



1. Introduction

The intent of the master plan is to serve as a guide and instrument, through established criterion, to determine resource additions and locations such as fire stations, equipment, and personnel. The Master Plan is built upon the foundation laid through the Strategic Plan and the Standards of Cover and Community Risk Assessment documents. The Master Plan utilizes data and criterion developed through the accreditation process to identify potential resource need trends prior to the resource being needed, and establish trigger points to take budgetary action to the identified needs.

2. Executive Summary

The 2014-2019 Master Plan has identified characteristics that influence call demand and level of service of the Town and Fire District. Through careful analysis of the identified metrics, the Fire Department hopes to provide Town leadership with advanced notice of trending that may affect station construction timelines, resource implementation, and staffing needs. Understanding that these needs have a significant impact on financial resources, advanced notification of impending new stations or resources is beneficial to Town decision makers. The 2014-2019 5-year Master Plan identifies population and subsequent emergency call volume in the Crystal Valley area at levels necessitating new station planning to begin in 2015. As call demand continues to grow to the 300 calls per year level in the future station's response area, the station will need to be built in order to maintain levels of service. Construction of a new station could be requested to begin between 2016 and 2018. The total 2018 estimated cost for a new station would be approximately \$5 million depending on infrastructure availability at the current site. Apparatus costs for a Quint and Type 6 Brush Truck would be \$1.1 million. In order to maintain the department personnel relief factor, 12 personnel would be needed to staff the station. Operating cost of the station would be approximately 2.1 million the first year and approximately \$1.96 million annually the subsequent years. The first year's operating costs would be higher due to initial one-time costs to train and equip the new personnel. Beyond the five year scope of the plan, if development continues at the present pace, a new fire station may be needed in the Castle Oaks/Liberty Village area within the 2020 to 2025 timeframe depending on demographics and growth to the area.

The lease for the temporary Public Safety Training Facility (PSTF) has a maximum lease extension of 2018. It is therefore imperative that the planned permanent PSTF be constructed prior to that time. The location identified for the PSTF is the abandoned water treatment site at the north end of Caprice Street. The cost for the PSTF is estimated to be \$4.3million in 2018.

Historical Perspective

The first mention of firefighting in Castle Rock is found in the Town minutes of April 1892 in which the Mayor was instructed to purchase fire hose. By April 1895, a Fire Chief was

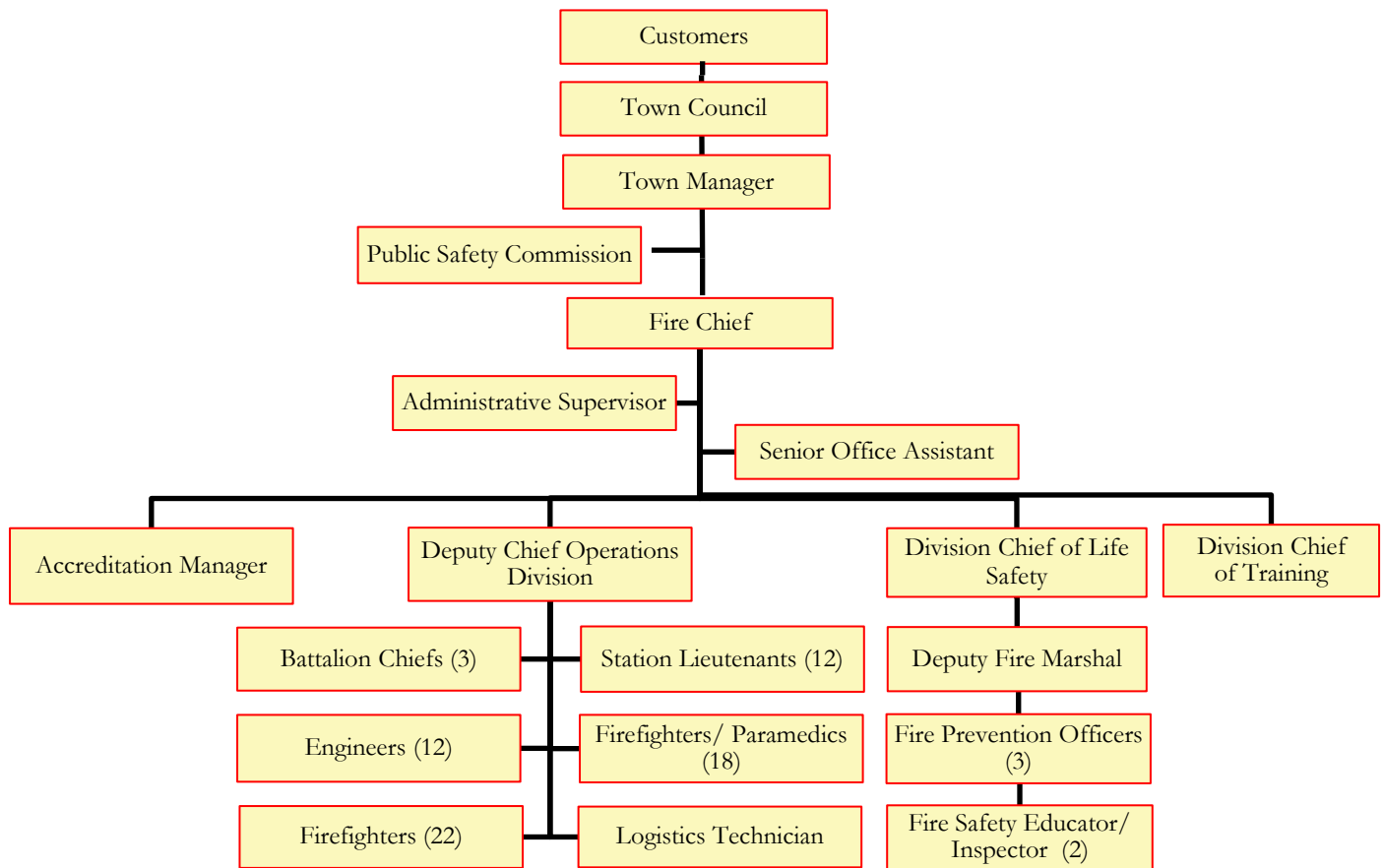


Town of Castle Rock Fire and Rescue Department 2014-2019 Fire Master Plan



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appointed and instructed to organize a company of seven people, though the discussion of organizing a formal volunteer Fire Department did not occur until January 1915 as a result of several local fires and losses. Today, the Castle Rock Fire and Rescue Department (CRFD) protects the life and property of the Town of Castle Rock (33 square miles with approximately 53,466 residents) and those within the Castle Rock Fire Protection District (CRFPD) (33 square miles with approximately 7,500 residents).





3. Current Resource Placement

The department has 80 career members (78 uniformed staff) and one volunteer member who staff four fire/rescue stations 24 hours a day to provide fire and emergency medical services to the community. In 2013, the department responded to 4,428 calls for service.

The Castle Rock Fire and Rescue Department provides:

- Fire: structural, wildland, and vehicle response
- Rescue: trench, confined space, building collapse, high/low angle rope rescue, heavy extrication, and water rescue services
- Emergency Medical Services (EMS): Advanced Life Support (ALS) (paramedic ambulance transportation) with all field personnel, at a minimum, certified as EMT Basics
- Hazardous Materials (HAZMAT): operations level response and mitigation with technician level response and mitigation through a regional HAZMAT team
- Specialized: Tracked Rescue Vehicle (TRV)
- Fire prevention / inspection services
- Public and risk-reduction education
- Emergency Management and coordination for the Town of Castle Rock

Fire Headquarters

Fire Headquarters, co-located within Station 151 opened in 1999. Fire Headquarters is home to the Fire Chief, Administrative Division, Operations Division, and the Life Safety Division.

Station 151

Station 151 is home to an engine, medic unit, Battalion Chief, a type 6 brush truck, support unit, and a reserve engine. In addition to CRFD's standard extrication equipment, Engine 151 also carries a compliment of heavy extrication equipment and responds to all vehicle entrapments.



Typical station assignments are:

- Engine 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 Chief 151: one Battalion Chief

The other units are cross-staffed as necessary.

Station 151 serves and protects: Wilcox Square, Plum Creek, Baldwin Park, Bell Mountain, Castle North, and the Woodlands, as well as other neighborhoods and business districts. Two elementary schools, two high schools, Castle Rock Town Hall, Douglas County administration buildings, parts of Interstate 25, and Rock Park are also in its service area.

Station 153

Station 153 is home to an engine, a type 6 brush truck, medic unit, cross staffed (4th out) reserve medic unit, TRV (tracked rescue vehicle), reserve battalion vehicle, and the antique fire truck.



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

The brush truck and reserve medic unit are cross-staffed when necessary.

Station 153 serves and protects Founders Village, Castle Oaks, Cobblestone Ranch, Castlewood Ranch, a small commercial area, a middle school, and three elementary schools.

Station 154

Station 154 is home to an engine, medic unit, a type 6 brush truck, structural collapse/trench rescue trailer, and a reserve engine.

Typical station assignments are:

- Engine 154: 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.
- Medic 154: one Firefighter / EMT and one Firefighter / Paramedic

The other units are cross-staffed as necessary.

Station 154 serves and protects The Meadows, Highlands Vista, and Red Hawk areas. Also in the station's district are the Outlets at Castle Rock, a commercial area west of I-25, a high school, a middle school, four elementary schools, a large industrial area, and the Douglas County Sheriff's Office, which houses the Douglas County Regional Communication Center (DRCC). The Castle Rock Adventist Health Campus and Bonaventure Senior Facility are located in Station 154's first due area as well.





Station 155

Station 155 is home to a quint, a type 3 brush truck, the hazardous materials unit (HAZMAT), and reserve quint.



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.
- The other units are cross-staffed as necessary.

Station 155 serves and protects the residents on Crowfoot Valley Road, Founders Parkway, Silver Heights, Sapphire Point, Diamond Ridge, and Metzler Ranch, one elementary school, as well as a large commercial area east of I-25 on the north end of Town.

In reviewing distribution data from 2007 through 2011, the data confirmed assumptions previously used for planning purposes. These assumptions included:

1. Stations 151 and 153 have the largest service areas in terms of square miles and road miles,
2. Station 155 has the smallest service area in terms of square miles, road miles, and population,
3. Stations 151 and 154 have the largest population centers,
4. The majority of Stations 151, 153, and 155 service areas are rural, while Station 154's is almost evenly split between rural and metro/urban.

Calls for service are occurring in the areas of higher population, and as a whole, the department's response times meet Commission on Fire Accreditation International (CFAI) baselines for the first arriving units. In the rural areas, the department is currently meeting or exceeding CFAI baselines. Overall, from a distribution standpoint, the department has done a good job in station and apparatus placement to serve the current needs of the Town and District.

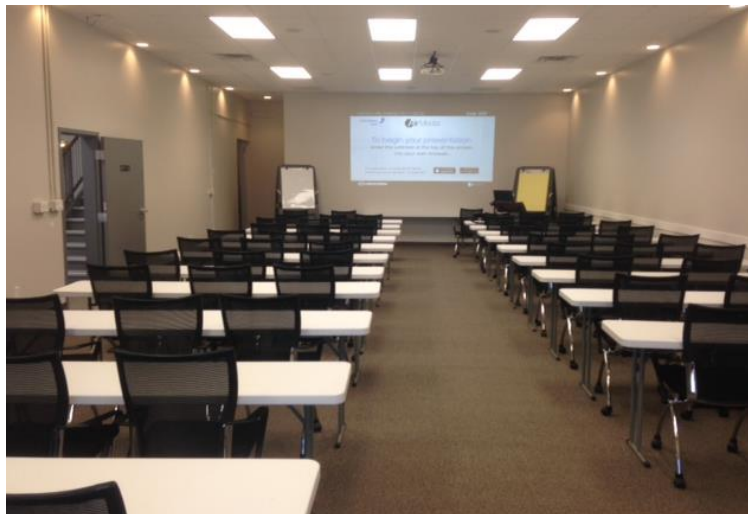
The concentration factors (accumulation of multiple apparatus), again confirmed assumptions about call volumes, call types, locations, and response times.

1. Stations 151 and 154 are the busiest stations, regardless of call type, and this coincides with having the largest population centers,
2. EMS is the number one call type and generates the most calls,
3. Fires of all types rank at the bottom in terms of number of calls, and ranks only ahead of technical rescue.



Public Safety Training Facility (PSTF)

The PSTF was opened in September of 2014 and is located at 1335 Park Street. It is located in a leased building from the owner of Douglas Lumber and adjoins the training burn tower property. The PSTF is shared by both the Fire and Police Departments and is open to all Town departments for use as scheduling allows. The Training Division Chief and the Logistics Technician have offices in this building. There is an office available for Police Department use as needed. The PSTF can seat 66 at tables and 90 in open seating.





Town of Castle Rock Fire and Rescue Department 2014-2019 Fire Master Plan

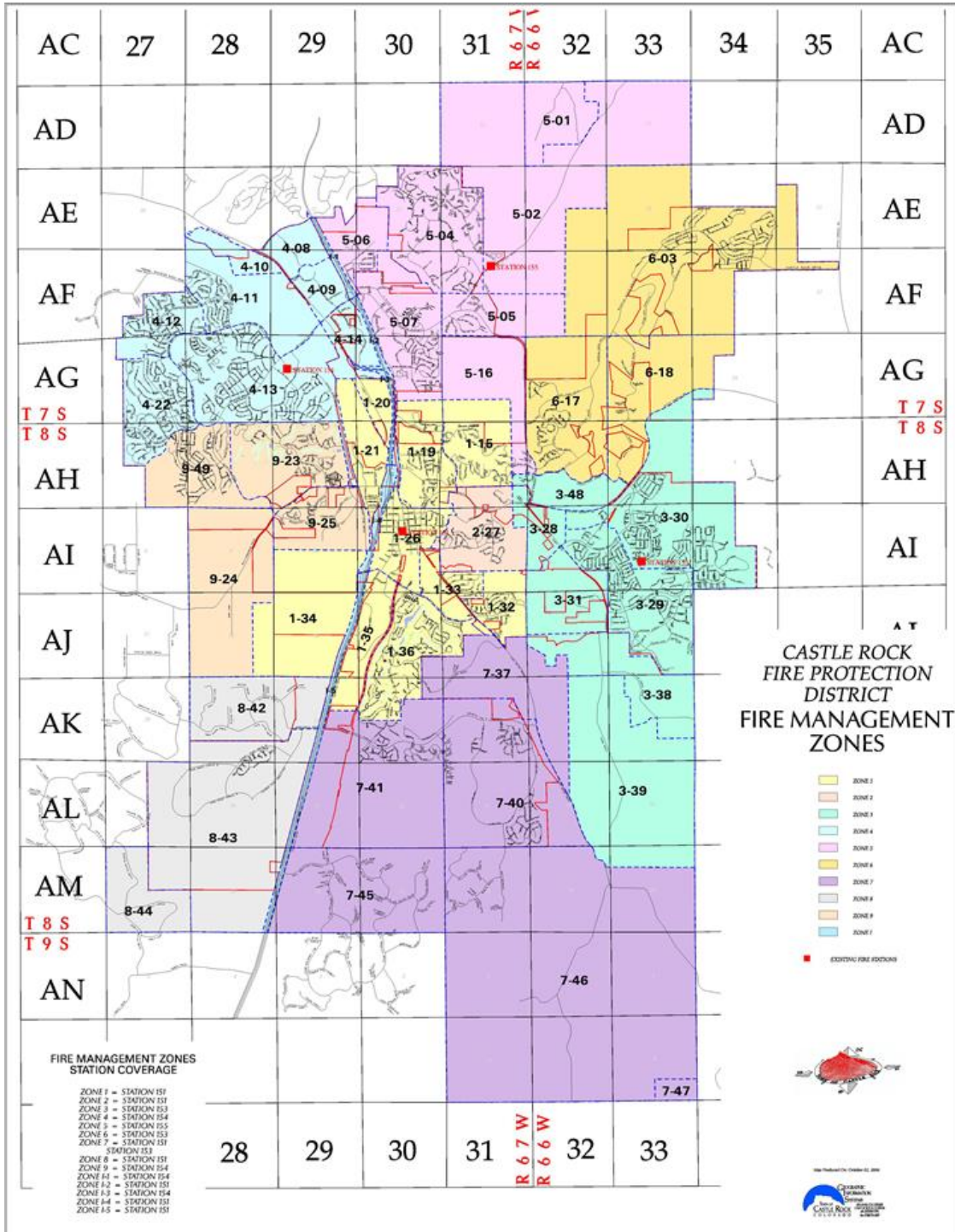


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Overall, the concentration of calls is toward the Interstate 25 corridor and the population centers. Call distribution moves out into the suburban and rural areas outside of normal business hours, indicating a return of residents from their places of work.

See map below for station locations and fire management zones.





4. Current Demographics

The Town’s median age is 33.8 with 55.6% of its population being between the ages of 25 and 63. The median income is \$84,781 with an average single family dwelling costing \$275,900. The Town also has a high degree of education with 95.5% of the population having a high school diploma, 81% having some college or technical training, and 45.1% having a college degree. As of 2013, Town staff estimated population to be 53,466.

Additional demographic features provided by the United States Census Bureau are detailed below. Data is based on 2010 Census and 2010 ACS Demographic Estimates.

Area Description Table 1.0

Economic Characteristics - 2010 Census	Estimate	Percent
In labor force (population 16 years and over)	4,199	77.2%
Mean travel time to work in minutes (workers 16 years and over)	28.4	(X)
Median household income (in 2010 inflation-adjusted dollars)	96,610	(X)
Median family income (in 2010 inflation-adjusted dollars)	95,973	(X)
Per capita income (in 2010 inflation-adjusted dollars)	34,089	(X)
Families below poverty level	(X)	4.0%
Individuals below poverty level	(X)	6.2%

ACS Demographic Estimates - 2010 Census

	Estimate	Percent
Total population	48,231	(X)
Male	23,927	49.6%
Female	24,304	50.4%
Median age (years)	33.9	(X)
Under 18 years	15,614	32.4%
18 years and over	32,617	67.6%
65 years and over	2,991	6.2%

Population by Race / Ethnicity - 2010 Census

One race	46,863	97.2%
White	43,768	90.7%
Black or African American	543	1.1%
American Indian and Alaska Native	286	0.6%
Asian	811	1.7%
Native Hawaiian and Other Pacific Islander	49	0.1%
Other	1,400	2.9%
Two or more races	1,374	2.8%
Hispanic or Latino (of any race)	4,819	10.3%

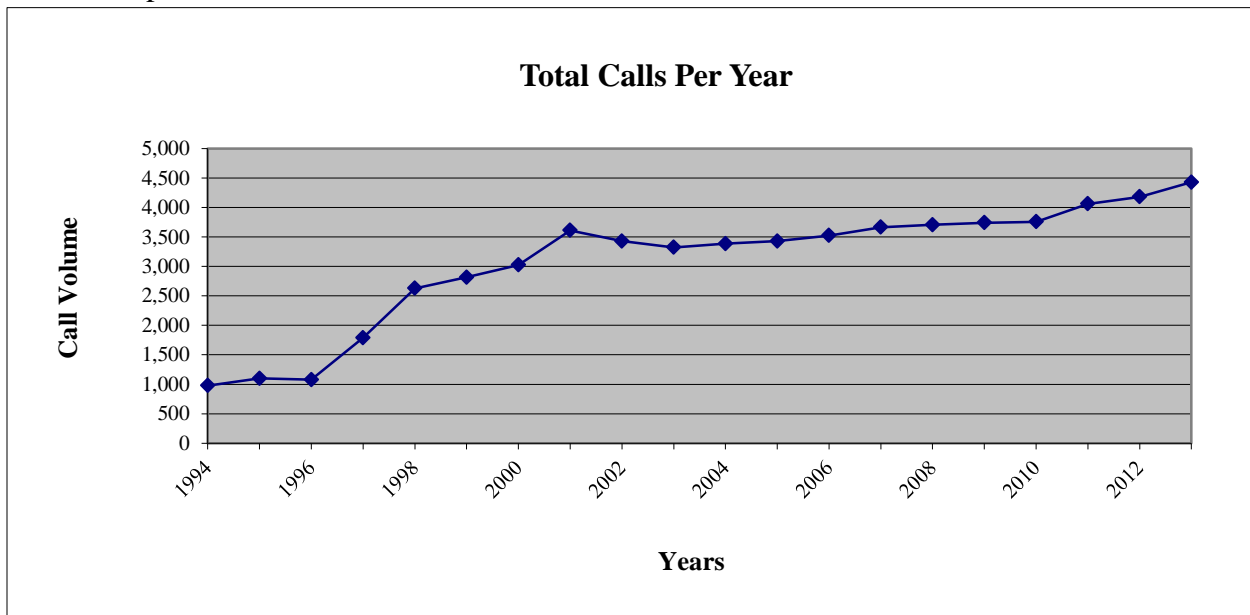


As can be seen in the tables above, Castle Rock is a predominantly white, upper middle class community whose residents are primarily between the ages of 18 and 65. The majority of the population works in the Denver metro or Colorado Springs areas. As a whole, the residents are well educated, generally have health and homeowners insurance, and have newer or updated homes. Through the Douglas County Senior Initiative study that was completed in 2014, it has been found that the age 60+ population is the fastest growing in the state, and has increased from 6.2% of the population in 2000 to 11.6% of the population in 2014. The department has seen increased response demand to areas specifically catering to seniors such as dedicated senior care facilities.

5. Community Response History

The department’s response history mirrors the growth that the Town and District experienced between 1990 and 2000. During the mid to late 1990’s and early 2000’s, Douglas County was listed as the fastest growing county in the nation, and Castle Rock experienced significant growth. As seen in the chart below, call volume increased drastically in the late 1990’s and then leveled off. The interesting statistic is that call volume leveled off during the 2000s even as the population more than doubled between 2000 and 2009.

CRFD Response Chart 1993-2013



Since 2002, call volume has grown at an average rate of 1.27% per year, though in the last 3 years call volume has increased at a rate of 5.64% on average. The types of calls the department



responds to has also remained somewhat static with EMS calls accounting for approximately 70% of the total call volume.

6. Community Expectations

As part of the accreditation process and to ensure that the level of service being provided was acceptable to the community, it was determined that a stakeholders meeting was needed.

In September of 2010, the Castle Rock Fire and Rescue Department held an “external stakeholder” meeting facilitated by the Center for Public Safety Excellence (CPSE). This meeting was open to local businesses, service groups, home owners associations, residents, and the public at large. The purpose of this meeting was to allow the department to gain a better understanding of the community’s priorities and expectations of their fire department. Using the information gathered, the department has developed a community driven strategic plan to align the services provided with the communities’ expectations, industry best practices, all of which support the risks identified by the department.

Community Expectations Table 1.0

Top 5 Expectations	
1	Timely Response
2	Training (current and future needs)
3	Equipment (good working order/current for needs)
4	Professional / Responsible personnel
5	Adequate Staffing (# of people / proper distribution)

In addition to providing expectations, the attendees were asked to identify areas of concern within the department.

Community Expectations Table 2.0

Top 5 Areas of Concern	
1	Public Education
2	Training (developing technologies)
3	Cost Reduction / Fiscal Responsibility
4	Future Planning
5	Response Time / Station Locations

Community Service Priorities

As part of the stakeholder’s meeting, the participants were asked to provide a ranked list of their priorities.



Community Service Table 1.0

Community Priorities of CRFD's Core Services Ranking	
1	Emergency Medical Services (EMS)
2	Fire Suppression
3	Technical Rescue
4	Fire Prevention
5	Public Fire/EMS Safety Education
6	Hazardous Materials Mitigation
7	Fire Investigations
8	Domestic Preparedness Planning & Response

The above information was the basis for a three-day Internal Stakeholder session facilitated by the Center for Public Safety Excellence (CPSE), with a single goal of developing the department's community-driven strategic plan. The internal stakeholders were a cross-section of the department representing all shifts, ranks, and functions with tenure ranging from one to twenty-four years with the department. For complete results, comments, and analysis of the external stakeholder meeting, please refer to the Strategic Plan posted on the department's website (<http://crgov.com/index.aspx?nid:812>). The strategic plan shall be updated annually and re-written every five years.

7. 2013 Community Survey

In 2013, the Town conducted the 2013 Castle Rock Community Survey where 1056 residents and 279 businesses responded. Rating scales were employed throughout the report. Almost all scales are 5-point measures from 1 = the lowest rating to 5 = the highest rating. The highest average ratings among 2013 respondents were for Castle Rock's Fire Department – a very positive 4.71 on a 5-point scale. Similar to 2011 study results, each of the evaluation components received an average rating of 4.36 or higher.

With a few exceptions, the top ten Town services considered essential / core among 2013 respondents were:

- Safe and reliable water supply (93%)
- Law enforcement (90%)
- **Emergency medical services (90%)**
- **Fire suppression (83%)**
- Snow and ice removal (81%)
- Road / sidewalk / curb maintenance (78%)
- **Fire prevention / inspection (77%)**
- Current and long-range planning (74%)
- **Maintaining safe public buildings (71%)**
- **Maintaining safe parks (70%)**



Ratings of Castle Rock Fire and Rescue Services

- Average ratings for the Town’s Fire and Rescue Services were all above 4.0. Moreover, ratings were higher in the 2013 survey than in 2011 for seven of the nine attributes used.
- Fire and Rescue Services were rated extremely high for both response attributes: medical emergency response quality (4.88) and response time in general (4.87).
- While still very positive, the lowest rated attributes for Fire and Rescue were fire prevention (4.37) and public education (4.16).

Survey Representative Comments

“I’ve had to call them for a business call before. They’re close to my business, and they arrived quickly.”

“We had a period where we had a faulty alarm system, so I got called several times in the middle of the night to come down. They were very responsive, very professional.”

“I’ve been involved with the leaders through the Leadership Douglas County program, and I think they are high quality.”

8. Standards of Coverage

The Standards of Cover and Community Risk Assessment (SOC) profile was approved by Town Council on June 19th of 2012. The 2011 Standards of Cover Document serves to capture community risk and identify acceptable standards of cover for the Town and District. Reference to the SOC appears throughout the Master Plan and serves as a basis for identifying department future needs.

9. If – then philosophy

The 2014 Master Plan is based on the development of a series of if-then logic steps, similar to computer language which develops recommendations based on data inputs. The Master Plan seeks to provide the Town and Fire Department with recommendations based on the inputs of what is happening, or what is trending for the Town, and provides metrics-based recommendations to allow for financial and departmental planning well in advance of the identified need. The recommendations are not concrete, but can serve to identify consequences of inaction, or benefits of effective planning.

10. Criterion development

Considerable effort was made to identify the criterion that influence Fire Department staffing needs, station placement and location, and apparatus needs such as ambulances. The influencing criterions were defined as factors that influence call volume or identify response capacity.



The factors are referred to as absolutes, or things ascertained through analysis. They are as follows:

Response Impacts by resident age and location-

- Residential: generate 1 call/12 people or 79.5/1000 (.0795)*
- Assisted living senior care: generate 1.2 calls/resident/yr.
- Skilled care senior living: generate .8 calls/yr./resident
- Senior >60 yr: generate 0.5 calls/resident
- Low to Moderate income housing: generate 1 call/11 residents or .091 calls per resident
- Apartments: generate 1 call/13 residents or .077 calls per resident
- Condos: generate 1 call/4 residents or 0.25 calls/resident
- Hotel/Motel: generate 1.28% all of calls annually (5 year average)
- Simultaneous calls: generate 33% (5 year average) 1% increase annually, currently at 36%
- Commercial/Retail/Office: generate 6.7% of calls

Note - Over the last seven years, which included a recession, the .0795 forecasting value projected with an accuracy within an error factor of 4% or less. Over the last three years, 2011-2013, were under projected by 91, 81 and 171 responses. There are two probable reasons for this. First, Development Services takes a conservative approach in estimating the number of permits they will issue within a calendar year. Castle Rock weathered the recession fairly well and recovered more quickly than anticipated. This accounted for an issuance of more residential permits than originally estimated. In 2013 for example, Development Services estimated they would issue 650 residential permits. They ended up issuing a total of 825 single family detached (SFD) residential permits, two single family attached (SFA) residential permits and 90 multi-family dwelling (MFD) permits. It should be noted that Development Services is going to continue in their conservative estimation through 2017 where they are projecting 650 units each of the nest two years as well and 652 units each of the following years.

Performance Thresholds:

Suppression Apparatus -

- Peak Unit Hour Utilization (UHU): .25
- 24 Hour UHU: .14
- 1st due total (Metropolitan/Urban/Suburban) compliance time
- 1st due total (Rural) compliance time
- Unit reliability: 77%

Medic Units -

- Peak UHU: .3
- 24 hour UHU: .26
- 1st due total (Metropolitan/Urban/Suburban) compliance time
- 1st due total (Rural) compliance time



Fire Management Zones (Stations) -

- 1st due total (Metropolitan/Urban/Suburban) compliance time
- 1st due total (Rural) compliance time
- Call Volume: 360 annually for new station/3650 for single suppression apparatus
- Suppression apparatus annual responses
- Medic unit annual responses
- Effective Response Force (ERF)² compliance
- Percentage of build out ³: 100%

Note ² - For the purpose of master planning, we are only looking at moderate risk EMS ERF responses

Note ³: Projects future growth within the response area

11. Performance Indicators

Performance indicators are the measurement of practical, actionable and quantitative service provisions used to assess the Castle Rock Fire and Rescue Department's level of service and project future performance and service demands.

The purpose of the indicators is to measure requests for service within established performance parameters and forecast the breach of performance thresholds as they apply to current fire stations, future fire stations, fire suppression and service apparatus, medic units, and fire management zones.

Performance indicators were developed for the 9 Fire Station Planning Zones (FPZ) and the 56 Fire Management Zones. This is considered relevant as development can influence performance in a FPZ that had been vacant and is now developed with senior housing. Though fire stations are established and static, their performance can erode due to call demand and increased reliance on second or third due units. The performance indicators used are:

Percentage of build-out: A measurement in percentage. An estimate of the current number of structures certified for occupancy compared to the current zoned occupancies within a specific planning zone as forecasted by the Town of Castle Rock and the Town's Department of Development Services Projection's and Platt's Document.

Calls generated: The total number of requests for service within a specific planning zone or response area over the duration of one year.

Suppression apparatus annual responses: A hard number. The total number of suppression apparatus requests for service within a specific planning zone or response area over the duration of one year.



Medic unit annual responses: The total number of medic unit requests for service within a specific planning zone or response area over the duration of one year.

First due total compliance time (M/U/S as established in the Annual Compliance Report): A measurement in percentage. The percentage of time the first arriving apparatus arrived within the baseline time as set by the most current performance and compliance report. This time is measured from the time the call is received at the dispatch center to the moment the first company arrives at the specific planning zone or response area location within the metropolitan, urban, and suburban population densities (residents per square mile).

Metropolitan/Urban/Suburban (M/U/S): equal to or greater than 1000 residents/mile²

Rural: less than 1000 residents/mile²

Effective response force compliance (m/u/s as established in the Annual Compliance Report): A measurement in percentage. The percentage of time the first alarm assignment (all apparatus and personnel needed to safely mitigate an emergency) arrived within the baseline time as set by the most current performance and compliance report. Compliance time shall be measured based on a given area's population density (residents per square mile). Metropolitan/Urban/Suburban (M/U/S): equal to or greater than 1000 residents/mile², rural: less than 1000 residents/mile².

Annual responses: The total number of requests for service provided by a specific apparatus over the duration of one year.

Peak unit hour utilization (UHU): A measurement in percentage. The percentage of an hour a unit is committed to a call for service over the historically busiest or peak hours of service within a 24 hour work period. The Peak UHU for the Castle Rock Fire and Rescue Department is between the hours of 7:00 a.m. and 8:00 p.m. (0700-2000).

24 hour unit hour utilization (UHU): A measurement in percentage. The percentage of an hour a unit is committed to a call for service over a 24 hour period.

Unit reliability: A measurement in percentage. The percentage of incidents that an apparatus is first to arrive within its assigned first due area. Optimally, the apparatus assigned to your service area arrives on scene of the request for service 77% of the time, at a minimum, the apparatus shall arrive 70% of the time, and anything less than that is a breach in performance threshold.

Percentage of build-out: A measurement in percentage. An estimate of the most recent projected number of structures certifiable for occupancy within a specific emergency zone as forecasted by the Town of Castle Rock and the Town's Department of Development Services Projection's and Platt's Document.



Projected calls generated: A projected estimation figure. The calculated total number of requests for service within a specific emergency zone or response area sanctioned by the Town of Castle Rock based on the Development Services Projection's and Platt's document.

Suppression apparatus annual responses: A projected figure based on historical responses. The calculated total number of requests for service within a specific emergency zone or response area requiring the service of one or more suppression apparatus, sanctioned by the Town of Castle Rock based on the Development Services Projection's and Platt's document and CRFD service equations.

Medic unit annual responses: A projected figure based on historical responses. The calculated total number of requests for service within a specific emergency zone or response area requiring the service of one or more medic unit, sanctioned by the Town of Castle Rock based on the Development Services Projection's and Platt's document and CRFD service equations.

The performance indicators for current fire stations are:

- Percentage of build-out
- Calls generated
- Suppression apparatus annual responses
- Medic unit annual responses
- First due total compliance - Metro/urban/suburban
- First due total compliance - Rural
- Effective response force compliance - Metro/urban/suburban
- Effective response force compliance - Rural

Though no single indicator has the ability to dictate imminent need, collectively they can serve to forecast where response issues are developing, with the strongest influencers being the calls generated, first due compliance time, and effective response force compliance.

The key influencers for future planning of fire stations in Fire Planning Zones are:

- Percentage of build-out
- Calls generated
- Suppression apparatus annual responses
- Medic unit annual responses



Fire Management Zones (FMZs) and Fire Planning Zones (FPZ)

The Town is divided into 9 overall Fire Planning Zones that are, have been, or will be served by a fire station. Within the FPZs are 56 fire management zones used to measure performance in smaller, more statistically valid areas. All data is managed by fire management zone in order to identify response shortcomings, the effectiveness of each station, and when new stations should be placed in the planning process and subsequently constructed. The areas identified in the FMZs are as follows:

FPZ 1 consists of FMZ 1-20 to 1-36 Downtown Castle Rock , Castle North, Plum Creek, the Woodlands, Yucca Hills, most of Escavera, and the South Gilbert Street corridor. This area is served by Station 151.

FPZ 2 consists of FMZ 2-27 The area surrounding Valley Dr. and South Street. This area was originally its own response district, but has been included into the Station 151 zone.

FPZ 3 consists of FMZ 3-28 to 3-39 Founders, Castlewood Ranch, and the south Ridge Road corridor. This zone is served by Station 153.

FPZ 4 consists of FMZ 4-08 to 4-22 The Meadows, the Castlegate Drive area, and the northern half of Redhawk. This zone is served by Station 154.

FPZ 5 consists of FMZ 5-01 to 5-16 Sapphire Point, Diamond Ridge, Echo Ridge, Silver Heights, a small portion of Escavera, Metzler Ranch, Lemon Gulch, and the Crowfoot Valley Road corridor are located within this zone. Station 155 provides coverage.

FPZ 6 consists of FMZ 6-03 to 6-18 Castle Oaks, Terrain and Liberty Village/Cobblestone Ranch fall into this zone. Currently this area is covered by Station 153 and Franktown Fire.

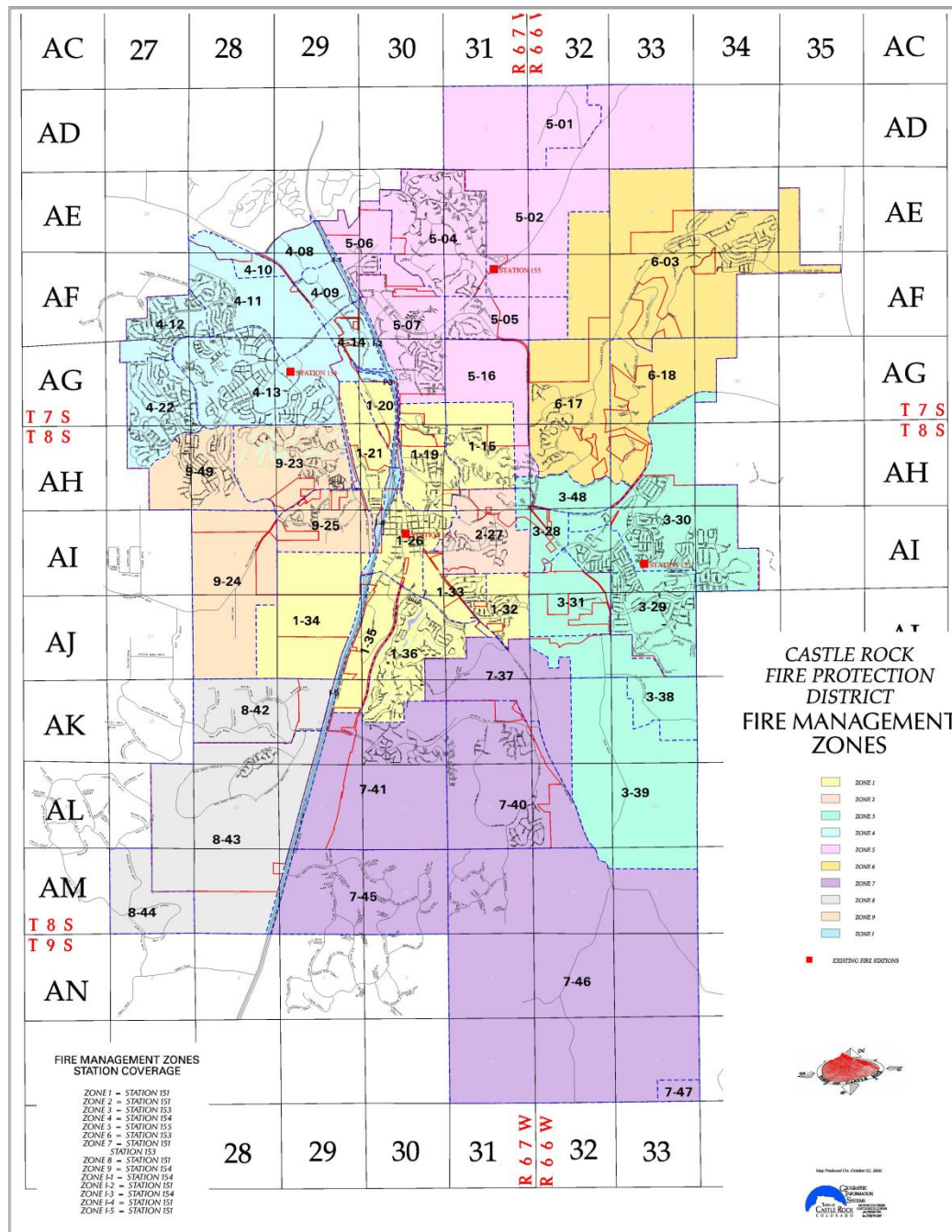
FPZ 7 consists of FMZ 7-37 to 7-47 Crystal Valley Ranch, the Lanterns, Heckendorf Ranch, Stone Canyon Ranch, Sellars Creek Ranch, Bell Mountain Ranch, and the South Lake Gulch Road corridor fall into this zone. Station 151 provides coverage to the north end of this zone and Station 153 provides coverage to the south end, but the entire area will be served by its own station when warrants are met.

FPZ 8 consists of FMZ 8-42 to 8-44 Dawson Ridge, Keene Ranch, and Twin Oaks fall into this zone and are covered by Station 151. When the Crystal Valley station opens, and the interchange is complete, it will provide coverage to this area. Even if the Crystal Valley Station is built, this area will still be covered by Station 151 until the Crystal Valley interchange is completed.



FPZ 9 consists of FMZ 9-25 to 9-49 The southern half of Redhawk, a portion of the Meadows, and the Wolfensberger Road Corridor fall into this area, as well as PS Miller Park and Auburn Ridge. Fire Stations 151 and 154 provide coverage to this zone.

The Fire Management Zone maps on the following pages serves to illustrate the respective zones and their sub-zones. For example, fire zone 6 has 3 sub-zones, namely 6-03, 6-17, and 6-18. FMZ 6 is dark yellow.





12. Indicators for Fire Station Construction

Through statistical analysis and a study of station placement as found in the Standards of Cover, it was discovered that the criterion for fire station planning and construction identified in the 2004 Strategic Master Plan remains valid, namely,

A fire station should be considered for construction when the following criteria are met:

- The collective zones that would form the cover district of the new fire station generate 200 calls per year.
- 3,000 homes are constructed in the collective zones that would form the cover district of the new fire station.
- 9,000 occupants dwell within the collective zones that would form the cover district of the new fire station.

A fire station should be planned for construction when the following warrants are met:

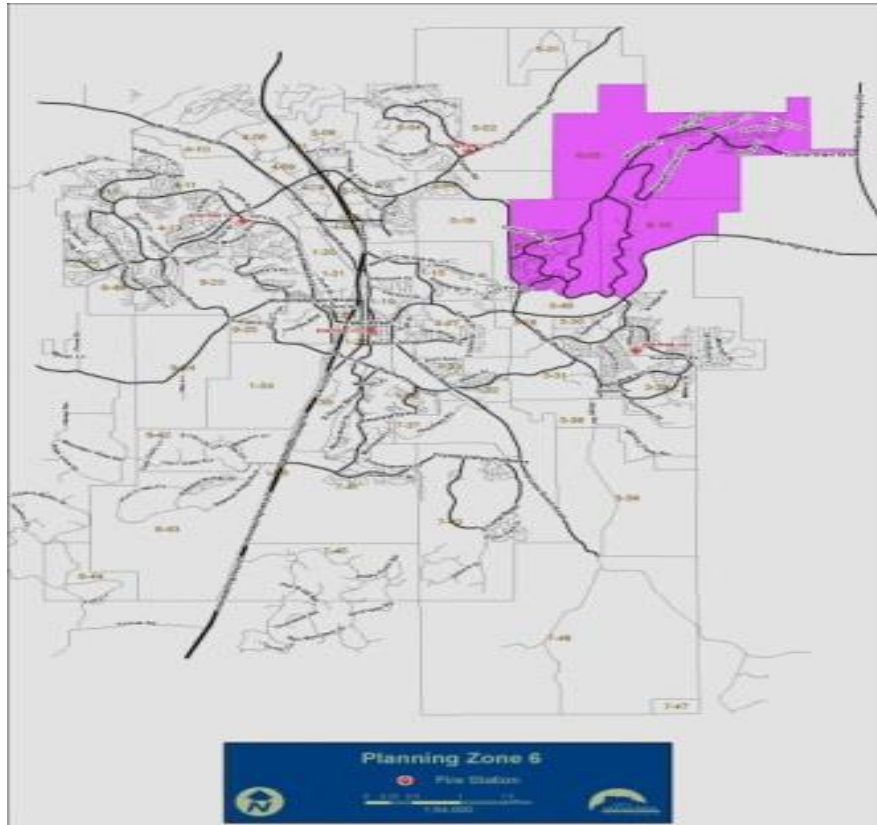
- The collective zones that would form the cover district of the new fire station generate 300 calls per year.
- 4,500 homes are constructed in the collective zones that would form the cover district of the new fire station.
- 13,500 occupants dwell within the collective zones that would form the cover district of the new fire station.

13. Future Fire Station Projections

Using the criterion that have been identified in the 2014 Master Plan, and with economic and development conditions remaining as they are at the time of this writing, the following station construction needs have been projected per FPZ. It should be noted that this estimate is a worst case scenario that is based on projected development. Actual call volume has historically been less depending on the demographics of the population moving into the Town.



FPZ 6 - (Castle Oaks) At the current rate of growth, a station may be considered for this zone between 2016 and 2018, with construction possibly needed in 2019-2020.

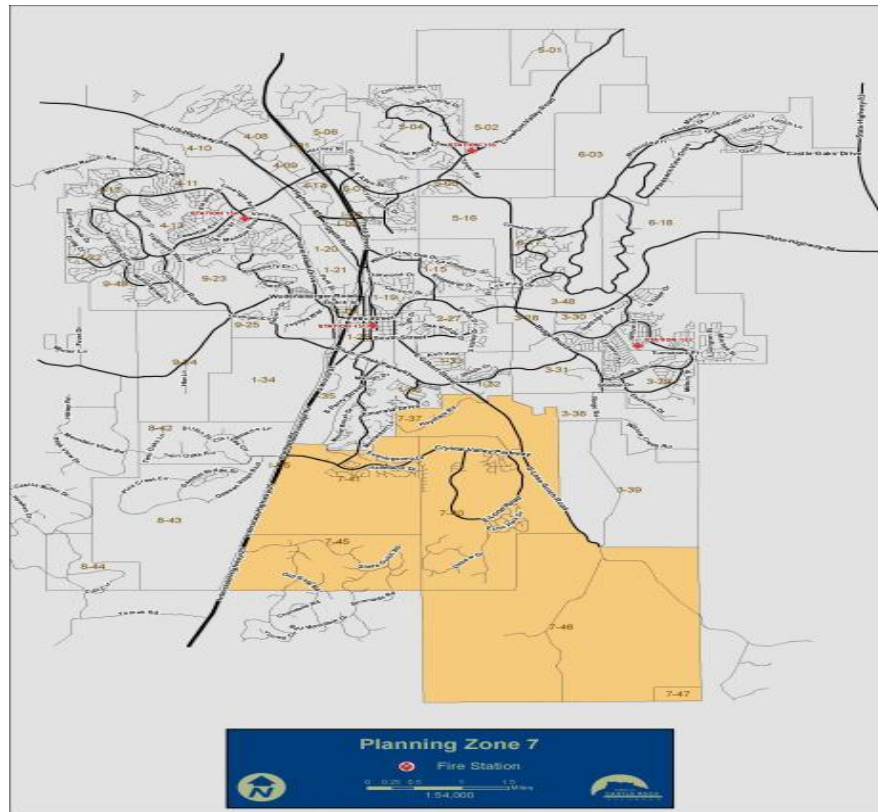


Fire Planning Zone 6							
Year	2014	2015	2016	2017	2018	2019	2020
Projected Responses	131	187	225	262	289	314	344
Percentage of Build Out	32%	36%	41%	44%	47%	51%	~54%



FPZ 7 - (Crystal Valley) At the current rate of growth, an additional fire station in the Crystal Valley area of Town, will need to be planned for construction in 2015. Actual construction should take place between 2016 and 2018 if building construction and call volume continue to grow at their present rate. In the planning period represented by the 2014-2019 Master Plan, this is the highest priority project identified in the plan, with the highest likelihood of occurring.

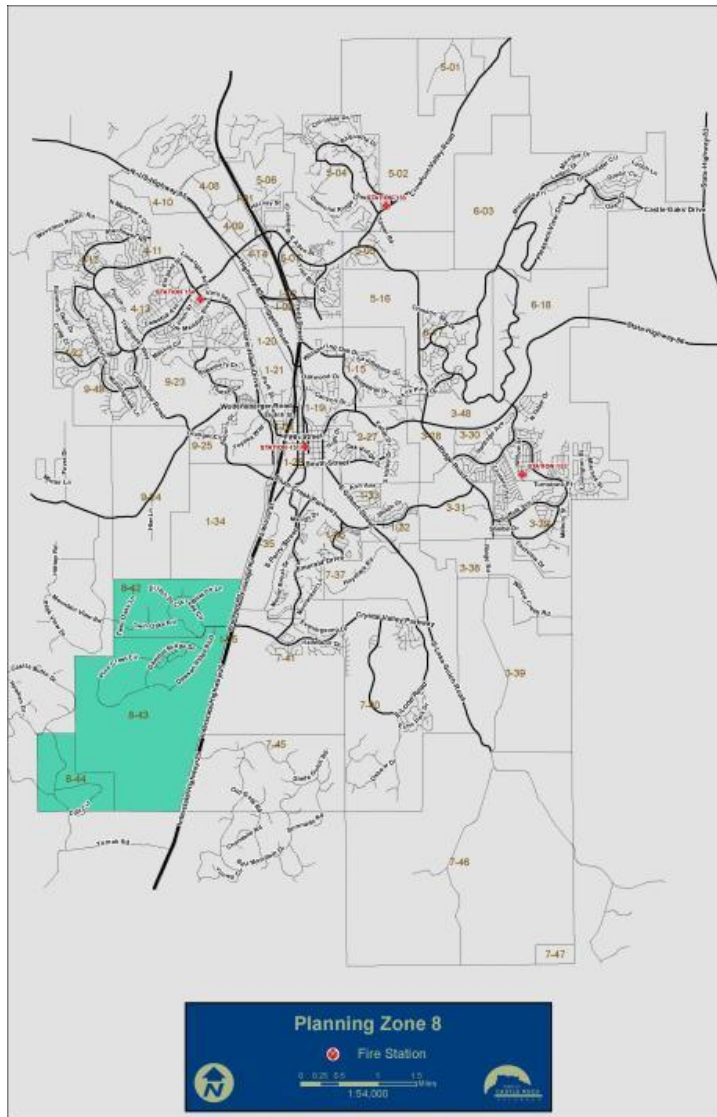
Planning for the financial impacts of the station should commence in 2015 for inclusion in the 2016 budget. The Town owns a site for this station at Plum Creek Blvd. and Crystal Valley Parkway. The station is anticipated to cost approximately \$5-6 M with equipment, and will require the hiring of 12 personnel to maintain the current relief factor. Ongoing operational costs including staffing are anticipated to be in the \$1.9 M range in future dollars.



Fire Planning Zone 7							
Year	2014	2015	2016	2017	2018	2019	2020
Projected Responses	247	286	358	440	508	568	643
Percentage of Build Out	23%	27%	31%	34%	37%	40%	~43%

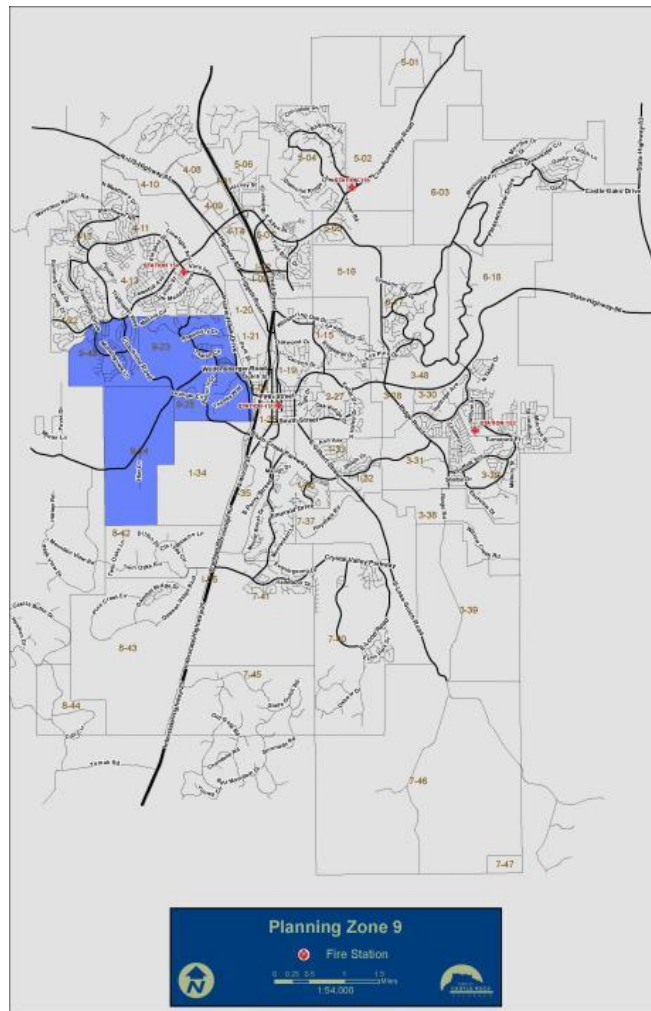


FPZ 8 - (Dawson Ridge, Twin Oaks, and Keene Ranch) None at this time, though this zone could be covered from Station 157 if an overpass is built over I-25 at Crystal Valley Pkwy. At present, this zone generates 4 calls per year.





FPZ 9 - (Coachline) Presently, this zone meets the requirements to plan building a station solely based on call volume (264 in 2013). This zone however, is being effectively covered by Stations 151 and 154 with M/U/S first due compliance of 8 minutes:10 seconds being met or exceeded 87.9% of the time, and M/U/S ERF compliance of 10 minutes: 30 seconds being met or exceeded 93.7% of the time. The capacity of the stations covering this area may reach concerning levels in 5-7 years with the development of Auburn Ridge and P.S. Miller Regional Park. The stations covering this area however, will receive relief from call volume with the opening of the Crystal Valley station.



Fire Planning Zone 9							
Year	2014	2015	2016	2017	2018	2019	2020
Projected Responses	319	516	559	696	722	745	773
Percentage of Build Out	76%	80%	83%	89%	92%	95%	~98%



14. Minimum staffing requirements for fire station staffing

The minimum staffing requirements for the department as approved by Town Council are:

- Three personnel per Engine
- Three personnel per Quint
- Two personnel per Medic Unit

15. Future Staffing Objectives

1. Consider 4th person staffing on the Quint.

In order to accomplish this objective, 3 additional personnel will be needed to serve as the 4th person on the quint. The additional staffing on the Quint is needed for the following reasons:

- To provide additional staffing to fires where heavy labor assigned to aerial apparatus required.
- To bring our staffing levels on aerial apparatus up to the levels of our surrounding mutual aid partners. At present, South Metro staffs aerial apparatus with a minimum of 4 personnel and have requested that we provide the same level of service to them when requested. At present we are unable to fill this request.
- Have extra staffing available on one unit for labor intensive activities such as heavy and technical rescue.
- Reduce the number of units required at a scene during a fire or rescue, as more labor ability is delivered on the Quint.

The additional staffing on the Quint would be Firefighter/EMTs, and would cost approximately \$250,000 annually.

16. Staffing relief factor for line personnel

The Department utilizes two distinct staffing models for planning and implementing personnel resource allocation for the various division functions. The Administrative, Training, and Fire Prevention 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 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 currently used for the Operations Division is referred to as a constant staffing model. This particular model requires having enough personnel to cover any leaves 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 current relief factor used for staffing this division is 3.47. This factor is calculated using the following formula:

The current minimum staffing is three firefighters on all fire suppression apparatus (four) and two firefighters on each medic unit (three), along with one Battalion Chief. This totals 19 personnel for each 24 hour work period.

Based on the current benefit package and average length of time in position for Emergency Response Operations Division personnel, eligible leave for personnel assumptions are as follows: 5.6 work periods of Sick Leave; 7.0 work periods of Vacation Leave and 1.5 work periods of Administrative 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 are allowed to attend various schools, seminars and trainings which will typically average one work period for each personnel every year. This totals approximately 15 work periods of eligible leave for each person annually. Therefore, a total of 285 work periods (19 X 15) will be vacated and needing replacement coverage annually.

365 days are covered by three separate shifts (A Shift, B Shift & C Shift); therefore each firefighter would be scheduled for 121.6 work periods annually. This number minus the 15 work periods of eligible leave will result in each firefighter being available to work 106.6 work periods annually.

To cover the 285 work periods of leave that will need to be covered on each shift throughout the year, three additional firefighters will need to be available on each shift daily ($285 / 106.6 : 2.67 : 3$).

This will require 22 (19 + 3) firefighters available to work on each shift to adequately cover eligible leave and personnel vacancies.

The department's relief factor of 3.47 is calculated by dividing the number of firefighters available to work on each shift (22) by the number of firefighters required to meet minimum staffing (19) multiplied by the three shifts which are necessary to cover the 365 days annually ($22 / 19 : 1.157 \times 3 : 3.47$).

What this actually means is that for each seat that needs to be filled for each work period, we require 3.47 firefighters to ensure minimum staffing needs are met on a constant basis and overtime expenditures are minimized.



However, the current relief factor of 3.47 is not a constant number, this number may vary. Factors that could affect this number would be changes to minimum staffing levels 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 3.5, Littleton Fire Rescue has a relief factor of 3.67, and West Metro Fire Rescue has a relief factor of 3.48. As this information demonstrates, the department's relief factor of 3.47 is very comparable to other local departments that utilize the constant staffing model.

17. Indicators for additional engine companies to existing stations

As with any operation, engine 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. **The maximum sustained call volume a station can effectively handle is 10 calls per day without significant drops in level of service.** At this rate, unit reliability could drop below 50%, with half of the station's calls being handled by surrounding stations. When a station reaches a sustained call volume of 7 calls per day, additional station resources, such as an additional engine company should be considered. Measures to decrease call volume, such as discontinuing non-emergent lock-out responses or implementing fire alarm single unit responses could also be considered. This would equate to a decrease in the level of service currently provided to the community.

18. Probable additional engine company timeline

No additional engine companies are anticipated during the projected period represented by the 2014-2019 Fire Master Plan.

19. Indicators 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 per 24 hour period is 8 calls. When a medic unit reaches this volume on a regular basis, reliance on surrounding units will also rise as they cover calls in the originating district. The out of service time per call has been influenced in a positive way by the opening of Castle Rock Adventist Hospital.



20. Probable additional medic unit timeline

At the time of this writing it is too soon to tell what the influence will be, but any potential need has been pushed beyond the foreseeable future.

21. Indicators for additional Battalion Chief staffing

The Battalion Chief (BC) responds to major calls and calls that are complex in nature. Due to this complexity, the calls have a tendency to last between 30 minutes to several hours. The BC is also responsible for his or her entire shift, all operations of the day, and special duties as assigned, which require approximately 10-12 hours per day. With this demand in mind, the BC has a sustained call capacity maximum of 6 calls per day before an additional Battalion Chief per shift should be considered.

Additionally, the Battalion Chief is responsible for direct supervision of the officers assigned to each station or suppression apparatus. Under adopted management practices, the supervisor to employee ratio can range from 1:3 up to a max of 1:7 with 1:5 being optimal. Currently, this ratio is 1:4, meaning the Battalion Chiefs directly supervise four officers. In order to ensure there is no reduction in level of service, the 1:5 ratios should be used to ensure Battalion Chief effectiveness. If additional stations are built or apparatus are added to existing stations, this will result in the addition of one officer per station or apparatus. Based on the station and apparatus projections above, three more officers per shift could be added to the existing personnel ranks, and this would raise the ratio to 1:7. Therefore, an additional Battalion Chief per shift should be considered when the ratio meets 1:5, and implemented when the ratio exceeds 1:6.

22. Probable additional Battalion Chief

No increase anticipated for the 5 year planning period. However, if additional resources are needed for FPZ 9, in addition to the Crystal Valley station, sooner than the projected time frame, then an additional Battalion Chief per shift may need to be added to manage these increased resources.

23. Apparatus Placement

Apparatus should be placed to meet the needs of the Town and to maintain the level of service. The minimum requirement for each station should be an engine and brush truck. Additional units such as medics or aerial apparatus should be implemented to maintain the level of service throughout the Town as determined by the Standards of Cover, or to improve the ISO rating of the department, thus reducing homeowner insurance premiums.

24. Life Safety Division staffing

Criteria for the maintenance of the level of service provided by the Life Safety Division are being developed and will be added to the Master Plan as an amendment.



25. Fire Training Division Staffing

Criteria for the maintenance of the level of service provided by the Training Division are being developed and will be added to the Master Plan as an amendment.

26. Public Safety Training Facility

The current Public Safety Training Facility (PSTF) is in a temporary location that has a maximum lease period of 3-4 years. This would require the PSTF to be built and occupied no later than 2018. This current facility is helping to identify actual building needs of the facility, and has made it very likely that the permanent facility will be similar to this structure in size and building type, which is an industrial metal building. This building type with a standard tenant finish should cost approximately \$1.5million in 2018. Design, site improvements, infrastructure, water taps, permitting fees and a 15% contingency would cost an additional \$2.8million. The Town Space Study identified the need of a training facility and recommended that it be located in the 17 acre abandoned water treatment plant located at the end of Caprice St. The Department will be conducting a site environmental assessment in anticipation of construction of the permanent PSTF. Availability of infrastructure and potential hazardous materials mitigation will strongly influence the cost of the project. With the construction of the PSTF to begin in 2017 for completion in 2018, the revised cost estimate is \$4.3million.

Financial planning for this endeavor will need to begin in 2015 in order to meet this objective and establish budgetary limits.

27. Administrative Assistant

An additional administrative assistant is planned for 2017. This position will be vital to meeting the growing workload currently being faced by the administrative staff, and the additional demand placed on the department with the opening of a new station.

28. Logistics Technician

With the addition of an additional station and related equipment, consideration should be given to adding an additional Logistics Technician (LT). The technician is responsible for all equipment repairs, testing, and maintenance. Additionally, the technician coordinates apparatus repairs, maintains apparatus records, supplies department personnel with PPE, uniforms, and equipment, and maintains all department radios. There is no replacement for the Logistics Technician, so when leave is taken, these duties are not completed, or are completed on an emergency basis by administrative staff and the Operations Chief. It would be prudent to employ an assistant technician in 2016 in order to have this person trained by the current LT as he is planning on retiring at the end of 2016.



29. Conclusion

In conclusion, this plan meets multiple requirements of the Commission on Fire Accreditation International's (CFAI) Self-Assessment Manual and Accreditation process. Specifically, it meets the following criterion, core competencies, and performance indicators: Criterion 2A, Documentation of Area Characteristics, which states, "The agency collects and analyzes data specific to the distinct characteristics of the community served and applies the findings to organizational planning."

Performance Indicator, 2A.2, "The agency organizes the community into geographic planning zone(s) for purposes of analyzing service provision."

Core Competency, 2A.3, "The agency analyzes the community by service area/population density for the purpose of developing total response time standards."

Core Competency, 2B.1, "Each planning zone and population area is analyzed and risk factors are evaluated in order to establish a standards of response coverage."

Criterion 3A, Goals and Objectives, which states, "The agency has established general goals and specific objectives that direct the agency's priorities in a manner consistent with its mission and appropriate for the community it serves."

Core Competency, 3A.1, "The agency publishes general organizational goals directed toward achieving the agency's long-range plans. Corresponding specific objectives are published to implement these goals and incorporate the measurable elements of time, quantity, and quality."

Core Competency, 5A.1, "Given the agency's standards of response coverage and emergency deployment objectives, the agency meets its staffing, response time, pumping capacity, apparatus and equipment deployment objectives for each type and magnitude of fire suppression emergency incidents."

Criterion 6A, Physical Resources Plan, which states, "Development and use of physical resources is consistent with the agency's established plans. A systematic and planned approach to the future development of facilities is in place."

Performance Indicator, 6A.1, "The development, construction, or purchase of physical resources is consistent with the agency's goals and the strategic plan."

Core Competency, 6A.2, "The governing body, administration and staff are involved in the planning for physical facilities."



Criterion 6B, Fixed Facilities, which states, “Fixed facility resources are designed, maintained, managed, and adequate to meet the agency’s goals and objectives.”

Core Competency, 6B.3, “Physical facilities are adequate and properly distributed in accordance with stated service level objectives and standards of response coverage.”

Criterion 6C, Apparatus and Vehicles, which states, “Apparatus resources are designed and purchased to be adequate to meet the agency’s goals and objectives.”

Core Competency, 6C.1, “Apparatus are located strategically to accomplish the stated standards of response coverage and service level objectives.”

While this plan meets the stated criterion, core competencies, and performance indicators, this plan is only one component of the overall accreditation process. When used in conjunction with the Strategic Plan, Self-Assessment, and Standards of Cover, these documents provide the basis for the department’s future, enables the department to remain accredited, and further allows the department “To Be the Best at Providing Emergency and Prevention Services.”