opinion from a physician and provides for periodic examinations as determined by the physician. The medical surveillance plan provides for a medical assessment after exposures above the permissible exposure limit (PEL). All employees receive proper fitting for respiratory protective equipment.

Training

The CCFD hazardous materials team certifies that its members have achieved technician level training in accordance with NFPA 470: *Hazardous Materials/Weapons of Mass Destruction (WMD) Standard for Responders.* CCFD keeps records for documenting initial and refresher training and requires the completion of job tasks for all members and certifies all members who are required to use respiratory protection. All members have been trained to a minimum level of EMT. The CCFD hazardous materials team has a plan for annual refresher training and measurement of continued competency of all team members. Team leaders have expressed that the ability to train more on these practices should be increased to increase efficiency and proficiency for rescuers in more complex rescue situations.

Equipment

An objective review of equipment available for hazardous materials response was conducted. CCFD has an adequate supply of decontamination equipment. This equipment consists of the required containment and collection items as well as the necessary solutions for decontamination operations. Gross decontamination as well as technical decontamination operations were evaluated and found to be adequate for the type of operations the CCFD may encounter.

The inherent ability of hazardous materials emergencies to progress into longer-term operations dictates the need for effective rehabilitative efforts. CCFD has arrangements in place for the sheltering of personnel during the rehabilitation process in an area out of the heat, cold, and elements. The means by which this is accomplished can be varied. Ambulances, buses, ventilated tents, and shelters are all possible means to achieve the desired outcome. CCFD has methods in place to obtain meals for responders during extended operations.

CCFD has various methods for analysis and detection of hazardous materials. This includes PH paper, multi-gas monitoring equipment, radiological monitors, and chemical detection and analysis. CCFD does not use colorimetric tubes for chemical detection and analysis due to the cost of operation. There are also sufficient supplies for gathering and collecting samples. CCFD uses the Smith Detection Hazmat ID, Gas ID, Area Rae, MSA single and multi-gas monitors to increase ability from simple detection to actual identification of specific compounds. These monitors are expensive and CCFD should ensure replacement plans are in place to ensure upgrades are made to keep up with technology changes.

Every member of the hazardous materials team operating on-scene should have radio communications with the safety officer and entry coordinator during entry operations. At a minimum, one portable radio must be available for every entry team member who is at any level of dress, (multiple entry teams and back up teams) as well as any team member who is coordinating a function (decontamination, research, safety, group leader, etc.) CCFD has the communication capability to do this and has made it part of its standard operating procedures.

CCFD has an assortment of equipment to handle LPG and NG leaks including flaring kits. Further spill and leak capabilities are available for various other types of hazardous materials releases. CCFD has a full array of chlorine leak kits at its disposal including rail car chlorine kits. They also include additional gaskets for use with these kits for other toxic chemicals. Moving equipment for handling drums is also available. CCFD stocks more than the appropriate amount of overpack drum capabilities.

CCFD provides adequate fire protection capabilities with foam application if required. There is an adequate amount of foam on hand as well as in reserve should the need materialize as well as the equipment to operate at 250 gallons per minute during application. CCFD does not have the capability for Class D metal fire extinguisher usage.

CCFD stocks the necessary medical equipment to monitor and provide treatment for team members during entry. As discussed previously in this report, CCFD relies on other agencies to provide medical treatment providers available with hazardous materials toxicology training. Team leaders believe additional training is required to increase the number of personnel who can serve in this role.

CCFD maintains an adequate number of reference materials and can provide internet capabilities for research. However, internet capabilities are limited by service connectivity. During times of inclement weather, the ability to access the internet is very limited if not altogether impossible. Identifying hazardous materials is delayed when technicians must search textbooks for information instead of faster internet-based search engines which reduce time tremendously. Furthermore, the ability to communicate can be limited and could be increased through use of satellite telephones. This is a common problem for rescuers to deal with. The addition of satellite internet and phone service could greatly enhance and prevent delays during weather related events. CCFD employs a weather station for immediate on-site analysis.

CCFD carries a standard compliment of protective ensembles for rescuers. These include both 60-minute SCBA bottles with sufficient reserve bottles and a cascade system to support long term operations. CCFD also requires responders to bring their issued turnout gear to ensure each rescuer has adequate NFPA compliant protective equipment that has been sized appropriately. This reduces the amount of equipment required to be stored for deployment. Industry best practices require each person operating as part of the team to be assigned NFPA compliant firefighting protective equipment.

TECHNICAL RESCUE RESPONSE CAPABILITIES

Much like fire and EMS incidents, CCFD needs to be prepared for technical rescue emergencies. Technical rescue includes vehicle machinery extrication, high angle rope rescue, confined space rescue, water rescue, ice rescue, trench, and collapse rescue categories.

CCFD includes a special operations component of technical rescue in place to respond to technical rescue incidents. These members are also cross trained as Hazardous Materials Technicians or Hazardous Materials Operations level members. The disciplines for which the agency is prepared include confined space rescue, rope (high angle) rescue, vehicle/machinery rescue, water rescue, ice rescue, trench rescue and limited structural collapse rescue. The technical rescue operations are well structured and appropriate training is in place. CCFD deploys assets that are trained in technical rescue inside the county as well as to the surrounding area as mutual aid. Several chief level officers are also trained in technical rescue and count towards the response numbers.

ESCI staff performed a comprehensive assessment based on the current standard practices consistent with the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.146, NFPA 1006: *Standard for Technical Rescuer Professional Qualifications*, NFPA 1670: *Standard on Operations and Training for Technical Search and Rescue Incidents*, NFPA 1710: *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, and the International Fire Service Training Association. The Division Chief and Battalion Chiefs of special operations were interviewed to identify strengths and weaknesses within the team or team administration. The assessment was not a hazard-based risk analysis of the community, but instead, is based on a minimum level of capability. These four areas were:

- Standard Operating Procedures, Policies, and Guidelines
- Human Resources
- Training
- Equipment

Standard Operating Procedures, Policies, and Guidelines

The first area of evaluation involves the established standard operating procedures, policies, and guidelines used to manage the team. CCFD does not have a dedicated Emergency Response Plan (ERP) for technical rescue incidents per se. However, they use an all-hazards response plan and standard operating guidelines and procedures for incidents. This plan is available online to all employees. Non-team members are also governed by specific Standard Operating Guidelines (SOGs) and Standard Operating Procedures (SOPs) that dictate scene operations for initial company arrival.

The Incident Command System is a standard on-site command and control system used to manage emergency incidents and planned events. CCFD has adopted and uses the National Incident Management System (NIMS) to manage its incidents. This system defines the lines of authority, roles, and responsibilities. Furthermore, it designates a single incident commander as well as recognizes the "Unified Command" concept. Passing of command to senior officials is recognized. CCFD identifies an incident safety officer for technical rescue incidents.

During technical rescue responses, CCFD relies on outside agencies to provide available advanced life support services on-scene for responders during actual and potential immediately dangerous to life and health (IDLH) atmospheres. Not all advanced life support personnel are specifically trained in the medical aspects of technical rescue incidents. This training is designed for incidents involving technical rescue. The roles of the emergency medical support personnel are clearly defined. Medical treatment protocols are in place that specifically address handling medical emergencies involving crush syndrome. Often crush syndrome is associated with technical rescue incidents. The local EMS system has a special operations group for EMS that provides assistance. Medical Treatment Protocols are a definite benefit to advanced life support personnel.

The standard operating guidelines used by CCFD address the required personal protective equipment to be employed along with emergency equipment. The procedures identify site security and control. The standard operating guidelines and procedures establish the usage of a personal accountability system. The standard operating guidelines are thorough and detail the use of emergency evacuation procedures. Finally, the plan also details the procedures for after action reports and critiques. CCFD has specific SOGs and SOPs for each discipline that provide further direction for personnel. These guidelines are in draft format and cover ice rescue, trench rescue, rope rescue, and confined space rescue.

The CCFD has a personal protective equipment plan or program specific to technical rescue equipment. All personnel are required to use a minimum of positive pressure, self-contained breathing apparatus until the atmosphere has been quantified.

CCFD has established policies and procedures that reference the usage of air monitors during the emergency response. CCFD has a four-gas monitor that has O_2, LEL, H_2S, and CO sensors assigned. Calibration tests are done at least every month. Furthermore, they maintain documented maintenance procedures and calibration of their air monitors. CCFD does not have a policy for developing a site safety plan. This is another general recommendation.

Human Resources

The number and type of qualified rescuers is an important aspect for special operations type responses. Some states, like Florida, have established industry best practices and outline personnel qualifications as well as the number of rescuers required for these teams. This is commonly called resource typing. The Florida Association of Search and Rescue Resource Typing for light technical rescue teams mandates that six technical rescue technicians should be present for light technical rescue operations as an industry standard. NFPA 1710: *Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, requires that employers ensure that firefighters establish teams when working and that a suitably equipped rescue team is readily available, when firefighters are required to engage in emergency responses that require specific and advanced training and specialized equipment. CCFD staffs 11 personnel throughout the county each day to handle technical rescue calls for service. Not all members are trained in every technical rescue discipline, but they are all trained in ice rescue. As with hazardous materials responses the geographical constraints of a large service area and limited numbers of specialized resources can delay services. Members at Fire Station 1 and Fire Station 9 are trained in most technical rescue disciplines.

CCFD has a written medical surveillance plan for all employees. This policy requires an opinion from a physician, and it provides for periodic examinations as determined by the physician. Because CCFD members are expected to perform rescues in confined spaces, the medical surveillance plan provides for a medical assessment after exposures above the permissible exposure limit (PEL). All employees receive proper fitting for respiratory protective equipment for use during confined space entry.

Training

The CCFD certifies that its members have achieved Technician level training in accordance with NFPA 1006: *Standard for Technical Rescuer Professional Qualifications*. CCFD keeps records for documenting initial and refresher training. The organization requires the completion of a task book for all members and certifies all members who are required to use respiratory protection. All members have been trained to a minimum level of an EMT. The CCFD has a plan for annual refresher training or measurement of continued competency of all team members. Annual requirements for confined space entries are maintained. This is a general recommendation and required by OSHA 1910.146(k)(2)(iv) to ensure that affected employees practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit spaces or from representative permit spaces.

It is noted that the CCFD has identified difficulty in obtaining continued training for team members. New team members must attend a long and extensive training regimen that requires significant commitment from the department to cover. As with many technical rescue teams the amount and variety of skills required to be maintained amongst the various disciplines often make it difficult to cover all of them frequently enough. This can be combated with frequent on going and recertification training.

Monthly training sessions are currently conducted; however, full team trainings would be beneficial and ensure greater proficiency and team cohesion. The members train weekly during their required department training regimen. The team is now provided three days a year for full team trainings. The team also conducts shift USAR training on Tuesdays based at the company level.

CCFD team leaders recognize a need for additional training in dealing with large type automotive incidents. Buses, semi-tractor trailers, trains, and aircraft can pose unique hazards and complications for rescuers. These incidents require specific training to ensure rescuers are prepared. Based on the transportation corridor through Campbell County, training in large vehicle operations should be encouraged.

Equipment

The disciplines involved with technical rescue require an extensive amount of necessary equipment to meet the demands of the incident. CCFD uses a well-structured mix of deployment methods to deliver the necessary resources to the scene. The ability to assemble the equipment and resources is further complicated by the expensive nature of this equipment. ESCI used an objective evaluation of CCFD equipment utilized to mitigate these emergencies.

For example, the extrication equipment employed by CCFD will eventually need to be replaced. The automotive industry has made significant breakthroughs in technology and materials that older extrication equipment with cutting forces of around 60,000 psi struggle to be effective on. Upgrading extrication equipment to handle the newer high strength structural steel with a required cutting strength of 300,000 psi that manufacturers are using in today’s automobiles will ensure that rescuers have the best chance of succeeding. CCFD has worked to make this transition but because this equipment is expensive and wears out over time, a replacement schedule much like those used for apparatus should be developed as well as the funding mechanisms to support it.

Another expensive area of replacement is lifting and moving airbags. This is a valuable piece of equipment and greatly enhances the abilities of the extrication team to handle a greater variety of rescue situations. These air bags are good for a specific life span. This characteristic presents the ability to schedule replacement timelines and prepare appropriate budget considerations. This is very similar to the rope rescue replacement plan already in use by CCFD. The main difference being the cost per item considered for replacement.

Water rescue and ice rescue services are provided using one Inflatable Rescue Boat (IRB). The equipment used for ice rescue is also expensive and requires a replacement schedule for suits as they age.

CCFD has a strong complement of technical rescue equipment. These current capabilities can be augmented with some increased training and a dedicated capital expenditure plan for replacement items. Team leaders have identified several of these shortfalls and have already begun the process of addressing them.

REVIEW OF COMMUNITY EXPECTATIONS AND PERFORMANCE GOALS

COMMUNITY SERVICE LEVEL CONSIDERATIONS

The goal of any emergency service delivery system is to provide sufficient resources (personnel, apparatus, and equipment) to the scene of an emergency in time to take effective action to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency to which the fire department responds. Obtaining and understanding the desires and expectations of stakeholders is an important first step.

Stakeholder Input

For this report, ESCI relied on analysis of the information provided in interviews. The Campbell County Commissioners, Gillette City Council, Mayor of Wright, the JPFB and the CCFD are committed to incorporating the needs and expectations of residents and policy makers in the service delivery planning process. During the week of March 20, 2023, ESCI team members came on-site to validate the information provided by the CCFD staff. Additionally, a series of stakeholder interviews were conducted to determine internal, external, and policy-maker expectations of the fire department. Internal stakeholder groups included a broad cross-section of the Department, including staff from administration, fire prevention, maintenance, part-time and full-time firefighters, and their officers. County Commissioners, City Council, the JPFB and mayor of Wright were interviewed, and an external citizen's stakeholder meeting was conducted.

For the citizens' group, ESCI held a public input meeting on the evening of March 21, 2023. Invitation to the public input meeting was provided through various means—including the CCFD's website as well as through social media. The input received will help guide the department's vision, planning efforts, policy decisions, and service delivery.

Stakeholder Interviews

ESCI interviewed a cross-section of stakeholders to gain a better understanding of issues, concerns, and opinions about CCFD's service delivery system. Questions sought to learn more about:

- Perceived strengths of the current service delivery system
- Identified weaknesses in the current system
- Opportunities for enhancement and improvement of the existing model
- Challenges that may need to be overcome in order to move forward in the future

Public Input Forums

After a presentation about the fire department by the Fire Chief and Deputy Fire Chief, ESCI facilitators led the external group through a structured online external stakeholder survey. A total of 7 people attended the meeting and submitted a completed survey.

Citizen Survey

ESCI reviewed the findings of the community input survey. The public request survey consisted of four sections: demographics, mission, vision, guiding principles, community planning priorities, community service priorities, contact with CCFD, and knowledge of the CCFD staffing/response/costs. A total of 191 survey responses were received.

Summary of Discussions and Survey Results

Interview Results

Those interviewed believe the primary purpose, and their expectation, is for the CCFD to provide a timely and well-prepared response to calls for emergency services. The overwhelming majority said CCFD is meeting community expectations while providing a very high level of customer service. Key interests focused on strengths, weaknesses, opportunities for improvement, and challenges to continued success.

Strengths

- The department is adding staff in the new budget
- The new budget includes pay increases
- The department equipment, apparatus, air packs, tools
- The department is getting a new aerial truck
- The department provides great training opportunities
- The variety of calls makes the work exciting
- Department administration is looking towards the future
- It seems the commissioners and the city council are supportive of the department
- There are opportunities for employee growth
- It seems like administration is able to work with the funding entities
- The crews like the wildland details
- Young staff
- Two sets of bunker gear per member
- The state pension plan
- The schedule is good
- The scale of the department
- Facilities are getting better
- Leadership is strong at the top
- There is a path identified for the department
- The in-house training program is good

Weaknesses

- Understaffed
- Lack of empowerment
- Rapid growth
- Experience levels of staff
- The slow death of part time staff
- No chain of command for part time staff
- Part time staff has an unclear purpose
- Lack of dedicated assignments on shift
- Large geographical area and small number of staff
- Great equipment and no staff for it
- Loss of institutional knowledge
- The website is old.
- Recruitment and retention
- Unclear who to contact in the department when addressing issues or needs "who is responsible for things?"
- Don't offer ALS services
- Call backs
- Need dedicated dispatch for fire
- Communication without punishment
- Can't go to the ball games or be out in public (Only allowed to leave station for 15 minutes)
- Succession planning
- Communication should cross all areas
- IT issues across the department

Opportunities for Improvement

- Cadet academy
- Bring back the training cadre
- Succession planning
- Tuition reimbursement
- Better marketing and social media
- More community outreach, public engagement
- Wildland deployments and a framework for that process
- Help local areas as a big brother department for surrounding area
- More special operations training

- Changing the schedule to 48/96
- Improve compensation
- Conduct a climate assessment
- Communicate the "why" for changes
- Get buy in for changes
- More ability to be out in public
- Ability to drink coffee in front of the station when weather is nice.
- Communicate the "commander's intent" better
- Committees for decision making opportunities
- Revamp the training books to be more relevant
- Leadership training for staff
- A single portal location for information
- Lowest level decision making opportunities
- Chain of command closed loop communication feedback
- More training for support staff
- Determine the role of part time staff and communicate it
- Develop different option for the type of part time staff needed so more can participate
- Hold officer meetings Potential to charge for services

Challenges for the Future

- Internal threats
- Fearful of things
- Lack of experience
- The funding model
- Lack of mentoring
- Level of commitment from all levels
- No physical fitness standard
- Young bloods
- Learning the job before moving up to the next level
- Lack of succession planning
- Closed door meeting make staff fearful
- Need to look outside for best practices
- Turnover rates
- Political climate changes

- Lack of public information
- Atmosphere is tough on some of the shifts with negative vibes
- The language on the task books is threatening
- Treatment of new employees
- Favoritism
- Ensure all employees feel wanted

Community Leader Stakeholder Results

- The need to determine appropriate funding models for fire and emergency services to ensure sustainability.
- Commitment to the planning processes being employed by CCFD.
- Determine the need and feasibility of a dedicated dispatch for the CCFD.
- The impact of economic development on service delivery needs, especially for the industrial areas and subsequent residential development on the west side of the city.
- The ability to maintain adequate staffing levels is of major concern.
- The need to determine the appropriate level of service and department footprint for resource location.
- The ability to maintain ISO requirements while determining the appropriate resource needs.
- The need to consider providing ALS services during first response.
- Additional collaboration to further improve current response times and reliability.
- The negative impact of mobility and road construction on response time.
- Increased public engagement activities.
- Determine the role of the part-time employees and communicate it widely.
- Those interviewed believe the services currently provided by CCFD are at historically high levels, with new increased department standards and expectations.
- There is a predominant expectation within the department and the community that this trend of high standards will continue, with some caution about how to sustain the high levels of service delivery with existing resources, when given the anticipated rate of economic and residential development.

Survey Results

Safety is a priority for community residents and businesses. Overall, there is a very high level of satisfaction with the level of services provided by CCFD.

Survey Demographics

The majority of survey respondents have lived in the jurisdiction for greater than 10 years and were between age 25 to 44. Respondents who own their home in the jurisdiction totaled 87%.

Community Planning Priorities

The third section, referred to as "community planning priorities," gave the participants planning considerations to weigh. This was a forced choice selection process, whereby the respondents compared a single element to each of the others, selecting the one that they believe is the highest priority element (e.g., technical competence versus containing costs, technical competence versus maintaining response times, etc.). This causes a ranking of the planning priorities for each participant. The community ranked ensuring technical competence of all personnel as the highest planning consideration at roughly 32 percent. Maintaining response times and ensuring adequate staffing we close seconds.

Community Service Priorities

The next portion of the survey focused on service priorities. A list of service priorities was provided, and the respondents ranked each service priority. Most respondents, 78%, ranked fire suppression the most important fire department function. Emergency medical care was second at 55% and wildland firefighting was ranked third most important function. When asked to identify the one single improvement some of the respondents responded with:

- More engagement with the public, outside of emergency calls. This was stated multiple times.
- More mentoring and or the cadet program needs to be looked at.
- More visual appearance during the day, IE inspections school activities.
- Getting the word out on Community Risk Reduction.
- Staffing and response times.
- Let more people volunteer with less commitment.
- Show the public what the fire department does daily through social media.
- Probably code enforcement and new build regulations.
- Adequate staffing throughout the service area.
- Providing ALS so when the hospital has no ambulances, firefighters can provide lifesaving interventions.

Contact with CCFD

The community was asked to gauge their interaction with CCFD if they had any. The majority had positive interactions with CCFD. Respondent who had excellent interaction ranked 48% and good interactions totaled an additional 33%. This yields an overwhelming positive interaction with the community by CCFD.

Knowledge of CCFD

Lastly the participants were asked to identify how prepared they felt the CCFD was to address specific types of emergencies. For most emergencies, the respondents felt the department was adequately prepared and the response is appropriate. The respondents did indicate, by almost 25%, that the CCFD does not have enough resources to address wildland fires and or major disasters.

When asked about the acceptable time for a fire department response 64% indicated response time should be between 4 and 8 minutes with 16% indicating that response times should be less than 4 minutes. Location of the incident affects response times according to respondent responses. Half of the respondents felt that the staffing was inadequate. When asked if the CCFD should offer Advanced Life Support Services (ALS) the majority responded "yes".

Opportunities for Improvement and Final Comments

The respondents were given an opportunity to close out the survey with suggestions for improvements and final comments. Some of the respondent's responses are listed below.

- Campbell County needs to develop a fire district and allow the CCFD to manage and seek the funds they need.
- If anything, getting the word out and letting the community know all that CCFD does and the services they provide.
- There are lots of unstaffed stations with expensive trucks and equipment in them that don't get utilized much.
- Recruiting & maintaining the membership.
- Provide some classes on disaster preparedness. Preparing for evacuation from home, preparing for shelter in place.

These results should not be considered statistically valid; instead, they should be viewed as a potential indicator of the general leanings of the public represented during the requests for input.

REVIEW OF HISTORICAL SYSTEM PERFORMANCE

SERVICE DELIVERY & PERFORMANCE

CCFD, like many departments across the nation, provides a plethora of services to the community. However, for most of the public and elected officials, the service that is of most importance is the ability of the department to respond to calls for service in a timely manner. CCFD leadership is aware of this key concept, along with the need to understand the various components that comprise service delivery. Within this section, ESCI will analyze the following components of service delivery.

- Service demand
- Resource distribution
- Resource concentration
- Resource reliability
- Response performance.

Service Demand Analysis

Ultimately, the requests for services from the public are the key factor associated with service delivery. The quantity and type of requests for services drive the need for resources, training, etc. This section will provide CCFD leadership with detailed analysis of the quantity and nature of historical service demand.

Incident Type Analysis

For many years, fire departments focused on one simple function—response to fires. Over time, departments have vastly expanded services and now respond to many different types of incidents. To assist fire departments with a systematic approach to quantifying incident types, the National Fire Incident Reporting System (NFIRS) was developed. Through a standardized approach, fire departments can analyze their own response data compared to other fire departments throughout the nation.

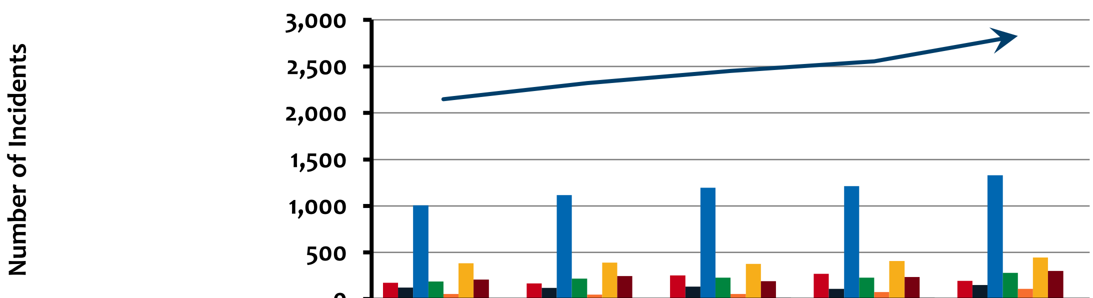
Within the NFIRS system, each incident type is assigned a three-digit code (there are currently 178 different codes). These codes are then organized into broader categories—referred to as series—based on the first digit of each code, as illustrated in the following figure.

Figure 53: NFIRS Incident Types

Incident Series	Incident Heading
100-Series	Fires
200-Series	Overpressure Rupture, Explosion, Overheat (No Fire)
300-Series	Rescue and Emergency Medical Service (EMS) Incidents
400-Series	Hazardous Condition (No Fire)
500-Series	Service Call
600-Series	Cancelled, Good Intent
700-Series	False Alarm, False Call
800-Series	Severe Weather, Natural Disaster
900-Series	Special Incident Type

As illustrated in the following figure, CCFD has experienced a 31.7% increase in overall requests for service. This overall change includes an 8% increase from 2018 to 2019, a 5.7% increase from 2019 to 2020, a 10.6% increase from 2020 to 2021, and a 7.1% increase from 2021 to 2022.

Figure 54: Service Demand by NFIRS Incident Type, 2018–2022

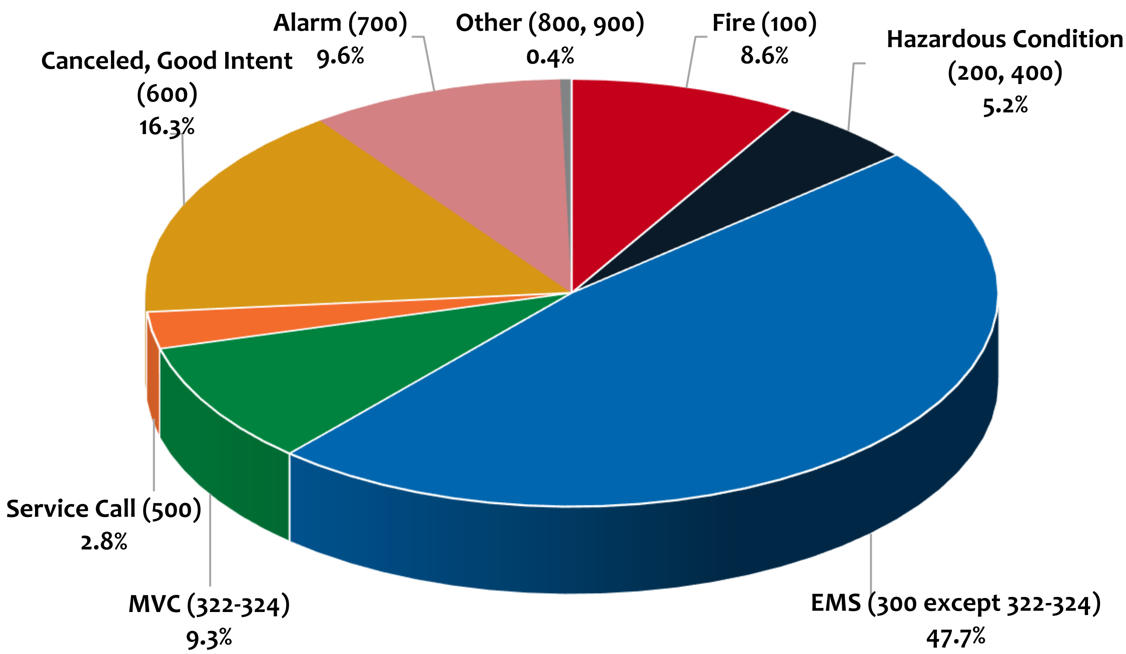


	2018	2019	2020	2021	2022
Fire (100)	174	168	254	271	196
Hazardous Condition (200, 400)	123	121	134	111	149
EMS (300 except 322-324)	1,007	1,117	1,195	1,213	1,331
MVC (322-324)	188	218	228	228	282
Service Call (500)	53	49	56	74	110
Canceled, Good Intent (600)	384	392	378	410	447
Alarm (700)	208	248	193	235	302
Other (800, 900)	10	6	14	13	10
Total	2,147	2,319	2,452	2,555	2,827

The preceding figure provides an excellent illustration of the yearly calls for service, and the change over time. There is also value for leadership to understand a different view of the same data—one that illustrates how each category compares to the whole, expressed as a percentage. A thorough understanding of the nature of service demand assists CCFD leadership in ensuring training, apparatus, equipment, etc. that would best meet the needs of that demand for service.

As illustrated in the following figure, emergency medical services incidents comprise most of service demand, at 47.7%. This is followed, in descending order, by canceled/good intent incidents, alarm incidents, motor vehicle collision incidents, fire incidents, hazardous condition incidents, service call incidents, and other incidents.

Figure 55: Service Demand by NFIRS Incident Type, 2018–2022



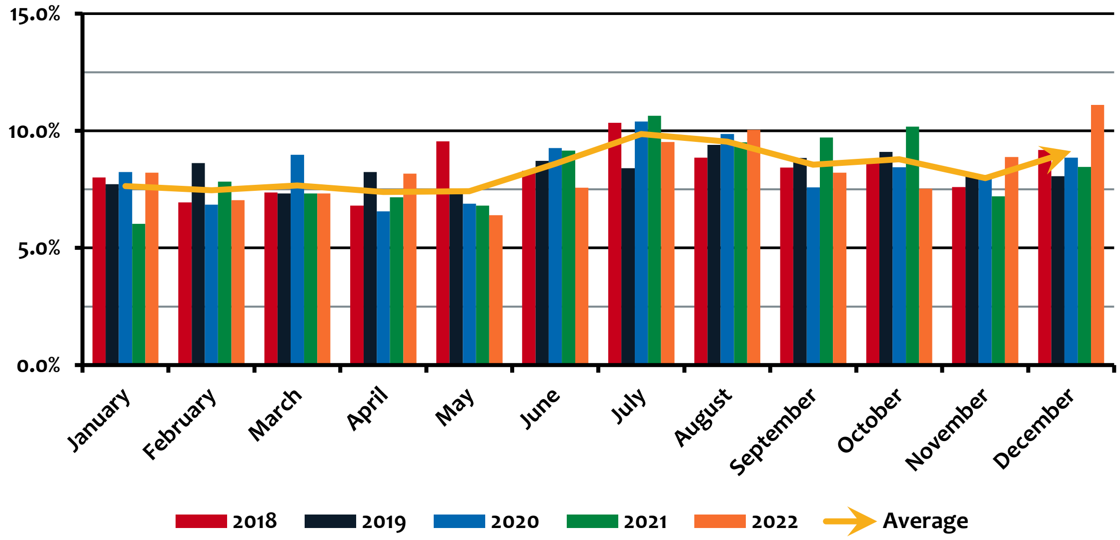
Temporal Variation

CCFD leadership can better understand the staffing needs of the department through an understanding of the temporal nature of service demand—in other words, when incidents occur. This same knowledge provides valuable insight for scheduling of non-incident activities such as the following:

- Pre-incident planning
- Training
- Station maintenance
- Apparatus maintenance
- Fire hose testing
- Fire hydrant testing
- Public education

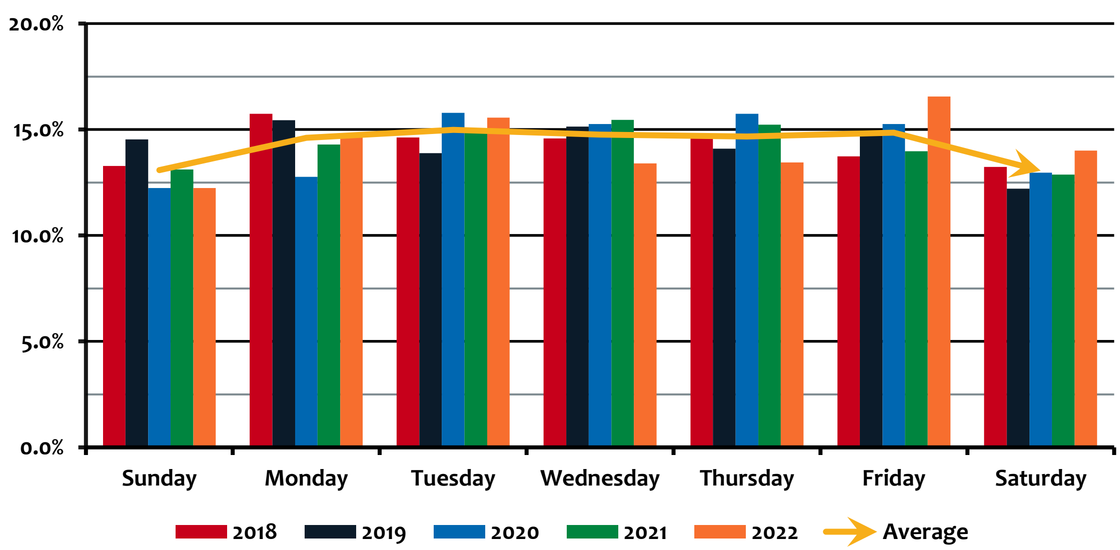
From the perspective of incident occurrence during the year, the first analysis considers temporal analysis by month of the year. As illustrated in the following figure, the lowest demand for service within the CCFD service area occurs in April and May. Demand for service reaches its highest level in July.

Figure 56: Service Demand by Month, 2018–2022



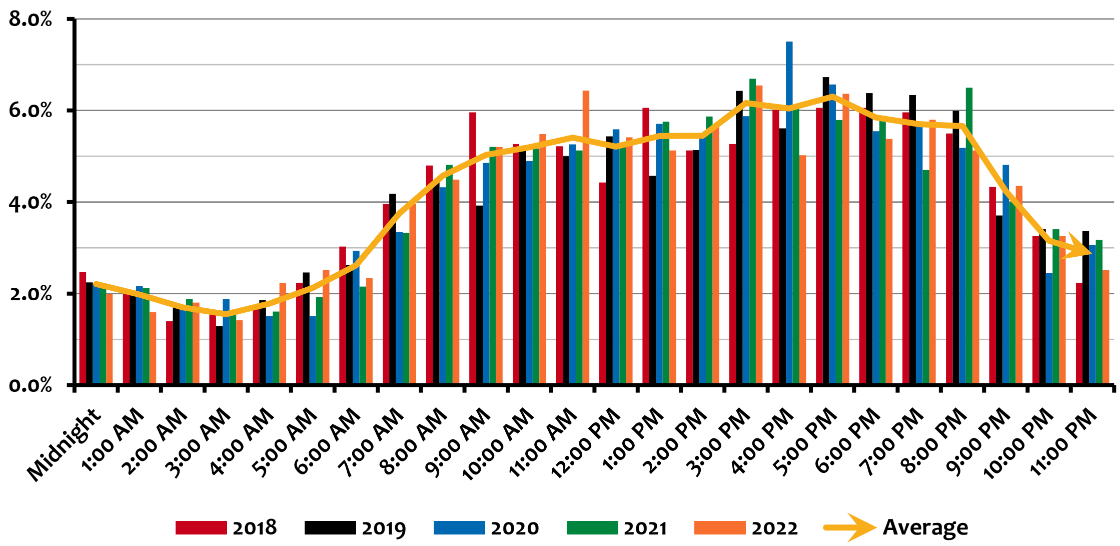
From the perspective of incident occurrence during the week, the second analysis considers temporal analysis by days of the week. As illustrated in the following figure, the lowest demand for service within the CCFD service area occurs on Saturday and Sunday. Demand for service reaches its highest level on Tuesday. However, service demand remains fairly level throughout all the weekdays.

Figure 57: Service Demand by Day, 2018–2022



From the perspective of incident occurrence during the day, the final analysis considers temporal analysis by hour-of-the-day. As illustrated in the following figure, the lowest demand for service within the CCFD service area occurs at 3 AM, consistent with when the population is asleep. Over the next few hours, there is a moderate increase in service demand as the population arises and prepares for their daily activities. As the population leaves their residences to begin their daily activities, service demand increases at a faster rate until reaching an initial peak at 11 AM. Through most of the early afternoon, service demand remains level before increasing again, reaching the highest level of service demand at 5 PM. As the day winds down, service demand decreases gradually, and then more rapidly as the population moves into their evening activities and ultimately returns to their homes. This same overall pattern is found within most communities.

Figure 58: Service Demand by Time-of-Day, 2018–2022



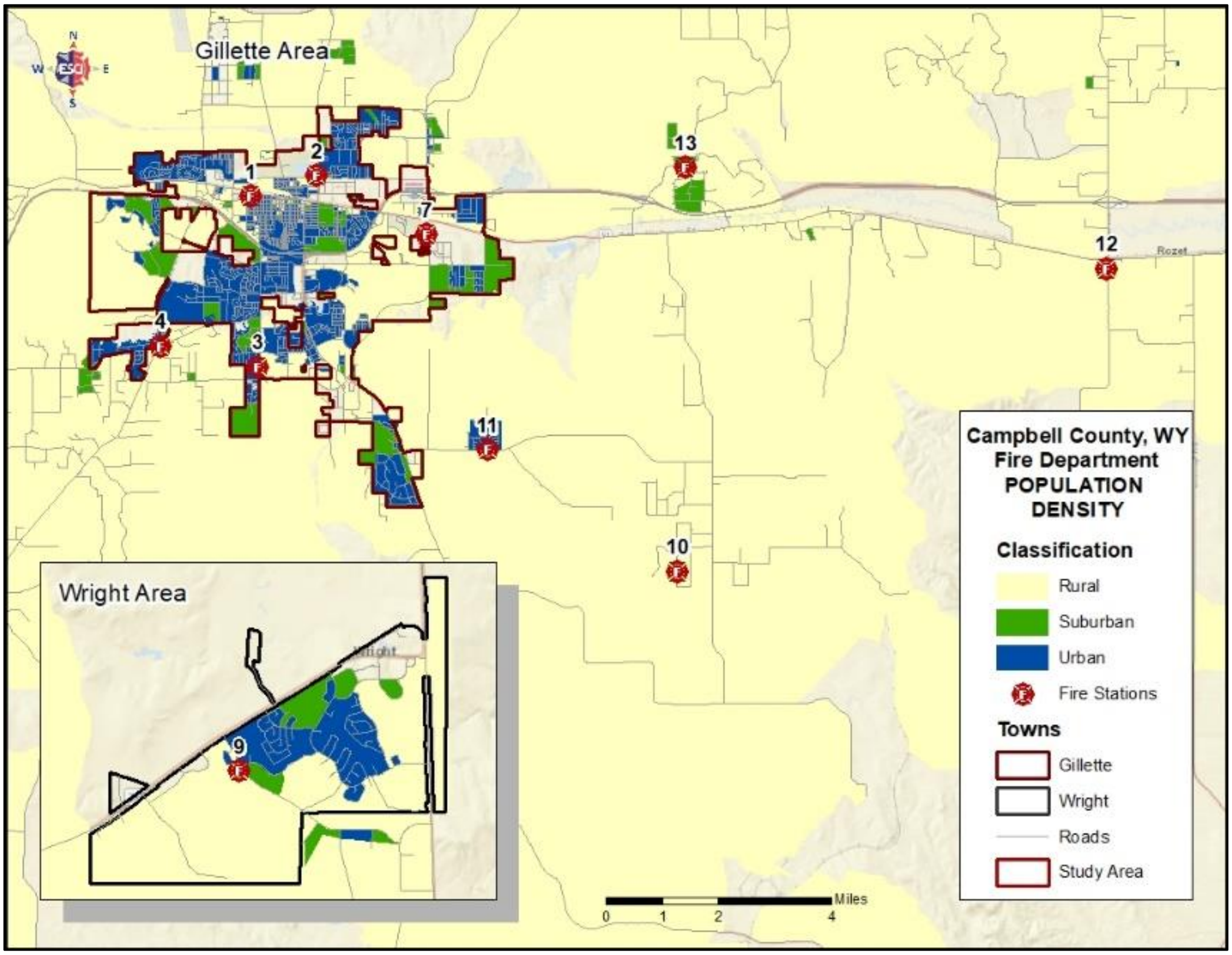
While the preceding figure illustrates that demand for service is at its lowest during the late night and early hours, leadership should ensure adequate staffing is still in place to quickly respond to and mitigate structure fire incidents. Based on a national study recently published, from 2014 to 2016, the occurrence of residential structure fires with fatalities were highest between 1 AM and 2 AM, and 4 AM to 5 AM. The 8-hour peak period (11 PM to 7 AM) accounted for 48% of residential fatal fires[28].

[28] *Fatal Fires in Residential Buildings (2014-2016), Topical Fire Report Series Volume 19, Issue 1 /June 18, U.S. Department of Homeland Security, U.S. Fire Administration, National Fire Data Center.*

Population Density & Geographic Service Demand

The final analysis of service demand considers incident location. The first component of this analysis is to understand population density within the community. For purposes of analyzing population density, ESCI uses the density as recorded by the U.S. Census Bureau for 2020 within each census block—the smallest unit of division within the census data. The population density for Campbell County is illustrated in the following figure.

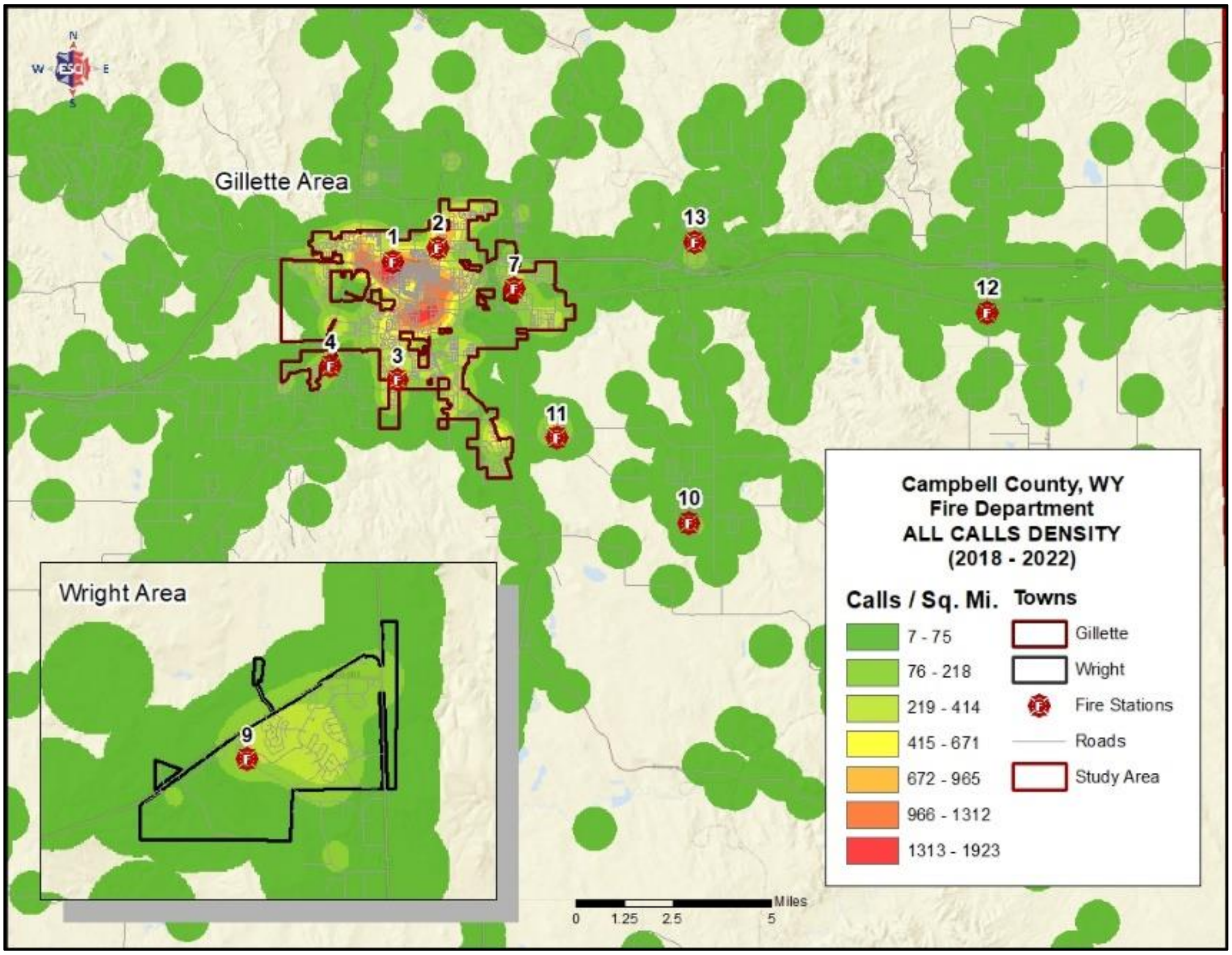
Figure 59: CCFD Population Density



Population density is important information as, most often, incident density is closely related to population density. Where there are greater numbers of people, there tends to be a greater number of incidents. Through the use of geographical information systems (GIS) software, ESCI analyzed the demand for service based upon the geographical location of each incident. This analysis calculates the mathematical density of incidents (incidents per square mile) and then illustrates this using a graphic known as heat mapping.

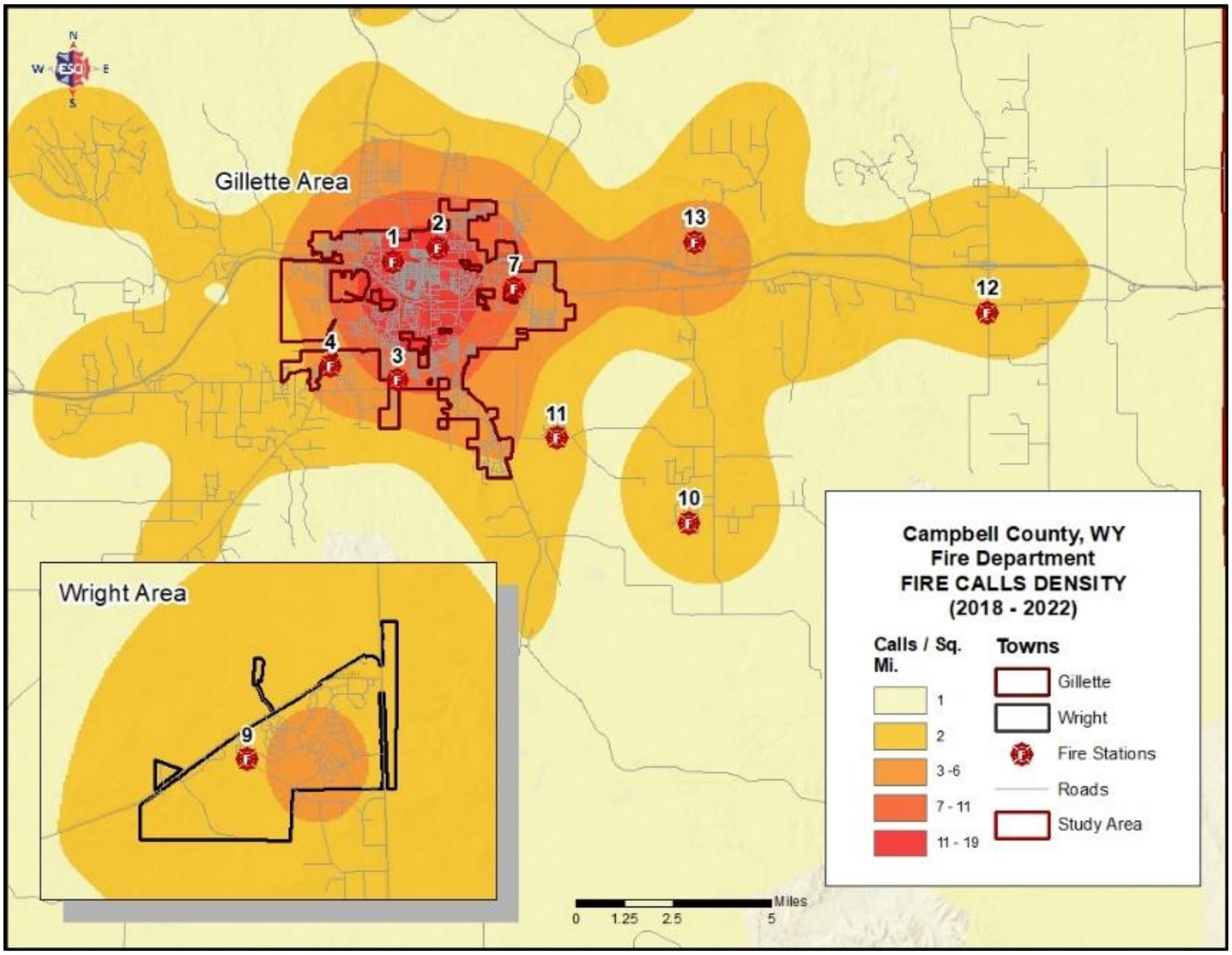
As illustrated in the following figure, there are incidents occurring throughout the jurisdiction, with the greater density occurring within the City of Gillette, also coinciding with the areas of greater population density. It is very common for this relationship of greater incident density near areas of greater population density, since such a large portion of incidents are emergency medical service incidents—directly related to the people, versus the geography.

Figure 60: CCFD Incident Density Analysis (All Incidents), 2018–2022



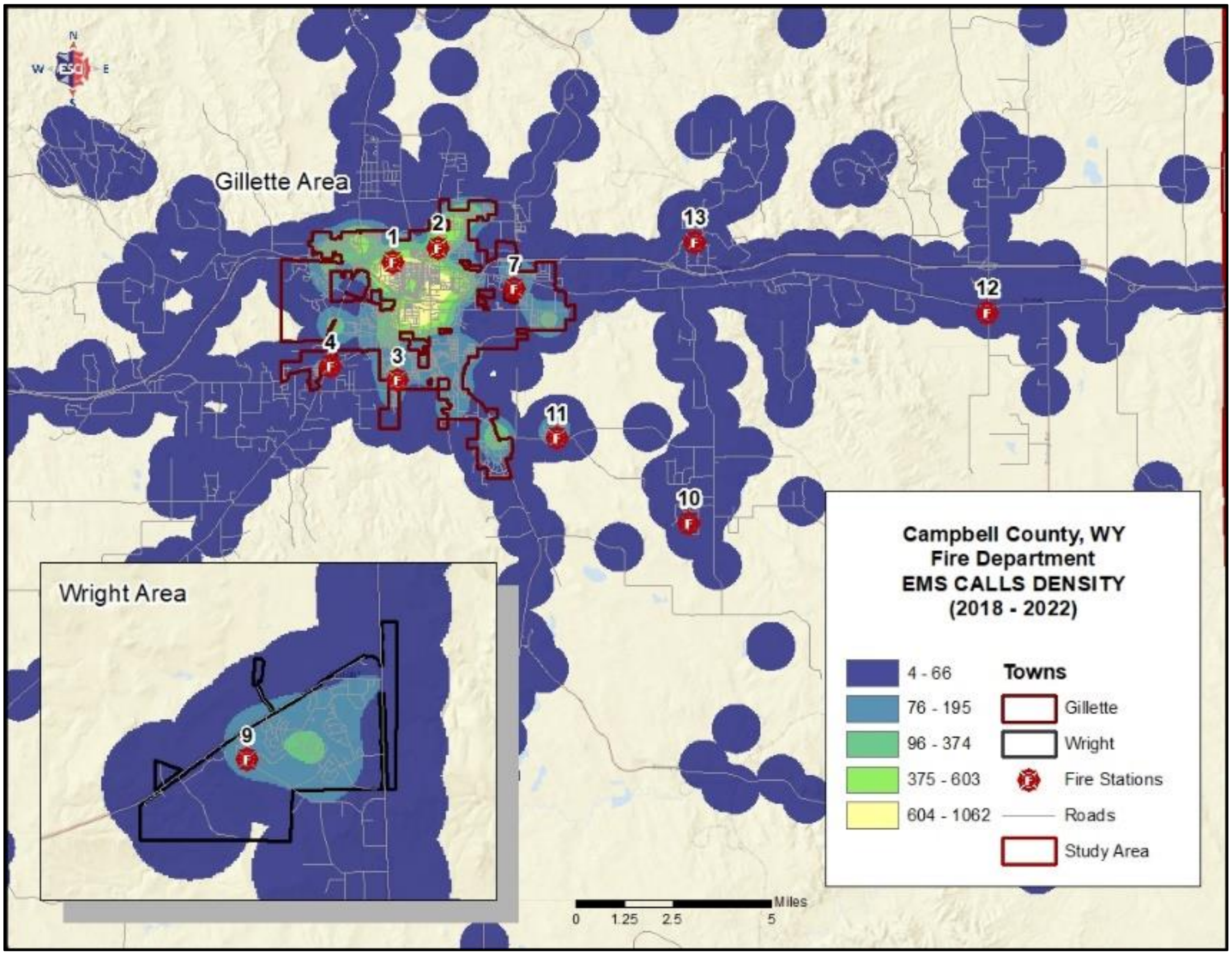
When analyzing the same data with a subset of all incidents to only include fire incidents (NFIRS Series 100), a similar pattern is seen. This is illustrated in the following figure.

Figure 61: CCFD Incident Density Analysis (Fire Incidents), 2018–2022



When analyzed for the subset of emergency medical incidents (NFIRS Series 300), the heat map pattern for emergency medical service incidents remains similar, as illustrated in the following figure.

Figure 62: CCFD Incident Density Analysis (EMS Incidents), 2018–2022



Resource Distribution

Within the community, it is important to work to locate resources where they are best suited to respond to the greatest number of incidents. Where this is accomplished, response times may be decreased, and citizens receive service quicker. It is important to note that as a combination department (career and volunteer staff) with less than 85% career members, CCFD falls within the National Fire Protection Association (NFPA) 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*. However, there is also value in comparison to NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. Throughout the following sections, both will be illustrated where appropriate. NFPA is an industry trade association that develops and provides standards and codes for fire departments and emergency medical services for use by local governments.

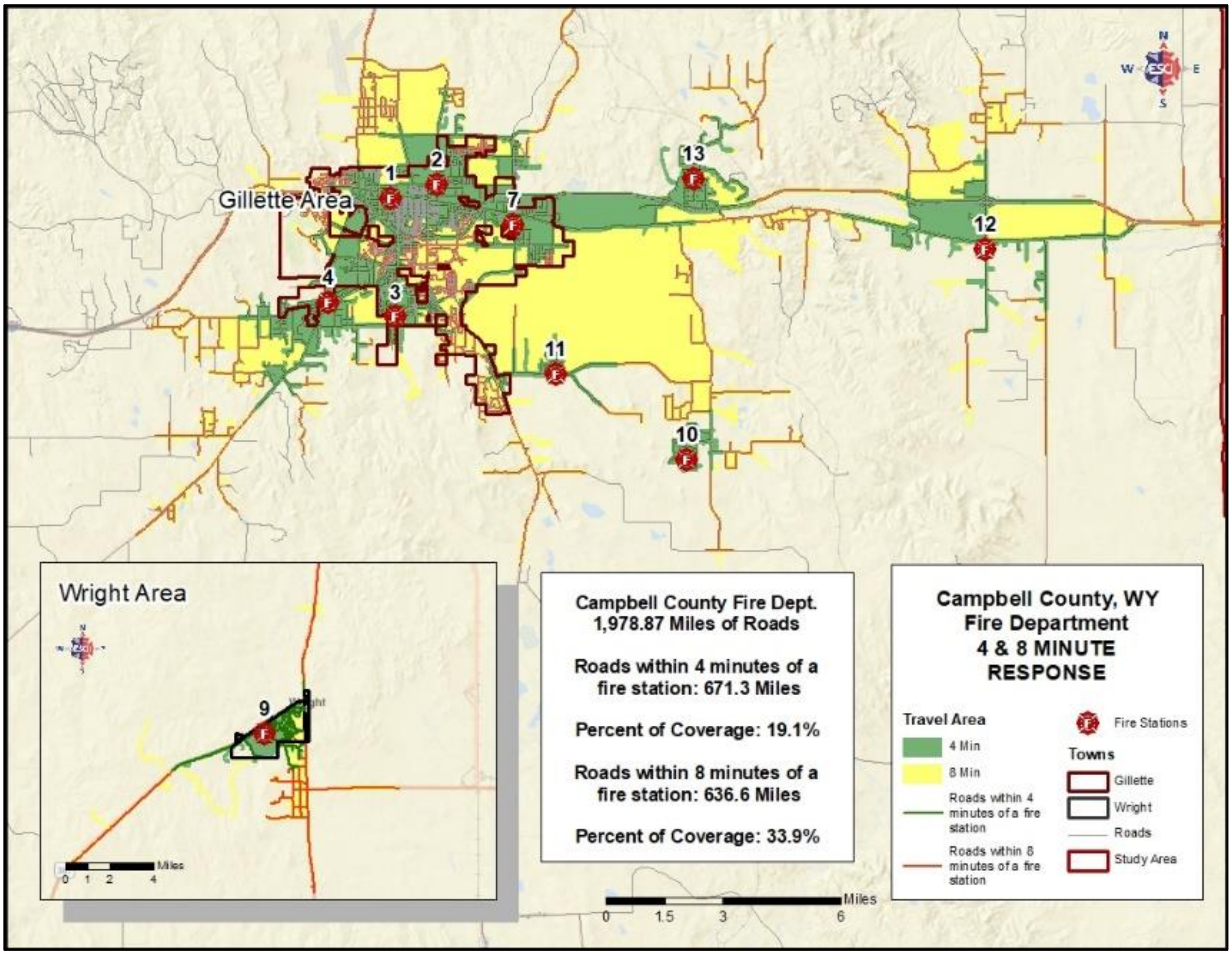
When evaluating distance and time measures as it relates to the various maps, ESCI uses GIS software which evaluates the actual road network provided by CCFD. While the software evaluates a theoretical travel time, the true measures will vary due to impact from factors such as road conditions, traffic, weather, road closures, etc. For this reason, there is variance between actual and the theoretical illustrations provided herein.

NFPA 1710 Criteria

NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, recommends a travel time of 240 seconds, or 4 minutes, as the benchmark for career departments to reach emergency incidents within their jurisdiction with the first arriving unit. Additionally, the balance of the response (called the effective response force or ERF) is required to arrive at the incident within 480 seconds, or 8 minutes.

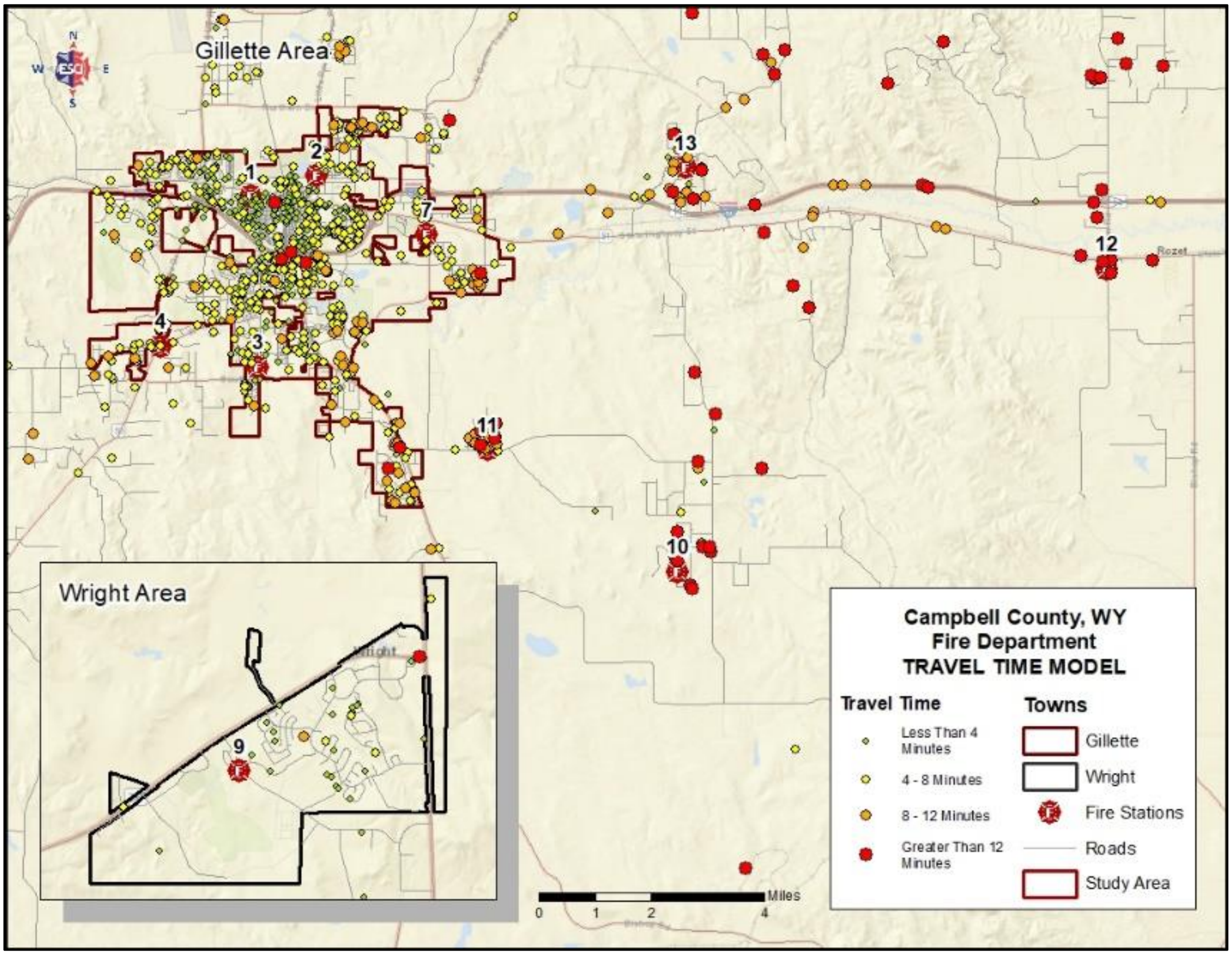
As illustrated in the following figure, 19.1% of the service area falls within the 4-minute travel time of a fire station and 33.9% falls within the 8-minute travel time of a fire station. This illustration accounts for speed limits, one-way streets, and other static factors. While these percentages of cover are low, it is to be expected based on the geographical makeup of the service area.

Figure 63: CCFD Predicted 4 and 8-Minute Travel Times, NFPA 1710



It is helpful to evaluate actual travel time against the theoretical mileage coverage and estimated travel time maps depicted above. As illustrated in the following figure, actual travel time to incidents was less than 4 minutes to 40.52% of incidents, 4–8 minutes to 38.81% of incidents, 8–12 minutes to 10.53% of incidents and greater than 12 minutes to 10.14% of incidents. Due to the geographic configuration of the service area—including large areas of rural density separate from the two main population centers—a lower percentage of travel time less than 4 minutes is to be expected.

Figure 64: CCFD Travel Time, 2022



ISO Distribution

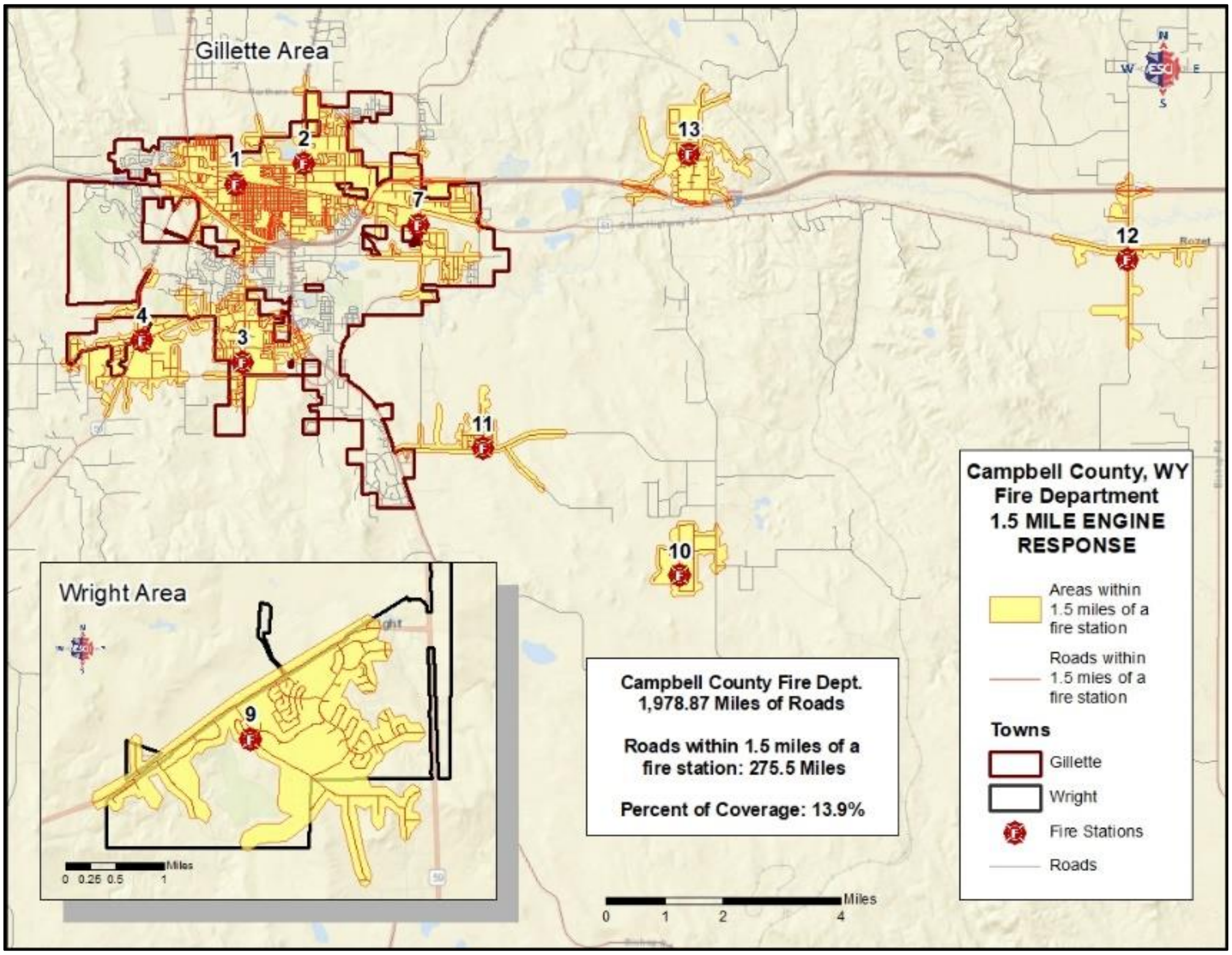
The Insurance Services Office (ISO) is a national insurance industry organization that evaluates fire protection for communities across the country. ISO assesses all areas of fire protection as broken down into four major categories including emergency communications, fire department, water supply, and community risk reduction. Following an on-site evaluation, an ISO rating, or specifically, a Public Protection Classification (PPC®) number is assigned to the community ranging from 1 (best protection) to 10 (no protection). The PPC® score is developed using the Fire Suppression Rating Schedule (FSRS), which outlines sub-categories of each of the major four, detailing the specific requirements for each area of evaluation.

A community's ISO rating is an important factor when considering fire station and apparatus concentration, distribution, and deployment due to its effect on the cost of fire insurance for the residents and businesses. To receive maximum credit for station and apparatus distribution, ISO evaluates the percentage of the community (contiguously built upon area) that is within specific distances of fire stations, central water supply access (fire hydrants), engine/pumper companies and aerial/ladder apparatus.

Engine Company Performance

As part of the ISO evaluation, an analysis determines the overall number of structures protected by a fire department that are located within 1.5 road miles of the closest fire station. This 1.5-road-mile standard is used to estimate a 4-minute travel time for first responding units as required by NFPA 1710. As illustrated in the following figure, 13.9% of the CCFD service area is covered within 1.5 road miles of the closest fire station.

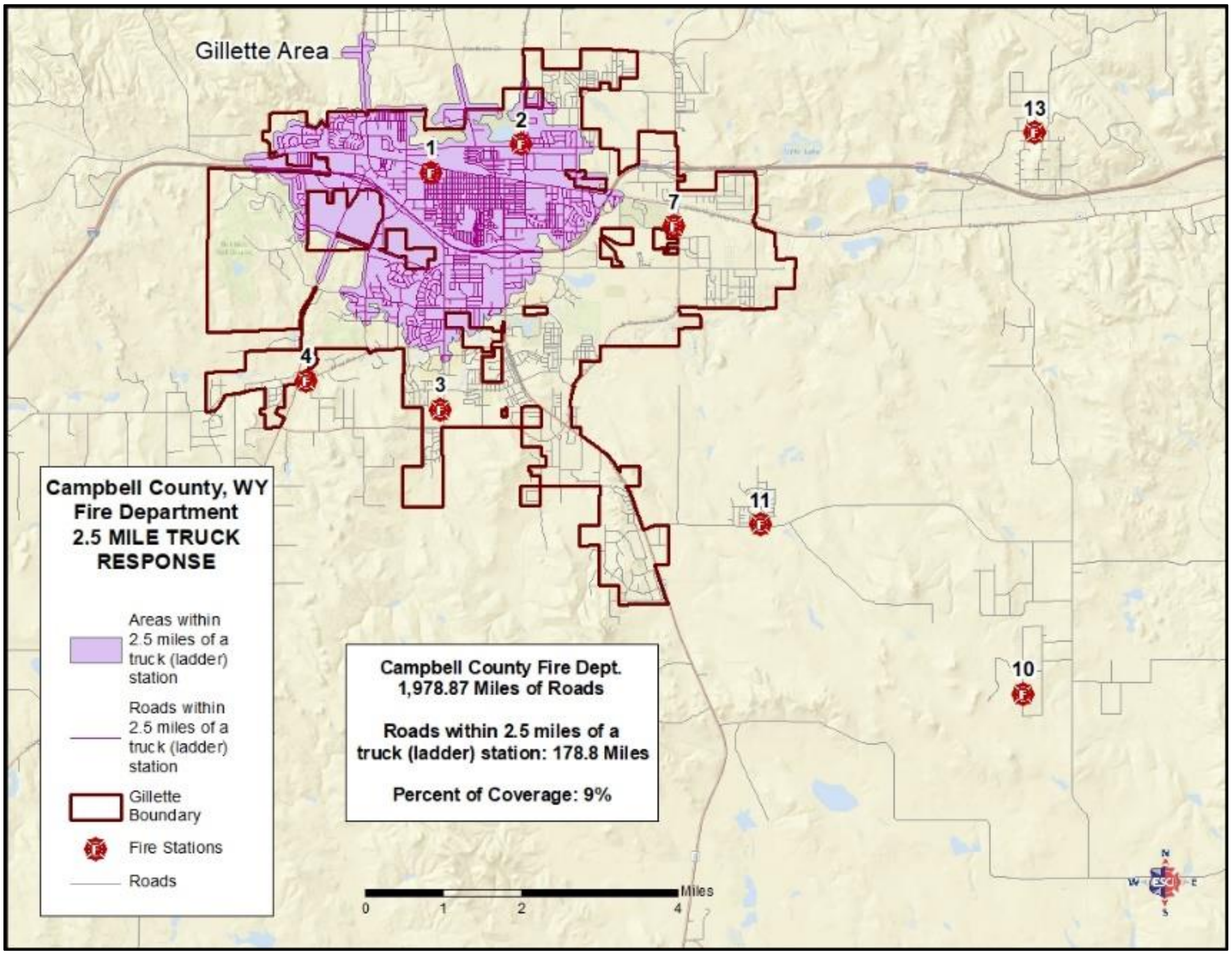
Figure 65: CCFD ISO 1.5-Mile Engine Company Service Areas



Ladder Company Performance

The next part of the ISO evaluation determines the overall number of structures protected by a fire department that are located within a 2.5 road-mile travel distance for ladder companies to estimate an 8-minute travel time in urban and suburban areas by ladder companies to provide the balance of personnel and equipment needed for incidents such as working fires. As illustrated in the following figure, 9% of the CCFD service area is located within 2.5 road miles of a ladder company.

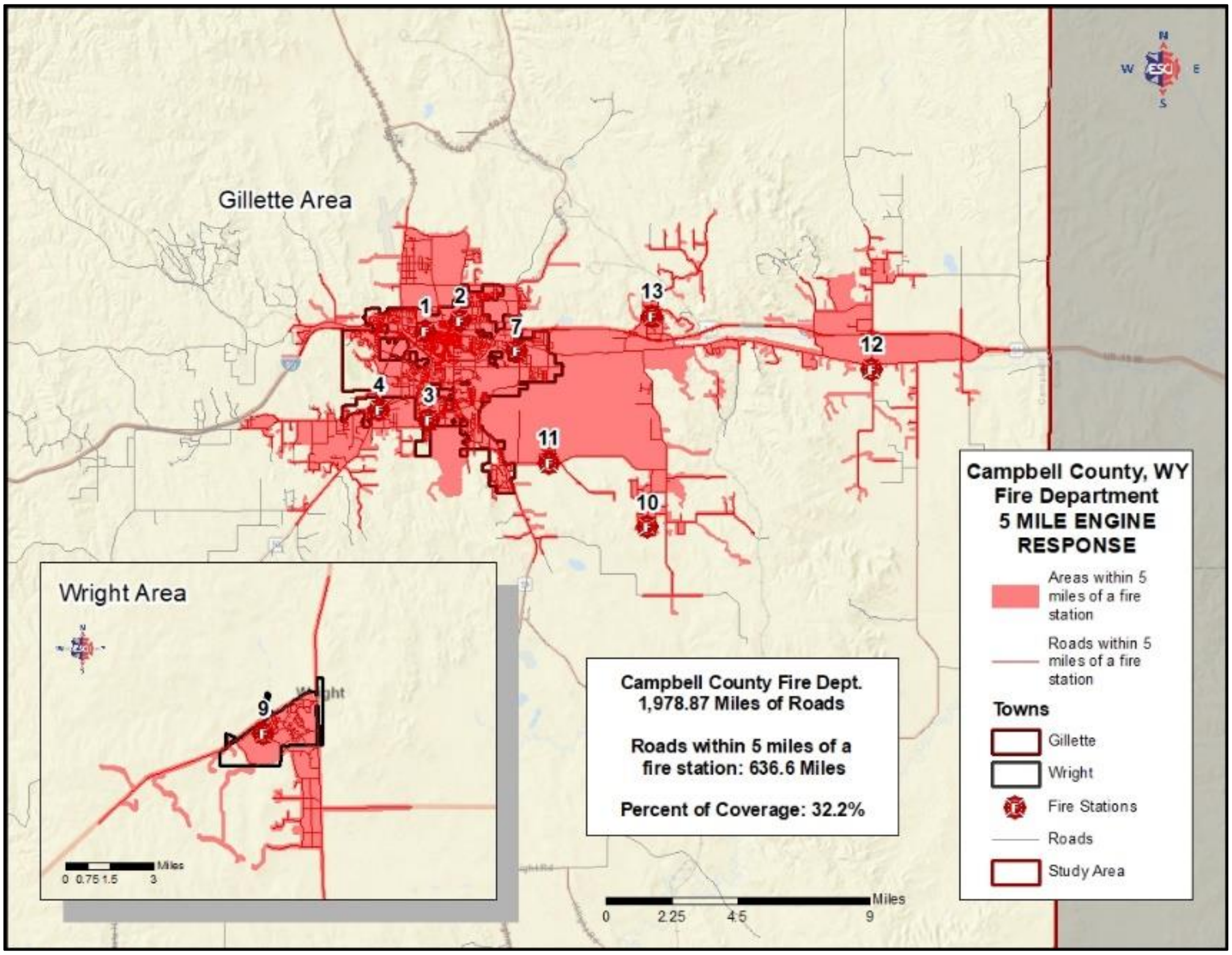
Figure 66: CCFD ISO 2.5-Mile Ladder Company Service Area



ISO Fire Station Coverage

The third part of the ISO evaluation determines the overall number of structures protected by a fire department that are located within a 5 road-mile travel distance of a fire station. Areas outside of 5 miles are subject to receiving a PPC® rating of 10 (no fire department protection available). As illustrated in the following figure, 32.2% of the CCFD service area is located within a 5-road-mile travel distance of a fire station.

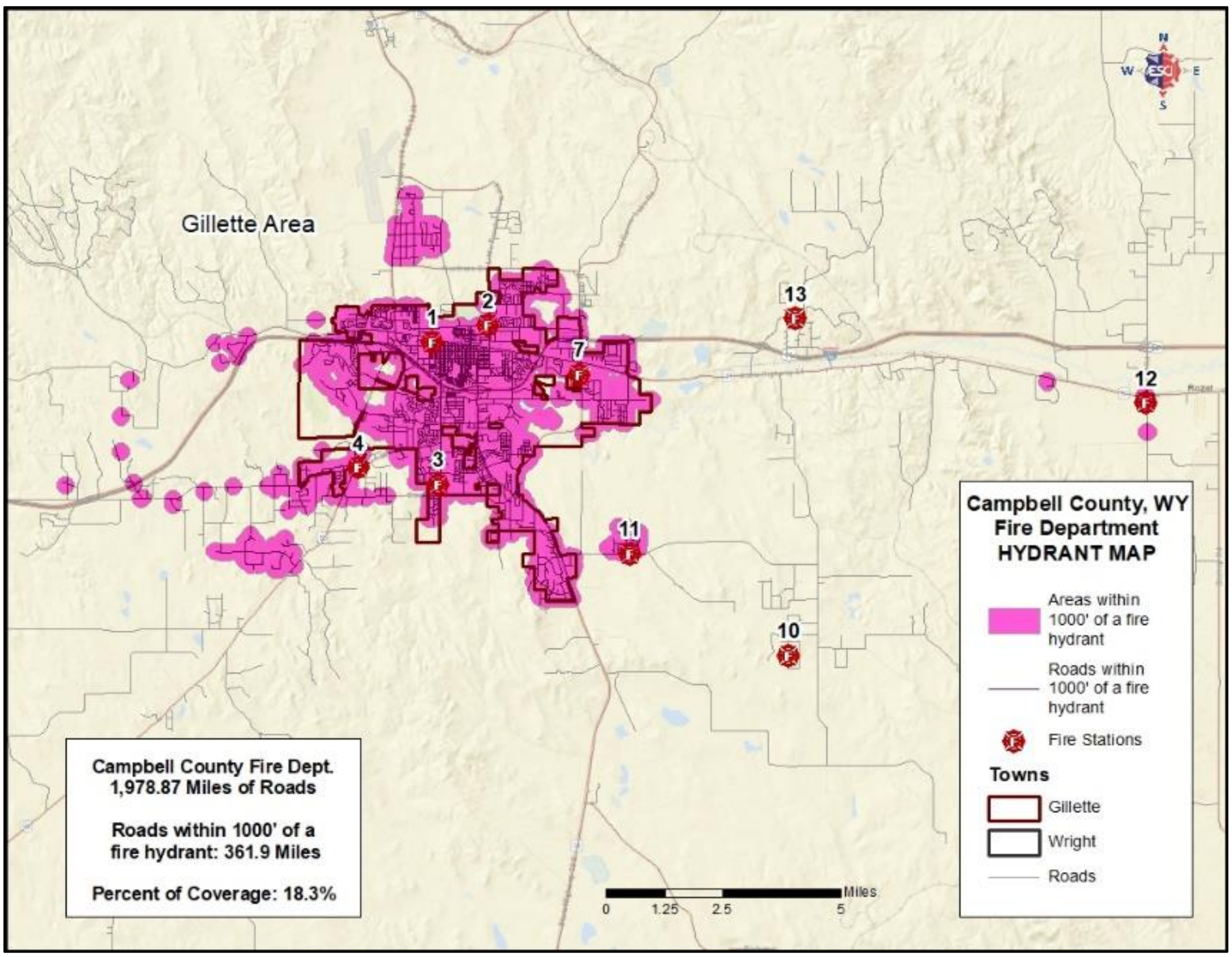
Figure 67: CCFD ISO 5-Mile Service Area



Water Supply and Hydrant Locations

ISO evaluates a community's availability of a sufficient water supply, which is critical for the extinguishment of fires. Included in this evaluation is the geographic location and distribution of fire hydrants. Structures outside a 1,000-foot radius of a fire hydrant are subject to a lower Public Protection Classification® rating than areas with adequate hydrant coverage, thus signifying limited fire protection. Exceptions are made when a fire department can show that either a dry hydrant or a suitable water tanker operation is possible to provide the needed volume of water for fire suppression activities for a specific period. As illustrated in the following figure, 18.3% of the CCFD service area is within 1,000 feet of a hydrant.

Figure 68: CCFD ISO Fire Hydrant Coverage



Resource Concentration

While the ability to have the first unit arrive on-scene in a timely manner is important, another key factor of effective management of the incident is the arrival of sufficient resources (apparatus, equipment, and personnel) within a timely manner is important as well. Ensuring the arrival of sufficient personnel and resources to safely control a fire or mitigate other types of emergencies prior to substantial damage, injury, or loss of life is referred to as effective response force (ERF). The following figure illustrates the ERF recommended through standards such as NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, NFPA 1720 Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments* and the Commission on Fire Accreditation (CFAI) Standards of Cover, 10th Edition.

Figure 69: NFPA 1710 ERF Recommendations Based on Risk

Functions/Tasks	Single-Family Residence (2,000 ft^2)	Open Air Strip Shopping Center (13,000–196,000 ft^2)	3-Story Garden Apartment (Mid-Rise Style Apartment) (1,200 ft^2)
Command	1	2	2
Apparatus Operator	1	2	2
Handlines (2 members each)	4	6	6
Support Members	2	3	3
Victim Search and Rescue team	2	4	4
Ground Ladders/Ventilation	2	4	4
Aerial Ladder Operator (If ladder used)	(1)	(1)	(1)
Initial Rapid Intervention Team	4	4	4
Initial Medical Care Component	N/A	2	2
Total	**16 (17)**	**27 (28)**	**27 (28)**

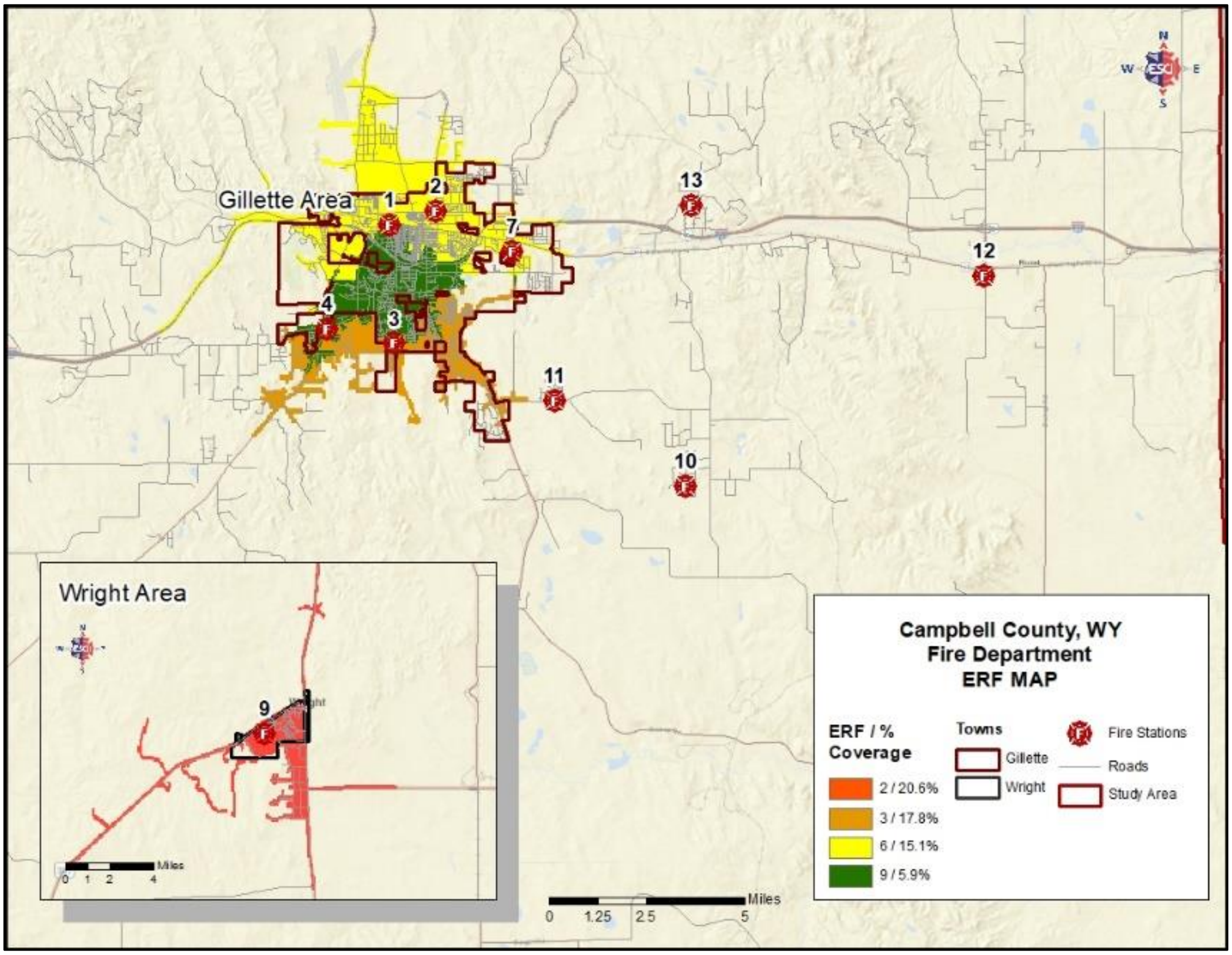
Figure 70: NFPA 1720 ERF Recommendations Based on Demand Zone

Demand Zone	Demographics	Minimum Staff to Respond	Response Time (minutes)	Meets Objective (%)
Urban Area	> 1,000 people/mi²	15	9	90
Suburban Area	500–1,000 people/mi²	10	10	80
Rural Area	< 500 people/mi²	6	14	80
Remote Area	Travel distance ≥ 8 miles	4	Directly dependent of travel distance	90
Special Risks	Determined by AHJ	Determined by AHJ based on risk	Determined by AHJ	90

* A jurisdiction can have more than one demand zone.
* Minimum staffing includes members responding from AHJ's department and automatic aid.
* Response time begins upon completion of the dispatch notification and ends at the time interval shown in the figure.

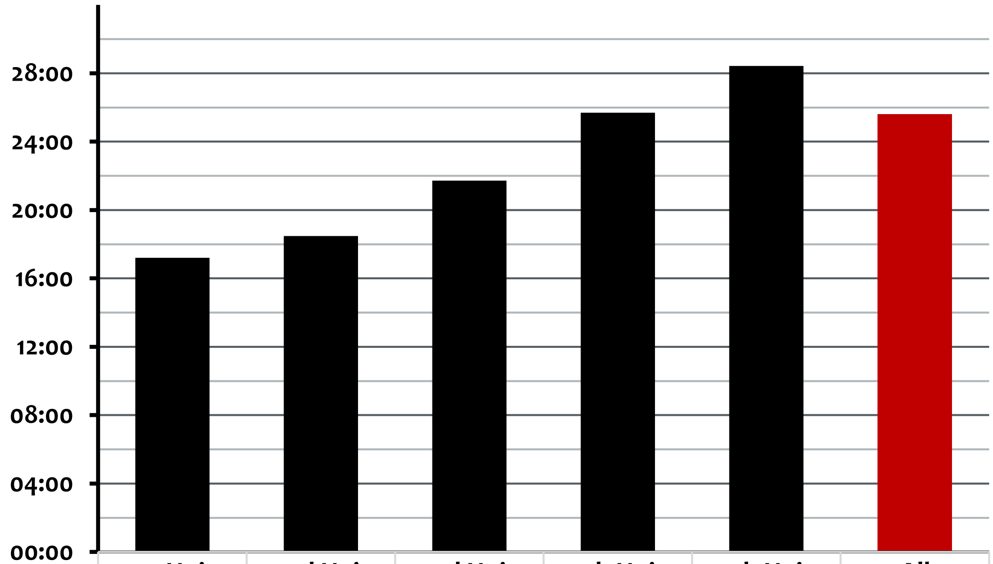
As illustrated in the following figure, within an 8-minute travel time, CCFD can assemble 2 firefighters within 20% of the service area, 3 firefighters within 17.8% of the service area, 6 firefighters within 15.1% of the service area, and 9 firefighters within 5.9% of the service area. The greater concentration of firefighters is within Gillette City due to the number of career personnel located there.

Figure 71: Effective Response Force (ERF), 8-Minute Travel



The preceding figure was created to illustrate the ERF with the assumption that all units and firefighters are located within the station at the time of dispatch. Also, there are additional units responding with volunteer firefighters which are not included in the ERF calculation. Thus, it is of value for CCFD leadership to understand the timing of unit arrival to structure fires. Putting all factors together may assist leadership in understanding what level of resources are available on scene within the various time frames. The following figure illustrates the order of arrival to units responding to structure fires within the service area. These arrival times are evaluated at the 90th percentile.

Figure 72: Structure Fire Order of Arrival, 2018–2022



	1st Unit	2nd Unit	3rd Unit	4th Unit	5th Unit	All
90th Percentile	17:12	18:29	21:43	25:42	28:26	25:35

Resource Reliability Study

Another consideration as to the ability of CCFD to provide timely services to the community is resource reliability. Within this concept, unit availability to respond to incidents may be impacted by either increased concurrency or by increased workload. As either (or both) of these factors increases, the unit within that zone may not be available and additional incidents may be assigned to other units, resulting in an increased response time.

Workload

Workload is the first factor for consideration. The measure of how much work an individual unit incurs could be as simple as a sum of incidents within a given period of time, such as a year. However, incident duration can vary significantly from minutes to hours and thus this method does not provide the best measure of workload. A more accurate method—while still not a perfect measure—is to consider the amount of time to which a unit is assigned and compare that to the amount of time the unit is in service, a measure referred to as unit hour utilization. The imperfection of this measure is that it does not capture other on-duty activities such as training, station maintenance, apparatus maintenance, hydrant testing, hose testing, pre-incident planning, public education events, etc.

While there are limited formal performance measures to use as a target measure, in May 2016, Henrico County (VA) Division of Fire published an article after studying their department's EMS workload.[29] As a result of the study, Henrico County Division of Fire developed a general commitment factor scale for their department. The next figure is a summary of the findings as it relates to commitment factors and may be utilized by CCFD leadership as a base for developing internal workload measures.

Figure 73: Commitment Factors as Developed by Henrico County (VA) Division, 2016

Factor	Indication	Description
16%-24%	Ideal Commitment Range	Personnel can maintain training requirements and physical fitness and can consistently achieve response time benchmarks. Units are available to the community more than 75% of the day.
25%	System Stress	Community availability and unit sustainability are not questioned. First-due units are responding to their assigned community 75% of the time, and response benchmarks are rarely missed.
26%-29%	Evaluation Range	The community served will experience delayed incident responses. Just under 30% of the day, first-due ambulances are unavailable; thus, neighboring responders will likely exceed goals.
30%	"Line in the Sand"	Not Sustainable: Commitment Threshold—community has less than a 70% chance of timely emergency service and immediate relief is vital. Personnel assigned to units at or exceeding 0.3 may show signs of fatigue and burnout and may be at increased risk of errors. Required training and physical fitness sessions are not consistently completed.

For this analysis, only those units with career staffing were considered. CCFD utilizes the existing staff at stations to cover multiple units (Station 1 has 5 personnel staffing E1, R1, T1 and E5; Station 3 has 3 personnel staffing E3; and Station 9 has two personnel during the day staffing E9 and R9). It is important to note that several of the apparatus in CCFD are cross staffed by the same employees and the percentages listed below represent only the time in that apparatus. As illustrated in the following figure, none of CCFD units are reaching a concerning level of workload individually.

[29] *How Busy Is Busy?; Retrieved from https://www.fireengineering.com/articles/print/volume-169/issue-5/departments/fireems/how-busy-is-busy.html*

Figure 74: CCFD Unit Hour Utilization, 2018–2022

Unit	2017	2018	2019	2020
E1	4.08%	3.49%	2.78%	2.55%
E5	0.43%	1.09%	2.54%	2.50%
R1	5.34%	5.24%	4.78%	5.13%
T1	0.13%	0.45%	1.09%	1.04%
E3	0.70%	0.28%	0.85%	0.52%
E9	0.17%	0.23%	0.27%	0.57%
R9	0.65%	0.99%	0.73%	0.85%

Incident Concurrency

Incident concurrency, the second factor to be considered, refers to the number of incidents occurring simultaneously within the service area. As the number of concurrent incidents increases, the ability to respond to additional calls for service decreases. As illustrated in the following figure, concurrency of greater than 2 incidents only occurs as 1.5% of the overall service demand. At this level, CCFD is well able to handle responses. However, it should be noted that this analysis assumes one unit responding to each call because the majority of CCFD calls are handled with one unit. Where there are multiple units responding to one call for service, additional requests may require use of automatic aid or mutual aid resources.

Figure 75: CCFD Call Concurrency, 2018–2022

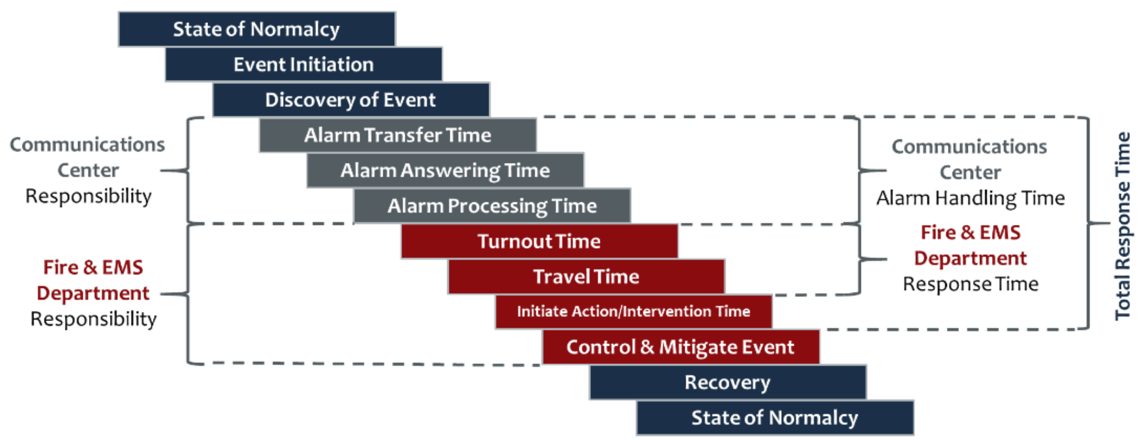
Concurrent Incidents in Progress	2018	2019	2020	2021	2022	Change Over Study Period
Single Incident	87.05%	84.95%	82.63%	79.14%	83.34%	-3.71%
Two Incidents	11.36%	12.81%	15.13%	16.24%	14.57%	3.21%
Three Incidents	1.12%	1.77%	2.08%	2.94%	1.70%	0.58%
Four Incidents	0.33%	0.30%	0.16%	0.82%	0.39%	0.06%
Five Incidents	0.09%	0.09%	0.00%	0.47%	0.00%	-0.09%
More than Five Incidents	0.05%	0.09%	0.00%	0.39%	0.00%	-0.05%

Response Performance

For the public, the key value of their fire department is the timely arrival of quality services when 911 is activated. This overall concept of 911 call to response is referred to as response performance and is comprised of the following components and illustrated in the following figure:

- **Alarm Handling Time:** The amount of time between when a call is answered by the 911 Primary Public Safety Answering Point (PSAP) or dispatch center, and when resources are dispatched.
- **Turnout Time:** The time interval between when response units are notified of the incident and when the apparatus begins to respond.
- **Travel Time:** The time the responding unit spends on the road traveling to the incident until arrival at the scene. This is a function of speed and distance.
- **Response Time:** The time from initial alerting of an incident until arrival on the scene. Response Time equals the sum of "Turnout Time" and "Travel Time."
- **Total Response Time:** This is the most apparent time to the caller requesting emergency services, as the time from when the emergency calls is placed until units arrive on the scene.

Figure 76: Total Response Time Continuum



Tracking the individual components of response time can help CCFD leadership identify impediments to timely response and make operational adjustments to improve; including developing response time goals and standards that are both relevant and achievable. Fire service best practices recommend that fire service organizations monitor and report the components of Total Response Time.

In analyzing response performance, ESCI generates percentile measurements of response time performance. The use of percentile measurement using the components of response time follows the recommendations of industry best practices. The best practices are derived by the Center for Public Safety Excellence (CPSE), Standard of Cover document and the National Fire Protection Association (NFPA) 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*.

The "average" measure is a commonly used descriptive statistic also called the mean of a data set. The most important reason for not using the average for performance standards is that it may not accurately reflect the performance for the entire data set and may be skewed by outliers, especially in small data sets. One extremely good or bad value can skew the average for the entire data set.

The "median" measure is another acceptable method of analyzing performance. This method identifies the value at the middle of a data set and thus tends to not be as strongly influenced by data outliers.

Percentile measurements are a better measure of performance because they show that most of the data set has achieved a particular level of performance. The 90th percentile means that 10% of the values are greater than the value stated, and all other data are at or below this level. This can be compared to the desired performance objective to determine the degree of success in achieving the goal.

As this report progresses through the performance analysis, it is important to keep in mind that each component of response performance is not cumulative. Each is analyzed as an individual component, and the point at which the percentile is calculated exists in a set of data unto itself. Each of the following analyses only included those incidents where the response was coded as "lights and sirens" priority. Each of the following analyses were conducted using the response data as provided by CCFD.

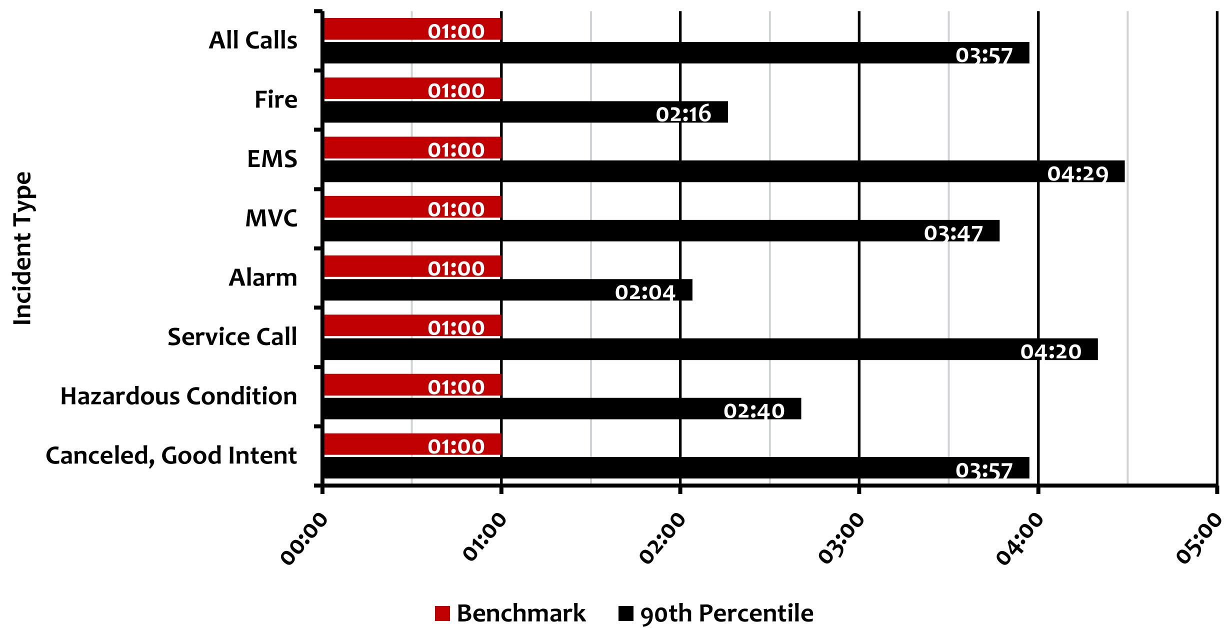
Alarm Handling Performance

Alarm handling performance measures the length of time between activation of 911 and dispatch of the first unit. CCFD units are dispatched by the Campbell County Sheriff's Department. As such, they do not have direct control over the call processing performance but should work with communications leadership to monitor performance and make improvements as needed. For this measure, there are two applicable standards as illustrated below.

Standard	Expected Performance
NFPA 1225: Standard for Emergency Services Communications (2022 Edition)	60 seconds at the 90th percentile

As illustrated in the following figure, overall alarm handling performance for CCFD was 3 minutes, 57 seconds, an improvement of 1 minute, 17 seconds from the analysis done for the 2019 study. When analyzed by incident type, performance ranged from 2 minutes 4 seconds for alarm incidents to 4 minutes, 29 seconds for emergency medical service incidents. While this performance exceeds the expected standard, CCFD leadership should coordinate with communications leadership to validate the measure including development of the local performance standard expectations to account for any priority dispatch procedures being used.

Figure 77: CCFD Alarm Handling at the 90th Percentile, 2018–2022



Turnout Performance

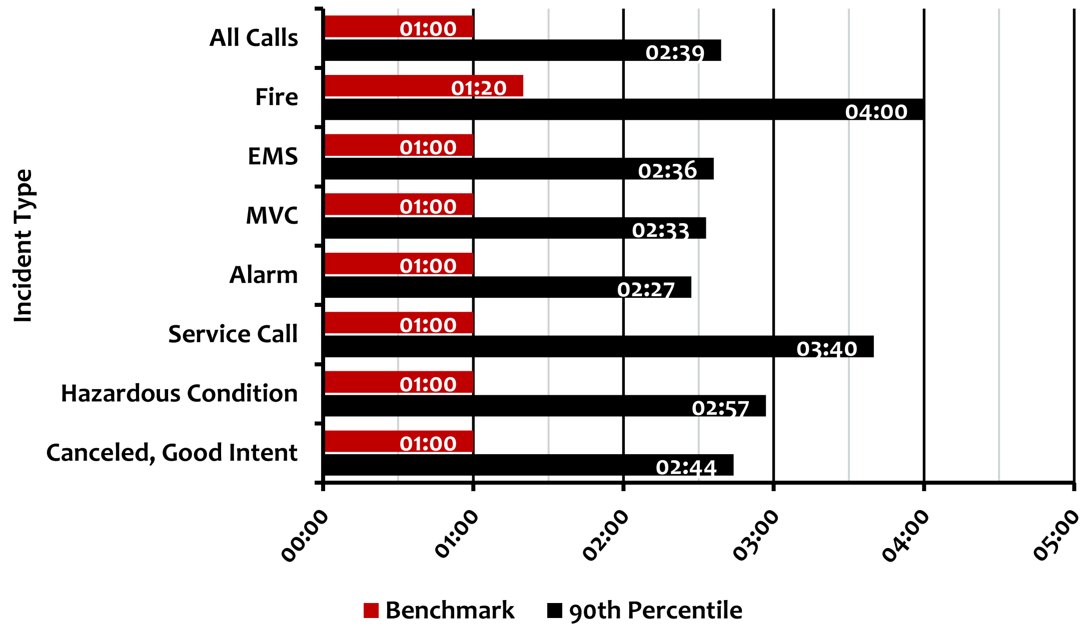
Turnout performance is measured by turnout time, which is the length of time between dispatch time and when a unit begins responding to the call. For this measure, there is one applicable standard as illustrated below.

Standard	Expected Performance
NFPA 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* recommends	<u>Fire and Special Operations Incidents</u> 80 seconds at the 90th percentile <u>All Other Incidents</u> 60 seconds at the 90th percentile

As illustrated the following figure, the overall turnout performance for CCFD is 2 minutes, 39 seconds, an improvement of 28 seconds from the analysis done for the 2019 study. When analyzed by incident type, performance ranged from 2 minutes, 27 seconds for alarm incidents to 4 minutes for fire incidents. Appendix B provides individual unit performance for this measure.

However, it should be noted that as a combination department with less than 85% of career staffing, CCFD does not fall within this performance measure. It is provided simply as a point of information for CCFD leadership to consider.

Figure 78: CCFD Turnout at the 90th Percentile, 2018–2022



As this is the first measure under direct control of the fire department, CCFD leadership may consider the various actions that occur within this measure and determine if there are areas where process changes could improve performance. These factors include:

- Systems used to notify personnel of an incident.
- Station design as it relates to the movement of personnel from living quarters to the apparatus bay.
- Personnel adherence to department policies and acting with appropriate speed towards the apparatus.
- Time required to don protective equipment prior to responding.
- Moving equipment between apparatus when units are cross-staffed.
- Time from starting apparatus until radio system is capable of transmitting.

Travel Performance

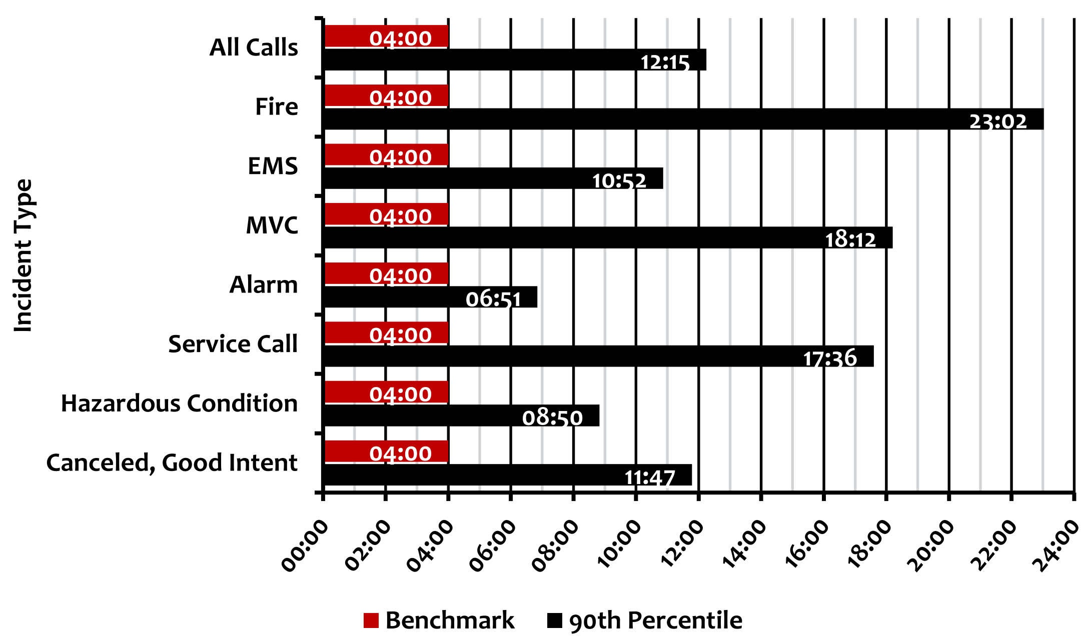
Travel performance is measured by travel time with is the length of time between when a unit begins to respond and arrival on scene. For this measure, there is one applicable standard as illustrated below. Appendix B provides individual unit performance for this measure.

However, it should be noted that as a combination department with less than 85% of career staffing, CCFD does not fall within this performance measure. It is provided simply as a point of information for CCFD leadership to consider.

Standard	Expected Performance
NFPA 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* recommends	First Unit 4 minutes at the 90th percentile Full Compliment 8 minutes at the 90th percentile

As illustrated in the following figure, overall travel performance for CCFD is 12 minutes, 15 seconds, an improvement of 2 minutes, 30 seconds from the analysis done for the 2019 study. When analyzed by incident type, performance ranged from 6 minutes, 51 seconds for alarm incidents to 23 minutes, 2 seconds for fire incidents. It is important to note that this includes all responses to fires throughout the jurisdiction and the long travel times to far reaches of the county account for the extended travel time.

Figure 79: CCFD Travel at the 90th Percentile, 2018–2022



Response Time Performance

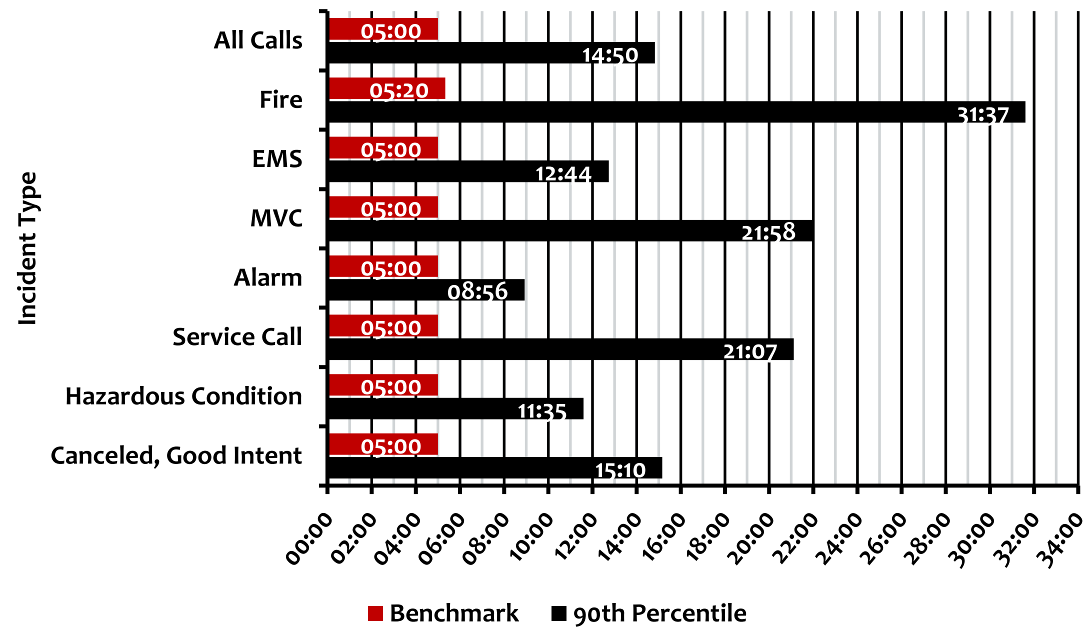
Response time is defined as the length of time between dispatch time and arrival at scene time. For this measure, there is not a specific applicable standard. However, by combining the individual component standards, the following figure illustrates expected performance. Appendix B provides individual unit performance for this measure.

However, it should be noted that as a combination department with less than 85% of career staffing, CCFD does not fall within this performance measure. It is provided simply as a point of information for CCFD leadership to consider.

Component	Expected Performance
Turnout Time	Fire and Special Operations Incidents 80 seconds at the 90th percentile All Other Incidents 60 seconds at the 90th percentile
Travel Time	4 minutes at the 90th percentile
Combined	Fire and Special Operations Incidents 5 minutes, 20 seconds at the 90th percentile All Other Incidents 5 Minutes at the 90th percentile

As illustrated in the following figure, overall response time performance for CCFD is 14 minutes, 50 seconds, an improvement of 2 minutes, 39 seconds from the analysis done for the 2019 study. When analyzed by incident type, performance ranged from 8 minutes, 56 seconds for alarm intent incidents to 31 minutes 37 seconds for fire incidents.

Figure 80: CCFD Response Time at the 90th Percentile, 2018–2022



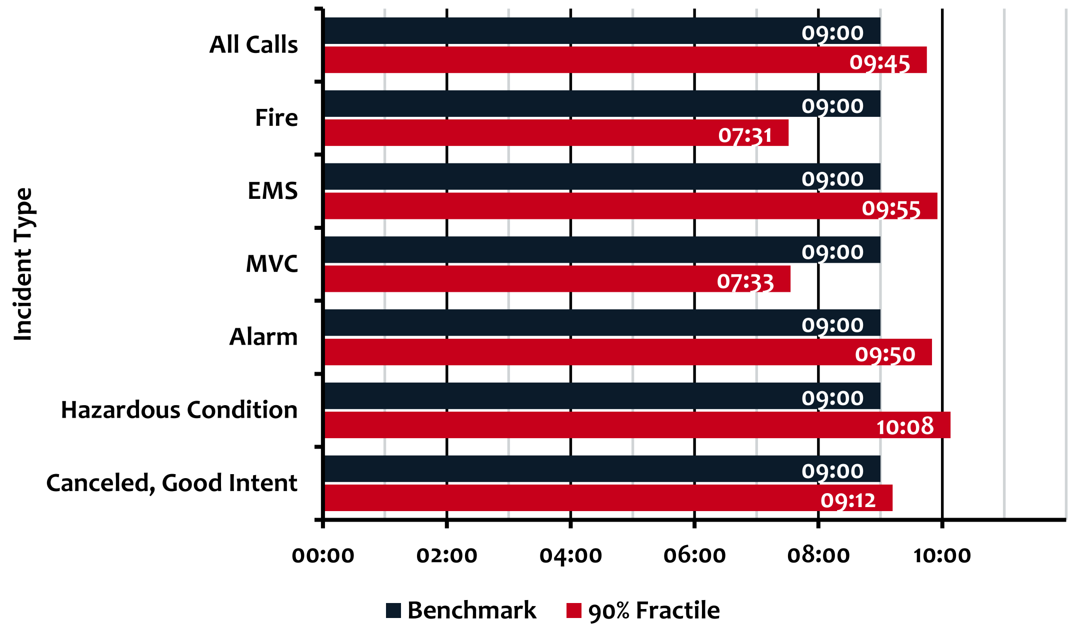
NFPA 1720 Performance Objectives and Measures

As a combination department, CCFD falls within NFPA 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*, which is measured based on the population density and is illustrated in the following figure.

Component	Expected Performance
Urban (Greater than 1,000 persons per square mile)	9 minutes or less at the 90th percentile
Suburban (500–1,000 persons per square mile)	10 minutes or less at the 80th percentile
Rural (Less than 500 persons per square mile)	14 minutes or less at the 80th percentile

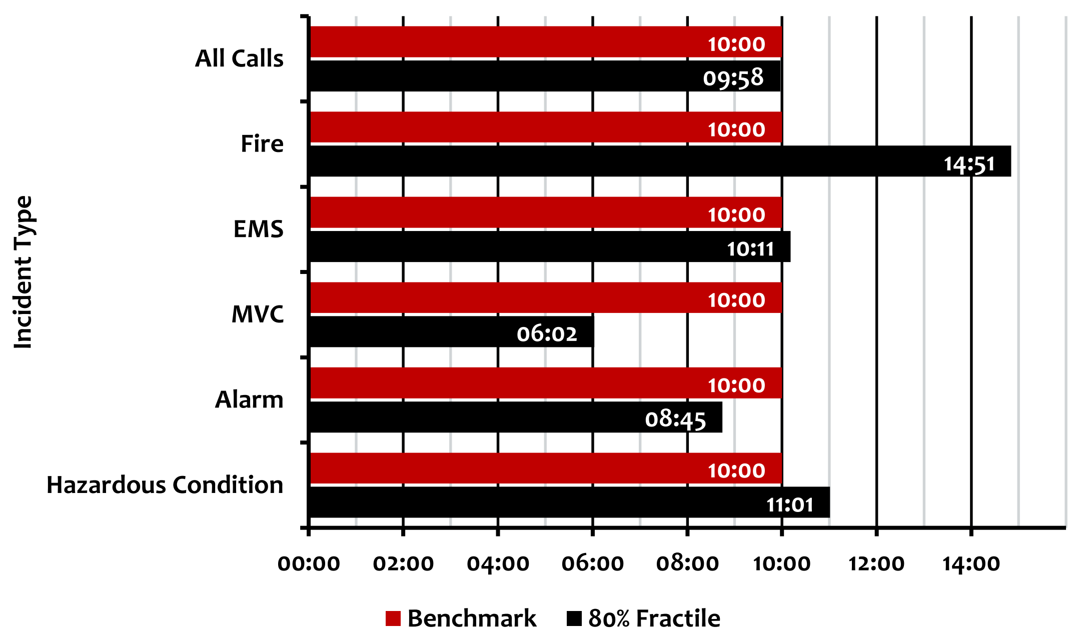
As illustrated in the following figure, the overall CCFD urban zone performance is 9 minutes, 45 seconds which is 45 seconds greater than the recommended standard.

Figure 81: CCFD NFPA 1720 Response (Urban), 2022



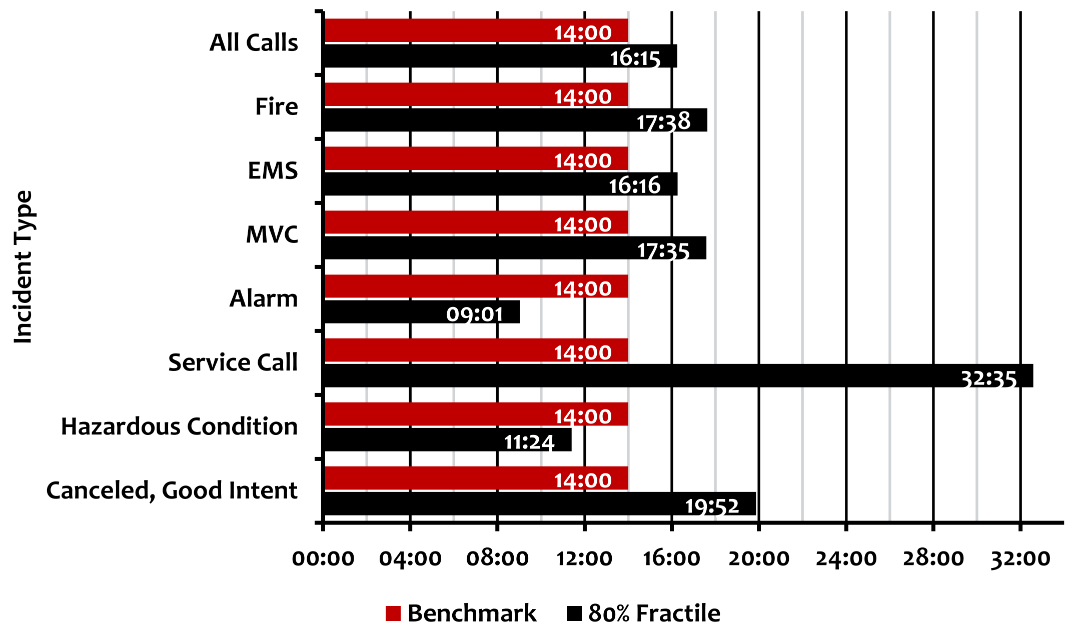
As illustrated in the following figure, the overall CCFD suburban performance is 9 minutes, 58 seconds, which is just below the expected standard.

Figure 82: CCFD NFPA 1720 Response (Suburban), 2022



As illustrated in the following figure, the overall CCFD rural performance is 16 minutes, 15 seconds which is approximately 2 minutes greater than the expected standard.

Figure 83: CCFD NFPA 1720 Response (Rural), 2022



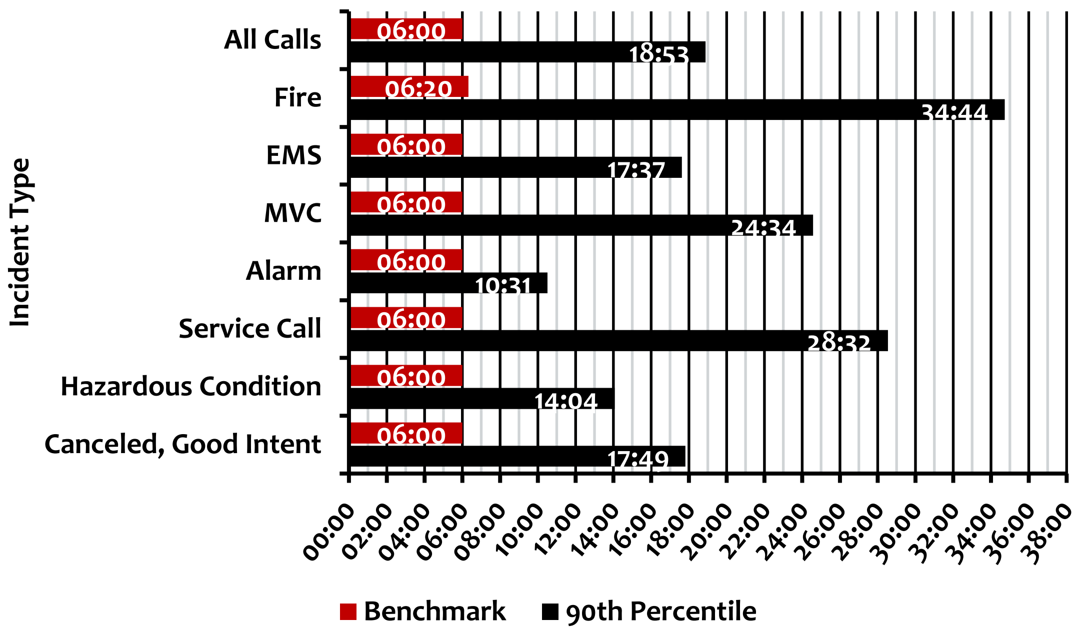
Total Response Time Performance

Total response time is defined as the length of time between activation of 911 and arrival at scene time. This performance measure is ultimately how the citizen views response performance. For this measure, there is not a specific applicable standard. However, by combining the individual component standards, the following figure illustrates expected performance. However, it should be noted that as a combination department with less than 85% of career staffing, CCFD does not fall within this performance measure. It is provided simply as a point of information for CCFD leadership to consider.

Component	Performance
Call Processing Time	60 seconds at the 90th percentile
Turnout Time	Fire and Special Operations Incidents 80 seconds at the 90th percentile All Other Incidents 60 seconds at the 90th percentile
Travel Time	4 minutes at the 90th percentile
Combined	Fire and Special Operations Incidents 6 minutes, 20 seconds at the 90th percentile All Other Incidents 6 Minutes at the 90th percentile

As illustrated in the following figure, overall total response time performance for CCFD is 18 minutes, 53 seconds, an improvement of 4 minutes, 36 seconds from the analysis done for the 2019 study. When analyzed by incident type, performance ranged from 10 minutes, 31 seconds for alarm incidents to 34 minutes, 44 seconds for fire incidents.

Figure 84: CCFD Total Response Time at the 90th Percentile, 2018–2022



OVERVIEW OF COMPLIANCE METHODOLOGY

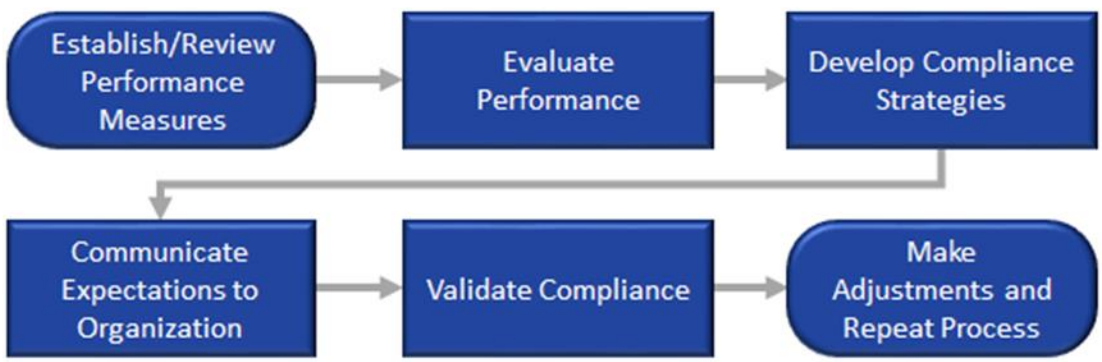
The preceding sections of this report provide a detailed analysis of the historical performance of the CCFD. For this analysis to prove beneficial to the CCFD and JPFB policymakers, the continued analysis should be performed on a routine basis. The data provided to the project team for analysis proved to be easy to analyze from the standpoint of consistency and completeness.

CCFD is committed to a continual process of analyzing and evaluating actual performance against the adopted Standards of Cover and will enhance the data collection procedures of field operations personnel. A periodic review of the CCFD's records management system reports will be necessary to ensure compliance and reliability of data.

Compliance Model

Compliance is best achieved through a systematic approach. ESCI has provided the following six-step compliance model.

Figure 85: Six-Step Compliance Model



Phase 1—Establish/Review Performance Measures

Complete the initial Standards of Cover process. Conduct a full review of the performance measures every five years:

- Identify services provided.
- Define levels of service.
- Categorize levels of risk.
- Develop performance objectives and measures:
  - By incident type
  - By geographic demand zone
  - Distribution (first on scene)
  - Concentration (arrival of full first alarm)

Phase 2—Evaluate Performance

Performance measures are applied to actual services provided:

- System level
- First due area level
- Unit level
- Full effective response force (ERF)

Phase 3—Develop Compliance Strategies

Determine issues and opportunities:

- Determine what needs to be done to close the gaps.
- Determine if resources can/should be reallocated.
- Seek alternative methods to provide service at the desired level.
- Develop budget estimates as necessary.
- Seek additional funding commitment as necessary.

Phase 4—Communicate Expectations to Organization

Communicate expectations:

- Explain the method of measuring compliance to personnel who are expected to perform services.
- Provide feedback mechanisms.
- Define the consequences of noncompliance.

Train personnel:

- Provide appropriate levels of training/direction for all affected personnel.
- Communicate the consequences of noncompliance.
- Modify (remediate) business processes, business application systems, and technical infrastructure as necessary to comply.

Phase 5—Validate Compliance

Develop and deploy verification tools and/or techniques that can be used by subsections of the organization on an ongoing basis to verify that they are meeting the requirements:

- Monthly evaluation:
  - Performance by unit
  - Overall performance
  - Review of performance by division/section management

- Quarterly evaluation:
  - Performance by unit
  - Performance by first due
  - Overall performance
  - Review of performance by executive management

Phase 6—Make Adjustments/Repeat Process

Review changes to ensure that service levels have been maintained or improved. Develop and implement a review program to ensure ongoing compliance:

- Annual review and evaluation:
  - Performance by unit
  - Performance by first due
  - Overall performance
  - Review of performance by governing body
  - Adjustment of performance standards by governing body as necessary
- Five-year update of Standards of Cover:
  - Performance by unit
  - Performance by first due
  - Full effective response force
  - Overall performance
  - Adoption of performance measures by the governing body
- Establish management processes to deal with future changes in the CCFD service area.

FUTURE SYSTEM DEMAND FORECASTS

POPULATION GROWTH PROJECTIONS

The study moves forward with an assessment of the future community conditions, service demand, and risks that the CCFD can be expected to serve. ESCI conducted an analysis of community growth projections with particular emphasis on emergency service planning and delivery.

Population Growth Projection Analysis

ESCI researched the historical and future projections from available comprehensive growth plans and the U.S. Census Bureau to develop an overview of historical population representations and future population expectations to provide decision makers with accurate estimates to aid the planning process. To start, some key terms need to be defined. *Natural increase* is defined by the U.S. Census Bureau as the rate of births minus deaths per 1,000 people and net migration is the rate of in-migrants minus out-migrants, both domestic and international, per 1,000 people. These numbers are used in conjunction with base population estimates to predict future population totals and reflect historical trends. When categorizing populations, rural counties have no urban center of 10,000 or more, micropolitan contains an urban center of 10,000 or more including the suburbs, and finally metropolitan includes central counties with an urban center over 50,000 people, plus outlying suburbs linked by commuting patterns.

Population History for Campbell County

This section provides a greater level of detail that supports the assumptions made therein. A news article from the Gillette News Record titled "*Wyoming population sees decline*" sites census data collected by the Wyoming Department of Administration and Information's Economic Analysis Division and shows that while Wyoming experienced its largest population loss in nearly three decades. There are two components that drive population change in Wyoming, natural change, which measures how many people were born in the state against how many died; and net migration, which measures the number of people who move to the state against the number who leave. At the state level, the net migration was 2,494, meaning that 2,494 more people moved into Wyoming than moved out between July 2021 and July 2022. The natural change, however, was -490 (6,189 births but 6,679 deaths)[30].

The primary driver of population change in Wyoming is employment. Between 2015 and 2017, the state lost about 17,000 jobs, resulting primarily from a bust in the mineral extraction industry. Consequently, the counties that are economically dependent on mineral extraction activities including Campbell, Converse, Natrona, and Sublette saw the largest population decreases. Only Teton and Lincoln counties benefitted from job growth between 2015 and 2017. Wyoming's population loss was more severe because nearby states have had thriving economies in recent years.

[30] *Wyoming Administration and Information, Economic Analysis Division, Most Wyoming Counties Added Residents in 2022*

Coal mining in Campbell County is still markedly below that of its heyday, when its mines collectively pulled from 300 million to more than 400 million tons of thermal coal from the ground annually. An increase in coal demand has brought with it an increase in jobs in the Campbell County area. This is made evident by the housing market only having a limited amount of affordable housing that the mine workers can afford.

Recognizing that most of the population lives inside of the two municipalities, it is assumed that future growth will follow a similar pattern. The next figure shows historical population data for Campbell County, including the annual population percentage changes.

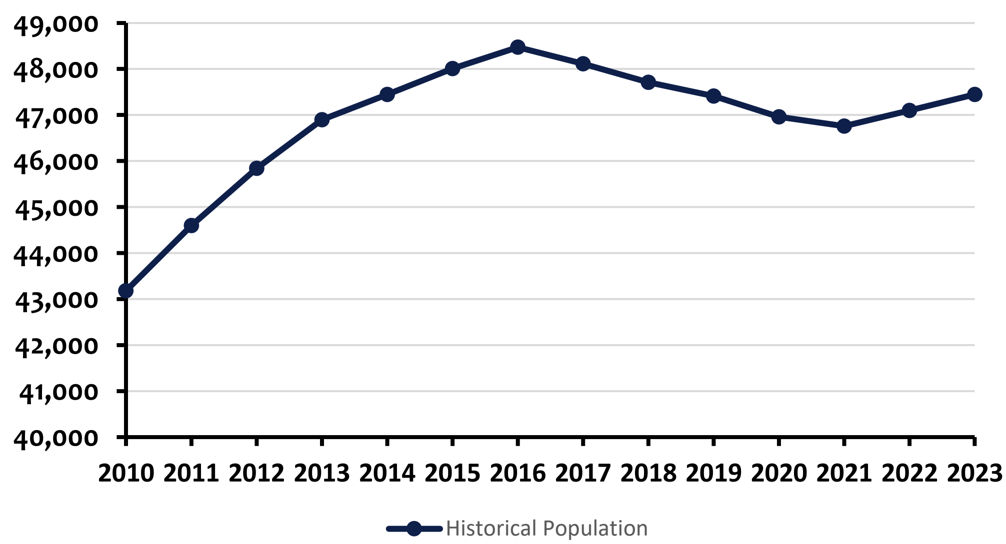
Figure 86: Campbell County, Wyoming Population Totals

Year	Campbell County Population	Annual Change
2010	43,179	
2011	44,599	3.29%
2012	45,840	2.78%
2013	46,901	2.31%
2014	47,448	1.17%
2015	48,103	1.19%
2016	48,473	0.96%
2017	48,116	-0.74%
2018	47,708	-0.85%
2019	47,409	-0.63%
2020	46,958	-0.95%
2021	46,758	-0.43%

The decrease in population can be attributed to the loss of industry jobs in the area in the early 2020's due potentially to the COVID pandemic that was rapidly spreading through the country and world. Forecasts of the population for 2023, indicated an uptick in growth in the Campbell County area. This can also be attributed to people from larger cities that want to move away from the "big city" life and are looking for rural areas to settle down in. Campbell County offers those things to people from these "big city" areas.

The following figure shows the historical population changes in Campbell County.

Figure 87: Historical Population Change for Campbell County, Wyoming



Census-Based Population Growth Projections

Population projections are estimates of the population for future dates. They are typically based on an estimated population consistent with the most recent decennial census. Projections illustrate possible courses of population change based on assumptions about future births, deaths, net international migration, and domestic migration. In some cases, several series of projections are produced based on alternative assumptions for future fertility, life expectancy, net international migration, and (for state-level projections) state-to-state or domestic migration.

Recent indicators bode well for the state's economy. Since the start of 2017, about 2,000 mineral extraction jobs have returned to the state and total employment statewide is up slightly. These improvements still demonstrate an economic reliance on mineral extraction, however, and could leave Wyoming vulnerable to another bust cycle.

The U.S. Census provides valuable guidance for local governments to begin their planning processes. The information provided by the U.S. Census allows community planning-based processes to tailor projections to their specific communities.

Community Planning-Based Population Growth Projections

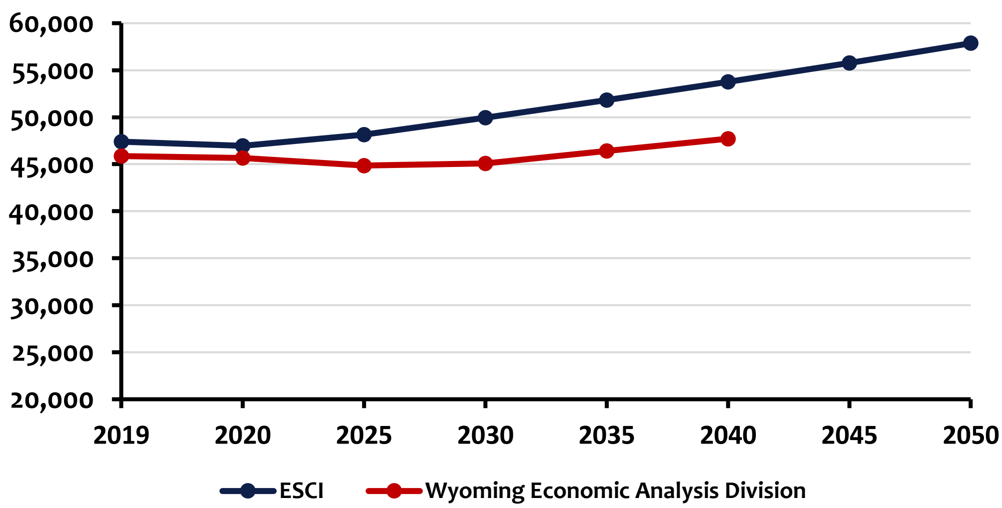
Campbell County has developed a *Campbell County Comprehensive Plan* to address community growth. The plan was adopted in August of 2013 and the community continues to implement and work towards implementation of the initiatives outlined in the plan. The City of Gillette also has developed an update to the *Campbell County Comprehensive Plan*, *The Gillette Plan*, adopted in 2013 as well. These plans provide guidance for community planning efforts. Planning documents like this Long-Range Master Plan with CRA/SOC provide additional information from subject matter experts upon which to base community related decisions.

Also considered was the Wyoming Economic Analysis Division who based projections strictly on previous mathematical growth rates, and do not include adjustments for amount of developable land; economic trends or conditions; current land use policies; and/or other similar factors. Their projections are very conservative and only predict the population to reach roughly 47,710 by 2040.

Using a conservative rate of increase of .74 percent ESCI projects population growth through the year 2050, Campbell County could expect to reach an estimated population of 57,863. This rate of increase was derived by taking the total percentage of change and extracting an average percentage change for the previous ten-year period. Because the estimates are using an average rate of change for population changes experienced in Campbell County, they vary from the U.S. Census Bureau theoretical estimates slightly over time.

The following figure represents the expected growth Campbell County can expect and find useful for planning purposes.

Figure 88: Campbell County Community Planning -Based Population Projections



SERVICE DEMAND PROJECTIONS

In evaluating the deployment of resources and staffing, it is imperative consideration be given to potential changes, such as population change, demographics, and economic activity, which can directly affect emergency workload. Changes in service demand might require changes and adjustments in the deployment of staffing, apparatus, and stations to maintain acceptable levels of performance.

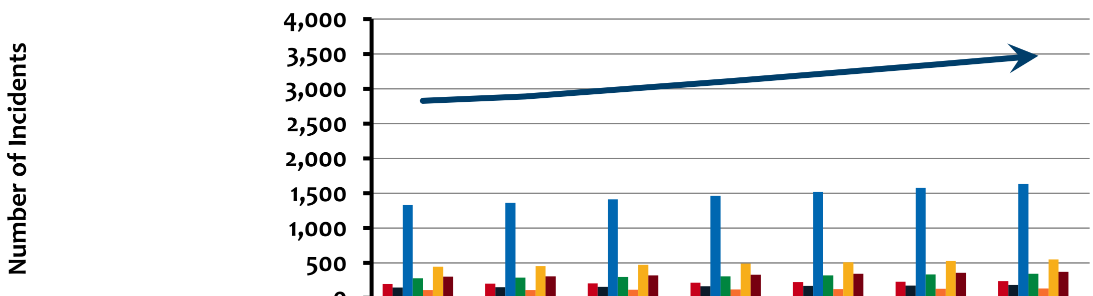
Service Demand Projection Analysis

Future population and the activity of that population is a significant predictor of future service demand. All requests for EMS service are people driven. The National Fire Protection Association (NFPA) reports that approximately 70% of all fires are the result of people doing either something they should not do (i.e., illegal burning, misuse of ignition source) or not doing something they should have (i.e., failure to maintain equipment). It is reasonable to use future population change to predict future service demand.

Examination of CCFD incident data reveals that service demand increased by nearly 31.7% from 2018 to 2022, or an average of about 7.1% each year. Based on that, ESCI was able to develop a range of projected increase in service demand—calls for service—from 2022 to 2050. This range was then compared to the historical records to determine a projected increase in service demand, based on a comparison of population-based and historically-based service projections, as shown in the following figure.

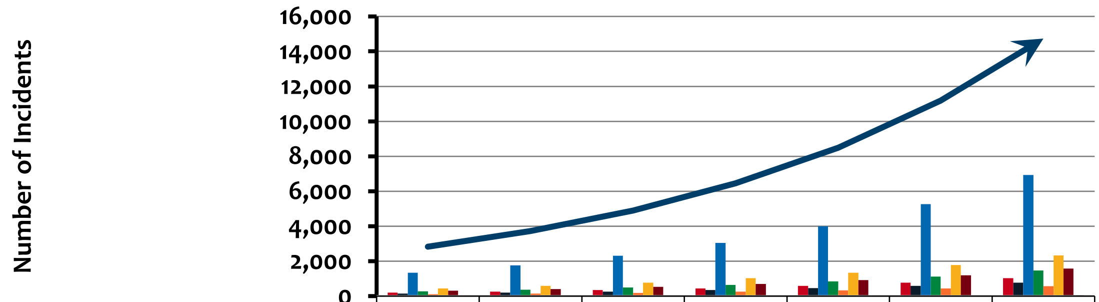
The potential service demand predictions are listed in the following figures.

Figure 89: CCFD Projected Service Demand by Population



	2022	2025	2030	2035	2040	2045	2050
Fire (100)	196	200	208	216	224	232	241
Hazardous Condition (200, 400)	149	152	158	164	170	176	183
EMS (300 except 322-324)	1,331	1,361	1,412	1,464	1,519	1,576	1,635
MVC (322-324)	282	288	299	310	322	334	346
Service Call (500)	110	112	117	121	126	130	135
Canceled, Good Intent (600)	447	457	474	492	510	529	549
Alarm (700)	302	309	320	332	345	358	371
Other (800, 900)	10	10	11	11	11	12	12
Total	2,827	2,890	2,998	3,110	3,227	3,348	3,473

Figure 90: CCFD Projected Service Demand by Historical Change



	2022	2025	2030	2035	2040	2045	2050
Fire (100)	196	258	340	447	589	776	1,021
Hazardous Condition (200, 400)	149	196	258	340	448	590	777
EMS (300 except 322-324)	1,331	1,753	2,308	3,039	4,001	5,268	6,937
MVC (322-324)	282	371	489	644	848	1,116	1,470
Service Call (500)	110	145	191	251	331	435	573
Canceled, Good Intent (600)	447	589	775	1,020	1,344	1,769	2,330
Alarm (700)	302	398	524	689	908	1,195	1,574
Other (800, 900)	10	13	17	23	30	40	52
Total	2,827	3,722	4,901	6,454	8,498	11,189	14,733

There is some disparity between the two projections, per capita and historical. In the CCFD service area, the number of actual calls has increased significantly higher than the rate estimated from population growth alone. This suggests that call volume will increase faster than population growth as fire department response models are asked to adopt an "all risks, all hazards" approach to emergency service delivery. This trend is not unique to CCFD; it is occurring across the country and is expected to continue.

Based on these comparisons, the "best case" demand for fire department services in the CCFD service area is projected to increase by 646 responses (23%) by the year 2050. This represents an increase of approximately 4.6% every five years.

Impact of Aging Population on Service Demand

It is very likely that the existing population will continue to age in place. The increasing number of elderly populations will increase the demand for emergency medical services as the elderly population is a disproportionately greater user of these services. National medical industry studies suggest that patients over 65 years of age are three times more likely to access local emergency services than other age groups.

The service demand by aging population base is included in the following figure.

Figure 91: Campbell County Service Demand for Aging Population 2021[31]

Age	Male	Female	Total
Under 5 years:	1,719	1,557	3,276
5 to 9 years:	1,970	2,049	4,019
10 to 14 years:	1,745	1,887	3,632
15 to 19 years:	1,554	1,370	2,924
20 to 24 years:	1,356	1,316	2,672
25 to 29 years:	1,579	1,451	3,030
30 to 34 years:	1,912	1,756	3,668
35 to 39 years:	1,868	1,975	3,843
40 to 44 years:	1,589	1,138	2,727
45 to 49 years:	1,444	1,233	2,677
50 to 54 years:	1,278	1,441	2,719
55 to 59 years:	1,810	1,675	3,485
60 and 64 years:	1,694	1,392	3,086
65 and 69 years:	989	1,404	2,393
70 to 74 years:	778	455	1,233
75 to 79 years:	398	375	773
80 to 84 years:	126	241	367
85 years and over:	66	168	234

The population for persons 65–84 years of age living in the county in 2021 was 4,766 with an additional 234 people over 85 years of age. Over the next ten years, assuming the current 55–74 years of age demographic stays in the county, this will become the 65–84-year-old cohort. This group will grow to 10,197 persons. In twenty years, the group which is currently 45–64 years of age will be 65–84 years of age and will reach 14,694 persons. In ten years, this age group will increase by roughly 5,431 people and in twenty years this age group will increase by 9,928 people.

The growth projection of an aging population over the next twenty years is illustrated in the following figure.

Figure 92: Projection of Aging Population 2019

Age	2021	2031	2041
65 to 84 years of age	4,766	10,197	14,694

[31] *https://data.census.gov/table?q=campbell+county+wy&tid=ACSST5Y2021.S0101*

It is reasonable to assume that demand for emergency medical services in this age group will increase in proportion to the increase in size of the demographic. Since the service demand data for EMS calls is not stratified as to age, it is difficult to predict the exact impact on the number of calls. It is also impossible to know if as persons age they will remain in the town or move to other areas. Conversely, it may be that the individuals moving into the county may be disproportionately in the "over 65" demographics. What can be derived is an increased aging population will most likely require emergency services greater than what is currently experienced today.

OVERVIEW OF COMMUNITY RISK ASSESSMENT

COMMUNITY RISK ASSESSMENT

Every community is unique in the types of risks present that potentially threaten people and property. Risks are identified and evaluated for potential impacts to Campbell County. In this section, community risks specific to the CCFD are presented based on the population and demographics, local land use and development, and the geography and natural hazards of the area. Mitigation of these risks affects the number of resources (personnel, equipment, and apparatus) necessary to improve the response, recovery, and resilience of the community. Not all hazards of individual occupancies can be considered; however, some risks are applicable within the entire jurisdiction.

Community Risk Assessment is defined by the National Fire Protection Association (NFPA) 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments* as:

> *A systematic approach that identifies, assesses, categorizes, and classifies the probabilities and consequences of a community's fire and non-fire hazards and threats, taking into account all pertinent facts that increase or decrease risks in each first-due response zone.*

This section provides a basic "all-risks, all-hazards" perspective of community risks in the service area. It is intended to assist fire department officials to (1) identify hazards and risks within the community, and (2) prioritize hazards and risks based on impact to determine the appropriate resources necessary to reduce risk and attain positive desired outcomes. This analysis is intended to provide insight into *what* needs exist, *where* those needs exist, and *how* those needs are expected to change in the future. Physical, economic, and demographic data were utilized to assess the fire/EMS-related hazards and risks that threaten the community, to include:

- Current hazard classification, planning, and mitigation measures from various sources;
- Specific information provided by Campbell County about target hazards and land use; and
- Planning zones established by Campbell County and the fire department.

Risk Assessment Methodology

Using FEMA's prescribed methodology to assess a community's risk, standardized language becomes used for all emergency services. This standard language allows for seamless collaboration locally, regionally, and nationally. The National Preparedness System has six components. These components are tied together to guide community-wide preparedness actions to achieve the goal of a prepared community and work to fulfill the National Preparedness Goal. The community risk assessment section focuses on six components, identifying and assessing risk.

Risk can be defined as the potential for negative impacts due to threats and hazards, including natural, technological, and human-caused occurrences. Through the risk assessment process, organizations identify common risks that may challenge their capabilities and risks in which the organization is not as capable as it wishes.

Figure 93: Components of Preparedness

These identified hazards that may challenge or exceed the organization's capabilities highlight capability gaps and barriers to a department's capability to prevent, protect against, mitigate, respond to, and recover from a threat or hazard.

Evaluating the risks that may occur helps the fire department to determine what level of preparedness they should plan to build and sustain. Although only some fire departments can budget, staff, and purchase the equipment needed to be prepared for all potential risks, these evaluations help to prioritize planning and help give insight into where get the most impact and value.

Characterizing Risk

Simply stated, a community risk assessment (CRA) is "the identification of potential and likely risks within a particular community and the process of prioritizing those risks." This concept is consistent with the FEMA concept of "whole community" and shared responsibility for emergency preparedness.[32] Thus, a CRA is a critical component of evaluating core capabilities as part of the phases of emergency management—prevent, prepare, respond, recover, and mitigate—as shown in Figure 94~~Figure 106~~.

Figure 94: Phases of Emergency Management

- **Prevention** focuses on preventing human hazards, primarily from potential natural disasters or terrorist attacks, both physical and biological.
- **Preparation** is a continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action.
- **Response** is the coordination and management of resources in an all-hazards approach with measures taken for life, property, and environmental safety.

[32] *National Planning Frameworks, U.S. Department of Homeland Security, FEMA, 2018. Retrieved from: https://www.fema.gov/whole-community#.*

- **Recovery** is the group of activities to restore critical community functions and begin to manage stabilization efforts.
- **Mitigation** is the effort to reduce the loss of life and property by lessening the impact of disasters and emergencies.

Preparedness is the shared responsibility of our entire community, region, state, and nation. The whole community must contribute, beginning with individuals, communities, and emergency services. This collaboration works toward fulfilling the National Preparedness Goal. The National Preparedness Goal states what it means for the community to be prepared for all disasters and emergencies.

The Federal Emergency Management Agency (FEMA) states the National Preparedness Goal: "A secure and resilient nation with the capabilities required across the whole community to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk." [33]

Community-Wide Risks

Every community has risks that are unique to that community. These risks can include natural hazards associated with climate and topography, population and demographics, technological and human-caused hazards, types of structures and their intended uses, and the type of service and transportation infrastructure. The CCFD acknowledges there are hazards in the community, that these hazards pose a risk to life and property, that these hazards vary in likelihood and impact, both on the community and the agency, and that these risks directly influence the fire department planning and response activities.

The CCFD has expanded the basic risk analysis process to match the "all hazards—all risk" methodologies common to emergency management. In addition to the traditional characteristics of likelihood and community impact, this approach provides qualitative data about the probability and consequences of an incident for both natural hazards and technological/human-caused hazards.

Campbell County is subject to a variety of community-wide risks. The most common of these are:

- Floods/High Water
- Severe winter storms
- Tornados/High winds
- Extreme Heat
- Winter Storms
- Wind Storms
- Hail/ Icy conditions

33 National Risk and Capability Assessment U.S. Department of Homeland Security, FEMA, 2018. Retrieved from: https://www.fema.gov/emergency-managers/risk-management/risk-capability-assessment#spr

History of Hazards and Vulnerabilities

Since 1953, the number of federally-declared disasters in Campbell County (5) is almost equal to the Wyoming average (5.3).[34] The United States average is (15). The cause for each of these declarations is shown in the next figure.

The Federally-Declared disasters from 1978 until 2023 are listed in the following figure.

Figure 95: Federally-Declared Disasters, 1978 to 2023[35]

Type	Campbell County	
	Number	Percentage
Flood	1	20%
Biological	2	40%
Toxic Substances	1	20%
Tornado	1	20%
Total	**5**	**100.0%**

In addition to the federally declared disasters mentioned above, there have been about 2,385 other extreme weather events within 50 miles of the county from 1950 to 2010. The site lists the following categories of extreme weather events are defined as Blizzard, Cold, Dense Fog, Drought, Flood, Hail, Heat, Heavy Snow, High Surf (not likely in Wyoming), Hurricane, Ice Storm, Landslide, Strong Wind, Thunderstorm Winds, Tropical Storms, Wildfire, Winter Storms, Winter Weather, and other non-specified. Over 69.9% of these events were categorized primarily as Thunderstorm Winds (3.9%), Hail (63%), or Flood (3%).[36]

Hazard Classification

A *hazard* is "a condition that presents the potential for harm or damage to people, property, or the environment." ESCI performed a Community Risk Assessment to determine community characteristics, vulnerabilities, special hazards, and risks. The information utilized in this assessment was gathered through surveys completed by CCFD staff, the 2018 Wyoming Region One Hazard Mitigation Plan (WROHMP), FEMA National Risk Index, and other sources.

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[34] *FEMA Disaster Declarations Summary - Open Government Dataset, U.S. Department of Homeland Security, last updated March 9,2023. Retrieved from: https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2*

[35] *FEMA Disaster Declarations Summary - Open Government Dataset, U.S. Department of Homeland Security, last updated March 9,2023. Retrieved from: https://www.fema.gov/openfema-data-page/disaster-declarations-summaries-v2*

[36] *Natural Disasters and Extremes, USA.com. Retrieved from: http://www.usa.com/campbell-county-wy-natural-disasters-extremes.htm*

The risk categories presented in this section are hazards the jurisdiction may be vulnerable to. These risks can significantly impact the local economy, residents of the jurisdiction, or the jurisdiction's service delivery capabilities. Therefore, hazards were assessed by the probability of occurrence and vulnerability and the likely impact on the community.

Risk management should also consider a community's fiscal and political environment, as policymakers must determine service priorities and funding levels to support these services.

CCFD may be vulnerable to a variety of hazards, which are grouped into one of three categories:

- **Natural hazards:** Result from acts of nature.
- **Technological hazards:** Result from accidents or failures of systems and structures.
- **Human-caused hazards:** Result from people's actions, both accidental and intentional.

Figure 96: Hazards by Category

Natural	Technological	Human-caused
Dam Inundation	Industrial Accidents	Mass Casualty Incidents
Drought	Hazardous Materials	Terrorism
Earthquake	Transportation Accidents	Civil Unrest
Winter Storms	Utility Disruptions	Cyber-attacks

Natural Hazards

Natural hazards can be classified into three primary areas. Natural hazards are typically challenging to prevent.

- **Meteorological** -Flooding, Dam Failure, Severe Thunderstorms (Wind, Rain, Lightning, Hail), Tornado, Windstorms, and Winter Storms (Snow/Ice).
- **Geological** -Earthquake, Landslide, Subsidence/Sinkhole.
- **Biological** - Pandemic Disease, Foodborne Illnesses.

The Federal Disaster declarations in Campbell County fall within the natural hazards or result from acts of nature. Based on ESCI's assessment model, the following table shows the relative risk of these natural hazards.

Figure 97: Risk Analysis Model- Natural Hazards

Event	Probability	Community Impact			Mitigation Capacity			Risk
	Likelihood this will occur	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPAREDNESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	*Relative Threat*
Drought	3	1	2	3	3	3	3	83%
Wildfire	3	2	3	2	3	2	2	78%
Blizzard	3	1	1	2	3	3	1	61%
Temperature Extremes	3	1	1	1	3	3	2	61%
Severe Thunderstorm	3	1	1	1	3	3	1	56%
Snow Fall	3	1	1	1	3	3	1	56%
Tornado	2	2	2	3	2	2	3	52%
Earthquake	2	1	2	2	3	3	2	48%
Ice Storm	2	1	1	3	3	3	1	44%
Flood, External	2	2	1	2	2	2	1	37%
Dam Inundation	1	1	2	2	3	3	3	26%
Epidemic	1	3	1	1	3	3	3	26%
Landslide	1	1	2	1	2	2	2	19%

The risk analysis shows that of the natural events, meteorological events pose the highest risk to CCFD. The top five risks are drought, wildfires, blizzards, temperature extremes, and severe storms. Even though these incidents are not preventable, a focused effort on education, planning, and response capabilities is the best way to mitigate the impact on the community. Of the meteorological events, wildfire is one of the most prevalent natural disasters in the area that would require a response from CCFD.

Campbell County has a relatively low-risk level for natural hazards[37]. The National Risk Index is a dataset tool to help illustrate risk for 18 natural hazards. It was designed and built by FEMA to assist with planning for natural hazards within a community. Campbell County scores 2 out of 100, with the national average just under 11.

[37] *FEMA National Risk Index https://hazards.fema.gov/nri/map*

Wildfire

A specific risk becoming more predominant in suburban areas is an urban interface fire, and they are becoming worse with summer's high heat and winds. Although the typical response is shared with Federal and mutual resources, planning for the response, notification, and evacuation is essential to maintain regularly, revise, and test.

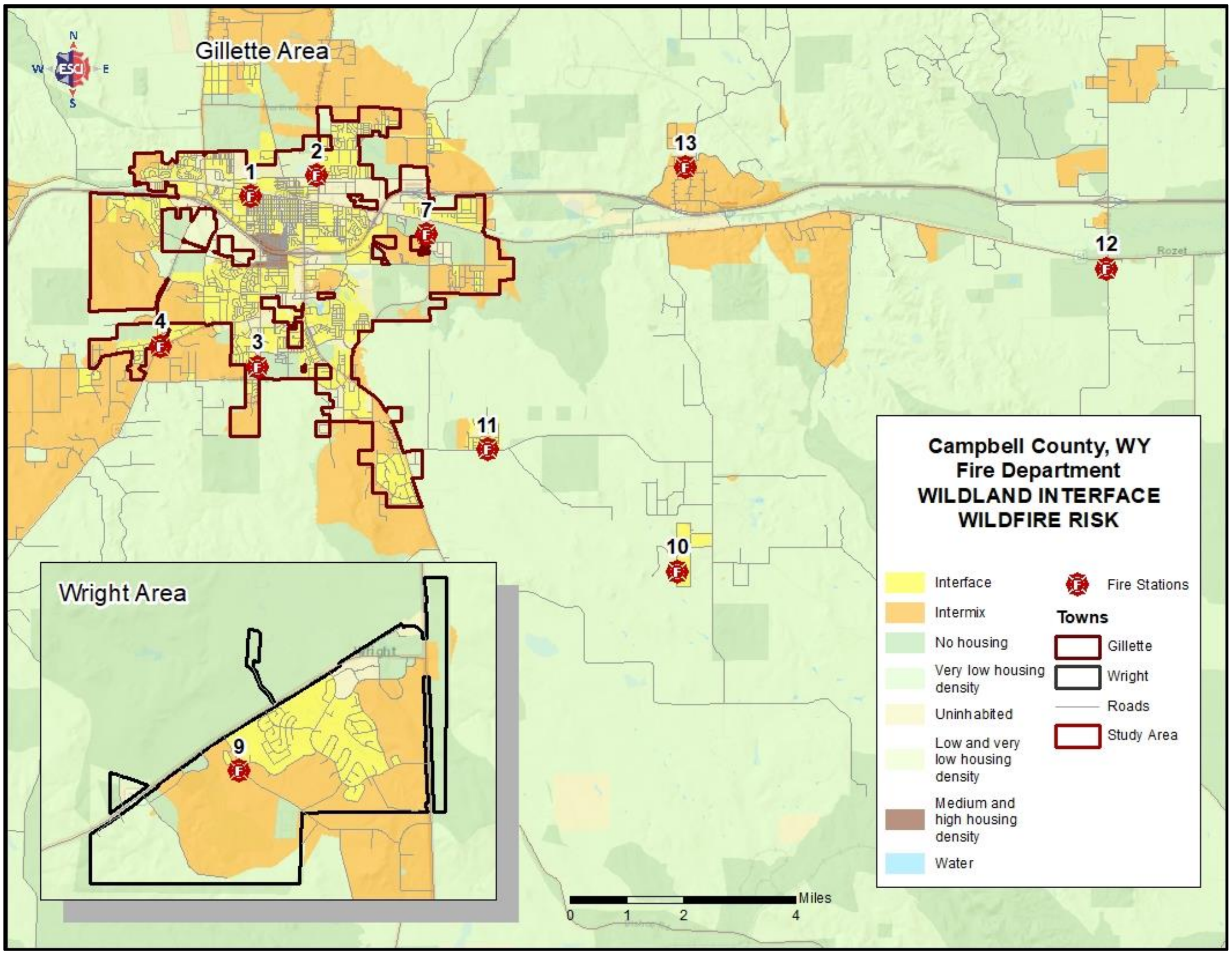
Wildfires can occur anywhere that natural vegetation exists as a fuel source. According to the WROHMP[38], Drought, wildfires, floods, and winter storms tend to cause the most damage or economic loss in the Region. Wildfire activity in the region in the last ten years, such as Horse Creek 2, Rourke, Collins, and Cedar Craw 2 fires, have demonstrated a propensity for increased wildfire activity in or adjacent to the jurisdiction.

The most significant concern for wildfire risk is in the wildland-urban interface (WUI) areas. The wildland-urban interface (WUI) is an environment where structures or other human developments meet or intermingle with wildland vegetation or fuels. WUI areas can include both public and private land bordering developed communities.

The following figure shows the wildland-urban interface (WUI) risk around the highest populated areas. For example, CCFD has significant areas of WUI around the towns of Gillette and Wright. Even though fuel types are mostly grass and shrubs, this can bring seasonal curing and increased risk with drought and wind, which are other significant natural hazards in the area.

[38] *https://www.campbellcountywy.gov/DocumentCenter/View/20772/Wyoming-Reg-1-HazMit-Update-Final-Adopted*

Figure 98: Wildland Urban Interface Exposure Area in Campbell County



Many actions can reduce wildfire risk by hardening structures, developing defensible spaces, planting fire-resistant vegetation, and other measures. These measures should be considered for creating a community wildfire protection plan to aid community-wide mitigation efforts. Other actions that help reduce wildfire risk are fire department risk assessments and county-wide building code and regulation adoption. In addition, programs exist to guide efforts to adapt to living with wildfire.

As the figure illustrates, CCFD has areas of significant exposure to wildfire around the population centers. Despite CCFD having a large area with the potential for extreme fire intensity, the low housing density in most areas minimizes CCFD's risk. CCFD should focus on wildfire planning in areas with the highest housing density. After completing wildfire planning in these areas, CCFD should move to prepare the lower-density areas. Intense planning with CCFD's wildfire response partners will benefit when a more significant incident occurs.

Other Climate-Related Events

Other climate-related events may impact service demand and the ability of the department to perform adequately. Although relatively infrequent, these events should be planned for, i.e., hail, winter storms, drought, and ice storms.

This area is characterized by a semi-arid climate with cold, dry winters and warm summers. The area receives an average of 13 inches of precipitation per year, with most of it occurring during the summer months in the form of thunderstorms. The average temperature in Campbell County during the winter months (December to February) ranges from the low teens to mid-20s Fahrenheit (-11 to -4 degrees Celsius), while the average temperature during the summer months (June to August) ranges from the mid-50s to mid-80s Fahrenheit (13 to 29 degrees Celsius).

However, it's worth noting that climate patterns can vary from year to year, and extreme weather events like droughts or heatwaves can occur.

Floods

Floods are the most prevalent hazard in the United States. A flood is defined as "two or more acres of dry land, or two or more properties, that are covered by water temporarily." There are three types of flooding that occur in Campbell County: river flood, inland (or sheet) flooding, and flash floods.

- A **river flood** occurs when water levels rise over the top of riverbanks due to excessive rain or persistent thunderstorms over the same area for extended periods of time.
- **Inland flooding**, or sheet flooding, occurs when moderate precipitation accumulates over a large area over several days, with periods of intense precipitation over a short period.
- **Flash floods** are usually characterized by raging torrents after heavy rains that rip through riverbeds and urban streets. A flash flood is caused by heavy or excessive rainfall in a short period of time, generally less than six hours.

Residents living in flood zones should be informed of the risks. During the planning process, CCFD must consider station location and relocations in relation to flood zones. Flood zone and flood insurance information should be part of the public education process to ensure flood awareness and actions residents need to take to ensure readiness.

During a flood event, CCFD personnel may respond to incidents that may involve water, possibly requiring intervention by specialty-trained technical rescue teams. In addition, after the flood, EMS-related incidents will increase as injuries and medical conditions occur. The following figure is a summary of flood zone risks.

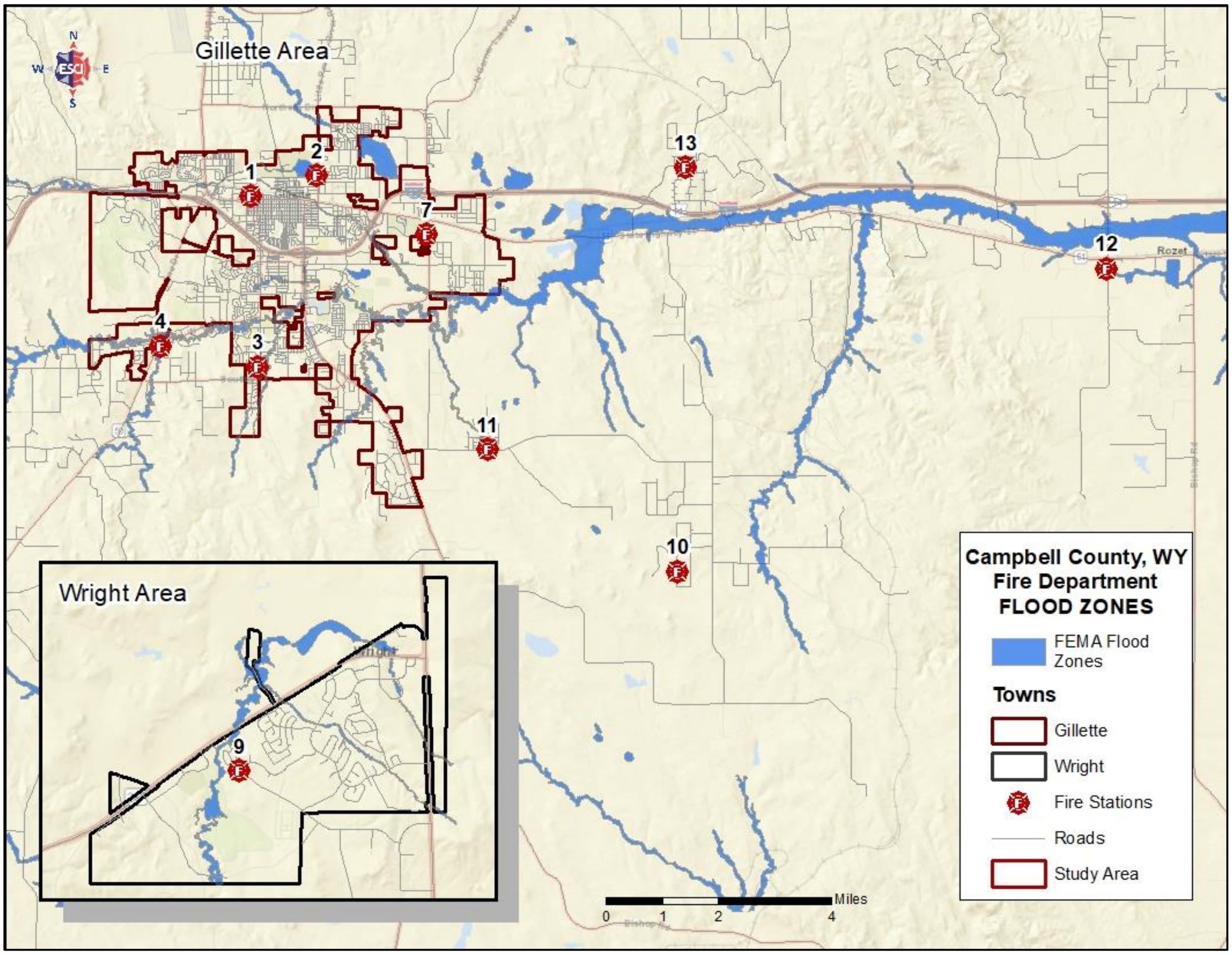
Figure 99: Summary of Flood Zone Risks

Zone	Risks
A Zone **AE Zone** **AO Zone**	• High Special Flood Hazard Area (SFHA) • Flood-prone building codes apply • Flood insurance is mandatory for most mortgage holders • A Zone: 100-year floodplain, with no Base Flood Elevations (BFEs) determined • AE Zone: 100-year floodplain, with Base determined • AO Zone: 100-year floodplain with sheet flow, BFEs determined
B, C, and X	Less than 1% chance of flooding each year
D	Possible but undetermined flood hazards
VE Zone, V1-V30	• High Special Flood Hazard Area (SFHA) • Flood-prone building codes apply • 100-year floodplain with wave action, no base flood elevation determined

Flooding hazards are the greatest in Gillette and Wright. The overall impact of flooding is not limited to the areas in the following figure, although the most significant impact on life and property is shown in the following figure. Other flooding hazards will be in the areas of drainages that feed the Little Powder River and Belle Fourche River. CCFD does not support a water rescue response, although due to the frequency of flooding hazards, the risk of this event is less than other risks the CCFD faces.

The following figure shows Campbell County in relation to the 100-year floodplain.

Figure 100: FEMA 100-Year Floodplain in Campbell County



Thunderstorms/Hail

The National Weather Service defines a severe thunderstorm as "a storm that has winds of at least 58 mph (50 knots), and/or hail at least 1-inch in diameter." Severe thunderstorms also can be capable of producing a tornado. Straight-line winds are often responsible for wind damage associated with a severe thunderstorm. Downbursts or microbursts are examples of damaging straight-line winds. Wind speeds in some of the stronger downbursts can reach 100 to 150 miles per hour.

Severe thunderstorms produce precipitation in the form of irregular pellets or balls of ice that combine and fall with rain. The size of hailstones is a direct correlation of the severity and size of the storm.

High-velocity updraft winds are required to keep hail in suspension in thunderclouds. Generally, the higher the strength of the updraft, the longer the suspension time and hailstone size. Due to the unpredictable nature of hailstorms, it is impossible to determine the exact area of their future occurrence. Thus, all of Campbell County is equally subject to thunderstorms, with accompanying lightning and hail. Large-size hail would cause major impacts to the community, causing severe roof damage and serious risk of injuries.

Tornado/Severe Winds

A tornado is defined as a rapidly rotating vortex or funnel of air extending groundward from a cumulonimbus cloud. Most of the time, vortices remain suspended in the atmosphere. Produced from powerful thunderstorms, tornadoes can cause fatalities and devastate neighborhoods in seconds. A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground, with winds that can reach 300 miles per hour. A total of 8 historical tornado events that had recorded magnitude of 2 or above found in or near Campbell County.[39]

Figure 101: Tornado Intensity, Enhanced Fujita Scale[40]

Designation	Wind Speed, mph	Typical Damage
EF-0	65–85	Minor or no damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF-0.
EF-1	86–110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	111–135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3	136–165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations are badly damaged.
EF-4	166–200	Devastating damage. Well-constructed and whole frame houses completely leveled; cars and other large objects thrown and small missiles generated.
EF-5	> 200	Extreme damage. Strong-framed, well-built houses leveled off foundations are swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately 1 mile (1.6 km).

[39] *Natural Disasters and Weather Extremes and Historic Tornado Events, Campbell County WY. Retrieved from: http://www.usa.com/campbell-county-wy-natural-disasters-extremes.htm.*

[40] *The Enhanced Fujita Scale, complied from multiple sources, Wikipedia. https://en.wikipedia.org/wiki/Enhanced_Fujita_scale.*

Severe Winter Storms

Severe winter weather can be a variety of precipitation that forms at low temperatures such as heavy snowfall, sleet, or ice. Many winter storms give rise to exceptionally heavy rain and widespread flooding. Conditions worsen if the precipitation is frozen. The biggest concern to the planning area is maintaining power to structures, as winter weather may cause disruptions. The other concern is the citizen's inexperience in preparing for, and driving in, severe winter weather events. There is always the risk of low temperature and wind chill from an EMS standpoint in terms of reduced body temperature and frostbite.

Technological Hazards

Many of the technological hazard risks can be classified as critical infrastructure. For the CCFD, there are several infrastructure systems evaluated. Typical types of technological hazards are listed below.

- Airplane Crash
- Communications failure or cyber-Incident
- Dam/Levee Failure
- Fire or Explosion
- Hazmat/CBRNE Release
- Industrial/Mine Incident
- Infrastructure failure
- Medical Emergency
- Pipeline Emergency
- Power Failure
- Structure Collapse
- Technical Rescue
- Train Derailment
- Urban Conflagration

Communications/Infrastructure Failure

Infrastructure is defined as the basic facilities and services needed for a community. Campbell County infrastructure includes roads, wastewater treatment plants, water and wastewater pipes, power plants, electrical lines, bridges, an airport, railroads, and schools. Infrastructure also includes telecommunications equipment, which, if impacted, may cause a communications failure. A communications failure is the interruption or loss of communications systems, including transmission lines, communications satellites, and associated hardware and software necessary for the communications system to function. It can include telecommunications, radio, and information technology failures. A communications failure may be the result of an equipment failure, human act (deliberate or accidental), or the result of another hazard event.

Nearly every aspect of modern life is dependent on digital infrastructure. A communications or infrastructure failure can impact critical infrastructure services, such as emergency services, utility services, water services, and telecommunications. Failures can result in a 911 or emergency warning system failure, a delay of response times by emergency service providers, and has the potential to impact the entire community.

Cyber Infrastructure Incidents

Cyber infrastructure includes electronic information and communications systems, and the information contained in those systems. Computer systems, control systems such as Supervisory Control and Data Acquisition (SCADA) systems, and networks such as the Internet are all part of cyberinfrastructure.[41] , Effectively securing the Nation's critical infrastructure requires investments in network resiliency as well as cyber infrastructure protection because of the pervasiveness of information technology (IT) and cyber networks systems in nearly every aspect of society. As all levels of government now rely on cyber networks and assets to provide national security, public safety, and economic prosperity, their operations depend on information systems that are maintained, protected, and secured from exploitation and attack.

Dam Inundation

There are 163 dams located in Campbell County. Similar to the flood inundation hazard, there is a limited impact from dams in or upstream of the CCFD. Most of the dams in Campbell County are used to create stock or small fishponds. However, one dam located in Westside is rated as having a high hazard potential[42]. Dams assigned high hazard potential classification are those where failure or failed operation will probably cause loss of human life. This dam is privately operated and currently has an emergency action plan.

Of the remaining dams, there are three that are rated as significant. Significant means those dams where failure or failed operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be in areas with moderate population and considerable infrastructure.

Based on these dam locations and the local flood plains (see flood section) for CCFD, the dam inundation hazard for the jurisdiction rates lower in the rank of other hazards due to the rate of occurrence and impact on the jurisdiction.

The following figure shows the locations of dams in Campbell County.

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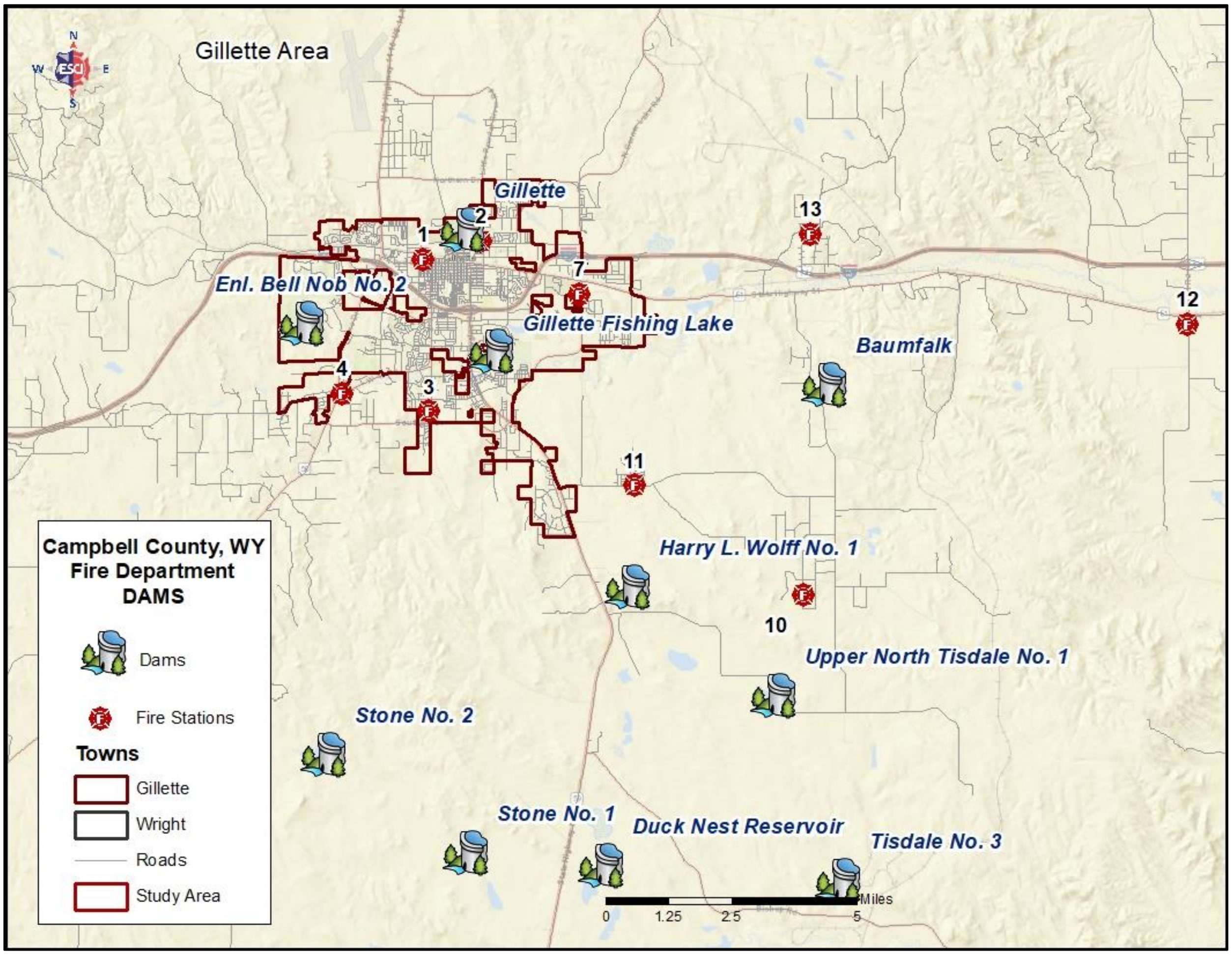
[41] *National Infrastructure Protection Plan (NIPP), 2016*
[42] *https://nid.usace.army.mil/#/dams/system/WY02505/inspections*

Figure 102: Dam Locations in Campbell County



Fire or Explosion

Fire is "a rapid oxidation process, which is a reaction resulting in the evolution of light and heat in varying intensities." An explosion is "the sudden conversion of potential energy (chemical or mechanical) into kinetic energy with the production and release of gases under pressure, or the release of gas under pressure. These high-pressure gases then do mechanical work such as moving, changing, or shattering nearby materials."

Fires are most likely to occur in residential structures due to careless acts involving cooking or smoking. The frequency of fires or explosions in large or high-risk structures is low due to fire-resistive construction and other fire protection systems; however, the potential impact may be serious. The full involvement of these structures is rare but may require special extinguishment techniques or the use of mutual aid from neighboring communities. An urban conflagration fire is a fire where multiple buildings or structures are involved. The risk of an urban conflagration in Campbell County is unlikely, but the potential impact could be substantial.

Hazardous Materials Release

Hazardous materials mean a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law (49 U.S.C. 5103). The term includes hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table[43], and materials that meet the defining criteria for hazard classes and divisions in part 173 of that subchapter.

A release of hazardous materials can occur throughout Campbell County, either during transport or while in production, use, packaging, or storage in a fixed facility. Thus, an incident involving hazardous materials could occur at any fixed site, including industrial, commercial, public, or residential locations.

A release could also occur along any transportation route. In Campbell County, the greatest potential for a release over-the-road transportation would be along the primary transportation corridors— Highways 50, 51, 59, 387, and 90. The greatest potential for a release during rail transportation would be along the route of the Burlington Northern Santa Fe (BNSF) line that runs east-west and roughly follows Interstate 90 corridor. A release of hazardous material could also occur along the route of any of the gas transmission, distribution, or service lines that lie underground throughout Campbell County.

Medical Emergency

A medical emergency usually involves an emergency medical services (EMS) response, i.e., pre-hospital medical care, typically delivered on-site by trained specialists, with transport by ground ambulance. Common responses include sick calls, vehicular incidents, difficulty breathing, injuries due to trauma, and heart attacks. The number of patients is usually small, and symptoms are within the capabilities of first arriving units. Some calls require only first aid; others require basic life support (BLS) or advanced life support (ALS). Overall, EMS responses accounted for over 47.7% of all CCFD calls for service during the 2018-2022 time period.

Mass casualty trauma calls involve multiple patients and require additional units. Mass casualty responses are most often associated with commercial bus, aircraft, or passenger train crashes; release of hazardous materials in a congested area (including a deliberate chemical attack); or evacuations of schools, office buildings, shopping centers, hospitals, or other health care facility. A mass casualty incident would cause minor to major impacts on the community; even though that type of incident is rare, the number of students and attendees during college game days make this a significant threat to life. On the other hand, medical emergencies are highly likely to occur, with a limited to minor impact on the community.

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[43] *49 CFR 172.101*

Power Outage

A power outage is defined as any interruption or loss of electrical service caused by disruption of power transmission, which may be the result of an accident, sabotage, natural hazards, or equipment failure. A significant power failure is defined as any incident of a long duration, which would require Campbell County to provide food, water, heating, cooling, or shelter.

Power outages in Campbell County are usually localized and the result of a natural hazard involving high winds and or ice storms. As days get warmer in summer months, temperatures rise, and demand for energy on the grid will increase, therefore increasing the vulnerability of the power providers in Campbell County. An extended power outage could become a cascading event that may cause impacts from extreme heat.

Structural Collapse/Technical Rescue

Structural collapse hazards are predominantly a problem in mature communities where several large structures predating modern building codes (built before 1970) are still in use by the public, or conversely, abandoned buildings or buildings under construction that have not been secured. A structural collapse usually occurs when a building or structure collapses due to engineering or construction problems, metal fatigue, changes to the load-bearing capacity of the structure, human operating error or intentional act, or other causes such as severe weather. Other types of technical rescue include the specialized rescue of victims from vehicles, elevators, rising water, confined spaces, elevated spaces (high-angle), or similar environments.

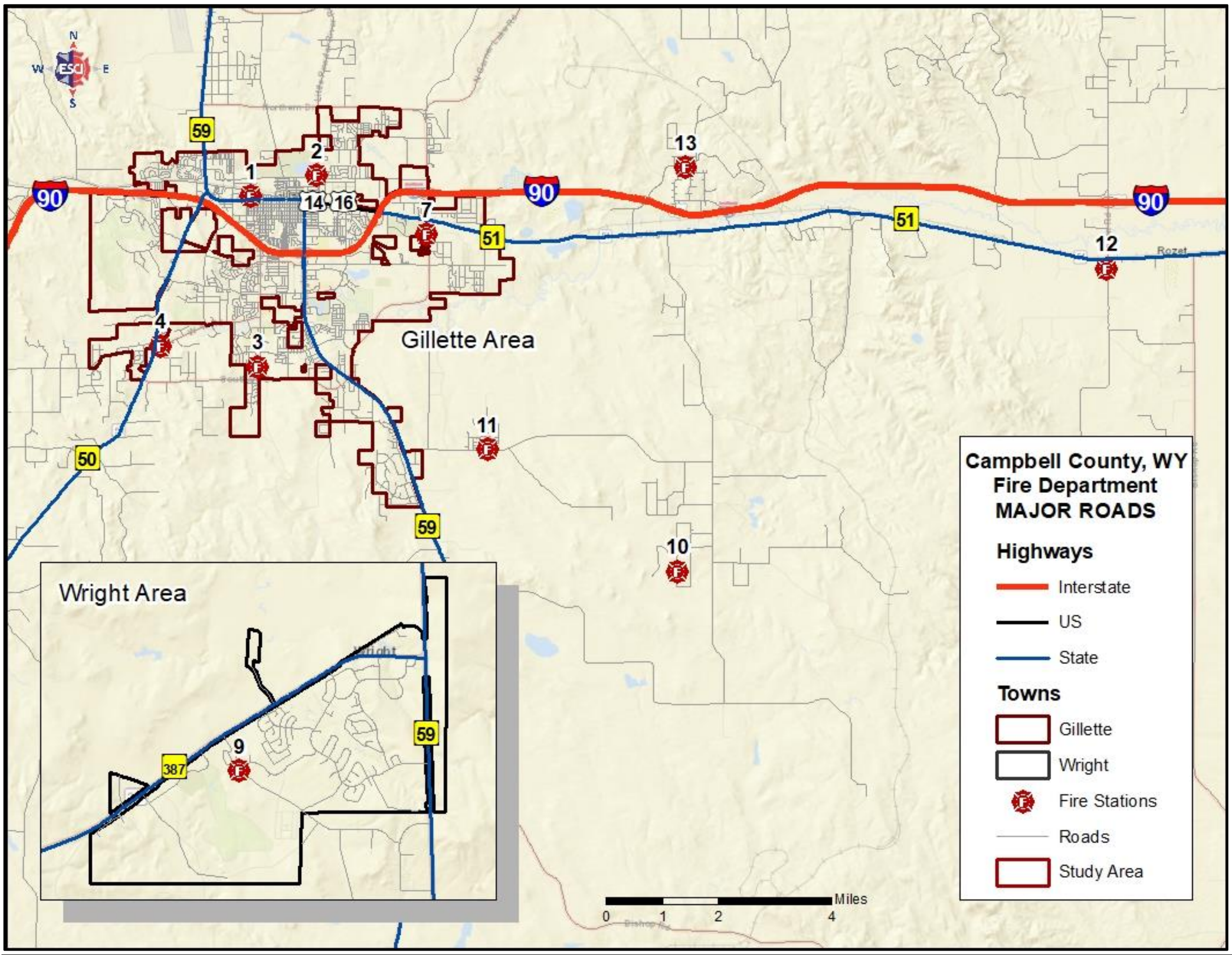
Transportation Corridors

CCFD has transportation routes that increase the potential for accidents and hazardous material spills. Interstate 90 is a primary route for travelers and the transportation of products across Campbell County. Travel on this interstate and the other multiple state highways will likely remain the same, except for the daily increase in vehicles. These routes carry hazards in terms of flammable and combustible liquids and toxic chemicals in large quantities. CCFD possesses the ability to respond to most hazardous material incidents. Accidents involving dangerous materials are rare but may occur on this route and have the potential for severe damage. In addition, vehicle accidents are common, and the ability to respond with the needed equipment for the extrication of victims is essential for CCFD. These high-speed roadways are an additional safety exposure for emergency workers.

The organization is susceptible to heavy vehicle and machinery rescue from different sources. These sources include commercial vehicle crashes on the highways, rail, mining, and agricultural accidents. Also, as the community experiences residential growth, the agricultural influence may decrease over time. However, agriculture accidents trapping persons in equipment will continue to be a service demand. The ability to extricate individuals from farming implements requires equipment and specialized training. CCFD maintains several technical rescue skills like trench and confined space. However, CCFD should consider adding heavy machinery rescue to reduce the reliance on other resources.

The following figure shows the locations of major roadways in Campbell County.

Figure 103: Major Roadways in Campbell County

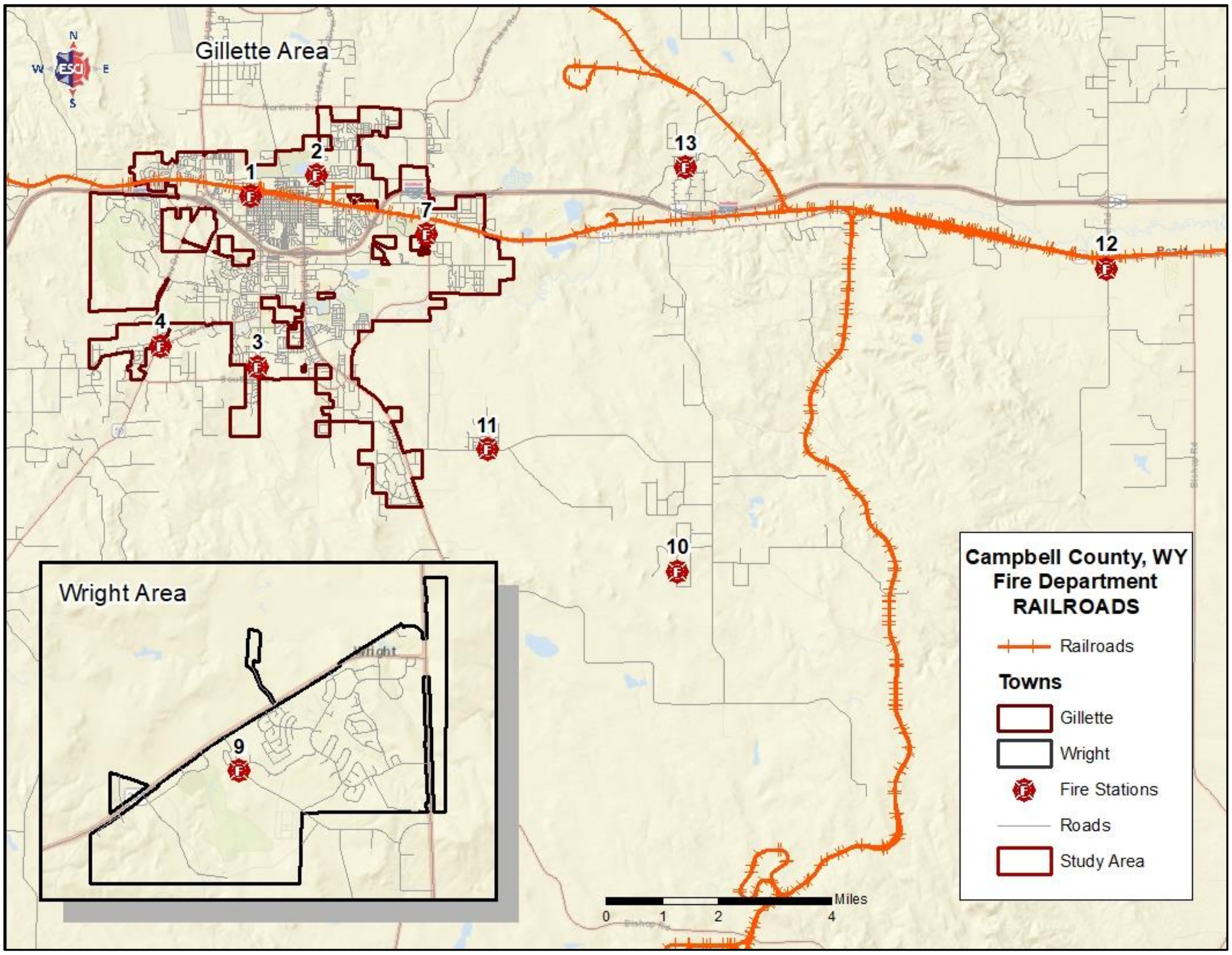


The Burlington Northern Santa Fe (BNSF) rail line runs east-west, dividing the service area. The rail line runs through the city of Gillette. According to the Association of American Railroads[44], coal is the number one commodity transported for materials originating in Wyoming, followed by other products, such as glass, stone, and farm products. Therefore, this rail line impacts emergency services by providing heavy extrication, hazardous material release, and response delays.

The following figure shows the locations of major railways in Campbell County.

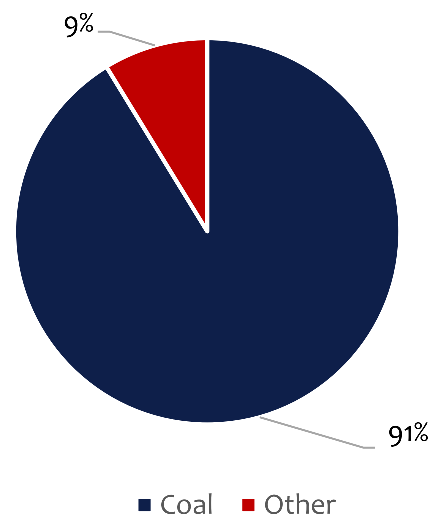
[44] *Colorado Freight by Railroads, Association of American Railroads, 2021 Retrieved at: https://www.aar.org/data-center/railroads-states/*

Figure 104: Major Railways in Campbell County



The following figure illustrates that most commodities carried on the rail system through CCFD are coal. As the nation's dependence on this resource changes, so will the hazard threat for CCFD. The second most common commodity transported by rail is farming products, which will likely become the number one commodity if coal is phased out of use. Along with the railroad being present in Gillette comes a concern of delayed response while crossing the railroad tracks. Gillette has three roads that either go over or under the tracks. Therefore, limited access should be considered when planning response plans.

Figure 105: Percentage of Commodities by Rail



Fixed Facility Target Hazards

A **target hazard** is any location at which there is a great likelihood of loss of life or property. These locations may require greater numbers of emergency response resources during an emergency. CCFD has identified several buildings to list as target hazards, e.g., places of public assembly, schools and childcare centers, medical and congregate-care facilities, residential care facilities, multi-family dwellings, and high-rise office buildings, and those that, if damaged or destroyed, would have a significant impact on the community. Responses to target hazards are expected to require a significant number of resources during an incident.

Assessing the risk of fixed facilities is vital because emergencies can occur anytime and without warning. Therefore, preplanned emergency response is crucial to ensure the safety and well-being of patients, the workforce, and visitors. In addition, preplanning emergency response in various settings is essential to ensure that emergency responders can respond quickly, effectively, and safely to any emergency. Locations such as hospitals, schools, churches, and other public places should have a well-planned response plan, rehearsed regularly, and updated to ensure its effectiveness. Such measures can save lives, minimize injuries, and protect the safety of all involved in emergencies.

Hospitals/Care Facilities

Gillette is an essential hub for the energy industry, and the hospital plays a critical role in providing healthcare services to workers in the industry. Therefore, having a preplanned response can help the hospital remain a resilient resource for the community. However, these facilities can also be a target for extremist attacks, and the CCFD should be aware of the layout and critical infrastructure needed to keep the hospital operational.

Responding to fires or emergencies at hospitals can be particularly challenging for fire departments due to hospital buildings' unique features and functions and potential risks to patients and staff.

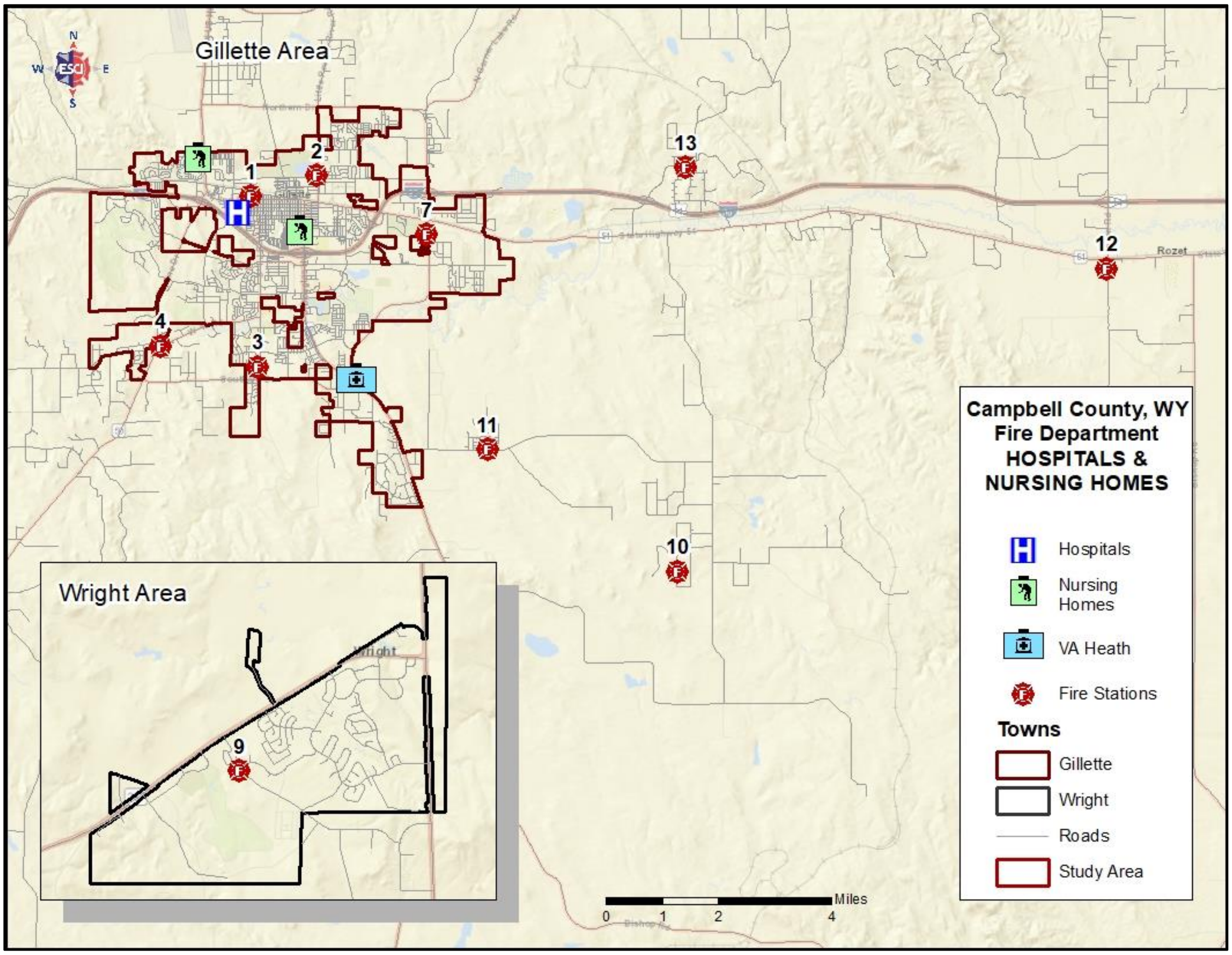
Some of the challenges that fire departments may face when responding to hospitals include the following:

- Complex building layouts: Hospitals are often large, complex buildings with multiple floors, wings, and specialized areas. This can make it difficult for firefighters to locate the source of the emergency and access it quickly.
- Life support equipment: Hospitals often have many patients dependent on equipment such as ventilators, oxygen tanks, and dialysis machines. These devices can be challenging to move, and their failure could put patients at risk.
- Patients with mobility issues: Many hospital patients have mobility issues, making evacuating quickly in a fire or emergency difficult.
- Containment of infectious diseases: Hospitals may have patients infected with contagious diseases, which can pose a risk to firefighters and other responders.
- Limited access: Hospitals often have limited access points, making it difficult for fire department vehicles and equipment to reach the building quickly and easily.

To overcome these challenges, fire departments typically work closely with hospital staff to develop emergency response plans that consider the unique features of the building and the needs of patients and staff. This should involve conducting regular training and fire drills, ensuring that all safety equipment is well-maintained, and establishing clear emergency plans between the hospital and the fire department.

The following figure shows the locations of hospitals and care facilities in Campbell County.

Figure 106: Hospital/Care Facilities in Campbell County



Churches

Effective emergency response planning for churches should involve a comprehensive risk assessment to identify potential hazards, developing emergency response procedures and protocols, training staff and part-time employees on those procedures, establishing communication channels to alert and inform those on the premises during an emergency, and practicing emergency response scenarios regularly to ensure preparedness. By prioritizing emergency response planning, churches can better protect their congregants and minimize the potential impact of emergencies on their communities.

Responding to church emergencies often presents unique challenges for fire departments due to the nature of church buildings and the potential risks to congregants and staff. Some of the challenges that fire departments may face when responding to churches include the following:

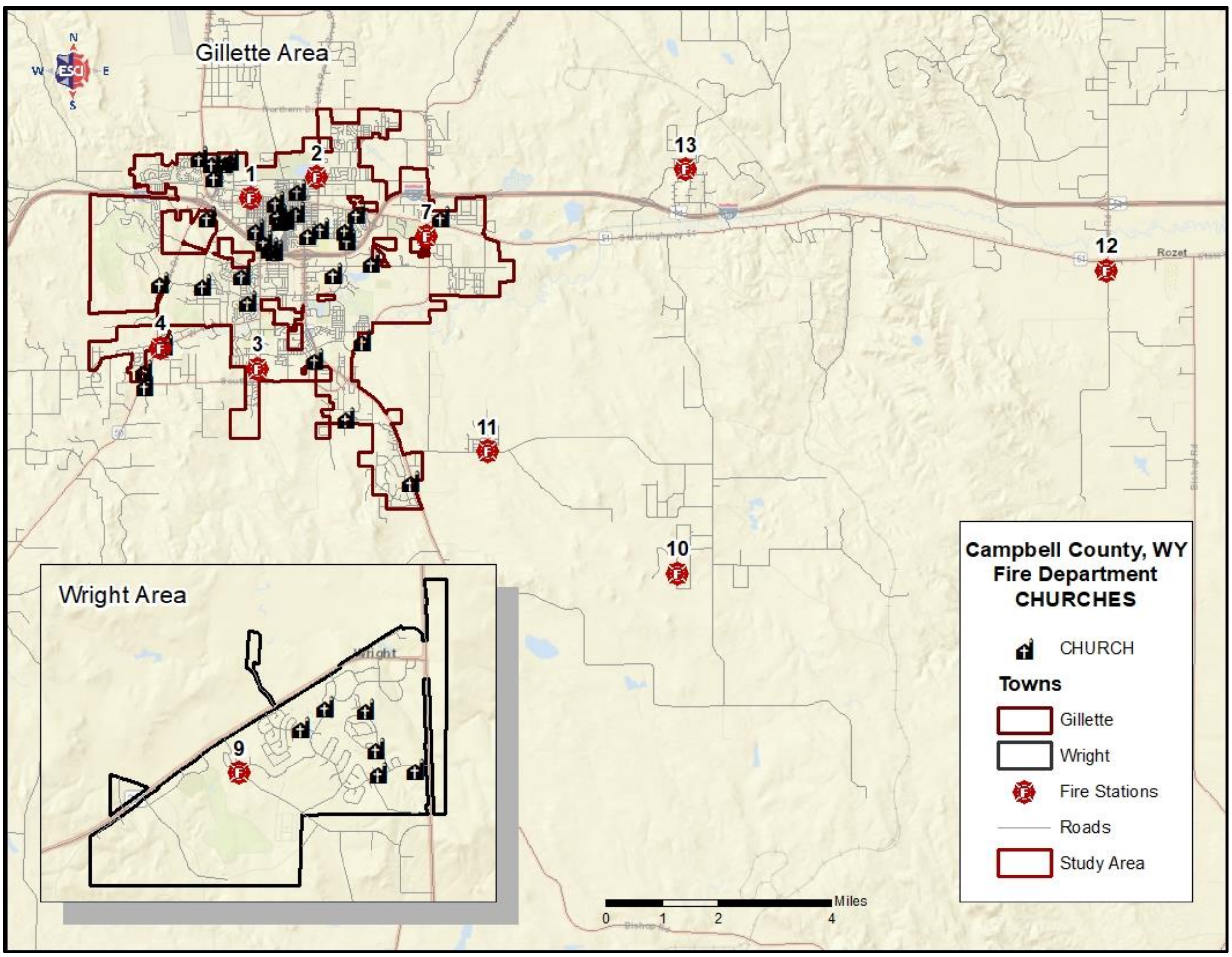
- Unique building designs: Churches often have unique architectural features and designs, making it difficult for firefighters to navigate the building and locate the source of an emergency.
- Limited access: Churches may have restricted access points or narrow staircases, making it difficult for fire department vehicles and personnel to reach areas of the building quickly and easily.

- Large crowds: Churches may have large congregations or visitors attending services, making evacuations more complex and requiring additional resources.
- Limited fire protection systems: Many older churches may not have modern fire protection systems installed, such as fire sprinklers or smoke alarms, which can increase the fire risk and make it more difficult to contain.
- Historical and cultural significance: Some churches may have significant historical or cultural value, which can complicate fire response efforts due to the need to balance preservation with emergency response.

To address these challenges, fire departments may work closely with church staff to develop emergency response plans that consider the unique features of the building and the needs of congregants and staff. This may involve conducting regular fire inspections, ensuring all fire safety equipment is up-to-date and well-maintained, and establishing a clear communication plan between the church and the fire department.

The following figure shows the locations of churches in Campbell County.

Figure 107: Church Location in Campbell County



Schools

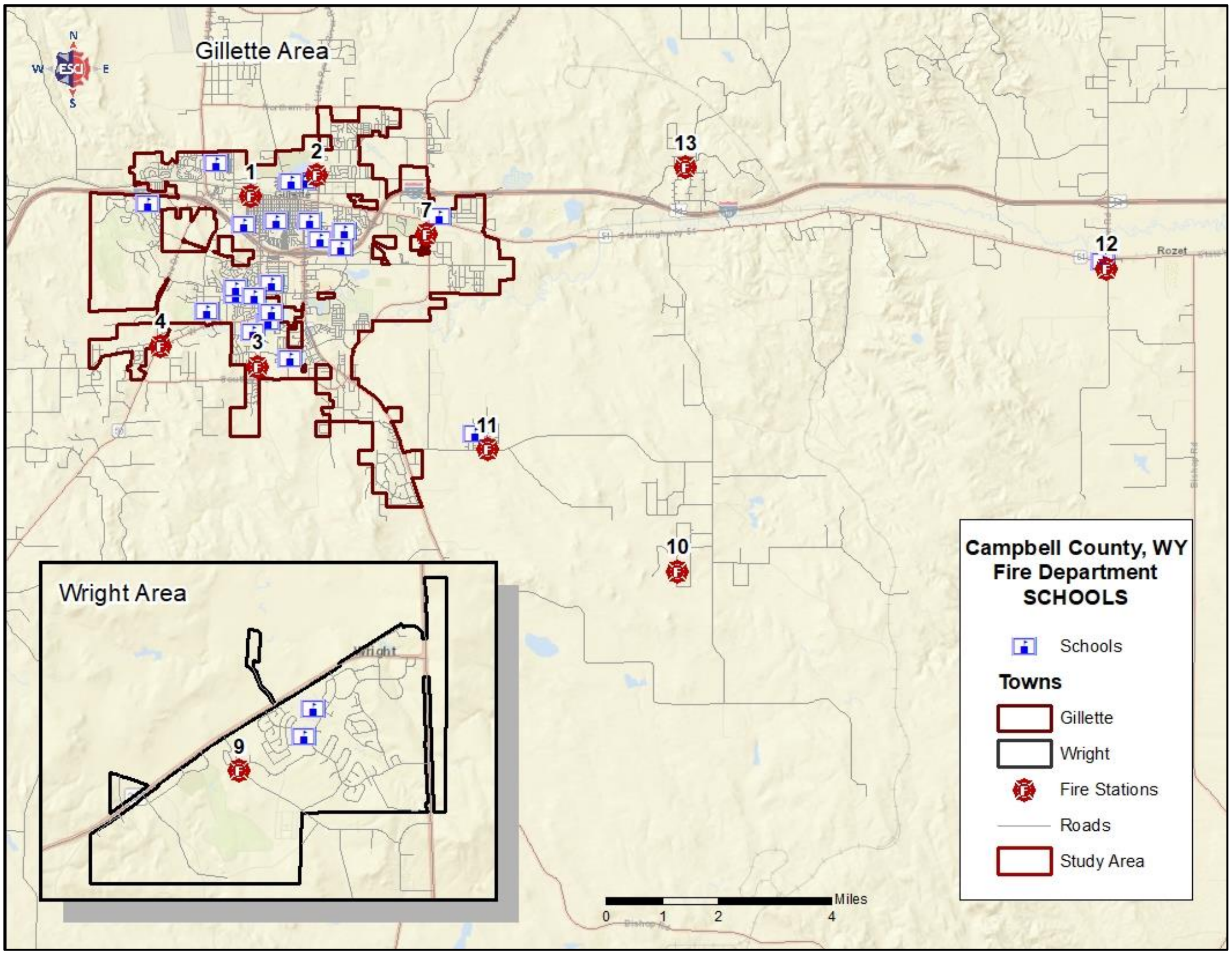
Fire departments can face unique challenges when responding to school emergencies, which are often large, complex buildings that house many people, including students, staff, and visitors. Some of the critical challenges that fire departments face when responding to schools include the following:

- A large number of people: Schools often have many people in the building, making it difficult to evacuate everyone quickly and safely during an emergency.
- Limited access: Schools may have limited access points, making it difficult for fire department vehicles, equipment, and personnel to reach portions of the building quickly.
- Unique building designs: Schools may have unique architectural features or building layouts, making it difficult for firefighters to navigate the building and locate the source of an emergency.
- Life safety issues: Schools may have a large number of children, some of whom may have mobility issues or special needs, which can make evacuation and rescue efforts more complex.
- Hazardous materials: Schools may have hazardous materials on-site, such as chemicals used in science labs or cleaning supplies, which can pose additional risks during an emergency.

Fire departments should work closely with school staff to develop emergency response plans that take into account the unique features of the building and the needs of students and staff. This may involve conducting regular lock-down training and fire drills, ensuring regular fire inspections, and establishing emergency plans between the school and the fire department for fire and other emergencies. Additionally, some schools should have fire suppression systems, such as sprinklers or fire alarms, to help detect and mitigate fires.

The following figure shows the locations of schools in Campbell County.

Figure 108: School Locations in Campbell County



Large Commercial Buildings

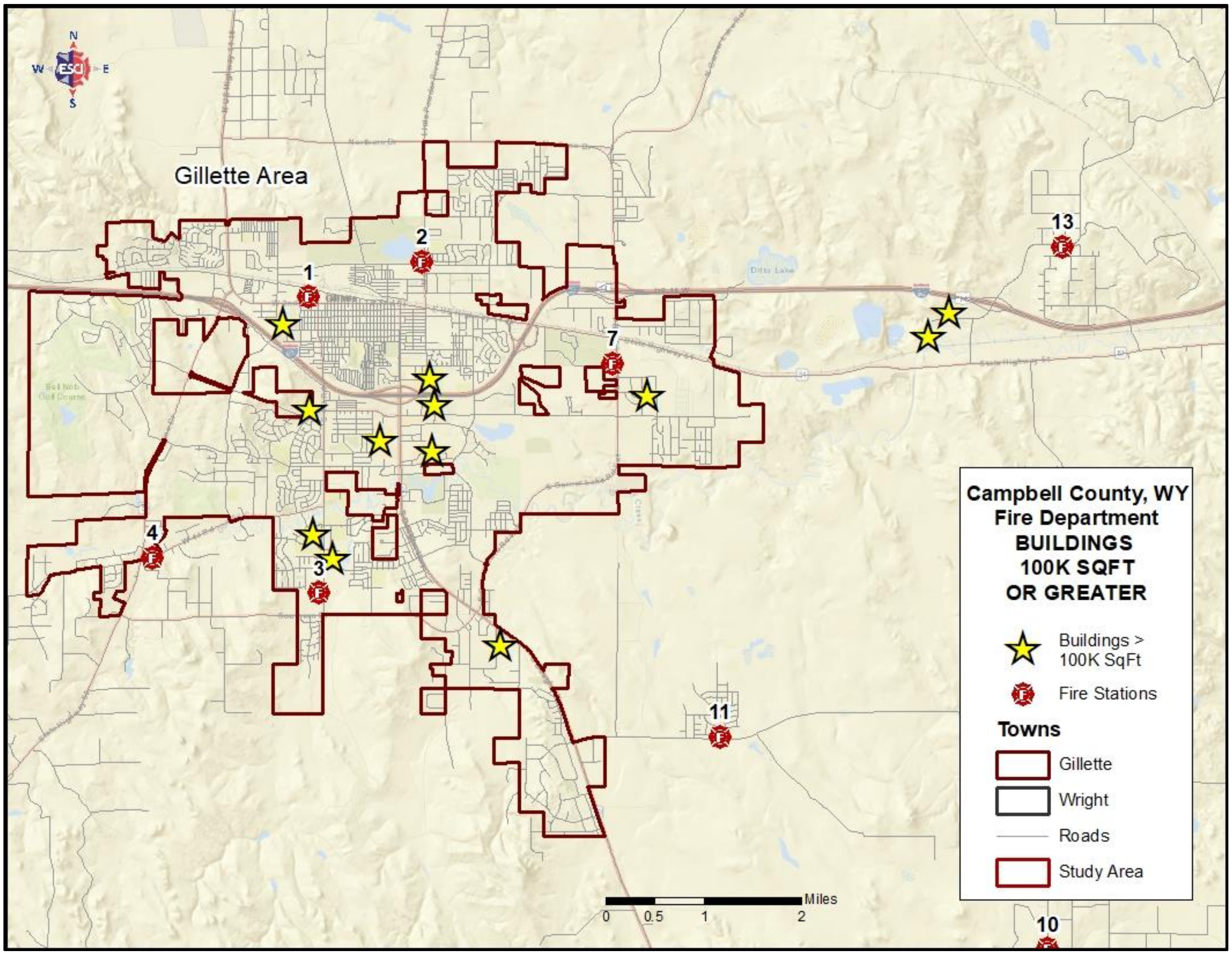
Responding to emergencies at large buildings, such as those that are 100,000 square feet or more, can pose unique challenges for fire departments. Some of the critical challenges that fire departments may face in these situations include the following:

- Large size: The sheer size of a 100,000-square-foot building can make it difficult for firefighters to quickly locate the source of an emergency, particularly if the building has multiple floors or sections.
- Fire spread: The size of the building and the presence of large open spaces can increase the risk of fire spread, making it more difficult for firefighters to contain the fire and prevent it from spreading to other parts of the building.
- Structural stability: large buildings may be more prone to collapse or structural damage during a fire or emergency, posing additional risks to firefighters and occupants.
- Limited resources: Responding to emergencies at large buildings may require a significant number of resources, including firefighters, equipment, and water. Fire departments may need to bring in additional resources from areas to manage the emergency effectively.

Fire departments usually create emergency response strategies that address the specific challenges posed by large buildings and tailor them to the occupants' needs. Additionally, some large facilities may have fire suppression systems, such as sprinklers or fire alarms, installed to aid in detecting and controlling fires. Ensuring all equipment is in good condition and up-to-date while creating effective emergency plans between the building owners or occupants and the fire department.

The following figure shows the locations of large commercial buildings in Campbell County.

Figure 109: Large Commercial Buildings in Campbell County



Human-Caused Hazards

Human-caused hazards result from people's actions, either accidental or intentional. Intentional acts are always deliberate; however, the intent may differ (e.g., a deliberate action may be planned, careless, reckless, or intended to cause harm). Likewise, the outcome may have unintended consequences in negligent or reckless acts or poorly designed and executed.

Terrorism

According to the Homeland Security Act of 2002, terrorism is defined as "activity that is dangerous to human life or potentially destructive of critical infrastructure or key resources." There are different types of terrorism defined by the motivation behind attacks. There are also different methods and tactics that terrorists use in their attacks, such as assassination, explosives, radiological threats, radicalization, chemical threats, biological threats, active shooters, infrastructure threats, arson, kidnapping, and cyber threats.

Although rare, it is necessary to account for human-caused risks. The highest risk for CCFD is a mass casualty incident. Due to the impact on life and the level of preparedness, this ranks highest on the human-caused hazard list. The risk of mass casualty is more common, either from trauma or medical. Both scenarios can impact a response system even for the most prepared organizations. The drawdown of resources and available capacity of treatment facilities creates a high risk for the jurisdiction.

Based on ESCI's assessment model, the following table shows the relative risk of these human-caused hazards.

Figure 110: Risk Analysis Model- Human-Caused

Event	Probability	Community Impact			Mitigation Capacity			Risk
	Likelihood this will occur	HUMAN IMPACT	PROPERTY IMPACT	BUSINESS IMPACT	PREPAREDNESS	INTERNAL RESPONSE	EXTERNAL RESPONSE	*Relative Threat*
Bomb Threat	2	1	3	3	2	2	2	**27%**
Mass Casualty Incident (trauma)	2	3	1	3	1	2	1	**23%**
Mass Casualty Inc. (medical)	2	3	1	3	1	2	1	**23%**
Terrorism	1	4	3	4	3	3	3	**21%**
Hostage Situation	2	1	0	1	2	3	3	**21%**

County-Wide Hazard Risks

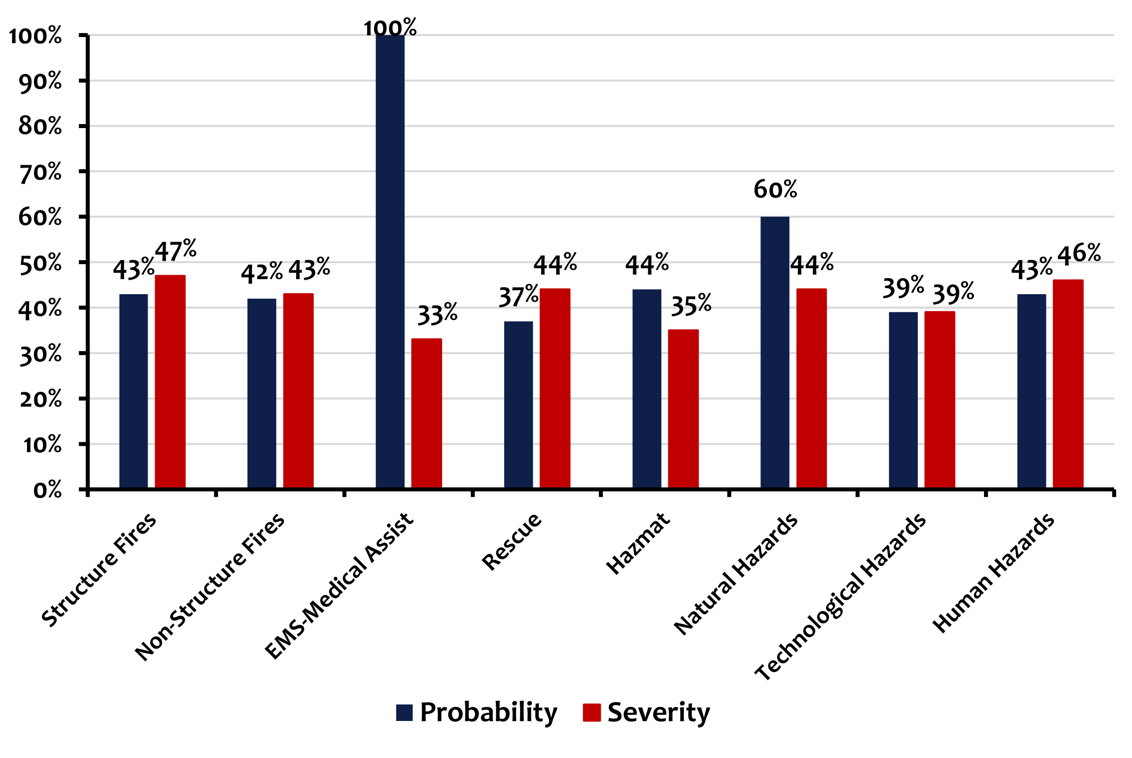
Much of Campbell County's unincorporated land is mainly zoned as low risk, while the City of Gillette contains the highest risk. The moderate and low-risk areas are shared across the county. Identifying potential risks in the CCFD's future assists in determining the impacts on the types of service and demand for service in the jurisdiction. As the jurisdiction continues to see a change in the areas, the impact of some risks could change dramatically. While CCFD cannot prevent all risks from occurring, as the initial response, CCFD will have to be prepared for the responsibility of the initial life safety, incident stabilization, and property conservation duties.

The City of Gillette is home to the Northeast Wyoming Regional Airport, which serves commercial airlines. Therefore, CCFD should work with the airport administration to plan for emergencies and consider the unique hazards of responding to a commercial airport.

Another response consideration for CCFD is the vast response area essentially serviced from two locations, Gillette, and Wright. Therefore, the need to travel long distances should be considered when considering response plans.

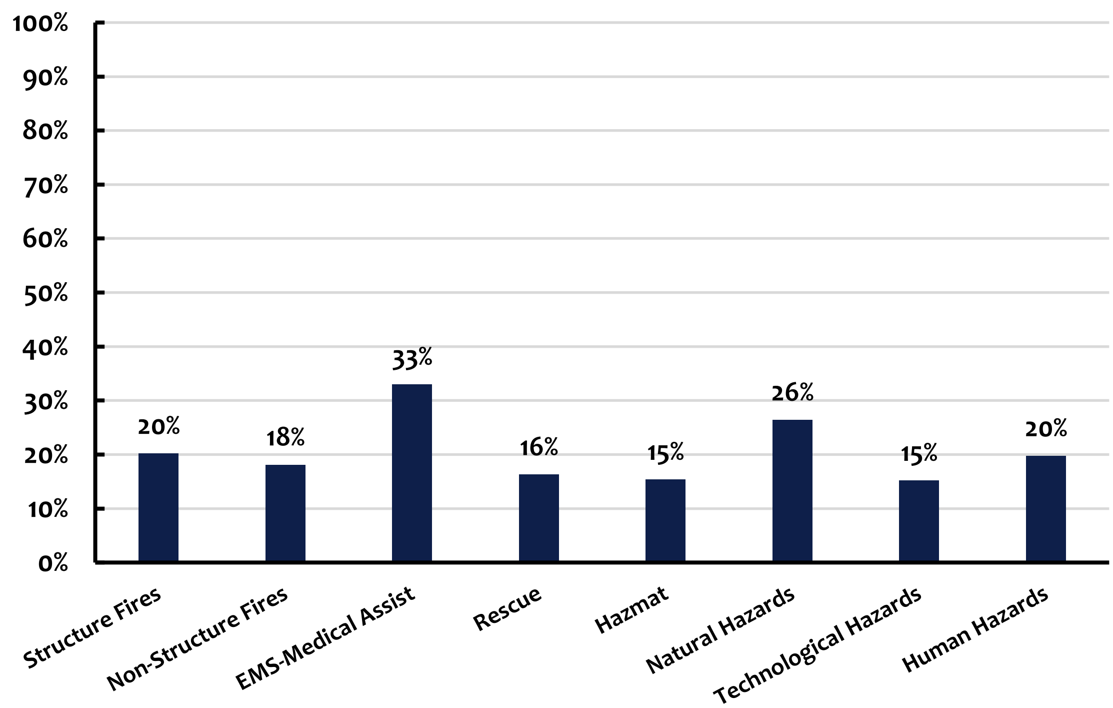
Campbell County is susceptible to hazards, both natural and technological/human-caused. Of the potential hazards that pose risk to the jurisdiction, this risk assessment identifies several because of the likelihood of everyday occurrence and/or potential consequences. EMS is ranked the highest community risk because of two primary factors—first, the human impact, and second, the probability. CCFD may also have extended response times to rural medical calls. In addition, risk is defined as the probability compared to the impact of an event; the following figure illustrates the comparison of those two factors across the eight event categories.

Figure 111: Hazard Specific Relative Probability and Severity



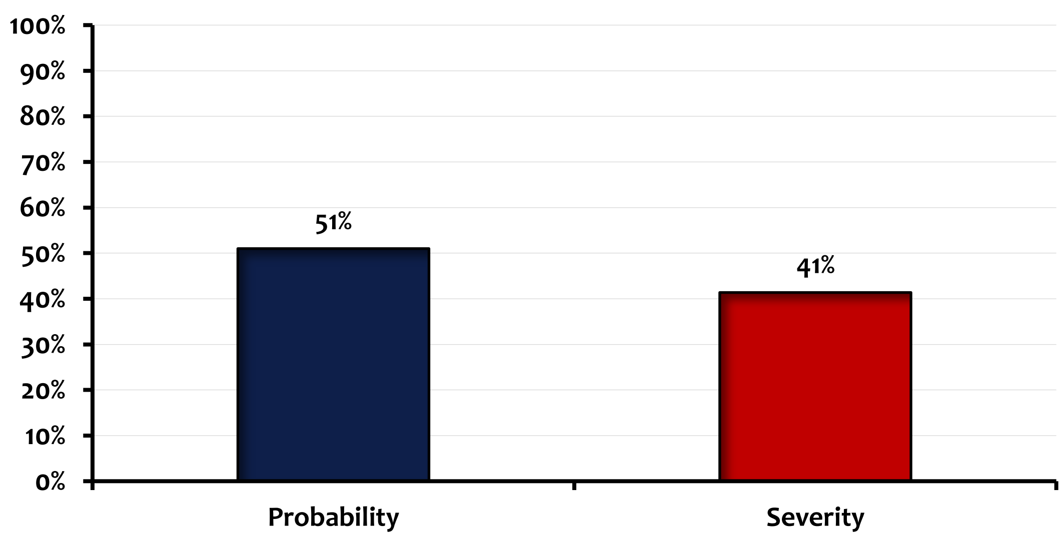
ESCI's community-wide risk analysis contains eight (8) categories of emergency events, under which 86 individual characteristics are evaluated and ranked based on event frequency, community impact, and mitigation capacity. The following table summarizes the emergency event characteristics and their relative threat index.

Figure 112: Relative Threat to the Community



As shown, when probability and impact are combined, EMS Medical Assist emergencies—pose the greatest relative risk potential within the CCFD service area, followed by natural hazards, structure fires, human hazards, and non-structure fires.

Figure 113: Relative Community Risk



As can be seen from the preceding figure, the overall probability of an incident occurring is moderate. The overall severity, or impact, of each incident type, is reduced by the high levels of CCFD mitigation efforts—pre-incident preparation and the capabilities of both internal and external resources. Put another way, the risk reduction and fire prevention efforts in the jurisdiction are reducing overall risk; however, there is still a moderate to high risk of an incident occurring within the jurisdiction, and when the fire department is called to respond, there is a high likelihood they are needed, and the severity of the incident warrants the response.

It is impossible to include or predict all aspects and indicators of hazards and risk. There are simply too many variables of weather, human behavior, and systems malfunction. Likewise, the potential impact on specific government entity-provided services may not be the same for all entities. Thus, it would not be unusual for CCFD to rank some hazards higher and others lower than the rankings provided by other local government entities.

In general, CCFD currently has properly trained and prepared personnel, plus well-maintained facilities and equipment, along with appropriate policies and plans to guide the organization in mitigating identified risks. They are currently able to provide appropriate levels of low-to moderate-risk response for the residential, industrial, and large commercial warehouse areas of the service area. As with most first responder agencies, there are opportunities for enhancements that will be discussed later in this report.

At-Risk Populations

The demographics of the population can affect the amount of service demand and the nature of risk within a community. In urban cities, several factors have been identified that place groups of people at risk. Reports by the U.S Fire Administration[45] and NFPA[46] has identified the groups that face a higher risk of being injured or killed in a fire as:

- Males
- Children under 5 years of age
- Older Adults over 65 years of age
- People with disabilities
- People with a language barrier
- People in low-income communities

According to the latest Census Bureau estimate, with exception of the male category listed above only a small number of the residents of the Campbell County service area are in one or more at-risk population groups. This segment of the population is more likely to use fire department services, especially emergency medical services (EMS), than other population groups.

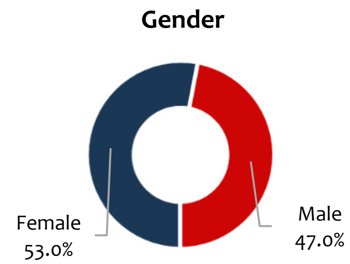
[45] *"Fire Risk in 2015," U.S. Fire Administration, September 2017, Volume 18, Issue 6; Retrieved from https://www.usfa.fema.gov/downloads/pdf/statistics/v18i6.pdf?utm_source=website&utm_medium=pubsapp&utm_content=Fire Risk in 2015&utm_campaign=RID*

[46] *http://www.nfpa.org/public-education/by-topic/people-at-risk/urban-fire-safety/reports-and-presentations*

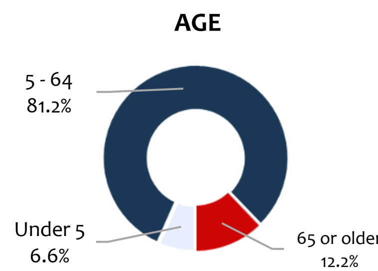
As discussed in the *Service Delivery and Performance* section, EMS incidents represent 47.7% of the total calls for service for the years 2018-2022. Older adults and individuals with lower incomes and no health insurance are more likely to use local EMS resources than individuals with health insurance and a personal physician. Further, quality of life issues and increased reliance on assisted living could affect service delivery and the number of resources required.

Selected demographics—age, sex, ethnicity, housing type, income level, primary language, education, health, and assessed property values—are shown in the following figures. Areas in blue are at lower risk, areas in yellow are at higher risk, and areas in red are at the highest risk.[47]

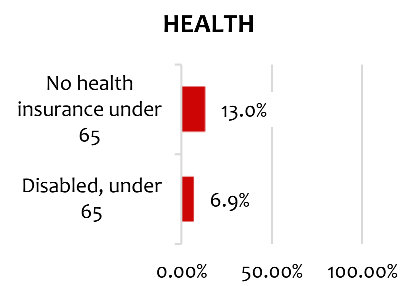
Gender: Males make up slightly less than half of the population; slightly more than half the population is female. Males, especially those under 25 YOA, are more prone to engage in risky activities and may require higher levels of emergency response. This is somewhat, but not completely, offset by complications during pregnancy. There is not a significant difference between the number of males and females living in Campbell County.



Age: Senior citizens can have difficulty escaping from fire due to physical limitations. Quality of life issues and increased reliance on assisted living could affect service delivery and the number of resources required due to an increase in service demand for emergency medical services. The very young also represent a vulnerable population, both regarding their ability to escape a structure fire as well as their susceptibility to serious medical ailments such as asthma, traumatic events, choking, or injury from vehicular accidents. The percentage of seniors and young children in Campbell County is a factor that could increase community risk and service demand in the service area.

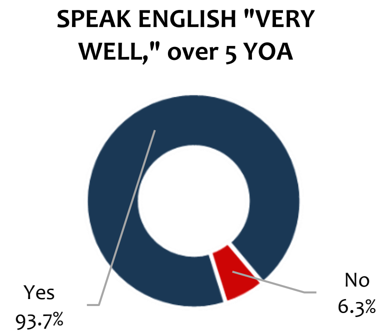


Disabilities: People living with a disability under 65 YOA may have difficulty or be incapable of self-preservation during an emergency. Thus, they may require a higher level of fire-rescue and EMS responses. Likewise, people under 65 years of age with no health insurance are more prone to chronic illness or exhibit poor physical condition simply because they do not seek treatment promptly. This, too, may lead to higher dependence on basic EMS care. Fortunately for Campbell County these populations are very low in percentage.

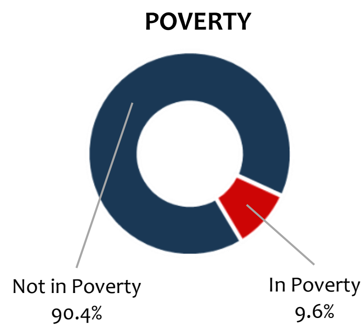


[47] *U.S. Census Bureau, Quick Facts and American Fact Finder. Retrieved from: https://www.census.gov.*

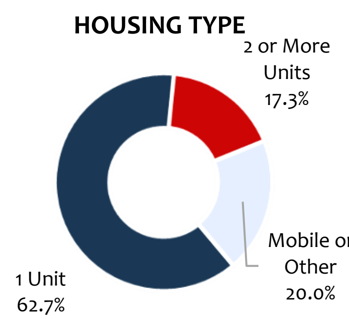
Language barrier: People may have cultural differences or language barriers that decrease the likelihood they would call for service or may affect their ability to communicate needs and concerns effectively. According to the NFPA, "Language barriers, cultural differences, and inexperience with unfamiliar home technologies are factors that mark the challenges of helping newcomers live safely from the threat of fire in the home."[48] By itself, speaking a language other than English at home does not directly contribute to difficulties in communicating with others; however, if a person has difficulty speaking English, it may contribute to negative outcomes during an emergency.



Low-income[49]: Likewise, low-income people are more at risk from fire or medical conditions due to age or condition of housing level, inability to pay for routine medical care, lack of medical insurance, and general health conditions. Sometimes, lack of access to transportation leads to increased use of care and transport. Those living below the poverty line are the most at risk. Low-income is often combined with other factors such as education, disability, and work status. In rural communities, low-income residents may live far from treatment centers and require extended response times.



Housing type: Although housing type is not included in the NFPA at-risk categories, certain housing types, such as older multi-family units and mobile homes pose a higher risk due to potential loss of life or lack of fire protection features.



Another at-risk population group not included in the NFPA report is the **transient population**—people that are not but are working, visiting, or passing through the service area. The department is often called to provide services for this population in addition to those offered to residents. While these people are in the service area, their needs must be considered when planning for emergency responses.

[48] *Serving immigrant and refugee populations, National Fire Protection Association, 2017. Retrieved from: https://www.nfpa.org/Public-Education/Campaigns/Fire-Prevention-Week/Teaching-FPW/Serving-immigrant-and-refuge-populations.*
[49] *Low-Income as designated by the U.S Census Bureau*

Risk by Land Use Designation

Future infrastructure requirements to sustain the growth in Campbell County will be critical to property owners and coincide with zoning, subdivision regulations, and higher property values. Infrastructure will include roads, bridges, sewers, water, and fire hydrants. When examining the zoning of a jurisdiction, additional considerations are the impacts that new development and changes to existing structures may have on emergency response capabilities.

The activities that occur within a building or on an undeveloped property can often be used to begin the process of risk classification. This is normally associated with the occupancy rating or classification for the intended use. The use of zoning maps can provide permitted use information for each parcel identified by land use designation. Vacant lots and open land are often identified as a much lower risk than commercial or industrial occupancies because open areas lack the people and processes associated with emergency incidents. Fires in commercial occupancies often lead to higher dollar loss than many residential properties, and the long-term income loss affects the people employed by the business when it is destroyed and usually generate higher risk classifications.

The following figure translates zoning to categories of relative fire and life risk.

Figure 114: Relative Fire and Life Risk Categories

Relative Risk Category	Zoning
Low Risk	Areas zoned and used for agricultural purposes, open space, and very-low-density residential use
Moderate Risk	Areas-zoned for medium-density single-family properties, small commercial and office uses, low-intensity retail sales, and equivalently sized business activities
High Risk	Areas zoned for higher-intensity business districts, mixed-use areas, high-density residential, industrial, warehousing, and large mercantile centers

The land use plan in Campbell County, Wyoming was established through a joint planning agreement among the county, the City of Gillette, and the Town of Wright in 2013. The plan was developed in accordance with Wyoming state law and updated to better reflect the needs of the community. The comprehensive plan and land use map, which were initially adopted in 1978 and subsequently revised in 1998, likely serve as the foundational documents for the land use plan in Campbell County. The plan and map provide a framework for how land should be used and developed throughout the county, including identifying different zones for residential, commercial, industrial, agricultural, and open space uses.

The Campbell County Planning Commission, in conjunction with the Comprehensive Plan Citizen Advisory committee, will likely recommend changes and amendments to the plan over time to ensure that it continues to reflect the changing needs and priorities of the community. These changes and amendments would be subject to review and approval by the relevant governing bodies, such as the county commission or city council.

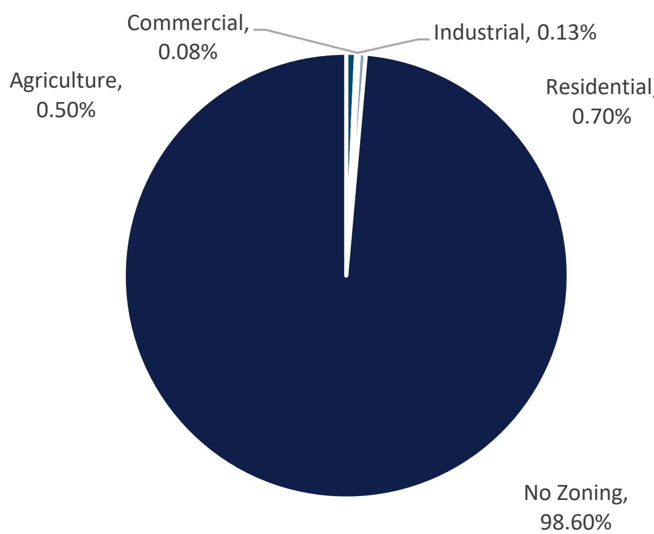
Overall, it appears that the land use plan in Campbell County is developed and revised through a collaborative process involving community stakeholders and the local government, and is intended to promote the health, safety, morals, and general welfare of the community.

Land Use Plan

Land use planning is the process of determining how land within a community should be used and developed over time. It typically involves zoning, which divides the land into different categories or zones, such as residential, commercial, industrial, agricultural, or open space. Each zone has specific regulations that govern what types of land use and developments are allowed, as well as standards for things like building height, setbacks, and parking.

The following figure shows the current land use by percentage throughout Campbell County.

Figure 115: Campbell County Current Land Use



In Campbell County, the land use plan was developed and implemented in collaboration with community stakeholders and interested parties. These plans are updated periodically to reflect changes in population, economic conditions, and other factors that impact land use. The last update was in 2013.

Some specific features of the land use plan in Campbell County include provisions for:

- Protecting natural resources, such as water, air, and wildlife habitats
- Preserving open space and recreational areas

- Encouraging economic development and job growth
- Promoting affordable housing and diverse residential options
- Balancing the needs of different land uses and minimizing conflicts
- Ensuring adequate infrastructure, such as roads, utilities, and public services

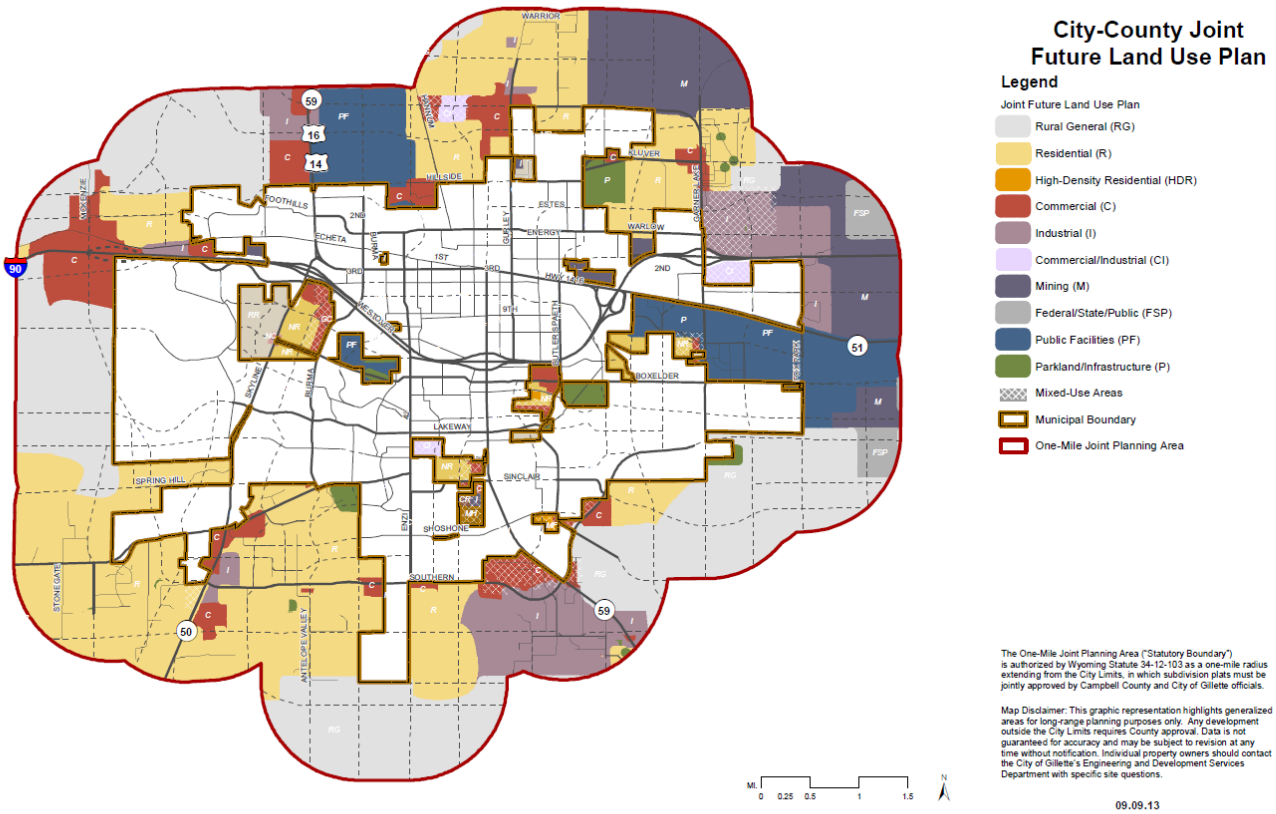
It's important to note that while ESCI can provide a general overview of land use planning practices, the specific details of the land use plan in Campbell County, the City of Gillette, and the Town of Wright can be found in the plan documents themselves. Based on the information provided, it appears that the City of Gillette has developed a separate comprehensive plan update that provides more specific guidance on land use and development within the city limits. This plan likely includes policies, programs, and project initiatives that are tailored to the unique needs and opportunities of Gillette.

The plan update, which was enacted in 2013, appears to be based on an analysis of key community issues, rather than a complete overhaul of the entire plan. This approach enables the city to respond to existing conditions and set precedent for new challenges and opportunities as they arise. Overall, it appears that the land use planning process in Campbell County, the City of Gillette, and the Town of Wright is designed to be collaborative, involving community stakeholders and government officials in developing and updating plans that reflect the needs and priorities of the local population.

The One -Mile Joint Planning Area ("Statutory Boundary") is authorized by Wyoming Statute 34-12-103 as a one-mile radius extending from the City Limits, in which subdivision plats must be jointly approved by Campbell County and City of Gillette officials. Most importantly the plans include an adopted City-County Future Land Use Plan Map for these Joint Planning Areas.

The City-County Future Land Use Map for the Joint Planning Areas is shown in the following figure.

Figure 116: City-County Joint Future Land Use Plan



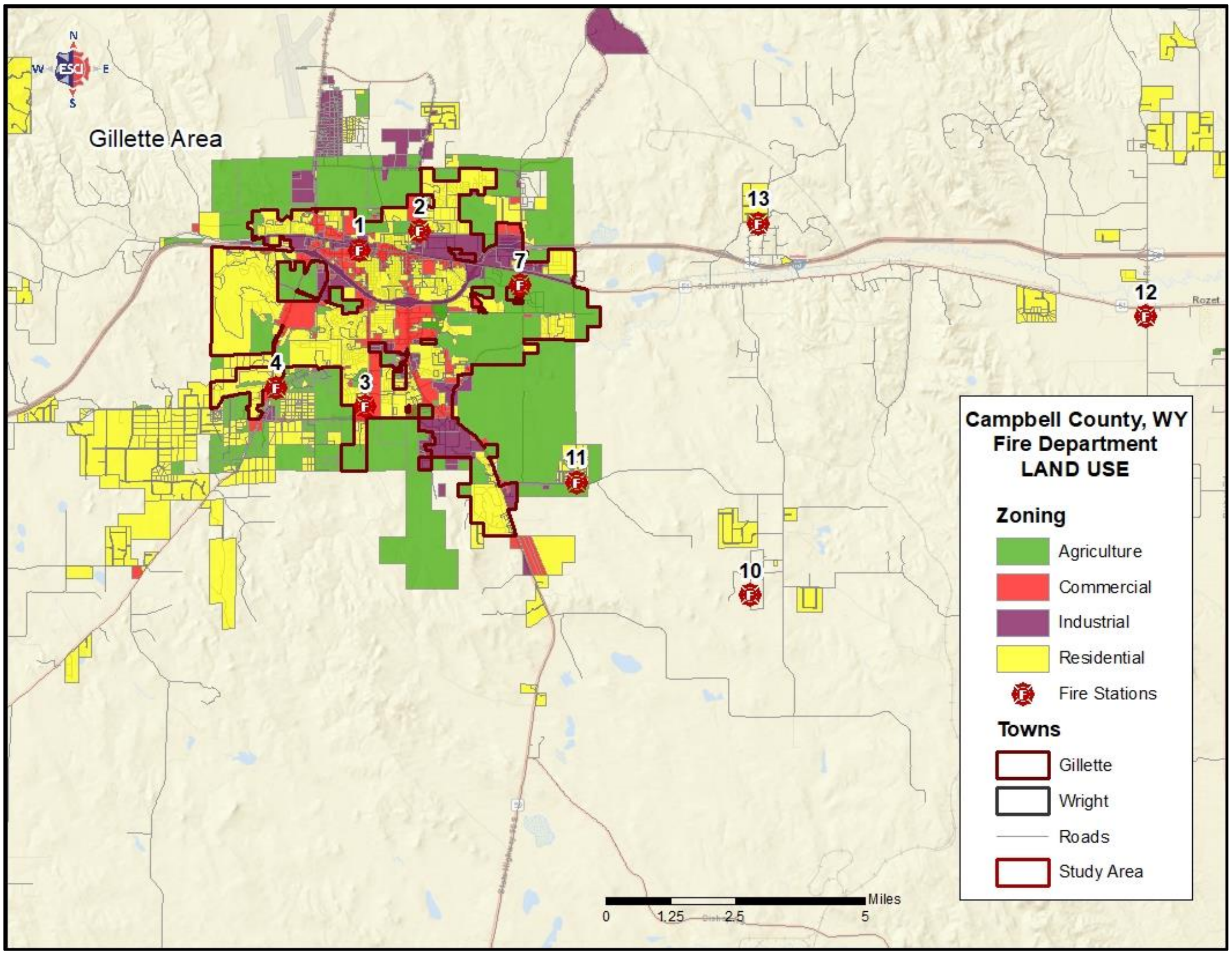
Occupancy Types by Land Use Designation

The Future Land Use Map (FLUM) depicts a snapshot into the future of the preferred future mix of land uses in the Joint Planning Areas. The FLUM will generally guide rural areas, residential, high-density residential, commercial, industrial, parks, and mining. The City of Gillette has also enacted current and future zoning for inside the city limits.

The details and specific planning of growth provide CCFD the added ability to examine and plan for risk ahead of time. Specifically, the ability to identify the need for additional resources in a predicable manner. This ability provides the CCFD an opportunity to plan and budget for appropriate resources before they are needed and avoid reactive efforts after significant community risk is present.

The following figure provides an illustration of the general classes of zoning found in and around the City of Gillette.

Figure 117: Campbell County Zoning Categories



Hazardous Substances and Processes

A federal law called the Emergency Planning and Community Right to Know Act (EPCRA) requires facilities in certain industries which manufacture, process, or use significant amounts of toxic chemicals, to report annually on their releases of these chemicals. The U.S. Environmental Protection Agency (EPA) maintains this information in a database called the Toxics Release Inventory (TRI). The toxic release files on the National Library of Medicine's® (NLM) Toxicology Data Network (TOXNET®) come from TRI. The reports contain information about the types and amounts of toxic chemicals that are released each year to the air, water, land, and by underground injection, as well as information on the quantities of toxic chemicals sent to other facilities for further waste management. Facilities with ten or more full-time employees that process more than 25,000 pounds in aggregate or use greater than 10,000 pounds of any one TRI chemical, are required to report releases annually. Industries and businesses use chemicals to make products such as pharmaceuticals, computers, paints, clothing, and automobiles. Most chemicals are included on the Toxic Release Inventory (TRI) chemical list managed by industrial facilities to minimize releases into the environment. Unfortunately, releases still occur as part of business operations. It is the right of citizens to know what TRI chemicals are being used in Campbell County as well as the management of amounts released into the environment and whether such quantities are increasing or decreasing over time.

The following figure shows the many factors that determine the human health risks resulting from exposure to chemicals.

Figure 118: Overview of Factors that Influence Risk

Emissions	Fate	Exposure	Toxicity	Risk
• TRI • Non-TRI	• Air • Water • Land	• Inhalation • Ingestion • Dermal	• Chemical Concentration • Chemical Properties	• Individual Exposed • Time of Exposure • Duration of Exposure

Wyoming ranks 50th out of 56 states/territories nationwide for the number of total releases of TRI chemicals per square mile.[50] Of the 21,087 facilities in the United States only 6 facilities are listed in the jurisdiction that requires reporting of TRI chemicals. These factors allow CCFD to prepare and plan for the future.

[50] *Environmental Protection Agency TRI National Analysis; retrieved from https://enviro.epa.gov/triexplorer/tri_factsheet.factsheet?pzip=&pstate=WY&pcity=&pcounty=Campbell&pyear=2021&pParent=TRI&pDataSet=TRIQ1*

STANDARD OF COVER PERFORMANCE OBJECTIVES AND MEASURES

MEASURING SYSTEM EFFECTIVENESS

ESCI evaluated the entire system regarding current station location and system performance metrics gathered during the evaluation to determine if the current system is poised to be able to handle the future expected demands. As with any emergency services system the ability to provide current service needs and prepare for future community needs becomes a delicate balancing act for government officials who ultimately are trusted with community funds generated for such purposes. These funds are all too often torn between competing priorities. Fire departments are faced with systems that often experience less fires than our previous generations but still require an appropriate level of preparedness "just in case" to prevent catastrophic results of potential emergencies.

It is imperative that nationally established standards are adhered to so that departments have the needed proof and backup to support their requests for the needed people, tools, and time to deliver these components of the system.

The key components of any system are listed in the following figure.

Figure 119: Measuring System Effectiveness

There is a direct relationship between available personnel and equipment and timing of their application in an emergency on fire department effectiveness. Increasing or decreasing one or more of these components can have a significant effect on the overall ability of the system to efficiently, safely and effectively mitigate an emergency incident. The following results of the previous analysis provide policy-makers with both general information on how this occurs and specific information regarding the potential system needs and/or improvements for CCFD.

PEOPLE

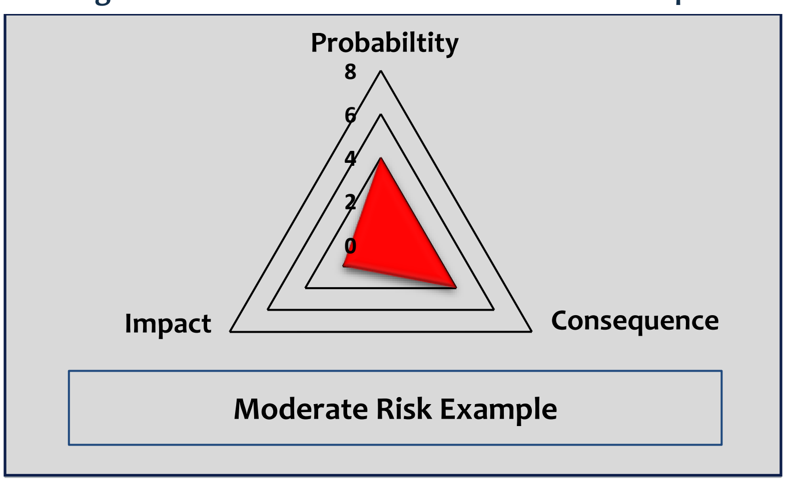
It takes an adequate and properly trained staff of emergency responders to put the appropriate emergency apparatus and equipment to its best use in mitigating incidents. Insufficient staffing at an emergency scene decreases the effectiveness of the response and increases the risk of injury to all individuals involved.

Critical Tasks, Risk, and Staffing Performance

The goal of any fire service organization is to provide adequate resources within a period of time to reasonably mitigate an emergency event. However, all emergency events inherently carry their own set of special circumstances and will require varying levels of staffing based upon factors surrounding the incident. Properties with high fire risk often require greater numbers of personnel and apparatus to mitigate the fire emergency effectively. CCFD should make staffing and deployment decisions with consideration of the level of risk involved.

Risks are classified as low, moderate, high, or maximum where the department gages threats considering the probability of occurrence, and hazard, danger, or loss and measures it in consequence. These risk categories are based on a three-axis risk calculation method. This method allows an agency to assign a numeric value to each axis, which represents Probability, Consequence, and Impact. The surface of the area of the triangle helps to determine the magnitude of the risk. The higher the surface area the greater the risk score. The next figure is an example of a medium risk score—moderate risk.

Figure 120: Three-Axis Calculation Method Example



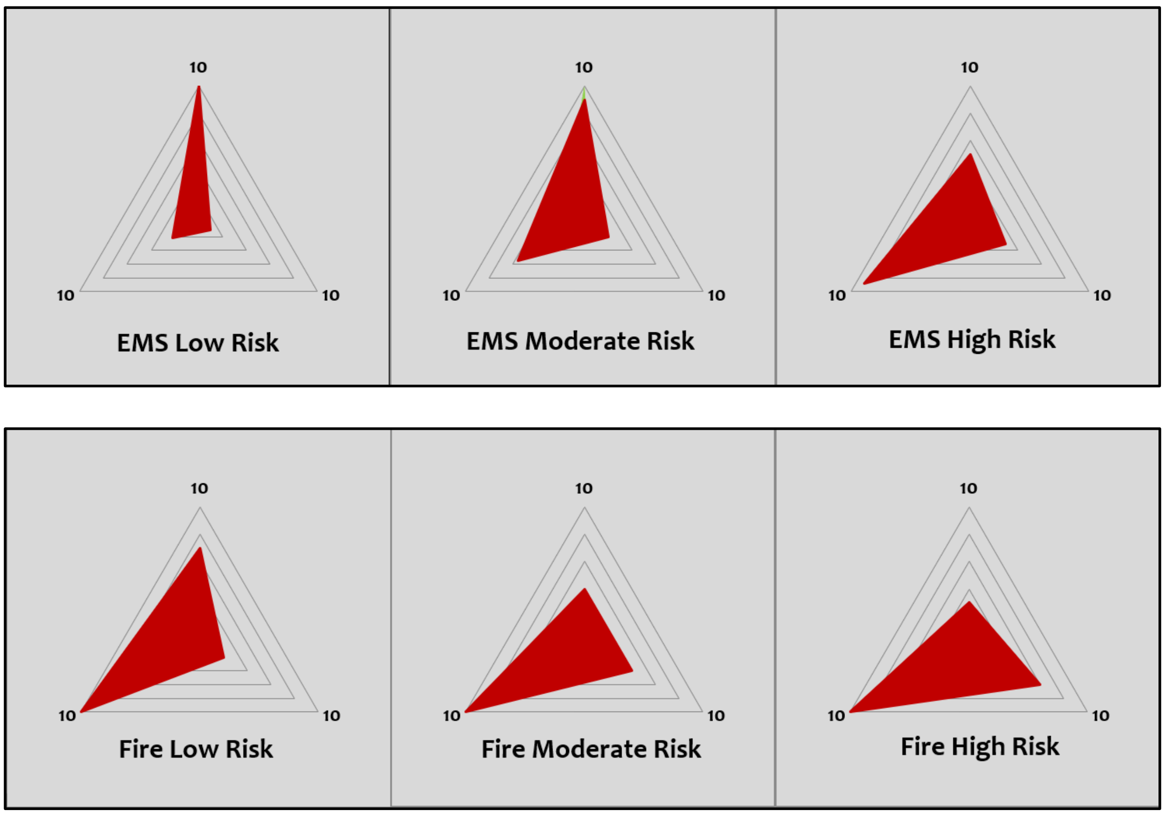
A community assesses its risks based on the preceding model. Specifically, the three factors as defined below.

- **Probability:** What is the likelihood that an incident will occur at the location?

- **Community Consequence:** What is the level of impact on the community an incident would have if the property were destroyed or deemed unusable? The consequence to the community is based on the loss of life or debilitating injury, the financial loss to the community, and the effect on community infrastructure.
- **Agency Impact:** What would be the potential impact of an incident at this location against the available operational forces of the fire department based on the critical tasks associated with the incident? Specifically, would an incident require a greater number of resources because of the property's characteristics, use, or location, and would this affect the department's ability to fulfill its mission in other areas?

The three-axis risk analysis for Campbell County is listed in the figure below.

Figure 121: Campbell County Three-Axis Risk Analysis



The next figure is an example of the staffing needs based on the CPSE recommendations for risk and its classification.

Figure 122: Example of Critical Task Staffing Analysis (Firefighters Needed) Based on Risk[51]

Task	Non-Structure Low Risk	Structure Moderate Risk	Structure High Risk	Structure Maximum Risk
Attack Line	2	2	4	4
Back-Up Line	(2)	2	2	
Support for Hose Lines/Water Supply		2#	3	
Ventilation		2	2	4
Search and Rescue		2	2	4
Forcible Entry/Support		2	2	
Standby/Rapid Intervention Team		2	2	4
Driver/Pump Operator	1	1	1	1
2nd Apparatus/Ladder Operator			1	
Command	1#	1	1	2
Communications/Safety		1	1	1
Accountability			1	
Rehabilitation				2
Building Fire Pump Monitor				(1)
Attack Line—Floor Above the Fire				2
Evacuation Management Teams				4
Elevator Operations Manager				1
Lobby Operations				1
Transport Equipment to Staging				2
EMS Crews				4
Division/Group Supervisors				4
Total	**3–6**	**16–17**	**22**	**40–41**

( ) indicates tasks may not be required at all incidents. # Indicates task may be completed concurrently with others.

As a comparison—The next figure is from NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* and illustrates the critical staffing for tasks associated with various types of structural fires as outlined in the standard.

[51] *Adapted from "Community Risk Assessment and Standards of Cover," 6th edition; Center for Public Safety Excellence.*

Figure 123: Example of Tasks and Staff Required as defined from NFPA 1710[52]

Task	Single-Family Dwelling[1]	Open-Air Strip Mall[2]	Apartments[3]	High-Rise[4]
Command	1	2	2	2
Apparatus Operator	1	2	2	1
Handlines (2 members on each)	4	6	6	4
Support Members	2	3	3	
Victim Search & Rescue Team	2	4	4	4
Ground Ladders/Ventilation	2	4	4	
Aerial Operator (if ladder used)	(1)	(1)	(1)	
Initial Rapid Intervention Team[5]	4	4	4	
Initial Medical Care Component		2	2	
Building Fire Pump Monitor (if equipped)				(1)
Hoseline—Floor Above Fire				2
Rapid Intervention Team				4
Accountability Officers (fire floor & floor above)				4
Evacuation Management Teams				4
Elevator Operations Manager				1
Incident Safety Officer				1
Interior Staging Manager				1
Member Rehabilitation				2
Vertical Ventilation Crew				4
Lobby Control				1
Transport Equipment				2
External Base Operations				1
EMS Crews with Transport[6]				4
Total Required:	**16 (17)**	**27 (28)**	**27 (28)**	**42 (43)**

[1] *Typical 2,000 ft., two-story single-family dwelling without a basement and no exposures.*
[2] *Typical open-air strip mall/shopping center ranging from 13,000–196,000 feet.*
[3] *Typical 1,200-foot apartment within a three-story, garden-style apartment building.*
[4] *Building with the highest floor greater than 75 feet above the lowest level of fire department vehicle access.*
[5] *At a minimum, an initial rapid intervention crew (IRIC) assembled from the initial attack crew and, as the initial alarm response arrives, a full and sustained rapid intervention crew (RIC) established.*
[6] *For Single-Family Dwellings: When the incident escalates beyond an initial full alarm assignment, or when significant risk is present to the members due to the magnitude of the incident, the Incident Commander shall request an EMS crew consisting of a minimum of two members to provide treatment and transport for injured members and civilians.*

[52] *NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2020.*

When reviewing the charts listed in

Figure 122 ~~Figure 122~~ and Figure 123~~Figure 123~~ compared to the daily minimum staffing listed in Figure 124~~Figure 136~~ employed by CCFD it is easy to see that they have the ability to handle smaller and less complex incidents. However, CCFD will quickly become understaffed and unable to handle incidents of more complexity based on the tasks required to mitigate these events. These are events that are highly likely based on current completed projects and future land use approved projects under construction.

Figure 124: CCFD Daily Minimum Staffing

CCFD Daily Minimum Staffing	
Battalion Chief	1
3 Engines	6 (8 during the day)
1 Truck	2
Part-Time Responders	Varies
Total Minimum Personnel	**9 (11)**

Distribution Performance Criterion

A fire department's *distribution* is essentially the location of resources to ensure an initial intervention within the specific time frame identified in the community's performance goals. Tasks that must be performed at a fire can also be broken down into three key components: life safety, incident stabilization, and property conservation. Responder's base life safety tasks on the number of building occupants; and their location, status, and ability to take self-preservation action. Life safety-related tasks involve search, rescue, and evacuation of victims. The incident stabilization element involves delivering enough water to extinguish the fire and create an environment within the building that allows entry by firefighters. Property conservation comes from efficient confinement and extinguishment.

The number and types of tasks needing simultaneous action will dictate the minimum number of firefighters required to combat different types of fires. In the absence of adequate personnel to perform concurrent action, the commanding officer must prioritize the tasks and complete some in chronological order, rather than concurrently. These tasks include:

- Command
- Scene Safety
- Search and Rescue
- Fire Attack
- Salvage
- Water Supply
- Pump Operation
- Ventilation
- Backup/Rapid Intervention
- Environmental Protection

Critical Tasking

Critical tasks are those activities that must be conducted promptly by firefighters at emergency incidents to control the situation, to stop-loss, and to perform necessary tasks required for a medical emergency. The CCFD is responsible for ensuring those responding companies are capable of performing all of the described tasks in a prompt, efficient, and safe manner. Critical tasking defines the minimum number of personnel needed by incident type. More personnel will be needed for incidents of increased complexity or size.

The first 15 minutes is the most crucial period in the suppression of a fire. How effectively and efficiently firefighters perform during this period has a significant impact on the overall outcome of the event. The first 15 minutes is also applicable to rescue and medical situations.

Critical tasks must be conducted promptly to control a fire or to treat a patient. Three scenarios of commonly encountered emergencies are routinely utilized by fire departments when conducting field validation and critical tasking: a moderate risk structure fire, a traffic collision with a trapped victim, and a cardiac arrest. Each scenario is conducted using standard operating procedures and realistic response times based on actual system performance. Each scenario is normally run multiple times with a variety of fire companies to validate and verify observations and times.

To further validate the analysis process, results are compared with records from actual working fires and similar incidents from previous years. Overall results are reviewed to determine if the actions taken within the early minutes of an incident resulted in a stop-loss or not, and if additional resources were required. The critical task analysis process demonstrates the rate at which the current deployment plan results in stopping loss a high percentage of time within initial critical time goals.

A critical tasking summary provided by CCFD is detailed in Appendix E.

Alarm Assignments

First alarm response assignments have been established to ensure sufficient personnel and apparatus are dispatched to an emergency event. "Total Staffing Needed" is the number identified in the critical tasking analysis outlined in Appendix E. It is important to remember that CCFD is minimally staffed and during the critical tasking the number of personnel and apparatus required to mitigate an active and complex working incident will require additional resources above and beyond the numbers listed.

A complete detailed account of the CCFD first alarm assignments are listed in Appendix F.

TOOLS

Delivering people and equipment to the scene of an emergency is another key component to measuring delivery system efficiency. In most cases the people and equipment arrive via specialized apparatus and/or fire department vehicle. A great deal of discussion is spent determining the location and siting of a fire station but the importance of reliable and adequate vehicles to travel the distance to the emergency must not be overlooked.

Apparatus Serviceability

Identifying and tracking the reliability and costs for maintaining expensive emergency apparatus are important aspects in ensuring prudent financial planning and emergency services delivery. Apparatus service-lives can be readily predicted based on factors including vehicle type, call volume, age, maintenance downtime, and maintenance costs.

NFPA 1901: *Standard for Automotive Fire Apparatus*, NFPA 1911: *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Emergency Vehicles*, and NFPA 1912: *Standard for Fire Apparatus Refurbishing* are three specific standards that are used to inform and guide fire department leadership in the management and oversight of emergency services fleets through effective specification, purchase, refurbishment, maintenance, and retirement of fire apparatus.

For instance, as a general guideline, NFPA 1901: *Standard for Automotive Fire Apparatus* recommends placing fire apparatus 15 years of age or older into reserve status and replacing apparatus 25 years or older. However, as mentioned previously, an apparatus's usage can have a significant effect and impact on the resource role during its life expectancy. This standard identifies the following objective criteria in evaluating fire apparatus lifespan:

- Vehicle road mileage.
- Engine operating hours.
- The quality of the preventative maintenance program.
- The quality of the driver-training program.
- Whether the fire apparatus was used within its design parameters.
- Whether the fire apparatus was manufactured on a custom or commercial chassis.
- The quality of workmanship by the original manufacturer.
- The quality of the components used in the manufacturing process.
- The availability of replacement parts.

ESCI supports Annex D of the NFPA 1901 standard as it relates to replacement schedules for heavy fire apparatus (engines, rescues, and trucks). CCFD's apparatus range in age from 1 to 72 years, with an average age of 15.1 years. The oldest frontline units are Rescue 9 (2004), Engine 4 (2004), Engine 11 (2004), and Truck 1 (2002).

Apparatus Replacement Planning

Clearly, no piece of mechanical equipment or vehicle can be expected to last indefinitely. As apparatus age, repairs tend to become more frequent and more complex. Parts may become more difficult to obtain, and downtime for repair and maintenance increases. Given that fire protection, EMS, and other emergencies are so critical to a community, downtime is one of the most frequently identified reasons for apparatus replacement.

CCFD has an apparatus replacement plan that established a 20-year front-line expectation for all structural apparatus. The units will start at the busier fire stations and then move to a slower response area to extend their life. The Rescue is retired at 20 years or 100,000 miles. The CCFD wildland engines can typically see a 30-year lifespan with a similar rotation plan.

Figure 125~~Figure 139~~ provides a useful guide for CCFD by providing a formulaic approach to apparatus replacement as an additional option for determining replacement schedules. This chart is just one way to provide a consistent evaluation of vehicle replacement planning and was not used in the evaluation of CCFD apparatus.

Figure 125: Apparatus Replacement Guide

Evaluation Components	Points Assignment Criteria
Age	One point for every year of chronological age, based on in-service date.
Miles/Hours	One point for each 10,000 miles or 1,000 hours of operation.
Service	1, 3, or 5 points are assigned based on the type of service unit. For instance, fire pumpers would be given a 5 because fire pumpers are classified as severe duty service.
Condition	This category takes into consideration body condition, rust, interior condition, accident history, anticipated repairs, etc. The better the condition, the lower the points assigned.
Reliability	Points are assigned as 1, 3, or 5 depending on the frequency that a vehicle is in the shop for repair. For example, a 5 would be assigned to a vehicle in the shop two or more times per month on average, while a 1 would be assigned to a vehicle in the shop an average of once every three months or less.

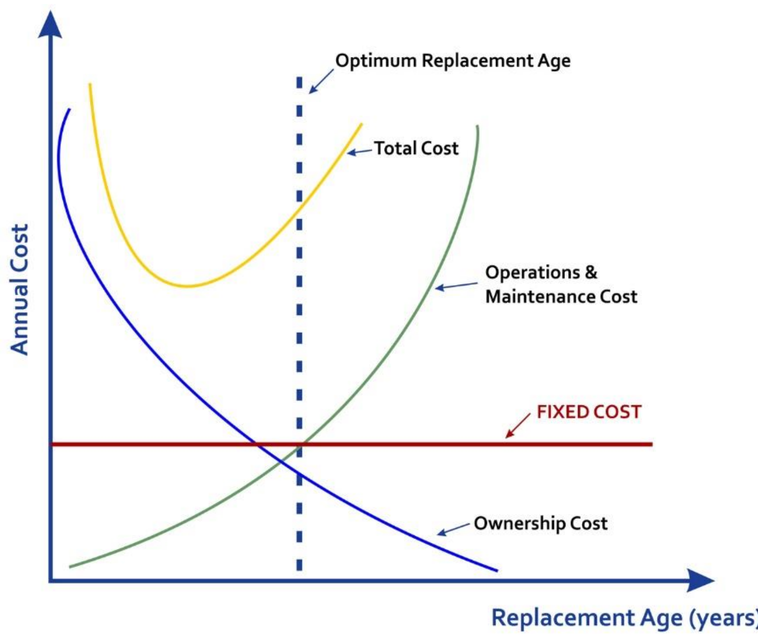
Point Ranges	Condition Rating	Condition Description
Under 18 points	Condition I	Excellent
18–22 points	Condition II	Good
23–27 points	Condition III	Consider Replacement
28 points or higher	Condition IV	Immediate Replacement

Economic Theory of Apparatus Replacement

The *Economic Theory of Vehicle Replacement* is another conceptual model used to determine when a vehicle should be replaced. The theory states that, as a vehicle ages, the cost of capital diminishes and its operating cost increases. The combination of these two costs produces a total cost curve. The model suggests the optimal time to replace any piece of apparatus is when the operating cost begins to exceed the capital costs. This optimal time may not be a fixed point, but rather a time range.

The following figure is a graphic representation of the *Economic Theory of Vehicle Replacement*.

Figure 126: Economic Theory of Vehicle Replacement



Shortening the replacement cycle time window can result in optimal savings to the fire department. If an agency does not routinely replace equipment in a timely manner, the overall reduction in replacement spending can result in accelerated maintenance and repair expenditures. Fire officials, who assume that deferring replacement purchases is a good tactic for balancing the budget, need to understand two possible outcomes that may occur because of that decision:

- Costs are transferred from the capital budget to the operating budget.
- Such deferral may increase overall fleet costs.

Other potential impacts are delays in service delivery and lengthened response times because of a lack of apparatus to respond when experiencing mechanical issues or in need of repairs. Regardless of its net effect on current apparatus costs, the deferral of replacement purchases unquestionably increases future replacement spending needs. This may also impact operational capabilities and safe and efficient use of the apparatus. CCFD has a significant unfunded apparatus replacement need regardless of which method for determining replacement is used. Having a reliable fleet is of the utmost importance when providing emergency services.

Fire Station Locations and Impacts of Modifications

When a community creates a fire department and builds its first fire station, a response time criterion is usually established. This response time anticipates that it applies throughout the area covered by the boundaries of that fire station. This is especially true when there is only one fire station and a small area to cover. Simply speaking, a central fire station is among the first public buildings created in most communities, no matter how small. As the community grows away from that fire station in incremental steps, the expectation is that the original fire station will still provide adequate coverage.

However, that expectation is problematic. The total area covered by a fire station may or may not be highly developed initially and is likely not even developed in a uniform manner. Even if a crew is available and capable of responding, it may not do so in a timely manner to some or any portions of its response area. Most fire departments begin as all volunteer departments, often for economic reasons. When population and service area increase, there is often pressure to add career staff and to consider adding additional stations in order to provide sufficient and timely response.

There are many variations on this theme. Older, established cities tend to be densely developed and smaller in dimension, but often annex new areas that may be less densely developed. Newer communities may be created from much larger areas than an initial fire station can cover and additional stations are needed. The bottom line for policy-makers is determining when to add fire stations and at what cost is a desired level of service to be achieved.

Response Failure

The contemporary method of measuring performance looks at incident response time as an indicator of levels of service. The way this is done is two-fold. The first is to measure the actual performance during emergencies; the second is to monitor the system to determine when the system fails to achieve the performance goals. This was done in the *Service Delivery & Performance* section of the report.

One point of caution – response time criterion should only be applied to calls that are emergency calls. When incidents are analyzed, the data should be reviewed to assure that non-emergency calls are not used when calculating performance. There are many calls for service that fire departments log as incidents that are non-threatening scenarios, and the responding companies will handle them on an as needed basis. To include these times in the analysis of emergency services tends to skew the outcome, leading to a false service indicator.

To understand when response failure occurs, we must first define what is being measured and how to measure the performance goal. For example, a basic question to be answered is whether a department is protecting the geographic location or mitigating the incident. Are we going to measure percentage of performance by first-due company or department wide? Generally, fire protection practitioners try to position fire stations to cover 90% of the ground in each first-due area, to provide overlap for concentration, redundancy for multiple calls, and for equity of access for customer service. It is economically impossible to cover 100% of the ground.

CCFD covers 13.9% of the total service area within 1.5 miles of a fire station. Based on actual calls for service, a jurisdiction could strive for 80 to 90% of the calls for service within first-due and achieving ERF concentration total reflex measures. Because of the geographical size of Campbell County this metric is not realistic and the JPFB has chosen to concentrate its resources where the majority of the population resides.

If the measure for either area or incidents is set at 80 to 90% effectiveness, how much deviation from the performance measure is acceptable? For example, if a historical incident measure is at the 85th percentile, but the other five percent is covered in the next 60 seconds, is that acceptable?

Maybe yes, maybe no. It is important to understand that the values at risk, the type of unmet calls, and the total number of calls can combine to create a need. If the deficiency is only five percent (say 25 calls out of 500), the significance of the gap depends largely on the size of the data sample and on the amount of geographic area represented.

For example, if the performance requirement was to arrive at the scene of an emergency within five minutes of travel time, 90% of the time, this criterion could be applied to one year of response data to see if the goal was achieved. It should be noted that this criterion allows for 10% of the calls to be beyond the five-minute travel time over a given reporting period. This provides flexibility in the assessment of coverage to cope with anomalies, such as extraordinary response conditions, responding from out of service area, or for delays caused by simultaneous alarms.

This raises an additional question: Of the 10% overage, how many of the incidents are covered within the next 30 to 60 seconds? For example, CCFD travel time in 2022 to actual incidents was less than 4 minutes to 40.52% of incidents, 4–8 minutes to 38.81% of incidents, 8–12 minutes to 10.53% of incidents and greater than 12 minutes to 10.14% of incidents.

The first indication of a problem in providing service is when a significant number of alarms exceeding the performance standard are documented. This may or may not be a function of new growth. It could be the result of in-fill that causes a higher number of alarms than the department can service. This is especially true when alarms come in simultaneously.

Moreover, when areas are being developed that begin to extend travel times, they do not automatically become the source of new alarms. In fact, new construction often has a period of several years before adding to fire service demand. The same is not necessarily true from the perspective of emergency medical service since people drive EMS call demand.

Additional Fire Stations or Response Resources

The question that many communities must address is when to add a fire station, additional response resources, or alternative response programs to meet time goals? Obviously, this has been answered in any community that has more than one fire station or response unit. The problem comes in finding a quantifiable threshold to determine that point for each specific situation, because it varies from community to community and even within a specific jurisdiction. The overall answer is part financial and part professional judgment. In fact, in the literature of the fire service today, there is very little definitive guidance on how this should be accomplished. Once the need has been established there are several factors to take into consideration. They consist of:

- Identifying areas with minimum coverage
- Identifying feasible locations for a new facility or response resource
- Evaluating those locations using specific criterion

The description in this document is based upon a growing body of knowledge acquired by ESCI and aimed at quantifying this process. What is unfortunate is that there is no universally acceptable algorithm. The fire protection planning process allows for an evaluation of potential loss because of deteriorating response times. One form of measurement is to assess the road and transportation network to ascertain the percentage of road mileage that theoretically is covered by the time criterion. This is done using computer-based modeling that will create a polygon that describes the areas of coverage. In fact, this process will also identify gaps and deficiencies where response time is not adequate.

As growth and development extends beyond the range of travel time of one fire station, the percentage of calls that exceed the performance requirement should begin to increase. It should be noted that growth, in and of itself, does not create an instantaneous demand. New construction has the advantage of better codes, a higher level of owner interest, and limited deterioration of fire-breeding conditions. However, new growth can introduce different types of occupancies with additional risks that were not considered or needed during initial fire station and resource planning.

A more subtle difference in today's fire service is the fact that community demand for medical services has increased almost from day one of occupancy. In short, this means that new construction may place more values and lives at risk, but the demand for service will be incremental. When demand for service begins, it will be based upon two factors – nature of the occupancy and hazards that are present.

Incident increases may first appear as a change in the performance of an existing fire station in the annual analysis of emergency calls. For example, if a fire station has 1,000 alarms and a 90% compliance rate with the response standard, there would be about 100 alarms per year that were beyond the goal. This would be the baseline for existing response performance. If the following year, the number of alarms was 1,200 and the percentage dropped to 85%, this would indicate that the department is losing ground on response performance.

If the change in the number of alarms had merely increased because of more calls in the same area, the response time percentage should have remained similar. One exception to this rule is when a single company has such a high call volume that it cannot handle all calls without call queuing. However, since the alarm rate went up and the performance went down, the failure threshold may be approaching.

Based upon actual response time analysis, one threshold that needs to be considered is the increase in alarms and the percentage of calls handled under the criterion adopted. Anything more than a 10% increase in calls and a 10% reduction in performance is a signal to evaluate the level of service being provided.

In larger departments, most practitioners factor out non-emergency calls for actual incident performance, only looking at *core or true emergencies*. The definition of core can be made locally based on risk and importance to the community, but they are usually structure fires and moderate to severe status EMS calls.

In general, if more than one measure must be slipping, an evaluation of all Standards of Coverage factors, along with the reason why the data is slipping, is required. A one-year snapshot may not be valid **if** the agency had a big storm event, a catastrophic weather event, major wildland fire, and stacked a large volume of calls for just a month of the year or in the case of COVID-19 a decrease that can be explained and attributed to the event but is expected to return to normal or higher levels.

The incident analysis approach depends upon having emergencies, which does not address what is at risk. That is where the GIS mapping technology applies. As depicted throughout this report, incident and land use can be GIS mapped for determining risk and demand usage. As structures and different types of fire problems are constructed on the ground, they may represent additional lives and property that are at risk that deserve equity in protection. One of the reasons for creating a governmental entity is to control land use and to create mechanisms for collecting taxes and determining ownership. Furthermore, these same individuals and properties are paying the taxes, fees, and permits for the level of services provided. In one sense, when growth occurs, the new properties are usually safer than the older part of the community because they are constructed to a higher standard.

What is clear to almost any community is that being slightly out of the response standard range does not trigger a new facility or additional response unit from an existing facility. One industry threshold for additional response capabilities should be to provide a new fire station or additional response unit into the appropriate zone in the jurisdiction outside the coverage area of current stations that has more than 35 to 50% of its parcels developed. Some of the secondary measures currently being used are 300 to 500 calls for service for any individual fire company or a service population of 10,000 to justify a full-time paid company or response unit.

The following criterion grid illustrates a series of measures that may be useful in deciding when a new fire station or additional response unit should be deployed within a jurisdiction.

Figure 127: Criterion for Fire Station and Resource Need Determination

Action Choices	Travel Distance	Criteria		
		Response Time Parameter	Out of Area Calls	Building/Risk Inventory
Maintain Status Quo	All risks within 1.5 miles	1st due company is within 5 minutes total response time, 90% of the time	100% in first due area	Existing inventory and infill
Temporary Facilities and Minimal Staffing	Risks 1.5 to 3.0 miles from existing fire station	1st due company Exceeds four-minutes travel time 10% of the time, but never exceeds 8 minutes	More than 10% of calls are in adjacent area	New area has 25% of same risk distribution as in initial area
Permanent Fire Station Needed	Risk locations exceeding 4.0 miles from the fire station	1st due company Exceeds four-minutes travel time 20–25% of the time; Some calls < 8 minutes	More than 20–25% of calls are in outlying area	New area has 35% of same risk distribution as in initial area of coverage
Permanent Fire Station Essential	Outlying risk locations exceeding 5.0 miles from the 1st fire station	1st due company Exceeds 4-minutes travel time 30% of the time; Some calls < 10 minutes	More than 30% of calls are in outlying area	New area has 50% of same risk distribution as in initial area

The decision-making process for placement of a new fire station should take into account staffing pattern decisions. It is not uncommon to construct a fire station and have the staffing model evolve over years from one system to another. For example, the station might initially be staffed with volunteers but then later have career staff added, either incrementally or all in one fiscal year. In the case of a fire station or alternative response resource under consideration, it should be anticipated that a policy decision needs to be made with respect to the staffing model to be used as soon as possible given the potential financial impacts. For example, a fully staffed paid company has a significant, associated price tag.

ESCI's experience has been that it takes multiple elements of the standards of coverage to be out-of-balance along with having additional economic resources to justify an additional paid company or staffing increase in one or more companies.

Capital Improvement Planning

Fire apparatus are typically unique pieces of equipment, often very customized to operate efficiently in a narrowly defined mission. A pumper may be engineered such that the compartments fit specific equipment and tools, with virtually every space on the truck designated in advance for functionality. This same vehicle, with its specialized design, cannot be expected to function in a completely different capacity, such as a hazardous materials unit or a rescue squad. For this reason, fire apparatus are very expensive and offer little flexibility in use and reassignment. As a result, communities across the country have sought to achieve the longest life span possible for these vehicles.

Due to the large expense of fire apparatus, most communities find the need to plan for the cost of replacement. To properly do so, agencies often turn to the long-accepted practice of establishing a life cycle for the apparatus that results in a replacement date anticipated well in advance. Forward-thinking organizations then set aside incremental funds during the life of the vehicle, so replacement dollars are ready when needed.

The same holds true for fire stations, training grounds, and other fixed facilities. As part of the site visit, ESCI surveyed capital replacement planning efforts. Campbell County and CCFD have a Capital Improvement Plan (CIP) for its facilities and apparatus that is on a rolling twenty-year schedule. However, this plan has not been formally adopted and funded by the JPFB. ESCI recommends that the department work with the board to formally adopt a CIP similar to those used by the funding entities for other needs.

The CCFD's capital replacement planning is summarized in the following figure.

Figure 128: Capital Assets and Capital Improvement Planning

Capital Planning	Campbell County Fire Department
Fire Stations/Structures Replacement Plan	
Period of plan	None
Apparatus Replacement Plan	
Period of plan	20-year plan
Support Equipment Replacement Plan	
Period of plan	SCBA, radios, and extrication equipment in place as needed

TIME

The time for resources to deploy and reach the emergency can sometimes be the difference in life or death and the difference between incident stabilization and devastation. It is to this end that communities across the country struggle to balance the ever-growing need for resources and the financial constraints to fund them. The importance of establishing realistic and essential standards for deployment of adequate resources based on risk classifications is paramount.

Dynamics of Fire in Buildings

Most fires within buildings develop predictably unless influenced by highly flammable material. Ignition, or the beginning of a fire, starts the sequence of events. It may take several minutes or even hours from the time of ignition until a flame is visible. This smoldering stage is very dangerous, especially during times when people are sleeping, since large amounts of highly toxic smoke may be generated during this phase.

Once flames do appear, the sequence continues rapidly. Combustible material adjacent to the flame heat and ignite, which in turn heats and ignites other adjacent materials if sufficient oxygen is present. As the objects burn, heated gases accumulate at the ceiling of the room. Some of the gases are flammable and highly toxic.

The spread of the fire from this point continues quickly. Soon the flammable gases at the ceiling as well as other combustible material in the room of origin reach ignition temperature. At that point, an event termed "flashover" occurs; the gases and other material ignite, which in turn ignites everything in the room. Once flashover occurs, damage caused by the fire is significant, and the environment within the room can no longer support human life.

There have been changes in the residential fire environment over the past several decades. These changes include larger homes, different home geometries, increased synthetic fuel loads, and changing construction materials.[53]

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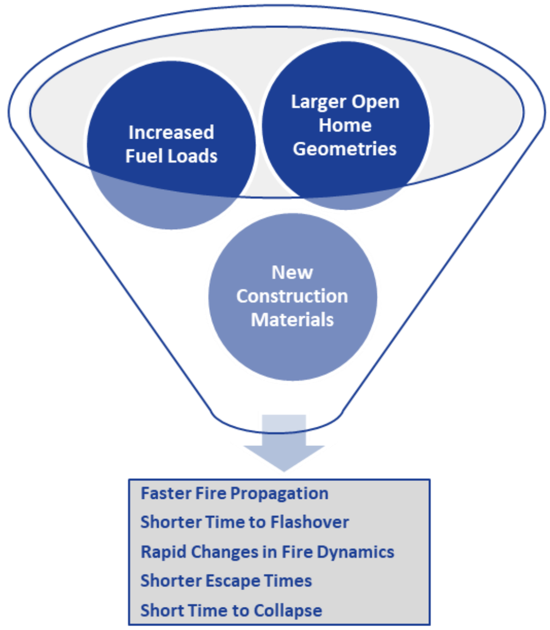
[53] *Stephen Kerber, Analysis of Changing Residential Fire Dynamics, and their Implications on Firefighter Operational Timeframes. Underwriters Laboratories.*

Figure 129: Changes in the Fire Environment & Effect on Fire Dynamics



Since flashover has such a dramatic influence on the outcome of a fire event, the goal of any fire agency is to apply water before flashover occurs.

Although modern codes tend to make fires in newer structures more infrequent, today's energy-efficient construction (designed to hold heat during the winter) also tends to confine the heat of a hostile fire. In addition, research has shown that modern furnishings generally ignite more quickly and burn hotter (due to synthetics).

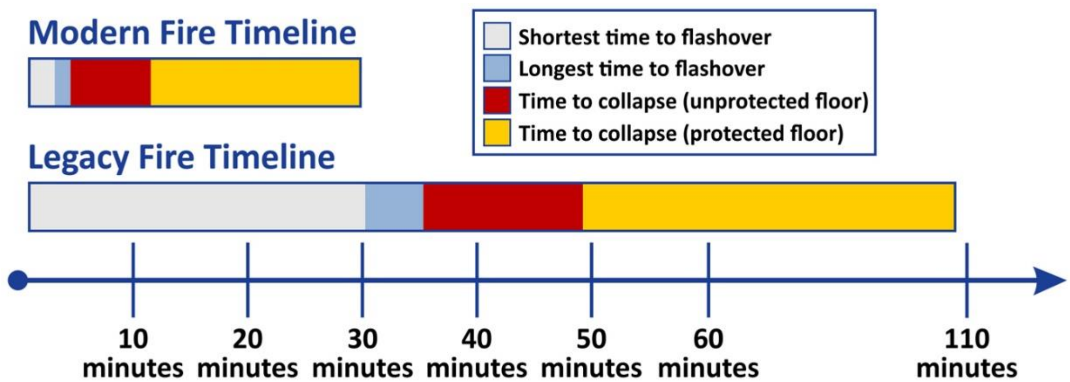
In the 1970s, scientists at the National Institute of Standards and Technology found that after a fire broke out, building occupants had about 17 minutes to escape before being overcome by heat and smoke. Today, that estimate is as short as three minutes in some cases based on materials and compartment configuration. The necessity of effective early warning (smoke alarms), early suppression (fire sprinklers), and firefighters arriving on the scene of a fire in the shortest span of time is more critical now than ever.

Perhaps as important as preventing flashover is the need to control a fire before it does damage to the structural framing of a building. Materials used to construct buildings today are often less fire-resistive than the heavy structural skeletons of older frame buildings. Roof trusses and floor joists are commonly made with lighter materials that are more easily weakened by the effects of fire. "Lightweight" roof trusses fail after five to seven minutes of direct flame impingement. Plywood I-beam joists can fail after as little as three minutes of flame contact. This creates a dangerous environment for firefighters.

Additionally, the contents of buildings today have a much greater potential for heat production than in the past. The widespread use of plastics in furnishings and other building contents rapidly accelerate fire spread and increase the amount of water needed to control a fire effectively. These factors make the need for early application of water essential to a successful fire outcome.

Several events must take place quickly to make it possible to achieve fire suppression before flashover. The next figure illustrates the sequence of events with a comparison of modern materials vs. legacy materials.

Figure 130: Fire Growth vs. Reflex Time[54]



As is apparent by this description of the sequence of events, the application of water in time to prevent flashover is a serious challenge for any fire department. It is critical, though, as studies of historical fire losses can demonstrate.

The importance of fire station locations with adequate staffing to perform the required tasks can be further evidenced by recommendations in national consensus standards. The National Fire Protection Association found that fires contained to the room of origin (typically extinguished prior to or immediately following flashover) had significantly lower rates of death, injury, and property loss when compared to fires that had an opportunity to spread beyond the room of origin (typically extinguished post-flashover).

As evidenced in the next figure, fire losses, casualties, and deaths rise significantly as the extent of fire damage increases.

Figure 131: Loss Rates by Fire Spread, Home Structure Fires (2012–2016)[55]

Flame Spread	Rate Per 1,000 Fires		Average Dollar Loss
	Civilian Deaths	Civilian Injuries	
Confined fire or fire spread confined to origin	0.4	11.1	$1,200
Confined to room of origin, including confined fire and fire confined to object	1.8	23.8	$4,000
Spread beyond the room of origin but confined to floor of origin	16.2	76.3	$35,000
Spread beyond the floor of origin	24.6	55.0	$65,900

[54] *Stephen Kerber, Analysis of Changing Residential Fire Dynamics, and their Implications on Firefighter Operational Timeframes. Underwriters Laboratories.*

[55] *Term "home" includes one- & two-family homes, manufactured homes, & apartments or other multi-family housing, regardless of ownership. Source: National Fire Protection Association Standard 1710, 2020 Edition.*

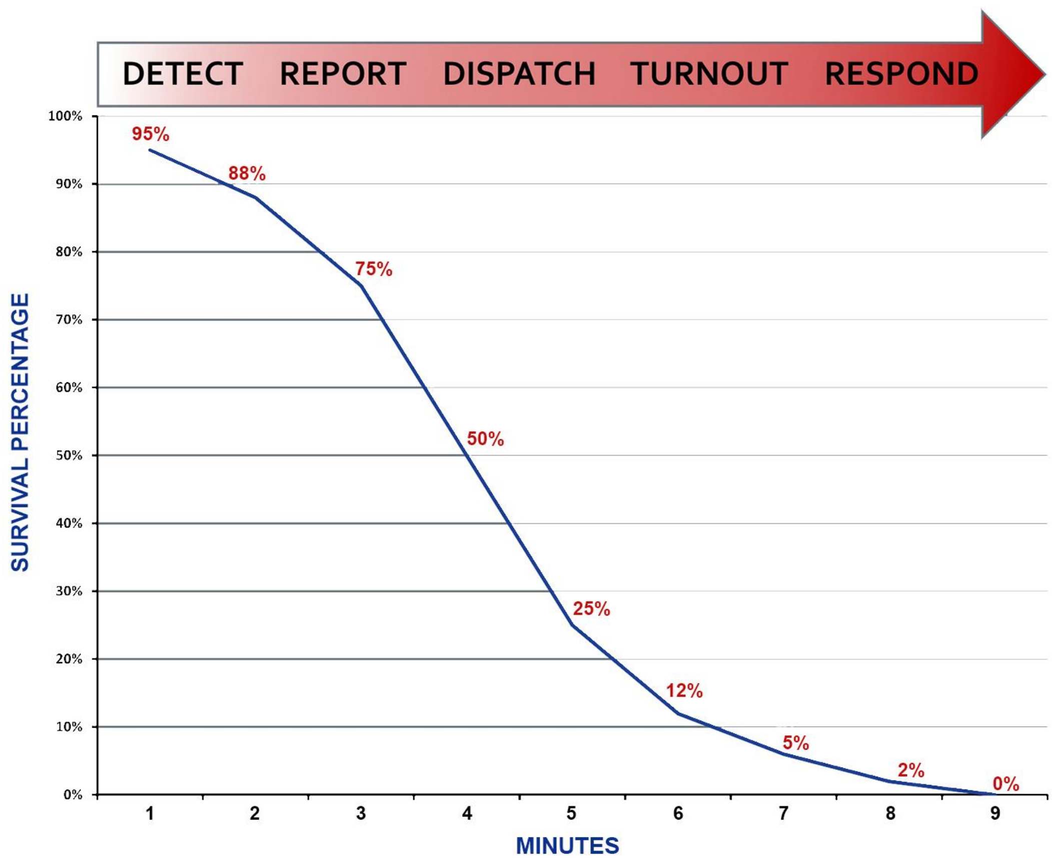
Emergency Medical Event Sequence

Cardiac arrest is the most significant life-threatening medical event in emergency medicine today. A victim of cardiac arrest has mere minutes in which to receive lifesaving care if there is to be any hope for resuscitation.

The American Heart Association (AHA) issued a set of cardiopulmonary resuscitation guidelines designed to streamline emergency procedures for heart attack victims and to increase the likelihood of survival. The AHA guidelines include goals for the application of cardiac defibrillation to cardiac arrest victims. Cardiac arrest survival chances fall by seven to ten percent for every minute between collapse and defibrillation. Consequently, the AHA recommends cardiac defibrillation within five minutes of cardiac arrest.

As with fires, the sequence of events that lead to emergency cardiac care can be graphically illustrated, as in the following figure.

Figure 132: Bystander Cardiac Arrest Event Sequence



The percentage of opportunity for recovery from cardiac arrest drops quickly as time progresses. By the time the citizen bystander recognizes the need for emergency care and notifies the 911 system three to five minutes may have passed. The stages of medical responses are very similar to the components described for fire responses. Research stresses the importance of immediate CPR, rapid cardiac defibrillation, and administration of certain medications as a means of improving the opportunity for successful resuscitation and survival.

RESPONSE STANDARDS, GOALS, AND TARGETS

ESCI emphasizes the importance of establishing and regularly monitoring performance metrics for the deployment of resources. These metrics serve as the foundation for determining whether the organization is meeting the expectations of the community that it serves. Without regular and consistent performance evaluation, it is impossible to set and achieve goals established to meet community expectations.

Response standards established by the CCFD must originate from the community served to create a balance between what it desires and what it can afford. Because of this, ESCI cannot impose baseline and benchmark performance metrics on the CCFD, or any given organization for that matter. However, recommendations based upon the analysis conducted throughout this report may help serve as a starting point for these discussions with the community or may serve as a reevaluation tool for the organization’s current standards.

Response standards are unique to each organization. Multiple factors such as staffing, financial constraints, size of the service area, and politics will influence each department’s ability to set achievable goals and objectives for response. Because CCFD is a combination department with less than 85% of career staffing the agency can choose to use either NFPA 1710 or NFPA 1720 performance metrics. A comparison of the two and how CCFD measures against these standards of performance is summarized below.

- When compared to NFPA 1710 criteria, the response time for all calls from the overall CCFD performance is:
    - 14 minutes, 50 seconds, which is 9 minutes, 50 seconds greater than the expected standard[56].
- When compared to NFPA 1720 which allows jurisdictions the ability to segregate response time by population demand density the overall CCFD performance is:
    - 9 minutes, 45 seconds for urban areas, which is 45 seconds greater than the recommended standard.
    - 9 minutes, 58 seconds for suburban areas, which is just below the expected standard.
    - 16 minutes, 15 seconds for rural areas, which is approximately 2 minutes greater than the expected standard.

Recommendations for a process of setting performance goals for each of the response time components are presented later in this section.

The next sections address the suggested process for a department to determine critical tasks based on local risk and setting response time standards.

[56] *This is still an improvement of 2 minutes, 39 seconds from the analysis done for the 2019 study.*

For a fire department to plan effectively and make appropriate decisions regarding the deployment of resources, it needs to use clearly identified criteria, response performance objectives (targets), and quantifiable means of measuring actual response relative to targeted objectives.

To do so, ESCI advises that performance objectives and measures be developed using the "**SMART**" acronym, meaning that targets should be:

- ✓ **S**pecific
- ✓ **M**easurable
- ✓ **A**ttainable
- ✓ **R**elevant
- ✓ **T**imely

ESCI emphasizes the importance of the establishment of response performance metrics by every fire department. Once established, these standards result in measurable goals for service delivery, which then form the foundation upon which the organization will plan for the deployment of resources. Absent these processes, the organization is not able to determine where it needs to go, nor is it able to know when it is achieving its goals and meeting the community's expectations.

Response Standards for People, Tools, & Time

Time matters a great deal in the achievement of an effective outcome to an emergency event. Time, however, is not the only factor. Delivering sufficient properly trained, appropriately equipped personnel within the critical time period completes the equation.

For medical emergencies, this can vary based on the nature of the emergency. Many medical emergencies are not time-critical. However, for serious trauma, cardiac arrest, strokes, or conditions that may lead to cardiac arrest, a rapid response is essential.

Equally critical is delivering enough personnel to the scene to perform all the concurrent tasks required to deliver quality emergency care. For a cardiac arrest, this can be up to six personnel; two to perform CPR, two to set up and operate advanced medical equipment, one to record the actions taken by emergency care workers, and one to direct patient care.

Thus, for a medical emergency, the real test of performance is the time it takes to provide the personnel and equipment needed to deal effectively with the patient's condition, not necessarily the time it takes for the first person to arrive. More importantly though are the patient outcomes that are experienced when sufficient resources arrive on scene in a timely manner.

Fire emergencies are even more resource critical. Again, the true test of performance is the time it takes to deliver sufficient personnel to search for lives and initiate the application of water to a fire. This is the only practical method to reverse the continuing internal temperature increases and ultimately prevent flashover. Positive outcomes are experienced when resources arrive and perform the necessary tasks to save lives and property, stabilize the incident, and conserve property. The arrival of one person with a portable radio does not provide fire intervention capability and should not be counted as "arrival" by the fire department.

FUTURE SYSTEM RECOMMENDATIONS AND IMPROVEMENTS

RECOMMENDATIONS & IMPROVEMENT GOALS

This *Long-Rang Master Plan with Community Risk Assessment: Standards of Cover* culminates in a series of recommendations and improvement goals based on the observations and analysis previously discussed. Addressing these recommendations should be approached pragmatically. As such, ESCI grouped them into recommended time frames to address.

Facilitating the adoption and implementation of many of these recommendations will take significant commitment, time, and resources (including financial). The suggested timeframes are intended to introduce a realistic "blueprint" for implementation. However, environmental conditions and circumstances may provide challenges or opportunities to address a recommendation(s) outside of the timeframes identified here.

ESCI has grouped the recommendations into three implementation timeline categories: Short-Term Recommendations (6 months–1 year), Mid-Term Improvement Goals (1–3 years), and Long-Term Improvement Goals (3–5 years).

Lastly, these recommendations are just that—recommendations. They are ESCI's best effort in providing guidance in addressing issues and deficiencies identified during the study period. County leaders, Town leaders, City leaders and citizens hold the ultimate authority in embracing, revising, or discounting the following guidance.

Short-Term Recommendations

A considerable volume of observations were made relating to CCFD current conditions in management and operations. The process of understanding, prioritizing, and implementing the recommended enhancements can be daunting, simply due to the amount of work that may be involved. The following recommendations should be considered for implementation in the short-term.

Management

- Use multiple methods when communicating with department personnel.
- Conduct regularly scheduled staff meetings with agenda and minutes distributed to the organization.
- Review and update applicable fire department human resource rules, policies, and procedures to ensure currency and effective processes. Finalize updating of all policies and procedures.
- Establish timetable for regular review and revision of all job descriptions.
- Review and update current job descriptions.

Planning

- Communicate succession planning efforts and ongoing plan.
- CCFD is encouraged to develop and maintain effective pre-incident and special hazard plans and incorporate the plans routinely into dispatch communications following NFPA 1660.

- Investigate software programs for pre-incident planning that can be uploaded to MDTs or to iPads.
- Ensure that operations personnel do tactical surveys on new construction.
- Create target hazards planning, including operational preplans for the response personnel, and incorporate them into dispatch procedures.
- Establish an internal planning group with a position delegated to the planning function: update the planning efforts annually.
- Create an emergency plan with hospital staff and practice it annually.
- Conduct a follow-up Strategic Plan to implement the recommendations, with goals related to service levels and performance with responsibilities and deadlines established.

Capital Assets

- Examine fleet size for a possible reduction of units to control the cost of maintenance and replacement.
- CCFD should work with the board to formally adopt a CIP similar to those used by the funding entities for other needs. Establish clearly defined vehicle replacement, equipment replacement, and facility improvement schedules.

Facilities

- Store turnout gear in a well-ventilated room to prevent additional firefighter exposure to off-gassing chemicals absorbed into turnout gear during a fire.
- Continue to take steps to reduce exposure to diesel soot and/or limit the potential for exposure of personnel and turnout gear to diesel fumes/soot.
- Properly decontaminate employees and their equipment in accordance with NFPA 1581: *Standard on Fire Department Infection Control Program*.
- Develop, adopt, and fund a long-range-facilities plan for the fire department.

Special Teams

Hazardous Materials

- Establish a written ERP for Hazardous Materials Response that is made available online to all members.
- Establish a plan to identify the required personal protective equipment to be employed along with emergency equipment.
- The ERP should include procedures for after-action reports and critiques.
- Create policies that reference a standardized methodology for assigning incident levels to hazardous materials emergencies.
- Develop a plan to outline the specific procedures for various tasks that team members may be required to perform, such as spill or leak control.

- Develop a training plan that includes the handling of more complex incidents.
- Establish and provide the capability for Class D metal fire extinguisher usage.
- Provide additional Hazardous Materials Toxicology training.
- Provide hazardous materials safety officer training in accordance with NFPA 472: *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.
- Explore options to establish additional capacity in geographical locations to provide hazardous materials and technical rescue services.
- Ensure replacement plans are in place to upgrade costly hazardous materials monitoring equipment, particularly to remain abreast of technological changes.

Technical Rescue

- Provide additional training for medical personnel in technical rescue-specific emergencies and injuries.
- Develop a personal protective equipment plan for technical rescue.
- CCFD should develop a policy for a site safety plan.
- Monthly training sessions are currently conducted on shift; however, increased full team training would be beneficial and ensure greater proficiency and team cohesion.
- Provide additional large vehicle machinery extrication training.
- Because rescue equipment is expensive and wears out over time, a replacement schedule, with appropriate funding, much like those used for apparatus should be developed for all big-ticket items.
- The equipment used for ice rescue is expensive and requires a replacement schedule for suits as they age.

Fire Prevention

- Continue to provide certification and training opportunities for fire prevention staff to achieve full ISO credit for Fire Prevention Certification and Training.
- Consider the addition of another fire inspector based on workload. Using retired firefighter annuitants or part-time staff may be another option for adding inspection capacity may be a cost-effective way to bolster the fire inspection program.
- Certify investigators in accordance with NFPA 1730, Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations and NFPA 921, Guide for Fire and Explosion Investigations.
- Develop a Community Risk Reduction (CRR) plan that focuses on all the risks throughout the area based on the findings in this report and continued analysis by CCFD staff.
- Create a Community Wildfire Protection Plan (CWPP) to identify and prioritize areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure and recommends measures to reduce structural ignitability throughout the at-risk community.

- It is recommended that the Fire Marshal's Office and the CCFD's leadership develop a monthly report to allow for the regular review of incident data and the response performance. The information contained within a common records management system provides valuable information that can assist the department in identifying areas of concern needing to be addressed through its fire prevention programs.
- ESCI further recommends that the CCFD consider the long-term establishment of the position of Community Outreach Coordinator. This position may be volunteer or paid and assigned to the Fire Marshal's Office. The role of the Community Outreach Coordinator would be to ensure that development, delivery, and enhancement of CCFD's Community Risk Reduction Program.

Public Education

- Establish a Fire and Life Safety Educator designation per NFPA 1035, Standard on Fire and Life Safety Educator, Public Information Officer, Youth Firesetter Intervention Specialist, and Youth Firesetter Program Manager Professional Qualifications to provide additional credibility to fire safety prevention and public education efforts and garner extra ISO points.
- Develop fire safety education pamphlets in several languages and ensure that they are readily available.
- Establish a wildland interface educational program.

Staffing

- Provide periodic reviews of current compensation structures, market competitiveness, and county compensation philosophies.
- Ensure all safety committee activities align with Chapter 4 of NFPA 1500.
- Ensure that the safety committee is diverse in their representation from across the department, ensuring representation by shift, rank, function, and interest, including representation from non-uniformed and staff members.
- The safety committee should meet monthly and should work to implement member safety education programs and encourage members' safety self-awareness.
- Update health and safety related policies to be current with the most recent applicable NFPA standards adopted in accordance with NFPA 1581.
- Ensure all members of the department understand how to access EAP resources.
- Develop and implement a formal recruitment program.
- Include cancer screenings as a part of the new hire and incumbent annual physicals.

EMS

- Establish a quality improvement (QI) program with a review of internal retrospective data.
- Establish an annual training calendar assigning specific monthly training to a particular purpose.

Training

- Officers should complete NIMS ICS 400 level training.
- Consider deploying members as part of wildland operations to provide training and experience that can be shared with members when they return.
- Provide support to ensure operations units get required training.
- Designate shift officers as training liaisons to assist with consistent training delivery across the shifts.
- Balance training program in three areas 1) training reflecting the current distribution of call types, 2) special team training, and 3) re-certification requirements.
- Identify gaps in high-risk low frequency events. Design the training program to address any deficiencies.
- There are better training records management software platforms available and CCFD should look to upgrade their program to one of these available alternatives.
- Schedule the required ISO training requirements across the entire year to ensure compliance.
- Create a training committee of individuals who are passionate about department training.
- Implement an analysis of the ability to complete tasks and evolutions as outlined in NFPA 1410, Standard on Training for Emergency Scene Operations.
- The department should make Post Incident Analysis (PIA) a part of the regular training program review.

Mid-Term Improvement Goals

Implementing mid-term improvement goals involves taking specific actions to achieve the objectives and goals set for a period of one to three years. General steps that can help in implementing mid-term strategies involve defining specific objectives and goals, assigning roles and responsibilities, developing action plans, allocating resources, monitoring progress, communicating, and engaging stakeholders in the implementation process, evaluating, and adjusting as necessary based on feedback. ESCI has identified several strategies to improve CCFD over the next one to three years.

Establish Geographic Response Demand Zones

CCFD should establish response benchmarks by considering geography, population density, and risk. Communities contain varying levels of population density and risk that allow fire jurisdictions to specify response performance objectives based on those considerations. NFPA 1720 categorizes population density as:

- **Urban** – A geographic area with a population density of over 1,000 people per square mile.
- **Suburban** – A geographic area with a population density of between 500 and 999 people per square mile.
- **Rural** – A geographic area with a population density of fewer than 500 people per square mile.
- **Remote**– Areas with a very low population density and limited access to emergency services.

In the CCFD service area, all of the risk levels are present based on the above criteria. Figure 59~~Figure 71~~ shows the differing levels of population risk in the service area. Most of the service area is rural; however, most responses occur where the population density is higher in the City of Gillette. ESCI recommends that the urban, suburban, and rural population densities each have a response standard. Often the response zone is defined by the closest station to respond, but other considerations may be used e.g., the route used for access or topography features,

CCFD may choose to divide rural areas into remote areas in accordance with NFPA 1720. Some areas are not easily accessible due to roads, topography, or other geographic issues. CCFD may extend the response time in remote areas as the time is based on factors out of the fire department's control.

Each response zone should be measured at least annually, although ESCI would recommend quarterly reporting. The analysis compares the actual performance to the adopted and approved benchmark. Over time the measures in a particular zone will indicate the action needed to improve performance. Management should use the analysis process to determine station location and timing. The quarterly or annual performance measurement needs to be published to the JPFB and the community.

Community Service Level Area Considerations

In many communities, it is appropriate to consider variations in the service levels and expectations of the community based on population densities and associated risk. The following are sample service delivery outcome goals established by ESCI for this Standards of Cover that accommodate the various demand zones located within the response area. These statements are based on ESCI's understanding of expectations across communities of similar size, demographics, and risk.

Figure 133: Community Outcome Goals

Service	Community Outcome Goal
Fire Suppression	For all fire incidents, the fire department shall strive to arrive in a timely manner with sufficient number and effective concentration of resources to rescue at-risk lives, contain and stop the escalation of the fire within the area of involvement, and perform property conservation operations while providing for the safety and security of the responders, the public, and the environment.
Emergency Medical Services	For all emergency medical incidents, the fire department shall strive to arrive in a timely manner with sufficient trained and equipped personnel to provide medical services that will stabilize the situation, provide care and support to the victim, and reduce, reverse, or eliminate the conditions that have caused the emergency while providing for the safety of the responders.
Vehicle Extrication	For all vehicle accidents where the rescue of victims is required, the fire department shall strive to arrive in a timely manner with sufficient resources to stabilize the situation and extricate the victim(s) from the emergency situation or location without causing further harm to the victim, responders, public, and the environment.
Technical Rescue	For all technical rescue incidents, the fire department shall strive to arrive in a timely manner with sufficient resources to stabilize the situation and establish an action plan for the successful conclusion of the incident. Working in conjunction with additional specially-trained and organized regional resources, the fire department will perform the necessary rescue functions while providing for the safety and security of the responders, public, and the environment.
Hazardous Materials	For all hazardous materials incidents, the fire department shall strive to arrive in a timely manner with sufficient resources to stabilize the situation and establish an action plan for the successful containment and notification and response of a specialized HazMat team and removal resources while ensuring the safety of the responders, the public, and the environment.

Formally Adopt Response Time Standards and Goals

Previously in this report, ESCI emphasized the importance of response standards and targets. These standards establish measurable goals for service delivery, which then form the baseline for the deployment of resources. Without defined goals and targets, an organization is unable to appropriately identify how effective it is providing services that meet community expectations. Response performance goals must be tailored to match community expectations and conditions and balanced against the financial aspect of what a community is able and willing to afford.

The response time continuum, the time between when the caller dials 911 and when assistance arrives, is comprised of several components. The following are the individual components analyzed by ESCI.

- **Call Processing Time**: The amount of time between when a dispatcher answers the 911 call and resources are dispatched.
- **Turnout Time**: The time interval between when units are notified of the incident and when the apparatus are responding.
- **Travel Time**: The amount of time the responding unit spends on the road to the incident.
- **Response Time**: A combination of turnout time and travel time. This is the most commonly utilized measure of fire department response performance.
- **Total Response Time**: The time interval from the receipt of the alarm at the dispatch center to when the first emergency response unit is initiating action or intervening to control the incident.

Total response time is the amount of time a resident or business waits for resources to arrive at the scene of an emergency beginning when they first call 911. This process begins for CCFD once the communications center dispatches the appropriate unit. The NFPA standard for call processing is derived from NFPA 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*. Similarly, NFPA 1710 provides response time measurements for career fire departments and is considered an industry best practice. The next figure illustrates these standards.

Figure 134: NFPA 1710 Standard for Fire/EMS Responses

Response Interval	NFPA Standard
Alarm Handling (NFPA 1225)	60 seconds or less at 90% for High Acuity Calls
Turnout Time	60 seconds or less at 90% for EMS 80 seconds or less at 90% for Fire and Special Operations
Travel Time	240 seconds or less at 90% for the First Arriving Unit

ESCI detailed the current CCFD response standards (fire and EMS) previously in this report, addressing call processing times, turnout times, and response times for the first unit on scene.

To review, the next figure demonstrates the CCFD emergency response performance for the first apparatus on the scene at an emergency incident. This information covers CCFD baseline performance from 2018 to 2022:

Figure 135: CCFD Current Response Time Performance Standards (All Calls) NFPA 1710

90TH PERCENTILE BASELINE PERFORMANCE AND BENCHMARK GOALS (FIRST APPARATUS ON SCENE)				
	Alarm Handling	Turnout	Travel	Response Time (Dispatched to First Apparatus on Scene)
CCFD 90% Baseline	3:57	2:39	12:15	14:50
NFPA 1225 Standard	1:00			
NFPA 1710 Standard		1:20	4:00	5:20

Figure 136: CCFD Current Response Time Performance Standards (Fire) NFPA 1710

90TH PERCENTILE BASELINE PERFORMANCE AND BENCHMARK GOALS (FIRST APPARATUS ON SCENE)				
	Alarm Handling	Turnout	Travel	Response Time (Dispatched to First Apparatus on Scene)
CCFD 90% Baseline	2:16	4:00	23:02	31:37
NFPA 1225 Standard	1:00			
NFPA 1710 Standard		1:20	4:00	5:20

This includes the extended distances traveled for wildland fires to the far reaches of the jurisdiction. One option is to distinguish between wildland and structure fires and set performance metrics for each.

Figure 137: CCFD Current Response Time Performance Standards (EMS) NFPA 1710

90TH PERCENTILE BASELINE PERFORMANCE AND BENCHMARK GOALS (FIRST APPARATUS ON SCENE)				
	Alarm Handling	Turnout	Travel	Response Time (Dispatched to First Apparatus on Scene)
CCFD 90% Baseline	4:29	2:36	10:52	12:44
NFPA 1225 Standard	1:00			
NFPA 1710 Standard		1:00	4:00	5:00

In addition to the response performance standards displayed in the previous two figures, CCFD has defined its respective full first alarm assignments (ERF) for a structure fire. Recommendations related to the assembly of an effective response force are provided later in this section.

In reviewing the performance by CCFD, ESCI found that, in general, the responses are higher than NFPA 1710 best practices and difficult to meet at best. ESCI recommends that the CCFD develop and formally adopt a single set of emergency response performance goals that work toward consistency with NFPA 1225 standards for alarm handling and NFPA 1710 standards for turnout times but incorporate NFPA 1720 demand zone criteria for response time. These response performance goals should address the components of response performance (call processing time, turnout time, and travel time) as well as overall response performance goals for predominant risks present in the communities.

The following figures detail the performance of CCFD in relation to these NFPA 1720 demand zone standards for 2022 and provide the ability to realize the benefit of incorporating NFPA 1720 demand zones responses into the performance metric development process.

Figure 138: CCFD Current Response Time Performance Standards (All Calls) NFPA 1720

PERCENTILE BASELINE PERFORMANCE AND BENCHMARK GOALS (FIRST APPARATUS ON SCENE)			
	NFPA 1720 Urban @ 90% Response Time (Dispatched to First Apparatus on Scene)	NFPA 1720 Suburban @ 80% Response Time (Dispatched to First Apparatus on Scene)	NFPA 1720 Rural @ 80% Response Time (Dispatched to First Apparatus on Scene)
CCFD NFPA 1720 Performance	9:45	9:58	16:15
NFPA 1720 Standard	9:00	10:00	14:00

Figure 139: CCFD Current Response Time Performance Standards (Fire) NFPA 1720

PERCENTILE BASELINE PERFORMANCE AND BENCHMARK GOALS (FIRST APPARATUS ON SCENE)			
	NFPA 1720 Urban @ 90% Response Time (Dispatched to First Apparatus on Scene)	NFPA 1720 Suburban @ 80% Response Time (Dispatched to First Apparatus on Scene)	NFPA 1720 Rural @ 80% Response Time (Dispatched to First Apparatus on Scene)
CCFD NFPA 1720 Performance	7:31	14:51	17:35
NFPA 1720 Standard	9:00	10:00	14:00

Figure 140: CCFD Current Response Time Performance Standards (EMS) NFPA 1720

PERCENTILE BASELINE PERFORMANCE AND BENCHMARK GOALS (FIRST APPARATUS ON SCENE)			
	NFPA 1720 Urban @ 90% Response Time (Dispatched to First Apparatus on Scene)	NFPA 1720 Suburban @ 80% Response Time (Dispatched to First Apparatus on Scene)	NFPA 1720 Rural @ 80% Response Time (Dispatched to First Apparatus on Scene)
CCFD NFPA 1720 Performance	9:55	10:11	16:16
NFPA 1720 Standard	9:00	10:00	14:00

The NFPA 1720 demand zone approach criteria allows for determining remote areas with travel time greater than eight miles. These responses could be carved out of the overall performance analysis to refine the performance measures even more. A well-defined, formally adopted set of response goals will accommodate more effective planning. Further, when considering the future deployment of resources decisions must be made using the same goals. In other words, it is much easier to strike a single target, rather than having different performance standards.

The following figure displays combined sample performance goals for consideration that address the various components of total response time:

Figure 141: Sample Response Goals—Components of Response Time (Fire) NFPA 1720

PERCENTILE PERFORMANCE BENCHMARK GOALS (FIRST APPARATUS ON SCENE) ANY EMERGENCY INCIDENT			
	Alarm Handling	Turnout Time	Response Time (Dispatched to First Apparatus on Scene)
Performance Goal (Urban)	01:00	01:20	9:00 @ 90%
Performance Goal (Suburban)	01:00	01:20	10:00 @ 80%
Performance Goal (Rural)	01:00	01:20	14:00 @ 80%
Performance Goal (Remote)	01:00	01:20	Directly dependent on travel distance.

Figure 142: Sample Response Goals—Components of Response Time (EMS) NFPA 1720

PERCENTILE PERFORMANCE BENCHMARK GOALS (FIRST APPARATUS ON SCENE) ANY EMERGENCY INCIDENT			
	Alarm Handling	Turnout Time	Response Time (Dispatched to First Apparatus on Scene)
Performance Goal (Urban)	01:00	01:00	9:00 @ 90%
Performance Goal (Suburban)	01:00	01:00	10:00 @ 80%
Performance Goal (Rural)	01:00	01:00	14:00 @ 80%
Performance Goal (Remote)	01:00	01:20	Directly dependent on travel distance.

The response performance benchmarks displayed in the previous two figures vary to some degree from the current 90th percentile performance of CCFD components of total response time.

ESCI believes that adopting the recommended emergency response time goal of 9 minutes in urban areas, 10 minutes in suburban areas, and 14 minutes in rural areas (dispatch to arrival) for the first arriving unit allows CCFD an opportunity to develop a compliance methodology to monitor actual response performance. This will provide CCFD leaders with the necessary data to monitor compliance of the adopted standards and adjust the adopted response performance goals as needed.

ESCI provides the following combined emergency response performance goals for the first unit on scene at any emergency incident, fire suppression emergencies, and EMS emergency incidents:

All Emergency Incidents—Response Performance Goal

- For 90% of all emergency incidents in urban areas, the first apparatus shall arrive within 9 minutes response time (Dispatch to first unit on-scene). The first apparatus on-scene shall be capable of establishing command, providing for scene safety, or initiating basic life support (BLS).

- For 80 percent of all emergency incidents in suburban areas, the first apparatus shall arrive within 10 minutes response time (Dispatch to first unit on-scene). The first apparatus on-scene shall be capable of establishing command, providing for scene safety, or initiating basic life support (BLS).
- For 80% of all emergency incidents in rural areas, the first apparatus shall arrive within 14 minutes response time (Dispatch to first unit on-scene). The first apparatus on-scene shall be capable of establishing command, providing for scene safety, or initiating basic life support (BLS).
- For 90% of all emergency incidents in remote areas, the first apparatus arrival shall be directly dependent on travel time (Dispatch to first unit on-scene). The first apparatus on-scene shall be capable of establishing command, providing for scene safety, or initiating basic life support (BLS).

Fire Suppression Incident—Response Performance Goal

- For 90% of all emergency fire suppression incidents in urban areas, the first fire apparatus shall arrive within 9 minutes response time (Dispatch to first unit on-scene). The first fire apparatus on-scene shall be capable of establishing command, initiating scene size-up, and initiating a defensive fire attack operation.
- For 80% of all emergency fire suppression incidents in suburban areas, the first fire apparatus shall arrive within 10 minutes response time (Dispatch to first unit on-scene). The first fire apparatus on-scene shall be capable of establishing command, initiating scene size-up, and initiating a defensive fire attack operation.
- For 80% of all emergency fire suppression incidents in rural areas, the first fire apparatus shall arrive within 14 minutes response time (Dispatch to first unit on-scene). The first fire apparatus on-scene shall be capable of establishing command, initiating scene size-up, and initiating a defensive fire attack operation.
- For 90% of all emergency fire suppression incidents in remote areas, the first fire apparatus arrival shall be directly dependent on travel time (Dispatch to first unit on-scene). The first fire apparatus on-scene shall be capable of establishing command, initiating scene size-up, and initiating a defensive fire attack operation.

All EMS Incidents—Response Performance Goal

- For 90% of all emergency EMS incidents in urban areas, the first on scene apparatus shall arrive within 9 minutes response time (Dispatch to first unit on-scene). The first on-scene unit shall be staffed with a minimum of two personnel capable of performing patient assessment, determining life-threatening conditions, and initiating patient care.
- For 80% of all emergency EMS incidents in suburban areas, the first on scene apparatus shall arrive within 10 minutes response time (Dispatch to first unit on-scene). The first on-scene unit shall be staffed with a minimum of two personnel capable of performing patient assessment, determining life-threatening conditions, and initiating patient care.

- For 80% of all emergency EMS incidents in rural areas, the first on scene apparatus shall arrive within 14 minutes response time (Dispatch to first unit on-scene). The first on-scene unit shall be staffed with a minimum of two personnel capable of performing patient assessment, determining life-threatening conditions, and initiating patient care.
- For 90% of all emergency EMS incidents in remote areas, the first on scene apparatus arrival shall be directly dependent on travel time (Dispatch to first unit on-scene). The first on-scene unit shall be staffed with a minimum of two personnel capable of performing patient assessment, determining life-threatening conditions, and initiating patient care.

Combined response performance goals for the assembly of an effective response force (ERF) are discussed as part of later recommendations.

Improve Alarm Handling Times

Currently, the Campbell County Sheriff's Office (CCSO) call-taking and dispatch times are in excess of NFPA standards. ESCI has identified several best practices and recommendations for review and consideration by the dispatch system to utilize as appropriate. CCSO dispatch should monitor alarm handling performance on a monthly basis, and strive to maintain or exceed adopted standards. Based on NFPA 1225 standards, alarm handling time—the time between when the call is answered and when the call is dispatched to responding units—should be less than 60 seconds, 90% of the time for high acuity incidents. Currently, the CCFD has call-handling performance of 3 minutes, 57 seconds at the 90th percentile. This is almost four times the performance standard as recommended by NFPA 1225.

- Implement processes to reduce alarm handling times. The single most cause of delay in the CCFD system has been identified as alarm handling time. (The Campbell County Sheriff's Office handles call processing and dispatch for CCFD)
- Enter into a service level agreement with the Campbell County Sheriff's Office communications center outlining transfer of call performance standards.
- Consider dedicated dispatcher for emergency services. A dedicated fire department dispatcher can help improve the efficiency, effectiveness, and safety of emergency response efforts.

Improve Turnout Time Performance

Turnout time is the one component of total response time over which the fire department has control and is not affected by outside influences. Turnout time, or the time from when the call is received by the response units (dispatched) to when the unit is enroute to the scene (responding), affects overall response times. Reducing this response time component reduces total response time. The NFPA 1710 calls for turnout times of 60 seconds for EMS incidents and 80 seconds for fire incidents. Overall turnout time performance for CCFD was 2 minutes, 39 seconds.

- ESCI recommends CCFD adopt a turnout time goal of 60 seconds for EMS incidents and 80 seconds for fires and special operations incidents at the 90th percentile.

- Conduct regular reporting of turn-out times with on-going analyses of turnout time delays. Current CCFD includes turnout time as part of the performance measures. Significant delay was attributed to turnout times.

With good information, training, and properly designed facilities that allow for rapid and efficient movement, responders can improve turnout time and hence total response time performance.

Response Performance Reporting

Once response time performance measures are adopted, the ability to measure performance is greatly dependent on collection and reporting of the data. Several recommendations are offered to improve data collection and reporting. The recommendations are listed here:

- Collect accurate and complete response time data for all units assigned to an incident. These times should include alarm handling and turnout times.
- Expand the incident reporting capability to include geographical distribution working with the City and County GIS unit. Include graphical data in annual report.
- Develop a quality assurance process for the data collection and analysis processes.

Insurance Services Office Public Protection Classification

Areas of deficiency within Community Risk Reduction that would have the greatest impact on the ISO PPC classification are shown in the next figure. ESCI recommends that CCFD confirm the overall potential impact on service delivery and implementation cost, its ISO rating, and potential discounts on property insurance premiums before investing in any improvements.

Figure 143: Areas of ISO Divergence

Factor	Score	Max Score	% Max Score	Impact
561. Credit for Deployment Analysis	3.30	10	**33%**	**HIGH**
571. Credit for Company Personnel	2.43	15	**16%**	**HIGH**
581. Credit for Training	6.54	9	**72.66%**	**MODERATE**
631. Credit for Inspection and Flow Testing	3.69	7	**52.7%**	**MODERATE**
1033. Credit for Public Safety Education (CFSE)	1.51	2.2	**68.6%**	**MODERATE**

CCFD scored 66.89 points out of 105.5 total available points during the ISO PPC evaluation. Based on the above recommended divergence factors CCFD is within 3.11 points from the next lower PPC classification. Additional enhancements are listed below.

- Ensure that all fire stations have primary and secondary dispatch circuits with appropriate emergency power supply, in accordance with NFPA 1221: *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems.*

- Increase staffing to improve response compliance with NFPA 1720: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*.
- Evaluate the frequency and methodology used to inspect and test hydrants.

Adapting the Purpose and Use of Part-Time Employees to Achieve Efficient Support of the Department Mission

There are several ways to adapt the part-time firefighting force and achieve efficient support of the department mission.

Recruitment and Retention

The first step is to recruit and retain part-time employees who are dedicated, committed, and willing to learn. The department should develop a recruitment plan that targets potential part-time personnel and highlights the benefits of membership, such as training and development opportunities, community involvement, and camaraderie.

Training and Development

Part-time employees should receive proper training and development to ensure they are competent and confident in their roles. The department should provide ongoing training that covers firefighting techniques, safety procedures, and equipment operation. Furthermore, the levels of support a part-time employee can offer can be divided into various support roles to meet the needs of the organization. For instance, the following levels of part-time employee could be developed to achieve different levels of support.

- **Combat Certified Firefighter**- This is a part-time employee who meets all required minimum standards for firefighting according to the State of Wyoming.
- **Wildland Firefighter**- This is a part-time employee who completes a wildland firefighter training program, such as the Wyoming State Forestry Division's Basic Wildland Firefighter Course or the National Wildfire Coordinating Group's (NWCG) Wildland Firefighter Type 2 course.
- **Support Member**- This is a part-time employee who is authorized to perform any firefighting operation that does not require wearing a self-contained breathing apparatus. This includes the operation of various fire department apparatus to include engines, tankers, grass trucks, etc.
- **Tender Operator**- This is a part-time employee who is authorized to perform the activities of operating a tanker/tender on roads and on scene and is excluded from all other emergency scene operations.
- **Observer**- This is a temporary position and is not authorized to perform any actions on an emergency incident other than to observe other personnel.

Each of the above part-time members would have a specific training program that provides the necessary knowledge, skills, and abilities to perform those functions. Often task books are created that allow for the ability to ensure members meet these job performance requirements before being allowed to operate. Programs like these allow for a more diverse demographic to take part in providing service to their community. The training should also include opportunities for part-time employees to develop leadership and management skills.

Technology Adoption

The department can adopt technology to streamline operations and improve communication. For example, a mobile app can be developed to alert part-time employees to emergencies, and cloud-based software can be used to manage schedules and training records.

Community Outreach

Part-time employees can engage with the community to build relationships and foster support. The department can organize open houses, public education campaigns, and community events that showcase the department's work and the role of part-time employees.

Recognition and Appreciation

Part-time employees should be recognized and appreciated for their contributions. The department can organize recognition events, such as awards ceremonies and appreciation dinners, and provide incentives, such as uniforms and equipment, to part-time employees who meet specific goals or milestones.

By implementing these strategies, the part-time firefighting force can become a more efficient and effective support system for the department mission.

Develop a Formal Succession Planning and Mentoring Program for Anticipated and Unanticipated Vacancies

CCFD will experience significant turnover in its leadership ranks as well as experience growth in these ranks from additional positions recently added. As fire service organizations navigate through the challenges of the 21st century, one key issue resonates to the forefront, “Who will lead our organizations in the future, and how will they do it successfully?” Many challenges facing organizations today, if not addressed, will lead to organizational turbulence and/or possible failure. Many organizations are not prepared for, nor have any real plan in place for this transition. To achieve trusted leadership and organizational success beyond the 21st century, organizations must overcome the challenges of building a leadership succession plan through education and the generation of social capital as the means for addressing healthy relationships, managing dissent, and recognizing the uses for evidence-based management in the fire service.

Key Challenges

Organizations today encounter a myriad of challenges that affect their ability to succeed. Many of these challenges can be anticipated and prepared for with proper identification, acknowledgment, and planning. Research yielded six main problems or concerns organizations will face and must address through succession planning: dealing with a retiring workforce, a loss of institutional knowledge, diminishing experience and practical wisdom, a resistance to organizational change, having four different generations in the workforce, and changing expectations and demands for emergency services. Through a vigilant effort to continuously improve the organization and develop a strategic plan to address these challenges, organizational leadership within CCFD will meet these challenges with solutions for the future.

Retiring Workforce

For fire-rescue departments, the retiring workforce can have a particularly significant impact. The specialized skills and experience required for firefighting and emergency response often take many years to develop, and losing experienced personnel can lead to gaps in service delivery and reduced operational effectiveness. The increase in the number of retirees all at once or the addition of leadership positions becomes difficult for organizations to manage and likewise produces other challenging issues if plans are not in place to address these gaps.

Loss of Institutional Knowledge

As the workforce retires and leaves, they take with them valuable, institutional knowledge gained during a career of serving the organization. Institutional knowledge is the mental history of learnings and teaching gained through employment with the organization. The history of the way things are done, or in some cases not done. Institutional knowledge collected and processed during the employee's day-to-day activities becomes valuable to the organization. The key to this institutional knowledge is time. Time served equates to lessons learned. These lessons, if not passed on through a formal and dedicated process to junior or successive employees, are lost.

Loss of Experience and Practical Wisdom

Along with the institutional knowledge are the physical experiences of doing the organization's work. This is experience gained through training and actual accounts yields wisdom. These together provide the employee with the ability to make sound decisions that will benefit the organization. Each account or situation an employee experiences provides valuable insight for use in the next situation. As employees leave the organization, these stored experiences are lost. If not passed down to other employees or cataloged, the experience must be relived to regain the knowledge lost through attrition.

Resistance to Organizational Change

Further challenges for the organization rest on the status of change within the organization. As the organization grows, it is inevitable that change will occur. Often the need for change will bring with it the unwillingness of employees to accept change based on inherent beliefs that may differ from this new direction.

As the primary link between the organization's change strategy and the employees responsible for implementing that strategy, managers must be able to "unfreeze" employee beliefs that the status quo is acceptable and motivate employees to make the desired changes. [57]

Generations in the Workforce

The type of employees that comprise the workforce is changing. Currently there are four different generations working side-by-side. These generational differences create difficulties and challenges for the organization as they navigate to appropriately address and communicate with each generation. Each of the four generations is vastly different in their approach and outlook on organizational methods for success. CCFD must approach these generational differences with methods that ensure clear communication of department mission, vision, and guiding principles and that they are understood.

Changing Expectations and Demands

In recent years, fire service organizations experienced decreasing revenues and budget cuts while requests for service have steadily increased. Fire service organizations across the nation are challenged by decreasing budgets with rising requests for service.

Effectively managing these challenges requires a basic understanding of how changes in levels of fire department resources deployed affect outcomes from emergencies that occur daily. Failing to manage these challenges can leave individuals, a fire department, and a community vulnerable to undesirable events. [58]

In some areas, these challenges move at speeds that leave organizations very little time to adjust and address the changing needs of the communities they serve. These changing community needs, coupled with other challenges, make organizational succession planning important for new leadership. Succession planning and management is indeed critical in the fire-rescue service, as it ensures that a department is adequately staffed and prepared for leadership changes, retirements, or unexpected departures. The International Association of Fire Chiefs' (IAFC) guide to succession planning provides helpful information for departments looking to start their own succession management plan.

[57] *Furst, S. A. (2008). Employee resistance to organizational change: Managerial influence tactics and leader-member exchange. Journal of Applied Psychology, 93 , (2), 453-462. doi:10.1037/0021-9010.93.2.453.*

[58] *Metropolitian Fire Chiefs. (2011, October 25). Fire Service Deployment: Assessing Community Vulnerability. Retrieved from www.NFPA.org.*

The guide is comprehensive and covers a range of topics, including why succession management is important, the benefits of having a plan, and how to develop and implement a plan. It also includes a history of succession management in the fire-rescue service and provides examples of successful plans from different departments.

Appendix 3 of the guide is a separate document that includes plans from three fire departments. These plans can serve as useful examples for other departments looking to develop their own succession management plans. It's always helpful to see how other departments have approached the process and what has worked for them.

Overall, the IAFC's guide and the plans included in Appendix 3 can be valuable resources for fire-rescue departments looking to improve their succession management practices. By taking the time to develop and implement a plan, CCFD can ensure they have the leadership and personnel needed to continue providing critical services to their communities.

Having a well-thought-out succession management program can be highly beneficial for fire-rescue organizations. It can help ensure a smooth transition of leadership and personnel, maintain continuity in operations and service delivery, and enable the organization to adapt and respond to changing needs. Furthermore, a succession management program that is tailored to the needs of the organization can enhance the morale and job satisfaction of current employees, by providing opportunities for career growth and advancement within the organization. Overall, this guide can be a valuable resource for any fire-rescue department looking to develop a meaningful succession management program that meets the needs of both their citizens and members and prepares for the future.

Long-Term Improvement Goals

To provide realistic alternatives to the current service delivery model, the following series of figures present several recommendations illustrating alternative approaches to the current service delivery model for consideration over the next five to ten years. Although these are by no means the only options, the following discussion does provide the CCFD with a sense of the range of models available to them and the impacts on service delivery.

Based on the analysis conducted during this study, ESCI provides several recommendations for consideration that would improve CCFD's ability to address increasing service demand, either with currently available resources or with additional resources. These recommendations would each enhance firefighter safety and effectiveness. The following analysis of these options will provide the CCFD with the information necessary to select the most appropriate and sustainable options and provide a prioritization for future funding decisions.

It is important to recognize that the options presented are based upon the data available at the time of this report and additional factors not readily available were not considered when forming the recommendations for consideration. Detailed analysis, including extensive financial modeling of options, is beyond the scope of this study. Further, CCFD may find that it would prefer to implement some variation of the options presented here.

Develop an Appropriate Funding Model

An appropriate funding model is crucial for the success of any organization, project, or initiative. A good funding model ensures that an organization or project can continue to operate and achieve its goals over the long term. This means that there must be a steady and reliable source of funding that can cover the costs of the organization as well as any future expansion or development plans. The right funding model can help an organization stay focused on its mission and goals. When funding is secure, the organization can concentrate on implementing its programs and activities without constantly worrying about where the next infusion of money will come from. Having a solid funding model can help attract talented people to an organization. This is because prospective employees or partners are more likely to be interested in working with an organization that has the resources to support its activities and growth.

Adequate funding allows an organization to take risks and experiment with new approaches or ideas. It provides the resources necessary to test and refine new strategies. A well-designed funding model includes clear metrics for measuring impact and success. This ensures that an organization can evaluate its effectiveness and make necessary adjustments to improve its performance over time. Overall, an appropriate funding model is essential for ensuring the sustainability, focus, talent attraction, innovation, and impact measurement for the organization.

Status Quo Projection

ESCI evaluated the historical information provided by staff to prepare a status quo expenditure forecast for the CCFD. Since the bulk of CCFD's funding is provided by partner operating and capital allocations as approved during the annual budget process this projection only considers expenditures for comparison purposes with the cost of potential future enhancements. The forecast relies on trends previously developed through the historical review period along with forecast information when available to understand potential anomalies due to personnel changes, apparatus acquisitions, and other major events. Certain assumptions were made about various expenditure components and are outlined below.

It should be noted that the model uses a straight-line annual increase for each of the five years in the projection for most items unless otherwise noted. Year-to-year fluctuation in each expenditure component is much more likely, but historical trending suggests that most changes are generally linear over an extended time frame. However, beyond five years, the use of an average annual increase based upon historical trending is highly speculative and should be monitored closely.

Since the JPFB has already approved the proposed FY 24 budget[59] which includes the addition of eight new staff positions (2 engineers, 5 captains, and 1 administrative coordinator), the status quo projection uses FY 24 as the base year but assumes no change in service level from FY 24 onward. This status quo forecast can then be compared against the differential cost of various staffing level scenarios that may be recommended for FY 25 and subsequent years.

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[59] *However, it should also be noted that the three JPA partners did not approved the FY 24 budget as proposed and approved by the JPFB. Regarding personnel in the budget request, two Captains and Two Engineers were approved. The additional staff was not funded. This report was generated based on the budget request as the status quo baseline.*

Expenditure Assumptions

The expenditure assumptions used in the CCFD forecasts are described in the next figure. Major expenditure categories are discussed below, but for each category, the average annual rates of increase forecast and their starting points may differ by program and as observed in the historical analysis. Individual program rates of increase will have an impact on the department totals in each category.

Figure 144: CCFD Revenue Forecast Assumptions (FY 24–28)

Category	Assumptions
Personnel Services	Average annual historical increase in wages across all CCFD positions based upon detailed annual salary data from FY 15 actual through FY 22 adopted is 1.48% while the average annual increase in benefits has been approximately 6.8%. However, since the JPA requires the CCFD to mirror Campbell County compensation practices[60], CCFD staff believes future annual wage increases will likely average 3-4% (combination of 2.0% COLA and merit increases of 1-3%) while benefits will likely increase at an average of 1.5% annually[61]. The forecast assumes a 4% annual increase in wages (2% COLA plus an average 2% merit increase) and a 1.5% annual increase in benefits using FY 24 proposed total figures as a basis. Overtime as percentage of regular wages varied from 6.7% in FY 15 to 8.3% in FY 22, averaging 8% for the period FY 15–22. Forecast assumes overtime will remain at or near 8% of total wages.
Opex – Administrative	Except for a spike in FY 20 due to the addition of EFSA expense[62], this class has increased at 6.1% annually between FY 17 and FY 22. Forecast uses FY 24 proposed budget amount as projection basis and growth at annual rate of 6.1%.
Opex – Facilities	Although fluctuating over the historical period, this class of expenditure has generally increased at approximately 10% annually. Forecast assumes FY 24 proposed as projection basis and growth at annual rate of 10%.
Opex – Fleet/Equipment	Although fluctuating over the historical period, this class of expenditure has generally increased at approximately 12.5% annually. Forecast assumes FY 24 proposed as projection basis and growth at annual rate of 12.5%.
Opex – Personnel	Although fluctuating over the historical period, this class of expenditure has generally increased at approximately 4.8% annually. Forecast assumes FY 24 proposed as projection basis and growth at annual rate of 4.8%.

[60] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022 D.B.A. Campbell County Fire Department; Article III – Powers of the Board A.(j).*

61 *Personal Communication with CCFD Finance Director 4/17/23*

62 *This is the Emergency Fire Suppression Account (EFSA) with the State of Wyoming which the JPFA joined in FY 20, paying for the current fiscal year and two prior years. The annual payment is based upon assessed value of the service area. EFSA funding is used by the State on behalf of participating jurisdictions when wildland fires occur on private lands and suppression exceeds local jurisdiction capabilities. The EFSA reimburses all suppression costs above $12,000 in a given fiscal year to participating agencies.*

Category	Assumptions
Opex – Operations	After dropping significantly between FY 17 and FY 18, this class of expenditures has increased slightly at an average annual rate of approximately 1.2% between FY 18 and FY 22. Forecast uses FY 24 proposed as projection basis and increases it at 1.2% annually.
Capex – Grants	CCFD has been very successful securing grant funding over the historical period and grant expenditures from state and federal grants have averaged near $180,000 annually between FY 17 and FY 22. Forecast uses FY 17–22 average of $180,000 each year of the forecast, except for FY 24 which uses the proposed amount.
Capex – Land	No expenditures have been made in this category in the historical review period and none are anticipated in the forecast period.
Capex – Building and Improvements	CCFD has spent between $105,000 and $130,000 in fiscal years FY 21 and FY 22 and anticipates spending just under $820,000 in FY 23. With aging facilities and the need to repair/renovate major building systems over the next five years, the forecast assumes an annual expenditure in this category of $250,000 in FY 25 escalating at 5% annually[63]. The FY 24 amount is that shown in the proposed budget.
Capex - Equipment	Except for a spike to $869,728 in FY 22 which largely covered replacement of SCBA inventory, department averaged $55,000 annually between FY 17 and FY 21 with projected spending in this category back down to $40,000 in FY 23 adopted. Forecast assumes annual equipment replacement of $55,000 starting in FY 25 with an annual inflation factor of 5%. The FY 24 amount is that shown in the FY 24 proposed budget.
Capex - Other	Only expenditure in this category is $64,583 in FY 23 adopted. Forecast assumes no expenditures in this category.
Capex - Apparatus	CCFD apparatus expenditures have fluctuated annually over the period FY 17-22 actual but have generally increased from a low of $121,169 in FY17 to a high of $2.5 million in FY 22 dropping back to $854,000 as projected in FY 23. The forecast assumes an expenditure of approximately $1.7 million in FY 25 increasing by 5% annually based upon industry estimates of inflation. The FY 24 amount is that shown in the FY 24 proposed budget.

[63] [Construction Inflation 2023 « Construction Analytics (edzarenski.com)]

Status Quo Forecast

The following figure shows total projected expenses for the CCFD for the forecast period FY 24–28 using the assumptions outlined above. The forecast assumes no major changes in service level or operational configuration beyond those in the FY 24 proposed budget. Expenses are anticipated to increase from $12.17 million in FY 24 to $14.1 million by FY 28, an increase of $1.96 million or almost 16.1%. This represents an average annual increase of 5.5%. With the underlying assumptions, including large uncertainties in the annual rate of inflation across a wide range of goods and services, in mind and the caveat that the forecast becomes very speculative beyond five years, it can be used to gauge the differential financial impact of adding career staffing over the period.

Figure 145: CCFD Status Quo Expenditure Forecast (FY 24–28)

Expenses	Status Quo Forecast				
	FY 24	FY 25	FY 26	FY 27	FY 28
Personnel Services	**$7,852,824**	**$8,162,401**	**$8,410,208**	**$8,666,747**	**$8,932,349**
Salaries & Wages	$4,751,782	$5,014,843	$5,215,437	$5,424,054	$5,641,017
Regular	*$ 4,464,782*	*$4,643,373*	*$4,829,108*	*$ 5,022,273*	*$ 5,223,163*
Overtime	*$287,000*	*$371,470*	*$ 386,329*	*$401,782*	*$ 417,853*
Benefits	$3,101,042	$3,147,558	$3,194,771	$3,242,693	$3,291,333
Operating	**$2,303,530**	**$2,435,194**	**$2,578,758**	**$2,735,482**	**$2,906,767**
Administrative	$749,307	$761,296	$773,477	$785,852	$798,426
Facilities	$474,400	$521,840	$574,024	$631,426	$694,569
Fleet/Equipment	$373,710	$420,424	$472,977	$532,099	$598,611
Personnel	$473,563	$496,294	$520,116	$545,082	$571,246
Operations	$232,550	$235,341	$238,165	$241,023	$243,915
Recurring Expenses	**$10,156,354**	**$10,597,595**	**$10,988,966**	**$11,402,229**	**$11,839,116**
Grants	$ 747,000	$747,000	$747,000	$747,000	$747,000
Land	$-	$-	$-	$ -	$ -
Buildings/Improvements	$80,000	$84,000	$ 88,200	$92,610	$97,241
Equipment	$188,300	$197,715	$207,601	$217,981	$228,880
Other	$-	$ -	$-	$-	$ -
Apparatus	$997,000	$1,046,850	$1,099,193	$1,154,152	$1,211,860
Total Non-Recur Exp	**$2,012,300**	**$2,075,565**	**$2,141,993**	**$2,211,743**	**$2,284,980**
TOTAL EXPENSES	**$12,168,654**	**$12,673,160**	**$13,130,959**	**$13,613,972**	**$14,124,096**

Cost Apportionment

Local governments provide services (such as fire protection) based on an assumption of public interest rather than the need for profitability, as in the private sector. Consequently, the limiting market forces of supply, demand, and price are not typically driving policy decisions concerning fire protection. While elected officials may spend significant time and effort debating the overall cost of fire protection, it is very unusual that the point of service price is considered. Thus, it is not surprising that local governments find it difficult to establish a fair market price for essential services when considering partnerships.

Usually when a single local government provides fire protection to its residents, that community bears the entire financial burden because of the presumption that everyone benefits from the service. In the case of municipalities, the full cost of the service may not be easily determined because administrative and support expenses are frequently borne by other municipal departments and not documented in the fire department's budget. It all works because individual users of the service are not charged; therefore, the real price of that service is never an issue. On the other hand, when two or more communities share in providing fire protection, elected officials must assure that each community assumes only its fair *pro rata* share of the cost, thereby fulfilling an obligation to the JPA while representing the best interests of their respective constituencies.

However, while purely economic considerations may suggest that those who benefit from a service should pay in direct proportion to the level of benefit (the "benefits received" principle), social and political concerns may also impact the price-setting process.

In analyzing various allocation scenarios, costs for the purpose of contracting for fire protection should be divided into two categories:

Direct or Allocated Costs: These are CCFD annual operating costs found in the department budget and allocated between Campbell County, the City of Gillette, and the Town of Wright based on a mutually agreed-upon allocation methodology, and which can be based upon a multi-variable formula. Various allocation options and factors used in determining an allocation formula between the partners are discussed below. Allocated costs should include a proportionate share of the total CCFD cost for goods and services provided to and across the jurisdictions, including materials and services costs, personnel costs, and capital costs.

Indirect Costs: These costs are any that are borne by one or more of the partners and found within their annual budgets, but which can be directly related to providing fire protection and administration of the JPA. These costs include any partner overhead costs such as administration, legal, audit and finance, risk management, facility and apparatus maintenance and support, and any other costs not directly found in the CCFD budget and administered as part of CCFD operations. These costs, if applicable, should be considered by the partners when discussing future allocation methodology.

Cost Allocation Variables

What follows is a listing of system variables that can be used (singly or in combination) to allocate costs between participating jurisdictions. Each variable is summarized by defining the variable, its advantages and disadvantages, and other factors that should be considered. Regardless of the methodology(s) chosen to share the cost of fire protection, the resulting JPA cost-sharing agreement needs to address the issues of full cost versus marginal cost and should be clear about the inclusion of administrative or overhead costs. In addition, service contracts often must reconcile the exchange of in-kind services between the participating agencies.

Area

The cost of emergency service can be apportioned based on the geographic area served relative to the whole. For instance, the jurisdictional boundaries of the three partners represent approximately 4,829 square miles. The following figure displays the respective service areas in square miles and the percentage for each jurisdiction.

Figure 146: Cost Allocation by Service Area, 2022

Jurisdiction	Service Area (sq mi)	% of Total
Campbell County	4,807.00	99.55%
City of Gillette	19.00	0.39%
Town of Wright	2.85	0.06%
Total	**4,828.85**	**100.00%**

Apportionment based on service area alone may work best in areas that are geographically and developmentally homogeneous, which is not the case here given the very rural nature of most of Campbell County.

Pro: Service area is easily calculable from a variety of sources. The size of the service area generally remains constant with few, if any, changes except in cases where either rapid or gradual annexation may be contemplated.

Con: Service area does not necessarily equate to greater risk or to greater workload particularly given an inhomogeneous distribution of population and occupancy types as seen in Campbell County.

Consider: Service area may be combined with other variables (such as assessed value and number of emergencies) to express a compound variable (such as assessed value per square mile and emergencies per square mile). This might be included as a factor in this case, albeit as a small factor, given that there is some degree of wildland fire risk and resultant workload associated with rural Campbell County.

Assessed Value

The assessed value (AV) of the partner jurisdictions is established by county tax assessors under laws of the state. Usually, higher-valued structures and complexes carry a greater risk to the community from loss by fire. Consequently, assessed value also tends to approximate the property values at risk within an area. Fire departments are charged with being sufficiently prepared to prevent property loss by fire. Therefore, the cost of fire protection may be apportioned relative to the assessed value of the allied jurisdictions. Typically, AV is used to apportion the cost of shared service by applying the percentage of each partner's AV to the whole. The following figure illustrates the allocation of cost by the assessed value of the three partners.

Figure 147: Cost Allocation by Assessed Value, FY 2023

Jurisdiction	Assessed Value	% of Total
Campbell County	$4,539,270,189	92.92%
City of Gillette	$333,964,903	6.84%
Town of Wright	$12,068,743	0.25%
Total	**$4,885,303,835**	**100.00%**

Pro: AV is updated regularly, ensuring that adjustments for changes relative to new construction, annexation, and inflation are included. Because a third party (the assessor) establishes AV in accordance with state law, it is generally viewed as an impartial and fair measurement for cost apportionment. Fire protection is typically considered a property-related service; thus, apportionment tied directly to property value has merit.

Con: AV may not reflect the property risk associated with certain exempt properties, such as schools, universities, government facilities, churches, and institutions. AV may not always represent the life risk of certain properties, such as nursing homes or places of assembly, which might dictate more significant use of resources. In addition, some large facilities may seek economic development incentives through AV exemptions or reductions. Adjustments may need to be made to AV of such large tracts of exempt property in one jurisdiction which can cause an imbalance in the calculation.

In the case of Campbell County, significant oil and gas and coal production operations are present and the combined assessed value of these resource extraction operations skews comparison of total assessed value between jurisdictions. In other words, assessed values that include mineral value does not necessarily reflect structural fire risk and may not be a good indicator of fire department workload. Thus, the use of total assessed value that includes natural resources extraction values may not be an appropriate factor to use in allocating fire department cost. Further, while it may be an obvious choice to exclude mineral values, the associated extraction infrastructure often has its own fire protection resources and, while there may be some associated fire risk, the resulting workload is mainly borne by the industrial fire brigades rather than CCFD resources. It might be more reasonable to compare assessed value of just the residential, commercial, and institutional occupancies across jurisdictions as shown in the figure below.

Figure 148: Cost Allocation by Assessed Value of Residential and Commercial (plus Institutional) Occupancies Only, FY 2023

Jurisdiction	Assessed Value	% of Total
Campbell County	$112,961,673	25.39%
City of Gillette	$321,241,160	72.20%
Town of Wright	$10,726,971	2.41%
Total	**$444,929,804**	**100.00%**

Lastly, AV typically includes the value of land, which is not usually at risk of loss by fire (although in some cases wildland fires may impact valuable timber and agricultural resources). Depending on the local circumstance, however, this may not be a significant factor.

Consider: Discounted AV depending on the class of property (commercial or residential), which may skew the overall proportion of those properties compared to risk. As an additional consideration, assessors usually establish the AV in accordance with the property tax cycle, which can lag somewhat behind the budget cycle. However, use of modified AV considering just residential and commercial (to include institutional) is likely a useful indicator of workload and thus should be considered as a factor in developing an apportionment formula.

Deployment

The cost for services provided is based on the cost of meeting specific deployment goals. Deployment goals may be tied to the physical location of fire stations, equipment, and personnel (strategic deployment) or by stating the desired outcome of deployment (standards of cover). A strategic goal could specify the location of two stations, two engines, and four on-duty firefighters. A standards of cover study might state the desired outcome as two engine companies and four emergency workers on the scene of all structure fire emergencies within eight minutes 90% of the time. While both strategic and outcome goals can be used effectively to assist in allocating cost, ESCI views outcome goals to be more dynamically linked to the quality of service and, therefore, preferable to strategic goals. This alternative is highly variable due to the independent desires of each community with respect to outcome goals. A weighted scoring system uses a critical task analysis. This type of scoring system allows the ranking of each jurisdiction based on the assigned risk as well as the apparatus, workforce, and Needed Fire Flow (NFF).

Pro: Deployment is intuitively linked to the level of service. The outcome of deployment based on adopted standards of cover can be monitored continuously to assure compliance. Such deployment can be adjusted if standards are not met. This ensures the continuous quality of emergency response throughout the life of a service contract.

Con: Strategic deployment may not equate to better service because such goals are prone to manipulation wherein resources may be sited more for political reasons and less for quality-of-service reasons. Outcome goals require common reporting points and the automatic time capture of dispatch and response activities to ensure accuracy. Record keeping needs to be meticulous to ensure the accurate interpretation of emergency response outcomes.

Consider: The JPFB is currently conducting a long-range master plan which includes a standards of cover/community risk assessment. The results of this study can be used by the partners to determine the level of service desired throughout the CCFD service area which includes distribution and level of resources needed to achieve desired outcomes. Once adopted, the desired level of service drives resource deployment that can then be used as an allocation factor in subsequent discussions. The JPFB partners should continue to review the allocation methodology and criteria every few years to ensure that all partners believe they are equitably treated.

Service Demand

Service demand may be used as an expression of the workload of a fire department over a geographical area. Cost allocation based on emergencies would consider the total emergency response of the service area and apportion system cost relative to the percentage of emergencies occurring in the jurisdictions. The following figure illustrates total in-county service demand by jurisdiction over the period 2018-2022. There was a total of 89 out-of-county responses that are not considered for the purposes of allocating costs between the partners.

Figure 149: Cost Allocation by Service Demand

Jurisdiction	Service Demand (2018-2022)	% of Total
Campbell County	3,408	27.91%
City of Gillette	8,417	68.93%
Town of Wright	386	3.16%
Total	**12,211**	**100.00%**

Pro: Easily expressed and understood. Changes in the workload over the long-term tend to mirror the amount of human activity (such as commerce, transportation, and recreation) in the corresponding area.

Con: Emergency response fluctuates from year-to-year depending on environmental and other factors not directly related to risk, which can cause the dependent allocation to fluctuate as well. Further, the number of alarms may not be representative of actual workload, for example, one large emergency event requiring many emergency workers and lasting many hours or days versus another response lasting only minutes and resulting in no actual work. Last, emergency response is open to (intentional and/or unintentional) manipulation by selectively downgrading minor responses, by responding off the air, or through use of mutual aid resources. Unintentional skewing of response is most often found in fire systems where dispatch and radio procedures are imprecisely followed. Further, service demand does not follow a predetermined ratio to land area. As such, the service demand per square mile ratios may produce large variations.

Consider: Using a rolling average of alarms over several years (as shown in the figure above) can help suppress the normal tendency for the year-to-year fluctuation of emergencies. Combining the number of emergencies with the number of emergency units and/or personnel required may help to align alarms with the actual workload more closely. However, doing so adds to the complexity of documentation. In a similar manner (and if accurate documentation is maintained), the partners could consider using the total time required for emergencies as an aid to establishing the comparative workload represented in each jurisdictional area. In this case, with one provider serving all three partner jurisdictions, skewing of calls between jurisdictions is unlikely to affect the relative proportions.

Sample Cost Allocation Options

While there may be other variables that could be significant to consider when developing a cost allocation methodology those presented above can be used singly or in combination to allocate costs between participating jurisdictions. In future discussions, the resulting JPA cost-sharing agreement should consider the full cost of providing fire and rescue service.

There are three areas of the JPA which are subject to an allocation methodology, and which are subject to change from time-to-time including ownership of all facilities and property of the CCFD, funding of the annual operating budget, and funding of the annual capital budget.[64] The partners recently amended the JPA changing the allocation formula and the current allocation percentages for the three areas found in the JPA are shown in the following figure. The partners may wish to consider aligning all three areas with a common allocation or at least aligning the ownership and capital allocations.

Figure 150: Current JPA Cost Allocation

Jurisdiction	Ownership of Capital	Operating Allocation	Capital Allocation
Campbell County	49.0%	49.0%	49.5%
City of Gillette	49.0%	49.0%	49.5%
Town of Wright	2.0%	2.0%	1.0%

The following figures provide several notional examples of how the different variables might be weighted and combined to develop a cost allocation formula. It should be noted that these variables will change with time thus the partners should consider reviewing the allocation formula at least every two years even if the JPA has a longer duration. There is no "correct" configuration. Rather, these are offered to show how the partners might approach an allocation methodology and reach consensus on the desired approach. It should be noted that in all examples, the Town of Wright is in the 2% range which is consistent with the current and past allocation methodologies used.

Figure 151: Allocation by Service Demand and Assessed Value

Department	Allocation Variable	Avg %	Weighting Factor Applied	%	Weighted % (Service Demand /AV)
Campbell County	Service Demand	27.9%	0.65	18.1%	50.7%
	Assessed Value	92.9%	0.35	32.5%	
City of Gillette	Service Demand	68.9%	0.65	44.8%	47.2%
	Assessed Value	6.8%	0.35	2.4%	
Town of Wright	Service Demand	3.2%	0.65	2.1%	2.1%
	Assessed Value	0.2%	0.35	0.1%	

[64] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022 D.B.A. Campbell County Fire Department; Article IV – Financing and Article V - Ownership.*

Service demand should likely be weighted in the 50-65% range given that this is a direct indication of workload with the prior caveats in mind (time and resources per call per jurisdiction). Further, service area likely should not be weighted more than about 15% given that much of unincorporated Campbell County is vacant land with limited human and structural risk due to fire loss.

Figure 152: Allocation by Service Area, Full Assessed Value, and Service Demand

Department	Allocation Variable	Avg %	Weighting Factor Applied	%	Weighted % (Service Demand /AV)
Campbell County	Service Area	99.5%	0.10	10.0%	51.3%
	Assessed Value	92.9%	0.25	23.2%	
	Service Demand	27.9%	0.65	18.1%	
City of Gillette	Service Area	0.4%	0.10	0.0%	46.6%
	Assessed Value	6.8%	0.25	1.7%	
	Service Demand	68.9%	0.65	44.8%	
Town of Wright	Service Area	0.1%	0.10	0.0%	2.1%
	Assessed Value	0.2%	0.25	0.1%	
	Service Demand	3.2%	0.65	2.1%	

Figure 153: Allocation by Service Area, Partial Assessed Value (Res/Comm Occupancies), and Service Demand

Department	Allocation Variable	Avg %	Weighting Factor Applied	%	Weighted % (Service Demand /AV)
Campbell County	Service Area	99.5%	0.10	10.0%	33.2%
	Assessed Value[1]	25.4%	0.20	5.1%	
	Service Demand	27.9%	0.65	18.1%	
City of Gillette	Service Area	0.4%	0.10	0.0%	59.3%
	Assessed Value[1]	72.2%	0.20	14.4%	
	Service Demand	68.9%	0.65	44.8%	
Town of Wright	Service Area	0.1%	0.10	0.0%	2.5%
	Assessed Value[1]	2.4%	0.20	0.5%	
	Service Demand	3.2%	0.65	2.1%	

Figure 154: Allocation by Service Area, Partial Assessed Value (Res/Comm Occupancies), and Service Demand with Different Weighting

Department	Allocation Variable	Avg %	Weighting Factor Applied	%	Weighted % (Service Demand /AV)
Campbell County	Service Area	99.5%	0.15	14.9%	37.8%
	Assessed Value[1]	25.4%	0.35	8.9%	
	Service Demand	27.9%	0.50	14.0%	
City of Gillette	Service Area	0.4%	0.15	0.1%	59.8%
	Assessed Value[1]	72.2%	0.35	25.3%	
	Service Demand	68.9%	0.50	34.5%	
Town of Wright	Service Area	0.1%	0.15	0.0%	2.4%
	Assessed Value[1]	2.4%	0.35	0.8%	
	Service Demand	3.2%	0.50	1.6%	

[1]Assessed value for residential and commercial (includes institutional) occupancies only

Figure 155: Allocation by Service Area, Partial Assessed Value (All Occupancies), and Service Demand

Department	Allocation Variable	Avg %	Weighting Factor Applied	%	Weighted % (Service Demand /AV)
Campbell County	Service Area	99.5%	0.10	10.0%	47.9%
	Assessed Value[1]	70.5%	0.30	21.2%	
	Service Demand	27.9%	0.60	16.7%	
City of Gillette	Service Area	0.4%	0.10	0.0%	49.9%
	Assessed Value[1]	28.4%	0.30	8.5%	
	Service Demand	68.9%	0.60	41.4%	
Town of Wright	Service Area	0.1%	0.10	0.0%	2.2%
	Assessed Value[1]	1.1%	0.30	0.3%	
	Service Demand	3.2%	0.60	1.9%	

[1]Assessed value for residential, commercial, and industrial occupancies only (excludes minerals)

Using full assessed values including minerals, weighted at 35% and 25% respectively in the first two examples yields allocation results very similar to last example which includes assessed value of all structures, including surface mineral extraction occupancies, weighted at 30%. The split between Campbell County and the City of Gillette in all three examples is close to that currently in the JPA.

Develop and Fund an Appropriate Fire Station Optimization Plan

One of the considerations ESCI was asked to analyze was the placement of current fire stations and the need for relocation if necessary. Based on the preceding analysis CCFD fire stations are very well situated and provide all the opportunity to continue to provide optimal, efficient, and effective response to service demand with some minor adjustments for efficiency as well as financial savings. When comparing station siting against national consensus standards and ISO requirements CCFD covers 32.2% of the service area within five miles of a fire station. Furthermore, 13.9% of the coverage area is within 1.5 miles of a fire station and 19.1% of the coverage area is within 4 minutes travel time from a CCFD Fire Station.

CCFD travel time in 2022 to incidents was less than 4 minutes to 40.52% of incidents, 4–8 minutes to 38.81% of incidents, 8–12 minutes to 10.53% of incidents and greater than 12 minutes to 10.14% of emergency incidents. In summary, 20.67% of emergency incidents took longer than 8 minutes for arrival of CCFD units. Furthermore, when looking at the ability to handle more than one emergency incident at a time from 2018-2022 CCFD experienced more than two concurrent calls 16.65% of the time.

GIS optimization tools predict the best possible fire station locations based on service demand inputs for maximizing coverage. To ensure optimized fire station location, ESCI uses the Location – Allocation tool in ArcGIS® desktop or Pro. This process evaluated 883 available parcels that fronted a road within the residential area on the west side of the city as viable potential candidates for relocation.

The following requirements are entered into the Location – Allocation tool to conduct the analysis.

- The fire station locations that must remain.
- Locations that are potential candidates for new stations. In this analysis 883 potential new locations were considered.
- The fire station locations that could be removed.
- The number of fire stations to consider having.
- The service demand.
- A typical cutoff for travel time – the optimized station must be able to provide service to a demand point within x number of minutes. In this analysis a travel time of four minutes was used.

For fire station analysis, the department’s emergency calls for service represent the demand inputs. In the analysis the Location – Allocation tools can only use 1000 demand inputs as a maximum. The most recent 1000 demand inputs were used for this analysis. If another type of service was being considered, one could use population in census blocks as the demand. The tool identifies the locations that provide the maximum coverage for the demand, using a national street network for routing. It returns a map of the best station locations, with lines connecting those stations to their matched demand points.

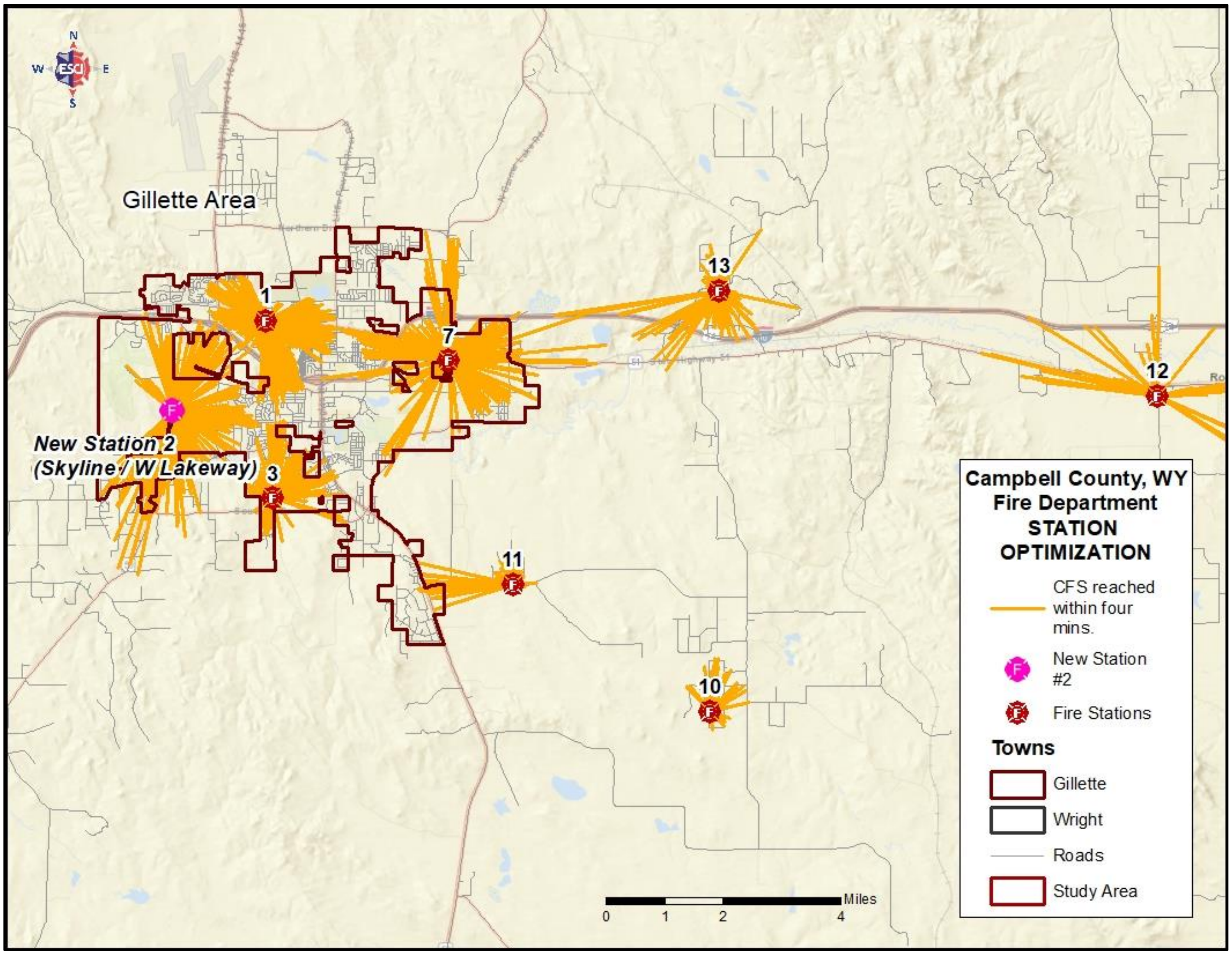
The following list describes how the “Maximize Coverage” problem handles demand:

- Any demand point outside all the facilities' impedance cutoffs is not allocated.
- A demand point inside the impedance cutoff of one facility has all its demand weight allocated to that facility.

- A demand point inside the impedance cutoff of two or more facilities has all its demand weight allocated to the nearest facility only.

The results of the optimization study are shown in the following figure.

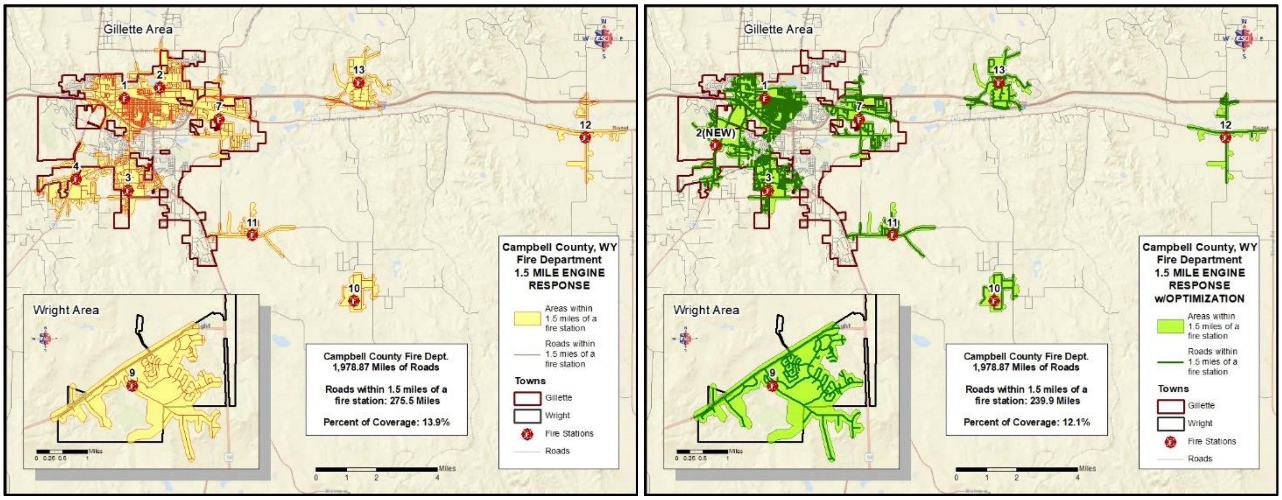
Figure 156: CCFD Station Optimization Analysis



The analysis returned the maximized coverage using the current fire station locations, shutting down two current stations, and adding one additional fire station. The parcel located at Skyline/W Lakeway was returned as the location for new Fire Station 2. This is further corroborated by the ISO 1.5-mile coverage map for the Skyline/W Lakeway property. The long-term approach to staffing and providing service from the current fire stations would best be suited with career staff at Fire Station 1, 3, and 7 prior to the addition of new Fire Station 2. This progression would provide immediate improvements to response time goals and metrics as currently only Fire Station 1 and 3 in the city are staffed.

The ISO 1.5-mile station coverage map for proposed property is listed in the following figure.

Figure 157: ISO 1.5 Mile Coverage Proposed New Fire Station 2



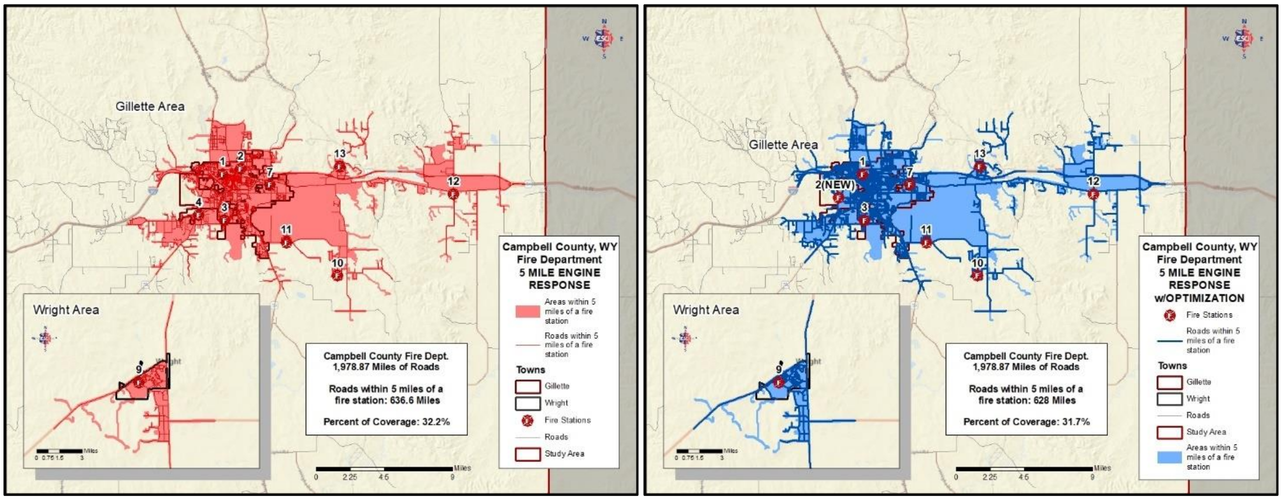
The service area coverage decreases from 13.9% to 12.1% in the new proposed Fire Station 2, a reduction of 1.85% in road mileage coverage. This percentage of road mileage coverage will most likely increase and surpass current coverage as additional roads are constructed on the west side of the city as continued development takes place. Immediate improvements would be realized with staffing a new Fire Station 2 as currently it is unstaffed.

Based on the optimization analysis, if CCFD chooses to relocate Fire Station 2 it will have to weigh the risk versus benefit of such a move. These benefits could include the ability to take advantage of the larger plot of land to house administration, fire prevention, community rooms, and police substations. Furthermore, the ability to construct a larger fire station to house additional apparatus in the future and current reserve apparatus are all reasons to consider a relocation if the current locations will not support those activities. The risks are the potential increase of response times from the new location as indicated by the optimization analysis.

Additionally, current construction near the golf course on the west side of the city places new residential units outside of the current ISO 5-mile station coverage. The proposed new Fire Station 2 will enhance that coverage as additional roads are constructed and increase road mile coverage beyond the current coverage.

The ISO 5-mile station coverage map for proposed property is listed in the following figure.

Figure 158: ISO 5-Mile Station Coverage Proposed New Fire Station 2



The service area coverage decreases from 32.2% to 31.7% in the new proposed Fire Station 2, a reduction of 0.5% in road mileage coverage. However, this percentage of road mileage coverage will most likely increase as additional roads are constructed on the west side of the city as continued development takes place near the golf course area and still allow for coverage of the current service area.

It is important to note that currently Fire Station 2 and Fire Station 4 are unstaffed, and the area must rely on part-time staff to respond from home or for staff to respond from Fire Station 1 and Fire Station 3. Therefore, response times should remain almost unchanged by the relocation but will provide the necessary foundation for a significant decrease in response times should career staff be placed there in the future. In fact, the station should be staffed with career staff when new construction takes place.

ESCI's analysis took many factors into consideration and determined that there is not a need for additional fire stations beyond the relocation of Fire Station 2 in the future but the addition of staff to current Fire Station 7 should become the priority. Service delivery and performance indicators conclude the location of current stations provide the ability to meet established metrics for response. While the optimization model indicates a small decrease in coverage if done before additional road network construction is completed on the west side of the city near the golf course, expected and approved construction in that area will yield an increased road network coverage as construction is completed. If the timelines are coordinated there could be very little divergence in coverage.

As discussed in the *Capital Facilities & Apparatus* section of the report, Fire Station 2 and Fire Station 4 are old and beyond their design life. Therefore, they should both be closed in conjunction with relocating and building a new Fire Station 2. When considering facilities, this report focuses on the inability to meet national consensus standards for fire station design and function regarding health and safety. Health and safety issues are at the top of the fire station design deficiencies and should be rectified for long term success of CCFD and employee welfare.

As CCFD begins to address the replacement, remodeling, or addition of fire stations, it is advisable to adopt a "standardized" design wherever possible. Newly constructed stations should take into consideration NFPA 1500, 1710, and 1851. These standards address specific design considerations to improve firefighter health and safety. NFPA 1500: *Standard on Fire Department Occupational Safety, Health, and Wellness Programs* addresses the separation of crew quarters from apparatus bays to protect firefighters from carcinogens, as well as workout and exercise facilities to improve cardiac health. NFPA 1851: *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting* addresses laundry facilities for personal protective equipment, uniforms, and bedding.

Based on this ESCI recommends developing a replacement, relocation, and/or renovation schedule to address current fire stations. A sample replacement/renovation plan for CCFD Fire Stations is listed below.

Figure 159: Sample 5 Year Fire Station Relocation/Renovation Schedule

Location	Year 1	Year 2	Year 3	Year 4	Year 5
Fire Station 2 (Relocate)	Acquire Land	Design	Construction	Completion	
Fire Station 7 (Renovation)			Design	Construction	Completion
Fire Station 3 (Renovation)				Design	Construction
Fire Training Facility	Design	Construction	Completion		

While NFPA 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* pertains to response times, the proper design of a fire station can have a positive impact on turnout times. Collectively, these NFPA standards can have a positive impact on the effectiveness of the department and the safety of its most valuable resource.

Campbell County could expand the role of public safety at these fire stations and approach rebuilding from a community public safety standpoint. This would include designing the spaces to accommodate police substations, ambulance housing, and community rooms for the public to use.

Improve Upon Response Deployment and NFPA 1720 Effective Response Force Assembly

Response Deployment

There are several opportunities for improving the response deployment model.

- Adopt ERF incident staffing based on geographic demand zone and occupancy risk rather than defining unit staffing.
- Determine structures that require additional effective response force personnel and plan for how to achieve those needs.
- Define fire target hazards and determine the necessary ERF for these hazards. This may require conducting a critical task analysis.
- Adopt a 1.25 relief factor when hiring adequate staff to achieve minimum staffing levels.

Add an Officer to the Aerial Ladder Truck at Fire Station 1

Campbell County has experienced growth and development regarding the types of occupancies being built in the service area. As discussed these occupancies allow the CCFD to predetermine the type of risk associated with each. Furthermore, the City FLUM has also provided the ability to predict and control the growth. Many of the recently completed and proposed projects involve moderate and high-risk occupancies with large square footage or multiple stories with large square footage. Firefighting activities significantly get more difficult with every story of height experienced. These types of occupancies require a larger ERF and more specifically the use of aerial ladder trucks.

Adding staffing to the aerial ladder truck at Fire Station 1 with 3-person daily staffing would be a significant positive step in addressing the established risk profile and current and future response needs of the CCFD. Essential aerial ladder company operations include search, ventilation, high angle rescue, heavy extrication, aerial and water tower operations. With the large housing stock, freeways, high-speed thoroughfares, multiple story structures, and complex building campuses, a 3-person aerial ladder truck equipped with search, rescue, and aerial ladder capabilities will provide essential critical tasking in a timely manner. This resource is an essential part of the critical tasking elements and serves an important part of the ERF response within the recommended ERF target.

For aerial ladder companies staffed with four personnel, the driver/operator of the first arriving aerial ladder company must remain with the apparatus to safely position and operate the aerial ladder while the other three firefighters also perform critical fireground tasks such as ventilation, search, and rescue. Due to the demands of fireground activities, a fire attack initiated by companies with only three or fewer firefighters is not capable of effecting a safe and effective fire suppression and/or rescue operation until additional personnel arrive. Currently only two firefighters are assigned to the aerial ladder greatly reducing the effectiveness of the unit.

Insufficient numbers of emergency response units or inadequate staffing levels on those units expose civilians and firefighters to increased risk, further drain already limited fire department resources, and stress the emergency response system by requiring additional apparatus to respond from further distances. Failing to assemble sufficient resources on the scene of a fire in time to stop the spread and extinguish the fire, conduct a search and rescue, or rescue any trapped occupants puts responding firefighters and occupants in a dangerous environment with exponential risk escalation such that it is difficult to catch up and mitigate the event.

Impact to Fire Suppression

CCFD implementation of this improvement goal prior to the adoption and increase of ERF recommended in the service area will still see a significant increase in ability to assemble an enhanced ERF to include an aerial truck. The increases in staffing would directly result in additional credit for the ISO categories evaluating deployment and staffing.

Adopt Effective Response Force Performance Goals

A fire department's *concentration* is the spacing of multiple resources close enough together so that an initial "Effective Response Force" (ERF) for a given risk can be assembled on the scene of an emergency within the specific time frame identified in the community's performance goals for that risk type. An initial effective response force is defined as that which will be most likely to stop the escalation of the emergency. The ability for CCFD to assemble an ERF diminishes in the outer areas of the service area due to a decreased concentration of resources. Because CCFD stations are so well placed the ability to increase ERF can be achieved by simply increasing the current minimum staffing of suppression units in the urban areas.

Based on the NFPA 1720 criteria used to establish response time goals, ESCI recommends the following accompanying ERF response performance goals for structure fires:

Figure 160: Effective Response Force (ERF) Goal, Structure Fire

PERCENTILE PERFORMANCE BENCHMARK GOALS (FIRST APPARATUS ON SCENE) ANY EMERGENCY INCIDENT				
	Alarm Handling	Turnout Time	Minimum Staff to Respond	Response Time (Dispatched to First Apparatus on Scene)
Performance Goal (Urban)	01:00	01:20	15	9:00 @ 90%
Performance Goal (Suburban)	01:00	01:20	10	10:00 @ 80%
Performance Goal (Rural)	01:00	01:20	6	14:00 @ 80%
Performance Goal (Remote)	01:00	01:20	4	Directly dependent on travel distance.

Moderate Risk Structure Fire—Effective Response Force (ERF) Response Performance Goals

The following response performance goals have been established to meet the NFPA 1720 demand zone ERF recommendations.

- For 90% of all emergency structure fire incidents in urban areas, the ERF with a minimum of 15 personnel deployed, a minimum of three engines, one aerial, various part-time staff, and one Battalion Chief shall arrive in 9 minutes (Dispatch to first unit on scene). The ERF shall be capable of establishing incident command, maintaining a sustained fire flow, advancing fire attack lines and back-up lines, initiating victim search and rescue, ventilation, and controlling utilities.
- For 80% of all emergency structure fire incidents in suburban areas, the ERF with a minimum of 10 personnel deployed, a minimum of three engines, one aerial, various part-time staff, and one Battalion Chief shall arrive in 10 minutes (Dispatch to first unit on scene). The ERF shall be capable of establishing incident command, maintaining a sustained fire flow, advancing fire attack lines and back-up lines, initiating victim search and rescue, ventilation, and controlling utilities.
- For 80% of all emergency structure fire incidents in rural areas, the ERF with a minimum of 6 personnel deployed, a minimum of three engines, various part-time staff, and one Battalion Chief shall arrive in 14 minutes (Dispatch to first unit on scene). The ERF shall be capable of establishing incident command, maintaining a sustained fire flow, advancing fire attack lines and back-up lines, initiating victim search and rescue, ventilation, and controlling utilities.
- For 90% of all emergency structure fire incidents in remote areas, the ERF with a minimum of 4 personnel deployed, a minimum of two engines, various part-time staff, and one Battalion Chief shall arrive in a time directly dependent on the drive time (Dispatch to first unit on scene). The ERF shall be capable of establishing incident command, maintaining a sustained fire flow, advancing fire attack lines and back-up lines, initiating victim search and rescue, ventilation, and controlling utilities.

Note that the effective response force may need to include part-time staff and mutual aid resources. If aid from adjacent agencies is required to achieve the ERF, it is essential that these resources be included in the initial dispatch. This reduces the response time necessary to assemble adequate resources to mitigate the emergency. It is understood that the closest mutual aid is a significant distance away and in most cases is not practical. This initial ERF does not necessarily represent the entire alarm assignment, as additional units may be assigned based on long-term incident needs and risks. Additional engines, ladders, or other specialty companies are assigned to higher risk responses to accomplish additional critical tasks that are necessary beyond the initial attack and containment.

NFPA 1500 and 1710 both recommend that a minimum acceptable fire company staffing level should be four members responding on, or arriving with, each engine and ladder company responding to any type of fire. However, local discretion is allowed to meet locally adopted standards and risk profiles, and would still be compliant with NFPA standards if they can validate and document they are equal or superior to the standard.

CCFD currently staffs nine firefighters in the urban area of Gillette. The additional staff required to achieve this improvement goal of an ERF of 15 firefighters can be hired over time and in conjunction with decreasing part-time staff availability to lessen the impacts of the increased staffing costs associated with the improvement goal. The following figure outlines the full-time employees (FTEs) needed to reach the recommended ERF.

These FTEs are displayed in a sample staffing schedule to achieve the ERF at different rates over five years.

Figure 161: Sample Staffing Schedule of Additional FTEs

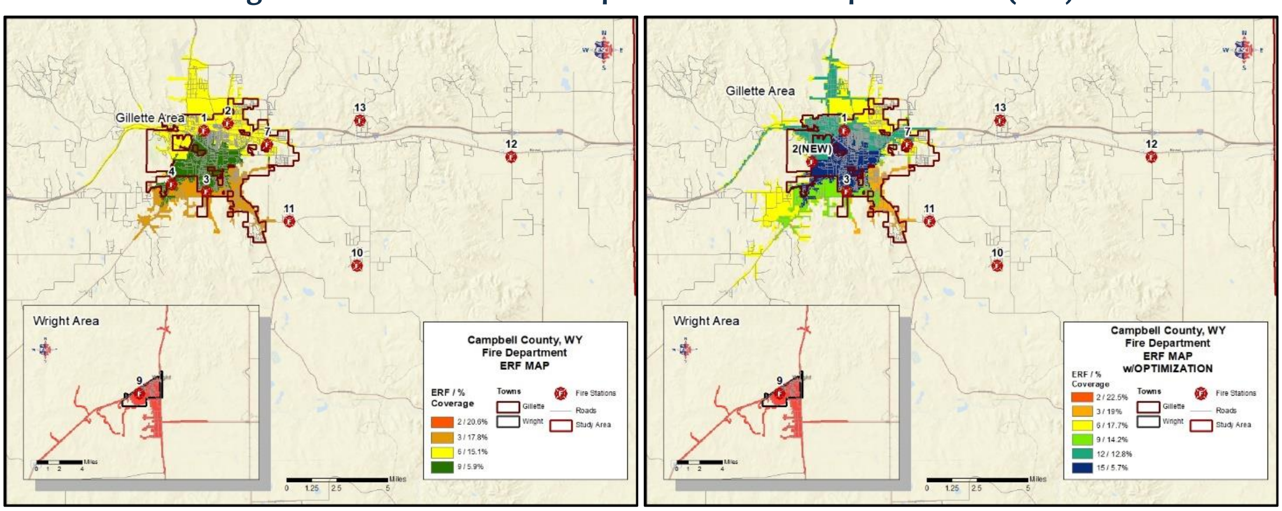
Plan	Year 1	Year 2	Year 3	Year 4	Year 5	Total
One Year	12 FTE					12 FTE
Two Year	6 FTE	6 FTE				12 FTE
Three Year	4 FTE	4 FTE	4 FTE			12 FTE
Four Year	3 FTE	3 FTE	3 FTE	3 FTE		12 FTE
Five Year	3 FTE	3 FTE	2 FTE	2 FTE	2 FTE	12 FTE

Impact to Fire Suppression

Establishing a minimum staffing level based on an Emergency Response Force (ERF) of 15 firefighters in urban areas provides for several improvements to the fire suppression capabilities of CCFD. The increases in staffing would directly result in additional credit for the ISO categories evaluating deployment and staffing. The following figure provides an illustration of CCFD's ability to assemble an effective response force based upon additional firefighters added to already existing response units and stations as well as the relocation of Fire Station 2 and adding staff when completed.

The current ERF and recommended ERF are shown for comparison in the following figure as shades of color. As the ERF increases the color gets darker. The larger the area of dark blue indicates the realization of increased ERF over the current ERF assembly. Compared side by side the reader can visualize the immediate benefit of adopting the minimum staffing based on an ERF of 15 firefighters in the urban area.

Figure 162: Current Versus Proposed Effective Response Force (ERF)



The ability for CCFD to assemble the ERF of 15 in accordance with NFPA 1720 is currently dependent on the availability of part-time staff and is often failing. The addition of staff over five years would allow for career staffing to augment the part-time staff and ensure the performance goals are met. Career staff could be added to Fire Station 1, Fire Station 7 and then to the newly relocated Fire Station 2 outlined in the fire station optimization improvement goal.

It is important to remember that according to NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* an ERF of 17 is recommended for mitigation of a single-family dwelling fire. The ERF required for moderate and major risk classifications increases from 17 firefighters to 28 firefighters for moderate risks and to 42 firefighters for major risks. These risks include mitigation of apartments, strip malls, and commercial building fires, all of which are present in the City of Gillette. Using the NFPA 1720 demand zone approach will provide for some assumption of risk by CCFD that will be beyond its capabilities.

Enhance Emergency Medical Services Through the Delivery of Advance Life Support

An important consideration for CCFD leadership is the possibility of expanding the service provided from basic life support (BLS) to advanced life support (ALS). There are many factors to be considered, such as cost, training requirements, equipment, medical direction, controlled medication tracking, etc. However, it is also important to compare those items to the potential benefit provided to the citizens.

NFPA 1710 recommends a travel time of 4 minutes or less for the arrival of the first unit with a minimum of BLS level personnel/equipment. The standard recommends a travel time of 8 minutes or less for the arrival of a unit with ALS level personnel/equipment. ESCI recommends that department leadership consider the risk versus benefits of making a change in the service level of the department. On many occasions the CCFD arrives first and must wait for ALS service to arrive.

Develop and Fund an Appropriate Apparatus Purchasing and Replacement Plan

CCFD has an apparatus replacement plan that established a 20-year front-line life-expectancy for its engines and its aerial ladder trucks. Apparatus replacement within the CCFD is primarily based on the age of apparatus, with apparatus being moved to slower stations or reserve status on a case-by-case basis as the apparatus ages or gets worn down. Because CCFD has over 60 pieces of apparatus significant replacement costs should be expected. As the mission and purpose of the part-time employees is adjusted to support the mission of the CCFD, the footprint and number of these apparatus to be replaced should be evaluated as well. Areas that are not staffed with combat certified firefighters should not have their pumpers replaced and instead should focus on the apparatus that will actually respond.

The following figure provides an estimate of replacement costs for each of CCFD's frontline engines, brush trucks, medium rescue trucks, command vehicles and aerial ladder trucks. As mentioned previously, NFPA 1901 recommends that fire apparatus 15 years of age or older be placed into reserve and replaced after another 10 years of use. Because CCFD uses 20 years for front line apparatus replacement, 20 years was used on all apparatus to demonstrate the replacement scenario.

The following figure illustrates the financial requirements for CCFD apparatus.

Figure 163: Estimated CCFD Major Apparatus Replacement Costs[65]

Type	Unit	Year	Base Replacement Cost	Replacement Cost w/ Inflation	Current Cash Requirements	Annual Cash Requirements	Current Age	Life Expectancy	Replacement Year	Years to Replacement
5	E1	2016	$630,000	$1,309,725	$327,431	$65,486	5	20	2036	15
5	E5	2020	$630,000	$1,591,979	$79,599	$79,599	1	20	2040	19
7	T1	2002	$1,200,000	$1,260,000	$1,197,000	$63,000	19	20	2022	1
2	R1	2012	$210,000	$359,171	$161,627	$17,959	9	20	2032	11
3	HM1	2020	$525,000	$1,326,649	$66,332	$66,332	1	20	2040	19
6	TND1	2016	$375,000	$779,598	$194,900	$38,980	5	20	2036	15
9	B1	2022	$315,000	$877,578	-$43,879	$43,879	-1	20	2042	21
8	G1	2017	$160,000	$349,260	$69,852	$17,463	4	20	2037	16
8	G5	2017	$160,000	$349,260	$69,852	$17,463	4	20	2037	16
1	SQ7	2008	$75,000	$105,533	$68,596	$5,277	13	20	2028	7
5	E24	1951	$630,000	$630,000	$630,000	N/A	70	20	OVERDUE	-50
5	E26	1978	$630,000	$630,000	$630,000	N/A	43	20	OVERDUE	-23
5	E14	2010	$630,000	$977,337	$537,535	$48,867	11	20	2030	9
5	E2	2009	$630,000	$930,797	$558,478	$46,540	12	20	2029	8
8	B2	2012	$160,000	$273,654	$123,144	$13,683	9	20	2032	11
5	E3	2010	$630,000	$977,337	$537,535	$48,867	11	20	2030	9
6	TND3	2010	$375,000	$581,748	$319,961	$29,087	11	20	2030	9
8	G3	2017	$160,000	$349,260	$69,852	$17,463	4	20	2037	16
5	E4	2004	$630,000	$729,304	$619,908	$36,465	17	20	2024	3
8	B4	2014	$160,000	$301,704	$105,596	$15,085	7	20	2034	13
5	E7	2012	$630,000	$1,077,514	$484,881	$53,876	9	20	2032	11
8	B7	2022	$160,000	$445,754	-$22,288	$22,288	-1	20	2042	21
6	TND7	2015	$375,000	$742,474	$222,742	$37,124	6	20	2035	14
5	E9	2009	$630,000	$930,797	$558,478	$46,540	12	20	2029	8
6	TND8	1990	$375,000	$375,000	$375,000	N/A	31	20	OVERDUE	-11
5	TND9	2012	$630,000	$1,077,514	$484,881	$53,876	9	20	2032	11
8	G9	2016	$160,000	$332,629	$83,157	$16,631	5	20	2036	15
8	G8	2017	$160,000	$349,260	$69,852	$17,463	4	20	2037	16
9	B9	2014	$315,000	$593,979	$207,893	$29,699	7	20	2034	13
1	R9	2004	$75,000	$86,822	$73,799	$4,341	17	20	2024	3
1	SQ80	1997	$75,000	$75,000	$75,000	N/A	24	20	OVERDUE	-4
5	E10	2012	$630,000	$1,077,514	$484,881	$53,876	9	20	2032	11
8	G10	2009	$160,000	$236,393	$141,836	$11,820	12	20	2029	8
5	E11	2004	$630,000	$729,304	$619,908	$36,465	17	20	2024	3
5	E12	2020	$630,000	$1,591,979	$79,599	$79,599	1	20	2040	19
5	TND12	2009	$630,000	$930,797	$558,478	$46,540	12	20	2029	8
8	G12	2016	$160,000	$332,629	$83,157	$16,631	5	20	2036	15
5	E13	2020	$630,000	$1,591,979	$79,599	$79,599	1	20	2040	19
6	TND13	1990	$375,000	$375,000	$375,000	N/A	31	20	OVERDUE	-11
8	G13	2008	$160,000	$225,136	$146,338	$11,257	13	20	2028	7
9	B51	2009	$315,000	$465,398	$279,239	$23,270	12	20	2029	8
9	B52	2009	$315,000	$465,398	$279,239	$23,270	12	20	2029	8
9	B53	1997	$315,000	$315,000	$315,000	N/A	24	20	OVERDUE	-4
9	B54	2013	$315,000	$565,695	$226,278	$28,285	8	20	2033	12
9	B62	1997	$315,000	$315,000	$315,000	N/A	24	20	OVERDUE	-4
9	B71	2004	$315,000	$364,652	$309,954	$18,233	17	20	2024	3
9	B81	2010	$315,000	$488,668	$268,768	$24,433	11	20	2030	9
8	G56	1989	$160,000	$160,000	$160,000	N/A	32	20	OVERDUE	-12
8	G57	1996	$160,000	$160,000	$160,000	N/A	25	20	OVERDUE	-5
8	G61	1990	$160,000	$160,000	$160,000	N/A	31	20	OVERDUE	-11
8	G66	2007	$160,000	$214,415	$150,091	$10,721	14	20	2027	6
8	G67	2007	$160,000	$214,415	$150,091	$10,721	14	20	2027	6
8	G76	2009	$160,000	$236,393	$141,836	$11,820	12	20	2029	8
8	G86	2008	$160,000	$225,136	$146,338	$11,257	13	20	2028	7
8	G6	2015	$160,000	$316,789	$95,037	$15,839	6	20	2035	14
8	G7	2013	$160,000	$287,337	$114,935	$14,367	8	20	2033	12
8	G4	2014	$160,000	$301,704	$105,596	$15,085	7	20	2034	13
	Total			**$33,123,366**	**$14,882,915**	**$1,496,418**				

[65] *Cost increase based upon industry expert projected annual increase of 5%*

The amounts contained in the preceding figure are rough estimates only and are intended to provide a context for the approximate potential costs and life expectancies of apparatus. This estimated replacement plan also does not take into consideration any apparatus currently being purchased or approved for purchase. Replacement costs could be higher or lower, depending upon the configurations of each apparatus and the actual date of replacement. Furthermore, the replacement schedule based on life expectancy decided upon can accelerate the expenditure of funds.

The replacement schedule was provided to outline the significant capital investment for apparatus replacement Campbell County can expect based on the current fleet.

Establish Funding to Construct a New Training Tower

The CCFD training facility is a modern facility that is modeled after a working firehouse with additional training classrooms and offices. The training tower located at the training facility is in poor condition and lacks the necessary components to conduct an effective training program. ESCI recommends the establishment of a funding strategy to design and construct a new training tower as soon as possible.

Constructing a modern training facility to comply with industry standards concerning classrooms, practice grounds, training tower, live-fire building, and training props is a significant investment of capital. The need for reconstruction is limited to the training tower and will significantly reduce the cost needed to bring the department into compliance. The ability to provide training is not only necessary it is required for ISO requirements. The requirements specifically require training at approved facilities.

CCFD will be challenged to finance the full build-out of the training facility on its own while rebuilding fire stations and replacing apparatus. These facilities allow for live fire training to be conducted with realistic training scenarios. The current plan developed for a new training facility would require significant funding and could better be used on service delivery enhancements while still providing a functional training tower to replace the current outdated one.

Examples of recently constructed basic fire training facilities in the following figure illustrate that these facilities need not be complicated or ornate to be quite functional.

Figure 164: Example Training Tower Facilities

COST PROJECTIONS FOR IMPROVEMENT GOALS

Financial Basis for Cost Projections

To estimate the future costs of any service level enhancement opportunities, it is first necessary to understand current year (FY 23) estimated costs for various decision unit components such as firefighter salary/benefits, onboarding costs, apparatus and equipment costs, and fire station construction and operating costs. Depending upon when these components may be added to the system, the FY 23 costs can be escalated based upon known or anticipated increases due to such influences as projected inflation for each component, authorized pay increases, rising benefit costs, or some combination of factors.

Policy decisions regarding the adoption of any enhancements designed to improve service level are generally evaluated based upon projected initial and recurring costs versus the benefit provided. To understand the future costs of any enhancement, it is important to evaluate improvements in terms of decision units. A decision unit can be considered the addition of a single firefighter, engineer, or company officer position, a career-staffed engine, rescue, or ladder company, shift Battalion Chief, or an operating fire station with various staffed units. These decision units are comprised of components such as personnel with various associated initial and recurring costs, capital apparatus and facility acquisition, and recurring capital operating costs.

The following discussion uses actual or estimated FY 23 costs, to the extent they are available, as a basis for costing of various decision unit components whose costs can then be escalated to that point in time when they may be added to the system. In other words, if the JPFB determines that the CCFD needs to add a new, staffed fire station or another engine company to its operation within the next five years, the following FY 23 personnel, capital, and operating costs will serve as a basis for the addition of that unit were it to be added in FY 23. The escalation factors for the various components of that decision unit, as estimated from various sources, will then be applied to show the future cost at the point in time the department wishes to add that unit.

Fiscal Year 23 Personnel Costs

Detailed salary and benefit information for all uniformed (operational) positions discussed in the following section was provided by the department for FY 23. The following figure provides annualized FY 23 average salary, benefit costs for the average salary, and the total compensation costs for various decision unit positions, including Firefighter, Engineer (Apparatus Operator), Captain (company officer), and Battalion Chief since these are the positions most likely to be added as the CCFD continues to add career personnel. It is anticipated that additional, career-staffed suppression apparatus (engines, rescue units, ladder trucks) would require some combination of the Captain, Engineer, and Firefighter positions. The analysis assumes that all positions above Firefighter would be occupied by experienced personnel, therefore, average salaries are used. On the other hand, the Firefighter position is costed at the entry-level or base salary since these positions could be filled by newly hired personnel.

Figure 165: Average Annual Salary/Estimated Benefits Various CCFD Uniformed Positions, FY 23

Position	Average Annual Salary[1]	Average Benefits	Avg. Total Compensation	Benefits as % of Total
Firefighter	$50,973	$33,523	**$84,316**	0.398
Engineer	$70,311	$51,453	**$121,763**	0.423
Captain	$80,091	$54,000	**$134,092**	0.403
Battalion Chief	$91,060	$58,821	**$149,881**	0.392

[1]*Model assumes experienced personnel and uses average for position except for Firefighter*

Almost 10 new uniformed FTE personnel in classifications from Firefighter to Battalion Chief have been added between FY 19 and FY 22 actual with an additional five added in FY 23 as adopted. Significant staff turnover, reclassifications, and benefit changes have occurred in many of these existing positions. The average annual changes in wages and benefits vary significantly between position classifications due to the various tenure and resultant compensation rate changes of the personnel moving into and out of positions within these classifications. This movement makes it difficult to readily determine historical wage and benefit increases by removing the fiscal impact of the added personnel and assuming the remaining changes are due to normally authorized wage and benefit increases over time. However, as discussed in the historical financial analysis section this methodology was utilized to estimate historical rates of change for these components of total compensation.

Total wages and benefits were compared between FY 15 and FY 22 and the net impact shown was applied to the FY 22 actual totals for an adjusted FY 22 budget (figure below) which removes the impact of the position changes. The average annual rate of increase is then computed between FY 15 and FY 22 using the FY 22 revised totals. The computed average annual increase in wages is 1.48% while the average annual increase in benefits is 6.8%. The computed average annual benefit increase is highly skewed due to a major increase in benefits provided by the CCFD to its personnel between FY 15 and FY 22. In FY 15, benefits as a percent of total compensation were only 2.4% which increased to 35.9% in FY 22 and is expected to be approximately 39.5% on average for uniformed positions in FY 23.

Figure 166: Average Annual Increase in Regular Wages and Benefits from FY 15 to FY 22 Actual

Expense	2015 Actual	2022 Actual	New Position Adjustment	2022 Revised	Avg Annual Increase
Personnel Services	**$3,369,143**	**$4,744,114**	**$517,465**	**$4,226,649**	
Salaries & Wages	$2,416,884	$2,993,908	$267,918	$2,725,990	
Regular	$2,253,828	$2,745,111	$247,385	$2,497,726	1.48%
Overtime	$163,056	$248,796	$20,533	$228,263	
Benefits	$952,259	$1,750,206	$249,546	$1,500,660	6.80%

Due to significant variability and change in historical trajectory of wage and benefit increases additional discussion between ESCI and CCFD led to consensus regarding future changes. The JPA requires the CCFD to utilize Campbell County compensation practices[66] which suggest future wage increases combining a COLA of 2.0% with a merit increase of between 1% and 3%. The forecast uses a 4% wage increase (2% COLA plus an average 2% merit increase) and a 1.5% benefit increase for all positions modeled each year of the forecast. Since benefits have historically increased and are approximately 39.5% of total compensation in FY 23, the weighted average annual total compensation increase would be 3.0%, which is applied to all positions throughout the forecast period. An additional assumption has been made that future apparatus staffing on engine or ladder companies would be comprised of three Captains (to fill the company officer role on each of three 24-hour shifts), three Engineers (serving as apparatus operators), and three Firefighters.

When adding positions, it is also important to include first-year on-boarding costs along with the recurring cost of each new position. These costs generally vary from department to department but typically include such items as background checks/polygraphs, physicals based upon the NFPA 1582 firefighter standard, recruit school costs, uniforms, SCBA facepieces, Personal Protective Equipment or Turnout Gear, and may include radio/technology packages or other items. The figure below shows CCFD FY 23 on-boarding costs for new hire firefighters which total $24,751. After the initial year, these costs would not continue with the added position, and the only recurring costs associated would be the total annual compensation. However, it is also understood that the department's annual operating costs over time would increase due to added PPE replacement, training, and other associated employee Maintenance and Operations costs. Further, unallocated supporting department costs would be expected to increase as the fire department adds significant staff. These non-fire department costs would include administrative, human resource/risk management, legal, finance/budget, IT, and various other supporting functions.

[66] *Integrated Amended Gillette/Wright/Campbell County Fire Protection Joint Powers Agreement Fourth Amendment – May 2022 D.B.A. Campbell County Fire Department; Article III – Powers of the Board A.(j).*

Figure 167: CCFD FY 23 New Hire (Uniformed Personnel) On-Boarding Costs

Uniforms		Communications Equipment		Personal Protective Equipment		Wildland Gear	
Badge/Brass	$200	Pager	$700	Bunker Pant x2	$3,310	Nomex Shirt	$86
Class A Uniform	$1,500	Portable Radio	$5,500	Bunker Coat x2	$3,800	Nomex Pant	$150
Duty Pants	$450			Suspenders	$140	Line Gear	$204
Badge Shirt/T Shirt	$2,050			Helmet	$372	Helmet	$70
Duty Coat	$150			Helmet Shield	$70	Fire Shelter	$408
Accessories	$200			MSA Mask	$335	Tent	$175
Clothing Allowance	$300			Gloves	$85	Sleeping Bag	$175
Wildland Pants	$1,500			Bunker Boots	$609	PG Bag	$210
				Nomex Hood	$92	Headlight	$30
				Flashlight	$55	Gloves	$17
				MSA Lanyard	$85		
				Bail Out System	$223		
Sub-total	$6,350		$6,200		$9,176		$1,525

Pre-Hire Evaluation	
Psych	$1,500
Medical/Physical	
Background	
Driver's License	

Total On-boarding Cost
$24,751

A further factor must be considered when evaluating the potential cost of adding positions. As with any other governmental employee, firefighters receive time off for various reasons such as vacation, sick and funeral leave, among others. CCFD has determined minimum staffing requirements for various response units based upon risk and response protocols to emergency incidents and has determined future minimum staffing. These minimum daily staffing needs require that when any firefighter is on leave, and daily staffing drops below the minimum, his or her position must be covered by another firefighter. This leave coverage required to maintain minimum daily staffing is termed the "relief factor." Based upon historical leave accruals and actual usage, the CCFD relief factor is approximately 1.25.

The current shift staffing schedule of 24 hours on duty means that for every minimum daily riding position on an apparatus, three FTE are required before considering any leave time (1 FTE x 3 shifts). The relief factor of 1.25 applied to each riding position means that 3.75 FTE are required to maintain that position and meet minimum staffing requirements. For the purposes of the projections provided for the addition of units, partial FTE are used to indicate the additional cost of covering leave time. This additional cost could either be accounted for with increased overtime or, with the hiring of additional FTE, as the level of need dictates.

Fiscal Year 23 Capital Apparatus/Equipment Costs

The next figure identifies FY 23 estimated apparatus costs based upon the current CCFD specifications for each apparatus class. Also included is the estimated cost to equip each type of vehicle. This table illustrates first-year capital costs only and does not consider annual or recurring operating costs such as fuel, oil, and routine maintenance costs (parts and labor). To build the most accurate cost of adding each type of apparatus, these recurring costs would need to be considered for future years. Further, the department should consider an annual apparatus replacement cost as part of its annual apparatus replacement program based upon life expectancy and usage for each vehicle class.

Figure 168: Apparatus and Equipment Costs, FY 23[1]

Class	Apparatus	Equipment	Total
Aerial (Ladder)	$1,598,850	$111,920	$1,710,770
Pumper	$817,515	$122,157	$939,672
Brush Truck	$195,462	$79,836	$275,298
Water Tender (Tanker)	$288,750	$86,250	$375,000
Medium Rescue	$345,280	$70,720	$416,000
Command Vehicle	$64,800	$55,200	$120,000

[1]Cost estimates based upon recent purchases according to apparatus replacement plan specifications.

Fiscal Year 23 Facility Capital/Operating Costs

The last category of costs considered as part of any potential future service level upgrade are those costs associated with building and equipping (FF&E) a new fire station, including both initial construction and annual operating costs. Land costs will vary considerably depending upon many factors, such as market condition, developer proffers, environmental, and other factors. Therefore, land costs are generally not included in the estimated costs of any notional new fire stations.

CCFD has no plans to build additional fire stations within the next five years and the following information is included for comparative purposes only. The following figure identifies notional fire station construction costs. Station designs may be configured to house multiple companies or single companies, which drives design features. For decision unit modeling purposes, a three-bay drive through station of approximately 12,000 square feet is shown.

WSKF Architects is a well-known public safety architectural firm that has constructed many fire stations around the country and has recommended using a construction analytics index to estimate square footage costs[67]. Zarenski (2023) has analyzed many factors impacting construction costs increases through FY 23[68] and found that annual increases in cost to commercial consumers rose 2.4% in FY 20, 8.0% in FY 21, 12.2% in FY 22 and are heading back down to 4.8% as of March 2023.

[67] *Personal communication from Rick Kuhl, Principal, WSKF Architects, 4/21/21*
[68] *Construction Inflation 2023 « Construction Analytics (edzarenski.com)*

Using WSKF square footage construction cost estimates for a typical fire station in FY 21 and applying the cited inflation rates leads to a square footage construction cost of $538 in FY 23 with a range of $523-554. If LEED standards are used, the costs increase to $554-585 per square foot. Using this notional station plan as a basis for future fire station projects along with other associated, estimated project costs provides an estimated (excluding land costs) FY 23 fire station construction project cost shown in the following figure which can then be used for financial planning related to future fire station construction decisions. A&E fees are estimated at 8.0% of construction costs, and FF&E costs are estimated at 4.6% of construction costs.

Figure 169: Estimated Fire Station Construction Costs, FY 23

FY 23 Estimated Fire Station Costs	
Category	**Cost**
Land	Varies
A&E Fees	$517,662
Construction	$6,470,773
FF&E	$297,656
Total	**$7,286,091**
Station Operating	$85,000

After construction costs are considered, there is an annual operating cost for a new facility that will be comprised of multiple components. Many jurisdictions provide and charge facilities maintenance, utilities, and related operating costs for the various fire department and other facilities on a square footage basis as an interfund charge. Fire departments will also budget for some routine station operating costs such as various O&M needs. Typical operating costs generally budgeted for may include printing/copying, telephone and internet, laundry and janitorial, office supplies, minor equipment, books and subscriptions, and other operating supplies. Costs either paid directly or to other external service providers including partner departments may include utilities, routine maintenance and janitorial, grounds maintenance, refuse and pest control services, among others. For projection purposes, average annual operating costs of $85,000 for FY 23 are used. This estimate is based upon an average of CCFD Station #1 and Station #9 operating costs.

Fiscal Year 23 Decision Unit Staffing Costs

To provide relief staffing (sick/vacation and other overtime coverage), the CCFD should plan and budget for 3.75 FTE to cover each required seat on an apparatus that is staffed 24/7 using three shifts. In other words, the department will apply a relief factor of 1.25 to each new FTE added according to the minimum staffing standard. The following figure shows the total number of personnel needed by rank and compensation level for a 3-person engine company (typical CCFD unit staffing), a 4-person engine, ladder, or rescue company depending upon adopted staffing policy for future units.

An engine is typically staffed with a minimum of three firefighters on each of three 24-hour shifts including one Firefighter, an Engineer, and a company officer (Captain). A ladder truck or service company should be staffed with a minimum of four firefighters per shift, so total staffing would include 3.75 additional FTE versus a typically staffed engine that may have three per shift. However, if the CCFD chooses to staff an aerial unit with three per shift, the upper table could be used to determine crew costs. Each 24-hour seat or position requires 3.75 budgeted FTE to ensure minimum daily staffing (one FTE for each of three shifts plus an additional 0.75 FTE as relief factor). The FY 23 cost per rank needed for one FTE is shown along with the total cost for all personnel required in each rank for all three shifts and relief coverage to maintain the minimum staffing.

Figure 170: Estimated Decision Unit Staffing Costs, FY 23

Single Resource			
Position	**FTEs**	**Unit Cost**	**Total Cost[1]**
Firefighter	3.75	$84,316	$316,185
Engineer	3.75	$121,763	$456,613
Captain	3.75	$134,092	$502,843
Battalion Chief	3.75	$149,881	$562,054

[1]*Total cost and FTE count provides for assumed relief factor of 1.25.*

3-Person Engine Company			
Position	**FTEs**	**Unit Cost**	**Total Cost[1]**
Firefighter	3.75	$84,316	$316,185
Engineer	3.75	$121,763	$456,613
Captain	3.75	$134,092	$502,843
Crew Total	11.25		$1,275,641

[1]*Total cost and FTE count provides for assumed relief factor of1.25*

4-Person Engine/Ladder Company			
Position	**FTEs**	**Unit Cost**	**Total Cost[1]**
Firefighter	3.75	$84,316	$316,185
Firefighter	3.75	$84,316	$316,185
Engineer	3.75	$121,763	$456,613
Captain	3.75	$134,092	$502,843
Crew Total	15.00		$1,591,826

[1]*Total cost and FTE count provides for assumed relief factor of 1.25*

Decision Unit Cost Projection

Using the estimated FY 23 decision unit staffing costs provided as a starting point, and making various assumptions about cost increases over time, decision unit costs are projected through FY 28 in the following figure. Personnel salary and benefit costs have been projected to increase annually at 4% and 1.5%, respectively, based upon assumptions about how Campbell County will approach future compensation (total compensation increase of 3.0%). Annual operating costs have been projected to increase by 6.0% annually based upon a recent decline in the Western Region CPI-U, as reported by the U.S. Bureau of Labor Statistics[69]. It is unclear what the future rate of inflation will be; therefore, the model uses 6% for the entire period.

Historical apparatus and equipment costs have been observed by ESCI to increase at approximately 4% annually. One fire apparatus manufacturer has stated that he has seen apparatus costs increase 29.5% between April 2021 and April 2023 with some vendors seeing even higher increases[70]. He further speculates that this level of cost increases is unsustainable, and that the industry should return to pre-COVID levels of annual price increases closer to 3-4% annually. The model assumes 5% increases in annual apparatus costs.

The projected decision unit costs are outlined in the following figure.

[69] *12-month percentage change, Consumer Price Index, by region and division, all items (bls.gov)*
[70] *Personal Communication from Larry Daniels, VP North American Sales, E-One, 3/30/23*

Figure 171: Projected Decision Unit Costs, FY 23 through FY 28

Decision Unit	Personnel Recurring Costs[1]					
	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Firefighter	$ 316,185	$ 325,710	$ 335,522	$ 345,630	$ 356,042	$ 366,768
Engineer	$ 456,613	$ 470,368	$ 484,538	$ 499,135	$ 514,171	$ 529,661
Captain	$ 502,843	$ 517,991	$ 533,596	$ 549,670	$ 566,229	$ 583,287
Battalion Chief	$ 562,054	$ 578,986	$ 596,428	$ 614,395	$ 632,904	$ 651,970
3-Person Company	$ 1,275,641	$ 1,314,070	$ 1,353,656	$ 1,394,435	$ 1,436,442	$ 1,479,715
4-Person Company	$ 1,591,826	$ 1,639,780	$ 1,689,178	$ 1,740,065	$ 1,792,484	$ 1,846,483

Decision Unit	Personnel On-Boarding Costs[2]					
	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Single FF Resource	$ 92,816	$ 98,385	$ 104,288	$ 110,546	$ 117,178	$ 124,209
3-Person Company	$ 278,449	$ 295,156	$ 312,865	$ 331,637	$ 351,535	$ 372,627
4-Person Company	$ 371,265	$ 393,541	$ 417,153	$ 442,183	$ 468,714	$ 496,836

Decision Unit	Capital Apparatus (Equipped) Cost[3]					
	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Engine (Pumper)	$ 939,672	$ 986,656	$ 1,035,988	$ 1,087,788	$ 1,142,177	$ 1,199,286
Brush Truck	$ 275,298	$ 289,063	$ 303,516	$ 318,692	$ 334,626	$ 351,358
Aerial (Ladder)	$ 1,710,770	$ 1,796,309	$ 1,886,124	$ 1,980,430	$ 2,079,452	$ 2,183,424
Medium Rescue	$ 416,000	$ 436,800	$ 458,640	$ 481,572	$ 505,651	$ 530,933
Command Vehicle	$ 120,000	$ 126,000	$ 132,300	$ 138,915	$ 145,861	$ 153,154

Decision Unit	Capital Facility (Initial and Recurring) Cost[2, 4]					
	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Station Construction	$ 7,286,091	$ 7,613,965	$ 7,956,593	$ 8,314,640	$ 8,688,799	$ 9,079,795
Station Operating	$ 85,000	$ 90,100	$ 95,506	$ 101,236	$ 107,311	$ 113,749

[1]Cost increase based on projected annual total compensation increase of 3.6%; includes sufficient FTEs to cover 1.25 relief factor

[2]Cost increase based on 2023 Western Region CPI-U average of 6% as of February, 2023

[3]Cost increase based upon industry expert projected annual increase of 5%

[4]Cost increase based upon historical non-residential construction cost increase over last four years of 4-5%

The first table in the figure shows total annual staff costs, including relief factor, for single resources (for example, one shift Firefighter, which requires 3.75 FTE in FY 23 costs $316,185), 3-person engine, and 4-person engine/ladder and two-person companies as projected from FY 23 through FY 28.

The second table shows what the one-time on-boarding costs would be incurred to hire the number of firefighters needed to fully staff each unit or individual position in any given year over the period. For example, if 11.25 FTE were added in FY 23 to staff a 3-person engine company, it would cost $1,275,641 in personnel costs plus $278,449 in on-boarding costs for a total of $1,554,090 the first year. Personnel costs would then increase at 3.0% annually so that the personnel costs for the same 11.25 firefighter FTE on that engine company would be $1,479,715 by FY 28. If a four-person engine or ladder company were to be added, the personnel costs would need to be escalated by 3.75 additional FTE whenever it was planned. A four-person company could have two Firefighters, one Engineer, and one Captain (company officer) assigned per shift.

The following two tables in the figure show the estimated capital costs; the first table shows the equipped apparatus cost throughout the projection period while the second table shows the facility construction and operating costs through FY 28 for a career-staffed fire station. Using the projected costs, a career-staffed fire station, excluding estimated land costs, would cost approximately $7.3 million to construct in FY 23 with an annual operating cost of $85,000. That same station, if constructed in FY 28, would cost approximately $9.08 million and have an operating cost of $114,000. Purchasing an equipped engine in FY 23 would cost $939,672, while that same engine in FY 28 would cost $1,199,286.

The projected figures for various decision unit components can be used as an approximate guide to determine the cost of implementing various potential enhancements as recommended in the study at whatever point over the next five years the JPFB finds appropriate and is able to fund them.

CONCLUSION

CONCLUSION

The ESCI project team began collecting information concerning CCFD in the winter of 2023. It takes a forward-thinking government and organization not afraid to question current policies and processes to truly achieve continuous improvement. The services provided by the CCFD are exceptional and, in many cases, exceed the national standard. The challenges faced by the Campbell County Commission, Gillette City Council, the Town of Wright Council, the JPFB and the CCFD are not unique to their jurisdiction and mimic discussions being held around the country. Measuring the effectiveness of services balanced with cost efficiencies are very important discussions. Policy decisions often require very tough conversations and can even lead to tougher decisions. Campbell County obviously takes this seriously, and ESCI appreciates the ability to provide a data-driven document to assist with those deliberations.

ESCI team members recognize that this report contains a large amount of information, and ESCI would like to thank the Chief, leadership, staff members, and employees for their efforts in bringing this project to fruition. ESCI would also like to thank the various individuals for their input, opinions, and candid conversations throughout this process. It is ESCI's sincere hope the information contained in this report is used to its fullest extent, and the emergency services provided to the citizens of Campbell County will continue to be best served by the Campbell County Fire Department.

APPENDICES

APPENDIX A: TABLE OF FIGURES

APPENDIX B: FIRE STATIONS & OTHER FACITLTIES

Figure 172: CCFD Fire Station 1, Headquarters

Address/Physical Location:	106 Rohan Ave, Gillette, WY 82716 (44.29417, -105.51300)

General Description: Headquarters and Administration

Fire Station 1 provides coverage to the City of Gillette and surrounding Campbell County. This station houses administrative offices as well as classrooms and a community meeting room.

Structure						
Construction Type	Type 1					
Date of Construction	2008					
Seismic Protection	None					
Auxiliary Power	Yes					
General Condition	Good					
Number of Apparatus Bays	7	Drive-through bays	0	Back-in bays		
Special Considerations	ADA Compliant					
Square Footage	39,709					
Facilities Available						
Separate Rooms/Dormitory/Other	12	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	Yes					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes- Commercial					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers	Yes					
Smoke Detection	Yes					
Decon/Biohazard Disposal	Yes- Limited					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 173: CCFD Fire Station 2

Address/Physical Location:	917 E. Warlow Drive, Gillette, WY 82716 (44.29941, -105.48951)					
	General Description: Fire Station 2 provides storage for apparatus not in use by frontline units. This station is not staffed full time.					
Structure						
Construction Type	Type 3					
Date of Construction	1978					
Seismic Protection	None					
Auxiliary Power	Yes					
General Condition	Fair					
Number of Apparatus Bays	0	Drive-through bays	2	Back-in bays		
Special Considerations	None					
Square Footage	2,000					
Facilities Available						
Separate Rooms/Dormitory/Other	0	Bedrooms	0	Beds	0	Dorm Beds
Maximum Station Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	No					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers	No					
Smoke Detection	No					
Decon/Biohazard Disposal	No					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 174: CCFD Fire Station 3

Address/Physical Location:	3 Wenger Drive, Gillette, WY 82718 (44.25025, -105.51046)

General Description:

Station 3 houses Engine, Grass, and Tender 3. These units are cross staffed by 3 full time personnel.

Structure						
Construction Type	Type 2					
Date of Construction	2017					
Seismic Protection	None					
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	2	Drive-through bays	0	Back-in bays		
Special Considerations	None					
Square Footage	6,603					
Facilities Available						
Separate Rooms/Dormitory/Other	6	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	6					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	No					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers	Yes					
Smoke Detection	Yes					
Decon/Biohazard Disposal	Yes					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 175: CCFD Fire Station 4

Address/Physical Location:	3110 W. 4J Road, Gillette, WY 82718 (44.25540, -105.54505)					
	General Description: Fire Station 4 provides storage for Engine 4 and Grass 4 which are not staffed.					
Structure						
Construction Type	Type 3					
Date of Construction	2001					
Seismic Protection	None					
Auxiliary Power	No					
General Condition	Fair					
Number of Apparatus Bays	0	Drive-through bays	2	Back-in bays		
Special Considerations	None					
Square Footage	1,862					
Facilities Available						
Separate Rooms/Dormitory/Other		Bedrooms		Beds	0	Dorm Beds
Maximum Station Staffing Capability						
Exercise/Workout Facilities	Work out area in the apparatus bays					
Kitchen Facilities	Yes- Residential					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes- Limited and cramped					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers	Yes					
Smoke Detection	Yes					
Decon/Biohazard Disposal	Yes					
Security	Door code entry					
Apparatus Exhaust System	No					

Figure 176: CCFD Fire Station 7

Address/Physical Location:	1200 Garner Lake Rd, Gillette, WY 82716 (44.28430, -105.45023)					
	General Description: Fire Station 7 provides storage for Engine 7, Brush 7, and Tender 7. These units are not staffed					
Structure						
Construction Type	Type 2					
Date of Construction	2011					
Seismic Protection						
Auxiliary Power	Yes					
General Condition	Excellent					
Number of Apparatus Bays	2	Drive-through bays		Back-in bays		
Special Considerations	ADA Compliant					
Square Footage	5,498					
Facilities Available						
Separate Rooms/Dormitory/Other	4	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	4					
Exercise/Workout Facilities	No					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	No					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers	Yes					
Smoke Detection	Yes					
Decon/Biohazard Disposal	Yes					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 177:: CCFD Fire Station 9

Address/Physical Location:	301 Sagebluff Drive, Wright, WY 82732 (43.74985, -105.50216)

General Description:

Fire Station 9 provides storage for Engine 9, Rescue 9, Brush 9, and Tender 9, Grass 9, and Tender 8. These units are cross staffed between the hours of 0800-1600, Monday through Friday.

Structure						
Construction Type	Type 2					
Date of Construction	2010					
Seismic Protection	None					
Auxiliary Power	Yes					
General Condition	Good					
Number of Apparatus Bays	4	Drive-through bays	0	Back-in bays		
Special Considerations	ADA Compliant					
Square Footage	13,807					
Facilities Available						
Separate Rooms/Dormitory/Other	4	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	4					
Exercise/Workout Facilities	Yes					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	Yes					
Shower Facilities	Yes					
Training/Meeting Rooms	Yes					
Washer/Dryer	Yes					
Safety & Security						
Sprinklers	Yes					
Smoke Detection	Yes					
Decon/Biohazard Disposal	Yes					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 178: CCFD Fire Station 10

Address/Physical Location:	85 Patrick Henry Rd, Gillette, WY 82718 (44.19773, -105-36004)

General Description:

Fire Station 10 provides storage for Tender 10 and Grass 10. These units are not staffed.

Structure						
Construction Type	Type 3					
Date of Construction	1987					
Seismic Protection	None					
Auxiliary Power	No					
General Condition	Fair					
Number of Apparatus Bays		Drive-through bays	2	Back-in bays		
Special Considerations	None					
Square Footage	2,681					
Facilities Available						
Separate Rooms/Dormitory/Other	0	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	No					
Shower Facilities	No					
Training/Meeting Rooms	Yes					
Washer/Dryer	No					
Safety & Security						
Sprinklers	No					
Smoke Detection	No					
Decon/Biohazard Disposal	No					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 179: CCFD Fire Station 11

Address/Physical Location:	165 Union Chapel Rd, Gillette, WY 82718 (44.22911, -105.42779)					
	General Description: Fire Station 11 provides storage for Engine 11 and Grass 11. These units are not staffed full time.					
Structure						
Construction Type	Type 3					
Date of Construction	1985					
Seismic Protection	None					
Auxiliary Power	No					
General Condition	Fair					
Number of Apparatus Bays		Drive-through bays	2	Back-in bays		
Special Considerations	None					
Square Footage	1,824					
Facilities Available						
Separate Rooms/Dormitory/Other	0	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	No					
Shower Facilities	No					
Training/Meeting Rooms	Yes					
Washer/Dryer	No					
Safety & Security						
Sprinklers	No					
Smoke Detection	No					
Decon/Biohazard Disposal	No					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 180: CCFD Fire Station 12

Address/Physical Location:	20 Jack Smith Rd, Rozet, WY 82727 (44.27591, -105.20634)				
	General Description: Fire Station 12 provides storage for Engine 12, Grass 12, and Tender 12. These units are not staffed.				
Structure					
Construction Type	Type 2				
Date of Construction	2001				
Seismic Protection	None				
Auxiliary Power	No				
General Condition	Good				
Number of Apparatus Bays	0	Drive-through bays	4	Back-in bays	
Special Considerations	ADA Compliant				
Square Footage	3.120				
Facilities Available					
Separate Rooms/Dormitory/Other	0	Bedrooms		Beds	Dorm Beds
Maximum Station Staffing Capability	0				
Exercise/Workout Facilities	No				
Kitchen Facilities	Yes				
Individual Lockers/Storage Assigned	No				
Shower Facilities	No				
Training/Meeting Rooms	Yes				
Washer/Dryer	No				
Safety & Security					
Sprinklers	No				
Smoke Detection	No				
Decon/Biohazard Disposal	No				
Security	Key Pad				
Apparatus Exhaust System	Yes				

Figure 181: CCFD Fire Station 13

Address/Physical Location:	1 Canary Rd, Gillette, WY 82716 (44.30187, -105.35727)

General Description:

Fire Station 13 provides storage for Engine 13, Grass 13, and Tender 13. These units are not staffed.

Structure						
Construction Type	Type 2					
Date of Construction	1987					
Seismic Protection	None					
Auxiliary Power	No					
General Condition	Fair					
Number of Apparatus Bays	0	Drive-through bays	2	Back-in bays		
Special Considerations	None					
Square Footage	2,520					
Facilities Available						
Separate Rooms/Dormitory/Other	0	Bedrooms		Beds		Dorm Beds
Maximum Station Staffing Capability	0					
Exercise/Workout Facilities	No					
Kitchen Facilities	Yes					
Individual Lockers/Storage Assigned	No					
Shower Facilities	No					
Training/Meeting Rooms	Yes					
Washer/Dryer	No					
Safety & Security						
Sprinklers	No					
Smoke Detection	No					
Decon/Biohazard Disposal	No					
Security	Key Pad					
Apparatus Exhaust System	Yes					

Figure 182: CCFD Wildland Apparatus

Station #	Location	Square Footage	Year Built
21	34 Soda Wells Road	1,200	1976
22	59 Greenough Road	600	1975
23	2600 Echeta Road	450	Unknown
24	520 Parks Road	1,200	1987
25	1050 Collins Road	450	Unknown
26	3694 Highway 50	1,200	1982
27	479 Bittercreek Road	280	2008
28	455 Olmstead Road	280	2008
29	6765 S. Highway 59	280	2008
30	16080 Highway 59	450	2008
31	1060 Adon Rd		
33	4489 Highway 50		2019

APPENDIX C: FIRE STATION APPARATUS/VEHICLES

Figure 183: CCFD Command Vehicles

Apparatus	Type	Manufacturer	Year	Assigned to:
402	Command	Ford Pickup	2020	Fire Chief
403	Command	Ford Pickup	2019	Deputy Chief of Ops.
404	Command	Ford Pickup	2019	Support Services Div.
405	Command	Ford Pickup	2016	

The following figure lists the fleet inventory of CCFD's engines, aerials, rescue, and specialty units.

Figure 184: CCFD Fleet

Apparatus	Type	Manufacturer	Year	Features
Station 1				
E1	Type 1 Engine	Rosenbauer	2016	Structural Engine
E5	Type 1 Engine	SVI/Spartan	2020	Structural Engine
T1	Aerial Platform	Pierce	2002	100' Aerial Platform
R1	Light Rescue	Spartan	2012	Light Rescue
HM1	HAZMAT Unit	SVI/Spartan	2020	Haz-Mat Unit
TND1	Type 1 Support Tender	Randco	2016	4000 Gallon Water Tender
B1	Type 4 Engine	Weis	2022	Brush Truck M2 106
G1	Type 6 Engine	Weis	2017	F-550 Grass Truck
G5	Type 6 Engine	Weis	2017	F-550 Grass Truck
SQ7	Air Light Support	SVI	2008	M2 Mobile Air / Support
E24	Type 1 Engine	Mack	1951	Class A Structural Eng
Old Station 1				
E14	Type 1 Engine	Pierce	2010	Class A Structural Eng
Station 2				
E2	Type 1 Engine	Pierce	2009	Class A Structural Eng
B2	Type 4 Engine	Spartan	2012	Brush Truck M2
Station 3				
E3	Type 1 Engine	Pierce	2010	Class A Structural Eng
TND3	Type 3 Support Tender	Danko	2010	Water Tender 2000
G3	Type 6 Engine	Weis	2017	F-550 Grass Truck
Station 4				
E4	Type 1 Engine	Elite	2004	Class A Structural Eng
B4	Type 4 Engine	Spartan	2014	Brush Truck M2 106

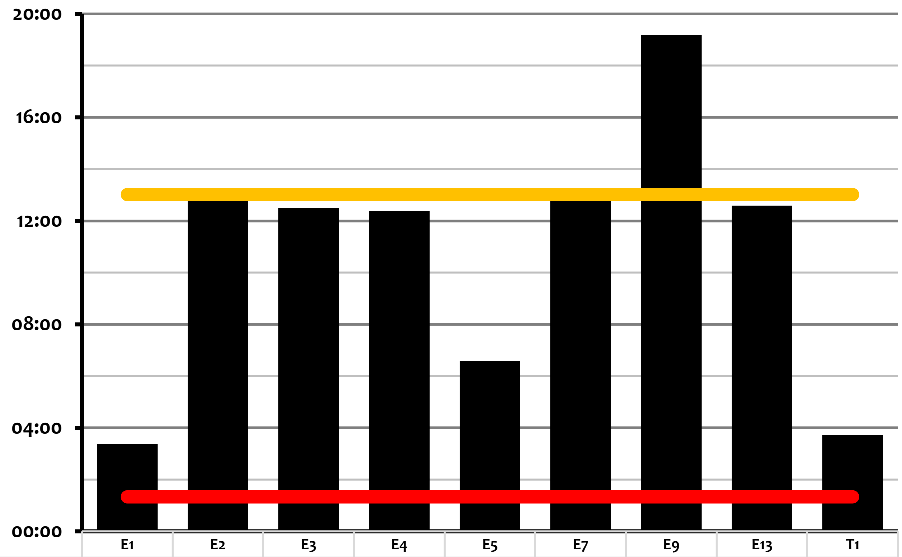
Apparatus	Type	Manufacturer	Year	Features
Station 7				
E7	Type 1 Engine	Pierce	2012	Class A Structural Eng
B7	Type 4 Engine	Weis	2022	Brush Truck M2 106
TND7	Type 3 Support Tender	Randco	2015	Water Tender 2000
Station 9				
410			2008	All-Terrain Vehicle
E9	Type 1 Engine	Pierce	2009	Structural Engine
TND8	Type 3 Support Tender		1990	Water Tender 2000
TND9	Type 1 Engine/Type 2 Support Tender		2012	M2-112 TND/Pumper
G9	Type 6 Engine		2016	F-550 Grass Truck
G8	Type 6 Engine	Weis	2017	F-550 Grass Truck
B9	Type 4 Engine		2014	Brush Truck M2 106
R9	Light Rescue		2004	Rescue F550 4X4
SQ80	Quick Attack Vehicle		1997	Quick Attack Structural
Station 10				
E10	Type 1 Engine		2012	Class A Structural Eng
G10	Type 6 Engine		2009	Grass Truck RAM 5500
Station 11				
E11	Type 1 Engine	Elite	2004	Class A Structural Eng
G11	Type 6 Engine		2014	Grass Truck F550
Station 12				
E12	Type 1 Engine	SVI	2020	Structural Engine
TND12	Type 1 Tac Tender	US Tanker	2009	7600 SBA
G12	Type 6 Engine		2016	F-550 Grass Truck
Station 13				
E13	Type 1 Engine	SVI	2020	Structural Engine
TND13	Type 3 Support Tender		1990	Water Tender 2000
G13	Type 6 Engine		2008	Grass Truck F550
Rural Brush Units				
B51	Type 4 Engine		2009	Brush Truck M2 106
B52	Type 4 Engine		2009	Brush Truck M2
B53	Type 4 Engine		1997	Brush Truck FL70
B54	Type 4 Engine	Weis	2013	Brush Truck M2
B62	Type 4 Engine		1997	Brush Truck FL70

Apparatus	Type	Manufacturer	Year	Features
B71	Type 4 Engine		2004	Brush Truck FL70
B81	Type 4 Engine		2010	Brush Truck M2 106
Rural Grass Units				
G56	Type 6 Engine		1989	Grass Truck K3500
G57	Type 6 Engine		1996	Grass Truck K3500
G61	Type 6 Engine		1990	Grass Truck K3500
G66	Type 6 Engine		2007	Grass Truck F550
G67	Type 6 Engine		2007	Grass Truck F550
G76	Type 6 Engine		2009	Grass Truck RAM 5500
G86	Type 6 Engine		2008	Grass Truck F550
Seasonal Units				
G6	Type 6 Engine	Weis	2015	F-550 Grass Truck
G7	Type 6 Engine	Weis	2013	F-550 Grass Truck
G4	Type 6 Engine		2014	Grass Truck F550

APPENDIX D: RESPONSE TIME PERFORMANCE BY UNIT

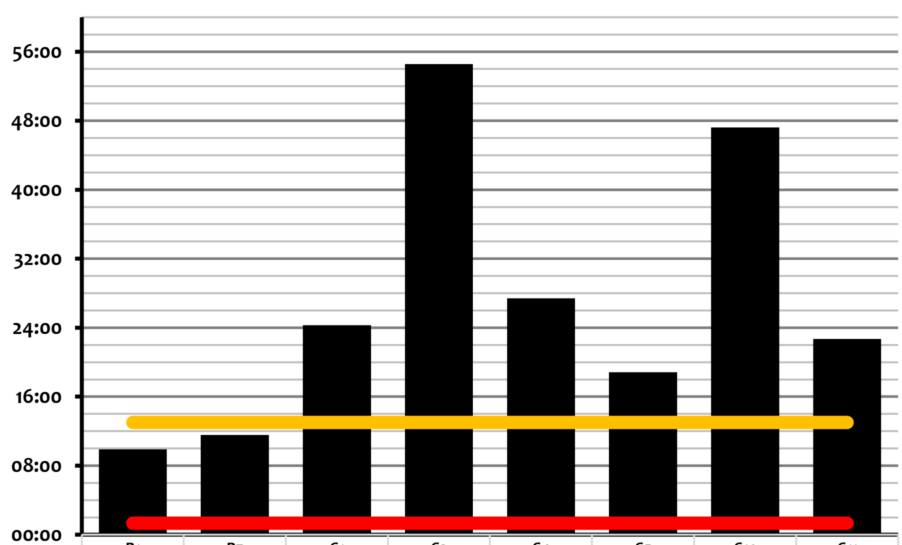
Each of the following charts illustrate the turnout time performance to fire incidents (NFIRS Series 100). Units that did not have sufficient data points to calculate the percentile measurement were excluded.

Figure 185 CCFD Turnout Time Performance to Fire Incidents (Engines/Truck), 2018–2022



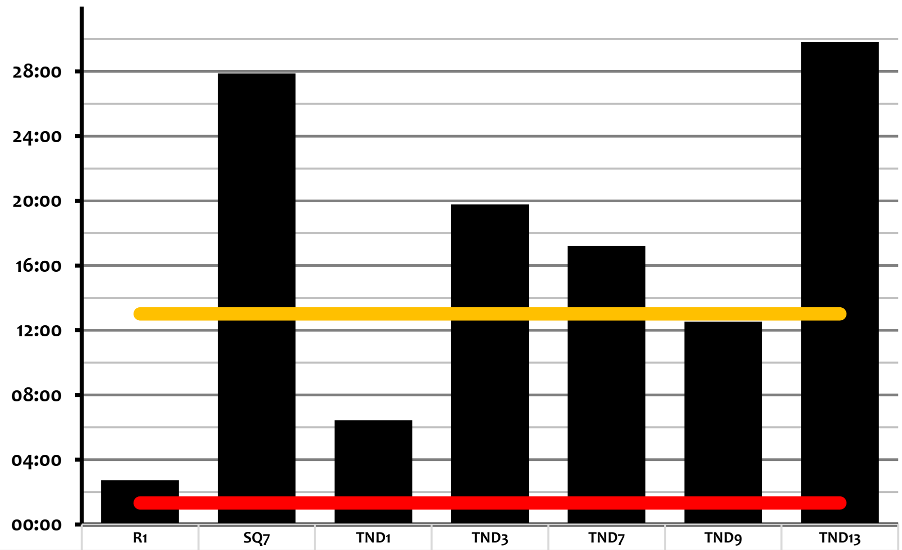
	E1	E2	E3	E4	E5	E7	E9	E13	T1
Turnout	03:23	13:14	12:30	12:23	06:35	12:58	19:10	12:35	03:44
NFPA 1710 Standard (1:20)	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20
CCFD 90th Percentile (13:01)	13:01	13:01	13:01	13:01	13:01	13:01	13:01	13:01	13:01

Figure 186 CCFD Turnout Time Performance to Fire Incidents (Brush/Grass), 2018–2022



	B1	B7	G1	G3	G4	G5	G10	G11
Turnout	09:53	11:35	24:17	54:35	27:25	18:50	47:14	22:42
NFPA 1710 Standard (1:20)	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20
CCFD 90th Percentile (13:01)	13:01	13:01	13:01	13:01	13:01	13:01	13:01	13:01

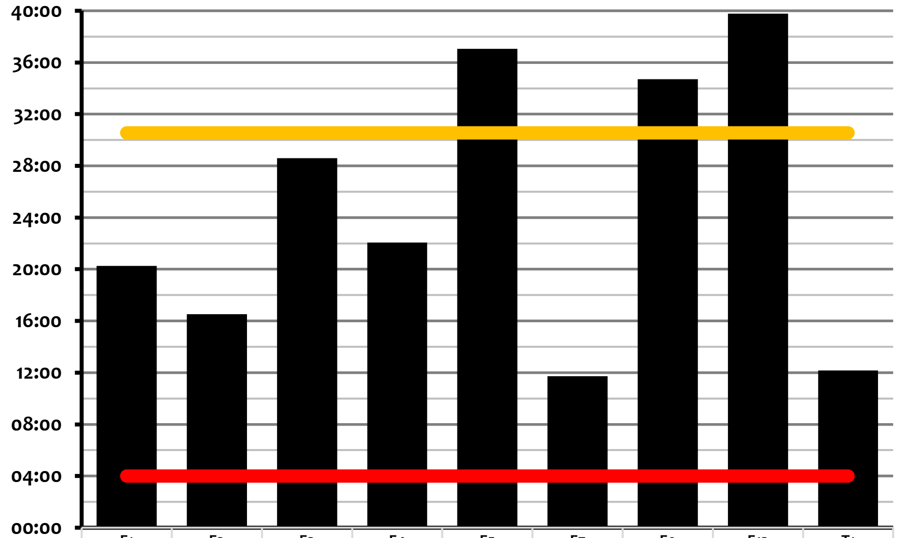
Figure 187 CCFD Turnout Time Performance to Fire Incidents (Rescue/Squad/Tender), 2018–2024



	R1	SQ7	TND1	TND3	TND7	TND9	TND13
Turnout	02:44	27:53	06:26	19:47	17:13	12:33	29:49
NFPA 1710 Standard (1:20)	01:20	01:20	01:20	01:20	01:20	01:20	01:20
CCFD 90th Percentile (13:01)	13:01	13:01	13:01	13:01	13:01	13:01	13:01

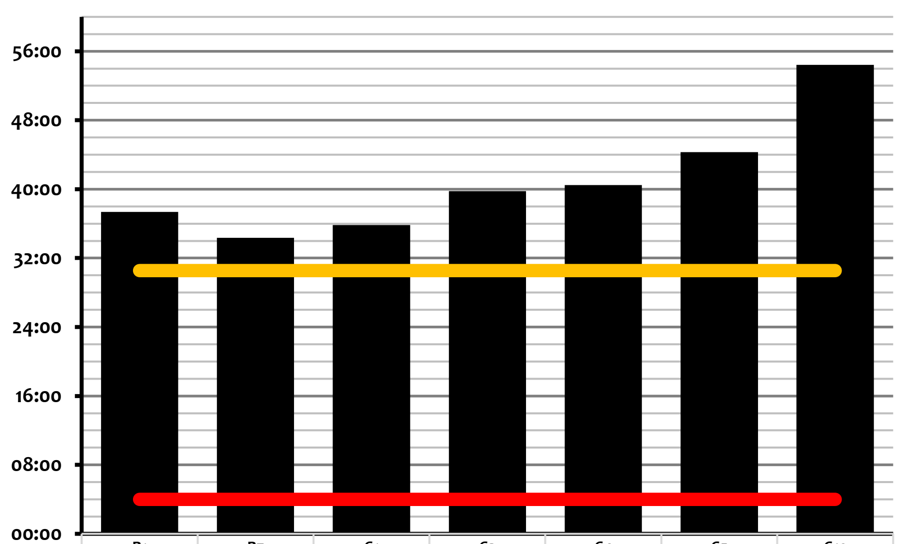
Each of the following charts illustrate the travel time performance to fire incidents (NFIRS Series 100). Units that did not have sufficient data points to calculate the percentile measurement were excluded.

Figure 188 CCFD Travel Time Performance to Fire Incidents (Engines/Truck), 2018–2022



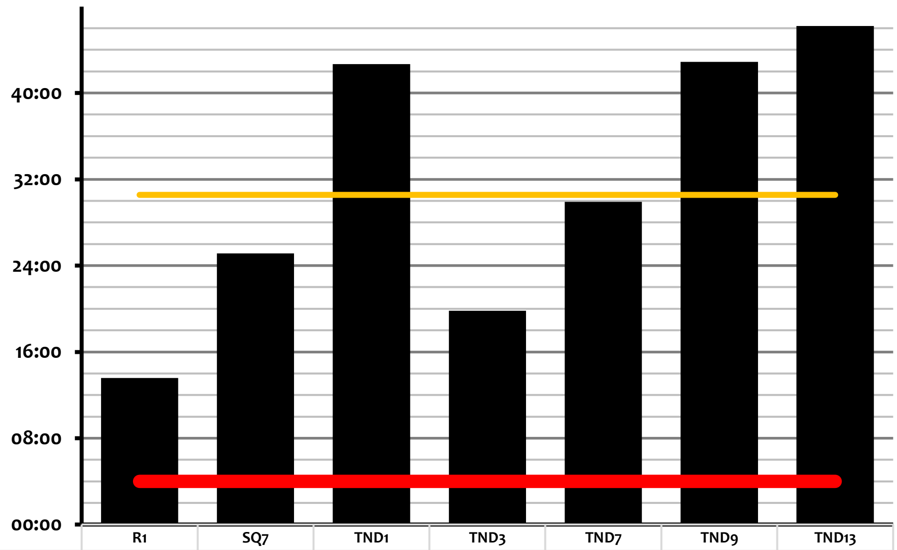
	E1	E2	E3	E4	E5	E7	E9	E13	T1
Travel	20:15	16:31	28:36	22:03	37:04	11:44	34:42	39:47	12:10
NFPA 1710 Standard (4:00)	04:00	04:00	04:00	04:00	04:00	04:00	04:00	04:00	04:00
CCFD 90th Percentile (30:33)	30:33	30:33	30:33	30:33	30:33	30:33	30:33	30:33	30:33

Figure 189 CCFD Travel Time Performance to Fire Incidents (Brush/Grass), 2018–2022



	B1	B7	G1	G3	G4	G5	G10
Travel	37:22	34:21	35:51	39:47	40:29	44:18	54:27
NFPA 1710 Standard (4:00)	04:00	04:00	04:00	04:00	04:00	04:00	04:00
CCFD 90th Percentile (30:33)	30:33	30:33	30:33	30:33	30:33	30:33	30:33

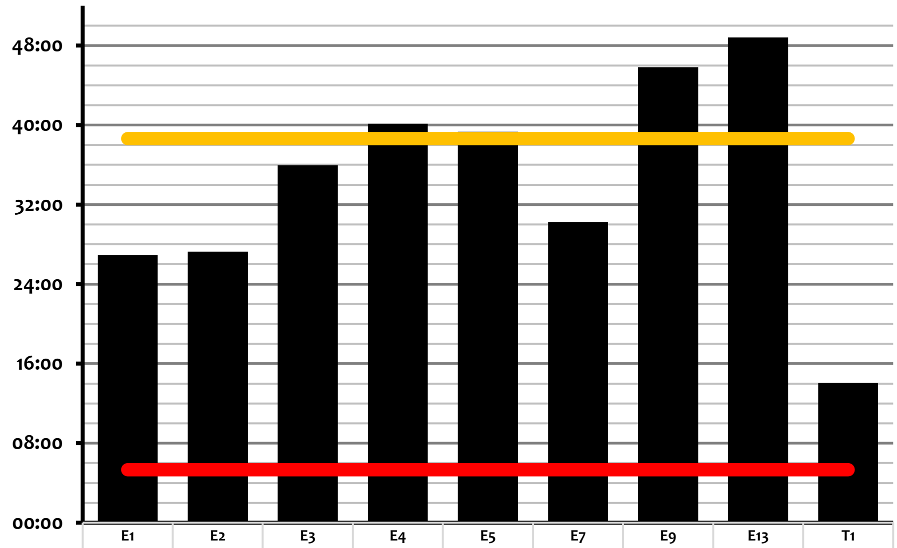
Figure 190 CCFD Travel Time Performance to Fire Incidents (Rescue/Squad/Tender), 2018–2024



	R1	SQ7	TND1	TND3	TND7	TND9	TND13
Travel	13:35	25:07	42:40	19:49	29:54	42:53	46:12
NFPA 1710 Standard (4:00)	04:00	04:00	04:00	04:00	04:00	04:00	04:00
CCFD 90th Percentile (30:33)	30:33	30:33	30:33	30:33	30:33	30:33	30:33

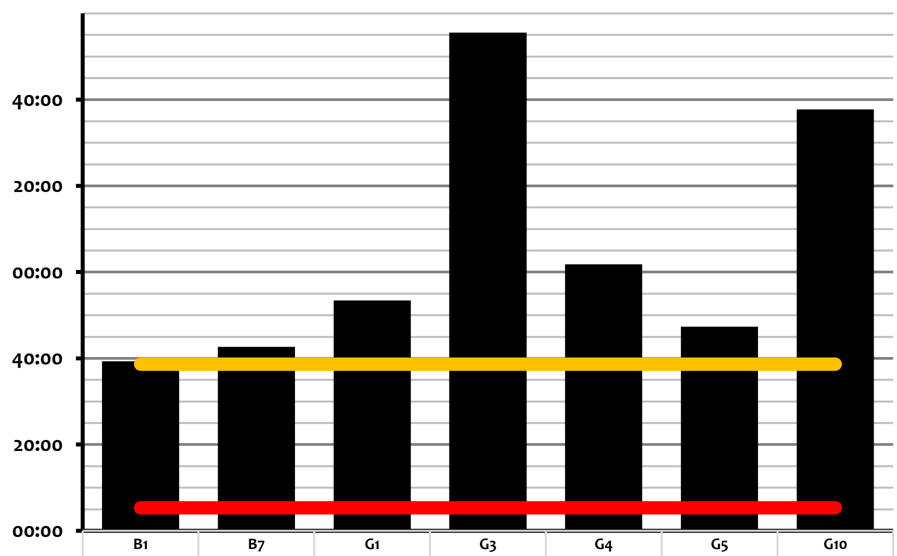
Each of the following charts illustrate the response time performance to fire incidents (NFIRS Series 100). Units that did not have sufficient data points to calculate the percentile measurement were excluded.

Figure 191 CCFD Response Time Performance to Fire Incidents (Engines/Truck), 2018–2022



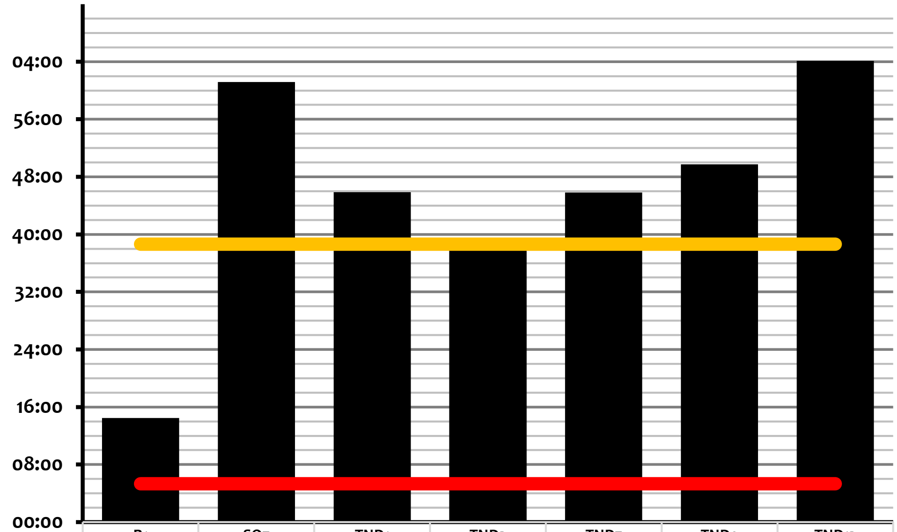
	E1	E2	E3	E4	E5	E7	E9	E13	T1
Response	26:55	27:16	35:57	40:08	39:21	30:16	45:49	48:49	14:03
NFPA 1710 Standard (5:00)	05:20	05:20	05:20	05:20	05:20	05:20	05:20	05:20	05:20
CCFD 90th Percentile (38:38)	38:38	38:38	38:38	38:38	38:38	38:38	38:38	38:38	38:38

Figure 192 CCFD Response Time Performance to Fire Incidents (Brush/Grass), 2018–2022



	B1	B7	G1	G3	G4	G5	G10
Response	39:22	42:39	53:27	55:32	01:48	47:20	37:42
NFPA 1710 Standard (5:00)	05:20	05:20	05:20	05:20	05:20	05:20	05:20
CCFD 90th Percentile (38:38)	38:38	38:38	38:38	38:38	38:38	38:38	38:38

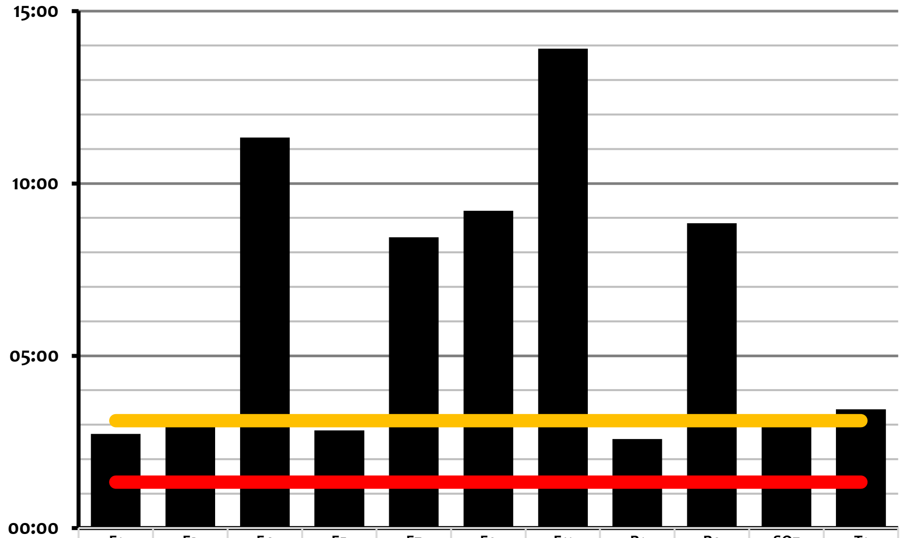
Figure 193 CCFD Response Time Performance to Fire Incidents (Rescue/Squad/Tender), 2018–2024



	R1	SQ7	TND1	TND3	TND7	TND9	TND13
Response	14:28	01:11	45:53	38:19	45:48	49:45	04:06
NFPA 1710 Standard (5:00)	05:20	05:20	05:20	05:20	05:20	05:20	05:20
CCFD 90th Percentile (38:38)	38:38	38:38	38:38	38:38	38:38	38:38	38:38

The following chart illustrates the turnout time performance to non-fire incidents (all NFIRS Series other than 100). Units that did not have sufficient data points to calculate the percentile measurement were excluded.

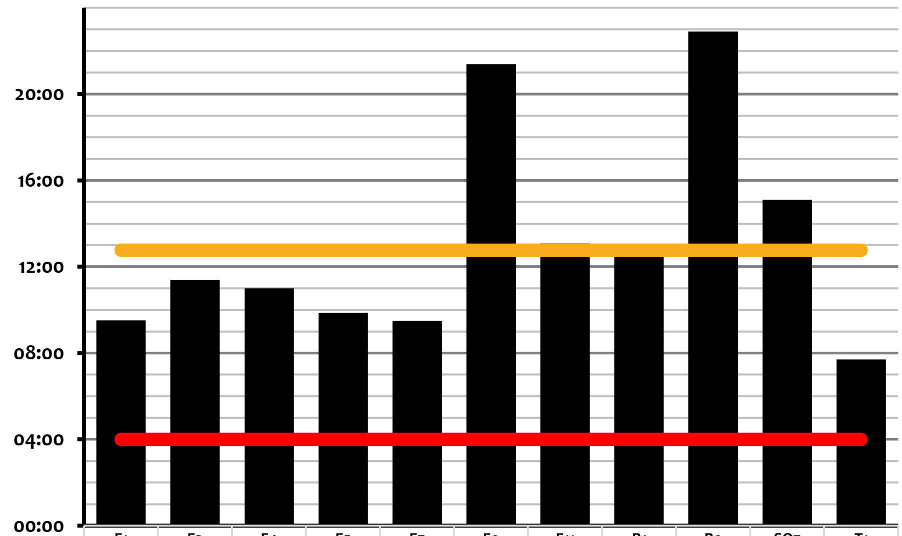
Figure 194 CCFD Turnout Time Performance to Non-Fire Incidents (All Units), 2018–2022



	E1	E3	E4	E5	E7	E9	E11	R1	R9	SQ7	T1
Turnout	02:44	03:02	11:20	02:50	08:26	09:12	13:55	02:35	08:51	03:12	03:27
NFPA 1710 Standard (1:20)	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20	01:20
CCFD 90th Percentile (3:07)	03:07	03:07	03:07	03:07	03:07	03:07	03:07	03:07	03:07	03:07	03:07

The following chart illustrates the travel time performance to non-fire incidents (all NFIRS Series other than 100). Units that did not have sufficient data points to calculate the percentile measurement were excluded.

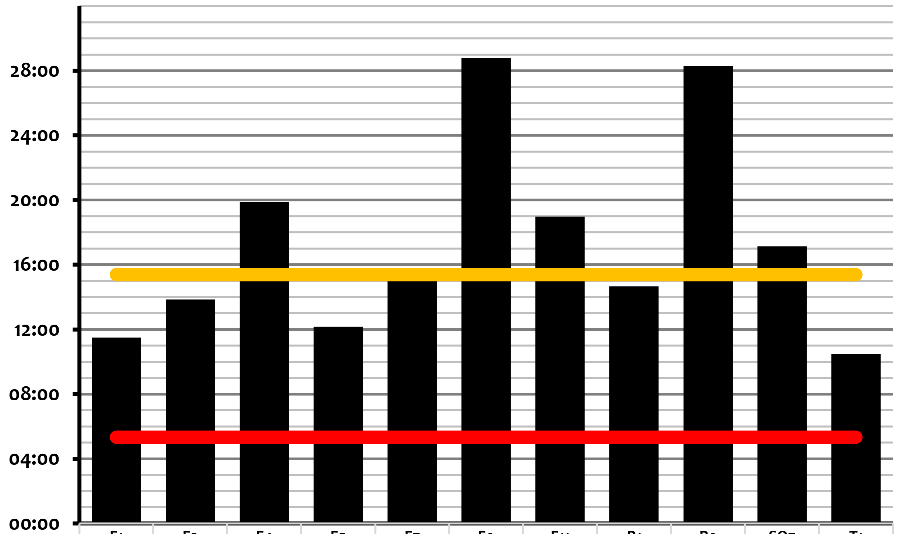
Figure 195 CCFD Travel Time Performance to Non-Fire Incidents (All Units), 2018–2022



	E1	E3	E4	E5	E7	E9	E11	R1	R9	SQ7	T1
Travel	09:31	11:24	11:00	09:52	09:29	21:23	13:05	12:56	22:54	15:06	07:42
NFPA 1710 Standard (4:00)	04:00	04:00	04:00	04:00	04:00	04:00	04:00	04:00	04:00	04:00	04:00
CCFD 90th Percentile (12:47)	12:46	12:46	12:46	12:46	12:46	12:46	12:46	12:46	12:46	12:46	12:46

The following chart illustrates the response time performance to non-fire incidents (all NFIRS Series other than 100). Units that did not have sufficient data points to calculate the percentile measurement were excluded.

Figure 196 CCFD Response Time Performance to Non-Fire Incidents (All Units), 2018–2022



	E1	E3	E4	E5	E7	E9	E11	R1	R9	SQ7	T1
Response	11:30	13:51	19:53	12:10	15:31	28:47	18:58	14:40	28:17	17:09	10:29
NFPA 1710 Standard (5:00)	05:20	05:20	05:20	05:20	05:20	05:20	05:20	05:20	05:20	05:20	05:20
CCFD 90th Percentile (15:24)	15:23	15:23	15:23	15:23	15:23	15:23	15:23	15:23	15:23	15:23	15:23

APPENDIX E: CRITICAL TASKING AND ALARM ASSIGNMENT SUMMARY

Figure 197: CCFD Critical Tasking

CCFD Critical Tasking for Initial Response	
STRUCTURE FIRE (HYDRANTED) TASKS	
Command	1
Safety	0
Pump Operations	1
Attack Line	2
Back-up Line	3
Search and Rescue	0
Ventilation	0
RIT	2
Other (hydrant)	0
Total Personnel	**9**
CCFD Critical Tasking for Initial Response	
STRUCTURE FIRE (NON-HYDRANTED) TASKS	
Command	1
Safety	0
Pump Operations	1
Attack Line	2
Back-up Line	2
Search and Rescue	0
Ventilation	0
RIT	2
Water Tender Operator	0
Total Personnel	**9**
CCFD Critical Tasking for Initial Response	
WILDLAND FIRE: HIGH RISK	
Command	1
Safety	0
Pump Operations/Lookout	0
Attack Line	6
Exposure Lines	0
Structure Protection	0
Water Supply	1
Other (mop-up, overhaul, line)	0
Total Personnel	**8**

CCFD Critical Tasking for Initial Response	
WILDLAND FIRE: LOW RISK	
Command	1
Safety	0
Pump Operations/Lookout	0
Attack Line	6
Exposure Lines	0
Structure Protection	0
Water Tender Operator	1
Other (mop-up, overhaul, line)	0
Total Personnel	**8**

CCFD Critical Tasking for Initial Response	
AIRCRAFT EMERGENCY	
Command/Safety	1
Aircraft Fire Suppression	0
Pump Operations	1
Attack Line	2
Back-up Line	0
Rescue	3
Emergency Medical Care	2
Water Supply	0
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
HAZARDOUS MATERIALS: HIGH RISK	
Command	1
Liaison	0
Decontamination	2
Research/Support	2
Entry team, and backup team	4
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
HAZARDOUS MATERIALS: LOW RISK	
Command	1
Liaison	0
Decontamination	2
Research/Support	2
Entry team, and backup team	4
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
EMERGENCY MEDICAL SERVICES	
Patient Management	0
Patient Care	3
Documentation	0
Total Personnel	**3**

CCFD Critical Tasking for Initial Response	
MOTOR VEHICLE COLLISION: NO ENTRAPMENT	
Scene Management/Documentation	0
Patient Care/Extrication	3
Total Personnel	**3**

CCFD Critical Tasking for Initial Response	
MOTOR VEHICLE COLLISION: WITH ENTRAPMENT	
Command	1
Safety	0
Scene Management	0
Patient Care	2
Extrication	3
Pump Operator/Suppression Line	0
Extrication/Vehicle Stabilization	0
Total Personnel	**6**

CCFD Critical Tasking for Initial Response	
MAJOR MEDICAL RESPONSE	
Incident Command	1
Safety	0
Triage	0
Treatment Manager	0
Patient Care	8
Transportation Manager	0
Documentation	0
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
TECHNICAL RESCUE: WATER	
Command/Safety	1
Rescue Team	2
Backup Team	2
Patient Care	2
Rope Tender	2
Upstream Spotter	0
Downstream Safety	0
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
TECHNICAL RESCUE: ROPE	
Command/Safety	1
Rescue Team	2
Backup Team	2
Patient Care	1
Rope Tender	2
Upstream Spotter	0
Downstream Safety	0
Safety	1
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
TECHNICAL RESCUE: CONFINED SPACE	
Command	1
Safety	1
Rescue Team	2
Backup Team	2
Patient Care	1
Rope Tender	2
Total Personnel	**9**

CCFD Critical Tasking for Initial Response	
TECHNICAL RESCUE: TRENCH RESCUE	
Command/Safety	1
Rescue Team	2
Rescue Team	0
Backup/support team	2
Patient Care	0
Shoring	4
Total Personnel	**9**

APPENDIX F: ALARM ASSIGNMENTS

Figure 198: CCFD Alarm Assignments

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
LOW-RISE STRUCTURE FIRE (HYDRANTED)						
Engine	2	6				
Ladder	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing:					**17**[71]	
Gap/Deficit:					**8**[72]	
LOW-RISE STRUCTURE FIRE (NON-HYDRANTED)						
Engine	2	6				
Ladder	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**17**[73]	
Gap/Deficit:					**8**[74]	
HIGH-RISE STRUCTURE FIRE (55+ feet) *Initial response (Big Box).						
Engine	2	6				
Ladder	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**43**[75]	
Gap/Deficit:					**34**[76]	

[71] NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2020.*
[72] *Available Part-time staff will help bridge this gap but not fully.*
[73] NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2020.*
[74] *Available Part-time staff will help bridge this gap but not fully.*
[75] NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments, 2020.*
[76] *Available Part-time staff will help bridge this gap but not fully.*

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
MODERATE-RISK COMMERCIAL STRUCTURE FIRE						
Engine	2	6				
Ladder	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**17**[77]	
Gap/Deficit:					**8**[78]	
HIGH-RISK COMMERCIAL STRUCTURE FIRE						
Engine	2	6				
Ladder	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**22**[79]	
Gap/Deficit:					**13**[80]	

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
WILDLAND FIRE: HIGH RISK						
Grass Unit	3	6				
Tender	1	1				
Battalion Chief	1	1				
Total Staffing/Units Provided:	**5**	**8**			**8**	
Total Staffing/Units Needed:					**8**	
Gap/Deficit:					**0**	
WILDLAND FIRE: LOW RISK						
Grass Unit	2	4				
Tender	1	1				
Battalion Chief	1	1				
Total Staffing/Units Provided:	**4**	**6**			**8**	
Total Staffing/Units Needed:					**8**	
Gap/Deficit:					**0**	

[77] *Adapted from "Community Risk Assessment and Standards of Cover," 6th edition; Center for Public Safety Excellence*
[78] *Available Part-time staff will help bridge this gap but not fully.*
[79] *Adapted from "Community Risk Assessment and Standards of Cover," 6th edition; Center for Public Safety Excellence*
[80] *Available Part-time staff will help bridge this gap but not fully.*

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
AIRCRAFT EMERGENCY						
Engine	1	3				
Rescue	1	2				
ARFF			1	1		
Medic Unit						
Battalion Chief	1	1				
Total Staffing/Units Provided:	3	6	1	1	6	1
Total Staffing/Units Needed:					6	1
Gap/Deficit:					0	0
HAZARDOUS MATERIALS: LOW RISK						
Engine	1	3				
Hazardous Materials Unit	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	3	6			6	
Total Staffing/Units Needed:					6	
Gap/Deficit:					0	
HAZARDOUS MATERIALS: HIGH RISK						
Engine	2	6				
Hazardous Materials Unit	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	4	9			9	
Total Staffing/Units Needed:					9	
Gap/Deficit:					0	

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
EMERGENCY MEDICAL SERVICES (Life Threatening)						
Engine	1	3				
Medic Unit						
Total Staffing/Units Provided:	**1**	**3**			**3**	
Total Staffing/Units Needed:					**3**	
Gap/Deficit:					**0**	
MAJOR MEDICAL RESPONSE (10+ Patients)						
Engine	2	6				
Rescue	1	2				
Medic						
Battalion Chief	1	1				
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**9**	
Gap/Deficit:					**0**	

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
MOTOR VEHICLE COLLISION: NO ENTRAPMENT						
Engine or Ladder	1	3				
Rescue	1	2				
Medic Unit						
Total Staffing/Units Provided:	**2**	**5**			**5**	
Total Staffing/Units Needed:					**5**	
Gap/Deficit:					**0**	
MOTOR VEHICLE COLLISION: WITH ENTRAPMENT						
Engine	1	3				
Rescue	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**3**	**6**			**6**	
Total Staffing/Units Needed:					**6**	
Gap/Deficit:					**0**	

Unit Type	CCFD		Mutual Aid		Total Personnel	
	Units	Staff	Units	Staff	Dept.	Mutual
TECHNICAL RESCUE: RISING OR SWIFT WATER						
Engine	2	6				
Rescue	1	2				
Boat (type)						
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**9**	
Gap/Deficit:					**0**	
TECHNICAL RESCUE: ROPE						
Engine	2	6				
Rescue	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**9**	
Gap/Deficit:					**0**	
TECHNICAL RESCUE: CONFINED SPACE						
Engine	2	6				
Rescue	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**9**	
Gap/Deficit:					**0**	
TECHNICAL RESCUE: TRENCH RESCUE						
Engine	2	6				
Rescue	1	2				
Battalion Chief	1	1				
Medic Unit						
Total Staffing/Units Provided:	**4**	**9**			**9**	
Total Staffing/Units Needed:					**9**	
Gap/Deficit:					**0**	