Castle Rock Fire and Rescue Department

2021 Master Plan

Table of Contents

Acknowledgments

The Castle Rock Fire and Rescue Department would like to acknowledge the Town of Castle Rock Mayor, Town Council, Town Manager, Town staff, and members of the Castle Rock Fire and Rescue Department. Without their support and assistance, this plan could not have been completed successfully.

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Resolution Adopting the 2021 Master Plan

Executive Summary

As part of the accreditation process and standard organizational management, the Fire and Rescue Department has developed this updated master plan for the years 2021-2025. The previous plan expired in 2019 and due to unforeseen challenges in 2020, this plan was delayed a year to account for a number of organizational changes.

This plan was developed using a variety of standards, criteria, and data to establish current and projected needs. One of the key references used was the Center for Public Safety Excellence's (CPSE) Quality Improvement for the Fire and Emergency Services manual. This plan meets numerous requirements as it relates to criterion, core competencies, and performance indicators found in Category 2 - Assessment and Planning, Category 5 – Community Risk Reduction, Category 6 - Physical Resources, Category 8 – Training and Competency, and Category 9 - Essential Resources. As with all plans, the plan itself is only as good as the data that was used to develop it, and any change in the data can drastically affect the plan.

Utilizing the most current data available, the following are recommendations for consideration and implementation. Each recommendation has supporting documentation that can be found under each category in the body of this plan. Current recommendations address resources needed now to maintain the department's level of service or position the department in anticipation of a future need while projected recommendations address anticipated resource needs based on an increase in call volume, construction, growth, and other outlined metrics.

Current Organizational Recommendations

1. It is recommended that the department increase its administrative support staffing to 4, reducing the ratio to 1:23 while also providing dedicated administrative support for the Public Safety Training Facility.
2. It is recommended that the department pursue funding for a dedicated, full-time emergency manager.
3. It is recommended that the department increase its Life Safety staffing by two Fire Prevention Officers (FPO) and two Fire Life Safety Educators/Inspectors (FLSE/I) in order to meet the recommended NFPA staffing and current needs.
4. It is recommended that the Life Safety Division evaluate other office and storage solutions to accommodate an increase in staffing.
5. It is recommended that the Logistics Division increase its Emergency Vehicle Technician staffing from one to two.
6. It is recommended that the Operations Division increase the line staffing by six positions (2 per shift) to allow for a total of 28 personnel per shift, up from the current 26.
7. It is recommended that the department increase the staff in the Training Division from two to five total members to achieve a ratio of 1:20.

Town of Castle Rock Fire and Rescue Department
2021 Fire Master Plan

Commission on
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8. Considering the limited availability of property suitable for a fire station in Planning Zone 9 (Meadows South, Red Hawk, Castle Highlands), the department should immediately explore station location options and secure property in the most advantageous location to provide a balanced response into Planning Zones 9, 4, and 1.

Projected Organizational Recommendations

1. It is recommended that the department evaluate its administrative support staff when the ratio exceeds 1:23 and provide for the addition of administrative support staff before the ratio exceeds 1:30.
2. It is recommended that the department evaluate the position of Fire Prevention Officer (FPO) when the amount of existing business inspections increase over 80 annually per FPO, and provide for the addition of a Fire Prevention Officer prior to the increase of 110 annually per FPO.
3. It is recommended that the department evaluate the current and forecasted workload of the Fire/Life Safety Educator/Inspector when business inspections account for 60% of their daily activities. It is further recommended that that department pursue additional staffing or modify responsibilities when business inspections meet or exceed 70% of their daily activities.
4. It is recommended that the department re-evaluate the Life Safety Division staffing model should there be a consistent increase in fire activity. This increase would result in more investigation and community education efforts and possible separation of inspection, investigation and community education activities.
5. It is recommended that the department maintain a ratio of 1.8 to 2.5 full-time Emergency Vehicle Technicians to adequately support its fleet of vehicles.
6. It is recommended that due to the lack of adequate fleet maintenance garage space and a decentralized storage program throughout the entire town, the department should acquire or build a Logistics Facility. This facility would need to provide appropriate fleet maintenance garage space and a centralized storage area for the logistics division.
7. It is recommended that the department increase the number of firefighters when defined parameters in the Master Plan and Standards of Cover are met.
8. Solely based upon call for service projections, Planning Zone 6 (Terrain, Cobblestone Ranch, Castle Oaks) should reach the planning threshold for new station consideration between 2022 and 2024 and the operational threshold between 2023 and 2025. Considering all factors, if they remain relatively consistent, the department should consider planning to open a station dedicated to Planning Zone 6 between 2024 and 2025.
9. Construction of a station should be considered when Stations 151 and 154 begin to reach planning thresholds for performance into Planning Zone 9, or when they are unavailable to the incidents within their primary planning zones, further increasing the travel time delta for aid received. Based on Station 151 and 154 current and projected workload, the

department estimates a station in Planning Zone 9 by 2026 – 2028. Alternatively, adding an additional apparatus at an existing fire station could potentially service this planning zone within current performance thresholds.

10. It is recommended that the department prepare for an additional medic unit, required staffing, and equipment by 2025.

11. It is recommended that as additional personnel are added, the department evaluate the need for additional training staff when a ratio of 1:25 is reached and increase training staff before a ratio of 1:30 is reached.

12. It is recommended to consider adding a second battalion chief position (3 personnel) with the opening of a sixth fire station. The addition of a seventh station would necessitate the addition of the second battalion chief.

With the addition of staff, consideration must also be given to securing additional office space. The current fire administration and public safety training facility south building cannot accommodate the requested staffing for the projected recommendations in their current configurations.

These recommendations were also not made in a vacuum as it relates to funding. All of these recommendations will require an increase in the department budget which equates to an increase in overall Town revenue. While this plan does not address revenue, it does provide the basis for estimated budget increases, based on current personnel and capital costs, moving forward. Understanding the timing and costs associated with building and equipping a fire station, purchasing apparatus, and hiring the needed personnel to staff the identified positions will provide a projected future cost for implementation.

Finally, the recommendations in this plan will allow the department to maintain the current level of service. While it may appear that the addition of personnel and capital would increase the department's level of service, it is simply to maintain as the Town continues to grow. The department's resources only have so much capacity, and growth further impacts that capacity. If the recommendations are not implemented as the metrics are met, this could result in a degradation in the level of service, i.e. longer response times, reduced capacity in the handling of calls, a reduction in inspections, plan reviews, public education, training, and fleet repair, and diminished administrative capabilities. Ultimately, the community decides what level of service they expect, what risks they are willing to accept, and the department will do its best to achieve that level of service with the provided resources.

Organizational Overview

Governance

The Town of Castle Rock (TCR, or Town), 28 miles south of Denver, founded in 1874, is the county seat of Douglas County, Colorado, and named for the prominent castle, tower-shaped butte near the center of town. The Castle Rock Fire and Rescue Department (CRFD, or department) provides an all-hazards emergency response (fire, emergency medical services, rescue, and hazardous materials) and serves as the emergency management agency for the Town of Castle Rock. The CRFD is a municipal department operating under the TCR with an at-large mayor and six council members elected to four-year terms. Additionally, CRFD provides all the same emergency services to the Castle Rock Fire Protection District (CRFPD, or district), as directed by court order 80-CV-209. The district maintains an independent board of directors which is required to meet with the Fire Chief no later than July 1 every third year after 2011 to determine if the current funding formula and resulting percentage is fair and reasonable.
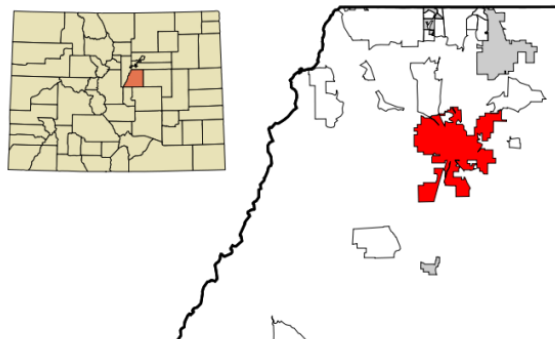
The Town operates as a "home rule" municipality under the Constitution of the State of Colorado, and under the Council-Manager form of government.

As outlined in the Castle Rock Municipal Code, Section 3-4, Other Offices, (3), "the Fire Chief, who shall be responsible for planning and directing the work of the fire department, and shall perform such other duties required by this Charter, or as required by the Council or the Town Manager and not inconsistent with this Charter."

Additionally, Section 8.02.010 Emergency Response Authority of the Castle Rock Municipal Code states the following:

> "The Castle Rock Fire Department, the Fire Chief, and his or her duly authorized representatives are hereby assigned as the designated emergency response authority for hazardous materials incidents within the Town of Castle Rock. The Fire Chief shall provide an emergency response to hazardous materials incidents by taking necessary initial action to minimize the effects of such an incident and provide continued supervision and authority over all further efforts to eliminate the threat of immediate and irreparable harm to the environment or public health and safety."

Financial Structure

The Castle Rock Fire and Rescue Department is funded through the Town of Castle Rock's annual budget. Within the budget, the department is funded through major and non-major government funds with the majority of the department's funding being derived from the general fund (major government fund). This fund is used to account for resources traditionally associated with government, and which are not required legally or by sound financial management to be accounted for in another fund. The functions accounted for within this fund include general government, police, fire, parks maintenance, zoning, historic preservation, and related capital projects.

The department also receives funding from the Castle Rock Fire Protection District through a court order. In the mid-1980s, the courts established that the Town was annexing the district's tax base and was thereby reducing the ability of the district to raise funds through property tax. The court order states the Town must provide service to the district, and the district provides the Town funds based on one of three formulas as detailed in the TOWN OF CASTLE ROCK/CASTLE ROCK FIRE PROTECTION DISTRICT AMENDED AND RESTATED INTERGOVERNMENTAL AGREEMENT, Article V.

The Fire Capital Fund is funded through the non-major government fund and accounts for resources and expenditures for the construction, expansion and improvement of fire facilities, and other capital needs of the department. The primary source of revenue in this fund is from development impact fees, which are collected at the time a building permit is issued.

Town of Castle Rock General Fund revenues are derived from taxes, licenses and permits, intergovernmental agreements, charges for service, fines and forfeits, investment earnings, contributions and donations, other revenue, and transfers in. The department budget is approximately 33% ($17,643,789) of the 2021 Town of Castle Rock General Fund ($54,154,376). Revenue that supports the growth of the community in the Fire Capital Fund comes from impact fees that are generated by development within Castle Rock. The 2021 Fire Capital Fund of $335,302 is intended to be used for future station construction or apparatus acquisition.

The Town of Castle Rock and the Castle Rock Fire and Rescue Department are subject to funding restrictions. TABOR, or the Taxpayer Bill of Rights, is an amendment to the Colorado Constitution approved by voters in 1992. This amendment places limits on the amount of revenue a government can collect and spend, and requires voter approval for certain changes in tax policy. Castle Rock's revenue growth is limited to annual growth plus inflation for the prior year. Due to these funding limitations, department budget projections are difficult to forecast beyond the next fiscal year.

Service Area

Castle Rock Fire and Rescue Department's jurisdiction is divided between two entities, the Town and the district, each with roughly 33 miles[2] for a total area of 66 miles[2]. Combined, the jurisdiction is home to approximately 79,000 residents with an overall population density of 1,174 residents/mile[2]. The Town of Castle Rock's Development Services maintains an annual estimate of the resident population for the 34 square miles of the Town of Castle Rock. As of October 2020, the population within town limits was estimated at 75,153[1]. The population density for the Town is 2,197 residents/mile[2] and is considered an urban population density (greater than 1,000 residents per mile[2]). The Castle Rock Fire Protection District represents the remaining 32 square miles of CRFD's jurisdiction and has an estimated population of 3,000 residents.

CRFPD's population density is 63 residents/mile[2] and is considered a rural population density (less than 1,000 residents per mile[2]). The population is concentrated in neighborhoods throughout the jurisdiction resulting in pockets of higher population densities. Therefore, CRFD has determined the population density within each of the 58 fire management zones (FMZ) and assigned a density value of rural or urban as appropriate.

The department has established performance guidelines for the rural and urban population densities. These performance guidelines are monitored monthly and revised annually as needed.

Based on the department's 2015 Daytime Population Study[2], the average daily transportation population on the road system in the Castle Rock area is approximately 118,070 vehicles per day or about 4,920/hour. Compared to data collected in 2011, there has been a total increase in traffic of 13.5%. Peak travel hours for Interstate 25, State Highway 85, and State Highway 86 are 05:00 through 22:00 (5 AM – 10 PM). The daily population surge due to the influx of employees, customers, and visitors was estimated to reach 80,840 people.

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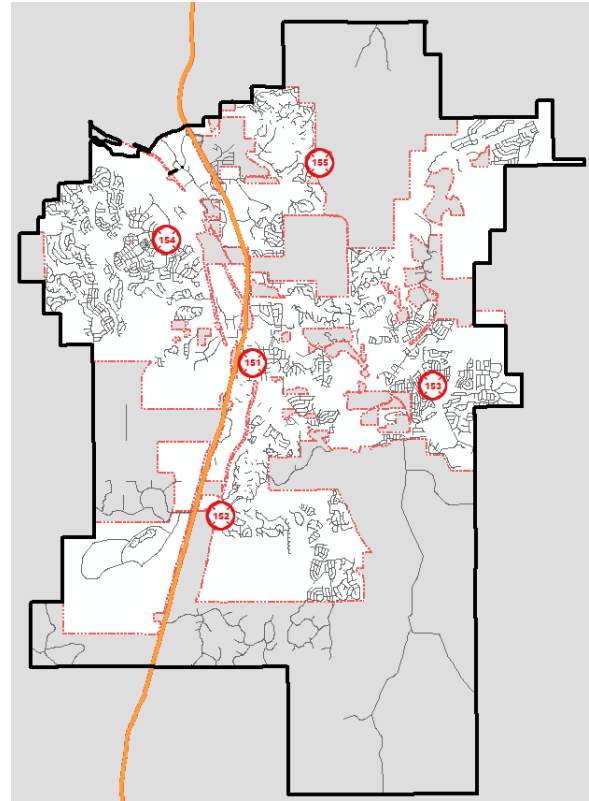
1 Town of Castle Rock Development Services Monthly Report: November 2020
[2] Town of Castle Rock, 2015 Daytime Population Study

Historical Response Summary

Total Calls for Service

The department's response history (total calls for service) has increased from 852 calls in 1993 to 5,876 in 2020, an increase of 590% at an annual rate of 8.7%. In the last ten years, calls for service have increased by 56% at a rate of 4.7% per year.

Annual Calls for Service
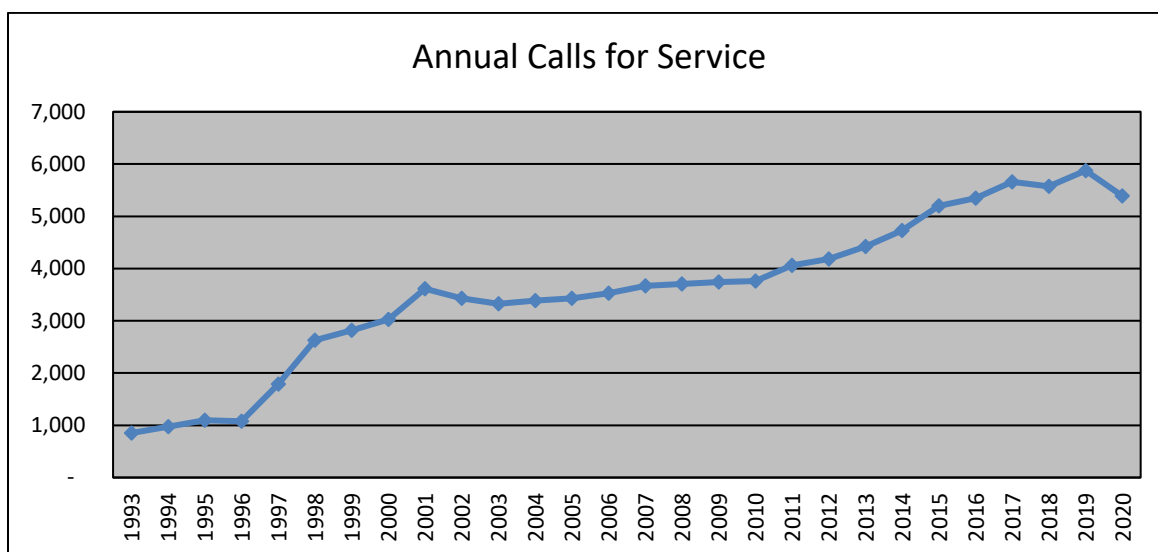
Calls for Service by Type

In addition to the total calls for service, CRFD monitors and reports the calls for service by type. Since 2007, Emergency Medical Services (EMS) continues to be the largest portion of CRFD's calls for service at 63%, followed by Other at 32% (lift assist, miscellaneous assist, fire alarms, etc.), Hazardous Materials (HAZMAT) at 3%, Fires at less than 2%, and Technical Rescue at less than 1%.

Calls for Service by Incident Type
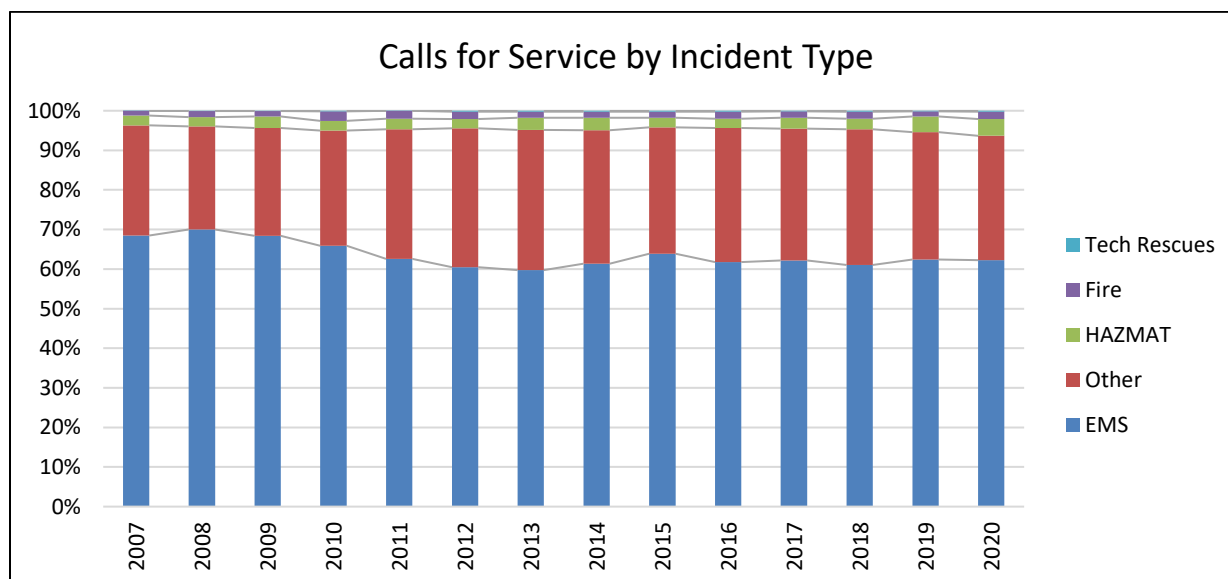
Community Expectations

Community Expectations and Concerns

For a department, regardless of the service(s) it provides, it is critical to understand its customers' expectations and concerns, otherwise, how could it hope to meet those expectations or address any concerns. This concept was a foundational element in the development of Castle Rock Fire and Rescue's 2020 – 2024 Strategic Plan[3]. CRFD gathered this information through community open houses and an online survey. In summary, the top three community expectations, representing 58.7% of all responses, were:

1. Training and Education: the expectation of highly qualified personnel, well trained in the latest techniques and industry best practices (25.0%).
2. Response Time: the expectation of a quick/timely response to all incidents (24.6%).
3. Staffing: expectation that the current staffing model provides adequate on-duty resources 9.1%).

In the same session, the community was asked to provide any concerns facing the Fire Department. The top three concerns represented 47.8% of all responses:

1. Growth and Development: concerns about the department's ability to keep pace with community growth and maintain current levels of service (18.8%).
2. Staffing: concerns that the current staffing model provides adequate on-duty resources (16.3%)
3. Resource Deployment: concerns ranged from the distance of some neighborhoods to a fire station, perceived excessive equipment on some incidents, and ensuring adequate availability of water, tools, and equipment (12.7%).

2019 Community Survey

In 2019, the Town of Castle Rock contracted with Northwest Research Group to conduct the 2019 Castle Rock Community Survey[4]. This four-week survey yielded a total of 588 responses. Additionally, all local businesses were invited to participate, with a total of 199 responses. All survey questions used a scale from 0 to 10, with "0" meaning "Did not meet my expectations at all" and "10" meaning "Greatly exceeded my expectations".

The Town of Castle Rock received a score of 7.54 on its "Overall Quality of Life", slightly above the national average, but below the peer cities identified in the study. While support for the overall direction of the Town (5.61) was lower than previous surveys (6.05 in 2017 and 6.83 in 2015). Support for public safety as a Town priority was slightly higher at 8.15 when compared to 7.95 in 2017 (no comparison to 2015 was offered).

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[3] CRFD's 2020 – 2024 Strategic Plan, please visit http://crgov.com/1871/Strategic-Documents

[4] For more information on the 2019 Community Survey, please visit http://crgov.com/survey

In the survey's overall ratings, Public Safety (Police and Fire Departments) held the highest rating of 8.07, with the highest rated question (8.73) dealing with the community's confidence in the Fire Department's ability to respond to emergencies.

In addition to the overarching question regarding the community's confidence in the Fire Department, there were four questions asked to those that indicated they had interacted with the Fire Department over the last two years. Below are the questions, score, and the number of responses:

- Professionalism of personnel at community events: 9.62 (n=52)
- Fire non-emergency response time: 9.57 (n=25)
- Fire emergency response time: 9.30 (n=74)
- Fire prevention and public education services: 9.12 (n=22)

Specific to the question about "Fire Emergency Response Time", only 2% of the respondents felt as if the Fire Department's response time did not meet their expectations. The remaining 98% felt that the fire department's response time either exceeded their expectation or greatly exceeded their expectations.

A few common themes came to light between the Fire Department open houses and the 2019 community survey when respondent were asked "What would you say is the single most important issue facing Castle Rock in the next 5 years?".

Issue/Concern	2019 Community Survey	Fire Department Open Houses
Growth/Development	Growing too fast, unmanaged growth, ability for infrastructure to keep pace	Ability of the Fire Department to maintain current levels of service with current/projected growth
Traffic	Too much traffic, condition of roads	Ability to respond quickly with increased traffic
Water Supply	Adequate water source(s) for current and projected needs, renewable water sources, cost of water	Concern about the availability of water to support emergency operations.

The common concern regarding growth and development are a central focus of this plan as it details performance metrics and thresholds that indicate when additional Fire Department resources may be needed.

Deployment and Staffing

The Castle Rock Fire and Rescue Department is comprised of five divisions; Administration, Life Safety, Logistics, Operations, and Training, with a total staffing of 96.5 career members (94.5 uniformed staff and 2 civilian staff) and four administrative volunteers. The department provides fire and emergency services 24 hours a day, seven days a week out of five fire stations, Fire Department Headquarters and the Public Safety Training Facility.

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                          Customers
                             |
                         Town Council
                             |
                         Town Manager
                             |
Public Safety Commission ----+
                             |
                        Fire Chief (1)
                             |
      Administrative Supervisor (1)    Assistant Chief (1) Strategic Planning
      Senior Office Assistant (1)
                 Chaplain            Medical Director

Deputy Chief (1)      Division Chief (1)    Division Chief / Fire Marshal(1)   Division Chief (1)
Operations Division    Training Division      Life Safety Division            Logistics Division

Emergency Services    Training Captain (1)   Deputy Fire Marshal (1)          Sr. EVT (1)

Battalion Chief (3)                 Fire Prevention      Public Education    Logistics Technician (1)

Lieutenant (15)            Fire Prevention Officer (4)   Fire and Life Safety Educator (2.5)

Engineer (15)  Firefighter/EMT (21)  Firefighter/PM (24)
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Fire Department Headquarters
The Fire Department Headquarters, co-located within Station 151, opened in 1999.   Fire Headquarters provides office and conference space for the Fire Chief, Administrative Division, Operations Division, and the Life Safety Division.

Station 151
Station 151 houses a Quint (Q151), Advanced Life Support (ALS) Medic (MED151), Battalion Chief (BC151), Type III Brush Truck (BR151), reserve medic unit (MED159), and the 1929 antique. The Type III brush truck is cross-staffed as necessary.

Typical station assignments are:

- Quint 151: one Lieutenant, one Engineer, two Firefighter/EMTs or Paramedics as staffing allows with a minimum of three personnel on the apparatus at any given time.
- Medic 151: one Firefighter/EMT, one Firefighter/Paramedic.
- Battalion 151: one Battalion Chief
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Station 152

Station 152 houses an Engine (E152), Type VI Brush Truck (BR152), the Tracked Rescue Vehicle (TRV), two reserve engines (E158, E159), and a reserve brush truck (BR159). The Type VI Brush Truck (BR152) and TRV are cross-staffed when necessary.

The typical Station 152 assignments are:

- Engine 152: one Lieutenant, one Engineer, and one Firefighter/EMT or Paramedic.

Station 153

Station 153 houses an Engine (E153), Type VI Brush Truck (BR153), Advanced Life Support Medic (MED153), Hazardous Materials Unit (HM153), and reserve battalion vehicle (BC159). The Type VI Brush Truck and HAZMAT are cross-staffed when necessary.

The typical Station 153 assignments are:

- Engine 153: one Lieutenant, one Engineer, and one Firefighter/EMT or Paramedic.
- Medic 153: one Firefighter/EMT, one Firefighter/Paramedic

Station 154

Station 154 houses an Engine (E154), Advanced Life Support Medic (MED154), Type VI Brush Truck (BR154), Squad (SQ154), and a Structural Collapse/Trench rescue trailer (COL154). The Type VI Brush Truck, Squad, and Collapse/Trench rescue trailer are cross-staffed as necessary.

Typical station assignments are:

- Engine 154: one Lieutenant, one Engineer, and one Firefighter/EMTs or Paramedic.
- Medic 154: one Firefighter/EMT and one Firefighter/Paramedic

Station 155
Station 155 houses a Quint (Q155), Type III Brush Truck (BR155), reserve medic (MED155), and reserve quint (Q159). The Type III Brush Truck is cross-staffed when necessary.

Typical station assignments are:

- Quint 155: one Lieutenant, one Engineer, and two Firefighter/EMTs or Paramedics as staffing allows with a minimum of three personnel on the apparatus at any given time.

Public Safety Training Facility (PSTF)
The PSTF consists of three adjacent facilities: the South building (PSTF South), the North building (PSTF North), and the Fire Training Center (FTC).

The PSTF South building is the primary office building for CRFD's Training and Logistics Divisions and includes office and storage space for the Castle Rock Police Department.

The PSTF North building is the primary classroom and multi-use training space for the Castle Rock Fire and Police departments. This facility includes two training rooms with accommodations for up to 299 students, and a large multi-use training space.

The FTC is a multi-use, five-story metal building with burn-rooms on the first, second and fourth floors. The FTC is the primary training facility of operational training evolutions and tactical exercises.

Administration Division

The Administration Division is approved for four (4) full time positions, Chief of the Department (1) Assistant Chief – Accreditation/Emergency Management (1), Administrative Supervisor (1), and Senior Office Assistant (1), and operates out of the Fire Headquarters. The Administration Division is responsible for the all administrative functions of the department and routinely coordinates its efforts with other Town departments.

Administration	Human Resources	Public Information	Strategic Planning	Volunteer Management
• Overall department direction • Budget & Finance • Records management • Town Council Liaison • Town Staff Representative • United Fire Dispatch Authority (UFDA) Executive Board • Awards & Recognition • Ceremonial Unit • Medical Director	• Payroll • Benefits • Leave Management • Employee Records • Position Discipline	• Public Information Officer • Community Partnership	• Master Planning • Accreditation • Mutual Aid Agreements • Policy Development • Emergency Management Oversight	• Chaplain Services • Volunteer Coordination

The Administration Division supports all divisions, programs, and projects to include, but not limited to:

Life Safety	Logistics	Operations	Training	Other Town Departments
• Personnel Action Forms (PAF)				• G.I.S. • Payroll • Legal • Public Works • DoIT • Human Resources • Development Services • Parks & Recreation • Water Department • Castle Rock Police
• Purchasing support/P-Cards				
• Peer support				
• New hire process				
• Coordinate IT, Facilities, and GIS Support				
• Office Supplies				
• Training travel and reservation coordination				
• Hazmat billing • Public Education scheduling and support • Building permit distribution and payment	• Coordinate apparatus testing schedule • Shipping and receiving	• Rehabilitation for long duration incidents	• Maintenance and storage of training records and certification	

Administration staff responsibilities:

The Chief of the Department (Fire Chief) has the primary responsibility for the administration, oversight, and budgetary impacts of all divisions, programs, projects, and personnel. Specific programs managed by the Fire Chief include emergency management and strategic and master planning. Other responsibilities of the Fire Chief include ensuring policies, practices, and personnel work in support of department and Town values and in conjunction with other Town departments.

The Assistant Chief of Accreditation and Emergency Management, as directed by the Fire Chief, has the primary responsibility for managing/overseeing the department's continuous quality improvement program, serve as CFAI peer assessor/team leader, and developing/managing the Town of Castle Rock's comprehensive emergency management program. Secondary responsibilities include, but are not limited to, participation and coordination with Douglas County Office of Emergency Management, Incident Management Team, and Emergency Operations Center, develop/deliver community preparedness programs, and respond to emergency/disaster incidents.

The Administrative Supervisor has the primary responsibility for providing administrative support to the Fire Chief and Fire Department, supervising clerical staff and those temporarily assigned to the Administrative Division, preparing correspondence and reports, arranging meetings, assisting with budget preparation, processing and tracking financial data, processing of all personnel action forms and evaluations, and preparing Town Council packet materials. Secondary responsibilities include, but are not limited to, draft, prepare, review, and edit complex correspondence, reports, spreadsheets, memorandums, and other documents, compose department monthly reports, serve as a member of the department's Peer Support Team, maintain current Child Safety Seat Technician (car seat) certification, and ensure timely and appropriate responses to internal and external customer inquiries, requests and complaints.

The Senior Office Assistant has the primary responsibility for providing complex administrative support in budgeting, billing and accounts payable/receivable, assist the Training Division with maintenance and retention of all required training certifications, submitting all required state filings and taxation documents, and ensuring adequate office and business supplies. Secondary responsibilities include, but are not limited to, administrative and clerical support to all Divisions and staff, support to the Public Safety Commission, coordination, maintenance, and update of the department website, acting as a lead office assistant, providing direction and support to staff temporarily assigned to the Administration Division, and maintain current Child Safety Seat Technician (car seat) certification.

Life Safety Division

The Life Safety Division is approved for eight and one-half (8.5) full time positions, Division Chief/Fire Marshal (1), Deputy Fire Marshal (1), Fire Prevention Officers [FPO] (4), Fire and Life Safety Educator/Inspectors [FLSE/I] (2.5), and operates out of Fire Headquarters. The Life Safety Division is comprised of three bureaus, each with different disciplines that may or may not overlap during the execution of their duties, such as:

Fire Prevention Bureau	Investigations Bureau	Public Education Bureau
• Building Plan Review & Permitting • Development Plan Review • Fire Inspections/Code Enforcement • Traffic plan review and Pre-Emption • Rapid Access/Knox Box • Mapping • Life Safety Systems • Insurance Services Office Rating • Site Development Review • Blasting Review and Permitting • Unmanned Aerial Vehicle (UAV) Program	• Environmental Crimes • Fire/Arson Investigations • Explosive Device Investigations • LEO/FD Support • Unmanned Aerial Vehicle (UAV) Program	• CPR Training • Hands-Only CPR • Business Services Training (Fire Extinguishers, etc.) • Safer Senior • Healthy Risks (Middle School) • Community Risk Reduction • Community Relations Liaison • Juvenile Firesetter Program • Risk Watch • Child Passenger Car Seat Inspection/ Installation • Fire Inspections/Code Enforcement

The Life Safety Division supports several internal divisions, programs and projects to include, but not limited to:

Administration	Logistics	Operations	Training	Other Town Departments
• Hiring processes • Employment testing • Background checks	• Technical Expertise: code compliance, consensus standard interpretation	• 24 hour FPO response • Technical expertise on protection and notification systems • UAV Support: investigation, search and rescue	• Pre-incident planning • Develop and deliver training on technical subjects: fire alarm, fire sprinkler/pumps, alternative extinguishing systems • Development Planning	• Development Services: • Building plan reviews • Police Department: UAV support, accident investigation • Legal: intergovernmental agreements, contract review

Life Safety staff responsibilities:

The Division Chief/Fire Marshal (Fire Marshal) has the primary responsibility for the administration and oversight of the Life Safety Division to include emergency and special operations, public education, and community risk reduction management. Also included is the potential of criminal and non-criminal investigations, and support of other fire department and

law enforcement agencies. This position also provides collaborative management of development-related services. Secondary responsibilities of the Fire Marshal include response to major incidents as the investigations branch, personnel performance review and evaluations, human resource activities, and coordination of projects and activities with other Town, County and other partners as needed.

The Deputy Fire Marshal has the primary responsibility for the day-to-day operation of the fire prevention and investigation bureaus. These are 24/7 operations with a Fire Prevention Officer assigned to each shift, and therefore have the potential for oversight at all hours of the day. Secondary responsibilities include, but are not limited to, oversight of law enforcement certifications including firearms training to maintain Peace Officer Standards and Training (POST) standards and Federal Aviation Administration (FAA) regulatory statutes pertaining to the UAV program including pilot licensing. This position is the backfill for the Fire Marshal and the Fire Prevention Officer positions.

The Fire Prevention Officers have the primary responsibility for responding to emergency scenes (for multiple reasons as either required or requested), reviewing all types of documents that get submitted to the fire department, including reviews from planning, planned development, zoning, master plans for developments, construction, environmental, and all life safety/fire protection systems, construction-related and site inspections, existing business inspections, hazardous materials reporting and inspections, parking enforcement for fire lanes, and fire/arson/explosive device investigations. Secondary responsibilities include, but are not limited to, public education, community risk reduction opportunities, support to the Operations Division on subjects that are technical in nature, support to the Training Division on subjects pertaining to this division, and public and private complaints pertaining to an all-hazards fire department. This position also performs some construction inspections throughout the fire protection district.

The Fire and Life Safety Educator/Inspectors have the primary responsibility for developing, coordinating, and delivering programs to the public that address certain potential health and/or life safety risk, i.e. CPR and child car seat programs, and support the Operations and Training Divisions with operational public educational events to improve the public's knowledge of abilities that the fire department possesses. Secondary responsibilities include research and development of programs to target certain demographics to reduce the risk associated with this identified group, and collecting data to ensure that the programs that are being offered are valid and show a reduction of risk in the community. Additionally, the personnel assigned to this bureau provide support with existing business inspections.

Logistics Division

The Logistics Division is approved for three (3) full-time positions; Division Chief of Logistics (1), Senior Emergency Vehicle Technician [EVT] (1), and Logistics and Equipment Support Technician [LEST] (1), and is based out of the PSTF South building, but operates out of multiple facilities throughout the Town. The Logistics Division has four primary functions; Facilities Support, Fleet Maintenance, Logistical Support, and Technology Support. Facilities Support is responsible for the general maintenance, upkeep, and repair of all fire department facilities to include furniture, appliances, HVAC and generator systems in coordination with the Town's Facilities Management Division. Facilities Support is also responsible for developing project specifications and requirements for CRFD's construction/remodel projects. Fleet Support is responsible for the maintenance, repair, and coordination of the department's fleet of vehicles in conjunction with the Town's Public Works Fleet Services Division. Logistics Support provides procurement and delivery support of various items, inspection and testing of fire hose, ground ladders, aerial ladders and personal protective equipment (PPE). Additionally, Logistics Support maintains an inventory of uniforms, PPE, tools, equipment, and other consumable items to ensure uninterrupted service delivery. Technology Support coordinates with the Town of Castle Rock Division of Innovation and Technology (DoIT) to ensure hardware/software compatibility and security, personal communications (mobile device support), network infrastructure and mobile connectivity. Additionally, Technology Support provides support and coordination for the department's multiple radio communication and notification systems.

Facilities Support	Fleet Support	Logistics Support	Technology Support
• Construction/Remodel • Coordination of maintenance and repair • Coordination of generator maintenance and repair • Grounds maintenance • Facility inspections • Equipment & furnishings • Physical Fitness Equipment	• Fleet Maintenance • Fuel Supply • Coordination with Town Fleet Services • Vehicle specification • Vehicle acceptance testing • Aerial testing • Pump testing	• Uniforms issuance and tracking • Station Supplies • Annual compliance testing (hose, ground ladders, SCBA) • PPE issuance, inspection, and tracking	• Communication (radio) • Communication (personal device) • Information Technology - Hardware • Personnel Protective Equipment (PPE) • Information Technology – Software

Each of the Division's four functions supports a multitude of programs and projects requiring coordination with other Town departments including, but not limited to:

Administration	Life Safety	Operations	Training	Other Town Departments
• Supplies procurement and delivery				Information Technology:
• Uniforms and Personal Protective Equipment				• Hardware (current/future needs)
• Apparatus specification and acquisition				• Software (current/future needs)
• Apparatus maintenance and repair				• Mobile devices
• Research and development				• Security
• Communications (radio)				Facilities:
• Communications (personal device)				• Station maintenance and repair
• Station supplies and furnishings				• Building renovation specification and coordination
• Planning		• Incident support	• Apparatus specific training • System-specific training (pumps, aerial, brakes, etc.)	• New construction specification and coordination • Generator maintenance and repair Public Works: Fleet Services • Fleet Maintenance • Fuel Supply • Apparatus specification

Logistics staff responsibilities:

The Division Chief of Logistics has the primary responsibility for the administration and oversight of the Logistics Division, personnel, and program management. Programs managed by the Logistics Division include the fleet and equipment management programs, the Administrative and Emergency Communications System, Information Systems Hardware and Software, Inventory Management System for department goods and services, and oversees the Facility Management Program for the department. Secondary responsibilities include performing fleet, equipment, facility, information or communication systems maintenance and may be required to report to emergency scenes to support operations.

The Senior Emergency Vehicle Technician has the primary responsibility for maintenance and repair of vehicles, apparatus and equipment (hydraulic and air brakes, ABS, gas and diesel engines, advanced electrical and on-board computers, fuel delivery, hydraulics, transmissions, air systems, exhaust, axles and suspensions, fire pumps, foam systems, and aerial apparatus), and required annual testing/certifications. Secondary responsibilities include the maintenance and repair of small gas/diesel and electrical equipment, and may be required to report to emergency calls as needed to perform vehicle and apparatus services. Also serves as the backup to the Logistics and Equipment Support Technician in their absence.

The Logistics and Equipment Support Technician has the primary responsibility of coordinating maintenance and repair of all fire department facilities with Town of Castle Rock Facilities Management Division, performs/coordinates preventative maintenance/testing/repairs of SCBAs, fire hose, ground ladders, radio, and miscellaneous tools and equipment, purchasing, issuance,

maintenance and tracking of personal protective equipment (PPE), purchasing, issuance and inventory control of uniforms, and ensuring adequate inventory of miscellaneous tools and equipment. Secondary responsibilities include assisting the EVT as needed, along with maintaining logs and other required reports and records.

Fleet:

The department maintains a total fleet of 46 vehicles and equipment; eleven heavy apparatus, five medic units (ambulance), five light vehicles, fifteen staff/bureau vehicles, four stationary generators and eight utility vehicles and trailers. The department's "light fleet" (medic units, staff, bureau, utility, trailers and chief vehicles) are maintained by the Town of Castle Rock Fleet Services while any Fire or EMS specific systems or problems are maintained by the Logistics Division. In addition to vehicle maintenance, the Logistics Division is also responsible for maintenance needs of the large quantity of equipment the department utilizes. This includes apparatus carried power tools, extrication tools, EMS equipment (patient stretchers, stair chairs, etc.), along with equipment and tools supplied to each station/facility.

Staff (15)	Utility (8)	Front Line (9)	Cross-Staffed (8)	Reserve (6)
8 Staff Vehicles	1 Utility Truck	2 Quints	3 Type VI Brush Trucks	1 Quint
7 Bureau Vehicles	1 Snow Plow	3 Engines	2 Type III Brush Trucks	2 Engines
	1 UTV	3 Medics	1 Tracked Rescue Vehicle	2 Medics
	5 Trailers	1 Chief Vehicle	1 HAZMAT	1 Type VI Brush Truck
			1 Squad/Trailer	

Facilities:

The Logistic Division's primary facility is the Public Safety Training Facility's South Building, as a shared facility with the Castle Rock Police Department (CRPD). The South Building provides office space, a small conference area, limited storage, and two garage areas. The larger garage area is used for fire apparatus maintenance, but has insufficient space to service the aerial apparatus (quints). Other facilities utilized by the Logistics Division include Fire Headquarters/Station 151 for administrative support, shipping/receiving, accounts payable, and additional storage, Station 152 (diesel exhaust fluid storage), Station 153 for HAZMAT supplies and for miscellaneous storage and hand tools, Station 154 for household and cleaning supplies and the wildland team equipment/PPE cache, and Station 155 houses the regional air/light trailer.

Operations Division

The Operations Division is approved for 79 full time positions; Deputy Fire Chief/Operations (1), Battalion Chief (3), Lieutenant (15), Engineer (15), Firefighter/Paramedic (24), and Firefighter/EMT (21). The Operations Division's primary responsibility is to provide an all-hazard emergency response. The Division operates a three-shift model working 48 hours on and 96 hours off (48/96), and each shift is approved for 26 full-time positions. The department maintains a minimum daily staffing of 22 members per shift. If at any time staffing falls below 22 members, the department backfills positions through overtime.

Apparatus Type	Number of Apparatus	Min. staffing	Min. Daily Staffing (total)
Engine	3	3	9
Quint	2	3	6
Medic Unit	3	2	6
Battalion Chief	1	1	1
		Total:	**22**

The Operation Division also supports other divisions, programs, and projects to include, but not limited to:

Administration	Training Division	Life Safety	Logistics	Other Town Departments
• Citizen inquiries • Accreditation: Program subject matter experts • Accreditation: Participation in CFAI Peer Teams • Assist with scheduling and registration of classes for all personnel • Disseminate pertinent information to all members	• Certification maintenance • Collaborate and facilitate all-hazard training opportunities • Serve as subject matter experts for specific training sessions • Provide staff and instructors for large scale or live fire training session • Ensure adequate district coverage when companies are out of service for training	• Hazard Identification • Child Safety Seat Inspection & Installation • In-Station Public Education • In-Community Public Education • Cause and origin investigation for minor fire incidents	• Routine apparatus maintenance • Routine tools & equipment maintenance • PPE Inspection and cleaning • Collaboration on apparatus specification • Collaboration with the research & development team • Inventory and purchasing of supplies and equipment	• CPR Training • Health and Wellness Programs • Finance: accounts payable/receivable, ambulance billing, payroll • Public Works: Coordinated response during significant weather events • Facilities: minor facility maintenance • Water Department: Water conservation, coordinated response for incidents involving water infrastructure or water ways

Operations staff responsibilities:

The Deputy Fire Chief/Operations has the primary responsibility for the administration and oversight of the Operations Division to include emergency operations, special operations, and emergency medical services (EMS). Secondary responsibilities include, but are not limited to, serving as the Acting Fire Chief in the absence of the Fire Chief, response to major incidents, assuming incident command as needed, establishment of performance standards, program performance review and evaluations, personnel performance review and evaluations, human resource activities (compensation, shift schedule, and disciplinary actions), and coordinates project and activities with other Town, County, regional, and State partners as needed.

The Battalion Chief has the primary responsibility of supervising the day-to-day operational functions of department, responding to calls for service in an all-hazard environment and leadership of their respective shift. Secondary responsibilities include, but are not limited to, staffing, overtime, command on incidents, coaching and mentorship of officers assigned to their shift, coordination and maintenance of facilities, project and program team leadership, administrative projects, and other duties as assigned.

The Lieutenants have the primary responsibility for responding to calls for service in an all-hazard environment, ensuring safe, efficient and effective delivery of services, and supervising members assigned to their apparatus/station. Secondary responsibilities include, but are not limited to, prioritization of daily tasks, participation with other associated teams (special operations, research & development, apparatus, peer fitness, etc.), providing and/or instructing company, shift, or department level training, and coaching and mentoring of assigned crew-members.

The Engineers have the primary responsibility for responding to calls for service in an all-hazard environment, the safe and effective operation of apparatus in emergent and non-emergent situations, ensuring the operational readiness of tools, equipment, and apparatus at the assigned station, and performing operational tasks and make decisions independently on emergency scenes. Secondary responsibilities include, but are not limited to, timely completion of station duties as well as other assignments given by the company officer, ensuring appropriate documentation for any maintenance or inventory issues in the assigned station, participation in, and possibly instructing, required training and continuing education, participation in and assisting with supervision of company-level community relation and risk reductions activities, coordination of, or participation with, special teams or projects, and other duties as assigned by the lieutenant or battalion chief.

The Firefighter/Paramedics have the primary responsibility for responding to calls for service in an all-hazard environment, conduct firefighting and hazardous materials operations, coordinating, directing and providing patient care, and ensuring safe and effective transport of ill

and injured patients. Secondary responsibilities include, but are not limited to, maintaining required certifications, community relations and risk reduction activities, participation in, and possibly instructing, required training and continuing education, coordination of, or participation with, special teams or projects, and other duties as assigned by the lieutenant or battalion chief. If appropriate, Firefighter/Paramedics may serve as field instructors or preceptors for Emergency Medical Technicians (EMTs) or paramedic students, newly hired CRFD members, or interns from local schools.

The Firefighter/EMTs have the primary responsibility for responding to calls for service in an all-hazard environment, conduct firefighting and hazardous material operations, ensuring safe and effective transport of ill and injured patients, and performing emergency and non-emergency tasks as assigned. Secondary responsibilities include, but are not limited to, maintaining required certifications, community relations and risk reduction activities, participation in, and possibly instructing, required training and continuing education, coordination of, or participation with, special teams or projects, and other duties as assigned by the lieutenant or battalion chief. If appropriate, Firefighter/EMTs may mentor new employees or students from local schools.

Training Division

The Training Division is approved for two (2) full time positions; Division Chief of Training and the Training Captain, and operates out of the Public Safety Training Facility with offices and conference space in the South Building, classrooms in the North Building, the Fire Training Center, and support training efforts at each fire station. The Training Division supports a multitude of programs and projects to include:

Administration	Life Safety	Logistics	Operations	Other Town Departments
• Coordination of the master training calendar				• Participation in the Town Safety Committee
• Management of all certifications				• Technical rescue trainings
• New hire process				• Town Manager's Office
• Recertification needs of membership				• Town Clerk
• Management of the Target Solutions program				• Division of Innovation and Technology
• Training and Safety Team • All promotional processes			• All department fire trainings • All department special operations trainings • Provide support and instruction to recruit academies • Acting Lieutenant and Engineer classes • Management of the fire training center including the building and equipment	• Human Resources • Finance Department • Legal Department • Castle Rock Police • Castle Rock Water • Parks and Recreation

Training staff responsibilities:

The Division Chief of Training has the primary responsibility for the administration and oversight of the Training Division, the personnel assigned to the division, and program management. This includes department level team participation (master plan, strategic plan, executive staff meetings, compliance team, etc.), budget creation and compliance, and participation in town wide and regional teams as assigned.

The Training Captain has the primary responsibility for the management of the certification processes, the management of the training calendar, the management of the fire training center, and the design and deliverance of crew-based training.

Facilities:

The Training Division's administrative offices are in the Public Safety Training Facility South Building. The Public Safety Training Facility North Building houses classrooms and indoor

training space for the Castle Rock Fire and Police Departments, and is available to other Town departments for meetings and training. The overall management of these facilities falls to the Logistics Division.

The Training Division is solely responsible for the Fire Training Center, which houses the burn building, a confined space training area, and a small concrete driving area. The division is currently working on minor site improvements as well as supporting a long-term strategic plan of improving the Fire Training Center's site and building.

Due to the limited staffing of the division, many of the projects and responsibilities are shared between both members in the division. Examples include the new hire processes, the promotional processes, acting lieutenant and engineer classes, and the design and delivery of division-lead trainings. Additionally, the division supports many other efforts for the implementation of training programs by members of the department that are not assigned to training. These include special operations trainings, wildland trainings, extrication trainings, mayday trainings, bailout trainings, and many more.

Current Department Staffing Model

The department utilizes two distinct staffing models for planning and implementing personnel resource allocation for the various division functions. The Administrative, Training, Life Safety, and Logistics Divisions currently use a static staffing model, while the Operations Division uses a constant staffing model which incorporates a relief factor to efficiently staff the positions while minimizing the use of overtime funding.

The static staffing model simply means that staffing of positions will be provided using the exact number of personnel needed to cover the allocated Full-Time Equivalent (FTE's) positions. With this model, any leave (vacation, administrative, sick, disability, or position vacancies, etc.) that needs to be covered is done so with the person's absence or overtime funding. This staffing model currently provides adequate coverage for the non-line personnel.

The staffing model used for the Operations Division is referred to as a constant staffing model. This particular model requires having enough personnel to cover any types of leave and position vacancies without consistently incurring overtime expense or requiring mandatory overtime for division personnel. This model does not eliminate overtime, rather it strives to keep overtime to a minimum. To successfully utilize this staffing model, a relief factor must be incorporated in personnel resource allocation and planning.

The relief factor from the previous plan (2014 - 2019 Master Plan) used for staffing this division is 3.47. However, with the addition of Station 152 as well as an aging workforce, this factor is no longer viable and does not provide for the needed resources to maintain constant staffing.

This relief factor is calculated using the following formula:

The current minimum staffing is three firefighters on all fire suppression apparatus (five) and two firefighters on each medic unit (three), along with one Battalion Chief. This totals 22 personnel for each 24-hour work period.

Based on the current benefit package and average length of time in position for Operations Division personnel, eligible leave for personnel assumptions are as follows: 7.0 work periods of Sick Leave, 14.0 work periods of Vacation Leave, and 1.5 work periods of Personal Leave. The current policy for managing leave usage for the division is to allow the scheduling of two leave positions per work period. At the discretion and judgment of the department, personnel can attend various schools, seminars and trainings which will typically average 2.0 work periods for each person every year. This totals approximately 24.5 work periods of eligible leave for each person annually. Therefore, a total of 539 work periods (22 people X 24.5 work periods) will be vacated and need replacement coverage annually.

To minimize overtime and plan for expected paid time off (vacation, sick leave, and training leave), the department is currently authorized to maintain a maximum per shift staffing of 26 firefighters.

In a calendar year, 365 days are covered by three separate shifts (A, B & C Shifts); therefore, each firefighter would be scheduled for 121.6 work periods annually. This number minus the 24.5 work periods of eligible leave will result in each firefighter being available to work 97.1 work periods annually.

To cover the 539 work periods of leave needed on each shift throughout the year, two additional firefighters will need to be available on each shift daily (539/97.1 : 5.55 : 6/3 : 2).

This will require 28 (26+2) firefighters available to work on each shift to adequately cover eligible leave and personnel vacancies.

The department's new relief factor of 3.82 is calculated by dividing the number of firefighters available to work on each shift (28) by the number of firefighters required to meet minimum staffing (22) multiplied by the three shifts which are necessary to cover the 365 days annually (28/22 : 1.272 X 3 : 3.82).

What this means is that for each seat that needs to be filled for each work period, we require 3.82 firefighters to ensure minimum staffing needs are met on a constant basis and overtime expenditures are minimized.

However, the current relief factor of 3.82 is not a constant number, and this number may vary depending on a number of factors. Factors that could affect this number would be changes to minimum staffing levels, the addition of more stations or apparatus, or eligible leave available to staff members, whether through increased years of service or potential future policy changes.

Comparing the department's current relief factor to other metro area departments, the following observations were noted: South Metro Fire Rescue Authority has a relief factor of 3.63, Aurora

Fire and Rescue Department has a relief factor of 3.5, and West Metro Fire Rescue has a relief factor of 25% above minimum staffing or 3.75 per staffed position.

Performance Indicators and Thresholds

CRFD has established multiple performance indicators and thresholds to evaluate the overall system workload. It is important to understand that there is no single metric or measurement that necessitates a change to the system be made, but an analysis of the system as a whole is required. For example, if a planning zone is exceeding the number of calls for service to build a new fire station, but the current fire stations and apparatus are able to respond to those calls within acceptable times without a degradation of service, is a new fire station needed? Conversely, if a planning area does not generate enough calls for service to warrant consideration for a new fire station, but existing fire stations are not able to respond within acceptable timeframes and may even exceed maximum acceptable response times, should a new fire

station be considered? There are no easy answers, especially considering the financial implications of building a fire station, purchasing apparatus, and hiring/training new employees.
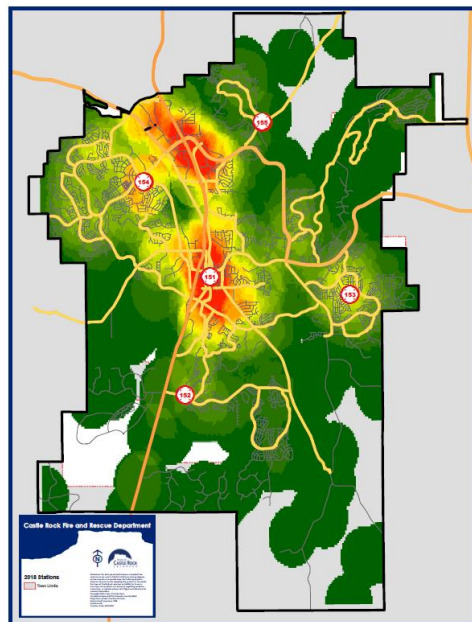
CRFD tracks and reports performance at three different levels: jurisdiction, station, and planning zone. Each performance indicator has two measurements, Operational Threshold and Planning Threshold. The operational threshold is a theoretical maximum. When an operational threshold is reached, system performance is unsustainable, even for short periods of time, and would result in local or systemic system degradation. The planning threshold is a point at which the department needs to actively evaluate the effectiveness of the system, develop potential corrective actions, and begin to formulate plans for process improvements. The planning threshold is calculated at 70 percent of the operational threshold and is only sustainable for short periods of time.

In the case of response time thresholds, the planning threshold is met when actual response times are less than 90% compliant and the operational threshold are when the response times are less than 80% compliant to the threshold.

When examining the number of calls for service per day by station areas, the department first established maximum unit hour utilization (UHU) for a 24-hour period and peak hours between 0900 and 2000, roughly 30% and 40% respectively. The UHU calculation takes into account department expectations of two hours of fire/EMS based training, one hour of physical fitness, and 10 minutes per incident for completing required documentation. Then a thirteen-year

response history was compiled, looking at suppression unit total incident duration. The department determined that the mode (or most frequent duration) was the best variable to determine the maximum call volume capacity per station. In this case, the suppression unit mode from 2007 through 2019 was 20 minutes. Based on the UHU thresholds, when a station routinely responds to 16 incidents per day and/or 7 incidents during peak hours, the workload is unstainable and will cause local or systemic system degradation.

The number of calls for service per day by planning zone represents threshold for evaluation, not necessarily system degradation. Meaning, when a planning zone reaches the planning threshold of 0.7 calls per day, the department should evaluate all other thresholds to determine if the call volume in that planning zone is beginning to negatively affect the primary station(s), and develop corrective actions if necessary. If a planning zone is meeting or exceeding the operational threshold of 1.0 calls per day, the department needs to determine if and how the primary station(s) are affected and develop recommendations to ensure minimum levels of service are maintained.

Ideally, CRFD should be able to take action(s) prior to thresholds being met through continuous monitoring and reporting. The tables below indicate the thresholds for the jurisdiction as a whole, station zones, and planning zones. The jurisdiction is all-inclusive, encompassing the 34 square miles of the Town and 32 square mile of the District.

Jurisdiction

Jurisdiction	Operational Threshold		Planning Threshold
Calls for service per day	N/A		N/A
Aid Given	15%	N/A	N/A
Aid Received	15%	N/A	N/A
Simultaneous call for service	N/A		N/A
1st arrival (urban)	9:30	Compliance ≤ 80%	Compliance ≤ 90%
1st arrival overall (rural)	9:40	Compliance ≤ 80%	Compliance ≤ 90%
EMS effective response force (urban)	12:40	Compliance ≤ 80%	Compliance ≤ 90%
EMS effective response force (rural)	12:50	Compliance ≤ 80%	Compliance ≤ 90%

The station areas represent each of the five existing stations.

Station Area

Station Area	Operational Threshold		Planning Threshold
Calls for service per day	16		11.2
Calls for service (peak)	7		6.25
Aid Given	≥15%		11.3%
Aid Received	≥15%		11.3%
Simultaneous call for service	≥25%		18.8%
Station demand/Utilization (24-hour)	≥29%		21.8%
Station demand/Utilization (peak)	≥39%		29.3%
Primary unit reliability	≤70%		85%
Time delta for aid received	≥4:00		3:00
1st arrival (urban)	9:30	Compliance ≤ 80%	Compliance ≤ 90%
1st arrival overall (rural)	9:40	Compliance ≤ 80%	Compliance ≤ 90%
EMS effective response force (urban)	12:40	Compliance ≤ 80%	Compliance ≤ 90%
EMS effective response force (rural)	12:50	Compliance ≤ 80%	Compliance ≤ 90%

The planning zones represent the nine theoretical station areas. Current stations may include all or part of these planning zones.

Planning Zone

Planning Zone	Operational Threshold		Planning Threshold
Calls for service annually	365		356
Calls for service per day	1		.75
Simultaneous call for service	≥15%		11.3%
Station demand/Utilization (24-hour)	≥1.7%		1.3%
Station demand/Utilization (peak)	≥2.4%		1.8%
Primary unit reliability	≤70%		85%
Time delta for aid received	≥4:00		3:00
1st arrival (urban)	9:30	Compliance ≤ 80%	Compliance ≤ 90%
1st arrival overall (rural)	9:40	Compliance ≤ 80%	Compliance ≤ 90%
EMS effective response force (urban)	12:40	Compliance ≤ 80%	Compliance ≤ 90%
EMS effective response force (rural)	12:50	Compliance ≤ 80%	Compliance ≤ 90%

Apparatus Responses

Considering most calls for service require more than one apparatus, apparatus responses are a critical metric and provide an indication of company/unit level workload. Apparatus responses are evaluated for each suppression (engine or quint) and EMS (medic unit/ambulance) apparatus.

Suppression Unit		Operational Threshold	Planning Threshold
Calls for service per day		16	11.2
Station demand/Utilization (24-hour)		≥29%	21.8%
Station demand/Utilization (peak)		≥31%	21.8%
Primary unit reliability		≤70%	85%
1st arrival (urban)	9:30	Compliance ≤ 80%	Compliance ≤ 90%
1st arrival overall (rural)	9:40	Compliance ≤ 80%	Compliance ≤ 90%

Medic (EMS) Unit		Operational Threshold	Planning Threshold
Calls for service per day		6	4.5
Station demand/Utilization (24-hour)		≥25%	18.8%
Station demand/Utilization (peak)		≥34%	25.5%
1st arrival (urban)	9:30	Compliance ≤ 80%	Compliance ≤ 90%
1st arrival overall (rural)	9:40	Compliance ≤ 80%	Compliance ≤ 90%

Other apparatus metrics that are monitored to provide insight into the system workload are suppression and EMS commitment. These are measurements of how often and how long all units of a given type are committed to a call, leaving no like resources available in the jurisdiction. No thresholds have been developed for these metrics, but they are regularly monitored for trends and reported.

Life Safety Metrics

The Life Safety Division is an integral part of the community's growth, development, and over all safety. All construction projects are reviewed for compliance to adopted codes, and commercial projects receive a series of inspections and then are regularly inspected to ensure on-going compliance to all applicable codes and standards.

To measure the Division's workload and productivity, it maintains and regularly reports several performance metrics.

- Building plan reviews:
  - completed within 10 business days of receipt
- Pre-incident planning:
  - All new commercial construction will have an Occupancy Vulnerability Assessment Profile (OVAP) completed prior to the issuance of a certificate of occupancy.
  - Review or completion of the OVAP on 20% of existing commercial structures annually.

- Fire Inspections/Code Enforcement:
    - All state-mandated inspections completed annually.
    - All general business inspections completed at least once every three years.
- Fire and explosion investigations:
    - Investigation report completed within three days of the incident, 90 percent of the time.
- Public Education:
    - CPR classes are offered at least six-times per year
    - All inquiries regarding public education or community events are answered within 48 hours to two business days.
    - Increase the department's annual contact, exposure, and/or interaction with the community at large by 10%.

Growth and Development

The growth and development within the community has a significant and direct impact on the number and types of call for service. As seen in both the 2019 Community Survey and the community feedback gathered when completing the 2020 -2024 Strategic Plan, the Town and department's ability to keep pace with growth was both an expectation and concern of the community.

This section of the Master Plan will detail certain growth and development factors that have shown a direct correlation to the levels of service and are often known in the early project planning stages. This benefits the department because even before construction is started, the department can estimate the project's impact on system utilization.

The key growth and development factors are population, population age, population density, and housing type. Other factors that should be evaluated are median home value and percent buildout of a planning zone. Percent buildout is a measure of how much more growth a planning zone can expect if all platted parcels are developed based on current approvals. Percent buildout is limited to the most recent platted lots and zoning. It is impossible to forecast changes in the zoning or land use requested by the land owner or developer.

Population

The Town's population has also seen significant growth since 1993 with a large increase in 2000 (+29.8%, or roughly 4,600). Immediately after that, there were steady increases between 8% and 15% until 2007. During that period, 2000 – 2007, the Town's population increased from 15,500 to over 42,000. Since 2007, the population has increased between 3% and 8% annual, averaging 4.7% annual since 2007. Currently, the Town's population is roughly 75,000 residents with a potential total build out of nearly 140,000 people.
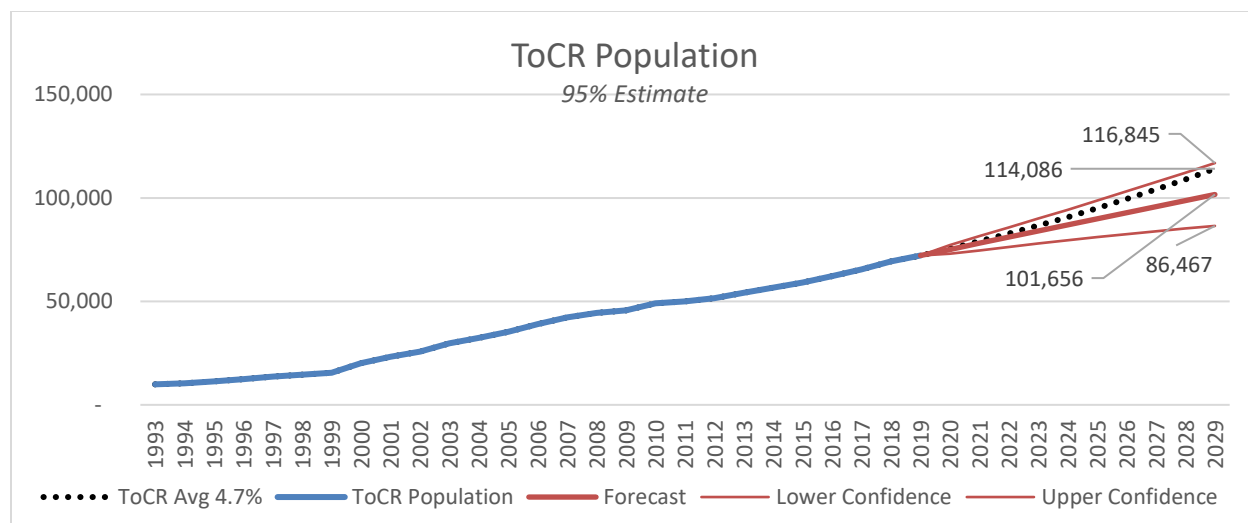
Population Age

Based on the American Community Survey's (ACS) latest data (2019[5]), the Town of Castle Rock's population is predominately between the ages of 18 and 64 years of age. As seen below, the 18 – 64 age group has shown a decrease since 2007, down from 65.4% to 60.8%. Conversely, the population over 65 has shown an increase over the same timeframe, up from 4.3% to 11.7%.

Percent of Population by Age													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
< 5	9.6%	9.1%	10.2%	10.2%	9.0%	9.0%	9.1%	8.7%	8.4%	8.4%	8.0%	7.7%	7.2%
5-17	20.7%	20.1%	20.4%	21.5%	22.3%	22.0%	22.2%	21.9%	21.1%	21.6%	22.0%	21.8%	20.2%
18-64	65.4%	66.1%	64.2%	62.3%	62.6%	62.6%	61.7%	62.0%	62.4%	61.2%	60.8%	61.0%	60.8%
>65	4.3%	4.6%	5.3%	6.0%	6.1%	6.4%	6.9%	7.4%	8.0%	8.7%	9.1%	9.5%	11.7%

The significance of the increasing senior population is an increase in fire and emergency medical system utilization. A basic statistical analysis of EMS utilization based on the age of the patient reveals there is a significant increase in use by patients over the age of 65 with nine percent of the total population representing roughly 37% of all EMS patients in 2019 and an average of 31% since 2007.

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[5] US Census Bureau https://www.census.gov/topics/population/age-and-sex.html

Percent of EMS by age group													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
< 5 yrs	5.3%	5.0%	4.6%	4.1%	3.7%	3.4%	3.4%	2.7%	3.3%	2.5%	2.7%	2.8%	3.3%
5-17 yrs	11.0%	13.0%	12.6%	12.5%	10.6%	11.6%	10.7%	11.6%	12.2%	11.9%	11.8%	11.5%	10.3%
18-64 yrs	61.0%	56.4%	57.1%	58.0%	57.5%	54.0%	51.2%	49.7%	47.9%	47.9%	48.0%	50.6%	48.5%
> 65 yrs	22.7%	25.6%	25.7%	25.4%	28.2%	31.0%	34.7%	36.1%	36.6%	37.7%	37.5%	35.1%	36.7%

Another method to quantify system utilization is to determine the number of residents per call for service. Over the past several years, the general population generated one EMS call for service per every 21 residents. However, when looking at the population over the age of 65, this ratio increases to one EMS call for service for every five residents, a four times greater utilization.

Estimated residents per EMS call by age group														
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Avg**
< 5 yrs	34	33	42	54	52	57	59	68	51	69	60	64	48	53
5-18 yrs	36	28	31	37	46	42	45	40	34	38	38	44	43	39
19-64 yrs	20	21	22	23	24	25	26	26	26	27	26	28	28	25
> 65 yrs	4	3	4	5	5	5	4	4	4	5	5	6	7	5
Total	19	18	19	21	22	22	22	21	20	21	20	23	22	21

Castle Rock Fire and Rescue does not collect demographic data for non-EMS incidents (fires, smoke alarms, odor investigations, etc.), so data on total system utilization can only be estimated based on the EMS utilization. However, to try to understand the potential impact of population age on overall system utilization, the same methodology was applied to the total calls for service. This resulted in one call for service for every 12 residents based on the total population, and one call for service per three seniors.

Estimated Residents per Call (Total Call volume)												
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Avg**
< 5	21	22	27	32	30	32	33	38	29	38	34	31
5-17	22	19	20	22	26	23	25	22	19	21	22	22
18-64	12	14	14	14	13	14	15	15	15	15	15	14
>65	2	2	3	3	3	3	2	2	2	3	3	3
Overall	12	12	12	13	12	12	12	12	11	12	12	12

This is of particular interest in planning for future resource needs given the aging population and anticipated increase in both the retired population and those reliant on federally subsidized healthcare (Medicare/Medicaid).

Population Density

Generally speaking, where there is a greater density of people, business, or buildings, there is a greater potential for a call for service. CRFD maintains two population density groups:

Urban: greater than 1,000 residents per square mile

Rural: less than 1,000 residents per square mile

Historically, the urban population areas account for 66% of all calls for service, while the rural population areas account for 25% of all calls. The remaining 9% are calls for service located on the highways, out of CRFD's jurisdiction, or were not able to be properly geo-located.

Calls for Service by Population Density													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Rural	31%	24%	27%	28%	27%	26%	31%	21%	21%	22%	22%	22%	19%
Urban	62%	69%	66%	66%	63%	64%	60%	70%	69%	66%	68%	66%	68%
Other	7%	7%	6%	6%	10%	9%	8%	9%	10%	12%	10%	12%	12%

While the urban population areas are responsible for the greatest number of calls for service, they account for 44% of the jurisdictional area. The rural population areas account for 55% of the area, and Interstate 25 is the remaining 1%.

Housing Type

The type of residential unit built can provide two important insights into potential system utilization; population density and potential call volume. The Town of Castle Rock maintains three residential occupancy types; single-family detached (SFD), single-family attached (SFA), and multi-family (MF). A single-family detached residence does not share a wall with any other residential structure. Single-family attached residences share one or more walls with another residential structure, and these include, but are not limited to, townhomes, paired homes, or carriage homes. Multi-family homes are apartments or condominium-style buildings with multiple residences on multiple floors. The Town of Castle Rock Development Services department uses an occupancy factor to estimate population based the housing type (SFD 3.02, SFA 2.5, MF 2.0). This provides an estimate for both the total population and population density of a proposed/planned housing project.

Along with the estimated population, the calls for service can be tracked based on the housing type for both total calls for service and EMS.

	Percent of total call volume	Residences per call	Percent of EMS call volume	Residences per EMS Call
Single Family Detached	29.5%	14	30.1%	22
Single Family Attached	4.0%%	13	4.2%	20
Multi-family	17.8%	4	21.6%	5
Non-Residential	48.7%	N/A	44.1%	N/A

There are certain occupancies that combine residential occupancy type and age utilization factors. These are the age restricted occupancies, generally over the age of 55. These can be further divided into three types; independent senior living, where the resident is wholly responsible for their own care and feeding; assisted living, where residents receive varying degrees of care and/or assistance; and skilled nursing facilities, where the residents are reliant on

the facility staff to assist in the completion of daily functions or are completely dependent on the staff for their care.

- Senior Living Facility: 1.4 residents per call:
  - Independent Senior Living: 4.5 residents per call
  - Assisted Living: 0.9 residents per call
  - Skilled Nursing Facility: 1.9 residents per call

Median Home Value

Median home value is the middle value of home prices within a specific planning zone (high value + low value / 2 = median). The table below provides a summary of home values within CRFD's jurisdiction and the relative impact on calls for service.

	Percent of total call volume	Residences per call	Percent of EMS call volume	Residences per EMS Call
Less than $120,000	1.7%	37	1.8%	44
$120,000 - $249,999	5.5%	7	5.5%	11
$250,000 - $399,999	41.7%	9	42.4%	13
$400,000 - $499,999	26.8%	11	26.4%	18
$500,000 - $599,999	12.2%	11	12.4%	17
$600,000 - $800,000	7.0%	9	7.0%	14
Greater than $800,000	5.1%	6	4.5%	10

Percent Build-out

The percent build-out is a simple percentage of the number of residential parcels that have been developed out of the total number of residential parcels platted as of the time of this report. This provides insight into how much more of the planning area could be developed over time.

Percent build-out is tracked based on the current station deployment and the nine planning zones.

Planning Area	Estimated Build-out
Station 151	93.5%
Station 152	74.8%
Station 153	86.8%
Station 154	94.3%
Station 155	85.0%
CRFD	88.6%

Planning Area	Estimated Build-out
Planning Zone 1	97.8%
Planning Zone 2	98.2%
Planning Zone 3	86.3%
Planning Zone 4	96.1%
Planning Zone 5	84.9%
Planning Zone 6	87.7%
Planning Zone 7	74.8%
Planning Zone 8	32.2%
Planning Zone 9	89.4%
CRFD	88.6%

Projected Systems Demands

Projecting system demands is challenging due to the fact that there are multiple factors that may affect any single performance indicator or metric. Furthermore, any projection is merely an estimate at a single point in time and subject to a high degree of variability.

To minimize the variables and generate the most conservative projections, estimates are based on the average annual increase over the past ten years (2010 – 2019) and sum estimate include a 95% upper and lower confidence boundary.

Population

In order to project the community population, the same model was applied as used for calls for service. Using a 95% confidence boundary, the Town is likely to see a population between 86,467 and 116,845 by 2029. Statistically, the 95% confidence suggests a population of 101,656. If the historical 10-year average 4.7% increase is applied, the population could increase to 114,086 by 2029. It is important to note that these estimates do not take any other factors than population growth year-to-year.
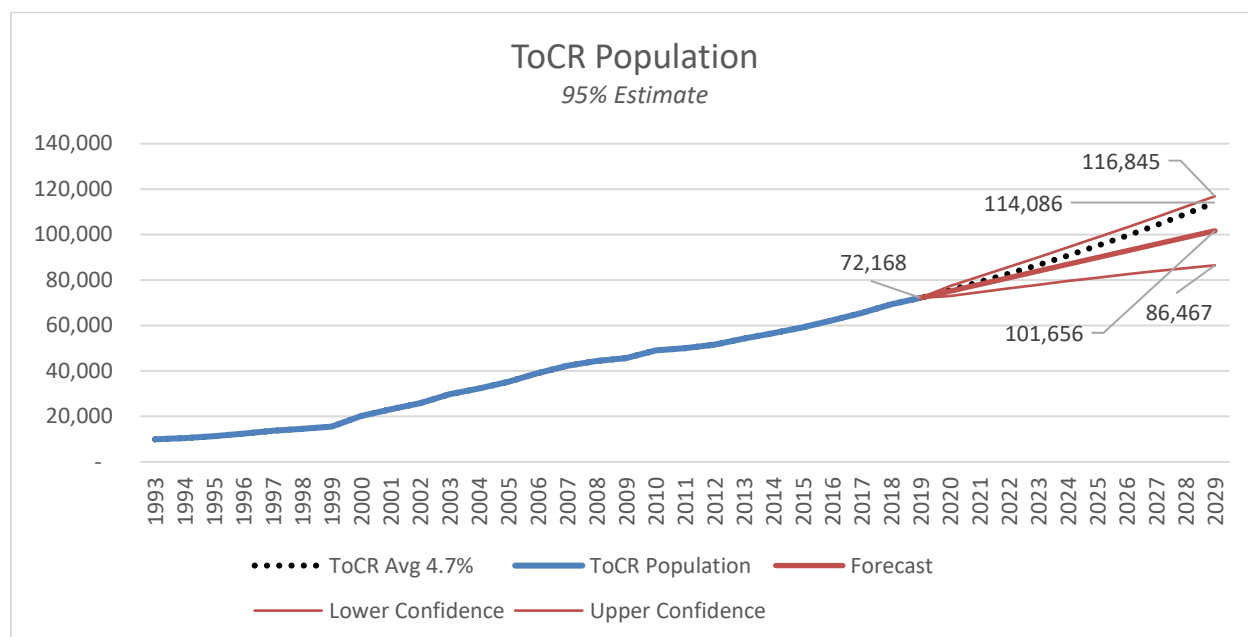
Aging Population

It has been well established that the population is aging. Specific to Douglas County, it is estimated that by 2030, the entire "baby boomer" generation (born between 1946 and 1964) will be over the age of 65[6] and represent 19% of the total population in Douglas County[7], currently at 9%. This would increase the senior population by roughly 4,000 people. Based on the call to resident ratio discussed earlier, this should represent an increase in calls for service by 1,000 EMS calls per year and a total increase of 2,000 calls per year if the new senior population were self-sufficient and lived independently. However, if portions of that population were to reside in

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[6] U.S. Census Bureau
https://www.census.gov/library/stories/2019/12/by-2030-all-baby-boomers-will-be-age-65-or-older.html
[7] Colorado State Demographer

an age-restricted community, tiered care facility, or skilled nursing facility, the calls for service would very likely increase beyond the estimated 2,000 calls per year.

Note: the estimated impacts of the aging population are not reflected in the calls for service projections

Planning Zone Development

Knowing how many residences of each type (SFD, SFA, MF) are needed to generate a call for service, we can estimate the potential system impacts of new development. Understanding the scope and design of proposed developments allows CRFD to estimate a project's impact(s) on service delivery. The table below estimates the number of residences needed to generate 365 (operational threshold) and 256 (planning threshold) calls for service. When residential counts could generate 256 calls for service, the department should begin the discussion of the best manner to address the increased calls for service (additional fire station, additional apparatus in existing fire stations, no action, etc.). Ideally, the department should use project plans submitted to the Town Development Services department to anticipate when planning thresholds will be met.

Housing Type	# Residence per call	# Residences for 256	# Residences for 365
SFD	14	3,584	5,110
SFA	13	3,328	4,745
MF	4	1,024	1,460

Commercial Development

As the community continues to grow, there will be associated commercial, industrial, and retail development. In general, these sectors typically do not pose significant impacts on the number of responses, but may introduce a new or significant operational or environmental risk that must be addressed or mitigated. However, commercial development has significant and direct impacts on the workload of the Life Safety Division. These impacts begin in the project development phase with site development, project and code review, and building and fire protection plan reviews. Once the project has begun, the Life Safety Division is responsible for in-process, on-going, and final site inspections, to include inspections required for temporary and final certificates of occupancy. Once a project is complete, the Life Safety Division maintains responsibility of on-going code compliance inspections for the life of the building. Currently, the department does not have a forecasting tool to project commercial development.

Calls for Service

Based on current projections, using a 95% confidence boundary, the department is likely to see a call volume between 4,000 and 11,700 calls per year. Statistically, the 95% confidence suggests
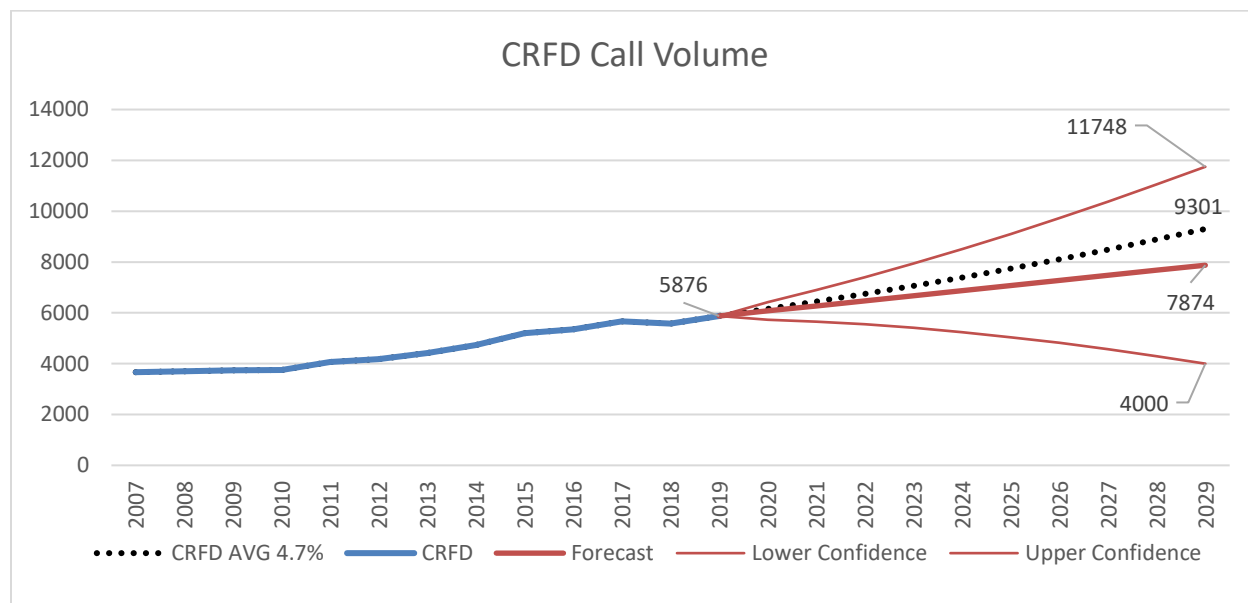
a call volume of 7874 or 21.6 calls per day. If the historical 10-year average 4.7% increase is applied, the annual call volume increases to 9301 or 25.5 calls per day by 2029.

Looking at each suppression and medic company's workload (calls per day) and projecting the apparatus responses using the unit's average annual increase provides a rough estimate of the increased call volume over time. However, it is important to note that this is under the assumption that all other factors remain constant.

Suppression Companies

When evaluating calls for service for each suppression company, all cross-staffed apparatus were included, e.g. total calls per day for Engine 154 includes Brush 154, Squad 154, and Collapse 154. All growth is projected using the average annual increase with the exception of Engine 152. Considering this company was placed in service in August of 2018, there is not enough data to project call volume. Given Engine 152's limited data, the average annual increase for Engine 153 was used since its district is most like Station 152, predominately residential.

In reviewing the data and chart, no suppression company should reach the operational or planning thresholds for calls for service per day by 2029.

Town of Castle Rock Fire and Rescue Department
2021 Fire Master Plan

Commission on
Fire Accreditation
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An internationally accredited Fire/Rescue agency 2017-2022

Suppression Company Calls for Service per Day
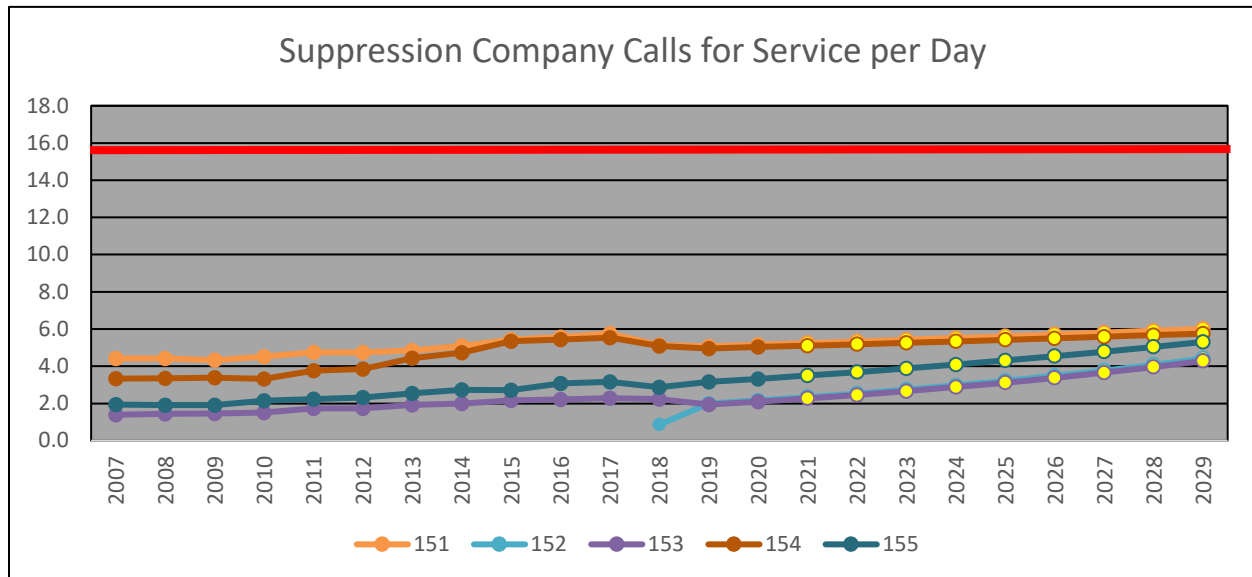
Medic Companies

When projecting the workload for each of the three medic units and applying the maximum of six calls for service per day, Medic 154 could meet or exceed that value as early as 2023. Medic 151 could reach the six calls per day maximum by 2029. Medic 153 would reach 4.2 calls per day by 2029.

Medic Calls per Day
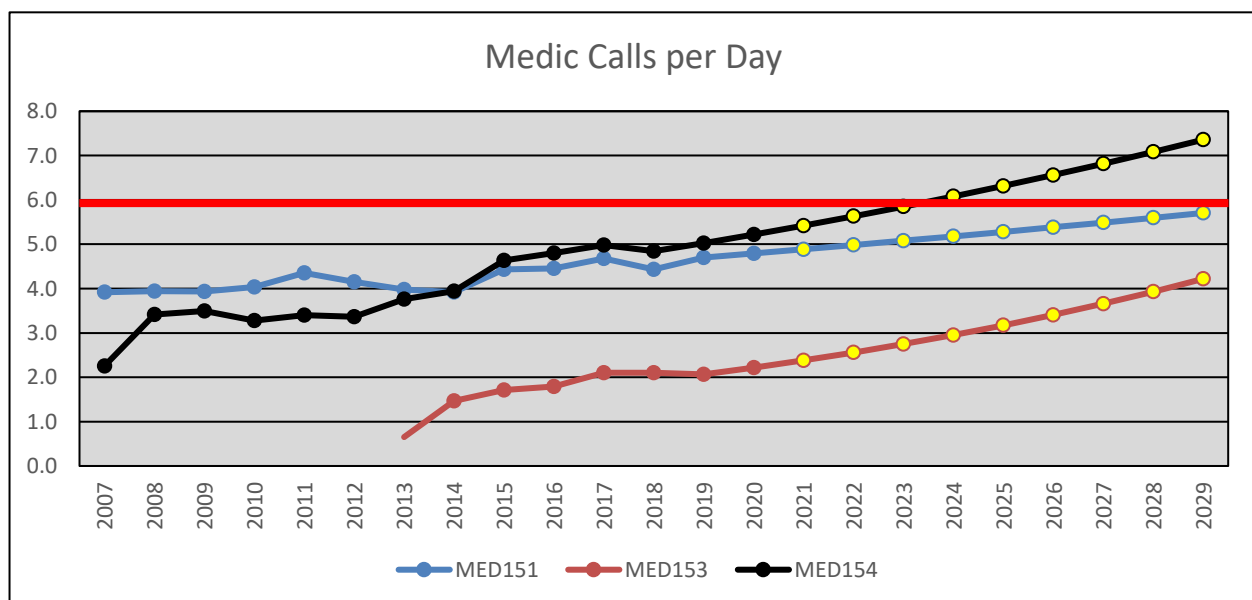
Current Organizational Recommendations

This section highlights current needs, by division, based on existing workload, staffing, resources and/or facility needs.

Administration

Current Staffing and Facility Needs

There are no known industry standards or best practices to gauge the number of administrative support personnel compared to the number of operational staff members, programs or project management support. The Castle Rock Fire and Rescue Department has maintained two (2) administrative support personnel since 2002 for a support staff ratio ranging from 1:23 to 1:48 with an increase of 109% staff over the same timeframe. However, other divisions and departments within the Town of Castle Rock range from 1:2 to 1:36 with an average administrative support ratio of 1:23. Currently CRFD, has a ratio of 1:48.

In reviewing fire department master plans facilitated by Emergency Services Consulting International (ESCI), there is a range of 7% to 20% of administrative support members, with an average of 13%. It is important to note that the roles and responsibilities of the "administrative support staff" varied within the ESCI documents and often included all members of a department's executive team, to include all members of the Prevention, Logistics, and Training Divisions. When comparing the administrative support staff from the ESCI models using CRFD's staffing model, the ESCI average is 7% with a low of 5% and a maximum of 10%, compared to CRFD's 4%.

Given the dynamic nature and anticipated growth of the Logistics and Training Divisions, the department should consider the addition of an administrative position dedicated to the staff at the Public Safety Training Facility South Building. This would reduce the number of deliveries to fire headquarters and the subsequent need to redistribute those deliveries. Additionally, the administrative position would provide direct support to both divisions, including budget management.

For CRFD to provide the same level of administrative support as other Town departments, CRFD would need to add 2 additional administrative positons. To follow the ESCI model, CRFD would need to add between one and three additional administrative support staff.

Recommendation: It is recommended that the department increase its administrative support staffing to 4, reducing the ratio to 1:23 while also providing dedicated administrative support for the Public Safety Training Facility.

Historically, the role of the Emergency Manager has been an additional duty assigned to a member of CRFD's executive staff. However, given the recent and projected growth throughout Castle Rock, the time required to effectively develop, manage, and maintain a comprehensive Emergency Management program has exceeded the capacity of a part-time or additional duty.

Recommendation: It is recommended that the department pursue funding for a dedicated, full-time emergency manager.

Planning Zone 9 covers 4.6 square miles encompassing the southern portions of the Meadows, Red Hawk, Castle Highlands, and Castle Meadows neighborhoods. The development in Planning Zone 9 is 97 percent residential, three percent commercial, and estimated at 98% residential buildout. Planning Zone 9 has three large apartment complexes, one of which is age-restricted.

Given the response time performance in Planning Zone 9, the call volume and station demand/utilization alone do not indicate the immediate need for additional resources. However, as both stations 151 and 154's workload continues to increase, the addition of a fire station in this planning zone would offer relief to 151 and 154 as well as being positioned for timely responses into districts 151 and 154. Additionally, as commercial interest increases in this planning zone, this could directly impact call volumes and response times, thus necessitating the need for an additional station.

Recommendation: Considering the limited availability of property suitable for a fire station in Planning Zone 9, the department should immediately explore station location options and secure property in the most advantageous location to provide a balanced response into Planning Zones 9, 4, and 1.

Life Safety Division

Current Staffing and Facility Needs

The Fire Prevention and Investigation Bureaus experienced increases in staffing in 2003, increasing from one to three FPOs, and then, again in 2013, increasing from three to four FPOs. In 2021, an additional FPO is being added to the division staffing.

The Public Education Bureau was established in 2014 with the hiring of one Fire and Life Safety Educator/Inspector. In 2015, 1.5 additional positions were dedicated to the Public Education Bureau.

Since 2012, there has been a significant increase in commercial occupancies, growing from 1,166 to 2,267, which is a 94% increase. In addition, there are a number of commercial and multi-family residential occupancies that are targeted for fire safety inspections by the Life Safety Division. These businesses are prioritized for inspection based on the occupancy type and fire and life safety risk, with 15% designated as high risk, 25% as moderate risk, and 60% as low risk. Certain business types in the high-risk category require annual inspections by the Colorado Division of Fire Prevention and Control. Those include all K-12 schools (public and private) and all levels of health care facilities (nursing care and hospitals). Additionally, facilities with certain amounts of hazardous materials are required to have an annual permit and inspection as

part of their Tier II reporting. In addition to these existing inspections, FPOs are also responsible for other duties such as plan reviews, new construction inspections (which can include multiple inspections for the same building), and special projects such as community wildfire protection, fireworks, UAVs, special events inspections, and fire cause determination.

Based on the National Fire Protection Association (NFPA) consensus standard *NFPA 1730 Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations*[8], evaluating the number of inspections and estimated time required for completion, follow-up and documentation, the Life Safety Division is understaffed by two Fire Prevention Officers and two Fire and Life Safety Educators/Inspectors.

The addition of 2 full-time FPOs and 2 FLSE/Is would allow the department to meet the increasing demands as well as maintain expected levels of service that supports the Town's established strategic priorities of ensuring outstanding public safety

Recommendation: It is recommended that the department increase its Life Safety staffing by two FPOs and two FLSE/I's in order to meet the recommended NFPA staffing.

This will assist in allowing the Fire Marshal and Deputy Fire Marshal to focus on the needed administrative duties that are required to operate the Life Safety Division. This will also allow the FPOs and FLSE's to complete reviews, construction inspections and existing business fire inspections in a timely manner. While this will not allow for 100% completion of all the mentioned areas, it would allow for a more comprehensive approach to getting closer to 100% compliance.

The Life Safety Division's current facilities within Fire Headquarters provide for adequate office space, storage, and technology infrastructure for the existing staffing level. However, when the Division increases its staff, the current facilities would no longer be sufficient.

Recommendation: It is recommended that the Life Safety Division evaluate other office and storage solutions to accommodate an increase in staffing.

Logistics Division

Current Staffing Needs

A thorough analysis of the department's current needs was completed based on industry standards/best practices[9]. Utilizing Standard Government Fleet Standards, similar department comparison, town fleet department standards and current staff workload ratios, the department should staff 1.8 – 2.5 Emergency Vehicle Technicians (EVT). Currently, the department staffs 1 full-time EVT.

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[8] NFPA 1730 Appendix A, paragraph 4.7.1
[9] https://www.government-fleet.com/146908/how-to-calculate-technician-to-vehicle-ratios

With the addition of Station 152, two more vehicles were added to the fleet. With only one EVT currently addressing all heavy fleet needs, the Division has no back-up or on-call capacity as it all falls to one individual. This is also a difficult position to fill due to the specific training and certifications that are needed. After conducting a Vehicle Equivalent Unit (VEU) analysis, the recommended EVTs for a heavy fleet of this size is 1.8 to 2.5, depending on which standard is used, i.e. APWA, Government, or fire service standards. Currently, this means the department is anywhere from .8 to 1.5 EVTs understaffed in this area.

Recommendation: It is recommended that the Logistics Division increase its EVT staffing from one to two.

Operations Division

Current Staffing Needs

As previously discussed, the current relief factor is not sufficient to maintain constant daily staffing without spending additional overtime funds. Based on the relief factor calculation, 28 personnel per shift are needed to adequately address daily staffing.

Recommendation: It is recommended that the Operations Division increase the line staffing by six positions (2 per shift) to allow for a total of 28 personnel per shift, up from the current 26.

Training Division

Current Staffing Needs

Based on professional recommendations from the Association for Talent Development (ATD)[10], the department should aim for a 1:20 ratio of training staff to department employees. Currently, the department has a 1:45 ratio.

Recommendation: It is recommended that the department immediately increase the staff in the Training Division to five total members to achieve a ratio of 1:20.

In addition to improving this ratio, these positions would be assigned to the line, 1 per shift, to serve as the liaison between the Training Division and the shift, thus improving the communications and oversight of the shift personnel from a training perspective. Finally, this position will also serve as the Safety Officer for the shift for all emergent and non-emergent incidents, fulfilling a critical role, especially on fire scenes, that has been identified in both the Critical Task Analysis (CTAs) and the accreditation process. Currently, this safety officer position is filled by an on-call chief officer on emergency scenes, and by the battalion chief for non-emergent incidents.

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[10] Association for Talent Development's 2018 State of the Industry Report, December 2018

Projected Organizational Recommendations

This section defines trigger points to either consider or act upon performance or growth-based metrics in an effort to keep pace with community growth and/or increased workload. All previous recommendations were to rectify current shortages and fill existing needs.

Administration Division

Future staffing needs/considerations:

The Administration Division is responsible for a broad spectrum of services to ensure the safe and efficient operations of the Castle Rock Fire and Rescue Department. As the Town and department continue to grow, the Administration Division needs to establish triggers points to ensure secondary responsibilities are effectively supported.

Recommendation: It is recommended that the department evaluate its administrative support staff when the ratio exceeds 1:23 and provide for the addition of administrative support staff before the ratio exceeds 1:30.

Future facility needs/considerations:

As the department continues to grow with the community, office space will become a limiting factor. The department is already at its capacity for office, desk, receiving and storage space in Fire Headquarters and the PSTF South building. When the department increases staffing for the Administration Division, additional space will need to be allocated to accommodate increased staff.

Life Safety Division

Future staffing needs/considerations:

The Life Safety Division is responsible for a broad spectrum of services to ensure the safe and efficient life safety operations of the Castle Rock Fire and Rescue Department. As the Town and department continue to grow, so shall the need for additional personnel that can complete plan reviews, construction inspections, and compliance requirements for new construction projects. The Town does not only rely solely on new construction to increase the local business community. This is where the Fire/Life Safety Educator/Inspectors play a significant role. While the majority of them are working on sustainable programs to assist in educating the public in fire safety and other items, some of them would be completing existing and new business inspections and education. Based on previously discussed standards, the following recommendations are made:

Recommendation: It is recommended that the department increase the number of Fire Prevention Officers when cumulative hours dedicated to plan reviews and/or construction inspections meets or exceeds 670 hours per qualified/certified FPO.

Recommendation: It is recommended that the department evaluate the current and forecasted workload of the Fire/Life Safety Educator/Inspector when business inspections account for 60% of their daily activities. It is further recommended that that department pursue additional staffing or modify responsibilities when business inspections meet or exceed 70% of their daily activates.

Recommendation: It is recommended that the department re-evaluate the Life Safety Division staffing model should there be a consistent increase in fire activity. This increase would result in more investigation and community education efforts and possible separation of inspection, investigation and community education activities.

Future facility needs/considerations:

As the department continues to grow with the community, office space will become a limiting factor. The department is already at its capacity for office and desk space in Fire Headquarters and the PSTF South building. When the Life Safety Division adds any additional staff, additional space will need to be secured to accommodate this increased staff.

Logistics Division

Future staffing needs/considerations:

The Logistics Division is responsible for a broad spectrum of services to ensure the safe and efficient operations of the Castle Rock Fire and Rescue Department. The goal of the logistics division is to become as self-sufficient as possible. Any outsourcing of services will create detrimental delays and require dependence on other service providers. As the Town and department continue to grow, the Logistics Division needs to establish trigger points to ensure secondary responsibilities are effectively supported.

A list of secondary responsibilities and potential trigger points for additional resource needs would include the opening of future stations, the addition of apparatus and vehicles to the department fleet, an increase of operations department staff that need support, and any additional facilities added as department resources.

Recommendation: It is recommended that the department maintain a ratio of 1.8 to 2.5 full-time EVTs to adequately support its fleet of vehicles.

Future facility needs/considerations:

The Logistic Division's primary facility is the Public Safety Training Facility's South Building, as a shared facility with the Castle Rock Police Department (CRPD). The South Building provides office space, a small conference area, limited storage, and two garage areas. The larger

garage area is used for fire apparatus maintenance, but has insufficient space to service the aerial apparatus (quints). The smaller garage is dedicated to storage. Other facilities utilized by the Logistics Division are; Fire Headquarters/Station 151 for administrative support, shipping/receiving, accounts payable, and additional storage; Station 152 (diesel exhaust fluid); Station 153 for HAZMAT supplies and for miscellaneous storage and hand tools; Station 154 for household, cleaning supplies, and the wildland team PPE equipment and cache; and Station 155 as the home for the regional air/light trailer.

While the department expanded its footprint with the addition of the PSTF North Building, this serves as a multi-use facility shared with other Town departments, primarily CRPD. This facility does not provide any relief to the inadequate fleet maintenance garage space required to service the aerial apparatus (quints) or any storage space for the logistics division.

Recommendation: It is recommended that due to the lack of adequate fleet maintenance garage space and a decentralized storage program throughout the entire town, the department should acquire or build a Logistics Facility. This facility would need to provide appropriate fleet maintenance garage space and a centralized storage area for the logistics division.

Apparatus needs/considerations:

As the department evaluates the need for additional stations or apparatus within existing stations, it also needs to consider Verisk's ISO (Insurance Standards Office) criteria for reserve apparatus to ensure maximum credit is received and uninterrupted service to the community.

Apparatus Type	Front Line	Reserve	Total	Ratio (current)	Min Ratio
Engine	3	2	5	3:2	8:1[11]
Aerial	2	1	3	2:1	8:1[12]
Medic/ Ambulance	3	2	5	3:2	
Type VI Brush	3	1	4	3:1	
Type III Brush	2	0	2	2:0	

At this time, there are no recommendations for additional apparatus to meet the requirements of ISO. If the ISO requirements change as it relates to the reserve apparatus, then a re-assessment will need to occur.

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[11] Public Protection Classification (PPC™) Summary Report June 2016, p. 14
[12] Public Protection Classification (PPC™) Summary Report June 2016, p. 15

Operations Division

Future staffing needs/considerations:

As the Town and district continue to grow, the Operations Division will need to grow as well. This growth could be in the form of additional stations or additional apparatus within existing stations. Using the current minimum staffing by apparatus and relief factor, the Operations Division needs to establish triggers points to ensure primary and secondary responsibilities are effectively supported.

Recommendation: It is recommended that the department increase the number of firefighters when defined parameters in the Master Plan and Standards of Cover are met.

Considerations for additional stations:

Additional fire stations should be <u>considered</u> when a planning zone meets one or more of the planning thresholds, planned growth in the area would pose a new or significant risk, and/or existing stations are not able to provide an adequate response.

Construction of an additional fire station should be <u>planned for construction and staffing</u> when a planning zone meets one or more of the operational thresholds, planned growth in the area would pose a new or significant risk, and/or existing stations are not able to provide an adequate response.

In reviewing the department's current deployment and staffing model, compared to historical calls for service, performance and current percent buildout, the department recognizes there are Planning Zones that represent a performance gap.

Planning Zone 6

Planning Zone 6 covers 6.9 square miles encompassing Castle Oaks, Terrain, Liberty Village, and Cobblestone Ranch neighborhoods. The development in Planning Zone 6 is 99 percent residential, one percent commercial, and estimated at 81% residential buildout.

Even with recent growth in Planning Zone 6, the calls for service remain below the threshold limit of 365 by 49%. The response time performance for the first arriving apparatus in this planning zone is mixed between the two distinct population centers. Response times to the area within Terrain and Castle Oaks (urban) fall just within the maximum acceptable urban time of 9:30 for 2020. Response times to the rural areas of PZ6 (Liberty Village and the Cobblestone Ranch) in the eastern portion of the planning zone exceeds the maximum acceptable rural response time of 9:40 in excess of 33.8% of the time for 2020.

Residence Parcel Analysis
Fire Planning Zones
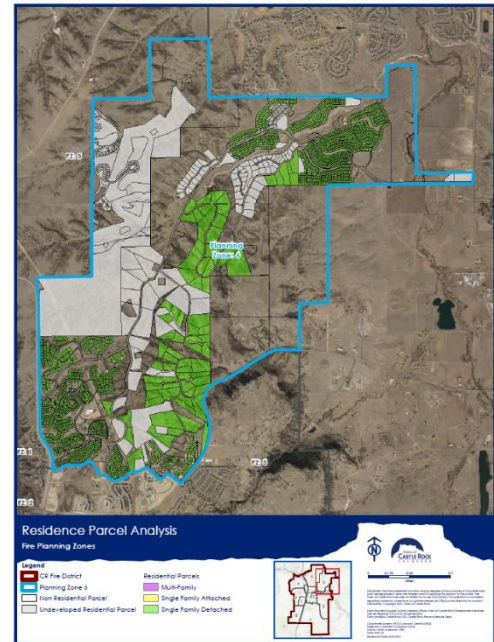
In 2020, other performance metrics that have exceeded or are approaching trigger points are the Station Demand/Utilization factors.

Planning Zone 6						2016	2017	2018	2019	2020
Threshold		Planning		Operational		2016	2017	2018	2019	2020
Annual Call Volume (24-hour)		>	256	>	365	98	150	151	182	176
Simultaneous Calls		>	11%	>	15%	1.0%	2.0%	0.7%	3.8%	1.1%
Station Demand / Utilization (24-hour)		>	1.2%	>	2%	0.7%	1.0%	1.0%	1.4%	1.4%
Station Demand / Utilization (peak)		>	1.7%	>	2%	1.0%	1.3%	1.3%	1.9%	1.8%
Suppression reliability		>	85%	>	70%	66.1%	49.0%	57.8%	41.9%	89.2%
Time delta for aid		>	3:00	>	4:00	-2:56	-1:11	-2:07	-0:56	1:30
1st arrival Threshold (urban)	9:30	>	90%	<	80%	68.8%	84.4%	80.5%	90.2%	88.5%
1st arrival Threshold (rural)	9:40	>	90%	<	80%	51.6%	58.8%	59.2%	64.3%	66.2%
EMS ERF Threshold (urban)	12:40	>	90%	<	80%	96.2%	97.0%	93.3%	97.8%	93.3%
EMS ERF Threshold (rural)	12:50	>	90%	<	80%	50.0%	78.9%	61.5%	76.9%	81.3%
Percent Buildout		N/A		N/A		N/A	N/A	N/A	81%	87%
Historical Performance										
1st arrival Benchmark Urban	7:10	>	80%	>	90%	15.6%	24.4%	14.6%	36.1%	23.1%
1st arrival Benchmark: Rural	8:10	>	80%	>	90%	45.2%	29.4%	28.2%	28.6%	36.5%
ERF Benchmark: Urban	8:40	>	80%	>	90%	23.1%	45.5%	46.7%	65.2%	30.0%

Based on residential growth specific to Planning Zone 6, the community has grown at a rate between 13 and 17 percent on a five-year and ten-year average. If Planning Zone 6 continues to see the same growth rates, it will reach a 90 percent build-out between 2023 and 2024.

Solely based upon call for service projections, Planning Zone 6 (Terrain, Cobblestone Ranch, Castle Oaks) should reach the planning threshold for new station consideration between 2023 and 2024 and the operational threshold between 2024 and 2025.

Considering all factors, if they remain relatively consistent, the department should consider planning to open a station dedicated to Planning Zone 6 between 2024 and 2025.

Planning Zone 6 Call Volume Projection
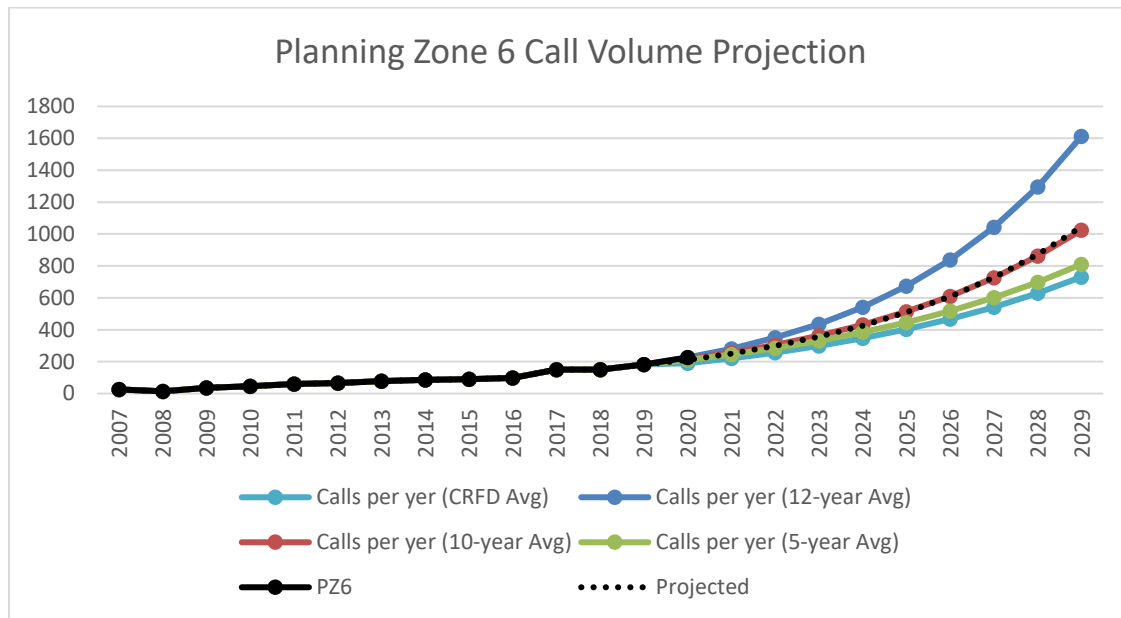
Planning Zone 8

Planning Zone 8 is west of Interstate-25 and includes the neighborhoods of Yucca Hills and Keene Ranch. It also includes the Westfield Trade Center and the vacant Dawson Ridge subdivision. This planning zone has a very small population and typically generates less than 10 calls for service annually. Given this extremely low call volume, the department should not consider a station dedicated to Planning Zone 8 for the foreseeable future. However, this area has been of increased interest by developers and is being considered for a partial interchange/exit for Crystal Valley Parkway. Should the I-25/Crystal Valley Parkway interchange come to fruition or the residential, commercial/industrial risk change, the department will need to closely monitor the planning, growth, and development in Planning Zone 8.

Residence Parcel Analysis
Fire Planning Zones
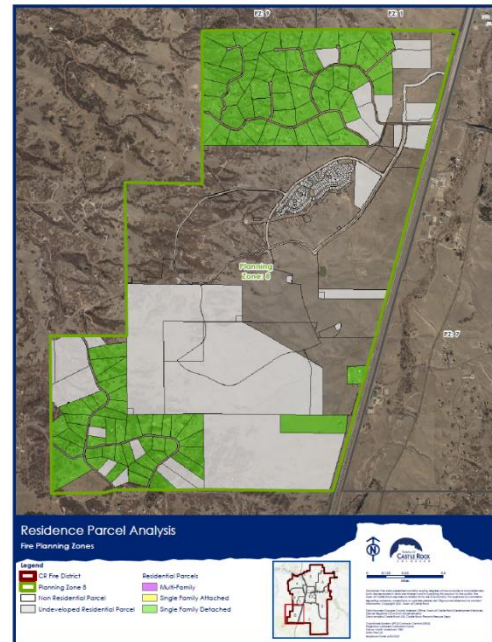
Planning Zone 8									
Threshold		Planning		Operational		2016	2017	2018	2019	2020
Annual Call Volume (24-hour)		> 256	>	365		4	12	10	4	12
Simultaneous Calls		> 11%	>	15%		0.0%	0.0%	0.0%	0.0%	0.0%
Station Demand / Utilization (24-hour)		> 1.2%	>	2%		0.1%	0.1%	0.1%	0.1%	0.3%
Station Demand / Utilization (peak)		> 1.7%	>	2%		0.1%	0.2%	0.1%	0.0%	0.4%
Suppression reliability		> 85%	>	70%		66.7%	75.0%	87.5%	100.0%	92.4%
Time delta for aid		> 3:00	>	4:00		2:03	-2:59	-2:19	0:00	4:01
1st arrival Threshold (urban)	9:30	> 90%	<	80%		N/A	N/A	N/A	N/A	N/A
1st arrival Threshold (rural)	9:40	> 90%	<	80%		0.0%	0.0%	37.5%	0.0%	44.4%
EMS ERF Threshold (urban)	12:40	> 90%	<	80%		N/A	N/A	N/A	N/A	N/A
EMS ERF Threshold (rural)	12:50	> 90%	<	80%		50.0%	0.0%	80.0%	33.3%	71.4%
Percent Buildout		N/A		N/A		N/A	N/A	N/A	45%	45%
Historical Performance										
1st arrival Benchmark Urban	7:10	> 80%	>	90%		N/A	N/A	N/A	N/A	N/A
1st arrival Benchmark: Rural	8:10	> 80%	>	90%		0.0%	0.0%	25.0%	0.0%	11.1%
ERF Benchmark: Urban	8:40	> 80%	>	90%		N/A	N/A	N/A	N/A	N/A
ERF Benchmark: Rural	10:10	> 80%	>	90%		0.0%	0.0%	40.0%	0.0%	28.6%

**Town of Castle Rock Fire and Rescue Department**
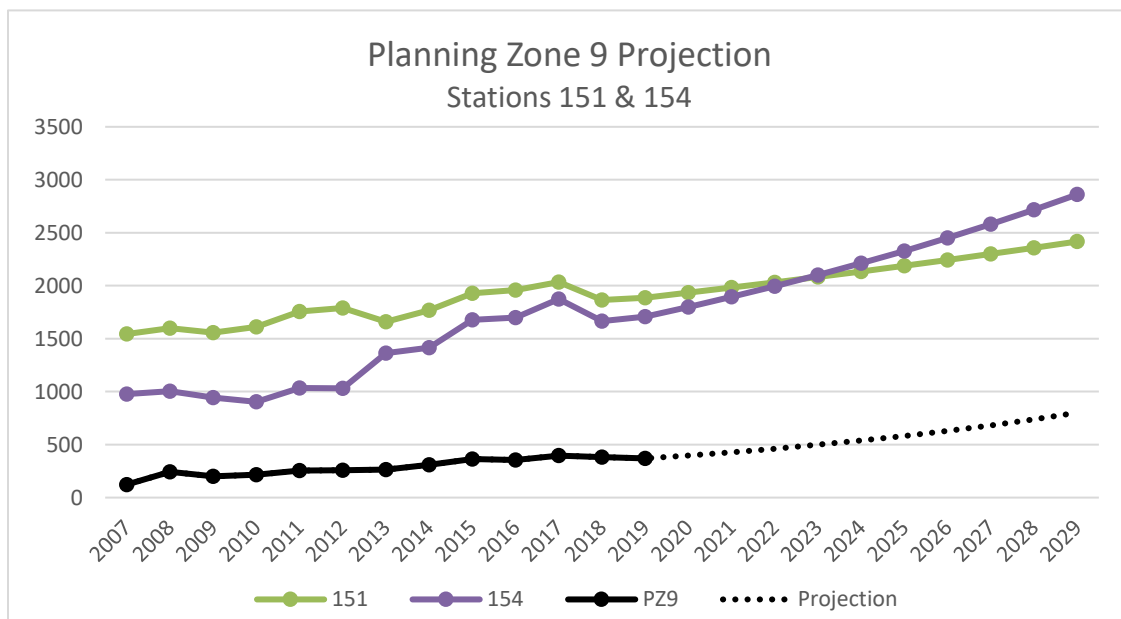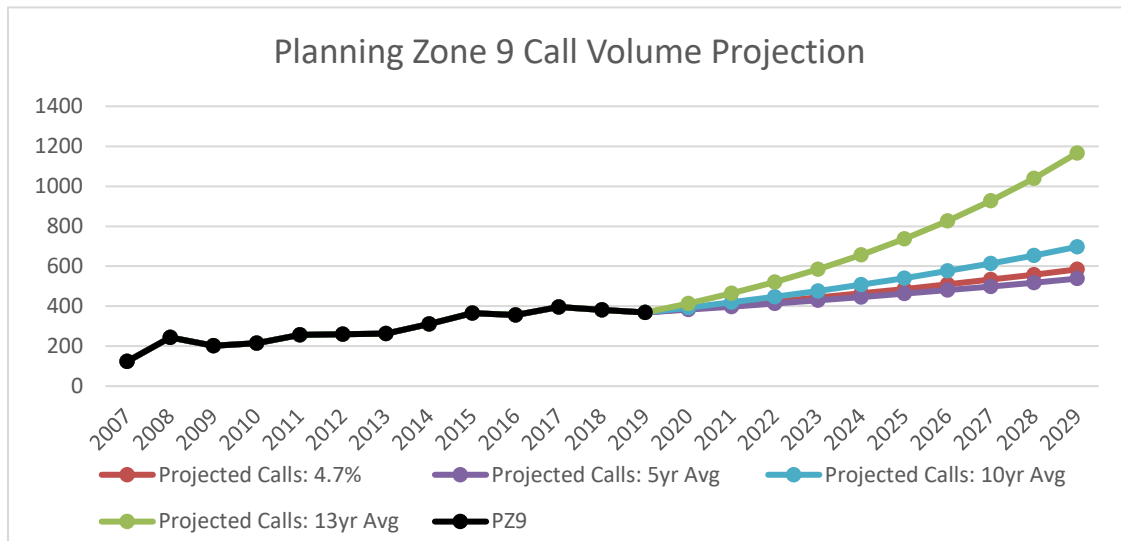**2021 Fire Master Plan**

Commission on
Fire Accreditation
International

An internationally accredited Fire/Rescue agency 2017-2022

Planning Zone 9

Planning Zone 9 covers 4.6 square miles encompassing the southern portions of the Meadows, Red Hawk, Castle Highlands, and Castle Meadows neighborhoods. The development in Planning Zone 9 is 97 percent residential, three percent commercial, and estimated at 98% residential buildout. Planning Zone 9 has three large apartment complexes, one of which is age-restricted.

This planning zone has regularly exceeded the threshold for the number of calls for service. However, the response time performance in the planning zone has remained within the performance thresholds for the urban areas with 90th percentile response time in 2020 of 9:30. The response time for the rural areas occasionally exceeds the threshold parameters at 9:40, but the rural area generates less than 10 calls per year and includes a gated neighborhood that further increases response times. Over the last few years, the department's actual performance in this planning zone has begun to degrade with increasing response times, shown by the decreasing compliance to the performance benchmarks.
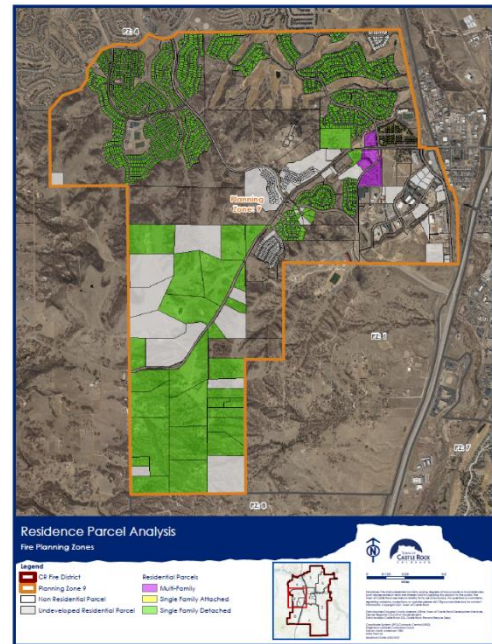
Other performance metrics that meet or exceed thresholds include the station demand/utilization.

Planning Zone 9						2016	2017	2018	2019	2020
Threshold		Planning		Operational		2016	2017	2018	2019	2020
Annual Call Volume (24-hour)		>	256	>	365	356	396	381	369	424
Simultaneous Calls		>	11%	>	15%	1.4%	2.3%	2.1%	4.9%	2.4%
Station Demand / Utilization (24-hour)		>	1.2%	>	2%	1.9%	2.2%	2.1%	2.0%	2.3%
Station Demand / Utilization (peak)		>	1.7%	>	2%	2.4%	3.1%	2.9%	2.9%	3.1%
Suppression reliability		>	85%	>	70%	86.4%	84.6%	83.1%	79.3%	90.4%
Time delta for aid		>	3:00	>	4:00	1:58	0:53	2:52	2:18	4:01
1st arrival Threshold (urban)	9:30	>	90%	<	80%	95.9%	98.8%	94.4%	96.6%	96.9%
1st arrival Threshold (rural)	9:40	>	90%	<	80%	100.0%	N/A	100.0%	0.0%	100.0%
EMS ERF Threshold (urban)	12:40	>	90%	<	80%	95.9%	98.8%	94.4%	96.6%	96.9%
EMS ERF Threshold (rural)	12:50	>	90%	<	80%	100.0%	N/A	100.0%	0.0%	100.0%
Percent Buildout		N/A		N/A		N/A	N/A	N/A	98%	88%
Historical Performance										
1st arrival Benchmark Urban	7:10	>	80%	>	90%	88.1%	77.6%	81.0%	79.2%	79.5%
1st arrival Benchmark: Rural	8:10	>	80%	>	90%	100.0%	N/A	100.0%	0.0%	50.0%
ERF Benchmark: Urban	8:40	>	80%	>	90%	85.5%	87.7%	77.0%	83.5%	89.2%
ERF Benchmark: Rural	10:10	>	80%	>	90%	100.0%	N/A	100.0%	0.0%	50.0%

Given the response time performance in Planning Zone 9, the call volume and station demand/utilization alone do not indicate the immediate need for additional resources. However, as both stations 151 and 154's workload continues to increase, the addition of a fire station in this planning zone would offer relief to 151 and 154 as well as being positioned for timely responses into districts 151 and 154. Additionally, as commercial interest increases in this planning zone, this could directly impact call volumes and response times, thus necessitating the need for an additional station.

Planning Zone 9 Call Volume Projection

Legend: Projected Calls: 4.7% | Projected Calls: 5yr Avg | Projected Calls: 10yr Avg | Projected Calls: 13yr Avg | PZ9

Planning Zone 9 Projection
Stations 151 & 154
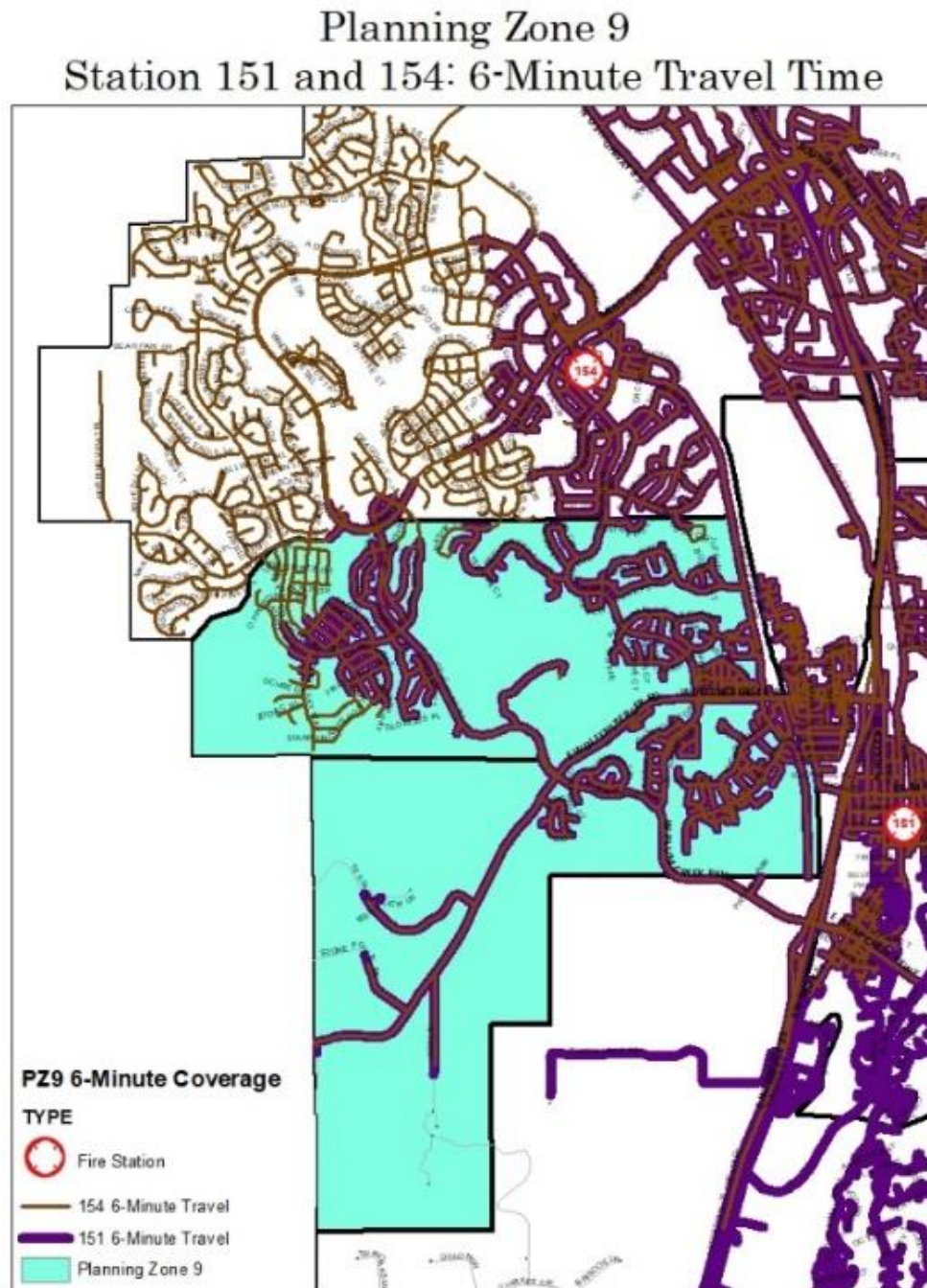
Legend: 151 | 154 | PZ9 | Projection

Construction of a station should be considered when Stations 151 and 154 begin to reach planning thresholds for performance into Planning Zone 9, or when they are unavailable to the

incidents within their primary planning zones, further increasing the travel time delta for aid received. Based on Station 151 and 154 current and projected workload, the department estimates a station in Planning Zone 9 by 2026 – 2028. Alternatively, placing an additional apparatus at an existing fire station could potentially service this planning zone within current

Planning Zone 9
Station 151 and 154: 6-Minute Travel Time

PZ9 6-Minute Coverage

TYPE

⭕ Fire Station

—— 154 6-Minute Travel

▬ 151 6-Minute Travel

▢ Planning Zone 9

performance thresholds.

Considerations for additional suppression apparatus within existing stations:

As with any operation, suppression companies, medic units, and battalion chiefs have a capacity of calls that they can effectively respond to without level of service degradation. Additionally, exceeding unit capacity will also serve to erode personnel training hours, fitness hours, and increase fatigue levels. When an apparatus is regularly responding to 16 incidents per day or 7 incidents during peak hours, the workload is unsustainable and will cause local or systemic system degradation. When a station reaches a sustained call volume of 11 calls per day, additional station resources, such as an additional suppression company should be considered. Measures to decrease call volume, such as discontinuing non-emergent lock-out responses or implementing single-unit responses to commercial fire alarms could also be considered. This would equate to a decrease in the level of service currently provided to the community.

Considerations for additional Medic Units:

Due to the longer time a medic unit is involved with a call with patient treatment and transport time, the capacity for a medic unit is 6 calls for service over a 24-hour period and/or 4 calls during the peak hours of 0800 - 2000. When a medic unit reaches this volume on a sustained basis, reliance on surrounding units will also rise as they cover calls in the originating district. As previously mentioned, Medic 154 is quickly approaching the operational threshold, and Medic 151 will likely reach the threshold by 2029

Recommendation: It is recommended that the department prepare for an additional medic unit, required staffing and equipment by 2025.

Considerations for an Additional Battalion Chief

With the addition of a sixth fire station, the department should give serious consideration to staffing a second Battalion Chief to each shift based on several factors. First, the calls for service the Battalion Chief immediately responds to are lower frequency, higher risk incidents, calling for more resources requiring more oversight, and a larger command and control presence. These incidents have the potential to last significantly longer and have a greater effect on the department's ability to respond to additional calls for service. Second, depending on the location of the next fire station, the district could be divided into two battalions (North/South or East/West) each with three stations. Third, the National Incident Management System (NIMS) defines a manageable span of control of three to seven subordinates, with five being optimal. The addition of a sixth fire station begins to push the NIMS threshold for a manageable span of control.

Recommendation: It is recommended to consider adding a second battalion chief position (3 personnel) with the opening of a sixth fire station. The addition of a seventh station would necessitate the addition of the second battalion chief.

Training Division

Given the risk involved in many fire department operations coupled with several "low frequency/high risk" incidents, the value of a well-developed and staffed training program cannot be understated.

Recommendation: It is recommended that as additional personnel are added, the department evaluate the need for additional training staff when a ratio of 1:25 is reached and increase training staff before a ratio of 1:30 is reached.

Conclusion

This plan was developed using a variety of standards, criteria, and data to establish current and projected needs. One of the key references used was the Center for Public Safety Excellence's (CPSE) Quality Improvement for the Fire and Emergency Services manual. This plan meets numerous requirements as it relates to criterion, core competencies, and performance indicators found in Category 2 – Assessment and Planning, Category 5 – Community Risk Reduction, Category 6 – Physical Resources, Category 8 – Training and Competency, and Category 9 – Essential Resources. As an accredited agency, continuous quality improvement is the driving force in everything that the department does, and the accreditation process serves as the basis for a number of documents, such as the strategic plan, the community risk assessment and standards of cover, and this master plan. All of these documents serve as the basis for guiding the future of the department, and they enable the department to continue to strive to meet the Vision "To Be the Best at Providing Emergency and Prevention Services".

As with all plans, it is only as good as the current data allows. General Patton stated, "Do not try to make circumstances fit your plans. Make plans that fit the circumstances." Therefore, any significant changes in growth, either positive or negative, can have an immediate impact on the department's level of service as well as the recommendations in this plan. If growth rapidly accelerates beyond what is forecasted, this could require the implementation of these recommendations ahead of projected schedules. Conversely, if growth suddenly slows, these recommendations may be extended out further than what is currently projected.

These recommendations were also not made in a vacuum as it relates to funding. All of these recommendations will require an increase in the department budget which equates to an increase in overall town revenue. While this plan does not address revenue, it does provide the basis for estimated budget increases, based on current personnel and capital costs, moving forward. Understanding the timing and costs associated with building and equipping a fire station, purchasing apparatus, and hiring the needed personnel to staff the identified positions will provide a projected future cost for implementation.

Finally, the recommendations in this plan will allow the department to maintain the current level of service. While it may appear that the addition of personnel and capital would increase the department's level of service, it is simply to maintain as the town continues to grow. The department's resources only have so much capacity, and growth further impacts that capacity. If the recommendations are not implemented as the metrics are met, this could result in a degradation in the level of service, i.e. longer response times, reduced capacity in the handling of calls, a reduction in inspections, plan reviews, public education, training, and fleet repair, and diminished administrative capabilities. Ultimately, the community decides what level of service they expect, what risks they are willing to accept, and the department will do its best to achieve that level of service with the provided resources.