



**Red, White & Blue FPD
Summit Fire & EMS Authority
Summit County Ambulance Service**

Summit County, Colorado



OPERATIONAL ANALYSIS OF THE EMS DELIVERY SYSTEM

August 2018



**Emergency Services
Consulting International**

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The various members of the Boards of Directors of the
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*...and all of the men and women of the Summit County
emergency services delivery system, who daily serve their
community with honor and distinction.*

ORGANIZATION & SYSTEM OVERVIEW

The following section is general description of Summit County, the various components of the Emergency Medical Services (EMS) system, and the primary providers of emergency medical services. This section will focus on the Summit County Ambulance Service (SCAS), Summit Fire & EMS (SFE), and the Red White & Blue Fire Protection District (RWB); but will also address other significant components of the EMS system.

Summit County

Located in the central Rocky Mountain region of Colorado, Summit County is comprised of 619 square miles, of which just over 98% (608 square miles) is land, with the remaining area being almost 2% water. Much of the land consists of mountainous terrain, with elevations ranging from 7,957–14,270 feet. There are 145 road miles in the County, of which 90 miles are asphalt-surfaced, and 55 miles are gravel-surfaced. In addition, there are 73 miles of forest service roads, which are unimproved (dirt) roads, and 25 miles of recreational pathways. The road network presents challenges to emergency services organizations, especially during times of extreme weather conditions. Summit County averages about 175 inches of snow annually, and about 21 inches of rain. The historical low average temperature in January is 7° F, while the average temperature in July has been 72° F. On average, there are 245 sunny days annually.

There are four primary population centers that include Breckenridge, Frisco, Silverthorne, and Dillon. The largest town is Breckenridge, which also serves as the County seat. The incorporated towns of Blue River and Montezuma, and the unincorporated areas of Keystone, Copper Mountain, Wildernest, Mesa Cortina, Dillon Valley, Summit Cove, Peak 7, and Heeney comprise the remaining population centers. The estimated 2016 permanent population ranged from 30,367–30,374 persons (estimates vary slightly between the U.S. Census Bureau and Colorado State Demographer).

Summit County is approximately 65 miles west of Denver. Its proximity to a large metropolitan community makes it a popular year-round destination for a variety of recreational activities. Recreation-based tourism is the dominant basic industry in Summit County.¹ It is home to four major ski areas (Arapahoe Basin, Breckenridge, Copper Mountain, and Keystone), which provide a wide variety of winter sports, and attracts several million skiers annually. During the summer months, the Blue River, Lake Dillon, and the Green Mountain Reservoirs provide fishing, boating, and other water-related activities. According to an article in the Summit Daily, Summit County has recently seen a record-breaking building boom in commercial properties, luxury homes, and spec homes.²

Local Governance & Authority

Summit County government operates under the authority of a three-member, elected Board of County Commissioners. The Board serves as the legislative and policy-setting body for County government, authorizes programs and all expenditures of County funds, and enacts countywide regulations. The County has also adopted its own “EMS Rules & Regulations” via Resolution 2012-19. Colorado statutes specify the powers of county governments, which include the authority to grant licenses to operate an ambulance service.^{3,4}

The *Summit County Emergency Services Authority* (ESA) was formed several years ago as an informal planning consortium comprised of the Summit County Ambulance Service, the Red, White & Blue Fire Protection District, and Summit Fire & EMS (previously the Copper Mountain Consolidated Metropolitan Fire District and Lake Dillon Fire District). The purpose of the ESA was to develop plans and strategies to meet the increasing demands for service.

Summit County EMS Provider Organizations

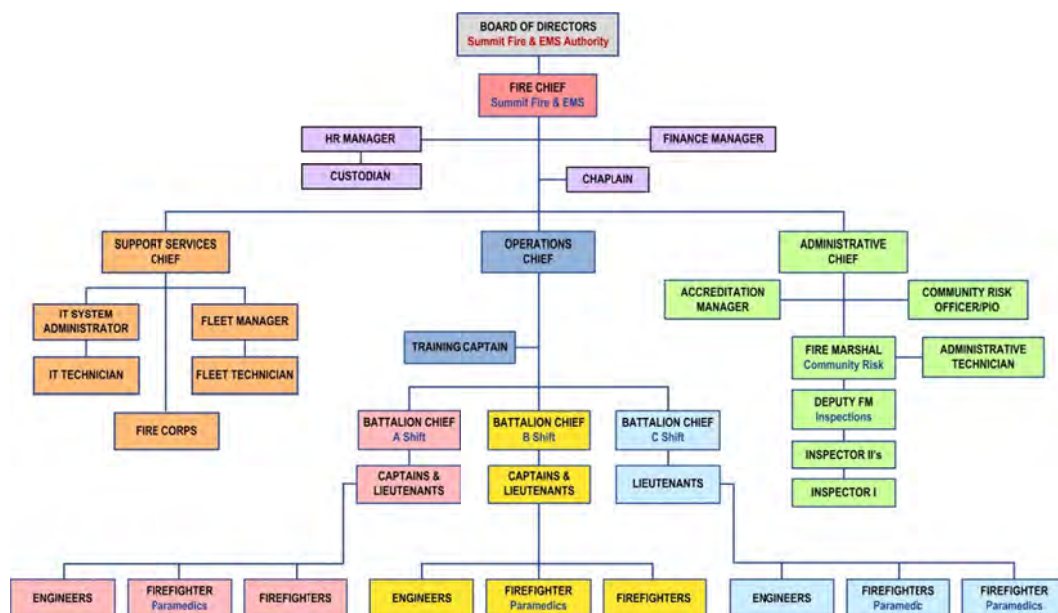
For this study, ESCI will evaluate three primary prehospital provider organizations. The following section contains a basic description of each of these agencies. More detail will be provided in later sections of this report.

Summit Fire & EMS Authority

The Summit Fire & EMS Authority (SFE) is a new organization that resulted from a recent functional consolidation of the Copper Mountain Fire Department (a part of the Copper Mountain Consolidated Metropolitan District) and Lake Dillon Fire-Rescue (Lake Dillon Fire Protection District) that began in January 2018. The intent was to eventually form the organization into a regional fire authority (RFA), if approved by the electorate. The process occurred through an intergovernmental agreement (IGA) between the two districts (one being a fire district and the other a metropolitan district), which became effective January 1, 2018. SFE assumed the contract with the Lower Blue Fire Protection District (LBFPD) to provide fire protection services to the northern end of the County. The new district is comprised of an area of 425 square miles, serving a permanent population of approximately 19,521 persons, and an *estimated* peak population of approximately 50,000.

SFE is governed by a five-member elected Board of Directors. The Fire Chief is an at-will employee who answers directly to the Board.

Figure 1: Summit Fire & EMS Organizational Chart (2018)



SFE employs more than 90 personnel. The department employs its own Human Resources Manager and Finance Manager. The Support Services Chief is responsible for information technology, fleet maintenance, and the Fire Corps program. The Administrative Chief is responsible for the Community Risk Division and the accreditation process in accordance with the *Commission on Fire Accreditation International* (CFAI).

Summit Fire & EMS maintains four staffed fire stations, along with an administration building and two vacant fire stations utilized primarily for storage. SFE maintains 63 full-time operational personnel. Administrative and support staff are comprised of 14 full-time personnel, 12 volunteers, and one part-time person. Operations personnel are assigned to one of three shifts, each of which is supervised by a Battalion Chief (BC), along with Captains and Lieutenants. Operations personnel consist of Engineers, Firefighter/Paramedics, and Firefighters

SFE General Operations

SFE deploys apparatus from each of their staffed fire stations, with a minimum staff of three firefighters per station. An engine company at each station is typically staffed as the first-due apparatus; although ladder trucks, wildland apparatus, and other vehicles are cross-staffed from the engines when necessary. The on-duty shift Battalion Chief is deployed from Station 8.

Summit Fire & EMS is an all-hazards organization that provides the conventional services typical of most fire departments: fire suppression, rescue, hazmat, and medical first-response (MFR) at the advanced life support (ALS) level utilizing Firefighter/Paramedics. In addition to these services, SFE provides supplemental staffing for the Summit County Ambulance Service. The department does not currently operate its own medic units.

Red, White & Blue Fire Protection District

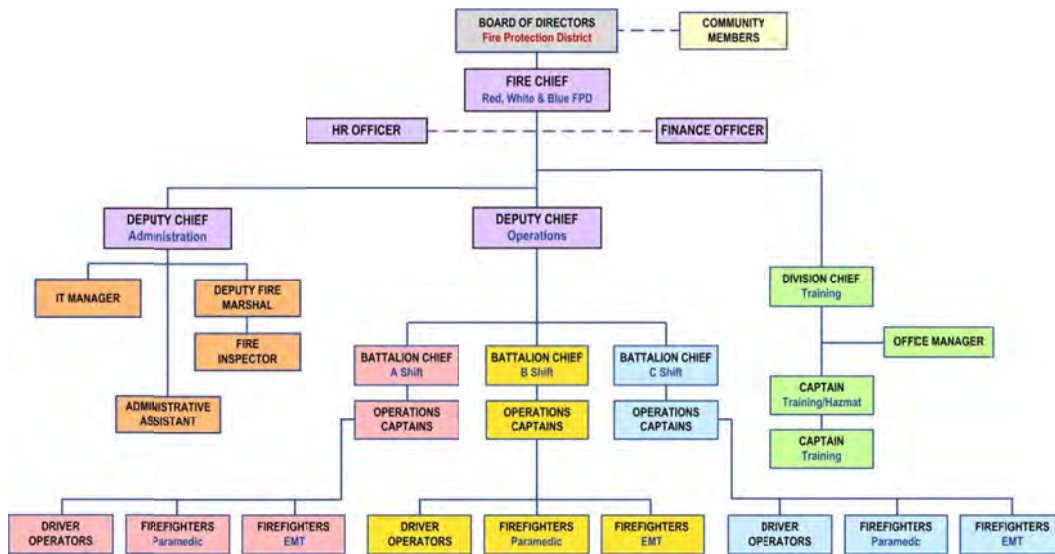
Formed in 1976, the Red, White & Blue Fire Protection District (RWB) is comprised of a service-area of about 138 square miles, with a permanent population of approximately of 9,664 persons.⁵ Depending upon the season, the daily population in the district may peak to more than 58,000 persons.⁶ RWB has recently renewed its accreditation through CFAI for 2017–2022, and is currently seeking accreditation (in cooperation with SCAS) through the *Commission on Accreditation of Ambulance Services* (CAAS).

The District is overseen by a five-member elected Board of Directors. The Fire Chief is hired under an annual contract and answers directly to the Board. RWB maintains its own Human Resources Officer and Finance Officer.

RWB has a total of 58 personnel to include 9 administrative and support staff. A Deputy Chief of Administration is responsible for information technology and fire prevention services. The Deputy Chief of Operations is responsible for three shifts, with a Battalion Chief assigned to each. Operations personnel are comprised of Captains, Driver Operators, Firefighter/Paramedics, and Firefighter/EMTs. The department has 46 personnel assigned to Operations.

The following figure represents the current organizational chart for the Red, White & Blue Fire Protection District.

Figure 2: Red, White & Blue Organizational Chart (2017)



RWB General Operations

RWB operates from four fire stations and is an all-hazards organization that provides the conventional services typical of most fire departments: fire suppression, rescue, and medical first-response (MFR) at the advanced life support (ALS) level utilizing Firefighter/Paramedics. In 2007, RWB purchased and placed into service its first two medic units because of “slow responses and service” from SCAS.

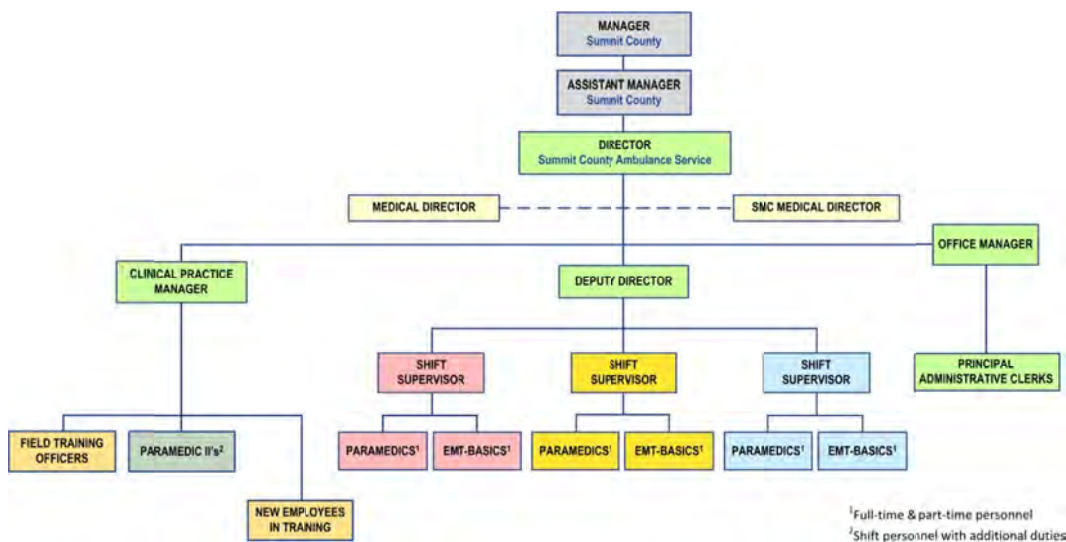
In addition to MFR, the department provides ALS transport through the deployment of a minimum of two medic units, each with two-person staffing—although additional medic units may be placed in service during increased seasonal demands. In some cases, these units are cross-staffed with personnel from an engine or truck company. Summit County has not granted RWB its own license to operate an ambulance service, but instead, RWB operates under the license of the Summit County Ambulance Service. However, RWB owns their medic units, staffs them with their personnel, provides all durable and disposable supplies, and covers all vehicle maintenance costs.

Summit County Ambulance Service

The Summit County Ambulance Service (SCAS) is owned and operated as a “third service” under the auspices of Summit County government. They serve the entire County of about 619 square miles, with an estimated permanent population of 30,367–30,374 persons, and an estimated countywide peak population ranging from 125,000–150,000. The SCAS Director reports directly to the Summit County Assistant Manager. The Deputy Director is primarily responsible for operations, with a Shift Supervisor assigned to each of the three shifts.

The Clinical Practice Manager (CPM) is responsible for the Field Training Officers (FTO) and new employees attending orientation and additional training. The CPM coordinates EMS training for SCAS, SFE, and RWB, and utilizes Paramedic IIs to assist with training and continuing medical education (CME) activities. The Office Manager and subordinates provide administrative support and billing services. Ambulances are staffed with single-role EMTs and Paramedics. SFE supplements SCAS staffing with one firefighter per shift.

Figure 3: Summit County Ambulance Organizational Chart (2017)



SCAS General Operations

SCAS operates an ALS ground emergency medical transport (GEMT) service from its headquarters station in Frisco, but will be moving to SFE Station 2 in the near future. In addition, the service leases or owns space at SFE Stations 1, 8, and 11, and RWB Station 4. Minimum ambulance staffing is one Paramedic (aka “medic”) and one EMT. SCAS owns four Type III and five Type I ambulances, along with a command unit assigned to the Shift Supervisors.

Air Ambulance Service

Flight for Life® (FFL) Colorado is an accredited organization operated by *Centura Health*, providing air ambulance and critical care transport services throughout the state. Their helicopters operate within a 120-mile radius of each of their five operational bases. In Summit County, *Lifeguard Two* is based at St. Anthony Summit Medical Center in Frisco.

In addition to its rotary wing service, the organization provides critical care ground transport ambulance service, aerial search support, and maintains an *Avalanche Deployment Program*. Their critical care transport unit is designated as *Terra Two*, which is stationed and deployed from St. Anthony's in Frisco. It is used as an alternative transport unit when weather conditions prevent the helicopter from flying. Terra Two utilizes specially trained nurses, paramedics, EMT-Basics, and respiratory therapists. SCAS previously provided billing services on behalf of Terra Two, but this was discontinued in 2018.

Training Center

The *High Country Training Center* (HCTC) operates under the auspices of the *Summit Fire Authority* (SFA), which is a joint training organization funded and supported by RWB and SFE; with some training provided by SCAS. The HCTC was originally created as a result of the efforts of CMFD, RWB, and LDFR, as well as other predecessor fire districts prior to the consolidation of CMFD and LDFR. Currently, it comprised of RWB and SFE. Phase A of the project was done in 1999, with Phase B completed in 2002.

HCTC maintains a broad range of fire and EMS training equipment, facilities, and props, as well as a fully equipped classroom and office facilities. The Center is utilized regularly by other local agencies such as law enforcement and various rescue-related organizations. HCTC personnel are employees of RWB, which administers and manages the Center. The staff includes two employees of RWB functioning as the Office Manager and Training Captain; with a second Training Captain employed by SFE. In accordance with an agreement, these employees are overseen by the Operations Chiefs of SFE and RWB.

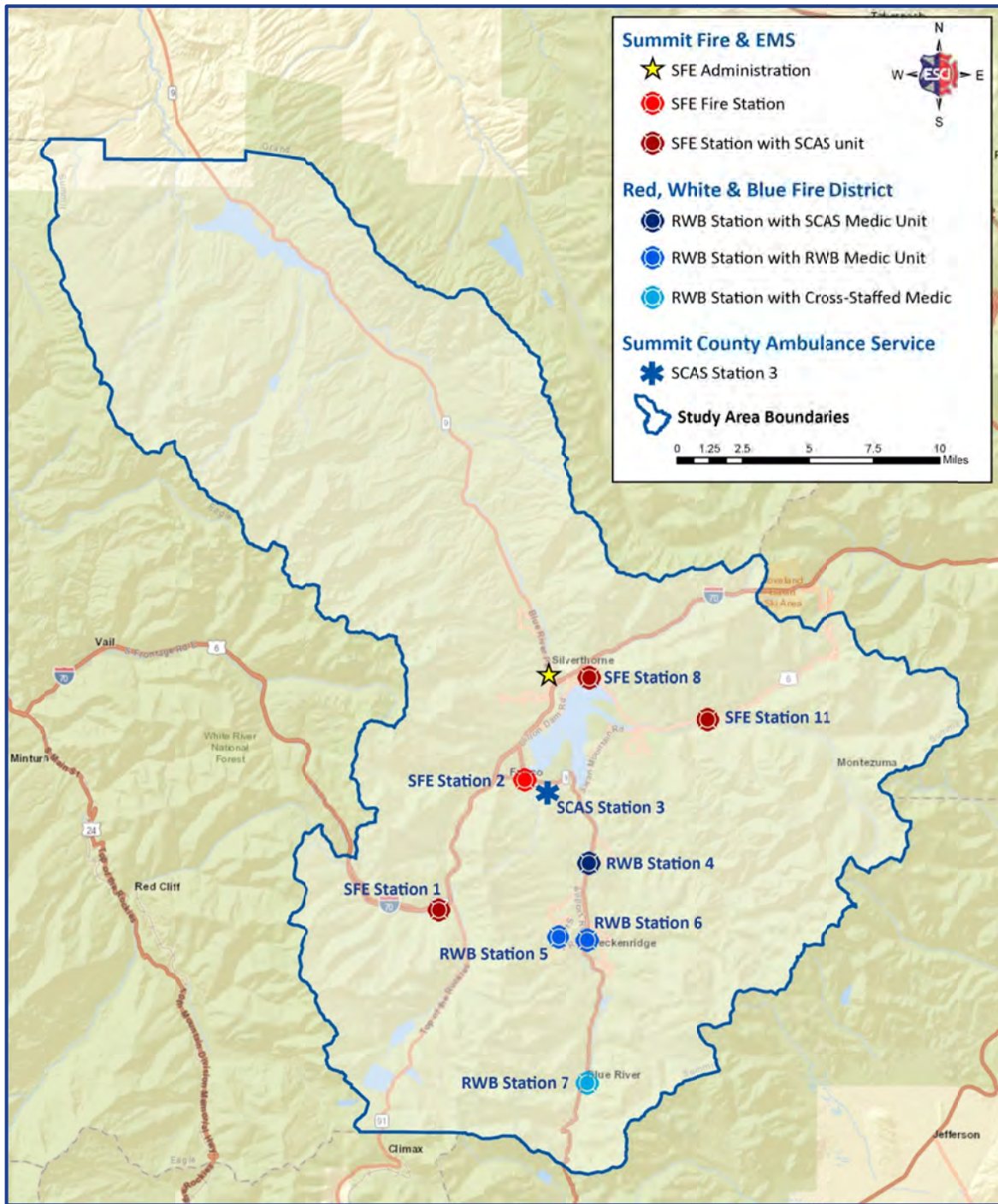
The SFA's operating budget is funded by fire district assessments, rental income, interest income, and revenue generated through classes and seminars, with most of the funding provided by the fire districts. In its annual report, for Fiscal Year 2017, SFA projected revenue of \$515,661 from the fire districts; \$10,530 in rental income; and \$7,166 from the sale of surplus training equipment, for a combined total of \$580,364 (an 8% increase over 2016). The report also projected FY 2017 expenses to be \$524,078 (6% over 2016), of which salary and wages accounted for most of costs.

Service Area

Both departments (Summit Fire & EMS and the Red, White & Blue FPD) provide an all-hazard response that includes fire suppression, emergency medical response, rescue, and other emergencies requiring mitigation throughout their respective response zones. In addition, they also provide both MFR and ground emergency medical transport in association with the Summit County Ambulance Service.

The following image is a GIS representation of Summit County and the locations of the various fire stations and locations of the medic units assigned to those stations, including SCAS Station 3—which does not house fire apparatus. In this report, the boundaries illustrated in this figure will represent the study area.

Figure 4: Summit County Study Area



Emergency Communications

The *Summit County 911 Center* is a department within Summit County government. It serves as the community's primary public safety answering point (PSAP) for all 911 calls initiated within the County. In addition, the Center provides dispatch and communications for nearly all public safety agencies, except for Flight for Life® and the Colorado State Patrol—both of whom operate their own dispatch centers based out of Denver.

The Center's dispatchers are trained and certified in *Emergency Medical Dispatch* (EMD) and provide pre-arrival instructions—such as cardiopulmonary resuscitation (CPR)—to 911 callers. The Center employs twelve full-time dispatchers, three supervisors, and several administrative and technical support staff. Minimum staffing for most days is two dispatchers, with one dispatcher on duty during the slower early morning hours. In the near future, the capacity to provide automatic vehicle location (AVL) technology will be added to the system.

Communications center technicians are responsible for maintaining all communications equipment and eight radio communication towers and sites located throughout the County. Information Technology (IT) administrative staff are responsible for the computer equipment, computer-aided dispatch (CAD) software, and other IT-related activities. Additionally, other technicians are responsible for various electronic databases.

Medical Direction & Medical Control

The Medical Director oversees all prehospital medical care provided by Summit County EMS personnel. Dr. Peter Vellman enjoys widespread support and an excellent local and statewide reputation. He works and resides in the Denver area, and infrequently travels to Summit County to interact with the EMS personnel. Dr. Vellman has chaired the Denver Metro EMS Medical Directors (DMEMSMD) group for the last 27 years. His role in quality management is typically done through phone and conference calls. St. Anthony Summit Medical Center (SMC), located in Frisco, provides online medical control. A local emergency physician provides additional oversight of the local EMS providers in association with the Medical Director.

Hospitals & Clinical Facilities

As part of the Centura Health network, St. Anthony Summit Medical Center provides a wide range of medical specialties and healthcare services. SMC is the busiest Level III Trauma Center in Colorado. The Center maintains a fully staffed emergency department with access to trauma surgeons and other specialists. Serious cases outside the capabilities of SMC are transported via Flight for Life, St. Anthony's Terra Two critical care ground transport unit, or one of the local transport agencies in Summit County.

Mountain Clinics

During the ski season, St. Anthony staffs and operates "mountain clinics" at the Breckenridge, Copper Mountain, and Keystone resorts. These mountain clinics are staffed with physicians and nurses trained in critical care, while emergency medical care at Arapahoe Basin is provided by the ski patrol. Each of the clinics has been designated as Level V Trauma Centers. In Summit County, transports from these facilities to SMC are considered in-county interfacility transports.

EMS Operations & Deployment

The following figure lists an overview of Summit County resources, excluding reserve units, by agency.

Figure 5: Overview of EMS-Response Resources in Summit County

Station & Units ¹	Level ²	Minimum Staffing	Days Scheduled	Hours ³
SUMMIT FIRE & EMS				
Station 1				
Engine 1	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Medic 1 (SCAS)	ALS	2 (medic, EMT)	Friday–Monday ⁴	12 hours
Station 2				
Engine 2	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Station 8				
Engine 8	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Medic 8 (SCAS)	ALS	2 (1 from SFE & 1 from SCAS)	Sunday–Saturday	24 hours
Station 11				
Engine 11	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Medic 11 (SCAS)	ALS	2 (medic, EMT)	Sunday–Saturday	24 hours
RED, WHITE & BLUE FPD				
Station 4				
Medic 4 (SCAS)	ALS	2 (medic, EMT)	Sunday–Saturday	12 hours
Engine 4	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Station 5				
Medic 5	ALS	2 (firefighter, medic)	Sunday–Saturday	24 hours
Engine 5	ALS	Cross-staffed with Medic 5	Sunday–Saturday	<i>As needed</i>
Station 6				
Medic 6	ALS	2 (firefighter, medic)	Sunday–Saturday	24 hours
Truck 6	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Station 7				
Engine 7	ALS	3 (officer, firefighter, medic)	Sunday–Saturday	24 hours
Medic 7 ⁵	ALS	Cross-staffed with Engine 7	Sunday–Saturday	<i>As needed</i>
SUMMIT COUNTY AMBULANCE SERVICE				
Station 3 (headquarters)⁶				
Medic 3	ALS	2 (medic, EMT)	Sunday–Saturday	24 hours

¹List does not include all fire apparatus assigned to each station

²Refers to type of equipment and supplies carried on apparatus/vehicle (ALS, ILS, BLS)

³Days and hours apparatus or unit is staffed; 12-hour units scheduled 1000–2200 hours

⁴Staffed seasonally winter & summer

⁵Surge unit. If staffed, usually moved up to Station 6

⁶Station 3 will be vacated in the near future, and Medic 3 moved to SFE Station 2

Summit Fire & EMS Deployment

Summit Fire & EMS deploys four-person (three-person minimum), ALS-equipped and staffed engine companies from four fire stations within its service area. Medic 8 and Medic 11 are two-person SCAS ambulances deployed from Stations 8 and 11. Each is staffed and scheduled 24 hours daily, year-round. Beginning in 2018, SFE began providing a single firefighter EMT or Paramedic as the second EMS provider on Medic 8 (previously, SFE provided two personnel). SCAS Medic 1 is a seasonal (winter and summer) peak-demand, 12-hour ambulance scheduled Fridays through Mondays.

Red, White & Blue Deployment

RWB deploys its apparatus and medic units from four stations. Engines 4 and 7 are ALS-equipped and staffed with a minimum of three firefighters. Truck 6 is similarly equipped and staffed. RWB Medic 5 is staffed with two firefighters, and cross-staffs Engine 5 when necessary, in order to address high-rise fire suppression incidents in the adjacent hotel complex. Medic 4 is staffed with SCAS personnel as a 12-hour peak-demand unit operating year-round. RWB Medic 7 is a "surge unit," and is cross-staffed by the Engine 7 crew when necessary. When this occurs, Medic 7 typically moves up to Station 6.

Summit County Ambulance Service Deployment

As mentioned previously, SCAS deploys four ambulances from SFE and RWB fire stations, as well as one from its headquarters location (Station 3). Medic 3, Medic 8, and Medic 11 are staffed 24 hours daily, year-round; while the others are a combination of 12-hour, peak-demand units scheduled seasonally, and/or four days per week (Fridays through Mondays). SCAS headquarters will move in 2018 to a new joint administrative building that will be shared with SFE. Medic 3 will then be moved to SFE Station 2.

The next figure lists the deployment locations and schedules of each of the SCAS medic units.

Figure 6: SCAS Medic-Unit Station Locations & Schedules

SCAS Medic Unit	Station Location	Days Scheduled	Hours
Medic 1	SFE Station 1	Friday–Monday ¹	12 hours
Medic 3	SCAS Headquarters	Sunday–Saturday	24 hours
Medic 4	RWB Station 4	Sunday–Saturday	12 hours
Medic 8	SFE Station 8	Sunday–Saturday	24 hours
Medic 11	SFE Station 11	Sunday–Saturday	24 hours

¹Staffed seasonally winter & summer

Scene Responses

When dispatched to local 911 EMS incidents within their service area, the closest fire apparatus is dispatched as an MFR unit, along with the nearest SCAS or RWB medic unit. Patients requiring definitive medical care and ambulance transport are subsequently transported to Summit Medical Center in Frisco; or, if patient condition merits a higher level of care, to another facility outside the County.

Out-of-County Interfacility Ground Transports

Each year hundreds of patients are transferred by medic unit from Summit Medical Center to another hospital or tertiary care facility—most often to one in the Denver metropolitan area. There are several reasons for this, including: high-acuity patients requiring treatment beyond the capabilities of SMC; patients who reside in the Denver metropolitan (or other areas); and/or because of a lack of available bed space or overload at SMC. Being the busiest Level III Trauma Center in Colorado, SMC may often reach its capacity to admit patients or maintain them in the emergency department for extended periods.

A previous study in 2016 showed the duration of OOC transports averaged nearly 4 hours, 21 minutes during June 1, 2015 through May 31, 2016.⁷ This same study reported 775 OOCs, or just over 2.1 per day. During that 12-month period, the report determined that two or more OOC transports occurred simultaneously 40% of the time.

Out-of-County Transports Discussion

The demand and responsibility for out-of-county interfacility transports (IFT) has a long history of significant controversy between Summit County government and the fire districts. Long OOC transports to the Denver-metropolitan and other areas reduce available fire department staff and resources for extended periods. Much of the controversy surrounds a difference in philosophies in response-readiness, capabilities, and divergent missions between the agencies. Some of the agencies tend to take the position that SMC is responsible for using other means to transport “their” patients to other facilities, but recognize that it is necessary for all transport agencies to provide at least some—but not all—of the IFTs.

Although prior studies have indicated that the volume of OOCs may have a minimal impact on each fire district’s respective ability to respond to other incidents, there are likely intangible negative effects that are not easily measured. Frequent OOCs *may* be contributing to physical, emotional, or mental exhaustion; along with occasional sleep deprivation among personnel assigned to the medic units. In the early 1980s, two ambulance crewmembers were killed while returning from an OOC transport. Apparently, sleep deprivation and/or fatigue contributed to the accident. It is beyond the scope of this study to definitively determine the effects of this factor, but it should be of concern among all component agency policymakers and leadership. Potentially, this could be mitigated through an equitable distribution of OOC transports among the Summit County emergency medical transport providers.

OPERATIONAL & ADMINISTRATIVE STAFFING

Overview of the Organizations

Managing personnel to achieve maximum efficiency, professionalism, and personal satisfaction is art as much as science. Consistency, fairness, safety, and opportunities for personal and professional growth are key values in a healthy management culture. This section provides an overview of the staffing configurations and management practices for the three organizations providing ground emergency medical transport in Summit County.

In this section of the staffing analysis, the ratio of administrative and support positions to total organizational staffing for each of the three agencies is compared to industry best practices and similar organizations. An appropriate balance of administration and support staff, compared to operational resources and service levels, is an important consideration to achieving organizational success.

In Summit County, the licensing, administration, and billing collection of the countywide ambulance transport program rests with Summit County government. Within the past five years, the key provider stakeholders: Summit County Ambulance Services, Copper Mountain Consolidated Metropolitan District, Red, White & Blue Fire District, and Lake Dillon Fire District formed the *Emergency Services Authority* (ESA)—an informal planning consortium organized to develop plans and strategies to meet the increasing demands for service and reductions in ambulance fee revenues.

Several national organizations recommend standards to address staffing issues. The *Occupational Health & Safety Administration* (OSHA) Respiratory Protection Standard, and the *National Fire Protection Association* (NFPA) Standard 1710 or 1720; (whichever is applicable) are frequently cited as authoritative documents.^{8,9,10} In addition, the *Center for Public Safety Excellence* (CPSE) publishes benchmarks for the number of personnel recommended on the emergency scene for various levels of risk.

All firefighters in the County, as well as SCAS field personnel, are trained and certified as Emergency Medical Technicians or Paramedics consistent with Colorado State regulations.¹¹ However, SCAS is the only licensed ambulance transport provider in Summit County. None of the employees or agencies is subject to union bargaining agreements.

The following section reviews the administration, support, and operations organizational structure of each provider agency.

Summit Fire & EMS Authority

Effective January 1, 2018, the Lake Dillon and Copper Mountain Consolidated Metropolitan Fire Districts merged, creating the *Summit Fire & EMS Authority*. ESCI did not review the integration of staff, or any additions or reduction of positions related to the merger. Instead, ESCI focused on the current staffing levels, and the deployment and services provided by the newly formed “agency.” SFE firefighters are cross-trained, dual-role EMTs and Paramedics.

The following figure shows the allocation of the various administrative and support positions within Summit Fire & EMS. Not shown in the following figure is a Training Captain employed by SFE and assigned to the High Country Training Center.

Figure 7: SFE Administrative & Support Positions & Salaries (2018)

Administrative & Support Positions	No. of Positions	Hours per Week	Annual Salary ^A
Full-Time (8 or 10-hour daily work schedule)			
Fire Chief	1	40	\$136,380
Assistant Chief	3	40	\$103,846
Administrative Technician	1	40	\$38,314
PIO/Community Risk Officer	1	40	\$65,270
Human Resources Manager	1	40	\$74,981
Finance Manager	1	40	\$91,682
IT System Administrator	1	40	\$79,161
IT Technician	1	40	\$48,277
Fleet Manager	1	40	\$78,624
Fleet Technician	1	40	\$50,249
Fire Marshal	1	40	\$88,209
Deputy Fire Marshal	1	40	\$60,523
Fire Inspectors	2	40	\$79,141
Total:	17		

^ASalaries represent an average between bottom and top step

SFE is self-sufficient in providing administrative support functions, including: human resources; financial management; fleet and capital equipment maintenance; and information technology. Fleet maintenance is shared with RWB. This arrangement enables SFE to provide its own internal specialized, custom support services. The level of administration and support staffing represents just over 23% of the total workforce.

The next figure lists the position titles, number of positions, average hours worked per week, and starting salaries of individuals assigned to emergency operations at Summit Fire & EMS. The department also maintains one Chaplain and 14 members of the Fire Corps.

Figure 8: SFE Operations Positions & Salaries (2018)

Operations Positions	No. of Positions	Average Workweek	Annual Salary ^A
Full-Time (48-hour shifts)			
Battalion Chief	3	56 hours	\$96,622
Captain	3	56 hours	\$89,696
Lieutenant	9	56 hours	\$85,424
Engineer	12	56 hours	\$74,824
Firefighter Technician/EMT-B	7	56 hours	\$60,711
Firefighter/EMT-B	10	56 hours	\$56,602
Firefighter/Paramedic	12	56 hours	\$74,824
Total:	56		

^ASalaries represent an average between bottom and top step, with routine overtime

The next figure illustrates the scheduling methodology and services provided by operations personnel at Summit Fire & EMS.

Figure 9: SFE Operations Staff Scheduling & Services

Description	Summit Fire & EMS
Operations Staff Scheduling Methodology	
Length of normal duty period	48 hours
Length of off-duty period	96 hours
Duty hours per week (average)	56
Bargaining unit agreement	No
Operations Staff Services	
Fire suppression	Yes
EMS/rescue, first response	Yes
EMS, ALS/BLS	Yes
EMS transport (with SCAS)	Yes
Specialized rescue	Tactical EMS; Search & Rescue
Hazmat	Yes
Emergency management	No
Public education	Yes

Red, White & Blue Fire District

All RWB firefighters are cross-trained as Emergency Medical Technicians, along with 16 Firefighter/Paramedics staffing a transport-capable ALS medic unit or an engine or truck company. Although RWB operates its own emergency medical transport service, it operates under the license of SCAS. The District originally hired and trained the 12 firefighters as Paramedics, anticipating they would be licensed by the County to perform ambulance transports within its fire district boundaries. About 16–18% of RWB's personnel are in administrative and support positions.

Figure 10: RWB Administrative & Support Positions (2018)

Administrative & Support Positions	No. of Positions	Hours per Week	Annual Salary
Full-Time (8 or 10-hour daily work schedule)			
Fire Chief	1	40	\$134,915
Deputy Chief—Administration	1	40	\$110,000
Deputy Chief—Operations	1	40	\$110,000
Human Resources Officer	1	40	\$64,500
Finance Officer	1	40	\$87,500
IT Manager	1	40	\$77,750
Deputy Fire Marshal	1	40	\$80,250
Fire Inspector	1	40	\$61,459
Administrative Assistant	1	40	\$49,490
Training Division Chief ^A	1	40	\$100,750
Training Captain ^A	1	40	\$80,405
Office Manager ^A	1	40	\$52,840
Total:	12		

^ATraining center staff; salaries & benefits for these positions are shared with SFE

Figure 11: RWB Operations Positions & Salaries

Operations Positions	No. of Positions	Average Workweek	Annual Salary ^A
Full-Time (48-hour shifts)			
Battalion Chief	3	56.8	\$102,986
Captain	9	56.8	\$86,062
Driver/Operator	9	56.8	\$75,829
Firefighter/EMT-B	14	56.8	\$60,506
Firefighter/Paramedic	12	56.8	\$76,565
Total:	47		

^ASalaries represent an average between bottom and top step, including specialty pay

The next figure illustrates the scheduling methodology and services provided by operations personnel at the Red, White & Blue Fire Protection District.

Figure 12: RWB Operations Staff Scheduling & Services

Description	Summit Fire & EMS
Operations Staff Scheduling Methodology	
Length of normal duty period	48 hours
Length of off-duty period	96 hours
Duty hours per week (average)	56.8 hours
Bargaining unit agreement	No
Operations Staff Services	
Fire suppression	Yes
EMS/rescue, first response	Yes
EMS, ALS/BLS	Yes
EMS transport (with SCAS)	Yes
Specialized rescue	Tactical EMS; Search & Rescue
Hazmat	Yes
Emergency management	No
Public education	Yes

Summit County Ambulance Service

SCAS employees function as single-role EMS providers, and are not cross-trained or equipped to perform fire suppression activities. Select employees are trained in specialized EMS care, including Tactical EMS and Search & Rescue (wilderness). SCAS administration consists of six employees, and 44 field staff. The following figure lists the administrative, support, and field staff at Summit County Ambulance Service.

Figure 13: SCAS Administrative & Support Positions (2018)

Administrative & Support Positions	No. of Positions	Hours per Week	Annual Salary
Full-Time (8 or 10-hour daily work schedule)			
Director	1	40	\$109,588
Deputy Director	1	40	\$82,933
Clinical Practice Manager	1	40	\$82,420
Office Manager	1	40	\$70,821
Administrative Clerk	2	40	\$43,400
Medical Director	1 ^A	N/A	N/A
Total:	6		

^ANot an employee

Figure 14: SCAS Operations Positions & Salaries (2018)

Operations Positions	No. of Positions	Average Workweek	Annual Salary
Full-Time (48-hour shifts)			
Shift Supervisors	3	56	\$83,433
EMT-Basic	1	56	\$54,496
EMT-Basic (per diem)	5	N/A	N/A
EMT-Intermediate (per diem)	2	N/A	N/A
EMT-IV (per diem & regular)	6	N/A	N/A
EMT-Paramedic	13	56	\$70,221
EMT-Paramedic (per diem)	17	N/A	N/A
Total:	47		

^ASalaries listed are the average between starting and top-step wages

The following figure lists the scheduling methodology and use of operational staff at SCAS.

Figure 15: SCAS Field Staff Scheduling & Services

Description	Summit County Ambulance
Field Staff Scheduling Methodology	
Length of normal duty period	48 hours
Length of off duty period	96 hours
Minimum unit staffing	1 EMT & 1 Paramedic
Bargaining unit agreement	No
Field Staff Services	
Fire suppression	No
EMS/rescue, first response	Yes
EMS, ALS/BLS	Yes
Specialized rescue	Tactical EMS; Search & Rescue
Emergency management	County Emergency Management
Public education	By County government

The level of administration and support staffing represents 15% of the total SCAS staff. Administrative functions directly related to EMS and 911 dispatching are centralized at the Public Safety Building. However, other administrative and support functions (human resources, legal, finance, etc.) are provided by other County departments located in Breckenridge, approximately 20 minutes away.

A Shift Supervisor manages daily emergency operations and coordinates patient care with hospital staff and physicians. The ratio of one supervisor to five response units is well within the incident-command span-of-control standards. However, there is substantial distance between ambulance stations. Shift Supervisors are occasionally dispatched to calls when all other units are unavailable due to other, concurrent calls. During these times, the supervisor is most likely unavailable to make important deployment or other supervisory decisions.

Comparative Analysis of Compensation & Work Schedule

ESCI evaluated the compensation, benefits, and work schedules of SCAS, SFE, and RWB to determine key similarities and differences which may enhance or obstruct future opportunities for system collaboration to accommodate growth and/or improve system efficiencies. All three agencies have various benefit packages for their employees that include variations on medical/dental/vision coverage, life insurance, disability insurance, deferred compensation, tuition reimbursement, and uniform allowance.

In comparing salaries between the three agencies, ESCI chose to average the top and bottom step pay ranges between the fire agencies, as each has different pay steps, specialty pay, and routine overtime pay included in their salaries. The following figure compares average emergency operations staff salaries between the three agencies. Routine *Fair Labor Standards Act* (FLSA) overtime is included in the compensation listed.

Figure 16: Comparative Analysis of Compensation

Position	SFE ^A	RWB ^A	SCAS
Battalion Chief	\$96,622	\$100,750	N/A
EMS Shift Supervisor	N/A	N/A	\$83,433 ^B
Captain	\$89,696	\$86,062	N/A
Lieutenant	\$85,404	N/A	N/A
Firefighter/EMT-Basic	\$56,602	\$60,506	N/A
EMS EMT-Basic	N/A	N/A	\$54,596 ^B
EMS EMT-Paramedic	N/A	N/A	\$70,221 ^B
Firefighter/Paramedic	\$74,824	\$76,565	N/A

^AThe SFE & RWB salaries were averaged together in calculating the difference with SCAS

^BSalaries listed are the average between starting and top-step wages

It should be noted that there is a significant difference in pay in between all three agencies—including between SFE and RWB. The largest difference is between the Battalion Chief positions and the SCAS Shift Supervisors. This comparison was done at the Battalion Chief level instead of a Captain or Lieutenant, because both positions are responsible for managing and coordinating multiple units during a shift. SCAS EMT-Basic full-time pay is approximately 7% lower than either of the fire agencies EMT-Basics. The difference in Firefighter/Paramedic pay and SCAS EMT-Paramedic pay is approximately 7.5%.

In evaluating EMS systems around the country, ESCI has seen a wide variety of EMS delivery models. Many of these were born out of necessity and circumstance, rather than a methodical system planning approach. Fee-for-service EMS systems are struggling to meet ever increasing service-demand, and at the same time experiencing significant serial reductions in federal and insurance reimbursement rates. As a result, this contributes to agency pressure to contain and/or reduce personnel costs. Additionally, EMS has yet to be viewed as a legitimate part of the healthcare system by many state and federal regulatory agencies. These influences have forced EMS agencies to reduce personnel costs, overtime, wages, and/or elimination of discretionary reimbursements (education incentives, travel, training, etc.).

A recent article entitled, “2016 EMS Salary Survey,” published in the *Journal of Emergency Medical Services* noted this conundrum.

Another important item to highlight is the continued depression of wages for EMS positions when compared to other similar positions in healthcare (which is considered most of the work we do). Although this comparison is beyond the scope of this article and our survey, we invite you to research healthcare wages from various valid sources on the Internet.

The only way to fill this wage gap is for EMS to elevate itself from a vocation to a profession, with education coupled hand-in-hand with federal and state healthcare reimbursement reforms. EMTs and Paramedics should be classified as healthcare providers and our work [compensation] should be based on living wages, should cover the actual costs of the care provided, and allow for a reasonable margin by which to recapitalize, perform research, and reinvest in the development of our people and profession.¹²

Work Schedules

All three agencies use a 48-hour on/96-hour off rotating work schedule for full-time employees. SFE and RWB firefighters are subject to the FLSA 7(k) [(29 USC §207(k)] exemption, and follow a work schedule based on a 24-day work period. The 24-day work period allows for a maximum of 182 hours worked at a regular rate of pay. Hours worked over 182 hours within the 24-day period must be paid at an overtime rate. The average annual hours worked in a week varies little between agencies.

Unlike RWB and SFE firefighter, SCAS employees are not eligible for the FLSA 7(k) exemption on workweek/overtime requirements. They also work a 48-hour on/96-hour off rotating work schedule, and receive overtime pay for all hours worked in each 7-day workweek. Due to the rotating schedule, this results in an average of 20 hours of overtime per week for full-time employees working the 48-hour on/96-hour off schedule. Full-time SCAS employees are paid at a lower base hourly rate to compensate for the overtime pay they earn weekly. SCAS also staffs peak-demand/seasonal medic units using employees (full-time, part-time, and per diem) who work 12-hour shifts.

Work Schedule & Staffing Discussion

While the 24-hour shift remains the predominant schedule for fire departments in the Western United States, the 48-hour shift is not uncommon. Given the relative remoteness of Summit County from Denver and the surrounding areas, and high housing costs in the County, many employees must live long distances from the workplace. Working a 48-hour shift reduces the commute for many of these employees. However, the 48-hour schedule has been questioned due to concerns about sleep deprivation and safety impacts during the latter portion of the 48-hour shift. As growth in service-demand increases, the negative impacts on safety as a result of sleep deprivation should be evaluated. This is especially important if out-of-county transports continue to increase—especially at night.

The same 48-hour on/96-hour off schedule used by all agencies is worth noting. Future fundamental system changes, including a merger, consolidation, or other integration models, would need to consider and accommodate employee work schedules. The fact that the schedules are the same, potentially removes a significant obstacle in considering a potential consolidation of SFE and SCAS (discussed later).

SCAS's use of per diem (part-time) employees to staff 12-hour units during the summer and winter seasons appears to be a reasonable and cost-effective approach. However, any future system design changes will need to consider how to efficiently accommodate this staffing model.

The current delivery model incorporates the use of SCAS and RWB as the primary ambulance transport providers, with SFE and RWB also providing medical first-response. The exception to this is the co-staffing of a SCAS ambulance by one SFE employee and one SCAS employee. During interviews with ESCI, some of the SFE firefighters expressed that, when assigned to a SCAS unit, they were often confused as to which agency (SFE or SCAS) supervisor to whom they were to answer.

There can be benefits to this mixed staffing. Ongoing exposure to SFE firefighters can provide SCAS personnel with a more distinct insight into fire department operations and culture. Conversely, SFE firefighters are exposed to the experience, culture, and knowledge of SCAS personnel—resulting in an increased knowledge of prehospital emergency medical services.

Paramedic Staffing

In Summit County, there are currently 37 full-time and 17 per diem Paramedics functioning in the system. The positive contributions and importance to prehospital emergency medical care of highly trained and experienced Paramedics is undisputed. Paramedics bring unique and critical skills to certain types of clinical conditions.

Regularly assigning SFE and RWB Paramedics to fire apparatus should also be closely analyzed. The current ambulance-licensing status of RWB resulted in the department routinely assigning Firefighter/Paramedics to fire apparatus in a cross-staffing configuration. There are benefits and negatives to this approach.

Some of the benefits may include: increased ALS-response capacity; earlier ALS intervention; and decreased EMS provider “burnout.” However, most of these potential benefits are anecdotal and unsupported by research. In fact, there is a growing body of evidence that shows that too many paramedics in a system can be wasteful, can impair proficiency, and in a few select situations, may even be detrimental to patients. Less patient contacts per Paramedic, can result in reduced clinical skills retention and experience in performing patient assessments. Additionally, there are higher costs in wages, training, and continuing medical education.

Regarding the number of medics in a system, a common misconception is that more is better. Under this assumption, many fire departments throughout the U.S. began to staff their engine companies and other first-response apparatus with Paramedics and advanced life support equipment. However, there is substantial evidence-based research to indicate the contrary. In some communities, the result has been an “overabundance” of Paramedics with limited opportunities to perform advanced clinical skills and conduct detailed patient assessments. In other words, the result was a large number of the Paramedic workforce with minimal experience in patient care.

In February 2017, Dr. David Ghilarducci, EMS Medical Director for Santa Cruz County (CA), wrote a paper proposing that the minimum ambulance staffing requirements be changed from a dual-Paramedic model to a one Paramedic and one EMT configuration.¹³ The paper relied on substantial evidence-based research that supported his position to reduce the number of medics in the Santa Cruz EMS system.

There are a number of studies demonstrating a direct relationship between the number of medics on scene, the inexperience of those Paramedics, and reduced survival in cardiopulmonary arrest.^{14,15,16,17} In a 2005 article in *USA Today*, the author surveyed EMS medical directors in 50 cities. The author found that those cities with the lowest number of paramedics per capita had the highest survival rates from out-of-hospital sudden cardiac arrest (e.g., Seattle had 13.5 medics/100,000 with a survival rate of 45%; compared to Omaha with 44.6 medics/100,000 and a survival rate of 3%).¹⁸

The preceding studies only evaluated the effect on cardiac arrest survival. However, as with most systems, cardiac arrest in Summit County represents a small subset of patients. In Summit County, traumatic injuries account for the most common (31%) condition among patients treated and transported by EMS. Several studies have indicated that certain advanced life support interventions (i.e., IV fluids; endotracheal intubation) may be *harmful* rather than beneficial in certain trauma patients.¹⁹

Prolonged scene times associated with performing these interventions may contribute to mortality, and IV fluids may worsen blood loss by the combined effect of increasing blood pressure and increasing the hemorrhage rate, as well as diluting the natural clotting factors and impairing hemostasis.^{20,21,22} Two studies found that endotracheal intubation (ETI) in the prehospital setting increased mortality in both adults and pediatric patients.^{23,24}

As mentioned previously, in EMS systems with a high number of practicing medics, the opportunity to perform advanced-level skills can be infrequent, and thus difficult for Paramedics to maintain proficiency through regular practice. Wang concluded that survival from cardiac arrest was dependent on the experience level of the medic.²⁵

An informal retrospective study in a large EMS system in Multnomah County, Oregon looked at endotracheal intubation success rates among Firefighter/Paramedics assigned to fire apparatus and functioning in a medical first-response capacity.²⁶ Patient transport was provided by a private company whose ambulances were staffed with two Paramedics. Although it was a busy system, the study found that the Firefighter/Paramedics had limited opportunity to perform advanced airway management. During the five-year study period, the ETI success rate was 76%, and the rapid sequence intubation (RSI) success rate was 65%. Improper placement of an endotracheal tube can have devastating results and, as suggested by Katz, Paramedics must maintain expertise in this skill.²⁷

The Summit County EMS provider agencies must also take into consideration the costs of maintaining a larger number of Paramedics than may be necessary or indicated. Wages and benefits for medics tend to be higher than those of BLS personnel. The costs associated with continuing medical education and maintenance of advanced clinical skills are typically higher than that of BLS providers. However, costs alone should not be the only factor in possibly reducing the number of medics in the system.

Finally, it must be *strongly emphasized* that the use of Paramedics providing prehospital ALS care contributes positively to patient outcomes. The reader must not conclude from the preceding discussion that Paramedics do not add value to the community. However, too many Paramedics in an EMS system may be unnecessary, and *possibly* detrimental to patient care. Before any changes are made, this must be examined carefully, so as to minimize potential negative consequences.

FINANCIAL ANALYSIS

Financial History

Considerable financial information and background data was provided to ESCI by Summit County government and various emergency services organizations. This information was reviewed in detail along with the *Comprehensive Annual Financial Reports (CAFR)* and annual budget documents from Fiscal Years (FY) 2013 through 2017. Beginning in 2018, the Copper Mountain Fire Department (CMFD) and Lake Dillon Fire-Rescue (LDFR) implemented a functional merger to become Summit Fire & EMS. Therefore, it was necessary to evaluate historical financial data from two separate departments that currently comprise SFE. RWB, CMFD, and LDFR use a modified accrual basis to account for annual revenues and expenditures. Each fire district has a significant, dedicated revenue stream—the bulk of whose funding comes from specific revenues such as property taxes or user fees. The fire districts do not break out specific EMS costs.

Summit County considers SCAS as a proprietary or enterprise fund, which reports business-like activities. SCAS finances are reported on an accrual basis. The policy of Summit County government is that SCAS costs will be financed primarily through user charges on a continuing basis, and that the ambulance fund does not levy ad valorem taxes. Both the County and fire districts operate on a January 1–December 31 fiscal year. The following discussion focuses primarily on SCAS revenue and expense given the focus of this study; that is, a review of the EMS system and potential for consolidation.

Summit County Government

The County follows the *Governmental Accounting Standards Board (GASB)* accounting pronouncements, which provide guidance for determining which governmental activities, organizations, and functions should be included within the financial reporting entity. The budget is prepared according to Generally Accepted Accounting Principles (GAAP) presented to the public on an annual basis and monitored by management throughout the year. Expenditures may not legally exceed appropriations, which lapse at the end of each year. The County does not use encumbrances at year-end.

Summit County has been budgeting conservatively for a number of years, due to the heavy reliance on tourism. Budgeted revenues are projected at the lower of last year's "actual" or this year's projected amount—whichever is lower—while maintaining a balanced budget.

Summit County Ambulance Financial Review

Under the Proprietary fund-type, an enterprise fund was established for Summit County Ambulance in 1992. Prior to that, operations had been reported as a department of the General Fund. During 1992–2005, user fees offset service costs. However, the economic recession, rising costs, and decreases in payor reimbursement created financial constraints (as experienced by emergency transport providers across the United States).

Proprietary funds distinguish operating revenues and expenses from non-operating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's principal ongoing operations.

The principal operating revenues of the enterprise and internal service funds are charges to customers for sales or services. Operating expenses include the cost of sales and services, administrative expenses, and depreciation on capital assets. While depreciation is considered an expense in the *Comprehensive Annual Financial Report (CAFR)*, it is not included in the following discussion of actual revenue and expense. All revenues and expenses not meeting the preceding definition are reported as non-operating revenues and expenses. The Ambulance Fund saw an increase in both total net position and unrestricted net position, due to better collection rates and holding 2016 expenditures to approximately the same as 2015.

For purposes of analyzing SCAS historical revenue and expense, and developing projections based upon historical trends, information was derived from the Summit County CAFR. However, for discussions concerning ambulance billing and revenue trends, data were provided by SCAS from its billing records. Billing revenue information was not consistent between the CAFR and the billing system as shown in the following figure. This is primarily due to timing differences between when revenue is booked and when it is received. The SCAS billing data in the figure is from a historical analysis of billing, write-offs, and revenue showing data by month, quarter, and year from 2009–2017; and as provided by SCAS to ESCI.

Figure 17: Comparison of Summit County CAFR to SCAS Billing Data

Category	2014 Actual	2015 Actual	2016 Actual	2017 Actual
Summit County CAFR				
Billed	\$5,544,932	\$6,327,003	\$6,909,353	\$6,791,200
Write-Offs	\$2,202,370	\$2,386,018	\$2,673,378	\$2,644,523
Collected	\$3,342,562	\$3,940,985	\$4,235,975	\$4,146,677
Summit County Ambulance Billing Data				
Billed	\$5,556,022	\$6,328,765	\$6,906,681	\$6,799,214
Write-Offs	\$2,202,370	\$2,386,018	\$2,587,230	\$2,644,523
Collected	\$3,498,779	\$3,685,528	\$4,025,831	\$4,072,951

Revenues considered recurring, are those generally expected to continue on a year-to-year basis. These include items such as ambulance charges; permit and standby fees; and continuing aid or grants from the State of Colorado. Non-recurring revenues are one-time grants such as the federal *Department of Homeland Security (DHS) Assistance to Firefighters (AFG)* and *Staffing for Adequate Firefighter & Emergency Response (SAFER)* grants and loan proceeds.

One recurring revenue stream is a transfer from the Summit County *Safety First Fund*. This funding source was established to account for property taxes specifically authorized by the voters in 2014 for ambulance operations, emergency dispatch operations, and capital expenditures for water protection programs. The fund was created in 2014, is authorized under C.R.S.30-25-101 and C.R.S. 29-1-101, and will expire after eight years in 2022, unless reauthorized by the voters.

SCAS Revenue

The table in the following figure shows specific actual historical revenue sources for the Summit County Ambulance Service from 2014 through 2017 unaudited period 13 and revised budgeted 2018 revenues. SCAS had a calculated 2018 beginning cash balance of \$1,798,426. As noted in the following figure, the beginning cash balance for both the 2017 unaudited and 2018 revised budgets are calculated while those for the preceding years are actuals from Summit County budget documents.

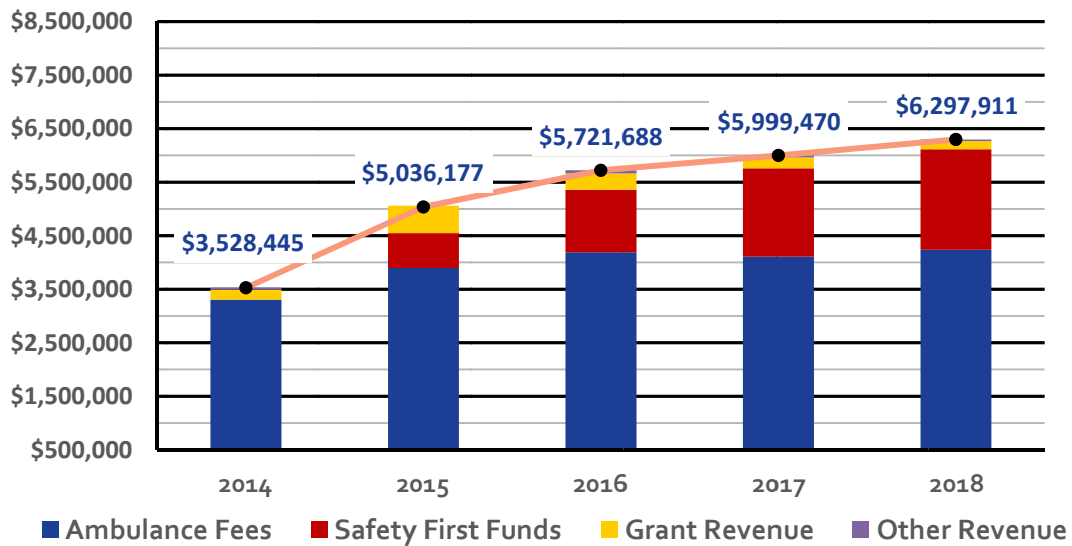
Figure 18: SCAS Financial Resources (2014–2017 actuals; 2018 revised)

Financial Resources	2014 Actual	2015 Actual	2016 Actual	2017 Unaudited	2018 Revised
Charges for Service	5,544,932	6,327,003	6,909,353	6,791,200	7,030,614
Less Uncollectible	-2,202,370	-2,386,018	-2,673,378	-2,644,523	-2,753,462
Less Discounts	0	0	0	0	0
Less Treasurer's Fees	-37,930	-43,668	-45,429	-38,988	-38,997
Subtotal:	\$3,304,632	\$3,897,317	\$4,190,546	\$4,107,689	4,238,155
Safety First Funds	0	650,000	1,167,500	1,650,000	1,876,990
Ambulance Contract	34,604	33,990	29,751	12,941	25,000
Training Fees	4,548	6,252	13,898	3,309	6,000
Grant Revenue	185,440	511,162	305,308	204,439	150,766
Interest Revenue	-779	2,239	5,435	10,314	1,000
Sale of Assets	0	-64,883	8,750	0	0
Miscellaneous Revenue	0	100	500	10,778	0
Subtotal Other:	\$223,813	\$1,138,760	\$1,531,142	\$1,891,781	\$2,059,756
Total Revenue:	\$3,528,445	\$5,036,177	\$5,721,688	\$5,999,470	\$6,297,911
Interfund Transfer In	450,000	0	0	0	0
Beginning Cash Balance ¹	14,641	16,690	24,679	714,937	1,798,426
Total Resources:	\$3,993,096	\$5,052,867	\$5,746,367	\$6,714,407	\$8,096,337

¹Actual beginning cash balance for 2014–2016; calculated for 2017–2018

As expected, the preceding figure shows that the majority of SCAS's revenue was acquired from charges for service (patient transport fees). During 2016 and 2017, patient charges accounted for 73% and 68% of the total revenue; respectively. While total revenue overall grew from \$3,528,445 in 2014, to just under \$6 million in 2017, that growth was driven by the introduction and increase in Safety First funding. Ambulance funding grew from \$3.3 million in 2014, to \$4.2 million in 2016 after which it plateaued while the Safety First funding continued to increase. During 2016, these funds accounted for 20% of total revenue which increased to 28% of total revenue in 2017. Although the majority of SCAS's revenue has traditionally been derived through user fees, the availability of increased revenue from the Safety First funding has been impacted by rising property values.

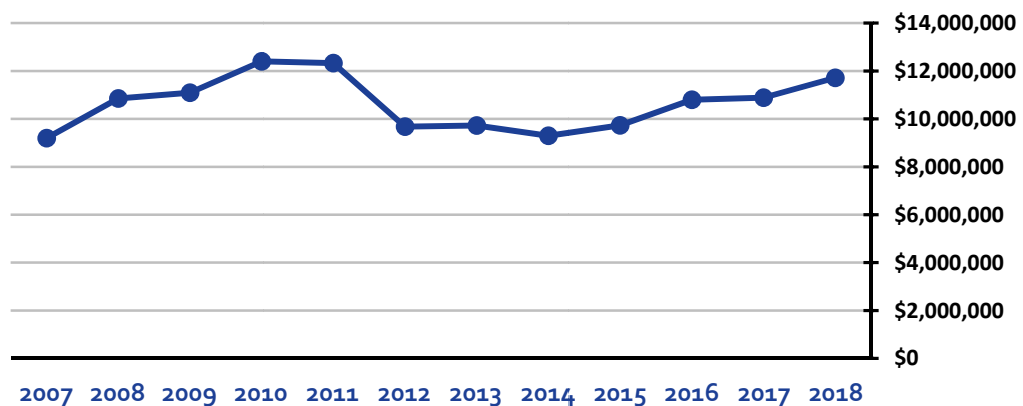
Figure 19: SCAS Major Revenue Sources (2014–2017 actuals; 2018 revised)



Grant funding, a non-recurring revenue source, has varied from a low of \$185,440 in 2014 to a high of \$511,162 in 2015 but has averaged approximately \$300,000 between 2014 and 2017. Other revenue sources are relatively minor.

Summit County property tax values are subject to a reassessment once every two years. As shown in the following figure, the County experienced a major drop in revenue in 2012, in reaction to the reassessment following the nationwide economic downturn that began in 2008. The County experienced another minor drop in 2014 before beginning a rebound in 2015, which continues to present day. However, as can be seen in the figure, property tax revenue has not attained the levels experienced in 2010–11; which has affected the County’s ability to fund ambulance service and other County operations. The County’s actual property valuation increased 11.1% due to reappraisal in 2015. This increase in property valuation is driving an increase in recurring ambulance fund revenue while ambulance fees have remained relatively flat overall the last two years.

Figure 20: Historical General & Capital Expenditure Fund Property Tax Revenue



Patient Transport Revenue & Intergovernmental Agreements

The revenue from patient transport (charges for services) described in the preceding figures is acquired from more than one source. While SCAS bills and collects fees from transporting patients in its medic units, it also collects fees on behalf of the other transporting agencies.

In accordance with an IGA between Summit County and RWB, the District operates its own medic units and employees. RWB ambulances are granted authority to treat and transport patients under the IGA, and operate under the SCAS license and protocols. Summit County provides the billing and collection of fees for patients transported by RWB. The rationale is to reduce the overhead costs to the transport providers. Based on the original cost-of-service discussions with RWB, in order to ensure costs were covered, the agreement allowed Summit County to retain 92.5% of the revenue collected on behalf of RWB; which has since been decreased to 50%. Previously, the IGA capped the amount that RWB could receive at a maximum of \$400,000 annually—regardless of the number of transports. However, the cap was discontinued in 2017.

A similar agreement was in place with Flight for Life's (Centura Health) Terra Two ground critical care transport ambulance. Terra Two also operates under the SCAS license, and Summit County provided the billing and collection for all of Terra Two's out-of-county transports. In this agreement, the County retained 47% of the amount billed and collected in exchange for SCAS providing an EMT driver. Beginning in January 2018, SCAS discontinued billing for Terra Two transports. Due to the approximate 90-day lag time from billing to collection, SCAS continued to remit 47% of the revenue to Centura Health for transports generated in late 2017.

Previously, CMFD and LDFR provided additional staffing for SCAS medic units. In exchange, Summit County provided 20% of the revenue collected on behalf of those departments, for patient transport calls involving their firefighters. After the consolidation of the two fire districts in 2018, SFE began providing only one firefighter per shift to provide additional staff on one SCAS ambulance. Summit County has continued to provide 22.5% of the collected revenue for each firefighter SFE places into the SCAS system.

Summit County Payor Mix & Collection Rates

The following figure lists the number of billable transports in 2017 and ratio of payors billed.

Figure 21: Summit County Ambulance Service Payor Mix

Source: SCAS Records

Payor	Number Billed	2017 % of Total
Medicare	603	18%
Medicaid	395	12%
Private Pay	254	7%
Insurance	2,165	63%
Totals:	3,417	100%

As shown in the preceding figure, the majority of revenue came from commercial insurance carriers, followed by payments from Medicare and Medicaid.

SCAS does not outsource its billing and collections, but instead utilizes an internal staff of two to perform the necessary administrative functions for billing. The next figure shows the gross billing and actual collection for SCAS each fiscal year from 2014–2017, along with total annual billable transports for the same period.

Total billable transports for 2017 differed slightly between these two figures (Figure 21 vs. Figure 22). Further, it is relevant to note that billing data obtained at different times by different SCAS employees was inconsistent. For example, the total data by year—as in the next figure (Figure 22)—is inconsistent with the data provided in the following figure (Figure 23). The SCAS Director believes that this is due to different employees obtaining data from the billing system while using different parameters.

Figure 22: SCAS Billing & Collections (2014–2017)

Source: Summit County Ambulance Service

Description	2014	2015	2016	2017
Gross Amount Charged	\$5,556,022	\$6,328,765	\$6,906,681	\$6,799,214
Cash Collected	\$3,498,779	\$3,685,528	\$4,025,831	\$4,072,951
Cash Collection Rate	63%	58%	58%	60%
Annual Billable Transports	2,992	3,113	3,296	3,412
Average Collected/Transport	\$1,184	\$1,184	\$1,221	\$1,194

The preceding figure shows relatively high collection rates compared to what is found in other communities throughout the United States. This is likely attributable to the demographic composition of the patients transported—most of who are not local and tend to be at a higher socioeconomic level—and the lack of contracted discounts with insurance providers. The preceding figure also shows that total transports and associated cash collections are increasing each year (an average of 4.5% and 5.2% per year, respectively) while average cash collected per transport has remained relatively static.

Interfacility Transport Revenue

In Summit County, interfacility transports (IFT) are categorized as either in-county (IC) or out-of-county (OOC). Since there are no skilled nursing facilities in the County, most in-county IFTs are transports from one of the mountain clinics to the hospital in Frisco. The majority of OOC transports are to the Denver metropolitan area. Terra Two are critical care transports.²⁸

The following figure lists the details of revenue and collection produced from interfacility transports. As noted previously, the data in the next figure (Figure 23) was obtained at a different time and from a different SCAS employee than the summary data in the preceding Figures 21 and 22. Totaling the in-county, out-of-county, and Terra Two IFT data in Figure 23 separate from the 911 transport data provided and obtained from the same data request, provides total transport figures well above those in Figures 21 and 22. The reasons for this discrepancy are unknown, but it is possible that some transports in the various categories were double-counted in the Figure 23 data request. The SCAS Director believes that the discrepancies are related to the parameters used to obtain the source data.

Figure 23: SCAS Interfacility Transport Billing & Collections (2015–2017)

Source: Summit County Ambulance Service

IFT Transport Type	FY 2015	FY 2016	FY 2017	Average (3 years)
In-County IFT Amount Billed¹	\$757,734	\$698,876	\$739,938	\$732,183
Number of Billable Transports	583	506	578	556
In-County Cash Collected	\$582,651	\$532,516	\$545,123	\$553,430
Average Cash Collected/Transport	\$999	\$1,052	\$943	\$996
Out-of-County IFT Amount Billed¹	\$2,196,851	\$2,664,247	\$2,551,977	\$247,1025
Number of Billable Transports	685	888	856	810
Out-of-County Cash Collected	\$1,242,945	\$1,514,412	\$1,451,393	\$1,402,917
Average Cash Collected/Transport	\$1,815	\$1,705	\$1,696	\$1,733
Terra Two OOC Transports Billed	\$375,195	\$400,170	\$259,205	\$344,857
Number of Billable Transports	107	110	140	119
Terra Two OOC Cash Collected	\$207,244	\$203,789	\$142,087	\$184,374
Average Cash Collected/Transport	\$1,937	\$1,853	\$1,015	\$1,602
Total IFT Cash Collected:	\$2,032,840	\$2,250,717	\$2,138,603	\$2,140,720
Total IFT Patients Billed:	1,375	1,504	1,574	1,484

¹Includes all Out-Of-County and In-County interfacility transports by both SCAS and RWB

Note: All dollar amounts rounded to the nearest integer

The figure shows that the cash payments received by SCAS for interfacility transports in the three years preceding 2018 averaged over \$2.1 million annually. Average cash collected per in-county and out-of-county transport was \$996 and \$1,739; respectively. The out-of-county transport revenue was much higher due to mileage charges. Terra Two transports averaged \$1,602 per transport.

While total transports increased slightly from 3,113 to 3,412 as shown in Figure 22, the relative proportion of the various transport types remained fairly constant. Scene (911) transports made up approximately 60% of the total patient transport volume; OOC IFTs averaging 23% with a range of 20–25%; and IC IFTs averaging 15% with a range of 14–17%. Terra Two transports remained a relatively small percentage of the overall patient transport volume at an average of 3%.

Interfacility versus 911 Transport Revenue

Data from the preceding table was combined with 911 scene-transport billing data obtained in the same data request, in order to produce the following figure comparing volumes of the various transport-types, and the associated billing and revenue recovery. While the totals are not consistent with those earlier figures as discussed previously, it is consistent with the data provided in Figure 22, and used in the interfacility transport discussion.

The largest patient transport workload—approximately 60%—is the 911-transport component. Even though this type of transport requires the most resources, it only returns 45% of the total transport billing revenue collected by SCAS. On the other hand, the out-of-county interfacility transports return 36% of the total billing revenue stream, while comprising only 23% of the total transport workload. In-county IFTs comprise 16% of the total workload, and return a similar amount of revenue (14%). The collection rate for in-county IFTs is 76%, while it varies between 53% and 58% for the other three categories.

Figure 24: Interfacility vs. 911 Transport Revenue

Source: Summit County Ambulance Service

THREE-YEAR AVERAGES (2015–2017)

Transport Type	Transports	% of Total ¹	Amount Billed	Amount Collected	Collection Rate	% of Total	Average/ Transport
In-County IFT	556	16%	\$732,183	\$553,430	76%	14%	\$996
OOC IFT	810	23%	\$2,471,025	\$1,402,917	57%	36%	\$1,733
Terra Two OOC	119	3%	\$344,857	\$184,373	53%	5%	\$1,549
911 Transports	2,066	58%	\$3,004,828	\$1,744,678	58%	45%	\$844
Totals:	3,550	100%	\$6,552,892	\$3,885,398	59%	100%	\$1,094

Note: Dollar amounts & percentages rounded to the nearest integer

Shared Patient-Transport Revenue History

The next figure shows the shared SCAS revenue distribution between the Copper Mountain Fire Department and Lake Dillon Fire-Rescue (which did not start receiving payments until 2016); the Red, White & Blue Fire District; and Centura Health's Terra Two. The share of cash payments paid by Summit County to each agency is based on their respective "mutual aid" agreements, and the services they provide (e.g., SFE firefighters are assigned to a Summit County medic unit and RWB provides staffed ambulances to Summit County). During 2016–2017, the agencies had a combined average share of the cash payments to SCAS of 39.3% for those transports that they either performed or for which they provided staff to SCAS.

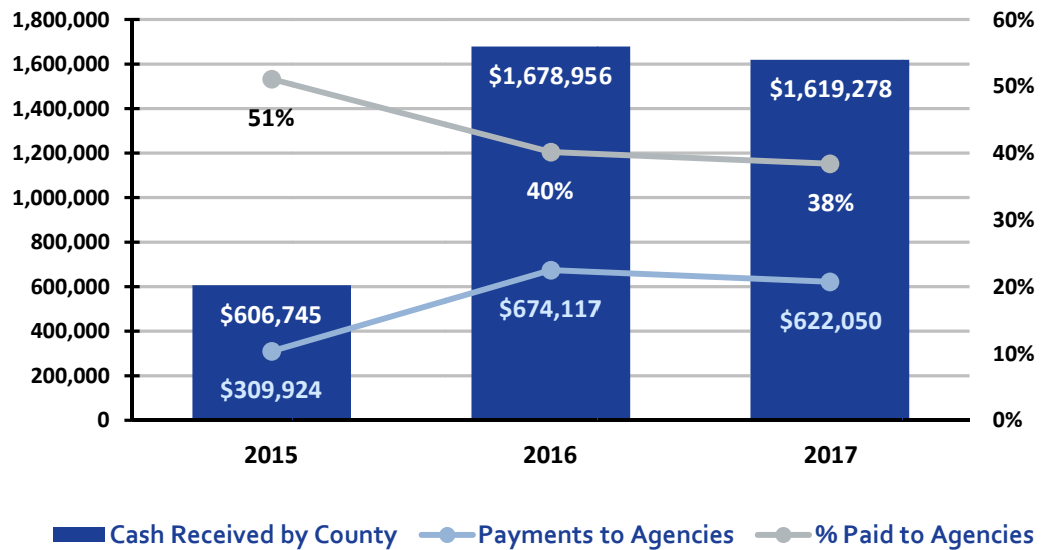
Figure 25: Summit County Shared Revenue Distribution

Organization	FY 2015	FY 2016	FY 2017
Copper Mountain Fire Department			
Number of billable transports	N/A	289	378
Amount billed		\$837,145	\$871,369
Total cash payments to SCAS		\$340,112	\$373,518
<i>Total amount paid to CMFD (20%)</i>		\$68,022	\$74,703
Lake Dillon Fire-Rescue			
Number of billable transports	N/A	458	594
Amount billed		\$1,281,222	\$1,271,899
Total cash payments to SCAS		\$581,438	\$589,854
<i>Total amount paid to LDFR (20%)</i>		\$116,287	\$117,970
Total paid to CMFD/LDFR combined	N/A	\$184,309	\$192,673
Red, White & Blue Fire District			
Number of billable transports	564	716	822
Amount billed	\$863,678	\$1,152,913	\$1,336,040
Total cash payments to SCAS	\$388,329	\$757,406	\$655,906
Total amount paid to RWB (50%)	\$194,164	\$378,703	\$327,953
Terra Two			
Number of billable transports	89	93	65
Amount billed	\$375,195	\$394,980	\$272,891
Total cash payments to SCAS	\$218,416	\$209,632	\$191,637
Total amount paid to Terra Two (53%)	\$115,760	\$111,105	\$101,424
Total Billable Transports:	653	1,556	1,859
Total Cash Payments to SCAS:	\$606,745	\$1,678,956	\$1,619,278
Total Paid to Agencies:	\$309,924	\$674,117	\$622,050
Difference:	\$296,821	\$1,004,839	\$997,228

Note: All figures rounded to the nearest integer

The next figure is a graphic illustration of the cash payments received by Summit County, which is approximately 60% of the total amount billed, and the combined amounts paid to each of the agencies (RWB, SFE, and Terra Two) during each fiscal year from 2015 through 2017.

Figure 26: Summit County Payments to Agencies (2015–2017)



As shown in the preceding figure, the combined agency share of revenue from contractual patient transports has declined each year since 2015 through 2017. In 2015, the agencies received just over 51% of the cash collected, while in 2017 this dropped to just over 38%. This drop in percentage is due largely to the addition of Lake Dillon and Copper Mountain joining the system at a lower collection rate, as they did not add medic units in to the system.

Beginning in 2018, SCAS began reimbursing Summit Fire & EMS at a rate of 22.5% of the transport revenue collected on any calls in which one SFE Firefighter/EMT or Firefighter/Paramedic was assigned to a medic unit. SFE is not reimbursed for any other calls in the district in which a firefighter was not assigned to a SCAS medic unit.

SCAS Budget & Expenditures

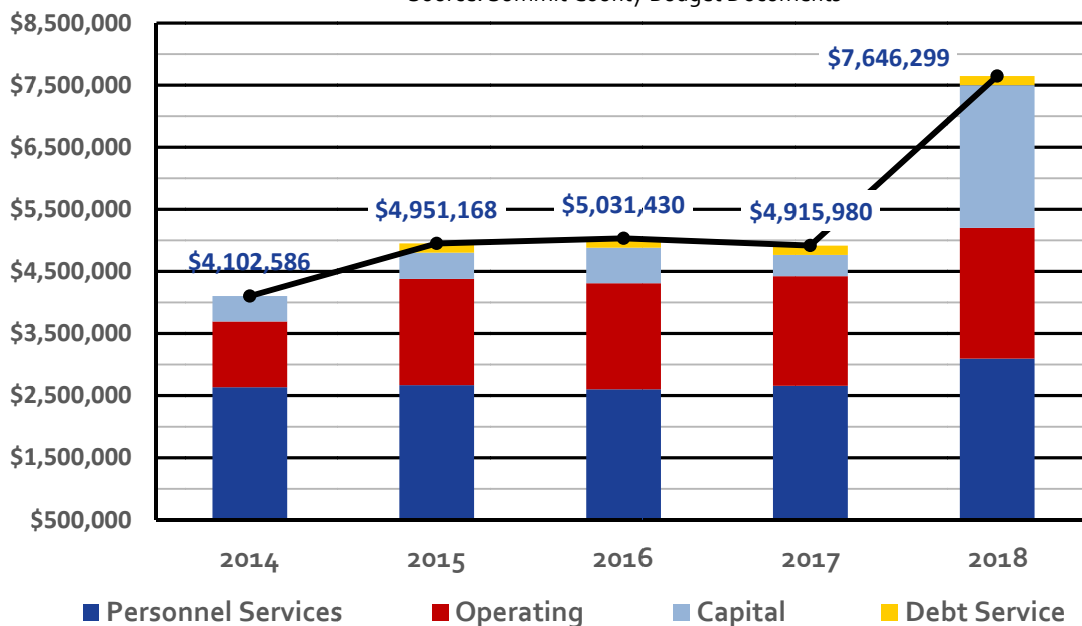
The next figure summarizes Summit County Ambulance's expenditures from Fiscal Year 2015 through the adopted FY 2018 budget. The table that follows shows SCAS expenditures in greater detail for the same period. Overall expenditures increased from \$4.1 million in 2014 to almost \$5 million in 2015 and remained relatively flat, averaging \$5 million for the period 2014–2017. The increase is due to the revenue-sharing agreement with RWB for the provision of ambulance service and the other districts for assisting SCAS with ambulance staff. Further, the General Fund made a no-interest loan to the ambulance fund of \$997,000 in 2015. The term of the loan is eight years and the annual payments are \$149,625 which began in 2015. The spike in capital spending budgeted for 2018 represents \$2.3 million set aside for capital projects.

The County charges the ambulance fund for various internal services, which are determined by the Summit County Auditor following a cost-allocation study. This is budgeted as an administrative charge and has increased from \$268,270 in 2014 to \$355,420 in 2017. This is an increase of \$87,150 or 32.5% over the period and represents an average annual increase of almost 10%. This can be primarily attributed to expenses associated with Information Systems and Facilities. Most other operating costs have remained relatively flat although building repair costs have increased from \$15,000 in 2014, to almost \$26,000 in 2017. Contractual payments to Centura Health have remained relatively flat averaging just under \$110,000 for the period. Payments to the fire districts represent the largest increase in expenditures, having grown from \$27,000 in 2014, to almost \$600,000 in 2016 and 2017, as intergovernmental agreements have been amended.

Figure 27: SCAS Expenditures by Major Category

(2014–2016 Actual/2017 Unaudited/2018 Revised)

Source: Summit County Budget Documents



The following figure lists the line-item expenditures for calendar years 2014 through 2017, and the 2018 revised figures. It also includes the cost-sharing expenses with the fire districts and Terra Two, as well as other miscellaneous costs and capital outlay.

Figure 28: SCAS Expenditures
(2014–2017 actuals; 2018 revised)

Expenses	2014 Actual	2015 Actual	2016 Actual	2017 Unaudited	2018 Revised
Salaries & Benefits	2,634,237	2,667,563	2,602,825	2,658,055	3,095,756
Operating Supplies	28,882	30,774	25,380	14,663	30,000
Vehicle Maintenance/Fuel	237,100	240,195	232,959	199,441	247,860
Safety	242	0	1,433	0	45,000
Property/Casualty Insurance	7,595	7,438	14,196	19,163	19,163
Employee Recognition	1,427	960	1,995	1,366	7,200
Medical Supplies	62,151	61,357	65,659	69,364	67,185
Administration Charges	268,270	279,332	300,215	355,420	376,429
Professional Assistance	8,064	8,368	39,386	69,598	47,000
Telephone	23,217	16,938	19,562	15,528	23,800
Postage/Freight	5,704	6,318	6,157	5,665	7,500
Travel/Transportation	217	2,635	2,455	1,738	2,200
Advertising/Legal	1,337	2,208	2,360	2,102	3,500
Dues & Meetings	3,016	2,478	3,878	3,731	3,500
Utilities	45,557	39,542	50,905	44,891	52,000
Equipment Repairs	3,234	3,259	1,972	1,717	5,000
Building Repairs	15,027	10,929	20,399	25,764	40,000
Equipment Rental	2,676	4,935	3,493	2,739	3,600
Office Rent	15,440	16,911	18,445	17,182	18,500
Maintenance Contracts	38,421	42,260	40,785	65,143	40,968
Printing	3,011	1,685	844	1,631	1,500
Books & Materials	2,046	3,309	2,162	3,510	4,500
Uniform Allowance	12,395	12,662	11,887	13,099	15,000
Education & Training	28,503	34,921	47,532	29,070	54,000
Personal Vehicle/Motor Pool	550	1,121	154	938	1,500
Revenue Sharing & Other Expenses					
Centura Health (Terra Two)	95,884	115,787	111,105	101,896	119,852
Fire District's Shares	27,032	223,298	585,333	583,818	750,000
CEPF Fund (Capital)	18,184	0	0	0	0
Special Projects	0	0	0	0	0
Grant Expenditure	3,150	443,752	990	0	0
Communications Center	118,789	98,996	94,297	115,925	117,661
Capital Outlay	391,228	421,612	573,042	343,198	2,300,500
Debt Service	0	149,625	149,625	149,625	149,625
Total Annual Expenditures:	\$4,102,586	\$4,951,168	\$5,031,430	\$4,915,980	\$7,650,299

SCAS Capital Expenditures

The following two figures illustrate SCAS capital expenditures for the period 2014–2017 and budgeted for 2018. SCAS has a solid apparatus and equipment replacement program as illustrated, spending an average of \$250,000 annually on apparatus replacement (both ambulances and command vehicles) and just under \$170,000 on equipment replacement (stretchers, defibrillators, radios, etc.). Capital replacement costs such as these should be considered as normal recurring expenses in any long-range budget planning.

Figure 29: SCAS Capital Expenditures
(2014–2016 actuals; 2017 unaudited; 2018 revised)

Source: Summit County Budget Documents

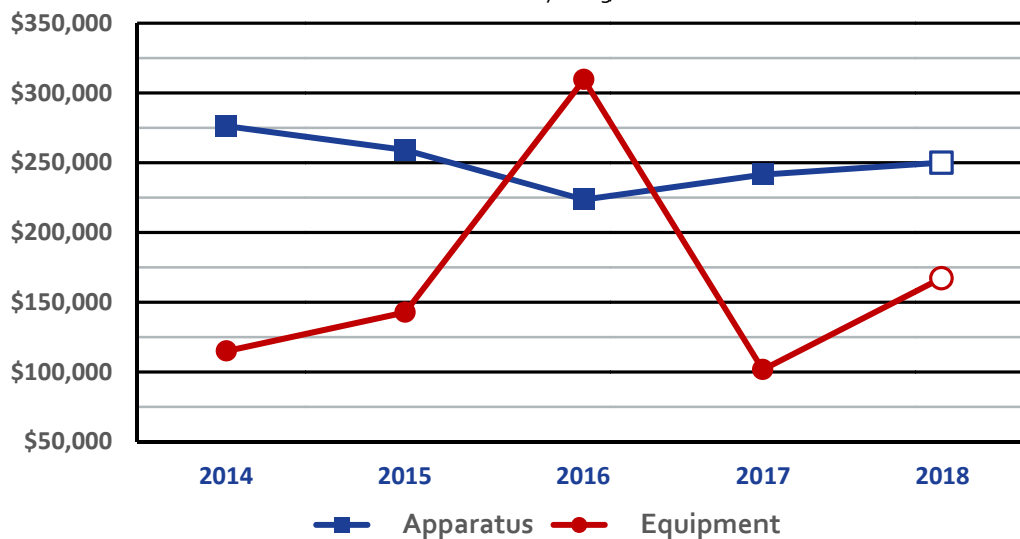
Description	2014	2015	2016	2017	2018
Vehicles	\$276,269	\$259,122	\$223,556	\$241,477	\$250,106
Equipment	\$114,959	\$142,699	\$309,679	\$101,721	\$167,265
Facilities	\$0	\$19,792	\$39,806	\$0	\$1,932,630
Total Capital	\$391,228	\$421,613	\$573,041	\$343,198	\$2,350,001

Capital facility spending (other than routine maintenance costs) is considered non-recurring, one-time expense that should be budgeted as part of a long-range capital improvement plan (CIP). Very little capital spending has occurred with facilities during the period. The department has budgeted \$1.6 million in 2018 to jointly construct an administrative complex with Lake Dillon.

Figure 30: SCAS Capital Apparatus (vehicles) & Equipment Expenditures

(2014–2016 Actuals; 2017 Unaudited; 2018 Revised)

Source: Summit County Budget Documents



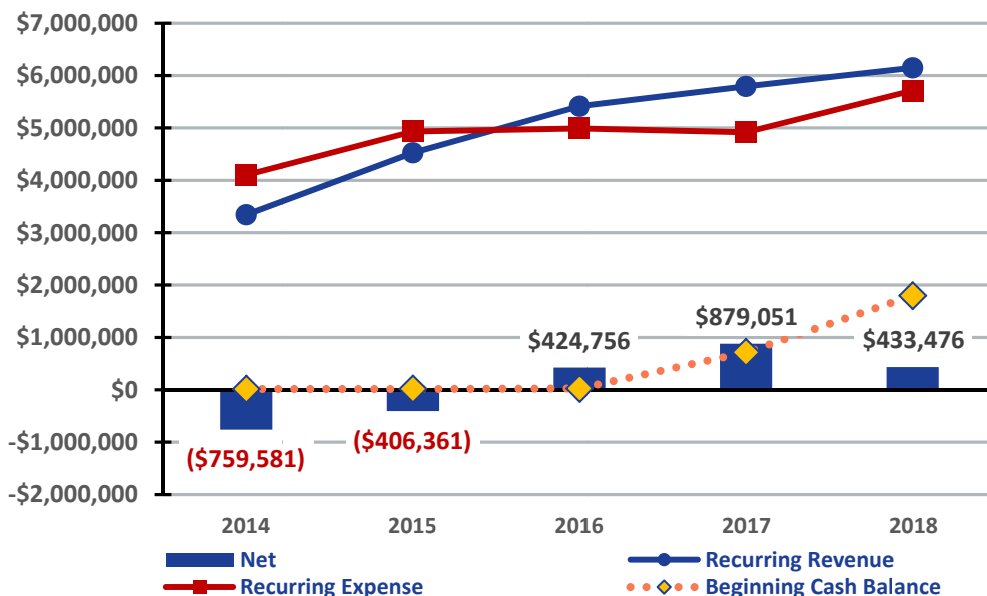
Net Annual Gain (Loss) & Beginning Cash Balance

As an enterprise fund of the County, SCAS is funded by a self-contained fund that carries its own cash balance. It is good practice to compare recurring revenue and expense and resulting effect on beginning cash balance each fiscal year. Recurring revenues are charges for services, tax revenues (Safety First funds), contractual fees, and interest. Non-recurring revenues are grants, sales of surplus equipment, donations, etc. Recurring expenses are personnel costs, operating expense, programmed apparatus and equipment replacement costs and payments to Centura Health and the fire service providers. Non-recurring costs are one-time expenses such as major capital construction projects.

The following figure shows recurring revenue in blue and recurring expense in red. Beginning cash balance is shown as a dotted line. When recurring expense exceeds recurring revenue, the fund operates at a deficit and must utilize cash balance carried forward to meet its operating expenses. The net increase or decrease is shown by the blue bars. SCAS operated at a deficit in 2014 and 2015 with a net loss to the fund of \$759,581 and \$406,361; respectively. This deficit was covered by transfers from the County General Fund.

Operating losses and resultant support from the GF led to the voters electing to implement the Safety First tax whose first revenues were received in 2015 (\$650,000). This revenue stream increased to \$1,167,500 in 2016 and by 2017 it reached \$1,650,000 with the expectation of further increases as the economy continues to improve. While SCAS kept its expenses relatively flat from 2015-2017, revenue increased significantly due to infusion of Safety First funds over and above expenses. The net effect of this change is that the ambulance service has been operating with an increasing annual surplus (\$424,756 in 2016 and \$879,051 in 2017) which has given rise to a beginning cash balance increasing from near \$0 in 2016 to almost \$1.8 million in 2018. The County has allocated much of this additional cash balance to capital construction as discussed previously. However, the construction project is a one-time or non-recurring expense. Depending on future operational costs, SCAS may be able to build its cash balance and operate with surplus funds.

Figure 31: Recurring Revenue/Expense–Net Gain (Loss)–Beginning Cash Balance



Although there is no specific reserve policy related to the ambulance fund, the County Commission has a reserve policy that generally requires a 2.5–3-month reserve (for example, the General Fund must maintain a 3-month operating reserve). The County is working toward developing a 12-month reserve for SCAS, in anticipation of losing the Safety First funding in 2023. The beginning cash balance in 2018 was approximately 30% of the total expenditure budget for the year.

Patient Billing & Collection Discussion

In Summit County, the overall cash collection rate for patient transports was good; averaging around 60%. As discussed previously, the collection rate for in-county interfacility transports was very high at 76%—although, at an average of \$996, the amount collected per transport was low. This is only slightly higher than 911 scene transports that were at \$844 per transport. The out-of-county and Terra Two transports collected a higher per-transport amount due primarily to higher mileage charges. Out-of-county, Terra Two, and 911 scene transport collection rates varied between a low of 53% for Terra Two, to 57% and 58% for out-of-county and 911 scene transports, respectively.

Billing & Collection Issues

It was apparent to ESCI that conflicts and confusion between SCAS and RWB regarding billing for patient transports provided by RWB have been ongoing for some time. RWB must rely on the billing staff at SCAS to accurately bill, collect, and reimburse their share of the cash collected. This assertion is supported by a number of correspondences between SCAS billing staff, the Summit County Finance Department, and the Finance Officer at RWB. ESCI reviewed dozens of e-mails from 2018 and previous years, and found:

- Problems with Safety Pad failing to generate some of the transports. This began in January 2018, and SCAS is taking steps to correct this.
- Discrepancies and confusion in the billing and collection amounts; including differences in previous reports to current reports.
- Reconciliation discrepancies and a lack of accountability in current versus prior year collections. Examples from 2018 only (these are unrelated to the Safety Pad issues):
 - January 2018 payment to RWB missing some 2017 revenue that was due.
 - February 2018 missing *all* of 2018 revenue to be paid to RWB.
 - March and April 2018 missing *all* of 2017 revenue to be paid to RWB (this was recently identified and steps are being taken to correct the problem).
- Concerns and questions regarding SCAS accounting for collections.
- Confusion and disagreement as to how RWB is paid for cash collected in the following year for transports conducted in the preceding year.

During this study, ESCI experienced difficulty in acquiring billing and data collection data. In multiple exchanges with SCAS, the numbers provided each time differed. This was dependent upon who was pulling the information, when the information was pulled, and what parameters were used. A detailed historical spreadsheet containing monthly, quarterly, and annual totals billed; write-offs; and amounts collected, which were originally provided by SCAS to ESCI, were later said to be inaccurate well into the study.

EMS organizations providing fee-for-service transports should have accurate billing and collection data readily available. Some of the issues could be related to previous temporary staff shortages. ESCI recognizes that errors will always occur. Yet, these may be more frequent than should be acceptable. However, there are indications that SCAS may have recently taken steps to resolve these issues and improve their reporting.

Billing Compliance with Federal Regulations

There have been, and continue to be, many changes in healthcare rules regarding reimbursement for patient transport. Keeping up with such changes is difficult for a small in-house billing staff. In September 2015, the *Office of the Inspector General (OIG)* at the *U.S. Department of Health and Human Services (HHS)* released a report describing the problems of inappropriate payments and questionable ambulance billing practices.²⁹

The problems identified in the OIG's report did not necessarily mean all were intentional or criminal, but also included inadvertent errors. As a result of this report, the *Centers for Medicare & Medicaid Services (CMS)* has increased its scrutiny of the billing practices of ambulance service providers. The OIG has developed compliance program guidance for ambulance providers, in order to assist them in preventing the submission of erroneous claims and eliminate fraudulent and abusive conduct.³⁰

In 2015, the Secretary of the *U.S. Department of Health & Human Services (HHS)* announced a major policy statement. She announced that by 2018, 90% of all Medicare fee-for-service payments will be linked to quality or value. The *Medicare Access & CHIP Reauthorization Act of 2015 (P.L. 114-10)* was signed into law in April 2015. It is likely that existing payment programs will be combined into a new merit-based incentive payment system that would tie reimbursement to quality, value, and accountability, and processed through *Accountable Care Organizations (ACO)*. However, given the current national political climate concerning health insurance, this may or may not occur.

Regardless of whether billing is outsourced or continued internally, it will be important to ensure billing practices comply with the OIG's program by reviewing current billing and claim processing policies and procedures. Additionally, the emergency medical transport providers in Summit County will need to structure their organizations to ensure accountability and enable measurement of quality and value.

Summit Fire & EMS Financial Review

As discussed previously, the Copper Mountain Fire Department and Lake Dillon Fire-Rescue began a *functional* merger in January 2018. Until the two departments are formally consolidated into a single district, the Lake Dillon Fire Protection District and the Copper Mountain Consolidated Metropolitan District will retain their respective board of directors and continue to collect property taxes separately. For the 2018 fiscal year, each district transferred funding into a consolidated budget to support Summit Fire and EMS which is discussed following a historical overview of each separate district's fire service revenue and expenses from 2013–2017.

Lake Dillon Fire-Rescue

Revenue

Lake Dillon Fire-Rescue is funded through the district's general fund. As presented here, general fund data for LDFR was compiled from staff budget reports as adopted in December 2017 (final 2018 budget report). The data does not correspond precisely with that presented in the district's CAFRs for the same period but is used because it offers year-to-year revenue and expense information by major budget category (Personnel, Operating and Capital expense) rather than by function (Operations, Fire Prevention, Administration, etc.). By using this method, it allows for a comparison with other Summit County emergency service providers. The district also operates the Snake River Fleet Services Fund, a proprietary fund which provides fleet services to LDFR, CMFD, RWB, and the Summit Fire Authority. This fund is not addressed as part of the following discussion.

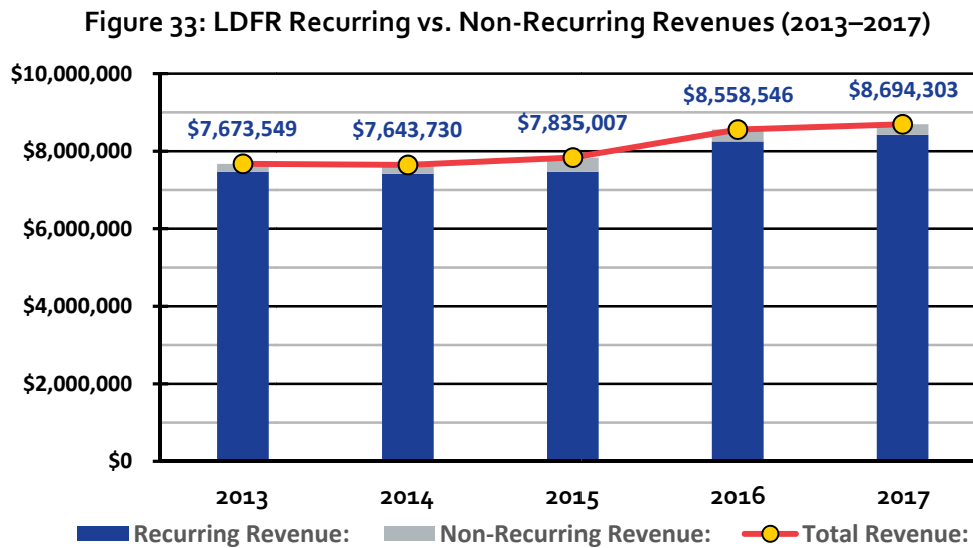
The next figure lists the major historical revenue sources of LDFR for each fiscal year from 2013–2017.

Figure 32: LDFR Historical Revenue Sources

Financial Resources	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Unaudited
Property Tax	6,534,041	6,545,093	6,564,047	7,110,615	7,191,096
Specific Ownership Tax ¹	369,955	345,497	351,426	371,784	360,000
Inspection/Plan Review	145,786	174,589	165,324	194,153	320,000
Fleet Reimbursement	8,228	145,842	155,463	159,608	162,447
Lower Blue FPD	46,240	18,000	20,000	20,000	20,000
SFA-HCTC	104,973	101,112	115,361	119,003	122,790
Summit County	93,959	15,025	20,352	184,740	154,500
Interest/Investments	166,209	70,000	73,875	90,084	92,000
Recurring Revenue:	\$7,469,391	\$7,415,158	\$7,465,848	\$8,249,987	\$8,422,833
Grants	22,653	14,187	29,110	9,068	10,625
Rental Income	4,481	107,767	124,660	56,265	54,535
Out of District Response	140,953	15,692	18,177	6,426	9,500
Wildland Response	18,000	66,519	185,525	216,761	180,000
Miscellaneous	18,071	24,407	11,687	20,039	16,810
Non-Recurring Revenue:	\$204,158	\$228,572	\$369,159	\$308,559	\$271,470
Total Revenue:	\$7,673,549	\$7,643,730	\$7,835,007	\$8,558,546	\$8,694,303
Unallocated Reserve	\$3,339,667	\$4,236,961	\$4,385,664	\$4,537,664	\$4,576,599
Capital Reserve	\$2,686,128	\$2,053,910	\$1,788,489	\$2,123,482	\$2,538,251
Total Financial Resources:	\$6,025,795	\$6,290,871	\$6,174,153	\$6,661,145	\$7,114,850

¹Includes Transfer to Authority—LDFPD & CMFD in 2013

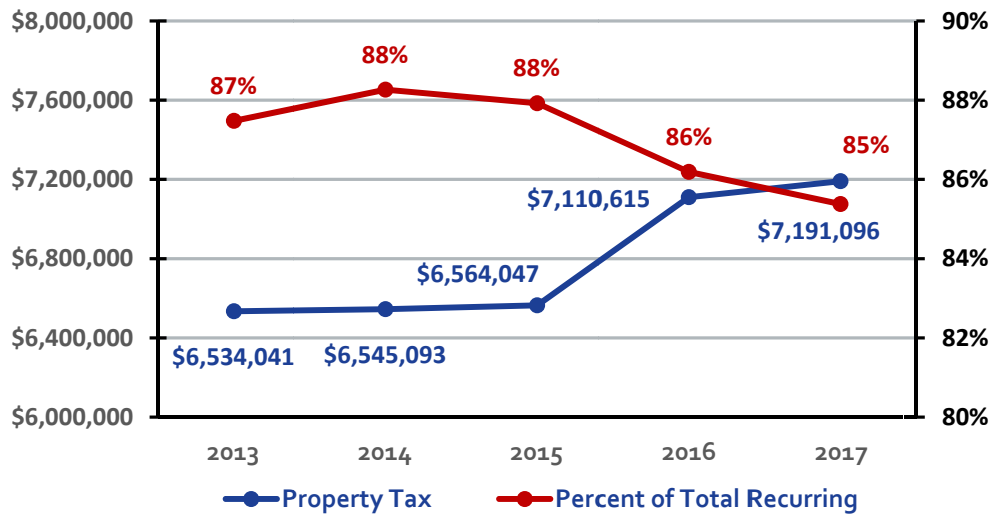
The following figure shows the historical trend of recurring versus non-recurring revenue applied to Lake Dillon Fire-Rescue expenditures. Recurring revenues are those reasonably expected to continue each year such as property taxes while non-recurring revenues are one-time or highly variable revenues such as grants, reimbursements, and sales of surplus equipment.



The majority of LDFR’s recurring revenue is acquired through property taxes. During the preceding five fiscal years, property taxes accounted for between 85–88% of recurring revenue, and 83–86% of the district’s total revenue. Between 2013 and 2017, non-recurring revenue accounted for approximately 3–5% of LDFR’s total revenues received.

The following figure shows the relationship of property tax revenue to recurring revenue for the District. Property tax revenue was relatively flat, averaging \$6.55 million between 2013 and 2015, increasing between \$550,000–650,000 in 2016–17. Despite that increase, property taxes as a percentage of recurring revenue decreased slightly due to the increase in payment from Summit County as part of the ambulance service intergovernmental agreement. Additionally, there was an increase in inspection fees.

Figure 34: LDFR Property Tax as Percent of Recurring Revenues (2013–2017)



Expenditures

The following figure provides a summary by major budget category of LDFR expenditures for the period 2013 through 2017.

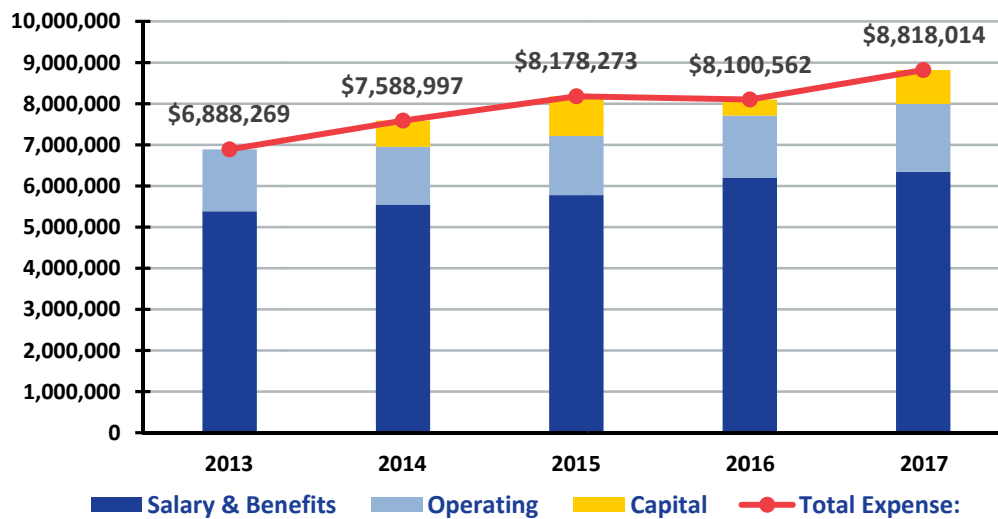
Figure 35: LDFR Historical Expenditure by Major Budget Category (2013–2017)

Expense	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Unaudited
Salary & Benefits	5,386,412	5,546,461	5,779,394	6,193,326	6,344,000
Operating	1,501,857	1,405,871	1,436,880	1,517,338	1,649,506
Capital	0	636,665	961,999	389,898	824,508
Debt Service	0	0	0	0	0
Total Expense:	\$6,888,269	\$7,588,997	\$8,178,273	\$8,100,562	\$8,818,014

By far, the most significant costs to LDFR were salary and benefits for its employees. These costs have increased approximately \$800,000 from 2013–2016 actual and were projected to climb an additional \$150,000 in 2017 (unaudited). Operating costs dropped \$100,000 between 2013 and 2014, from \$1.5 to \$1.4 million after which they have climbed each year to an estimated \$1.65 million in 2017. The average for the period is \$1.5 million. Capital costs have varied considerably from \$0 in 2013 to a high of \$961,999 in 2015. The average annual capital costs between 2013 actual and 2017 unaudited have been approximately \$560,000.

The following figure graphically depicts the relationship between major budget categories and total expenditures from 2013–2017.

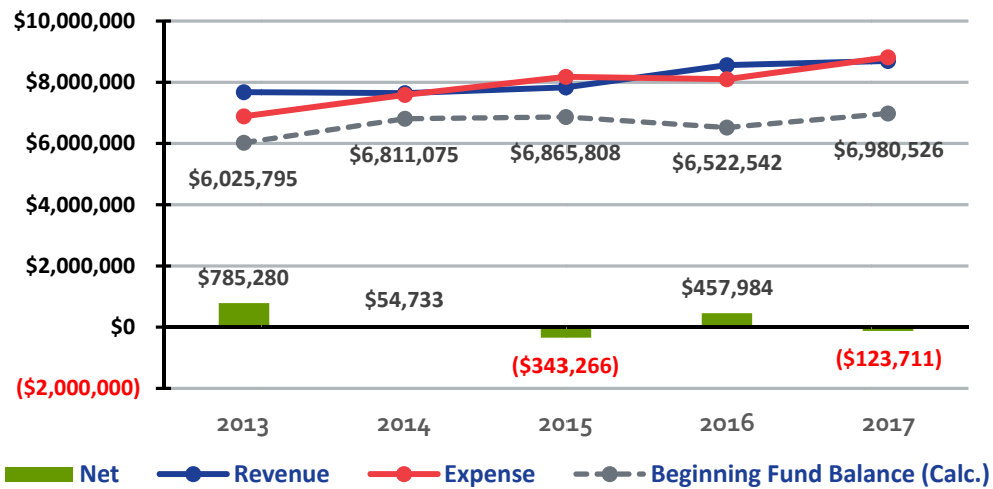
Figure 36: Relationship of LDFR Expenditures by Major Budget Category to Total (2013–2017)



Net Annual Gain (Loss) & Beginning Cash Balance

As a fire protection district organized under Colorado Revised Statute 32-1-8, Special District Article 1, Title 32, the District budgets annual revenue and expense within a self-contained fund that carries its own cash balance. At a minimum, it is good financial practice to compare recurring revenue and expense and the resulting effect on beginning cash balance each fiscal year. In this case, it is assumed that the average annual capital replacement costs of \$560,000 are a recurring expense, and that there are no non-recurring expenses over the historical period. Further, while non-recurring revenues have varied over the period, they have generally increased from just over \$200,000 in 2013, to almost \$275,000 in 2017 unaudited, and comprise a relatively small percentage of total annual revenue. Therefore, the following discussion refers to total revenue and expense versus fund balance.

The next figure shows total revenue and total expense. Calculated beginning cash balance is shown as a dashed line. When expense exceeds revenue, the fund operates at a deficit and must utilize cash balance carried forward to meet its operating expenses. The net increase or decrease each year is shown by the green bars. LDFR operated at a deficit in 2015 when capital purchases reached just under \$1 million. This operating deficit was supported by the planned use and subsequent reduction of cash balance.

Figure 37: Relationship of LDFR Total Revenue, Expense, & Beginning Fund Balance (2013–2017)

It should be noted that financial best practices call for governmental bodies to adopt policy for reserve funding levels. The Lake Dillon Fire Protection District has set a reserve policy that requires its restricted, assigned, and unassigned portions of the fund balance of approximately 33% or 3.5 months of expenditures. The current (2018) reserve is above this required policy.

Most agencies with fund balance policies require a minimum of 2–3 months annual operating expenses be held as unassigned reserves with varying additional reserves for capital expenditures—such as capital apparatus and facilities, and emergencies or contingencies. Some entities also require a tax stabilization reserve to help soften economic fluctuations. Calculated fund balance differs somewhat each year from actual fund balance reported because the effect of various other revenues and transfers in the capital fund has not been accounted for in the preceding figure.

Copper Mountain Fire Department

The Copper Mountain Fire Department is one of several departments funded through the *Copper Mountain Consolidated Metropolitan District* (CMCMD) and whose expenditure budget is located within the district General Fund (GF). Along with fire services, the GF also supports the Administrative and Roads and Parks budgets. The district also provides business type activities with are housed in separate enterprise funds. These include the Television Relay/High Speed Internet and Water/Sewer Services Funds. Further, the district maintains separate Debt Service, Capital Projects, and Pension Funds.

From a budgetary standpoint, the CMFD essentially functions the same as a municipal fire department housed within the city General Fund. In the following discussion, fire department expenses and specific revenues are discussed within the context of the GF revenue and expense budget. It is understood that any difference between fire department annual expenses and specific revenues such as inspection fees, etc. will be covered by general District revenues.

Capital expenses are housed within the Capital Projects Fund (and Debt Service Fund for those projects that are financed). Fire department capital expenditures will therefore be discussed but shown separately from the GF analysis to provide the reader with a more accurate picture of total department costs. It should also be pointed out that certain support costs such as legal; finance; human resources; risk management; and other related administrative overhead costs are included elsewhere in the District General Fund.

CMFD Revenues

The following figure shows actual financial resources available in the CMCMD General Fund for the period 2013–2016 and forecast for 2017. The primary sources of general fund revenue are property and specific ownership taxes. Property taxes averaged approximately \$1.5 million from 2013–2016 but were increased in 2017 along with specific ownership taxes. Revenues specifically related to fire department activities are shown in the figure following the table and include Inspection/Plan Review and Response Fees, Wildland Response recovery and revenue from the SCAS IGA. SCAS rental of CMCMD facilities is shown in the Rental/Leases line item.

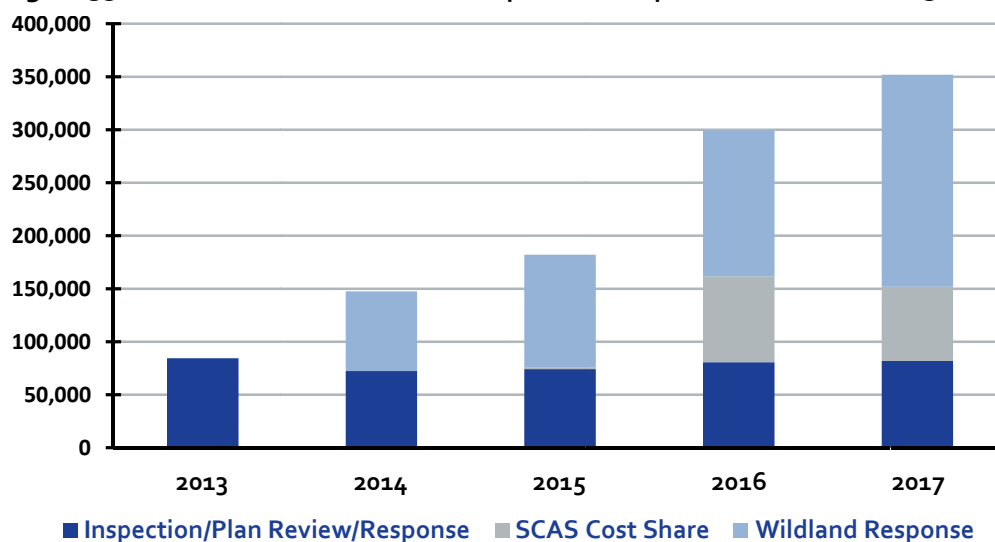
Figure 38: CMCMD General Fund Historical Financial Resources (2013–2017)

Financial Resources	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Forecast
Property Tax	1,522,783	1,439,561	1,442,256	1,539,998	2,349,429
Specific Ownership Tax	72,114	75,890	77,123	80,498	133,917
Delinquent Tax/Interest	7,158	2,503	2,332	2,095	2,900
Interest	27,543	35,636	35,428	38,217	65,775
Inspection/Plan Review ¹	84,489	72,303	74,199	80,744	81,920
SCAS Cost Share	0	0	1,372	81,026	70,000
Wildland Response	0	75,229	106,594	137,722	200,000
Rental/Leases	30,882	34,202	51,911	50,661	56,267
Other	126,953	25,267	13,082	113,784	6,600
Sale of Assets	0	129,372	0	0	4,000
Total Revenue:	\$1,871,922	\$1,889,963	\$1,804,297	\$2,124,745	\$2,970,808
Transfers In(out)	(\$50,000)	\$50,000	(\$7,000)	\$30,000	\$31,000
Capital Transfers In(out)	\$0	\$0	\$0	(\$175,000)	(\$569,000)
Beginning Fund Balance:	\$769,598	\$729,554	\$839,414	\$669,897	\$599,780

¹Includes Emergency Services fees

Inspection/Plan Review/Response fee revenue fluctuated somewhat dropping from near \$84,500 in 2013 to \$72,000 in 2014 then climbing back to a forecast \$82,000. This source has averaged approximately \$79,000 annually during the review period. The IGA with Summit County has averaged \$75,000 between 2016 and 2017. Wildland Response recovery has increased from \$75,000 in 2014 to a forecast \$200,000 in 2017 but this is a non-recurring revenue source based upon wildland fire activity and response in the region and should not be counted upon as a sustainable source of funding.

Figure 39: CMCMD General Fund Fire Department-Specific Revenues (2013–2017)



CMFD Expenditures

The following figure summarizes expenditures in the CMFD General Fund. As discussed above, the Copper Mountain Fire Department is a department of the Copper Mountain General Fund. Shown in the following figure are fire department personnel costs and operating expenses from 2013–2017 relative to all other department expenses in the general fund. Capital equipment, apparatus, and facilities costs are maintained separately in the CMFD Capital Project Fund. Debt-service supporting various purchases such as apparatus lease purchases is maintained in the CMFD Debt Service Fund.

Figure 40: CMFD General Fund Historical Expenditures (2013–2017)

Expense	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Forecast
Fire Department Expense	1,592,433	1,533,928	1,671,452	1,740,148	1,974,190
Salary & Benefits	1,346,464	1,263,950	1,388,460	1,488,121	1,656,814
Operating	245,969	269,978	282,992	252,027	317,376
Other GF Expense	269,533	296,175	295,362	309,714	342,755
Total GF Expense:	\$1,861,966	\$1,830,103	\$1,966,814	\$2,049,862	\$2,316,945

The next figure illustrates the relationship between the fire department and other General Fund department costs over the review period. As overall general fund costs have escalated, the fire department's proportionate share of the Copper Mountain district's General Fund has averaged near 85%.

Figure 41: CMFD Historical Expense as Percentage of CMCMD GF (2013–2017)

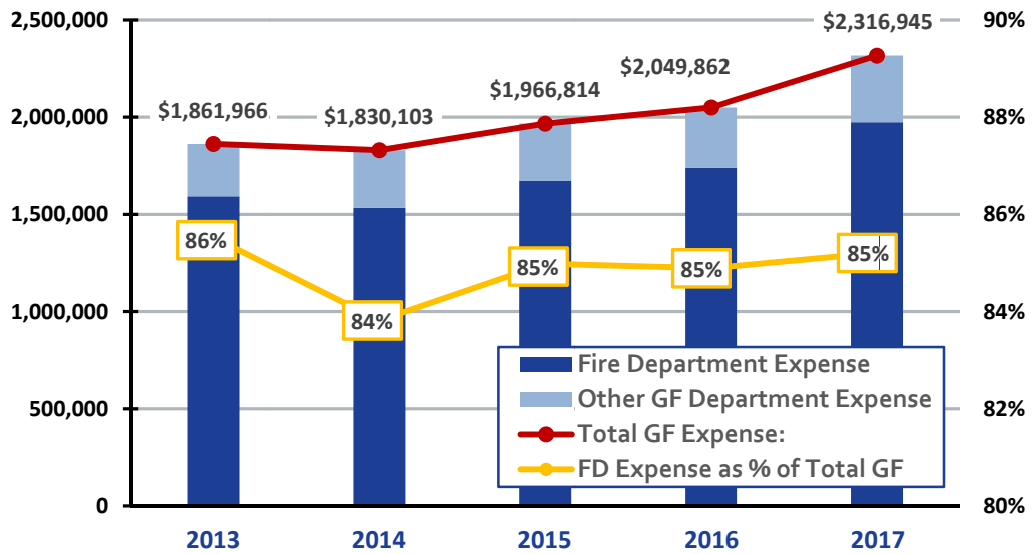
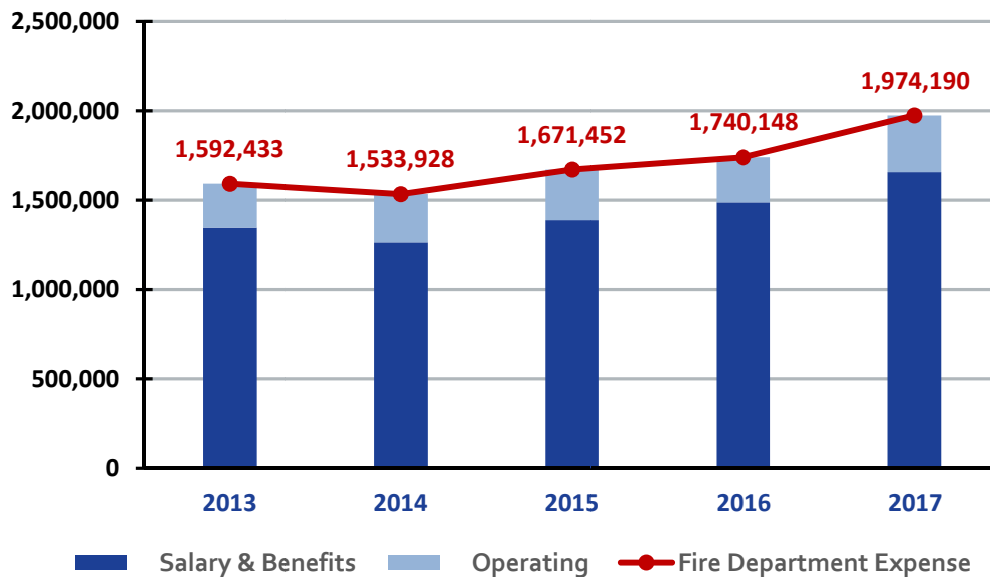


Figure 42: CMFD Historical GF Expense by Major Category (2013–2017)



The preceding figure shows CMFD costs from 2013–2017 by major budget category. As mentioned previously, capital and debt service costs as budgeted in funds separate from the District General Fund. Personnel costs were relatively flat at approximately \$1.55 million in 2013–14 before steadily climbing to a forecast of \$1.97 million in 2017. Operating costs, while showing some fluctuation, have generally risen from \$246,000 in 2013 to a forecast \$317,000 in 2017. As with many career departments, personnel costs are the largest percentage of the budget and have averaged 84% of the total CMFD operating budget over the review period.

The following figure shows a breakdown of actual and forecast capital expenditures for the Copper Mountain Fire Department from 2014 through 2018, as budgeted prior to preparation of the combined authority budget.

Figure 43: CMFD Capital Expenditures (2014–2018 as proposed)

Capital Expense	2014 Actual	2015 Actual	2016 Actual	2017 Forecast	2018 Proposed
Buildings	\$0	\$0	\$0	\$0	\$0
Apparatus	\$0	\$0	\$1,188,000	\$853,564	\$147,000
Equipment	\$121,755	\$25,080	\$100,000	\$62,010	\$0
Totals:	\$121,755	\$25,080	\$1,288,000	\$915,574	\$147,000

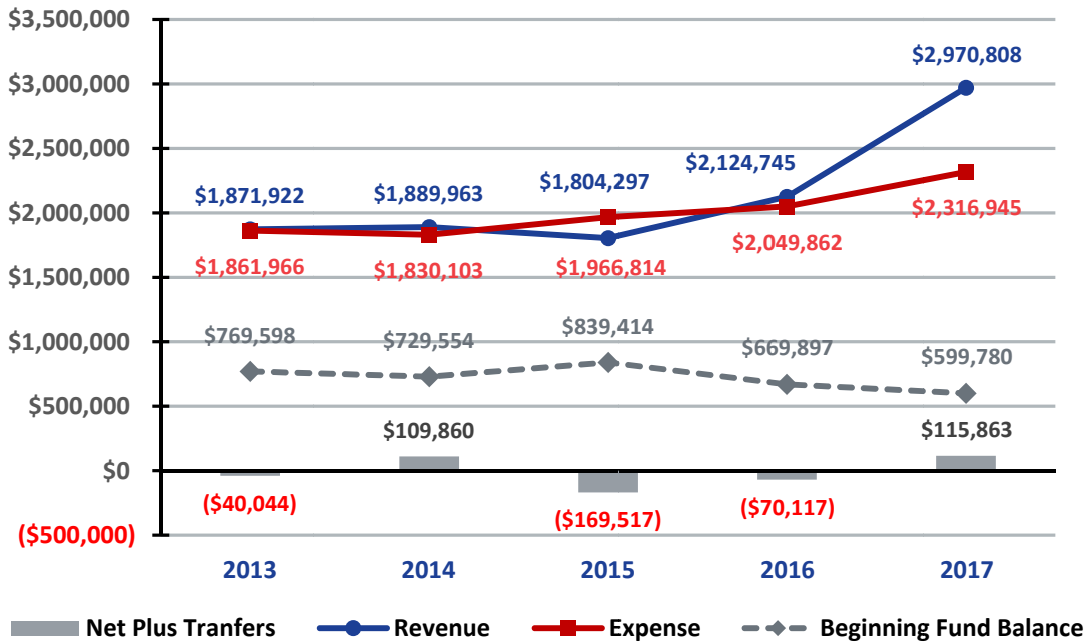
Net Annual Gain (Loss) & Beginning Cash Balance

As with the Lake Dillon Fire Protection District, the Copper Mountain Consolidated Metropolitan District budgets annual revenue and expense within self-contained funds that carry their own cash balance. However, the CMCMD uses several different funds including the General, Capital Projects and Debt Service Funds which all carry revenue and expense related to fire department operations. Several CMCMD enterprise funds—while part of the district—are unrelated to fire department operations and are not relevant to a discussion of the CMFD. CMFD specific revenue and unrestricted general fund revenue, as well as expenses for the fire department as part of the general fund, are discussed below as they relate to the general fund beginning balance.

Since the fire department is such a large component of the CMCMD General Fund, it is instructive to understand how total revenue and expense, including transfers into and out of the general fund, relate to its beginning balance. When expense exceeds revenue, the fund operates at a deficit and must utilize cash balance carried forward to meet its operating expenses. The net increase or decrease each year is shown by the green bars.

The CMCMD General Fund operated at a deficit in 2013, 2015, and 2016, when transfers out of the fund were taken into consideration. This operating deficit was supported by the planned use and subsequent reduction of the cash balance. Although there is a large transfer out to the Capital Projects Fund for fire department apparatus in 2017, the increase in tax revenue more than offset this added expense and the General Fund showed a net gain that increased the beginning cash balance into 2018. The following figure shows total revenue, expenses, (including transfers), and beginning fund balance.

Figure 44: Relationship of CMCMD GF Total Revenue, Expenses, & Beginning Fund Balance



Summary of SFE Revenue & Expenditures

As previously discussed, the Lake Dillon Fire Protection District and the Copper Mountain Consolidated Municipal District have agreed to a functional merger of their fire departments effective January 1, 2018. They have prepared a consolidated budget for fire service under the Summit County Fire & EMS Authority, and each is contributing revenue based upon respective 2018 expected expenditures of the authority.

The following figure lists unaudited/forecast revenue and expenditures of the Lake Dillon Fire Protection District and the Copper Mountain CMD General Fund for 2017, used to support 2017 expenditures of each respective fire department, the 2018 adopted budgets for each as well as the Authority budget for 2018. District expenditure totals for fire rescue service in 2017 and 2018 are shown in red. The intent of this is to give a perspective on the combined total revenue and expenses of the two districts and the change to an Authority budget.

Figure 45: Department Revenue (2017–18) Compared to Authority Revenue (2018)

Financial Resources	Lake Dillon		Copper Mountain GF		Authority
	2017 Unaudited	2018 Adopted	2017 Forecast	2018 Adopted	2018 Adopted
FD Expense/Contribution ¹	(8,818,014)	(7,575,000) ²	(1,974,190)	(1,903,221)	9,478,221
Property Tax	7,191,096	7,728,002	2,352,329	2,386,682	0
Specific Ownership Tax	360,000	330,000	133,917	126,388	0
Inspection/Plan Review ³	320,000	0	81,920	62,420	115,000
Fleet Reimbursement	162,447	0	0	0	172,393
Lower Blue FPD	20,000	20,000	0	0	0
SFA-HCTC	122,790	0	0	0	126,279
Summit County	154,500	0	70,000	0	144,000
Interest/Investments	92,000	77,000	65,775	47,000	10,000
Recurring Revenue:	\$8,422,833	\$8,155,002	\$2,703,941	\$2,622,490	\$10,045,893
Grants	10,625	37,500	0	0	0
Rental Income	54,535	69,015	56,267	57,416	0
Out of District Response	9,500	0	0	0	10,000
Wildland Response ⁴	180,000	0	200,000	0	0
Miscellaneous	16,810	6,400	10,600	2,700	0
Non-Recurring Revenue:	\$271,470	\$112,915	\$266,867	\$60,116	\$10,000
Total Revenue:	\$8,694,303	\$8,267,917	\$2,970,808	\$2,682,606	\$10,055,893

¹Fire department operating cost (excludes capital) in 2017; contribution based on 2018 share of Authority expense budget.

²Contribution does not include certain LDFR expenses that remained with the District General Fund, including Treasurer fees, legal and audit fees, TIF reductions, and the Lake Dillon Volunteer Pension Plan contribution.

³Includes Emergency Services Fee for CMCMD GF only; CMCMD will continue collection in 2018; other fire-related fees to be collected by Authority.

⁴Wildland Response revenue based upon reimbursement/workload; not budgeted as revenue in adopted budget.

In the "FD Expense/Contribution" (to Authority) line of the preceding figure, the fire department operating cost for FY 2017 and 2018 is shown as a negative number, since this is not revenue for each district; but only for the Authority where it is shown as a positive number. This negative amount for FY 2017 and 2018 is shown for reference only, and is not subtracted from each respective district's revenue. The fire department operating cost for 2017 is shown for comparison with the 2018 proposed cost, since each district's 2018 contribution is based upon their respective proposed share of the operating budget for 2018.

Excluding capital costs, which vary significantly year-to-year, both Lake Dillon and Copper Mountain fire protection costs have remained relatively flat from 2017 to 2018. Lake Dillon's have risen slightly from approximately \$8 million to \$8.1 million, while Copper Mountain's have remained at approximately \$2.1 million. The LDFPD contribution to the Authority does not include certain expenses that remained in the District budget, including Treasurer fees; legal, and audit fees; TIF reductions; and Lake Dillon Volunteer Pension Plan contributions. Both districts have retained capital costs within the respective district budgets, and there are no 2018 budgeted Authority capital costs.

The next figure shows total 2017 fire department total costs (versus just operating) for both districts, along with the 2018 costs. Lake Dillon summarizes capital and debt-service costs as part of the fire department budget (although detailed associated revenue and expenses are included in the Capital Fund), while Copper Mountain shows fire department capital and debt-service costs in two separate funds. CMFD annual operating costs shown in the CMCMD General Fund only contain personnel and operating costs, exclusive of annual capital and debt service. Lake Dillon had \$824,508 in capital costs in 2017, which is above their historical average capital cost of \$560,000. Copper Mountain had nearly \$920,000 in capital equipment and apparatus replacement costs in 2017 (\$853,564 in apparatus) along with debt-service costs of \$127,652.

The Authority has only budgeted \$195,000 in capital costs for 2018—which is considerably less than the combined average annual capital cost for both departments. CMCMD has budgeted \$195,000 in capital costs for 2018, of which approximately \$160,000 is the bulk for the replacement of a wildland fire engine at \$160,000. Lake Dillon has budgeted \$265,000 for apparatus replacement in 2018. These combined apparatus replacement costs are considerably less than the average annual capital costs for both departments, and the Authority will need to ensure that it has adequately developed and funded the apparatus and capital equipment replacement plan moving forward. Copper Mountain is currently continuing to carry the debt service on apparatus replaced through the lease purchase in 2017.

Figure 46: LDFPD/CMCMD GF Expense (2017–18) Compared to Authority Expense (2018)

Expenditures	Lake Dillon FPD		Copper Mountain GF		Authority
	2017 Unaudited	2018 Adopted ³	2017 Forecast	2018 Adopted	2018 Adopted
Contribution to Authority	—	7,575,000	—	1,903,221	—
Salary & Benefits	6,344,000	92,582	1,656,814	—	7,976,213
Operating	1,649,506	460,047	317,376	—	1,502,009
Capital ¹	824,508	2,602,603	918,574	195,000	—
Debt Service ²	—	—	127,652	177,375	—
Total Expense:	\$8,818,014	\$10,730,232	\$3,020,416	\$2,275,596	\$9,478,222

¹CMFD capital expenditures budgeted in separate CMCMD Capital Project Fund (for 2017 \$853,564 is apparatus replacement with remainder being equipment); capex moved to Authority budget for 2018 (\$160,000 is for apparatus); Lake Dillon capital remains within the LDFPD budget for 2018

²CMCMD Capital Project Fund will continue to carry two lease purchase payments for CMFD apparatus

³LDFPD 2018 budget contains \$92,582 for pension costs and \$460,047 for various operating costs such as treasurer and other professional fees

Red, White & Blue Fire District

RWB's annual budget serves as the foundation for its financial planning and management. The senior personnel of all divisions are required to participate in the specific development and management of the annual budget. The Fire Chief and Finance Officer use appropriation requests along with the revenue projections to develop a proposed budget. The Board of Directors is required to hold public hearings on the proposed budget, and subsequently adopt a final budget. The necessary and appropriate property tax mill levy must be certified to the Summit County Board of Commissioners in mid-December. The Board of Directors must approve any revision that alters the total appropriation of the General Fund through a supplemental resolution and budget amendment.

The District enjoyed a stable economic environment prior to the 2008 economic downturn, with assessed valuation of properties-protected experiencing an average 6% annual growth rate. Property values fell substantially with the countrywide economic downturn, but subsequently began to rebound by 2012—a trend which continued through 2014. Beginning in 2014, many properties transitioned from the "vacant land" schedule onto the "new construction" property tax schedule—which is at a lower rate. In 2015 and 2016, the District saw increased assessments once again. The District closely monitors economic conditions and forecasts any potential repercussions as the impact on property values historically lags several years beyond benchmark economic indicators.

For 2018, RWB established two separate funds to more efficiently budget and track expenses; the General Operating (Fund #1000) and Capital Expenditures Funds (Fund #9000). For 2017 and prior years, all expenditures were aggregated in the General Operating Fund. During the 2012 budget process, the Board established an unassigned Capital Reserve Fund of \$2 million distinct from the General Fund Reserve. The new Capital Expenditure Fund has been funded with a \$2 million transfer from General Operating Fund reserve, and each year it receives 0.5 Mill Property Tax Levy designated for Capital Expenditures. RWB Fire receives 8.508 Mill Property Tax Levy for General Operating Funds.

As of 2017, the RWB board also revised its fund balance or reserve policy. The revised policy states that the district will maintain a General Fund Reserve equivalent to six months of the annual operating budget (\$4.4 million for 2018) and five years of capital expenditures as identified in the Capital Expenditure Plan (\$3.6 million). RWB's former fiscal policy stated that the General Fund Reserve balance should be maintained at an equivalent to the next six months of General Fund Expenditures (Budgeted Operating & Capital Expenditures). As of December 31, 2017, the General Fund Reserve—including designated emergency and unassigned reserves—totaled approximately \$6.2 million or 77% of its reserve target set by the newly adopted reserve policy.

Revenue

The following figure lists RWB's historical recurring and non-recurring revenue sources for the period 2013 through 2017 audited and the projected revenues, as adopted in the 2018 budget. As expected, property taxes, followed by the Specific Ownership Tax, continued to be the major recurring revenue sources for the Red, White & Blue Fire District.

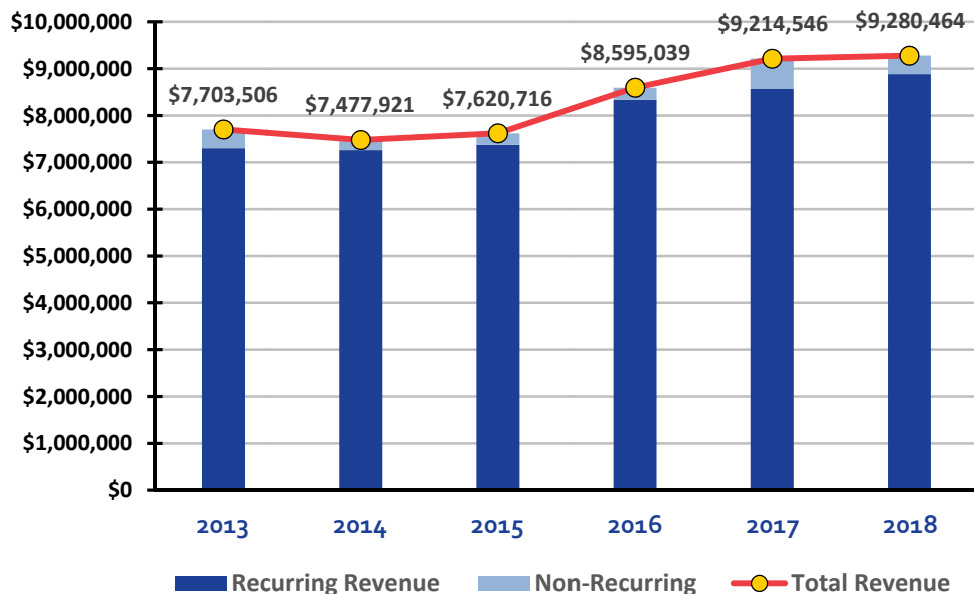
Figure 47: RWB Historical Revenue Sources (2013–2018)

Financial Resources	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Adopted
Property Tax	6,691,759	6,307,043	6,424,302	7,077,664	7,188,114	7,717,128
Spec. Ownership Tax	317,239	333,130	343,571	371,547	428,195	350,000
Interest/Investments	17,319	15,465	23,701	48,481	77,038	67,600
Plan Rev./Other Fees	38,328	307,749	165,828	195,291	228,674	156,000
Summit Fire Authority	218,011	274,957	205,275	256,408	289,062	294,525
SCAS IGA	20,351	22,834	212,484	388,303	354,784	300,000
Recurring Revenue:	\$7,303,007	\$7,261,178	\$7,375,161	\$8,337,694	\$8,565,867	\$8,885,253
Grants/Contributions ¹	284,269	188,859	213,736	237,721	630,135	373,013
Other	116,230	27,884	31,819	19,624	18,544	22,198
Non-Recurring:	\$400,499	\$216,743	\$245,555	\$257,345	\$648,679	\$395,211
Total Revenue:	\$7,703,506	\$7,477,921	\$7,620,716	\$8,595,039	\$9,214,546	\$9,280,464
Begin. Fund Balance	\$4,051,403	\$4,507,086	\$4,759,462	\$5,225,546	\$5,679,184	\$6,214,012
Total Resources:	\$11,754,909	\$11,985,007	\$12,380,178	\$13,820,585	\$14,893,730	\$15,494,476

¹Wildland reimbursement shown as Grants/Other Contributions; not budgeted initially as revenue due to uncertainty of workload

As will be shown in the next figure, the majority of RWB's recurring revenue is acquired through property taxes. During the preceding six fiscal years, property taxes accounted for 84–92% of recurring revenue, and 78–87% of the District's total revenue. Between 2013 and 2017, non-recurring revenue accounted for approximately 3–7% of RWB's total revenues received. The relationship between recurring and non-recurring revenue is shown in following figure. Revenues were relatively flat, averaging \$7.6 million between 2013 and 2015; after which they increased to \$9.2 million by 2017 (approximate 10% increase).

Figure 48: RWB Historical Recurring & Non-Recurring Revenue Sources



Expenditures

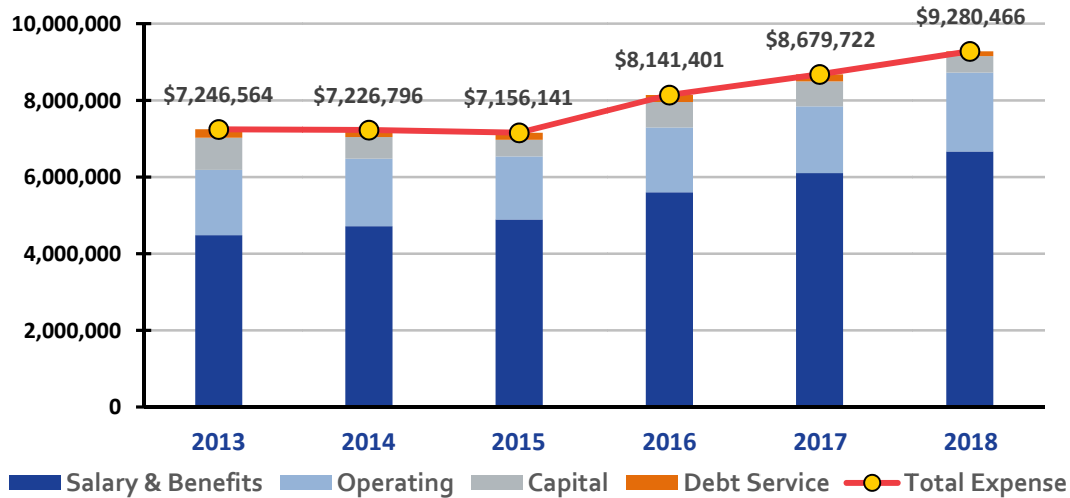
As discussed, prior to 2018 all expenditures were carried in the General Fund after which capital expenditures and related debt service were housed in a separate Capital Fund. In the next figure, all expenditures are captured in the same chart to show total RWB financial impact for the period 2013–2017 actual and budgeted 2018. The RWB CAFRs typically do not break out expenses in the major budget categories of Personnel, Operating, Capital, and Debt Service expense. Further, changes made after several past CAFRs were published make historical analysis and agency comparisons using the CAFRs problematic. Therefore, the following data were obtained directly from the latest RWB staff reports, which provide a more accurate picture of historical trends for RWB expenses. This allows a comparison by major budget category with other Summit County emergency service providers.

Figure 49: RWB Historical Expenditures (2013–2018)

Expense	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Adopted
Salary & Benefits	4,484,473	4,716,404	4,892,093	5,600,910	6,101,870	6,667,337
Operating	1,702,278	1,764,582	1,647,174	1,693,621	1,742,243	2,057,540
Capital	839,343	561,256	432,096	661,793	650,607	430,000
Debt Service	220,470	184,554	184,778	185,077	185,002	125,589
Total Expense:	\$7,246,564	\$7,226,796	\$7,156,141	\$8,141,401	\$8,679,722	\$9,280,466

The following figure shows historical expenditures by major budget category: Personnel, Operating, Capital and Debt Service. As with most career or substantially career departments, personnel costs account for the largest portion of the expenditure budget—increasing from 62% in 2013 to 70% by 2017. This increase has resulted from both annual wage and benefit increases and the addition of staff over the period as service levels have increased. Although personnel costs increased between 2013 and 2015, overall expenditures remained relatively flat averaging \$7.2 million while revenue remained flat during the same period. Expenditures then began increasing in 2016.

Figure 50: RWB Historical Expenditures by Major Budget Category (2013–2018)



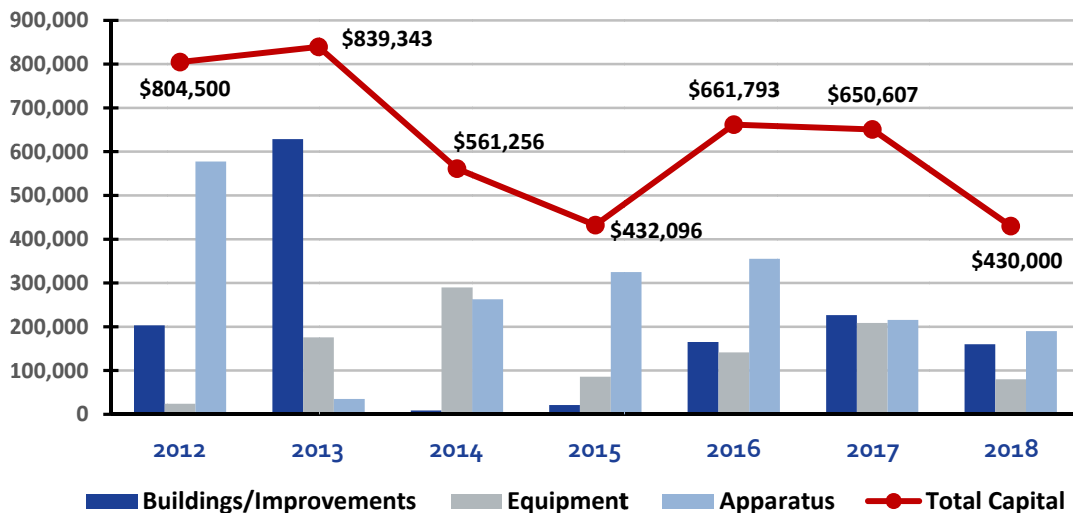
Operating expenses have remained relatively flat from 2013 through 2017; averaging \$1.7 million annually. Debt Service costs have decreased slightly from a high of \$220,000 in 2013 to an adopted \$125,000; as various notes have been retired. Capital expenses have varied considerably during the period, and include expenses for Buildings/Other Improvements, and equipment and apparatus replacement. The following figure provides an overview of RWB capital expenditures from 2012–2017 actual and 2018 budgeted.

Figure 51: RWB Capital Expenditures by Major Category (2012–2018)

Capital Expense	2012 Actual	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	2018 Adopted
Facilities	203,046	628,628	8,629	21,204	165,118	226,448	160,000
Equipment	24,063	175,675	289,946	85,844	141,273	208,525	80,000
Apparatus	577,391	35,040	262,681	325,048	355,402	215,634	190,000
Total Capital:	\$804,500	\$839,343	\$561,256	\$432,096	\$661,793	\$650,607	\$430,000

The department has developed a long-range capital apparatus replacement plan that relies upon a “pay as you go” philosophy, rather than borrowed funding with accompanying debt service costs moving into the future. With a robust capital reserve, and a recurring funding source as mentioned previously, the department is able to replace equipment on a planned replacement cycle, as it becomes obsolete. Average annual apparatus replacement cost for the period has been \$280,000. Annual equipment costs, while variable, have averaged approximately \$145,000 annually. Capital construction/renovation costs are generally considered a non-recurring capital expense and are planned as part of a long-term Capital Improvement Plan (CIP). These costs can either be paid through the use of some type of financing, or with capital reserves for which it has been planned. The latter is how the RWB District has chosen to fund these projects—which is the reason they have selected their current fund-balance policy.

Figure 52: RWB Capital Expenditures by Major Category versus Total Cost (2012–2018)



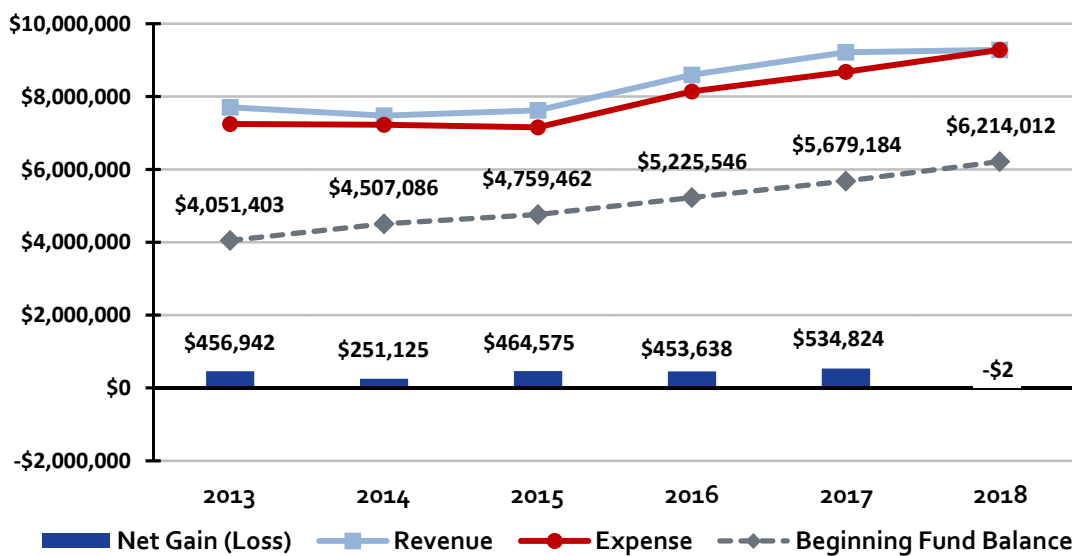
Net Annual Gain (Loss) & Beginning Cash Balance

As with the Lake Dillion and Copper Mountain districts, RWB budgets annual revenue and expenses within a self-contained fund that carries its own cash balance. As of 2018, RWB uses two different funds—including the General and Capital Projects Funds, which all carry revenue and expenses related to fire department operations. For the purposes of this discussion, these two funds are combined. RWB specific revenue and unrestricted general fund revenue, as well as expenses, are discussed in the following as they relate to the General Fund beginning balance. The majority of the annual revenue is considered recurring in nature, and since the non-recurring portion of total revenue is relatively minor, this discussion considers total revenue.

Further, although some expenses such as capital facility construction/renovation costs are normally considered non-recurring, the District has developed long-range capital improvement and replacement plans that rely on both total annual revenue and fund balance. Therefore, considered here, are total revenue versus total expenses, and impact on annual fund balance. When expense exceeds revenue, the fund operates at a deficit and must utilize cash balance carried forward to meet its operating expenses. This may be the case in any given year when large capital expenditures are made and is an intentional policy of the district.

RWB has consistently operated with an annual budget surplus. This operating surplus has allowed the district to build its restricted and unrestricted reserve funds from \$4 million in 2013 to \$6.2 million as budgeted in 2018.

Figure 53: Relationship of RWB Total Revenue, Expense, & Beginning Fund Balance



Financial Summary

The financial history of each agency participating in the Summit County EMS system has been discussed previously, including Lake Dillion Fire Rescue and the Copper Mountain Consolidated Municipal District, both prior to and after the 2018 functional merger into the Summit County Fire & EMS Authority. This discussion has provided a framework and understanding of total historical resources and costs of providing fire rescue and emergency medical transport service to the citizens and visitors of Summit County.

While it is worthwhile studying each agency as a separate entity, it is perhaps more useful to understand the current combined resources and costs of providing these services as a starting point to any discussion of system optimization. The following two figures provide an overview of system resources and expenses as budgeted for 2018.

Figure 54: Budgeted Combined Agency Resources (2018)

2018 Adopted Budget

Financial Resources	SCAS	SFE	RWB	TOTAL
Property Tax ¹			\$7,717,128	\$7,717,128
Specific Ownership Tax ¹			\$350,000	\$350,000
Safety First Tax ²	\$1,876,990			\$1,876,990
Interest/Investments	\$1,000	\$10,000	\$67,600	\$78,600
Transfers ³		\$9,478,221		\$9,478,221
Ambulance Fees ⁴	\$4,238,155			\$4,238,155
Other Fees	\$6,000	\$287,393	\$156,000	\$449,393
Contracts (other than SCAS)	\$25,000	\$126,279	\$294,525	\$445,804
Grants/Contributions	\$150,766		\$373,013	\$523,779
Miscellaneous/Other Revenues			\$22,198	\$22,198
Total Revenue:	\$6,297,911	\$9,901,893	\$8,980,464	\$25,180,268
Beginning Fund Balance ⁵	\$630,927	\$0	\$6,214,012	\$6,844,939
Total Resources:	\$6,928,838	\$9,901,893	\$15,194,476	\$32,025,207

¹Tax revenue not shown for SFE partner districts, which provide transfer to Authority but retain tax collection powers

²Safety First Tax collected by Summit County; a portion of which is shown & designated for support of ambulance service

³Transfers from SFE partner districts based upon proposed annual expenditures for fire and EMS

⁴Total ambulance fees anticipated prior to any contractual split with other agencies

⁵Beginning fund Balance for LDFD General/Capital Fund is \$6,991,138; CMFR General Fund is approximately \$715,000

The preceding figure shows total resources available in the individual agency budgets for 2018. It should be noted that both LDFR and the CMCMD contribute funding to Summit Fire & EMS (Summit Fire & EMS Authority) under a JPA, and is based upon the proposed costs for 2018. LDFR still budgets separately for all revenues (such as property and specific ownership tax, various fees, etc.) and certain expenses (primarily capital), as well as a fund balance carried forward (and constituent reserve balances), as previously discussed in the individual agency evaluation.

CMCMD, in its General and Capital Funds, also continues to budget for its own revenues, non-fire/rescue-related expenditures, and fund balance carried forward. Total SFE revenue for 2018 is budgeted at \$9.9 million, while total expenditures, shown in the next figure, totals \$9.67 million. Presumably, the partners are attempting to develop a reserve fund to be carried forward. Initially, this 2018 ending fund balance will be approximately \$230,000.

Figure 55: Budgeted Combined Agency Fire & EMS Expenditures (2018)

2018 Adopted Budget

Financial Resources	SCAS	SFE	RWB	TOTAL
Staff (salary/benefits)	\$3,095,756	\$7,976,213	\$6,667,337	\$17,739,306
Operating	\$1,354,418	\$1,502,009	\$2,057,540	\$4,913,967
Capital ¹	\$2,300,500	\$195,000	\$430,000	\$2,925,500
<i>Facilities</i>	\$1,883,130	\$0	\$160,000	\$2,043,130
<i>Equipment</i>	\$167,265	\$35,000	\$80,000	\$282,265
<i>Apparatus</i>	\$250,106	\$160,000	\$190,000	\$600,106
Debt Service	\$145,625	\$0	\$125,589	\$271,214
Total Expenditures:	\$6,896,299	\$9,673,222	\$9,280,466	\$25,849,987

¹Lake Dillon retains capital in fire district budget for 2018, rather than transferring to SFE, as did CMCMD; LD 2018 Facility budget is \$2,180,603; apparatus is \$265,000; & Equipment \$157,000

Capital expenditures of \$195,000 reflect only those apparatus and equipment purchases originally budgeted in 2018 by CMCMD for the fire service. LDFR capital apparatus and equipment expense—while not included in the preceding figure, since the District did not make that part of the SFE budget in 2018—represents a combined total expense of \$422,000. This expense is covered by the District reserves budgeted for capital expense according to the capital replacement plan as adopted by the District Board.

In order to better understand what the combined agencies are spending each year to maintain the current level of service, LDFR equipment and apparatus expenses for 2018 are included in the next figure under SFE total expense. Total expense for the combined agencies includes apparatus and equipment only, as these are considered a recurring annual cost along with operating and personnel costs. This figure is presented to illustrate an overall financial perspective of each of the primary provider agencies.

Figure 56: Budgeted Combined Agency Revenue, Expense, & Net Impact (2018)

— 2018 Adopted Budgets —

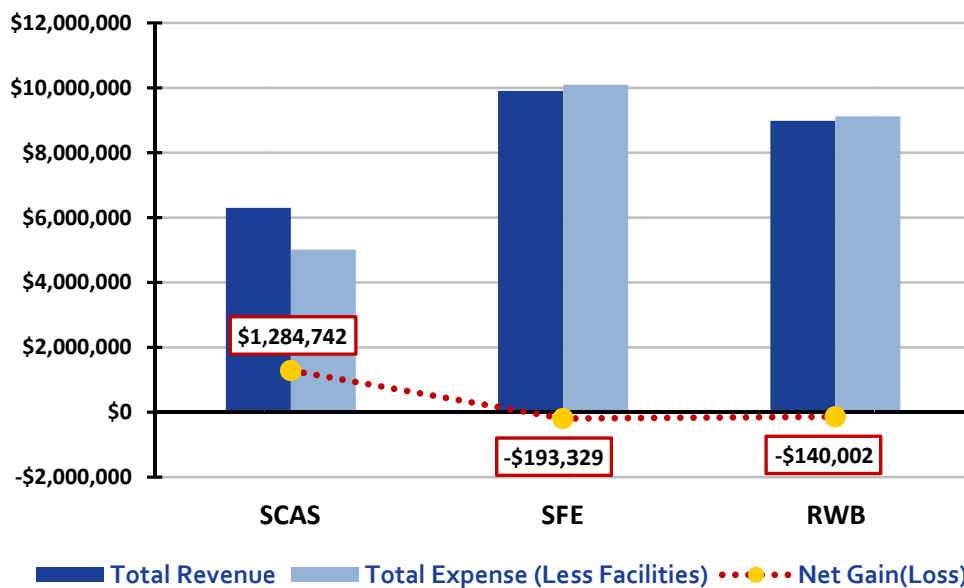
Revenue/Expense	SCAS	SFE	RWB	TOTAL
Total Revenue	\$6,297,911	\$9,901,893	\$8,980,464	\$25,180,268
Total Expense (less facilities)	\$5,300,299	\$10,095,222	\$9,120,466	\$24,515,987
Net Gain(Loss)	\$997,612	-\$193,329	-\$140,002	\$664,281

Total revenue—the majority of which is recurring—is shown in the preceding figure as an offset to “recurring” expense. The net gain or loss is shown without consideration of facility expense budgeted for 2018, so as to provide a perspective for the financial health of the overall fire protection and EMS system in Summit County moving forward.

Both LDFR and RWB have very strong reserves and policies in place to maintain them at a level necessary to accomplish annual capital replacement. The net loss shown for SFE and RWB in the preceding figure is covered by a reduction in fund balance as planned by the districts in their 2018 budgets. The net gain shown for SCAS is due to the Safety First funds. While this funding is largely used for the 2018 facility construction project, if that were removed, the excess revenue over recurring expense is almost \$1.3 million.

This “cushion” could provide the County with the ability to make some changes to the overall EMS system in Summit County—at least during the term of the tax levy, or longer if renewed by the voters. Potential options for optimization of the system are discussed elsewhere. This relationship between revenue, “recurring” expense (excluding facilities), and net annual gain or loss is shown graphically in the following figure for each provider agency.

Figure 57: Budgeted Combined Agency Revenue/Expenditure vs. Fund Balance (2018)



Estimated Costs of EMS Transport

As part of this study, ESCI examined the cost of ground emergency medical transport services throughout Summit County. Since SCAS and RWB are the primary providers of 911 scene responses and IFT services, the analysis focused on the costs of these two agencies.

Total Cost Estimates

In order to compare costs as fairly and equitably as possible, the adopted 2018 operating budgets for each agency were used, while capital expenditures were excluded. Although the primary mission of SCAS is the provision of ambulance service, and its total cost can be fully apportioned to its ambulance fleet and attendant personnel, this is not the case with RWB.

To understand the costs for RWB to operate each of its two 24-hour staffed medic units, and compare the costs to SCAS, an allocation process of the full RWB operating budget had to be performed. The following figure shows the full 2018 operating costs by division, and then how those costs may be attributed either directly or indirectly to EMS transport services.

Figure 58: RWB Division Expenditure Budget & EMS Costs (2018)

Source: RWB Budget Documents

Expenditure Budget (2018 GF)	Total Cost	EMS Costs	
		Direct	Indirect
4100 Administration	\$1,280,477	—	\$256,095
4200 Operations	\$5,453,729	\$1,417,970	—
4300 Community Risk Management	\$201,856	—	—
4400 Training	\$603,676	—	\$60,368
4500 IT/Communications	\$190,750	—	\$38,150
4600 Fleet (\$71,300 overhead)	\$205,100	\$29,300	\$15,686
4700 EMS	\$62,000	\$62,000	—
4800 Buildings (\$18,500 overhead)	\$162,770	—	\$4,810
4840 North Station (#4)	\$34,860	—	—
4850 West Station (#5)	\$10,760	\$10,760	—
860 Main Station (#6)	\$67,500	\$27,000	—
4870 South Station (#7)	\$31,150	—	—
4900 Other	\$349,882	—	\$69,976
Total RWB Operating Expense:	\$8,654,510	—	—
EMS Direct/Indirect Cost	—	\$1,547,030	\$445,085
EMS Operating Expense:	—	\$1,992,115	

While there are different ways in which the costs of various functional programs can be broken out of a total organizational budget, the incremental approach using direct and indirect allocated costs is used here. For most non-operational budgets in the RWB 2018 operating expenditure budget, the percentage of personnel assigned primarily to medic units was used to determine indirect costs that would be applied to the EMS budget. For example, the Administrative Division budget of \$1.28 million is comprised of command and various other administrative staff, and the costs associated with running the overall organization.

In order to completely and specifically apportion indirect EMS costs to non-operational functions, the number of personnel typically assigned to that role (12 of 47 operational staff assigned to medic units on a 24-hour daily basis) was divided by the total number of department personnel (59) to arrive at an EMS factor of 20%. That percentage or factor applied against the total in the case of the Administrative Division gives an indirect EMS cost of \$256,095 (total division cost of \$1.28 million multiplied by an EMS staff of 12 per total staff of 59 or 20%). Similarly, and unless otherwise noted, this factor was applied against the total 2018 costs for the other non-operational divisions to arrive at an indirect EMS cost.

In the case of the Operations Division, the number of staff assigned primarily to medic units (12) was divided solely by the number of operational staff (47 up through shift Battalion Chief) to obtain a direct cost of the entire operations division based upon the split of personnel according to their primary assignment. It is understood that primary medic crews may from time-to-time cross-staff an engine, and that engine or truck crews may occasionally cross-staff back-up medic units. However, this analysis assumes that those instances are infrequent enough to be of little consequence to the overall allocation.

The Risk Management Division is considered entirely a non-EMS function with no allocated costs. The Training Division only provides scheduling documentation of training hours for EMS personnel whose training is provide mainly by SCAS. Therefore, a factor of 10% was applied to the Training Division costs to arrive at an indirect EMS cost. The IT/Communications budget was allocated indirectly based upon the 20% staffing criteria, and EMS Division costs allocated at 100% to EMS transport; even though it is understood that some of those costs would go to non-medic units for medical first-response services. Total Fleet Division costs included both direct apparatus fuel and maintenance costs, and indirect overhead costs. All direct apparatus costs were totaled and subtracted from the Division cost to arrive at an overhead of \$71,300. The percentage of direct medic unit fuel and maintenance costs in relation to other apparatus (22%) was applied to the overhead to obtain an indirect EMS overhead cost.

RWB-staffed medic units are housed at Stations 5 and 6. There is a two-person crew primarily assigned to Medic 5, with no full-time staffing assigned to the engine. Therefore, the station operating costs were directly assigned 100% to EMS. Station 6 has both a medic crew of two and an engine crew of three. Thus, only 40% of the direct station operating cost was assigned to EMS. The Other category contains various leave payout and other indirect costs such as tax collector fees, which were assigned on the basis of the staffing split (20%) to EMS.

Based on the logic described previously, a total of \$1,992,115 (\$1,547,030 in direct costs, and \$445,085 in indirect costs) or 23% of the total 2018 RWB operating budget of \$8,654,510 can be attributed to the EMS or EMS transport function.

Methods of Cost-Comparison

With the EMS costs computed for RWB, a comparison can be made between the 2018 budgeted-cost per projected patient transport and costs to operate an equivalent full-time, year-round (24 hours daily) medic unit. As discussed earlier, SCAS operates five medic units on a 24-hour daily basis, and several others as a peak-demand unit and/or seasonally staffed units.

To determine unit costs, the total operating budget assigned to EMS is divided by the number of actual and fractional equivalent full-time medic units. Adding total available hours for SCAS medic units during 2018 (49,140), divided by the total available hours for one medic unit (8,760), gives a total of 5.6 equivalent full-time medic units. RWB has two full-time medic units.

The total SCAS operating budget for 2018 (less capital) is \$5,349,799. Dividing that total annual cost by 5.6 medic units gives an operating cost of \$955,321 per unit for SCAS during 2018. The RWB EMS cost for 2018 is \$1,992,115. Dividing that figure by the two units results in a 2018 operating cost of \$996,057 per RWB medic unit; or approximately 4% more than the cost of operating a single SCAS medic unit.

Another way to look at cost of service is by examining the cost per patient-transport. Data presented previously in this report showed that RWB averaged 76.7% billable transports of all EMS calls dispatched in any given year, while SCAS averaged an 81.2% transport rate relative to total EMS calls dispatched.

Based upon the projected EMS call volume for 2018, which indicates that SCAS will transport approximately 2,868 patients (3,532 projected EMS calls multiplied by an 81.2% transport rate), while RWB will transport about 1,062 patients (1,385 projected EMS calls multiplied by a 76.7% transport rate). Dividing the SCAS 2018 expenditure budget (excluding capital) of \$5,349,799 by the projected number of transports (2,868) leads to a total cost per transport of \$1,865. Dividing the RWB 2018 EMS expenditure budget (excluding capital) of \$1,992,115 by the projected number of transports (1,062) results in a cost of \$1,875 per transport; approximately the same cost as operating a single SCAS medic unit.

The following figure compares the two methods utilized to evaluate the costs of EMS transport services between SCAS and RWB.

Figure 59: Results of Methods Used to Compare Costs of EMS Transport Services

Analysis Method	SCAS	RWB	Difference
Annual cost to operate a single full-time medic unit	\$955,321	\$996,057	+4%
Agency cost per individual transport	\$1,865	\$1,875	+0.5%

Discussion of EMS-Transport Services Costs

As anticipated, the costs of operating a fire-based ground emergency medical transport service were somewhat higher than the costs to operate a third-service model. However, when considering the difference, other issues must be considered. SCAS functions as a single-role provider of emergency medical care and transport, RWB is an all-hazards emergency services organization with medic units staffed with cross-trained/dual-role firefighters. Because of this, there is an added value (and cost) with this configuration.

While some may argue that firefighters assigned to a medic unit are there *only* to provide EMS, this is not entirely true. Even when assigned to a medic unit, the additional equipment, skills, and training of firefighters can be utilized to mitigate a variety of other emergencies.

It must be clearly stated and emphasized that ESCI does *not* suggest that fire-based EMS providers are superior to third-service organizations. In a number of counties around North America, third-service agencies are the best option, and provide high-quality service. However, in the case of Summit County, ESCI contends that merging SCAS with SFE remains the best solution.

CAPITAL FACILITIES, VEHICLES, & EQUIPMENT

Fire & Ambulance Stations

Summit County Ambulance has lease agreements with Summit Fire & EMS and the Red, White & Blue Fire District to house ALS units in fire stations. SCAS units are housed in SFE Stations 1, 8, and 11. An additional unit is located at SCAS headquarters (referred to as Station 3) in *Summit County Emergency Services Building*. SCAS and SFE are currently building a joint administration building and, when completed, SCAS will move into that facility (and Medic 3 will be moved to SFE Station 2). In addition, RWB has two front line ambulances (Medic 5 and 6) as well, operating out of RWB stations.

Statically locating fire and EMS stations is typically based on two main factors: ability to provide rapid first-response to geographical areas with concentrated service-demand, along with the ability to respond in a timely manner to adjacent response zones when the first-due units are out of service on concurrent calls and/or the emergency requires additional resources as part of the first-response assignment.

Housing medic units in fire stations is ideal, as the speed at which a structure fire grows to flashover stage without fire suppression efforts is similar to the survivability of a cardiac arrest patient without timely definitive care. In other words, speed is of the essence in both situations, and rapid first-response and quick action to mitigate the problem increases the chances of containing a fire or successfully resuscitating a patient.

The following figures represent a general overview of each of the fire and SCAS stations currently housing apparatus and personnel. SFE Station 10 was not included, as it is an administrative station. SFE and SCAS are currently building a joint administrative facility, and Medic 3 will eventually be moved to, and deployed from, SFE Station 2. SFE Station 12 was also excluded, as it serves as an auxiliary facility for equipment storage.

The following figures represent those stations that are staffed, have apparatus and/or medic units assigned to them, and are operational.

Summit Fire & EMS Facilities

The next several figures list each of the SFE fire station facilities and their basic features and condition.

Figure 6o: SFE Fire Station 1

Physical Address: 0477 Copper Road, Copper Mountain, CO 80443



General Description:

This is a very large staffed station with a SCAS medic unit assigned, including reserve SCAS unit. The crew cross-staffs and engine and ladder company. The second floor contains substantial office space. A multi-story training tower is incorporated into the station.

Structure					
Construction Type	Block and steel framed				
Date of Construction	2009				
Seismic Protection	No				
Auxiliary Power	Yes				
General Condition	Excellent				
Apparatus Bays	No back-in bays	4 drive-through bays			
Special Considerations (ADA, etc.)	ADA compliant with elevator				
Square Footage	30,508 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	10 rooms	10 beds			
Maximum station staffing capability	10 personnel				
Exercise/Workout	Yes				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	Yes				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Yes				
Decontamination/Biohazard Disposal	Yes				
Security	Combination locks only				
Apparatus Exhaust System	Yes				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Engine 1	Type 1	2016	Sutphen Custom	Very Good	3 personnel
Truck 1	Aerial	2016	Sutphen 75-ft. Quint	Very Good	Cross-staffed
Wildland 1	Type 6	2018		Excellent	Cross-staffed

Figure 61: SFE Fire Station 2

Physical Address: 301 S. 8th Avenue, Frisco, CO 80443



General Description:

Staffed station that has been remodeled multiple times. Currently houses Community Risk staff. Weight room takes up one bay but will need to be moved. SCAS Medic 3 will eventually be housed there, and remodeling will be required for additional sleeping quarters for the ambulance crew.

Structure					
Construction Type	Ordinary wood frame				
Date of Construction	1980				
Seismic Protection	No				
Auxiliary Power	No				
General Condition	Needs updating				
Apparatus Bays	2 back-in bays		2 drive-through		
Special Considerations (ADA, etc.)	None				
Square Footage	12,800 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	4 rooms		4 beds		
Maximum station staffing capability	Will change after remodeling				
Exercise/Workout	Yes				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	Yes				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Yes				
Decontamination/Biohazard Disposal	No				
Security	Combination locks only				
Apparatus Exhaust System	Partial; two units covered				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Engine 2	Type 1	2016	Pierce -Enforcer	Excellent	3 personnel
Hazmat 2	Rescue	1992	E-1 Cyclone	Very good	Cross-staffed
Wildland 2	Type 6	2003	Ford F-550	Good	Cross-staffed

Figure 62: SFE Fire Station 8

Physical Address: 225 Lake Dillon Dr., Dillon, CO 80435



General Description:

Staffed station. One ALS staffed engine company, and one cross-staffed SCAS/SFE medic unit.

Structure					
Construction Type	Pre-stressed concrete				
Date of Construction	1986				
Seismic Protection	No				
Auxiliary Power	Yes				
General Condition	Good				
Apparatus Bays	2 back-in bays		4 drive-through bays		
Special Considerations (ADA, etc.)	No				
Square Footage	10,941 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	7 rooms		7 beds		
Maximum station staffing capability	7				
Exercise/Workout	Yes				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	Yes				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Yes				
Decontamination/Biohazard Disposal	Biohazard disposal				
Security	Combination locks only				
Apparatus Exhaust System	Yes				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Battalion 8	Command	2016	Ford F-150	Excellent	1 person
Engine 8	Type 1	2014	Rosenbauer	Very good	3 personnel
Tender 8	Type 1	2017	Rosenbauer	Excellent	Cross-staffed
Wildland 8	Type 6	2008	Ford F-550	Excellent	Cross-staffed

Figure 63: SFE Fire Station 11**Physical Address:** 22393 US Highway 6, Keystone, CO 80435**General Description:**

Houses SCAS Medic 11, and was the old Snake River Fire Department headquarters station. This station has a large training room with folding walls to segregate training space.

Structure					
Construction Type	Ordinary, block, steel & wood framed				
Date of Construction	1996				
Seismic Protection	No				
Auxiliary Power	Yes				
General Condition	Good				
Apparatus Bays	No back-in bays		4 drive-through bays		
Special Considerations (ADA, etc.)	ADA compliant				
Square Footage	15,600 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	8 rooms		8 beds		
Maximum station staffing capability	8				
Exercise/Workout	Yes				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	Yes				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Yes				
Decontamination/Biohazard Disposal	No				
Security	Combination locks only				
Apparatus Exhaust System	Partial; two units covered				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Engine 11	Type 1	2005	Pierce Dash	Good	3 personnel
Truck 11	Aerial	2010	Sutphen SPH 100	Very Good	Cross-staffed
Wildland	Type 3	2000	Pierce International	Good	Cross-staffed

Red, White & Blue Fire District Fire Station Facilities

The following figures list each of the RWB fire station facilities and their basic features and condition.

Figure 64: RWB Fire Station 4

Physical Address: 13549 Hwy 9, Breckenridge, CO 80424



General Description:

Originally built to house office staff, resident firefighters, and vehicle maintenance. Has since been adapted to house firefighters on second floor. Portion of lower level leased to SCAS.

Structure					
Construction Type	Type V-1 hour				
Date of Construction	2002				
Seismic Protection	No				
Auxiliary Power	Will be a 2018 capital project				
General Condition	Good				
Apparatus Bays	3 drive-through bays				
Special Considerations (ADA, etc.)	ADA accessible on main level only				
Square Footage	13,418 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	8 rooms		8 beds		
Maximum station staffing capability	8				
Exercise/Workout	Yes				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	Yes				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Monitored smoke & sprinkler system				
Decontamination/Biohazard Disposal	No				
Security	Exterior locks can be audited				
Apparatus Exhaust System	Yes; with exception of SCAS ambulances				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Engine 4	Type 1	2016	E-One/Cyclone II	New	3 personnel
Engine 4Z	Type 1	2004	E-One/Cyclone II	Reserve	N/A
Tender 4	Type 1	2015	Rosenbauer	New	Cross-staffed
Wildland 4	Type VI	2012	Ford F350	Good	Cross-staffed

Figure 65: RWB Fire Station 5**Physical Address:** 1999 Ski Hill Road Breckenridge, CO 80424**General Description:**

Constructed in 2013 as part of the Master Plan for the base area of Peak 7 and Peak 8 of the Breckenridge Ski Resort. Constructed as part of a public/private partnership.

Structure					
Construction Type	Type IIB				
Date of Construction	2013				
Seismic Protection	Yes				
Auxiliary Power	Yes				
General Condition	Excellent				
Apparatus Bays	2 back-in bays	No drive-through			
Special Considerations (ADA, etc.)	No				
Square Footage	2,287 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	2 rooms	3 beds			
Maximum station staffing capability	3				
Exercise/Workout	No				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	No				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Monitored smoke & sprinkler system				
Decontamination/Biohazard Disposal	No				
Security	Exterior locks can be audited				
Apparatus Exhaust System	On all apparatus				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Engine 5	Type III	2012	Rosenbauer	Fair	Cross-staffed
Medic 5	Type I Ambulance	2017	Lifeline	Excellent	2 personnel

Figure 66: RWB Fire Station 6

Physical Address: 316 N. Main Street, Breckenridge, CO 80424



General Description:

Three-story building originally constructed in 1976. Multiple additions to accommodate career staff and administration.

Structure

Construction Type	Type V-N	
Date of Construction	1976	
Seismic Protection	None	
Auxiliary Power	Generator runs entire facility	
General Condition	Good	
Apparatus Bays	2 back-in bays	2 drive-through
Special Considerations (ADA, etc.)	ADA accessible on main level only	
Square Footage	15,608 square feet	

Facilities Available

Separate Rooms/Dormitory/Other	7 rooms	7 beds
Maximum station staffing capability	7	
Exercise/Workout	Yes	
Kitchen/Dormitory	Yes	
Individual Lockers/Storage Assigned	Yes	
Shower Facilities	Yes	
Training/Meeting Rooms	Yes	
Washer/Dryer	Yes	

Safety Systems & Assignments

Sprinklers and/or Smoke Detection	Monitored smoke & sprinkler system
Decontamination/Biohazard Disposal	Biohazard disposal for all facilities
Security	Silent alarm, video, & exterior locks can be audited
Apparatus Exhaust System	On all apparatus

Assigned Apparatus/Vehicles

Unit	Type	Year	Make/Model	Condition	Staffing
Truck 6	Type I Aerial	2010	Pierce/Velocity	Good	3 personnel
Medic 6	Type I	2007	AEV	Fair	2 personnel
Tender 6	Type I Tender	2012	Pierce	Excellent	Cross-staffed
Wildland 6	Type VI Engine	2004	Ford F550	Good	Cross-staffed
Battalion 6	Command	2010	Chevrolet	Good	1 person

Figure 67: RWB Fire Station 7**Physical Address:** 0120 Whispering Pines Circle, Blue River, CO 80424**General Description:**

In 1996 the facility was remodeled to add six dorm rooms for resident firefighters. Additional remodels completed to adapt for career staff.

Structure					
Construction Type	Type V-N				
Date of Construction	1976 (addition in 1996)				
Seismic Protection	None				
Auxiliary Power	Will be a 2019 capital project				
General Condition	Good				
Apparatus Bays	3 back-in bays	No drive-through			
Special Considerations (ADA, etc.)	None				
Square Footage	4,855 square feet				
Facilities Available					
Separate Rooms/Dormitory/Other	3 rooms	3 beds			
Maximum station staffing capability	3				
Exercise/Workout	Yes				
Kitchen/Dormitory	Yes				
Individual Lockers/Storage Assigned	Yes				
Shower Facilities	Yes				
Training/Meeting Rooms	No				
Washer/Dryer	Yes				
Safety Systems & Assignments					
Sprinklers and/or Smoke Detection	Monitored smoke & sprinkler system				
Decontamination/Biohazard Disposal	No				
Security	Exterior locks can be audited				
Apparatus Exhaust System	On all apparatus				
Assigned Apparatus/Vehicles					
Unit	Type	Year	Make/Model	Condition	Staffing
Engine 7	Type I Engine	2007	E-One	Good	3 personnel
Medic 7	Type I Ambulance	2007	AEV	Reserve	Cross-staffed
Wildland 7	Type VI Engine	2006	Ford F550	Good	Cross-staffed

Summit County Ambulance Service Station Facilities

SCAS maintains its one headquarters station in the County's Emergency Services (ES) building in Frisco. It also leases space at SFE Fire Stations 1, 8, and 11; and RWB Station 4.

Figure 68: SCAS Station 3 (Headquarters)

Physical Address: 227 County Shops Road, Frisco, CO 80443



General Description:

This facility houses all the management and administrative staff and office facilities. Medic 3 is deployed from here but will be moving to SFE Station 2. SFE and SCAS will be building a joint administrative facility.

Structure			
Construction Type	Metal frame, missionary, stucco		
Date of Construction	1996		
Seismic Protection	No		
Auxiliary Power	Yes		
General Condition	Fair		
Apparatus Bays	3 drive-through bays		
Special Considerations (ADA, etc.)	Unknown		
Square Footage	12,455 square feet		
Facilities Available			
Separate Rooms/Dormitory/Other	3 rooms	3 beds	
Maximum station staffing capability	3		
Exercise/Workout	No		
Kitchen/Dormitory	Yes		
Individual Lockers/Storage Assigned	Yes		
Adequate equipment/supply storage	Not reported		
Training/Meeting Rooms	Yes		
Washer/Dryer	Yes		
Safety Systems & Assignments			
Decontamination/biohazard disposal	No (unknown if there is an exhaust removal system)		
Sprinkler System	Yes		
Smoke Detection	Yes		
Security	Badge system		
Assigned Apparatus/Vehicles			
Unit	Minimum Staffing	Equipped (BLS, ALS)	Comments
Medic 3	2	Advanced life support	Squad 3 is also located here
Medic 3-Z	Reserve	Advanced life support	
Medic 33	Reserve	Advanced life support	

Capital Medical Equipment

All three agencies use similar capital medical equipment, including cardiac monitor/defibrillators (with SAO₂/CO₂ monitoring capability); powered gurneys; automated external defibrillators (AED); and video laryngoscopes. There is a slight variation in the model of cardiac monitors being used by SFE and RWB. However, operation of these devices is fundamentally the same. SFE and RWB have a combination of HeartStart® and Zoll® AEDs.

Separate agencies working with substantially similar equipment is extremely beneficial from a patient-care standpoint—especially when working on scenes with multiple patients, where more than one agency is providing medical care. It also makes it more efficient for SFE, RWB, or SCAS personnel—who occasionally work shifts at the other agencies—to seamlessly integrate into agency operations.

Ambulance Fleet & Vehicles

Depending on the vehicle type (Type I, II, or III), a fully equipped medic unit (aka ambulance) represents a significant capital investment. The type used by Summit County agencies typically would go well beyond \$150,000. With such highly complex and technically configured vehicles (and large investment), medic units must be included in a regular preventative maintenance program.

SCAS maintains a fleet of five front-line and four Type I four-wheel drive reserve ambulances manufactured by *Life Line Emergency Vehicles*. The newest front-line unit was placed into service in early 2018, and the oldest unit was placed into service in 2008. The *Summit County Fleet Maintenance Division* performs all maintenance and repairs of SCAS apparatus. RWB maintains two front-line and one reserve Type I ambulances, manufactured by *Life Line Emergency Vehicles* and *American Emergency Vehicles* (AEV). The newest unit was purchased in 2017, and the oldest in 2007. *Snake River Fleet Services* maintains RWB ambulances.

Ambulance Fleet Discussion

Mileage, age, and cost are key elements in any fleet maintenance plan. Some authorities consider the “industry standard” for the useful life expectancy of an ambulance as between 150,000 and 250,000 miles, at an age of 4–7 years. However, geography and road terrain also affect ambulance life span. Summit County’s primarily rural environment, with numerous unimproved roadways and seasonal adverse weather conditions, are hard on ambulance running gear. Due to high replacement costs, some agencies elect to re-chassis their modular ambulances—purchasing a new cab and chassis only; refurbishing the existing modular patient compartment box; and reinstalling onto the new chassis. This typically lowers the cost of total replacement by approximately one third. However, due to winter road maintenance, corrosion of the ambulance “box” can shorten its overall life span, making re-chassis impractical from a cost-savings standpoint. However, experience varies, as SCAS has had success when doing a re-chassis of their units.

RWB spent over \$8,000 each for repairs of Medic 6 and Medic 7 in 2017, due to faulty engine design. This made the units inefficient and unreliable in terms of cost-effectiveness and safety. RWB is planning to replace both units as soon as possible. SCAS placed a new medic unit in service in early 2018, and has applied for grants to replace more units.

Capital Facilities Discussion

In general, all SFE and RWB stations are adequate for housing ambulance units, with the exception of the living quarters at RWB Station 5—which can only accommodate three personnel in the living space. Several of the SFE and RWB stations have been extensively remodeled over the years to accommodate growth and transitions from volunteer/resident firefighter programs to full-time career personnel.

With few exceptions, all stations include biohazard/decontamination capability, and sufficient office space, internet connectivity, apparatus floor space, and living quarters for stand-alone ambulance crews. Summit Fire & EMS apparatus bays have Nederman® exhaust extraction systems, which are being incrementally replaced with Plymovent® systems. As a result, some SCAS ambulances cannot currently connect to these systems. All RWB stations use the Plymovent system. However, the SCAS unit housed at RWB Station 4 cannot connect to the system due to the configuration of the vehicle exhaust pipes.

ESCI notes the current station apparatus bay and living quarters currently provide flexibility in placing units in the most advantageous locations to provide rapid first-response and back-up response capability to the geographically isolated response zones for each agency.

SERVICE DELIVERY & OPERATIONAL PERFORMANCE

In this section ESCI has evaluated the operational components of Summit County service delivery and performance from the perspective of service-demand, distribution, response-reliability, ambulance transport, and response performance. Although the other components addressed in this report contribute to the success of the various emergency services organizations, the provision of prehospital emergency medical care and transport, as well as other emergency services, is the primary reason for their existence.

Incident Data Sources

A significant challenge of this study involved conducting the various analyses of data. The datasets came from six separate sources: Lake Dillon Fire Rescue; the Copper Mountain Fire Department; Summit County Ambulance; the Red, White & Blue Fire District; Terra Two (Centura Health); and computer-aided dispatch (CAD) records provided by the Summit County 911 Center.

In order to obtain accurate results, it was necessary for ESCI to “clean” and manipulate hundreds of records, in order to eliminate duplicate incidents and obvious outliers. The 911 Center’s CAD system does not utilize a unique numbering system for each incident dispatched—which made it problematic when attempting to evaluate call volumes and other elements of a particular EMS incident.

As will be seen in the following service-demand analyses, comparisons of countywide volumes will not be equal those of the collective totals of the agencies. Countywide incident data was calculated from CAD records, while agency data was acquired from their respective records management system. For example, there could be 100 individual motor vehicle collisions that occurred during one month. If SFE and SCAS each responded to those 100 incidents, combined, the records would should 200 motor vehicle collisions.

EMS Delivery System Study Area

In the following analyses, the study area included all of the incorporated and unincorporated communities within the boundaries of Summit County. This represents an area of about 619 square miles, and a resident population of approximately 30,367–30,374 persons.

Service Demand Study

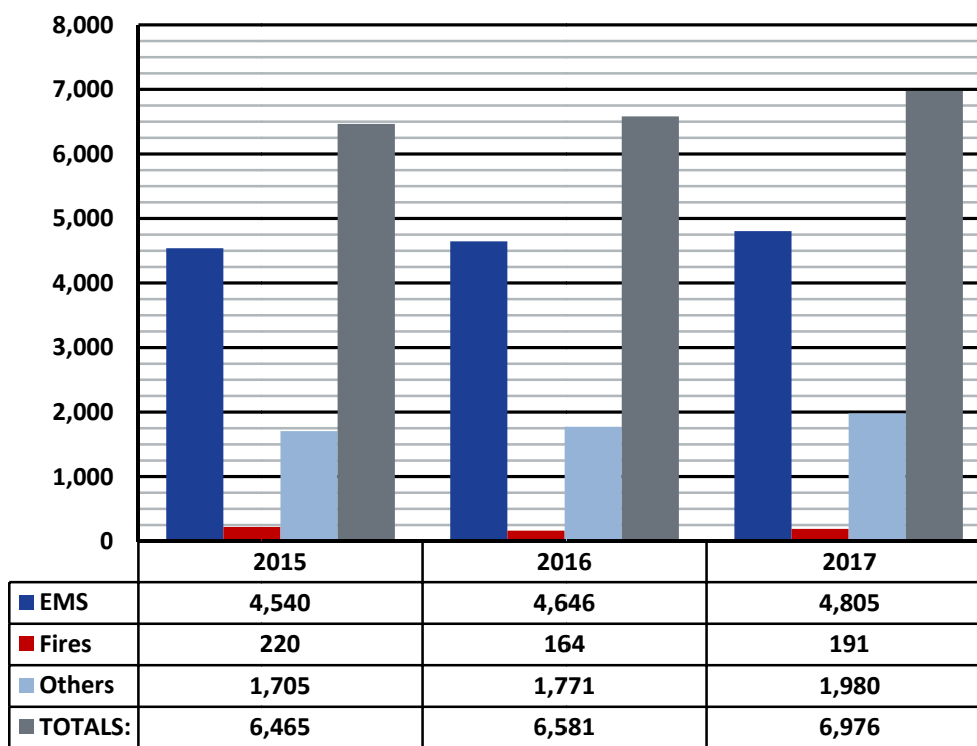
The demand for services is the primary driver for determining appropriate resources, and the methods for deployment of those resources. In the following analyses, ESCI reviews current and historical service-demand by incident type and temporal variation. The analyses will include a review of service-demand on a countywide basis, as well as by individual emergency services organizations. GIS software has been utilized to provide a geographic display of demand within the study area.

Countywide Service Demand

The following figure illustrates the combined service demand of all agencies and incident types in Summit County by call-type and frequency. The source of this data was CAD records provided by the Summit County 911 Center from the 36-month study period of 2015–2017. The dataset also included 313 additional records designated as either "Information Fire" or "Information Medical." ESCI assumed these were not actual incidents, and they were excluded from the following results.

Figure 6g: Summit County Service-Demand—All Agencies

Source: CAD records



The CAD system does not use the *National Fire Incident Reporting System* (NFIRS) incident type codes. Instead, incidents are classified using custom "Call Type Codes" and an accompanying description. In the preceding figure, "EMS" represents all 911/scene responses and both in-county and out-of-county interfacility transports. "Fires" were those that appeared in the dataset to fall within one of the NFIRS 100 codes (e.g., structure fires, vehicle fires, wildland, etc.). "Others" were all other non-fire and non-EMS calls (e.g., fire and false alarms; public assists; gas leaks; etc.).

Countywide, EMS service-demand increased by just over 5.8% between 2015 and 2017. Fire calls have fluctuated from year-to-year, but decreased from 2015–2017 by approximately 13%. During the same period, "Other" calls increased by slightly over 16%. Overall, total service-demand in Summit County increased by nearly 8% over the previous three years.

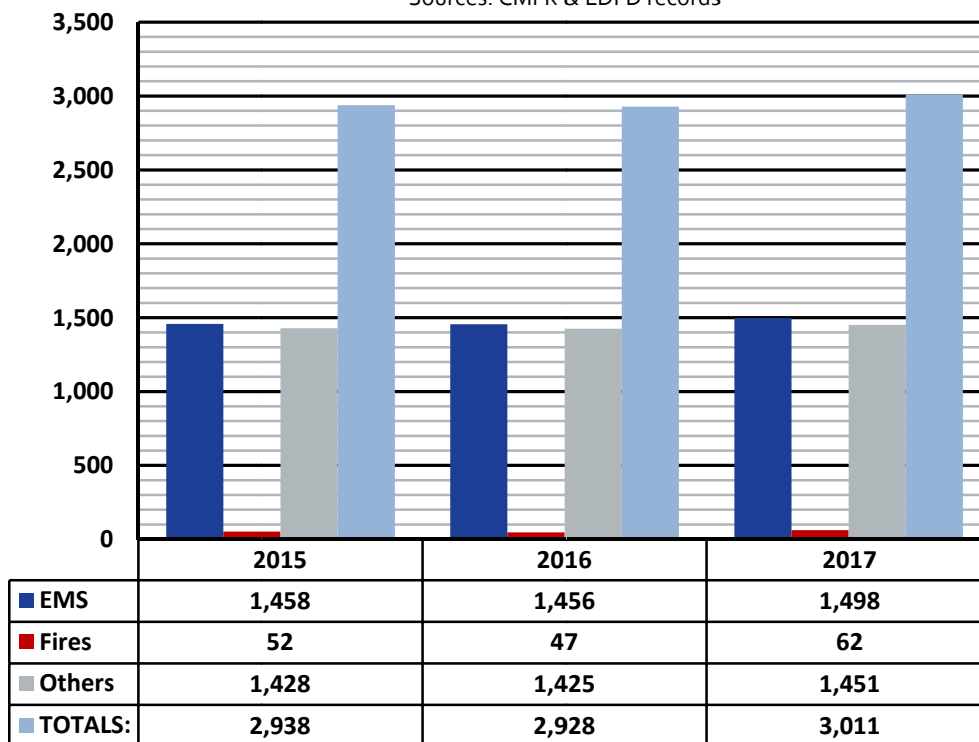
Service-Demand by Agency

The next section evaluates historical service-demand by individual agency between 2015 and 2017. The analyses are based on incident data provided to ESCI from each organization’s records management system (RMS). These included all calls *dispatched*, and those cancelled en route. Where applicable, both medical first-response and medic unit response data were included. For the two fire departments, fires and other incident-types were included in the results. It is important to note that the total results found among following figures will not necessarily equate to each other. This was due to a variety of data issues, including the necessity of using multiple datasets from multiple sources.

The following figure represents SFE service-demand. In this case, historical incident data from Lake Dillon Fire-Rescue and the Copper Mountain Fire Department was combined into the total results.

Figure 70: SFE Historical Service Demand

Sources: CMFR & LDFD records

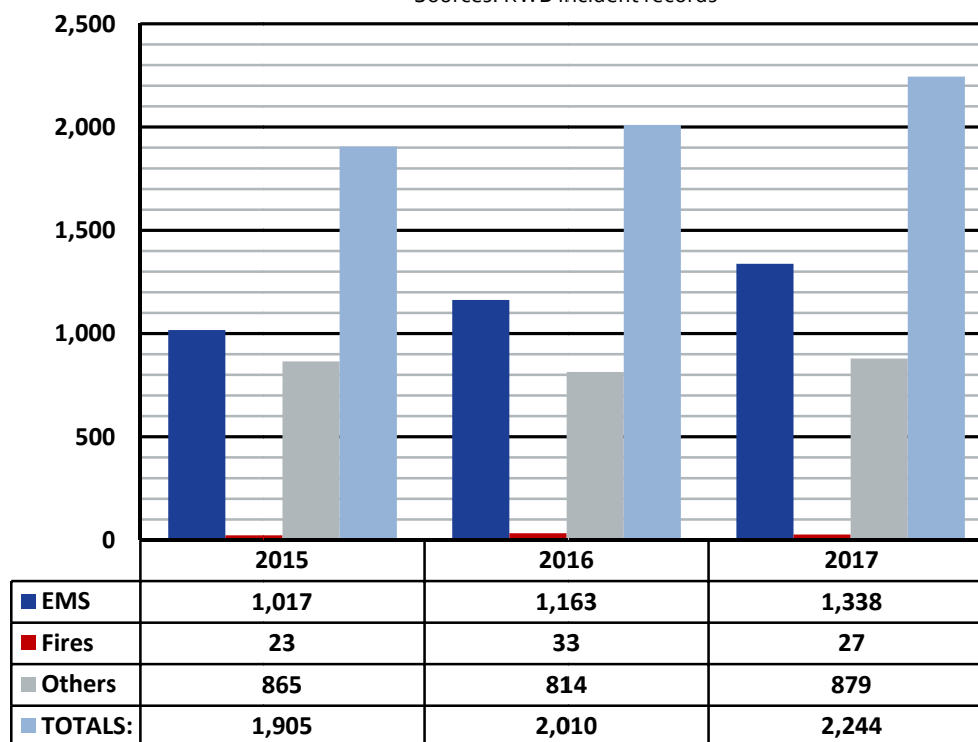


Service-demand for Summit Fire & EMS followed a similar pattern to the overall call volumes for Summit County, but had an increase in fire calls of just over 19% between 2015 and 2017. This result should not be misinterpreted, as this represented only 10 additional fires during this period. Demand for EMS increased by about 2.7%, while all others went up by 1.6%. Over the three-year study period, SFE’s total service-demand increased by approximately 2.5%.

The following figure lists the service-demand of the Red, White & Blue Fire District. As with the preceding figure, these include all incidents dispatched during the 36-month study period of 2015–2017.

Figure 71: RWB Historical Service Demand

Sources: RWB incident records



During the 36-month study period, the Red, White & Blue Fire District had an increase in service-demand in each of the three incident-type categories. The largest increase (31.6%) occurred with EMS during 2015–2017. Although fire calls increased between 2015 and 2017, they rose slightly (4.3%) between 2015 and 2016—but declined the following year. Incidents classified as “Others” increased by approximately 1.6% during this period. During the study period, total service-demand for RWB increased by about 17.8%.

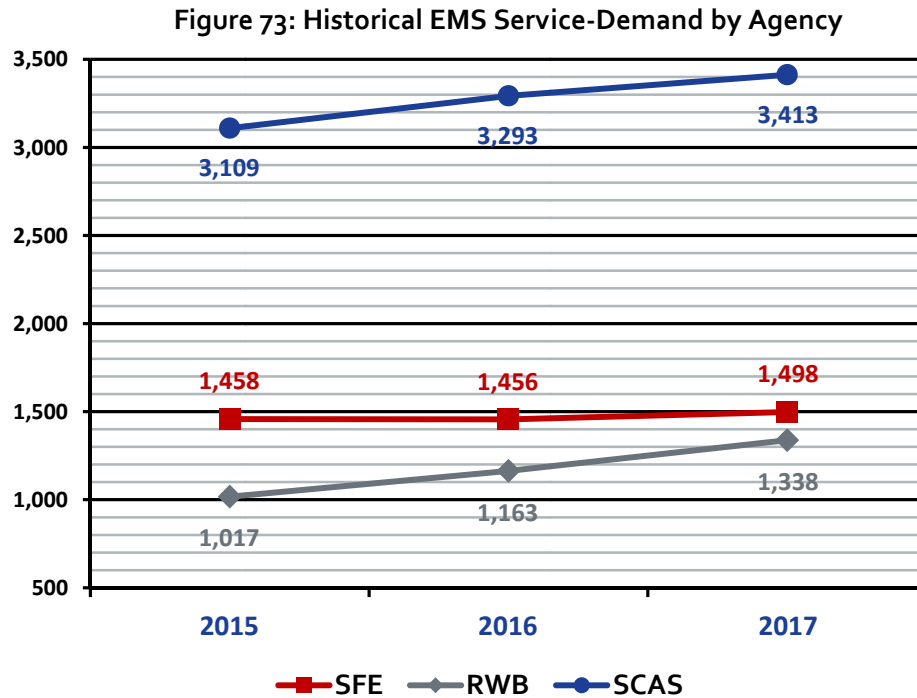
The next figure includes the historical service-demand of Summit County Ambulance. The results show all calls dispatched, including those cancelled en route. The figures do not necessarily represent the number of patients transported.

Figure 72: SCAS Historical EMS Service Demand

Incident Type	2015	2016	2017
EMS Only	3,109	3,293	3,413

The results show that Summit County Ambulance experienced a steady increase in service demand over the 36-month study period. Between 2015 and 2016, EMS calls increased by 6%; with an increase of nearly 4% between 2016 and 2017. During the study period, SCAS had a nearly 10% increase in EMS calls.

The next figure shows the historical trend of EMS incidents during 2015–2017 for each of the agencies.



Temporal Variation

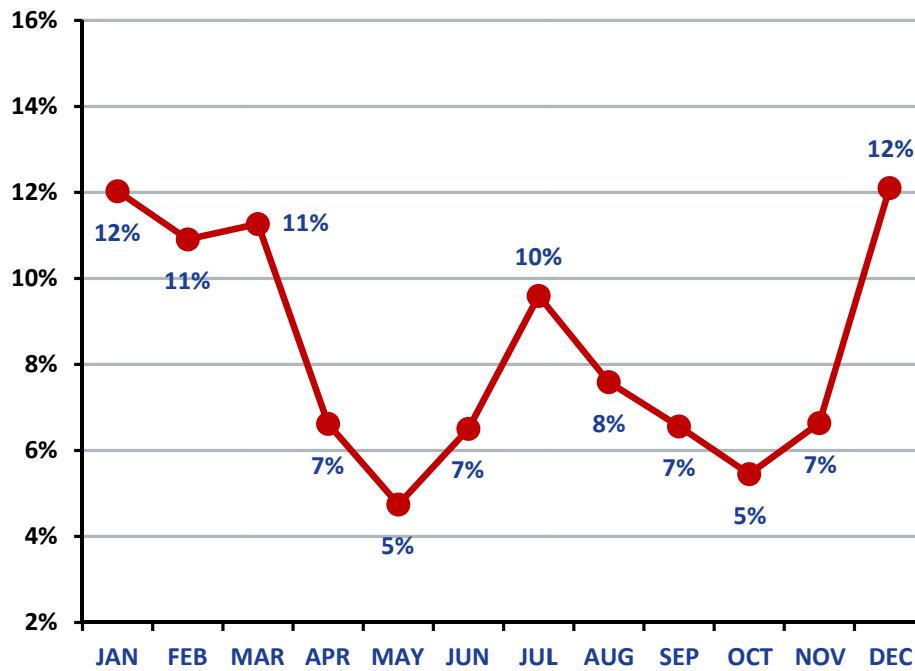
Demand for services can often occur in cyclical patterns. Temporal variation—based on factors such as time of day or season of the year—can provide insight in to predicting how future service demand will occur. To determine whether or not these patterns exist within the incident data, the following figures are presented, and discussed.

Call Frequency by Month

Summit County is unique to other communities, as it has a relatively small resident population, which has a substantial seasonal population increase during the winter and summer months. The next figure shows service demand by month, and represents all calls dispatched among the three agencies.

As shown—and expected—the four busiest months of the year were December through March, representing 46% of the total service demand during the 36-month study period of 2015–2017. The summer months with highest call frequency were June through August, which accounted for about 25% of the annual service demand. April and September had nearly the same call volumes as the summer months, while the lowest service demand occurred during May and October.

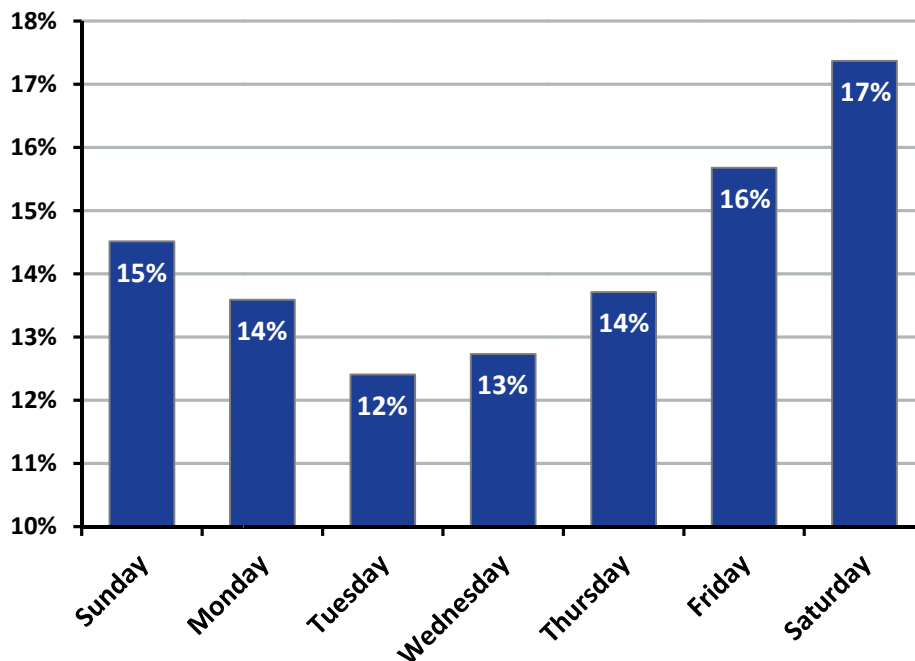
Figure 74: Overall Summit County Call-Frequency by Month (2015–2017)



Call Frequency by Day-of-Week

The next figure represents the frequency of all incident types by day-of-week during 2015–2017. The figure shows that Fridays through Sundays have the highest call frequency, and account for 48% of the weekly service demand throughout Summit County.

Figure 75: Overall Summit County Call-Frequency by Day-of-Week (2015–2017)

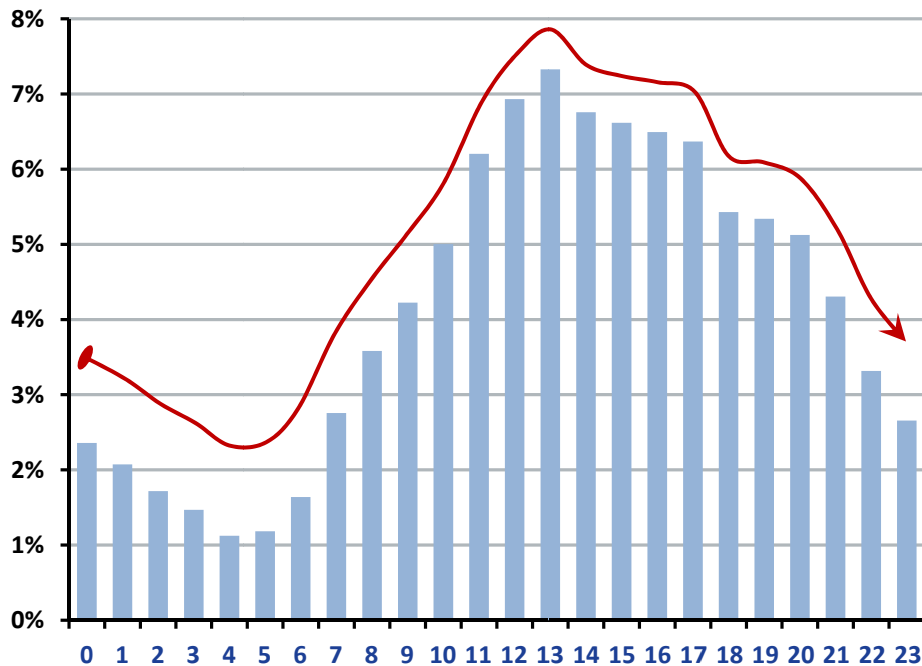


Being a recreational community, it is not surprising that the results illustrated in the preceding figure show that Friday through Sunday is the busiest period for call frequency during the week.

Call Frequency by Hour

The next figure illustrates call frequency by hour-of-the-day. This is valuable information when determining staff schedules and the potential for adding peak-demand units.

Figure 76: Overall Summit County Call-Frequency by Hour-of-Day (2015–2017)



The results shown in the preceding figure are typical of what is found in most communities, where the most frequent service-demand occurs during those periods in which human activity is at its highest.

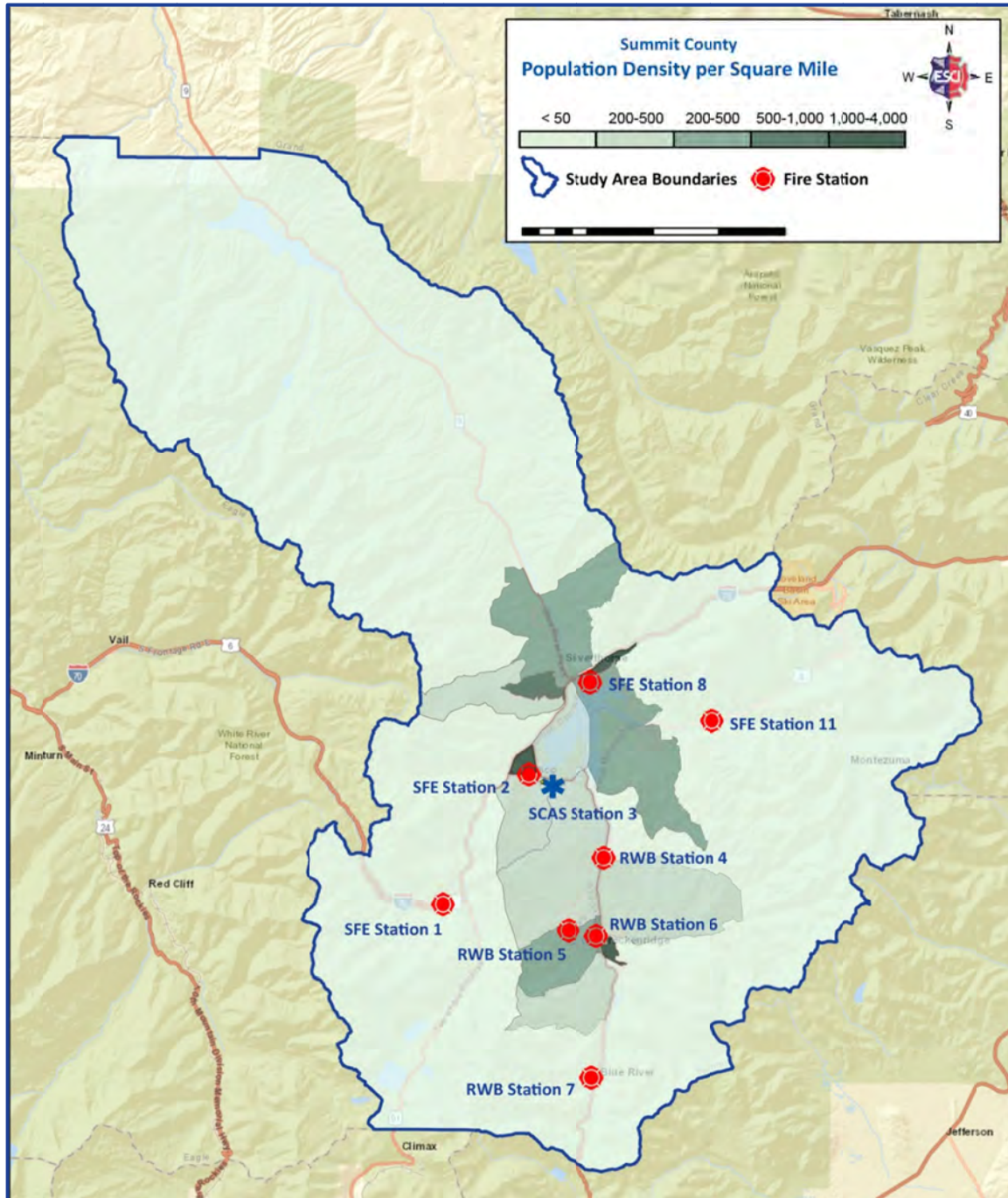
Service-demand begins to increase at 0600 hours (6 am) and peaks at 1300 hours (1 pm). The frequency of calls levels off through the afternoon, until 1800 hours (6 pm), where they begin to decline until the early morning hours. During this 36-month period, the busiest consecutive 12 hours occurred during 0900–2100 hours (9 am–9 pm), which represented 76% of the daily call volume. The next busiest 12-hour period occurred during 0800–2000 hours (8 am–8 pm).

Population Density

The next figure illustrates the permanent *resident* population density in Summit County. Summit County's resident population is primarily concentrated in the central and south regions.

Figure 77: Summit County Resident Population Density

Source: 2016 ACS Estimates by Block Group



SFE Stations 2 and 8, and RWB Stations 5 and 6, are located in the most populated areas of Summit County; with RWB Station 4 located in an area with a slightly lower population density. SFE Stations 1 and 11, and RWB Station 7, are located in areas with lowest population density at less than 50 persons per square mile.

The preceding image can be misleading. Population densities are based on residents, and do not account for the large increase in the transient population during the winter and summer months. Further, population figures are based on the latest available GIS data acquired from the 2016 U.S. Census Bureau, American Community Survey *estimates*. Recently constructed multifamily residences and other developments are likely not accounted for in this figure.

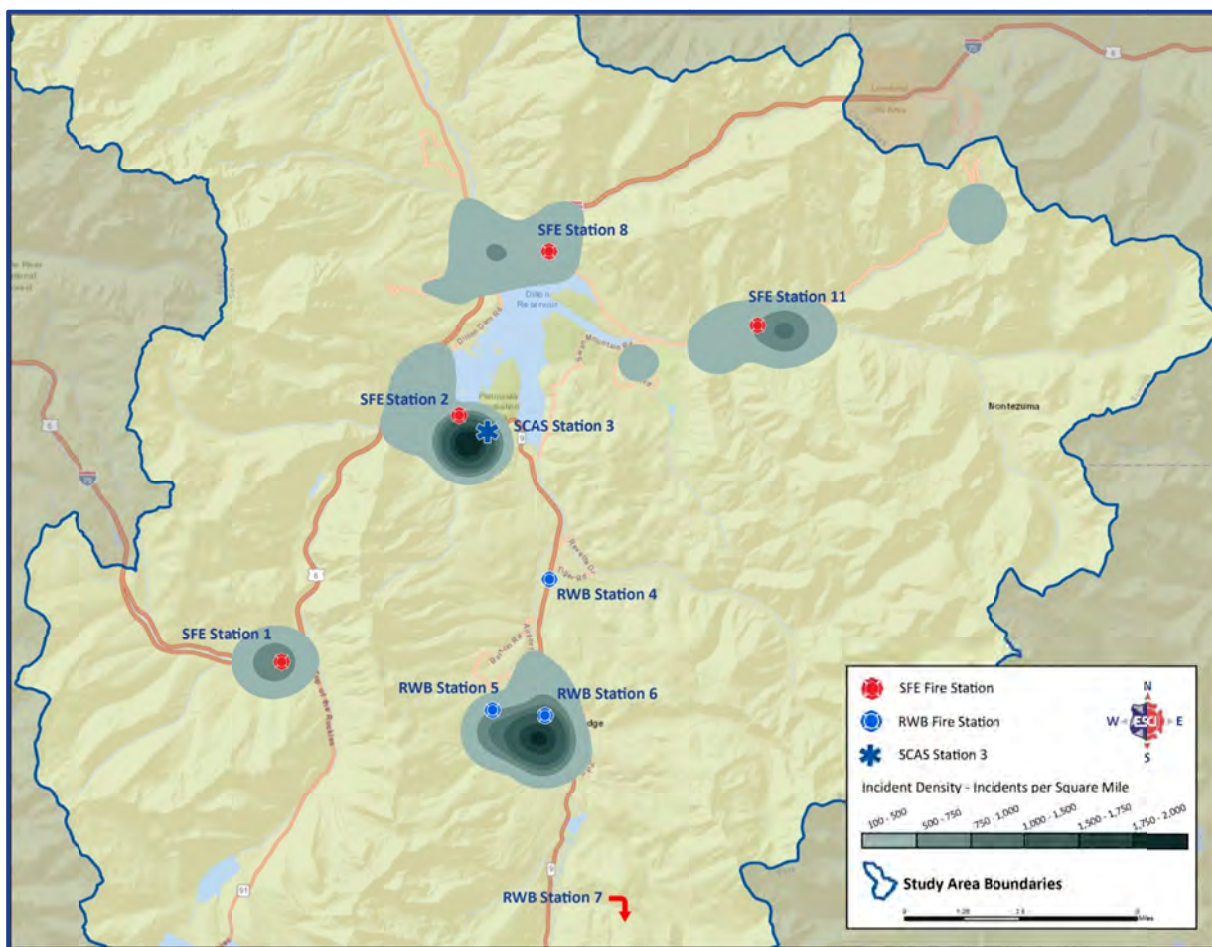
Distribution Study

Incident Distribution

ESCI conducted an incident density analysis—also known as a “Hot Spot” analysis—to identify those areas experiencing the highest levels of service-demand. In this analysis, the calculated density of service-demand was calculated to provide areas in which call frequency and their proximity to one another could be represented to display areas of concentrated demand, or a “hot spot.”

Because population distributions and factors that lend themselves to changes in service demand are subject to change over time, the data selected for the following series of analyses used the most recent 36-month period—January 1, 2015 through December 31, 2017. In the first figure, incident density for EMS incidents and their hot spots are displayed.

Figure 78: EMS Incident Density in Summit County (2015–2017)



This figure does not represent the actual total number of calls that occurred, but instead the calculated density if the locations of the service-demand points were to occur at the same rate per square mile.

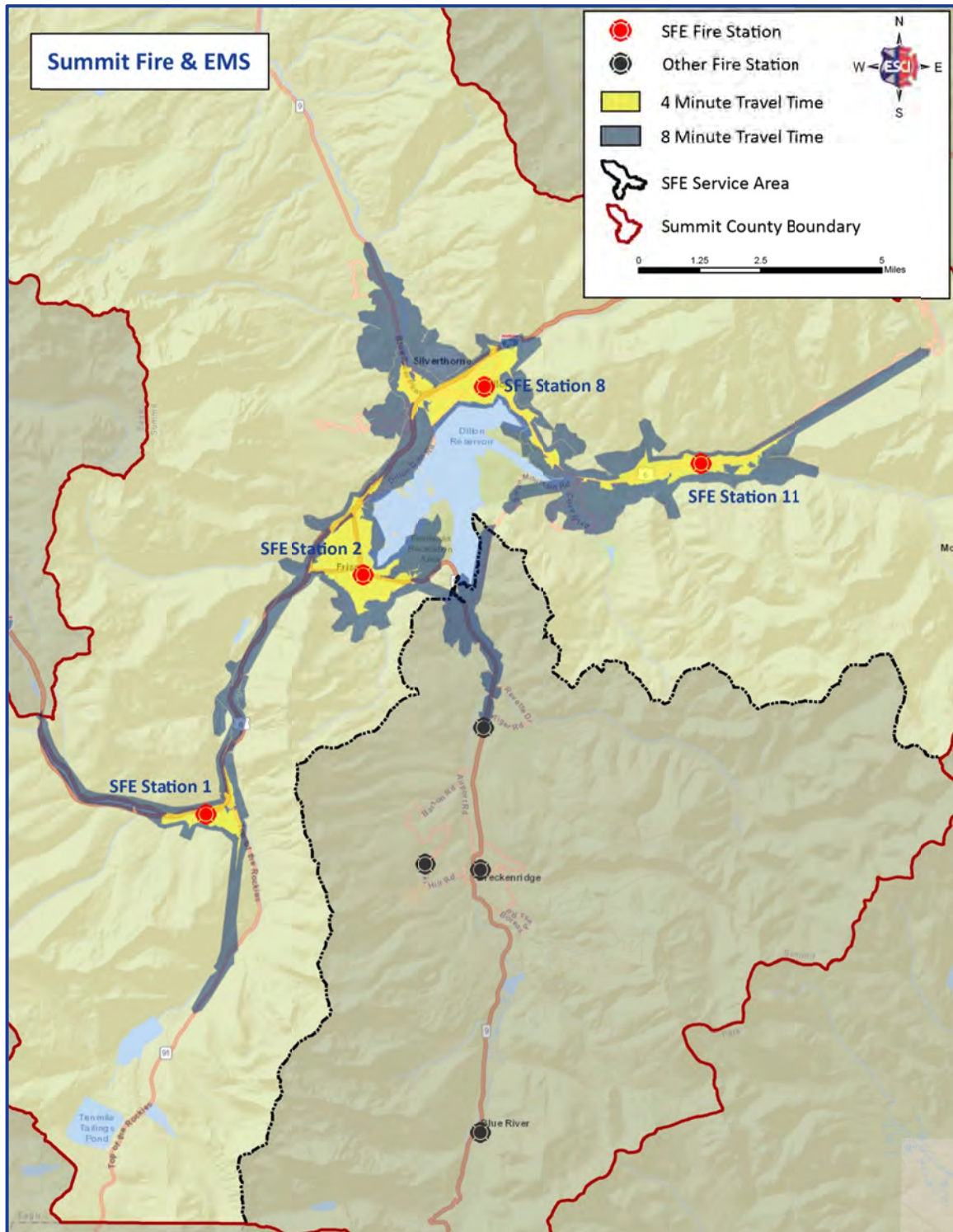
Fire Station Distribution

This section will discuss the distribution of fire department resources based upon their current locations and staffing models. Although this study focuses primarily on the delivery of emergency medical services, ESCI has elected to evaluate and compare the distribution of fire stations throughout Summit County based on NFPA 1710 criteria and the *Insurance Services Office (ISO)* standards.³¹ Since medic units are usually deployed from fixed locations (i.e., fire stations), this impacts the response-capability of those units.

NFPA Criteria

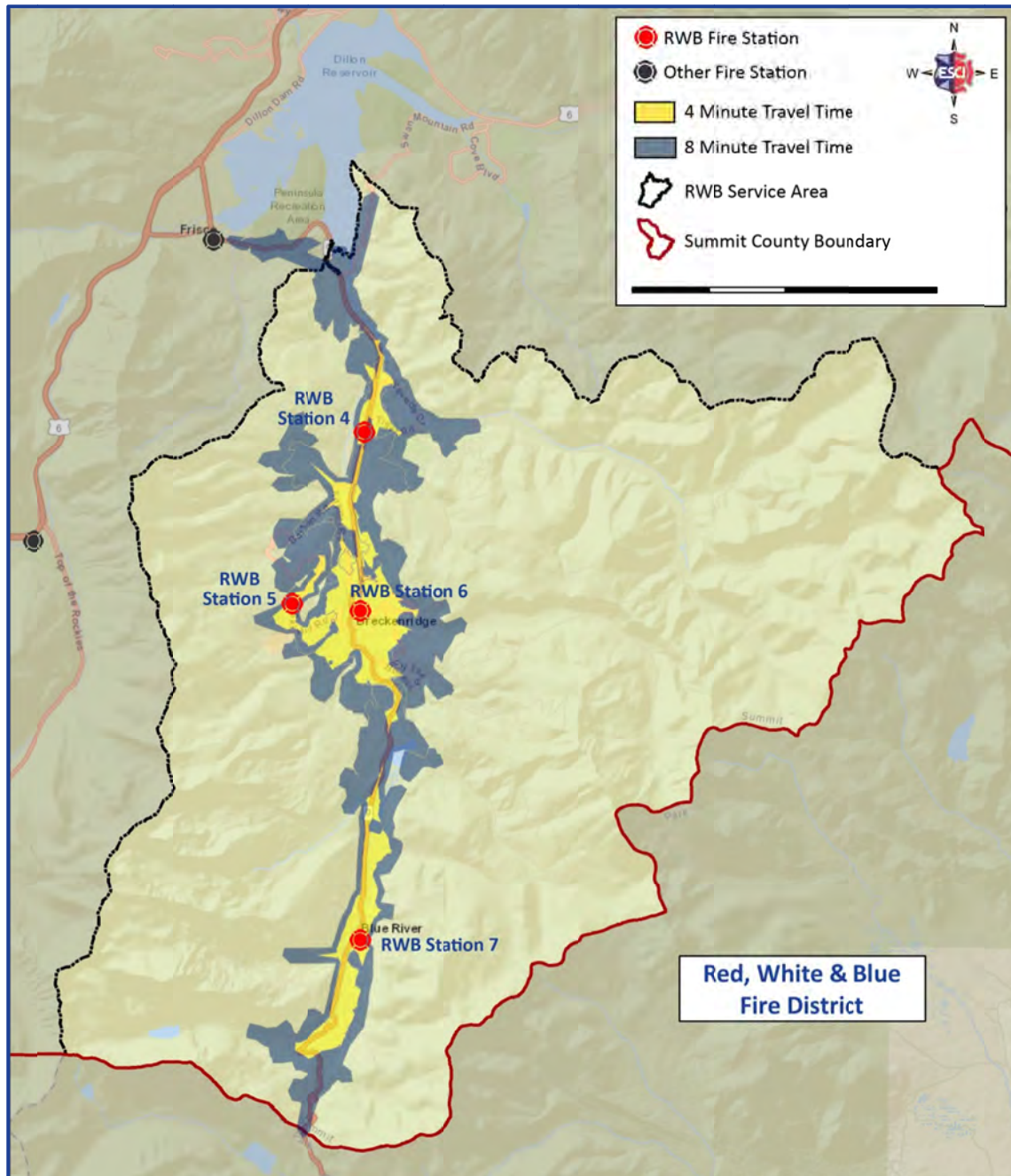
The following two figures show the NFPA 1710 criteria for 4- and 8-minute travel times from the SFE and RWB stations. Travel-time is defined as the interval between when the unit begins to respond until its arrival at the incident scene.

Figure 79: Projected Travel Times from SFE Fire Stations (4 & 8 minutes)



The preceding figure shows that the majority of the Summit Fire & EMS service area can be accessed from its various stations within a travel time of 8 minutes or less. Those areas of the district with the highest population densities can be accessed with a travel time of 4 minutes or less. However, it is important to note, as with each of the agencies, that winter road conditions can significantly impact travel times.

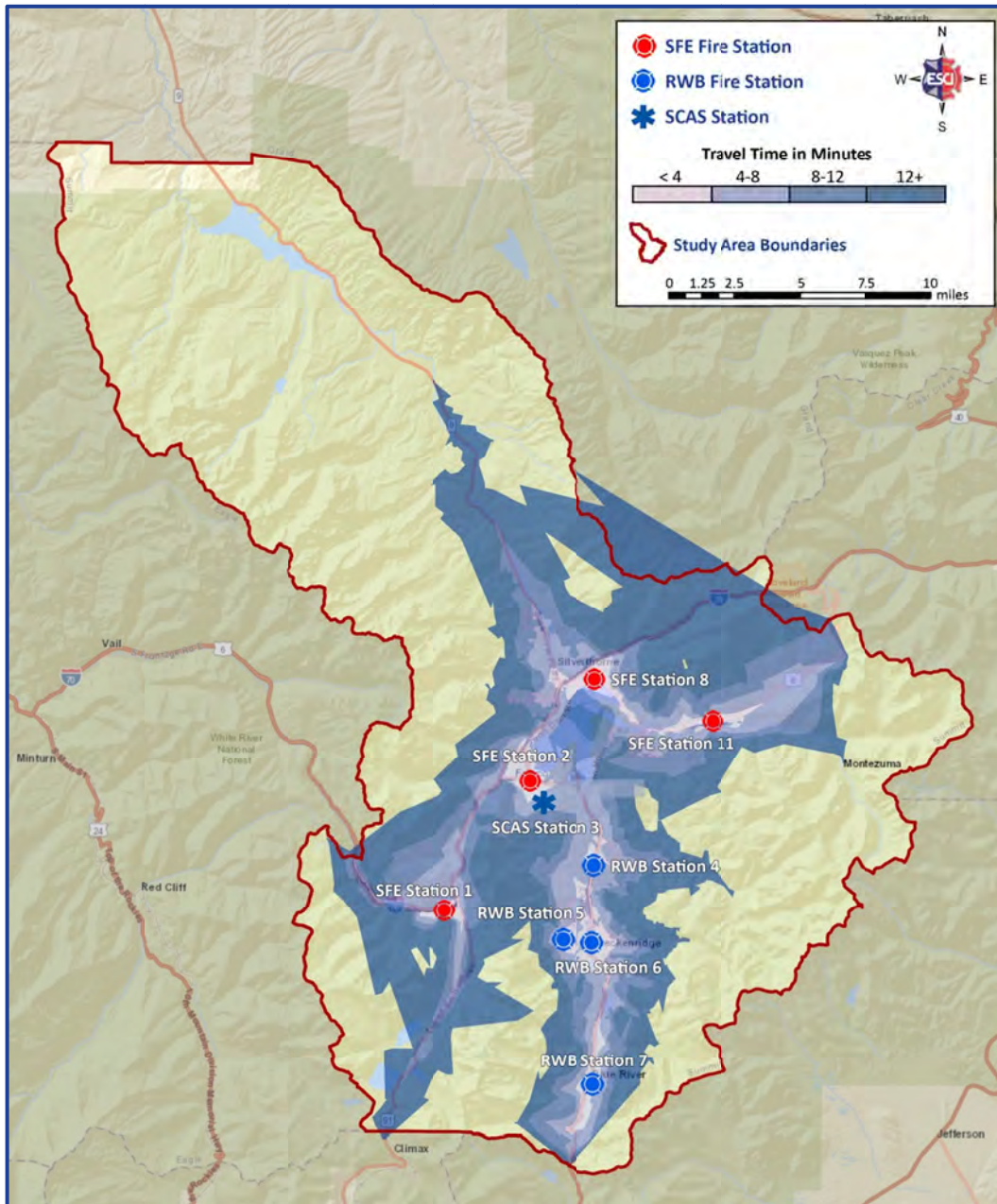
Figure 8o: Projected Travel Times from RWB Fire Stations (4 & 8 minutes)



From a travel-time perspective, the preceding figure shows that the majority of the RWB service area can be accessed from their stations within a travel time of eight minutes or less. As with SFE, those areas of the RWB fire district with highest population densities can be accessed with a travel time of 4 minutes or less.

The next figure illustrates predicted travel times from the various fixed locations (stations) of the various medic units distributed throughout Summit County.

Figure 81: Projected Travel Times of Medic Units from Fixed Locations



The preceding figure shows that most of Summit County—particularly those areas with the highest population density—can be accessed within reasonable travel times as recommended in NFPA 1710.

ISO Distribution

ISO uses the PPC[®] scoring system that classifies communities based upon a rating scale in various areas related to fire protection. The first component of ISO distribution is the ability of a fire department to arrive on scene with sufficient personnel and equipment to mitigate a fire.

The following figures present each station within a five-mile (by road) radius extending outward. Generally speaking, ISO is concerned with the provision of fire suppression services to contiguously built-upon areas—meaning that ISO is unconcerned with the protection of unpopulated regions of a service area or those areas that lack permanent structures, as well as EMS performance.

Figure 82: SFE 1.5-mile & 5-mile ISO Distribution

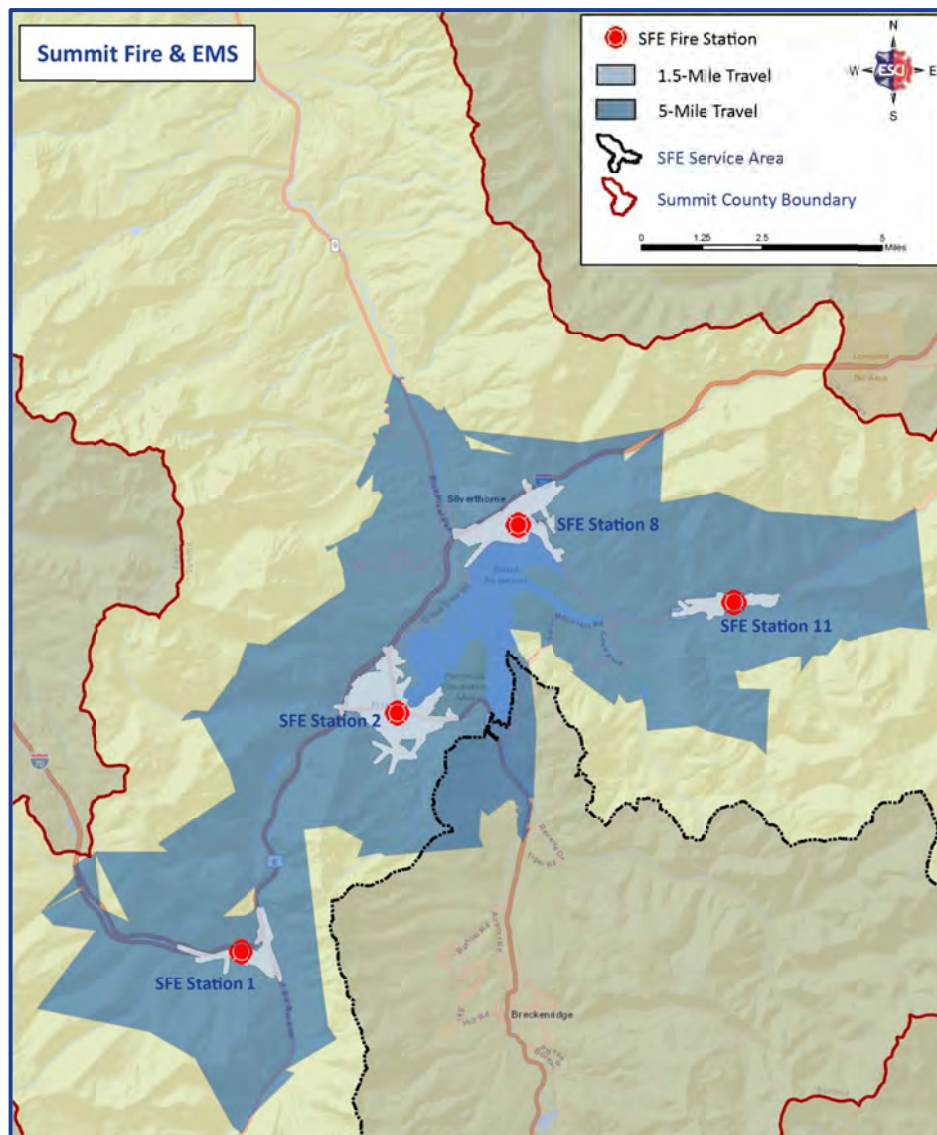
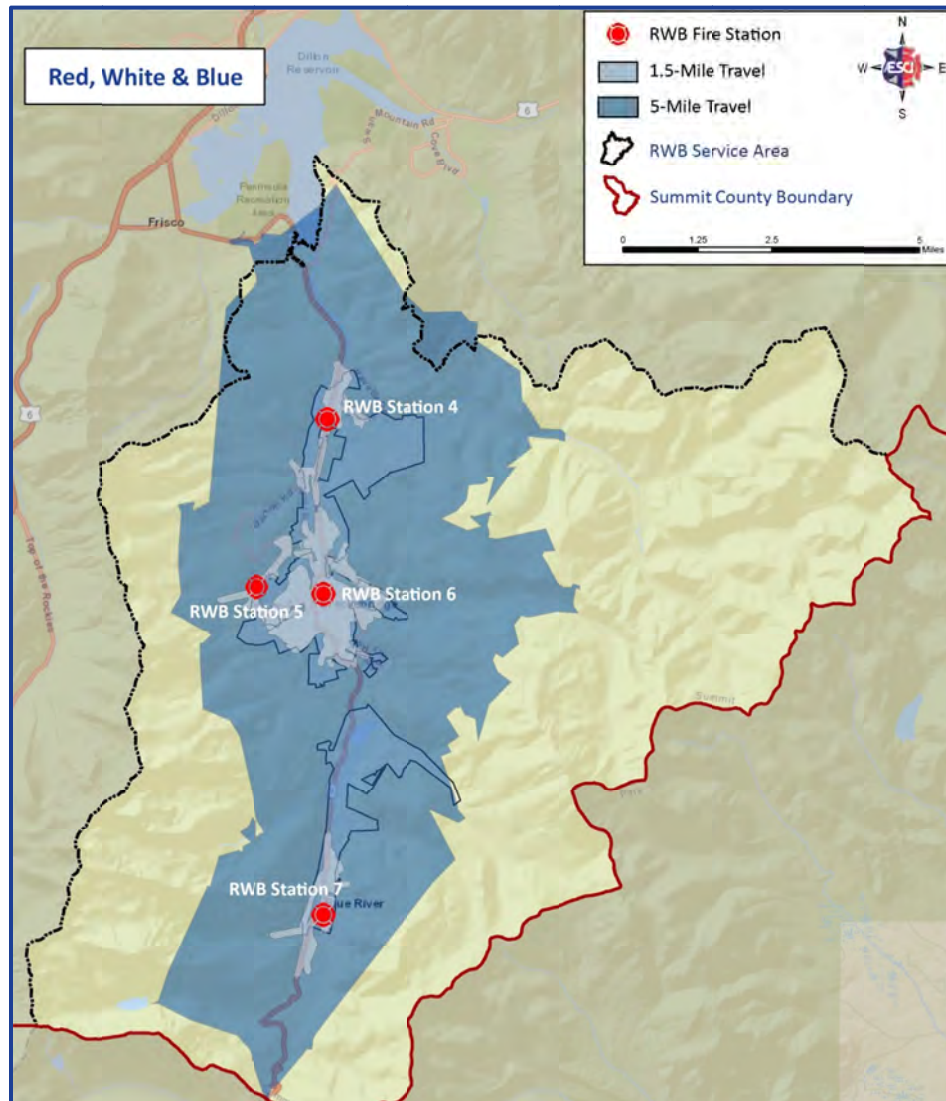


Figure 83: RWB SFE 1.5-mile & 5-mile ISO Distribution



Distribution Discussion

The results of the various GIS distribution analyses indicate that the fixed locations of the fire and ambulance stations are positioned to access the majority of Summit County and its population centers within reasonable travel times and distances. However, it must be noted that these analyses do not take into account severe winter weather, in which challenging road conditions can impact travel times. This must be considered when planning future expansion or deployment changes.

Response Reliability Study

In this section, ESCI has analyzed fire/ambulance stations and apparatus workload among each of the three agencies. This data can reveal much about response-performance and an agency's ability to assemble adequate resources to mitigate simultaneous incidents. Although fire stations, medic units, and apparatus may be distributed in a manner to provide a quick response, that level of performance can only be obtained when apparatus are available in their primary service areas.

Again, as mentioned previously, the totals found among the following figures will not necessarily equate to each other. This was due to a reliance on multiple datasets from multiple sources, as well as the lack of a unique incident identification number. Regardless, ESCI believes these results are as accurate as can be achieved with such limitations.

Service-Demand by Fire & Ambulance Stations

The following figure shows service-demand for all incident-types by each of the SFE and RWB fire stations, and SCAS Station 3. As expected, EMS calls represented the majority of incident-responses among the two fire departments. These figures represent distinct incidents across the County from January 2015 through November 2017, and were calculated by tallying the totals from the primary unit assigned by dispatch.

Figure 84: Service-Demand by Incident Type & Stations (2015–2017)

Agency/Station	EMS	Fires	Other	TOTALS
Summit Fire & EMS				
Station 1	1,638	45	603	2,286
Station 2	555	76	399	1,030
Station 8	3,026	231	939	4,196
Station 11	2,002	63	683	2,748
Red, White & Blue Fire District				
Station 4	1,021	28	376	1,425
Station 5 ^A	93	0	12	105
Station 6	3,062	104	1,396	4,562
Station 7	201	21	311	533
Summit County Ambulance Service				
Station 3	2,032	2	27	2,061

^ANote that RWB Station 5 did not open until October 14, 2017

Based on the primary units dispatched, the busiest stations were SFE Station 8 and RWB Station 6. Combined, these two stations accounted for 46% of the calls over the 36-month study period. However, Station 6's future responses should begin to decline with the addition of RWB Station 5.

Service-Demand by Medic Unit & Fire Apparatus

The next figure lists the service-demand on each fire apparatus by basic incident type during 2015–2017. These figures were based on primary unit dispatched as assigned by the dispatch center for distinct incidents.

Figure 85: Service-Demand by Fire Apparatus & Incident Type (2015–2017)

Apparatus	EMS	Fires	Other	TOTALS
Summit Fire & EMS				
Engine 1	412	30	436	878
Engine 2	553	61	379	993
Engine 8	837	185	709	1,731
Engine 11	390	25	360	775
Red, White & Blue Fire District				
Engine 4	197	25	375	597
Engine 5 ^A	0	0	0	0
Truck 6	739	65	873	1,677
Engine 7	162	14	299	475

^ANote that RWB Station 5 did not open until October 14, 2017

The following figure lists the primary unit assignment of each of the medic units during the 36-month study period. It is important to note that not all units are staffed 24-hours daily; scheduled seven days weekly; or staffed year-round.

Figure 86: Medic Unit Service-Demand (2015–2017)

Medic Unit	EMS	Other	TOTALS
Red, White & Blue Fire District			
Medic 5 ^A	93	12	105
Medic 6	2,251	11	2,262
Medic 7 ^B	39	0	39
Summit County Ambulance Service			
Medic 1 ^C	1,181	4	1,185
Medic 3	1,926	12	1,938
Medic 4 ^C	824	0	824
Medic 8	2,161	6	2,167
Medic 11	1,580	3	1,583

^AMedic 5 was not placed into service until October 14, 2017

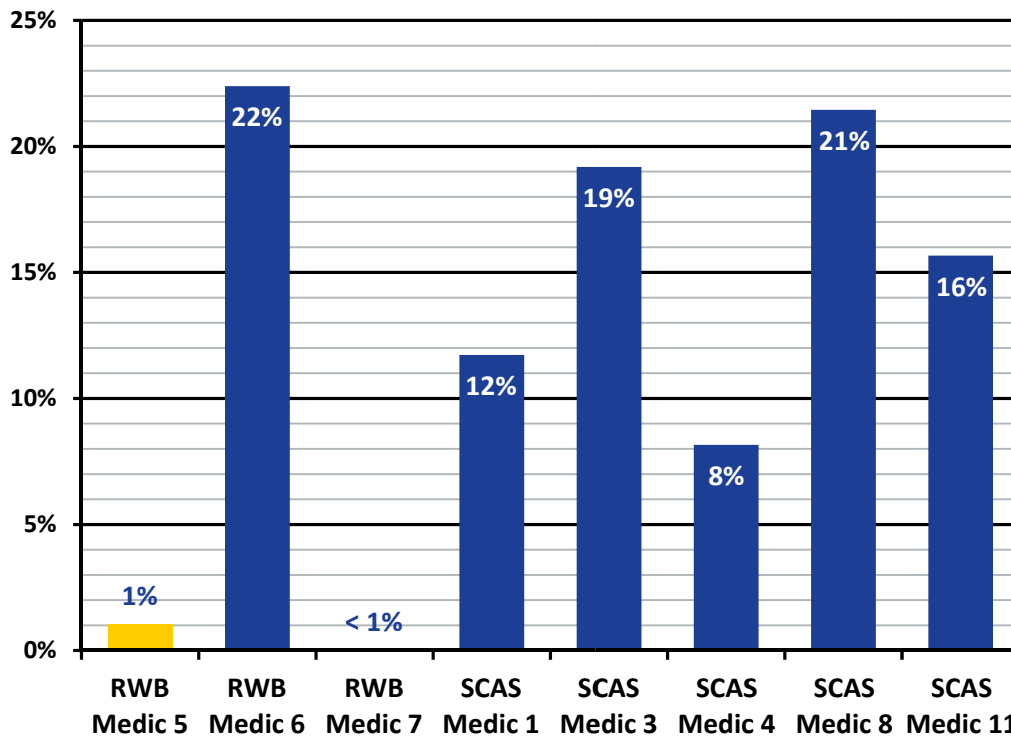
^BCross-staffed as needed

^CPeak-demand unit; 12-hour shift

SCAS Medic 1 is staffed four days per week at 12 hours per day, seasonally during the winter and summer months. SCAS Medic 4 is a 12-hour unit staffed daily year-round. RWB Medic 7 is a cross-staffed unit with Engine 7, and deployed as a “surge unit” when needed.

The next figure is an illustration of each medic unit’s percentage of all incident-types during the 36-month study period. Using data from the preceding figure, the following image presents the analysis of incident distribution among the medic units in a graphical format.

Figure 87: Medic Units Share of Service-Demand by All Incident Types (2015–2017)



The much lower service-demand volumes shown with Medic 5, can be attributed to that unit not being placed into service until mid-October 2017.

Medic Unit Commit Times

The following figure lists the total and average times committed per call by each medic unit during 2015–2017 (Station 5 and Medic 5 were not placed into service until October 14, 2017).

Figure 88: Medic Unit Average & Total Time Commitment (2015–2017)

Medic Unit	Average Time Committed	Total Time Committed
Red, White & Blue Fire District		
Medic 5	0:47:52	103:42:02
Medic 6	0:50:24	2974:53:23
Medic 7 ^A	0:34:18	53:09:22
Summit County Ambulance Service		
Medic 1 ^B	1:35:59	2871:37:13
Medic 3	1:28:55	5326:35:32
Medic 4 ^B	1:50:13	2431:56:01
Medic 8	1:11:14	4500:01:38
Medic 11	1:33:48	3380:08:45

^ACross-staffed as needed

^BPeak-demand unit; 12-hour shift

During 2015–2017, the combined average time-commitment per call on all incidents among all medic units, was 1 hour, 14 minutes. The combined average commitment for all SCAS medic units was 1 hour, 32 minutes. For RWB medic units, the combined time commitment was 44 minutes, 11 seconds. If Medic 7 is excluded from the calculations (because of its low service-demand), the average commitment for RWB medic units is 49 minutes, 8 seconds.

Concurrent Incidents

Simultaneous or concurrent incidents can impact an emergency service organization's ability to assemble adequate resources to respond to additional emergencies. The following figure illustrates the percentage of time that Summit County fire apparatus and medic units, from all agencies, were committed to more than one incident at the same time during 2015–2017.

Figure 89: Concurrent Calls in Summit County—All Incident Types (2015–2017)

Concurrent Incidents	Percent
Single Incident	29.2%
Two Incidents	29.6%
Three Incidents	20.1%
Four or more	21.1%

The preceding figure shows that two or more calls (representing all types of incidents) occurred simultaneously 70.8% of the time during the 36-month study period. Three or more incidents occurred 41.2% of the time during that period. The next figure represents concurrent EMS incidents among all of the agencies for the same time period.

Figure 90: Concurrent EMS Incidents (2015–2017)

Concurrent Incidents	Percent
Single Incident	37.3%
Two Incidents	30.0%
Three Incidents	17.6%
Four or more	15.1%

During the study period, two or more EMS incidents occurred simultaneously in Summit County 62.7% of the time; and three or more incidents 32.7% of the time. The next figure shows all concurrent out-of-county interfacility transports during the 36-month study period. In the majority of cases (58.5%), only a single OOC IFT occurred.

Figure 91: Concurrent Out-of-County IFTs (2015–2017)

Concurrent Incidents	Percent
Single Incident	58.5%
Two Incidents	29.1%
Three Incidents	10.0%
Four or more	2.4%

While the majority represented a single OOC IFT, two or more occurred simultaneously 41.5% of the time; with three or more occurring concurrently 12.4% of the time.

Unit Hour Utilization

About Unit Hour Utilization

Unit hour utilization (UHU) is a calculation that measures productivity. Essentially, UHU measures the percentage of on-duty time consumed by emergency operations. UHU is one of the most widely used and often most misunderstood performance-measurement metrics. A unit-hour (UH) is defined as one hour of service by a fully equipped unit available for dispatch or assigned to a call. A 24-hour unit consumes 8,760 hours annually.

Some fire departments consider higher utilization rates as having a negative impact on personnel, and contributing to personnel "burnout." Those providing fire-based medical transport services may choose a UHU target of 0.15–0.25 (15–25%) in order to maintain effective response times and crew safety and effectiveness.

Different types of EMS organizational structures use varying levels of UHU as their benchmark for efficiency. Although there is no published standard for what this level should be, anecdotal data suggests the following thresholds, which can be used as a comparison.

Figure 92: Typical UHU Thresholds by Service Types

Service Type	UHU
Private or Public Utility	0.35–0.50
Third Service	0.25–0.35
Fire-Based Service	0.15–0.25

The UHU value is not the only measure of service demand, but does provide one perspective on the workload being placed on the various individual apparatus and medic units.

It also worth noting that private ambulance services, public utility models, and third-service agencies provide EMS and medical transport only. Fire-based organizations with cross-trained firefighters must also respond to and provide other non-EMS emergency services; attend additional training beyond continuing medical education; conduct fire inspections, service calls, and public education—to name a few of the differences. This may be the reason why third-service providers (e.g., SCAS) can have higher thresholds. However, those agencies that attend training while on duty may have challenges similar to fire-based organizations.

Medic Unit UHU Rates

The next figure presents the unit hour utilization rates of each individual medic unit, by agency, in Summit County during 2015–2017. These represent all incident types. Not unexpectedly, SCAS Medic Units 3 and 8, followed by RWB Medic 6 had the highest UHU rates during the 36-month study period.

Figure 93: Medic Unit UHU Rates (2015–2017)

Medic Unit	UHU	UHU as %
Red, White & Blue Fire District		
Medic 5 ^A	0.004	0.40%
Medic 6	0.116	11.60%
Medic 7 ^B	0.002	0.20%
Summit County Ambulance Service		
Medic 1	0.112	11.20%
Medic 3	0.208	20.80%
Medic 4 ^C	0.095	9.50%
Medic 8	0.176	17.60%
Medic 11	0.132	13.20%

^AMedic 5 not placed into service until October 14, 2017

^BMedic 7 is a surge unit

^CMedic 4 is scheduled seasonally

During 2015–2017, no single medic unit in Summit County had an excessive UHU rate. As mentioned previously, the UHU analysis is only one perspective of service demand on individual units, as it does not take into account all other non-response activities in which a medic unit may be involved.

Performance Summary

Likely the most noticeable component of an EMS delivery system is that of response-time performance. Policymakers and citizens want to know how quickly they can expect services in the event of a medical or other emergency. In the following section, ESCI examines the various response-performance elements of Summit Fire & EMS; the Red, White & Blue Fire District; and the Summit County Ambulance Service.

Operational Performance Standards

Probably the most commonly accepted response-time performance standard for fire-based EMS systems are found in the recommended benchmarks developed by the NFPA or CFAI. Other standards exist with the *Commission on Accreditation of Ambulance Services* (CAAS), which suggests communities establish their own standards, but uses a default of 7 minutes, 59 seconds. In most national standards, total response time (TRT) is defined and comprised of several components:

- *Alarm Processing (or call processing) Time*: The time interval between when a dispatcher answers the 911 call and resources are dispatched.
- *Turnout Time*: The time between when a unit is dispatched and when the unit goes en route.
- *Travel Time*: The amount of time the responding unit actually spends travelling to the incident.
- *Total Response Time*: The combination of Alarm Processing Time, Turnout Time, and Travel Time.

Some fire and EMS organizations continue to use “average” response-performance measures, since this method is commonly used and widely understood in other industries. The most important reason for not using average for performance standards is that is usually not an accurate reflection of the entire dataset. The results can be skewed by data outliers. Most progressive systems use the “fractile” method of analyzing response performance. This method uses percentile measurements (usually at 90%), and are a more accurate measure—since they show the majority of the records have achieved a particular performance level.

NFPA/CFAI Recommended Standards

The CFAI relies on many of the NFPA standards for response times, as well as its own recommendations. For staffed stations, the benchmark recommendations are as follows:

- *Call-Processing (alarm processing) Time*: 60 sec. or less at 95% (CFAI lists this at 90%)
- *Turnout Time*: EMS—60 sec. or less at 90%; Fires & Special Operations—80 sec. or less at 90%
- *Travel Time*:
 - Urban (first unit)—4 minutes or less at 90%
 - Suburban (first unit)—5 minutes or less at 90%
 - Rural (first unit)—10 minutes or less at 90%

Call-Processing Times

The time interval required to process, or “handle” a 911 call is actually comprised of multiple components. The dataset provided to ESCI did not include each of these. Therefore, in this analysis, based on the CAD data provided by Summit County 911, ESCI utilized the interval between the timestamp “Incident Time Created” and “Unit Time Dispatched” to determine call-processing times.

The following figure lists the Summit County call-processing times of incidents dispatched by the 911 center. Non-emergent calls, OOC transports, and SAR incidents have been excluded from the analysis. Additionally, call-processing times in excess of 30 minutes were excluded from the analysis. These represented 333 incidents within the 2015–2017 dataset. The dataset includes call-processing times for incidents in which SFE and RWB were dispatched.

Figure 94: Summit County 911—Incident Call-Processing Times

Year	90 th Percentile	Average Time
2015	03:46	01:50
2016	03:25	01:35
2017	03:21	01:31

The *average* results found in the preceding figure are misleading, and incorrect for a statistical analysis of distinct data. The average results are presented here only as a comparison to the 90% fractile method, as some communications centers measure average performance. In other words, the fractile results are the more accurate measure of call-processing times. The 90% fractile call-processing time is more than triple the 60-second standard during each year of 2015 through 2017.

EMS-Incident Turnout Times

Turnout-time is an important element of response time performance. Several factors can influence turnout-time intervals: minimum staffing requirements before a medic unit or apparatus can respond; staffed versus unstaffed stations; station design; and the donning of personal protective equipment prior to leaving the station. NFPA 1710 recommends turnout times of 60 seconds or less at the 90th percentile for EMS calls; and 80 seconds or less at the 90th percentile for fires and special operations (longer turnout times are to be expected in these cases, due to the need for additional time to don appropriate turnout gear or other protective items).

The following figure lists the overall turnout times of *emergent* EMS incidents for each Summit County agency during 2015–2017. Wherever possible, and when it could be determined with some degree of accuracy, non-emergent incidents, and obvious outliers were excluded from the analysis. In addition, out-of-county transports were excluded from the analysis.

Figure 95: Medic-Unit Turnout Times at the 90th Percentile (2015–2017)

Agency	2015	2016	2017
Summit Fire & EMS	03:36	03:18	03:34
Red, White & Blue Fire District	03:18	03:12	02:56
Summit County Ambulance	04:22	03:38	03:19

When considering the NFPA 1710 standard, none of the emergency services organizations consistently met the performance goals for turnout times. None of the agencies evaluated met the 60-second standard for EMS turnout time, with all being close to or exceeding three times the industry standard.

Medic-Unit Travel Times

The following figure illustrates the actual travel-time performance of medic units operated by Summit County Ambulance and the Red, White & Blue Fire District.

Figure 96: Medic Unit Travel Times at the 90th Percentile

Agency	2015	2016	2017
Red, White & Blue Fire District	08:27	09:45	08:35
Summit County Ambulance	15:22	15:34	15:32

Travel times for RWB have fluctuated slightly since 2015 through the end of 2017. Travel times for SCAS remained relatively flat over the three-year study period.

In this next figure, ESCI analyzed actual travel-time performance of the RWB and SCAS medic units to compare the busy winter months (i.e., “ski season”) to the other months during the year.

Figure 97: Comparison of Travel-Time by Season at the 90th Percentile (2015–2017)

Agency	December–March	All Other Months
Red, White & Blue Fire District	08:51	08:56
Summit County Ambulance	16:10	15:00

Not surprisingly, travel times for SCAS during the months of December through March were longer than the other eight months of the year. However, for RWB, travel times tended to be relatively constant when comparing the summer months to the winter months. Travel times were 1 minute, 10 seconds longer for SCAS during the four-month winter period.

The next figure illustrates travel times at the 90th percentile, along with the averages by individual medic units during 2015–2017.

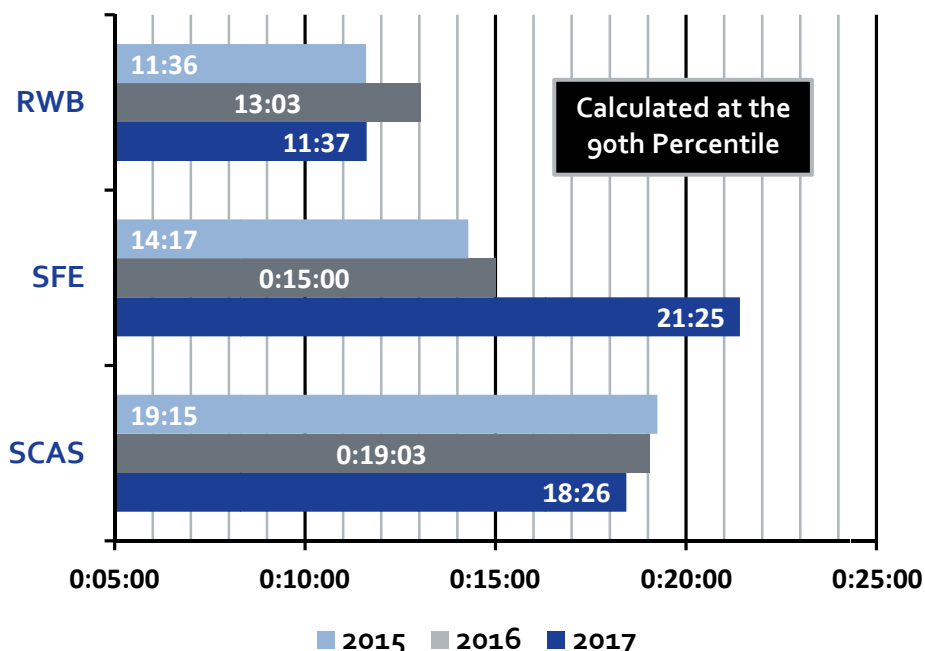
Figure 98: Medic Unit Travel Times at 90% & Average (2015–2017)

Medic Unit	90th Percentile	Average
Red, White & Blue Fire District		
Medic 5	11:03	06:10
Medic 6	08:33	04:30
Medic 7	15:40	08:27
Summit County Ambulance Service		
Medic 1	15:53	07:59
Medic 3	15:44	08:07
Medic 4	21:16	11:00
Medic 8	14:59	08:13
Medic 11	15:03	07:29

Total Response Times

In the following section, total response times were calculated using the national standard definition. This entailed the interval between when the unit was received at Summit County 911 and when the apparatus or medic unit arrived on scene. The following figure shows the TRT of EMS incidents-only by individual agency for each year from 2015–2017.

Figure 99: EMS Incident Total Response Times by Agency



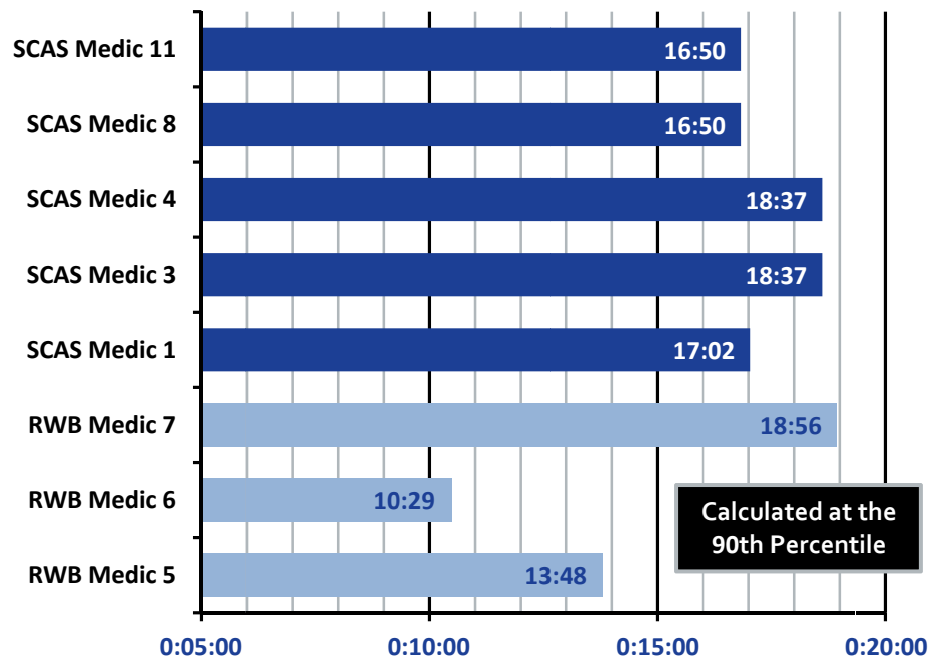
Total response times improved for RWB and SCAS between 2015 and 2017. For SFE, response times in 2017 increased significantly from the previous two years. The cause of the substantial increase in total response time at SFE could not be identified. This may be due to an anomaly or, more likely, combining records from CMFR and LDFD. If the response time performance in 2018 is similar to 2017, SFE should assess this in order to identify the reasons for increased response times.

The next figure lists the total response times of each of the medic units at both the 90th percentile and average times during the combined 36-month study period.

Figure 100: Response Time Performance by Medic Unit (2015–2017)

Medic Unit	90 th Percentile	Average
Red, White & Blue Fire District		
Medic 5	13:48	07:39
Medic 6	10:29	06:07
Medic 7	18:56	10:46
Summit County Ambulance Service		
Medic 1	17:02	09:09
Medic 3	18:37	10:13
Medic 4	18:37	10:57
Medic 8	16:50	10:11
Medic 11	16:50	09:09

The following uses the results from the preceding figure to provide a graphical representation of individual medic unit response-time performance for the combined 36-month study period.

Figure 101: Medic Unit Response-Time Performance (2015–2017)

The next figure shows the call processing times at Summit County 911, along with the response times (interval between when the unit was dispatched and when it arrived on scene) for each agency during 2015–2017. The last column combines the two in order to provide a perspective on the actual total response times for emergency medical incidents throughout Summit County.

Figure 102: Call Processing & Response Time Performance by Agency (2015–2017)

Agency	Call Processing (at 90%)	Response Time (at 90%)	TOTAL (at 90%)
Summit Fire & EMS	02:26	14:48	16:15
Red, White & Blue Fire District	01:59	10:52	12:01
Summit County Ambulance	02:26	17:18	18:59

Nothing in the datasets provided to ESCI indicated the reason why call-processing times for calls involving Summit County Ambulance were substantially longer than the times found with SFE and RWB. When compared to RWB's times, the longer response times of SFE and SCAS are likely due to their larger geographic service areas. A significant number of calls occur in distant locations such as Vail Pass, Freemont Pass, the Eisenhower Tunnel, and the Heeney area, which contribute to the overall response-time calculations for both SCAS and SFE.

Patient Transport Analysis

The volume of patients transported in relation to the number of EMS calls dispatched is relevant for several reasons. Revenue is generated when patients are transported. Calls not resulting in a transport fail to produce important revenue necessary to maintain the cost of providing service to the community.

When a small percentage of EMS calls dispatched result in a transport, medic units may be needlessly unavailable to respond to other incidents, and the system may not be operating as efficiently as possible. Some of these potential non-transports can be reduced with proper triaging of 911 calls at the PSAP/dispatch center.

The following figure lists the volume of EMS incidents dispatched, and patients transported during the 36-month study period; along with the percentage of patients transported.

Figure 103: Patient Transports in Summit County (2015–2017)

Transport Provider	EMS Calls Dispatched	Patients Transported	Percent Transported
Summit County Ambulance	7,824	6,350	81.2%
Red, White & Blue Fire District	2,430	1,864	76.7%
Totals:	10,254	8,214	80.1%

The results in the preceding figure were determined by reviewing the number of calls in which a medic unit was dispatched, versus the number of patients transported. While RWB has a slightly lower transport rate than SCAS, patient-transport rates countywide were just over 80%.

Patient Transport & Hospital Turnaround Times

The following figure shows both the average and 90th percentile of *in-county* patient transport and hospital turnaround times for the 36-month study period. Transport time was defined as the interval between when the medic unit left the scene and when it arrived at the hospital or facility. Hospital turnaround time was defined as the period between when the medic unit arrived at the hospital and when it either left the hospital or notified dispatch that it was back in service.

Figure 104: In-County Patient Transport & Hospital Turnaround Times (2015–2017)

Transport Provider	Patient Transport Times		Hospital Turnaround Times	
	Average	90%	Average	90%
SCAS	0:19:19	0:28:50	0:20:11	0:31:34
RWB	0:18:35	0:24:47	0:09:53	0:28:23
Totals:	0:19:06	0:28:02	0:20:07	0:30:21

While overall in-county patient transports averaged just over 19 minutes during the study period, the majority (90%) were just over 28 minutes or less. Hospital turnaround times averaged just over 20 minutes; while in 90% of the cases the time was 30.5 minutes or less. Although there is no published industry standard for hospital turnaround times, ESCI's experience in many other systems suggests that these times are reasonable. While a medic unit may have transferred the patient to the hospital staff, and the unit is still located at the hospital, it does not necessarily mean it is unavailable for another call.

The next figure shows patient transport and return-to-service times specifically for out-of-county transports during the study period. The datasets did not include a timestamp for the time the medic unit left the hospital to begin traveling back to Summit County. Therefore, the return-to-service time represents the interval between when the medic unit arrived at the hospital and when it was back in service in Summit County.

Figure 105: Out-of-County Patient Transport & Return-to-Service Times (2015–2017)

Transport Provider	Patient Transport Times		Return-to-Service Times	
	Average	90%	Average	90%
SCAS	1:28:54	2:03:51	1:58:42	2:59:43
RWB	1:46:18	2:20:00	1:54:43	2:34:20
Totals:	1:29:17	2:05:19	1:58:37	2:58:50

As expected, there was a significant contrast between the transport times of calls in Summit County and the OOC patient transport times. During the 36-month study period, most of the transport times required just over 2 hours or less, averaging nearly 1.5 hours. Combined, following arrival at the hospital, the time to return to service averaged nearly two hours, while 90% of the transports were nearly 3 hours or less.

Interfacility Transports

In this study, interfacility transports were categorized as either "out-of-county" or "in-county." Since there are no skilled nursing or other similar facilities in Summit County, in-county IFTs consist primarily of transports from the mountain clinics to Summit Medical Center in Frisco. The following figure lists the IFTs by RWB and SCAS medic units (excluding Terra Two calls) during the 36-month study period.

Figure 106: Interfacility Transports by Agency (2015–2017)

IFT Type	RWB	SCAS	TOTALS
Out-of-County Transports	58	2,288	2,346
In-County Transports	1,806	4,062	5,868
Totals:	1,864	6,350	8,214

The results in the preceding figure showed that SCAS provided 97.5% of the total out-of-county transports between 2015 and 2017. It must be noted that, in accordance with an IGA (later amended), RWB did not begin providing OOC transports until January 1, 2016, and only for calls originating in the District. However, prior to that, RWB did occasionally provide out-of-county transports for critical patients, or during times of excessive system demand.

The next figure shows the combined total time committed by each medic unit on out-of-county transports during 2015–2017. It also includes the average time committed per each OOC transport.

Figure 107: Time Commitment on OOC Transports by Medic Unit (2015–2017)

Medic Unit	Total Time	Average/IFT
Red, White & Blue Fire District		
Medic 5	N/A	N/A
Medic 6	200:39:02	3:27:34
Medic 7	N/A	N/A
RWB Subtotals:	200:39:02	3:27:34
Summit County Ambulance Service		
Medic 1	1723:26:03	4:01:36
Medic 3	2167:45:33	3:43:52
Medic 4	1573:06:04	4:02:01
Medic 8	1809:37:54	4:02:22
Medic 11	1780:50:42	4:06:46
SCAS Subtotals:	9054:46:15	3:58:17
Grand Totals:	9255:25:17	3:57:31

The preceding figure shows that RWB spent an average of nearly 3.5 hours on out-of-county transports, while SCAS averaged nearly 4 hours on OOC transports. The results of both agencies combined indicated the average time spent on OOC transports was nearly 3 hours, 58 minutes.

The dataset of patient records provided by SCAS includes a field entitled, "Classification." The records were classified in the following proportions:

- ALS 1 (requires moderate level of intervention/treatment on the part of the Paramedic): **63%**
- ALS 2 (requires more extensive level of intervention/treatment on the part of the Paramedic): **5%**
- BLS-E (an emergent call but a slightly lower level of care required): **32%**

Terra Two Interfacility Transports

Flight for Life (Centura Health) operates Terra Two as an advanced life support transport unit when Lifeguard Two is unable to fly due to weather conditions. Terra Two does not respond to 911 calls or IFTs within Summit County. Terra Two's most frequent patient transport destinations were St. Anthony Hospital-Denver (71%); University of Colorado Hospital-Aurora (15%); and Children's Hospital-Denver (6%).

The following figure lists the quantity of out-of-county IFTs completed by Terra Two during 2015–2017, along with the documented initial patient-acuity levels. During this period, patient acuity was classified as either "critical," "emergent," or "lower acuity."

Figure 108: Terra Two Transports & Patient Acuity Levels

Source: Centura Health dataset

Level of Acuity	2015 (% total)	2016 (% total)	2017 (% total)	Cumulative Totals
Critical	16 (44%)	17 (35%)	23 (53%)	56 (44%)
Emergent	19 (53%)	28 (58%)	19 (44%)	66 (52%)
Lower Acuity	1 (3%)	3 (6%)	1 (2%)	5 (4%)
Annual Totals:	36	48	43	127

The preceding figure shows that 96% of patients transported to a facility outside of Summit County were considered either critical or emergent.

Transport Mode

The mode (emergent versus non-emergent) in which a patient is transported from the scene to the hospital is one indicator of a patient's level of acuity. SCAS patient records list four transport modes. The following is a list that shows the proportion of patients, and the mode in which they were transported during 2014 through 2017. The results represent 911 calls in Summit County only.

- Non-emergent: 83%
- Emergent: 15%
- Non-emergent initially, changed to emergent: 2%
- Emergent initially, changed to non-emergent: < 1%

It can be reasonably concluded from the preceding list that at least 17% of the patients transported by Summit County Ambulance likely had high acuity levels.

Transport Destinations by Ground Units

The next figure shows the five most frequent destinations to which patients were transported by Summit County medic units during 2014–2017.

Figure 109: Most Frequent Patient Transport Destinations (2014–2017)

Source: SCAS patient records dataset

Facility	Percent of Total
Summit Medical Center	71%
St. Anthony Hospital	17%
Children’s Hospital Colorado	2%
Porter Adventist Hospital	1%
University Hospital	1%

Patient Demographics & Characteristics

There is value in knowing the various attributes of the patients typically seen in a particular community. This can be valuable in the development of patient-care protocols; designing continuing medical education programs; and acquisition of specific medical equipment and supplies.

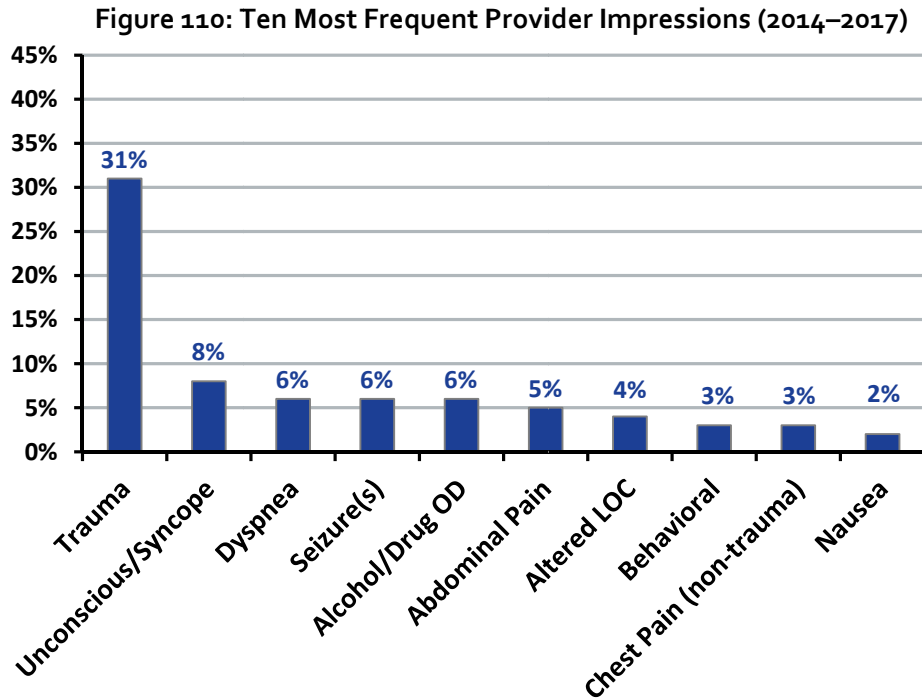
Utilizing data from SCAS patient records from 2014–2017, ESCI evaluated the demographics and characteristics of patients. The dataset contained multiple duplicate records of the same patient, and included transports provided by agencies other than SCAS. Wherever possible, duplicates were removed from the analyses.

Patient Demographics

Of the patients transported by ground units, 39% were female, and 61% male. Patient ages ranged from less than one year to 101 years. Median age was 45 years, with a mean of 44.8 years. Patients tended to be older than the 2016 Summit County resident median age of 38.2 years.³²

Patient Characteristics

The patient records include a field to document “Primary Patient Problem” or the provider’s impression. The next figure shows the top ten provider impressions for calls during the 48-month study period of 2014 through 2017. These included both traumatic injuries and various non-traumatic medical conditions.



The most common non-traumatic (medical) conditions were unconscious/syncopal episodes; respiratory distress (dyspnea); seizure(s); alcohol and/or drug overdose; and abdominal pain.

Not surprisingly, traumatic injuries represented the vast majority of patient conditions. At 33% of all trauma cases, extremity injuries were the most frequent, followed by head trauma (32%); neck/back injuries (18%); and chest trauma (8%). Pelvic injuries and abdominal trauma combined, comprised the remaining types of trauma at 9%.

The following shows the most common causes of injuries:

- Motor vehicle accidents: 29%
- Ground-level falls: 21%
- Bicycle accidents: 13%
- Other falls (20 feet or less): 7%
- Assaults: 6%
- Skiing/snowboarding: 5%
- Sports injuries: 2%
- Vehicle versus pedestrian: 2%
- Motorcycle accidents: 1%
- All other causes: < 1%

Incident Data Discussion

Development of the various data analyses was a major challenge in this project. ESCI utilized a number of incident data sources that included Summit County 911 CAD data, patient records (without identifiers) from SCAS, and incident datasets from the records management systems of the Red, White & Blue Fire District, Lake Dillon Fire Rescue, the Copper Mountain Fire Department, and Summit County Ambulance; along with summary data from Terra Two and Lifeguard Two.

Nearly all of the datasets lacked a unique record identification number, and included thousands of duplicate records. Substantial errors found in many of the datasets made it necessary to exclude obvious outliers and other records.

Summit County 911 is currently upgrading its Motorola Solutions™ CAD software. This could potentially resolve some of the issues. However, the individual emergency services organizations in Summit County—as well as Summit County 911—should pursue methods for improving their records management through ongoing quality improvement methods.

INTERFACILITY TRANSPORTS

There is no doubt that interfacility transports have had a substantial impact on the Summit County EMS delivery system—particularly those that require transportation to facilities outside the County. A review of historical incident records showed that OOC IFTs required an average turnaround time of approximately 3.5–4 hours. SFE (when using firefighters to supplement SCAS medic unit staffing) and RWB have expressed concern that out-of-county transports have placed a burden on their respective organizations. While there may be philosophical differences, most of the leadership seems to agree that the first priority of the Summit County EMS provider agencies is to ensure service is available to the residents, visitors, and taxpayers.

These extended interfacility transports affect the availability of medic units to provide service locally. Less tangible, is how lengthy OOC transports affect the ambulance crews. Anecdotal evidence indicates that crews conducting multiple OOC transports in a shift experience increased fatigue and a decline in morale. If accurate, this brings up concerns for both ambulance crew and patient safety.

During the 36-month study period of 2015–2017, SCAS or RWB medic units did not have an excessive service demand or high unit hour utilization rates. The frequency of concurrent or simultaneous incidents can affect the ability to respond to service demand.

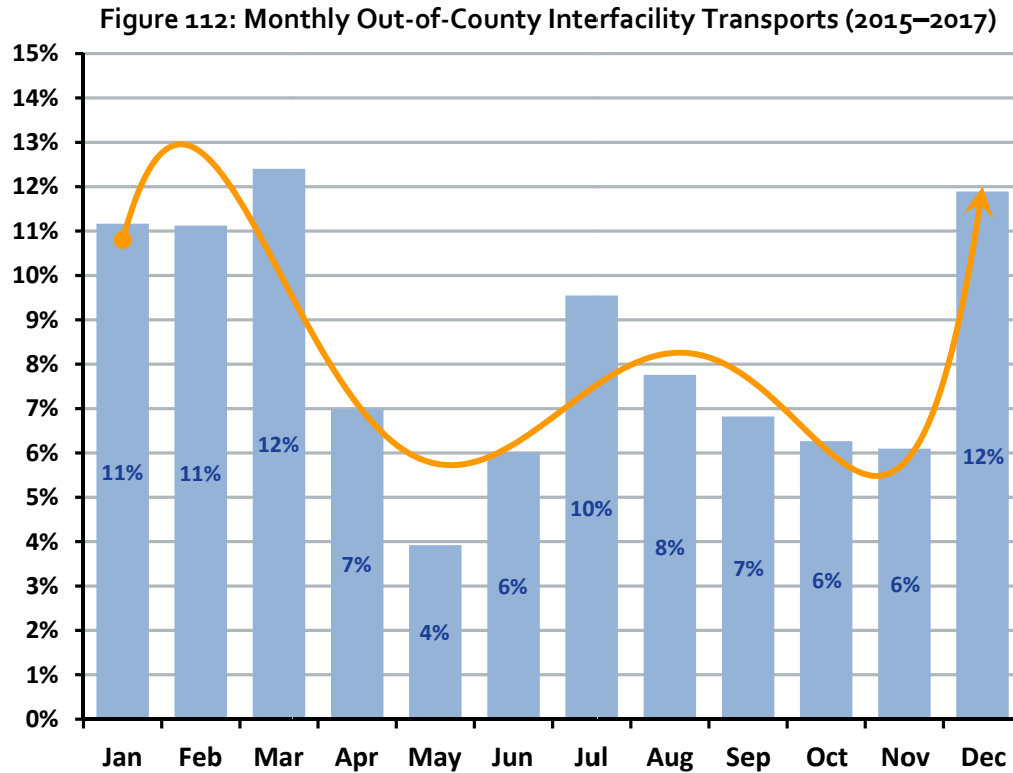
Figure 111: Call-Concurrency by Incident Type (2015–2017)

Concurrent Incidents	All Incidents	EMS Only	OOO IFTs
Single Incident	29.2%	37.3%	58.5%
Two Incidents	29.6%	30.0%	29.1%
Three Incidents	20.1%	17.6%	10.0%
Four or more	21.1%	15.1%	2.4%

The preceding figure shows that during the 36-month study period, two or more EMS calls occurred simultaneously in Summit County nearly 63% of the time; and three or more nearly 33% of the time. Two or more OOC interfacility transports occurred concurrently 41.5% of the time; with three or more occurring 12.4% of the time.

Monthly OOC IFT Service Demand

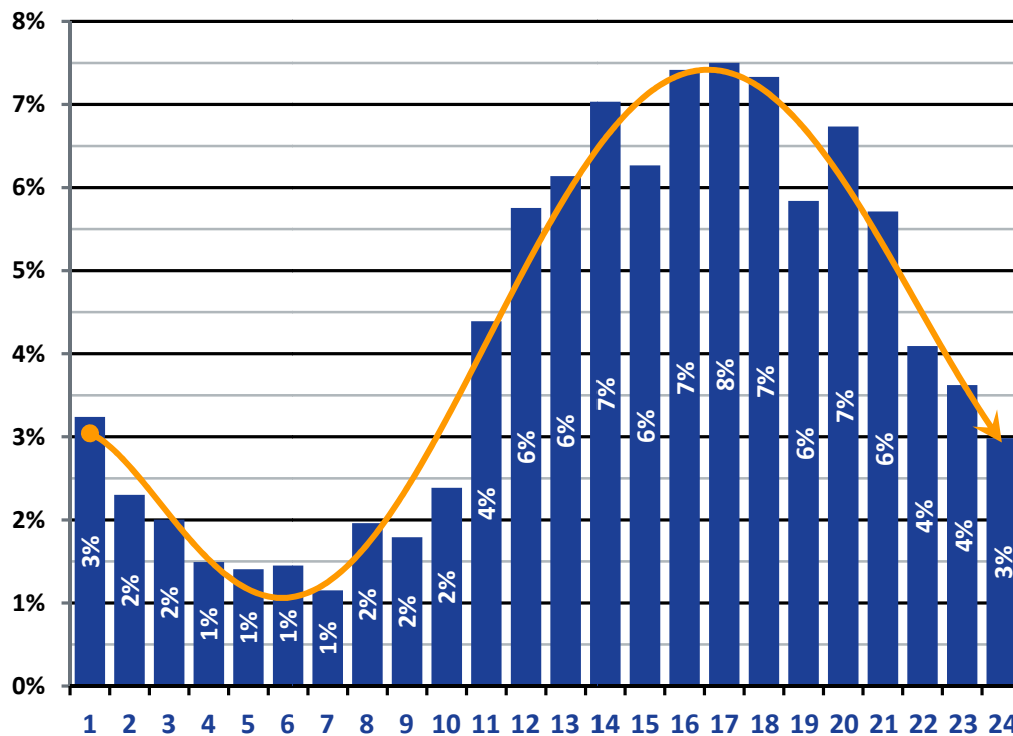
As expected, an analysis of the monthly service-demand from out-of-county interfacility transports during 2015–2017, showed that the highest call volumes during the winter months occurred in January, February, March, and December—representing 47% of the annual total. During the summer months, the highest demand for OOC IFTs occurred during July, August, and September. Combined, these seven months out of the year represent 71% of all requests for OOC interfacility transports. The following figure illustrates monthly OOC IFT service-demand for the 36-month study period.



OOC IFT Hourly Service Demand

During the 36-month study period (2015–2017), the highest 12 consecutive hours for service demand for out-of-county interfacility transports occurred between 1000 (10:00 am) and 2159 (9:59 pm) hours. These calls accounted for 74% of the calls by hour. The 12-hour period with the least number of OOC IFT calls occurred between 2300 (11:00 pm) and 0959 (9:59 am) hours. The next figure illustrates OOC IFT service-demand by hour-of-the-day during 2015–2017.

Figure 113: Hourly Service-Demand of Out-of-County IFTs (2015–2017)



Historically, the majority (74%) of OOC IFTs have occurred during the consecutive 12-hour period between 10:00 am and 9:59 pm.

Financial Issues

Based on records provided by Summit County, interfacility transports represented 42% of the patients transported during 2015–2017. Yet IC and OOC IFTs combined, accounted for approximately 55% of the cash collected for all patient transports. In contrast, local 911 scene-calls accounted for 58% of the transports, but only 45% of the cash collected from patient billing. Excluding Terra Two transports, IFT collection rates ranged from 57–76%, compared to 911 transports with a collection rate of 58%.

The following figure illustrates the potential loss in revenue to the Summit County EMS transport providers should they reduce the number of OOC and IC interfacility transports. The results are based on historical cash collections and averages. The estimates are based on random reduction rates of 25%, 50%, and 75%.

Figure 114: Estimated Financial Impact on Revenue with Reduced IFTs

IFT Transports Revenue	OOC Transports ¹		IC Transports	
Average Annual Cash Collected ²	\$1,402,917		\$553,430	
Percent Reduced	Reduction	Revenue	Reduction	Revenue
Cash collected if reduced by 25%	-\$350,729	\$1,052,188	-\$138,357	\$415,073
Cash collected if reduced by 50%	-\$701,458	\$701,458	-\$276,715	\$276,715
Cash collected if reduced by 75%	-\$1,052,188	\$350,729	-\$415,073	\$138,357

¹Excludes Terra Two OOC transports

²Annual average between 2015 through 2017

Discussion of Interfacility Transports

Out-of-county IFTs represent *the* major source of patient transport revenue in Summit County. As shown in the preceding figure, if the Summit County transport providers were to substantially reduce OOC interfacility transports, they would lose a major share of available revenue. Unless alternative funding sources could be obtained, each of the local EMS transport providers will need to continue to provide a portion of the OOC interfacility transports.

In interviews with RWB staff and members of the Board of Directors, ESCI noted their concerns regarding sending on-duty firefighter/paramedic crews on OOC IFTs, and the potential impact on maintaining an overall Effective Response Force (ERF) within their district. Further, Medic 5 was placed into service in October, 2017, adding significant EMS-transport coverage in the District.

The addition of Medic 5 likely reduces patient-transport workload on the other units. However, an accurate prediction of the impact of this addition on the District's overall effective response capability is difficult to determine, given the lack of historical data. Until the District compiles sufficient historical data to evaluate the impact of this additional unit, and system changes recommended in this report are implemented, it should continue the practice of adding a peak-demand unit during anticipated high call-volume periods. As mentioned previously, fatigue and other more intangible effects on medic-unit personnel assigned to frequent OOC interfacility transports likely have a negative impact on service among all of the transport providers.

COMMUNITY PARAMEDICINE ANALYSIS

For decades, emergency department (ED) overcrowding and EMS system abuse in the U.S. has escalated, along with the rising cost of healthcare and diminishing government subsidies. This has forced people living on limited incomes to use EMS and EDs as primary care providers. In an attempt to address these issues, agencies and communities around the country are taking innovative steps to try and relieve pressure on the use of EMS and impact on hospital emergency departments, by implementing Mobile Integrated Healthcare-Community Paramedicine (MIH-CP) programs. It should be noted that MIH-CP programs have been in place in the United Kingdom, Canada, and Australia for almost two decades. While there may be slight variations in how these programs are implemented, the fundamental goals are the same—extend health care to a patient’s home and reduce EMS service-demand, ED visits, and hospital readmissions.

MIH-CP programs often focus on the highest users of prehospital EMS and emergency departments—typically low-income patients; those with chronic mental and/or physical health issues; patients without means of transportation; substance abusers; and any combination thereof.

MIH-CP involves sending EMTs, Paramedics, or specially trained *Community Paramedics* (CP) into patient homes to provide specialized home care services, such as:

- Hospital discharge follow-up
- Medication reconciliation
- Blood draws and glucose monitoring
- Home safety, social services, and nutritional assessments
- Well baby/child checks
- Blood pressure and oxygen saturation checks
- Post-injury/illness follow-up/wound care
- Illness/medication education and compliance
- Liaison with health care providers

The benefits of using local EMS providers to deliver this specialized type of care include:

- The ability to tailor the program to meet local health care gaps.
- EMS providers already possess most of the required skills and are comfortable and experienced in working in patient homes and environments.
- EMS providers are the largest pool of mobile health care resources available.

Because of the relatively recent implementation of these various programs, scientific evidence of program effectiveness and efficacy is limited. Efforts are underway throughout the United States to determine and verify impacts on EMS performance, system demand, and most importantly, appropriate patient care.

However, there are many anecdotal stories of success in reducing repeat 911 calls for various categories of patients.

Colorado state regulations enable the establishment and provide guidance for MIH-CP programs.³³ One of the most effective MIH-CP programs can be found in the Colorado Springs, with the Colorado Fire Department's *Community Assistance, Referral and Education Services (CARES)* and *Community Response Team (CRT)* programs. In place since 2012, these programs have significantly reduced the use of 911 by frequent EMS users.

For example, in 2014 the CARES program evaluated 500 patients, and decreased the use of 911 by approximately 50% in two-thirds of these patients.³⁴ The department's CRT program, using a multi-disciplinary team of law enforcement, behavioral health, and EMS professionals, focuses on citizens with more complex mental health and substance abuse issues. Initial funding for these programs came from the fire department, hospital, and Colorado State Office of Behavioral Health.

Another MIH-CP program can be found in adjacent Eagle County, Colorado. Widely acknowledged as being the first of its kind in the United States, the Western Eagle County Health Services District (now called *Eagle County Paramedic Services*) Community Paramedic Program was launched in 2010 to provide primary care services to the county's rural areas, which were remote from clinics, physicians, and/or healthcare facilities. Since its inception, this program has been viewed as a model for other communities to emulate.

Indications for an MIH-CP Program

From ESCI's perspective, the following factors influence the need and viability of implementing a MIH-CP program: EMS and ED system overload, support, and integration of the local healthcare system; and finding a sustainable funding source.

Data provided to ESCI was insufficient to identify excessive use of the EMS system via 911 calls (as opposed to OOC transports) by patients with chronic conditions, mental health issues, or potential abuse, to determine if an MIH-CP program could be justified in Summit County. However, an analysis of 911 scene responses throughout the County, and discussions with agency administrators, did not indicate excessive system overload and/or abuse.

Another factor to consider in implementing a MIH-CP program is ED overcrowding and misuse. As the only Level III Trauma Center and emergency department in Summit County, the capacity and appropriate usage of the ED must be considered. In 2016 St. Anthony Summit Medical Center conducted a required *Community Health Needs Assessment (CHNA)*.³⁵ The results determined that behavioral health and unintentional injuries should be the top priorities to address within the healthcare system. The CHNA did not specifically identify ED overload as a factor in either priority. Moreover, the strategies to address each of these priorities did not include participation of prehospital EMS transport agencies or the local fire departments.

Identifying the Patient Population

At a minimum, successful implementation of a CP program requires collaboration with healthcare organizations, hospitals, physicians, payer sources, social services, *Accountable Care Organizations* (ACO), home-health agencies, and mental health resources. Implementation of a CP program in Summit County would require identifying underserved populations or those patients in need of in-home services who could benefit from immediate and regular availability of assessment and intervention.

Hospitals today are more interested in funding CP programs than they were a few years ago. The readmission penalties imposed by the *Centers for Medicare & Medicaid Services* (CMS) are having a greater impact on their revenue streams, as additional diagnoses are added to the penalty list, and the national readmission rates continue to decline. By using Community Paramedics to follow-up with recently discharged hospital patients, so as to ensure their compliance with medications and after-care therapy, experience has demonstrated reduced hospital re-admission frequency. For this and other reasons, a broad-based collaborative effort between EMS and their partners in the local healthcare system can reap benefits for all involved.

An analysis of patient-disposition data showed that approximately 20% (about 2,000) of Summit County EMS responses did not result in a transport. While there is no direct correlation between these dispositions and the potential number of patients that might be enrolled in a MIH-CP program, it is reasonable to assume that a small percentage of these patients would likely benefit from a CP response.

The 2016 *Community Health Needs Assessment* (CHNA)³⁶ noted a significant percentage (19.5%) of the Summit County population has no access to social, emotional, or behavioral support. Lack of this type of support can *sometimes* result in suicide. A review of the *Summit County Coroner's* annual death statistics from 2015–2017, revealed that suicide was the cause of death in 11% of the total County deaths in 2015, 16% in 2016, and 8% in 2017. Summit County social-service providers, government officials, and community members have been working to identify strategies and programs to reduce the number of suicides. Implementation of an MIH-CP program is one approach some feel may help address this issue. It is important to note that MIH-CP paramedic providers are typically not formally trained or certified to provide mental health care. However, they can be an excellent resource to help connect patients who are struggling with behavioral and/or mental health issues with appropriate mental health care providers.

Sustainability

The success of MIH-CP programs is largely determined by the sustainability of funding, community support, and support and participation of other healthcare providers. Grants are often used to launch these programs. However, many grants are short-term and/or one-time funding opportunities, and are not well suited to supporting long-term operations of such a program. The ability to demonstrate value to the payers over the long term is critical for continued funding. It is important for EMS systems to develop and mutually agree on meaningful metrics with healthcare partners early on in the process, which will demonstrate value to the payer. Additionally, CP programs are well aligned with *the Institute for Healthcare Improvement's Triple Aim* initiative:

- Improving the patient experience of care (including quality and satisfaction).
- Improving the health of populations.
- Reducing the per capita cost of healthcare.

Program Development Components

Planning and implementing a sustainable MIH-CP program requires focused collaboration with various healthcare and social service agencies and the community. If Summit County decides to implement an MIH-CP program, the following action-areas should be carefully considered:

- Assess program feasibility.
- Identify pertinent Colorado regulations.
- Secure internal agency and key partner commitments.
- Assess community needs.
- Determine program scope and services to be provided.
- Recruit and deliver specialized paramedic training.
- Identify sustainable funding sources and budget.
- Determine methodologies for measuring success and impact.
- Engage the community.
- Develop policies, procedures, and standard operating guidelines.

Discussion

ESCI believes the feasibility and sustainability of a MIH-CP program will be determined only by initiating a focused and collaborative community and stakeholder planning effort that addresses the components listed above. For Summit County, efforts to expand into the realm of MIH-CP should *not* be considered in the short-term, at least until other issues related to the future and sustainability of the current EMS system are addressed. However, if future community demographics and/or EMS service-demand indicates a potential benefit of an MIH-CP program, a joint venture among local healthcare providers, Summit County and EMS agencies should be explored in depth.

FUTURE SYSTEM-DEMAND PROJECTIONS

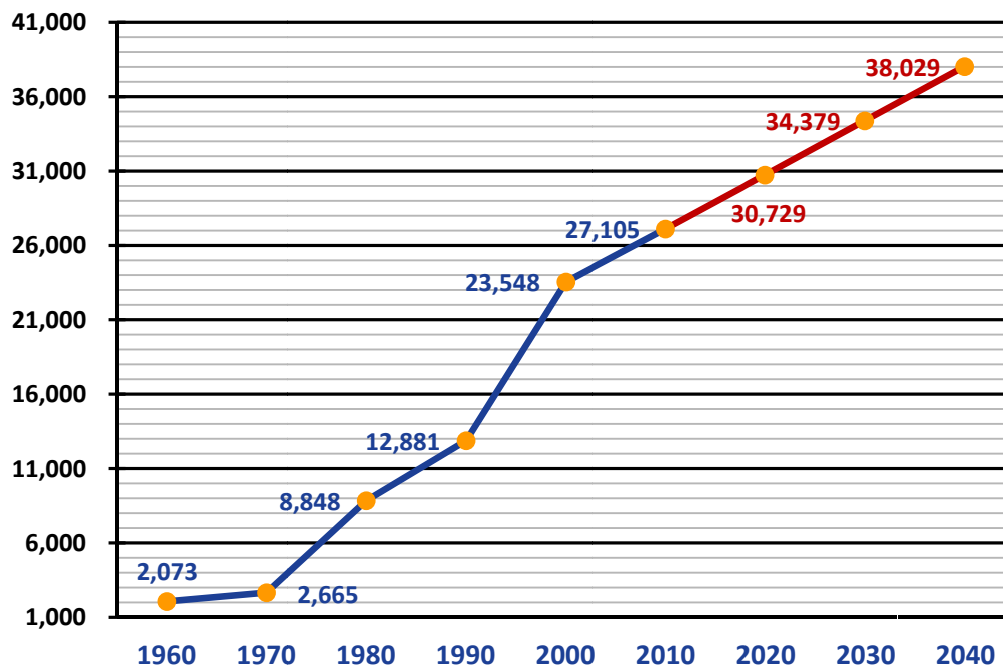
In the following section, future system-demand projections begin with an overview of estimated population growth in Summit County, followed by a forecast of potential future service-demand in Summit County.

Projected Resident Population Growth

As mentioned previously in this report, a community's population is the primary driver of the demand for emergency medical services. The following figure illustrates the resident population growth in Summit County between 1960 and 2010, along with the projected growth after 2010 through 2040. While this will undoubtedly impact future service-demand, it does not take into account the large increase in the transient population during the recreational periods in the summer and winter months. The recent building boom in Summit County is yet another indicator of a growing population and a potential indicator for increasing EMS service-demand.

Figure 115: Historical & Projected Population Growth in Summit County (1960–2040)

Source: 2016 American Community Survey, U.S. Census Bureau



The preceding figure utilized data from the U.S. Census Bureau. However, *the Colorado State Demography Office* has projected significantly higher population growth for Summit County. For example:

- 2020: 32,760
- 2030: 39,540
- 2040: 45,859

According to a 2017 article in the *Summit Daily*, “The Summit School District’s enrollment numbers continue to climb year-over-year, at a pace even greater than annual County population expansion, making the local school system one of the fastest growing in the entire state.”³⁷ According to the article, this information was based on a study by A+ Colorado, a Denver-based non-profit organization.

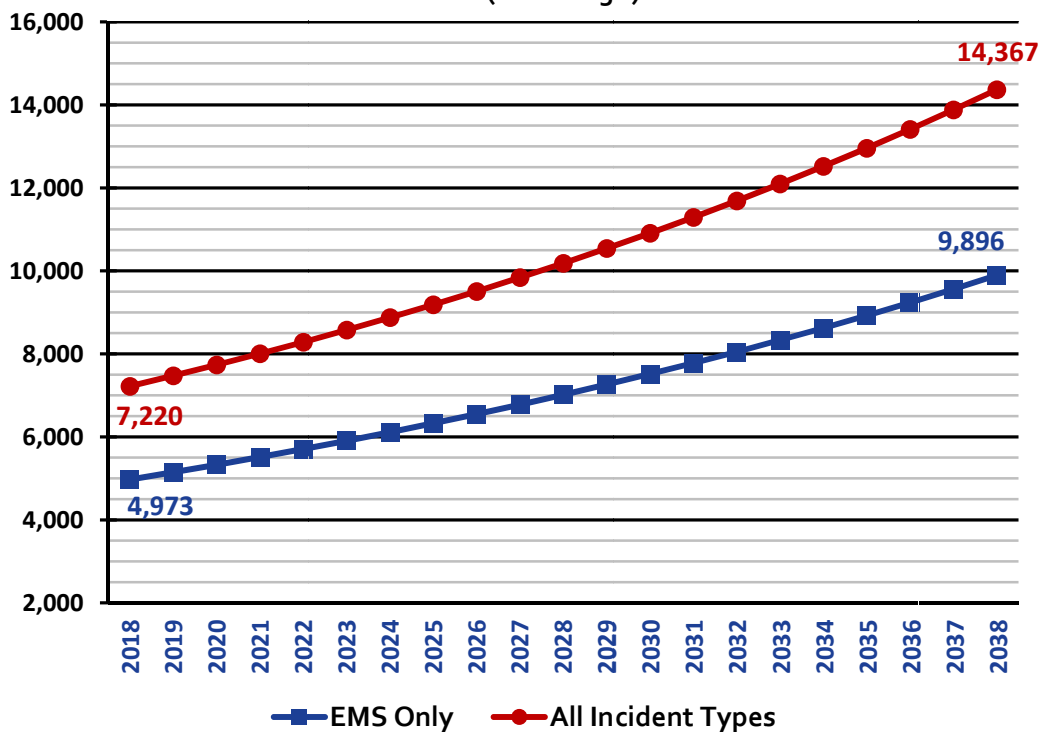
Future Service-Demand Projections

It is important to consider projected population growth when determining future service-demand and planning for the potential need to add staff, facilities, apparatus, and other resources. Increases in population growth—particularly in EMS service-demand—can directly affect fire department workload and the effectiveness of the organization. Changes in service-demand may require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance.

It is not the intent of this study to be a definitive authority for the projection of future service-demand in Summit County, but rather to base recommendations for future emergency services needs on a reasonable association with projected service demand. With limited incident data, forecasting future service-demand is less precise. In this case, ESCI used an annual increase of 3.5% to arrive at the projected results.

The next figure illustrates estimated future EMS-only service-demand, along with all incident types combined, for the next 20 years through 2038. All incident types were included, since total service-demand will impact the system’s ability to respond to emergency medical incidents.

Figure 116: Projected Future Service-Demand in Summit County (2018–2038)

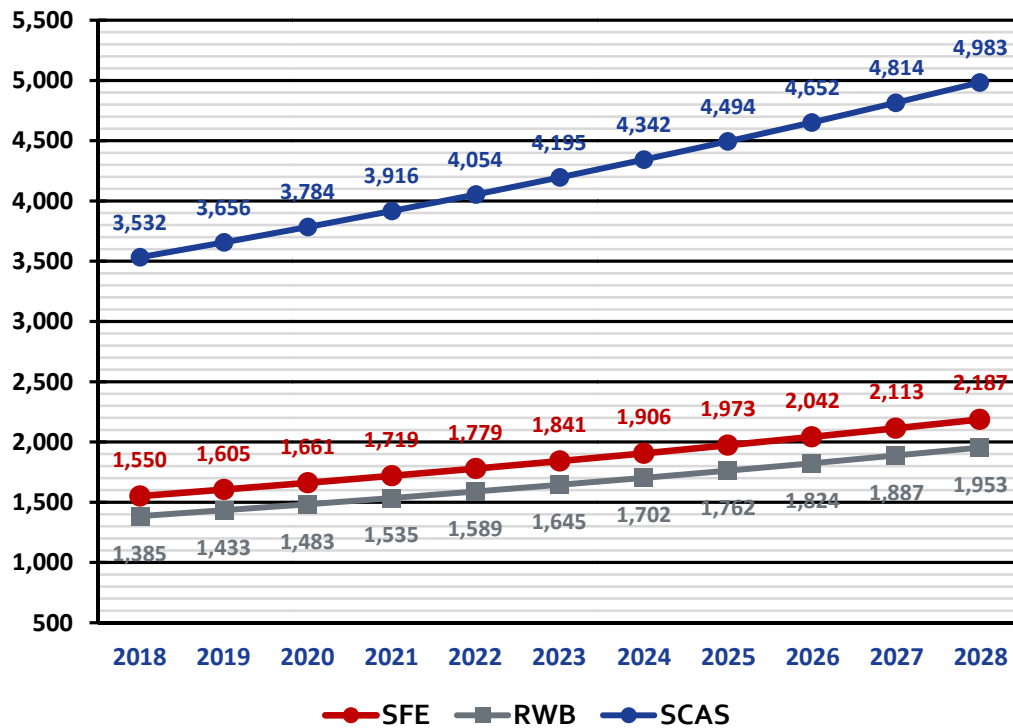


The calculations indicate that call volumes for all incident types, as well as EMS-only calls, may increase by nearly 99% by 2038. Since these were based on the U.S. Census Bureau’s projections, they may be conservative estimates. Should the Colorado State Demographer’s projections be more accurate, Summit County should expect an even higher increase in service-demand.

In the more immediate future, both EMS service-demand and all incidents combined could increase by nearly 15% within the next five years (2018–2022).

The next figure shows a forecast of EMS incidents by individual emergency services organizations for the next ten years (2018–2028). The projections indicate a steady increase in the demand for emergency medical services each year through 2028.

Figure 117: Projected Future EMS Service-Demand by Agency (2018–2028)



The service-demand projections in the preceding figures can be useful in planning for future system development; potential re-adjustments in deployment methods; and development of capital equipment and facilities replacement and planning.

FUTURE SERVICE-DELIVERY OPTIONS

The following section presents options for future EMS service-delivery in Summit County. These are based on the results of ESCI's comprehensive analysis and evaluation of the myriad components of the existing system; numerous interviews and comments from key stakeholders and field personnel; various observations; and a historical analysis. The basic components of each option will be described below, with more details presented later in this section.

Option A: SFE/SCAS Consolidation & System Improvements

The basic elements of Option A are described below.

- Summit County government should discontinue its direct role in the delivery of EMS, and transfer all operations to SFE.
 - SFE would continue uninterrupted provision of ALS transport services to the current SCAS service area.
 - Former SCAS employees would not see a reduction in salaries and benefits.
 - A new organizational structure is described in detail in "*Appendix A: Proposed Organizational Structure of SFE.*" It must be noted that this is a suggested organizational structure. Ultimately, this will need thorough discussions and negotiations between Summit County and SFE.
- Summit County government would grant SFE, RWB, and Terra Two an independent license to operate ambulance service in accordance with the current Summit County EMS regulations, a new County ordinance, and/or intergovernmental agreements.
- Each agency would be responsible for their organization's patient billing and collections, and will retain 100% of the revenue they collect.

SFE/SCAS Merger Forecast Assumptions

SFE revenue is primarily based upon contributions from the two districts that comprise the current SFE Authority; Lake Dillon and Copper Mountain CMD. The contribution amounts are based upon combined, projected fire protection and EMS expenditures for the districts (less capital for Lake Dillon). In order to develop a forecast of SFE revenues under a SCAS merger scenario, several key expenditure assumptions have been made as follows:

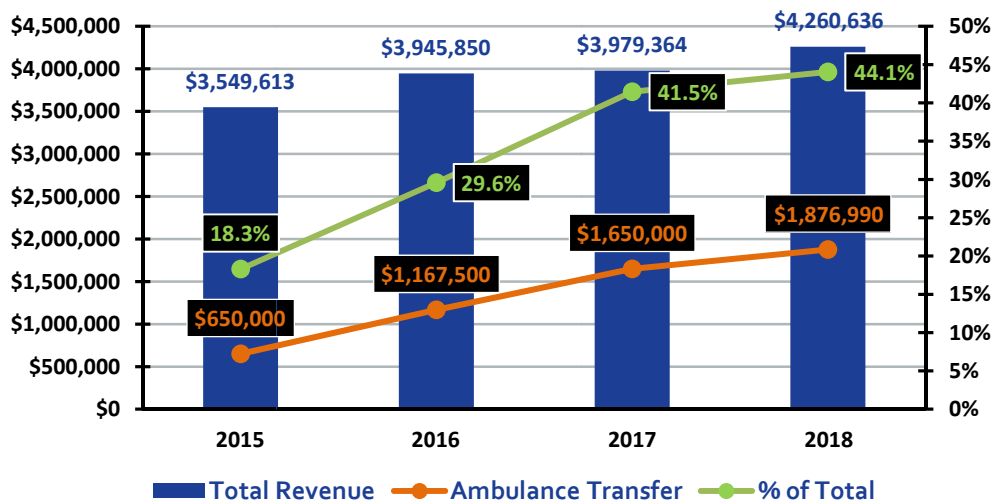
- Lake Dillon will transfer equipment and apparatus expenditures into the Authority budget after 2018, and will increase their annual contribution to the Authority to fund these costs.
- Base 2019 annual equipment and apparatus expenditures for Lake Dillon will approximate average historical 2015 (actual) to 2018 (budgeted) amounts of \$362,638 and \$149,414, respectively.
- Base 2019 Copper Mountain average annual equipment and apparatus expenditures will approximate average historical 2014 (actual) to 2018 (budgeted) amounts of \$437,713 and \$61,769, respectively.
- Apparatus and equipment costs will escalate 4% annually after 2019, and historical average costs used for the 2019 forecast-budget.

- All current employees will remain with the combined agency, but no new positions will be added.
- Personnel costs will increase at 5% annually from 2018 base amounts.
 - There may be additional administrative costs associated with adding new employees, although SFE believes it has the capacity to address additional personnel through several means.
- Operating costs will increase at Denver-Boulder-Greeley CPI-U late 2017 inflation rate of 3.5% annually from 2018 base amounts.
- Other SFE revenues, such as inspection fees, contractual payments, fleet reimbursements, etc. will grow at an annual rate of 2% from the 2018 base amount.

Further, several assumptions must be made concerning ambulance revenue within the County, Safety First Funds, and other SCAS revenue that would contribute to the overall partnership as outlined. These revenue assumptions are listed below:

- Total countywide ambulance revenues, including Terra Two and RWB transport revenue, will grow at an annual rate of 2%.
- Terra Two and RWB transport revenue will also grow at an annual rate of 2% from the 2018 base amount and will increase from 50% to 100% of revenue collected per transport (SCAS will no longer bill for these transports, provide personnel, or retain a percentage of the revenue), with the remaining revenue allocated to the partnership.
- Payor mix and collection rates for various categories of ambulance transport remain as they currently are for the forecast period.
- Total Safety First Tax funds, as shown in the following figure, are assumed to grow at an annual rate of 3%, and the percentage allocated to SCAS in 2018 will remain the same during the forecast period.

Figure 118: Total Safety First Tax Funds & Ambulance Transfer (2015–2018)



- Safety First Tax funding was authorized by the voters in 2014—to begin in 2015—and sunset after an 8-year period. Therefore, the forecast assumes no Safety First funding will be available to the partnership beginning in 2023.
- Other SCAS revenues, such as contractual payments, interest and grant revenues, etc., will grow at an annual rate of 2% from the 2018 base amount.

The following figure shows the adjusted revenue that would have been available to the partnership in 2018, for comparison along with forecast revenues available to the partnership for the period 2019–2023, based upon the above forecast assumptions.

For comparison with the forecast period, one must subtract Summit County payments of \$144,000 to SFE for partnership in the ambulance service in 2018. Additionally, payments to RWB and Centura Health for Terra Two must be subtracted from total County ambulance revenue in 2018 for comparison purposes. Payments received by RWB and Centura Health for transports will increase by 50–53% in 2019, if SCAS no longer provides billing, collections, or personnel, and retention of a portion of the revenue received.

Total revenues available to the partnership would increase from \$15.8 million in 2018 to \$17.1 million in 2019, primarily due to the increased transfer from Lake Dillon and Copper Mountain based upon increased expenditures in the Authority capital budget. From 2019 forward, revenues would increase by approximately \$650,000–\$700,000 annually until 2023 when the Safety First Tax is set to expire.

Figure 119: Projected Revenues of a SFE/SCAS Merger

Revenue	2018 Budget	2019 Forecast	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast
SFE Partner Transfers	\$9,478,221	\$10,941,136	\$11,454,759	\$11,992,842	\$12,556,564	\$13,147,160
SFE Other Revenues	\$577,672	\$589,225	\$601,010	\$613,030	\$625,291	\$637,797
Less SC payments	-\$144,000					
SCAS Cash Collections ¹	\$4,238,155	\$4,322,918	\$4,409,376	\$4,497,564	\$4,587,515	\$4,679,266
Less Other ²	-\$419,852	-\$856,498	-\$873,628	-\$891,101	-\$908,923	-\$927,101
Safety First Funds	\$1,876,990	\$1,933,300	\$1,991,299	\$2,051,038	\$2,112,569	\$0
Other SCAS Revenue	\$182,766	\$186,421	\$190,150	\$193,953	\$197,832	\$201,788
Total Revenue:	\$15,789,952	\$17,116,503	\$17,772,966	\$18,457,326	\$19,170,848	\$17,738,909

¹Forecast revenue includes the amounts from all Summit County transports combined

²Revenue from RWB and Terra Two transports escalates at same historical rate as total transport revenue

It is important to note that revenue stream described in the preceding figure assumes that SFE would continue with the current volume of out-of-county interfacility transports. This does not take into account any potential impact on future property tax revenue as a result of the *Gallagher Amendment* to the Colorado Constitution, an economic downturn, or better economic conditions.

Figure 120: Projected Expenditures of a SFE/SCAS Merger

Expenditures	2018 Budget	2019 Forecast	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast
SFE Annual Expenses ^{1,2}	\$9,478,222	\$10,941,136	\$11,454,759	\$11,992,842	\$12,556,564	\$13,147,160
SCAS Expenses ¹	\$5,349,799	\$4,605,426	\$4,810,124	\$5,024,424	\$5,248,785	\$5,483,686
Less Other ³	-\$563,852					
Less SC Admin. Fees	-\$376,429					
Total Expenditures:	\$13,887,740	\$15,546,562	\$16,264,883	\$17,017,266	\$17,805,349	\$18,630,846
Difference between Revenue & Expenditures						
Totals:	\$1,902,212	\$1,569,941	\$1,508,083	\$1,440,060	\$1,365,499	-\$891,936

¹Excludes one-time capital expenditures, including SCAS contribution to joint administration building of \$1,600,000 in 2018

²Includes all expenditures necessary for fire/EMS operations and administration

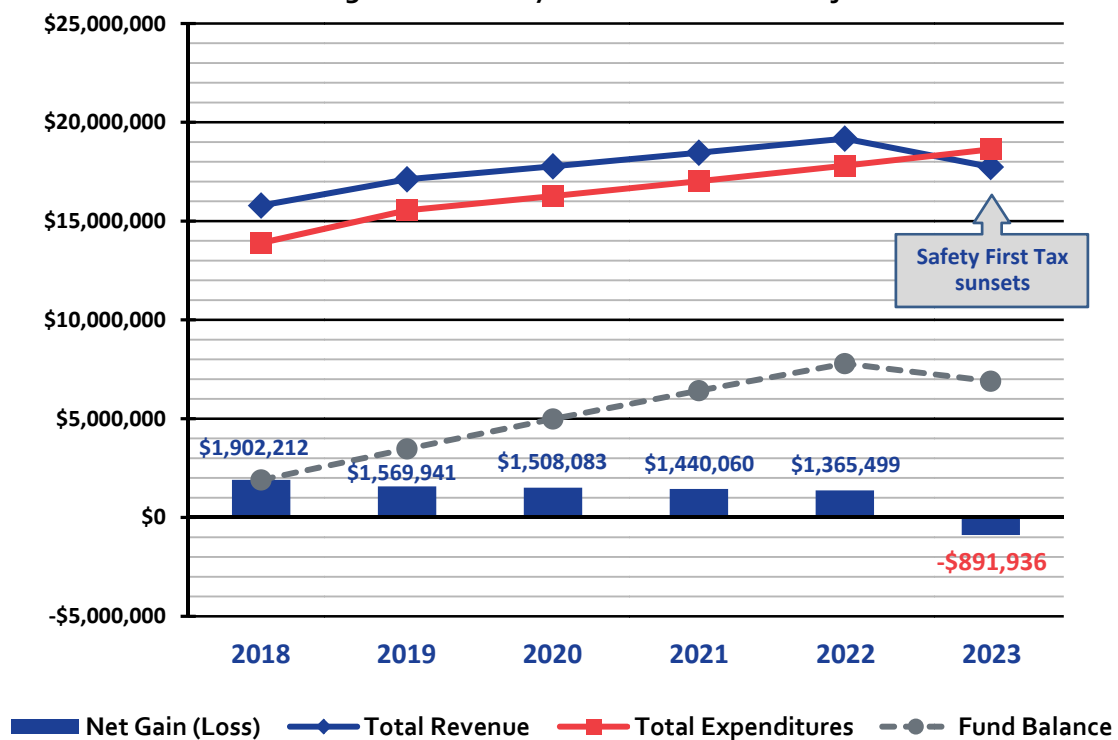
³Payments to SFE, RWB, & Terra Two

Forecasted expenditures also require an explanation of assumptions. SFE expenditure assumptions have been covered above. Assumptions relative to SCAS annual expenditures during the forecast period are described as follows:

- All current employees will remain with the combined agency, but no new positions will be added.
- Personnel costs will increase at 5% annually from 2018 base amounts.
- Since SCAS will no longer be a County operation, there will be no allocated costs for supporting services from the County, and the "Administrative Fee" (\$376,429) in the 2018 budget will no longer appear. Support services previously provided by the County would be provided by Summit Fire & EMS with existing staff (SFE expressed to ESCI that they would have the capacity necessary to address the additional costs of Human Resources, IT, finance, etc.).
- Terra Two payments will no longer be part of the expenditure budget because Centura Health will bill patients directly for this service, and the same assumption is made for patients transported by RWB (they will be responsible for the collection of their own transport fees).
- Operating costs will increase at Denver-Boulder-Greeley CPI-U late 2017 inflation rate of 3.5% annually from 2018 base amounts.
- Single-role EMS personnel (not functioning in a firefighter role) employed by SFE, will not be subject to the same FLSA overtime requirements as SFE firefighters.
- The forecast assumes that capital apparatus and equipment will be replaced at the average historical rate for SCAS for the period 2014–2017, with approximately \$250,000 per year spent on apparatus, and \$170,000 spent on equipment effective 2019.
- Debt service will continue to be budgeted at approximately \$150,000 annually. This figure could be folded into a reserve if the note(s) is/are retired prior to 2023.

Based upon the preceding expenditure and revenue assumptions, it appears that a combined SCAS/SFE organization would be able to fund its operation with an excess of revenue over expense. The following figure shows the projection of the combined services from 2019 through 2023. There is an annual net gain in fund balance from \$1.57 million in 2019, declining to \$1.37 million in 2022; after which expense will annually exceed revenue as the Safety First tax sunsets. This assumes no capital facility spending, but does factor in capital equipment and apparatus replacement. Once the Safety First Tax sunsets, the operation will run an annual deficit of approximately \$0.9 million. With a surplus from 2019 through 2022, a strong fund balance is built to \$7.8 million in 2022 (approximately 44% of total expenditure budget) which would give some additional organizational longevity before other tax or financial support could be developed.

Figure 121: Safety First Tax Revenue Projections



Acquisition & Transfer of SCAS Assets

- ESCI recommends that Summit County transfer full ownership of all capital equipment, vehicles, durable medical equipment, and disposable supplies necessary for operations to SFE.
 - This should be clearly addressed through an IGA between SFE and Summit County.
- Since SCAS vehicles and equipment were originally purchased with taxpayer funds (and other resources), and SFE will continue to provide emergency medical transport to the current SCAS response areas, ESCI recommends that this should occur at no cost to Summit Fire & EMS.

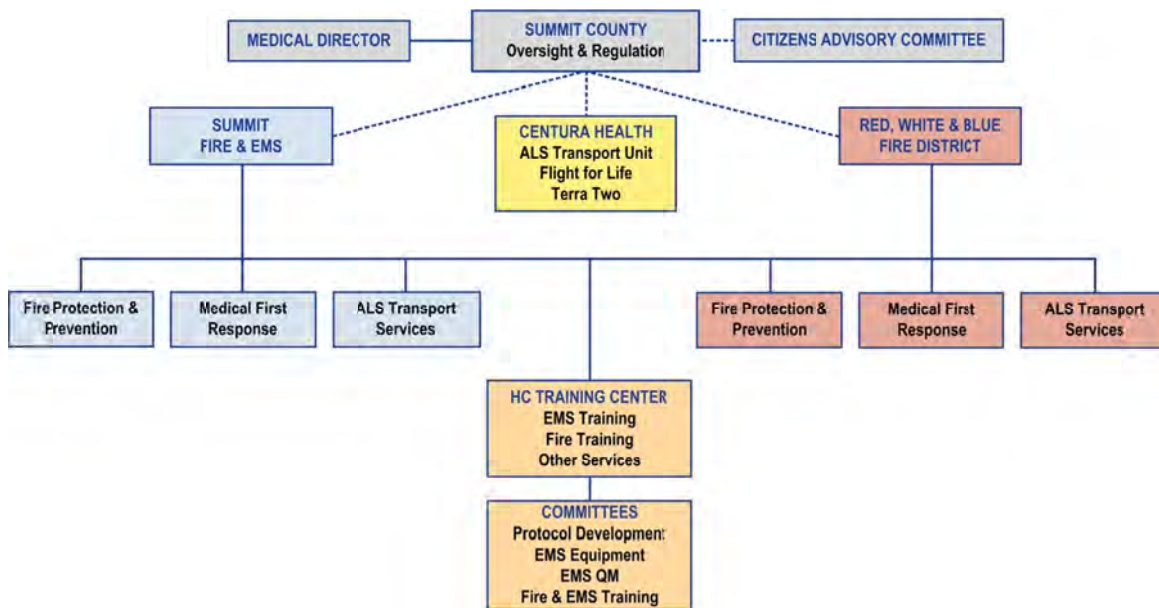
Licensing & Regulatory Role of Summit County

In this option, Summit County government would assume an expanded role of ambulance service licensing and regulation of emergency medical transportation services. ESCI recognizes that Summit County desires to ensure a high quality, efficient, sustainable, and cost-effective EMS delivery system.

Proposed Summit County Organizational Structure

The following figure represents a simple graphical illustration of the organizational structure of the Summit County EMS system, should the recommendations contained in this report be adopted.

Figure 122: Proposed Summit County EMS System Organizational Structure



Role of Summit County Government

- Summit County government would modify its role and focus on providing objective EMS system oversight and regulatory compliance, rather than the direct provision of ambulance service.
- The community would be served better if Summit County is in a position to ensure that EMS provider organizations comply with reasonable regulations and/or performance standards.
- Summit County should consider creating a *Citizen's EMS Advisory Committee* to provide public input on the EMS system.

Regulatory Options

In accordance with Colorado regulations, Summit County currently has the authority to grant licenses to operate ambulance services within the County. There are several options in which the County could expand its regulatory role.

- Summit County could consider modifying its current “EMS Rules & Regulations,” or adopting a new EMS ordinance or resolution requiring performance standards and other criteria for agencies requesting a license to operate ambulance service in Summit County.
 - An alternative to the options above could be IGAs with the individual emergency services organizations.
- Regardless of which option is selected, it should include performance criteria, minimum staffing requirements, equipment standards, and other elements to ensure quality assurance.

Regulatory Components

An appendix in this report includes the complete City of Denver/Denver County EMS ordinance (“*Appendix B: Denver EMS Regulations*”). While this could be used in Summit County as the basis for an ordinance or IGA for emergency medical transport, it falls short of other performance standards that should be considered.

When developing an ordinance or IGA, Summit County should apply the five hallmarks of good system design as suggested by the *American Ambulance Association*, and paraphrased below:

1. Ensure the medical transport providers are held accountable.
2. Provide fair, equitable, and objective oversight.
3. Account for all EMS system costs.
4. Require system features that ensure economic efficiency.
5. Require long-term high-performance service through measurement.

The following is a list of additional performance criteria that should be considered for adoption in an ordinance or IGA. These are considered key elements, and an ordinance or IGA should not necessarily be limited to these.

Response-Time Requirements

Response-time performance and measurement is one of the most common standards found in EMS (ambulance) ordinances, contracts, and intergovernmental agreements. The rationale is that a certain subset of patient conditions can benefit from a rapid response of an ALS transport unit, and because citizens expect to receive a quick response from their emergency services organizations—regardless of the seriousness of the patient’s condition.

Summit County is unique to other systems in that the highest service-demand occurs during the winter months when road conditions can be difficult. Therefore, if response-time performance standards are adopted, they must be reasonable and attainable. ESCI does not recommend specific response-time standards, as that remains a function that needs to be determined local policymakers and leadership. Prior to determining such criteria, the policymakers should answer the following questions:

1. What are the expectations of the community and elected officials with regard to initial response times of the emergency services organizations to an emergency medical incident?
2. What is the public's perception of quality emergency services where response time is concerned?
3. What response-time performance would be reasonable and effective reducing mortality and morbidity (death and disability) in sudden illness and injury?

Response Time Discussion

The NFPA recommends an ALS response time of 8 minutes or less at the 90th percentile. CAAS suggests that local agencies must determine their own response-time standards, but recommends a default of 7 minutes, 59 seconds or less at 90%.

It has been ESCI's experience (including published research) that, in most communities, only a small percentage (5–10%) of patients may benefit from a rapid ALS medic unit response (e.g., cardiac arrest; acute MI/STEMI; multisystem trauma; stroke; etc.). There is a growing body of evidence to support this contention, and that the need for emergent (lights and siren) is often unnecessary in many cases.^{38,39,40,41,42}

Response Time Definition & Measurement Methodologies

- Since the agencies do not have direct control over Summit County 911, the alarm-handling time interval should be excluded, and "Total Response Time" defined as: the interval between when the first medic unit is dispatched and when it arrives on scene.
 - Response times should be measured in minutes and integer (whole) seconds.
- Response-time criteria should be different for emergent and non-emergent calls (preferably, in accordance with MPDS, if implemented by Summit County 911).
- Response times should be calculated on a monthly basis using the "fractile" method. Typically, this is 90%. However, because of the inclement weather, Summit County may want to consider 80% compliance.

Response-Time Exemptions

Exemptions from the response-time performance criteria should be allowed for certain situations, and excluded from the monthly reports. The following should be considered, but not necessarily limited to:

- Mutual aid requests to locations from outside Summit County.
- Calls that are initially dispatched as emergent, and downgraded to non-emergent; and those that are initially dispatched as non-emergent, and upgraded to emergent.
- Out-of-county transports; or at least non-emergent OOC transports.
- Incidents in which Summit County 911 dispatched units to an incorrect location.

Agencies should be allowed a process for requesting exemptions on individual incidents. Requests should be submitted in writing with an explanation.

Other Terms

Reporting Requirements

- EMS transport agencies should submit a report within 30 calendar days after the last day of the end of the quarter, the following:
 - Response-time compliance (each component of the response-time continuum).
 - Number of incidents dispatched and patients transported.
 - Customer complaints and a summary of the patient satisfaction surveys.
 - Financial report on transports billed and cash collected.

Compliance Provisions

Include mandatory requirements to comply with:

- Medicare and Medicaid policies and procedures.
- Health Insurance Portability & Accountability Act of 1996 (“HIPAA”).

Medic Unit Staffing & Scheduling

Current schedule among all organizations are 48-hour shifts. This may be a potential risk-management issue. Consider:

- Language that does not allow medic-unit personnel to work more than 48 consecutive hours without a minimum of 8–12 hours of “down time” before working another shift.

Penalties for Compliance Failures

- Consider adopting *reasonable* monetary penalties for ambulance services that *consistently* fail to meet the regulatory requirements of the ordinance, or the contractual terms of the IGA.
 - Funds collected from monetary penalties should be placed in a special fund to be utilized as “grants” to improve the EMS delivery system.

Patient Charges & Fees

- Patient charges and fees should be standard among all the agencies providing medical transport in Summit County.
- Medical transport providers may request an increase in patient charges and fees, provided they submit such a request outlining the justification for the increase.
- Summit County should be allowed to audit and inspect patient billing and collection records of any medical transport provider. This should be limited *only* to patient transports and related services, and not any other unrelated financial processes of the agency.

Observations & Inspections

- Summit County representatives should, at any time, and without notification, directly observe the EMS transport provider’s operations and facilities.

Material Breach of Contract or Failure to Comply

Should Summit County elect to employ IGAs with the transport providers, the terms should define what would constitute a material breach of contract, and what processes should occur in this event; including an opportunity for an agency to take corrective action. The same elements should be adopted if an ordinance is adopted.

Emergency Takeover

Summit County government has expressed concerns in the unlikely event that should RWB and/or SFE discontinue emergency medical transport services, that there would be no alternative services available for the community. The following outlines terms and actions that could be included in an IGA or ordinance, and employed in the event transport service is discontinued.

- In the event of a major material breach of contract or failure to consistently comply with the regulations of an ordinance; or in the event of a voluntary discontinuation of emergency medical transport services (should exclude Centura Health), Summit County can institute an Emergency Takeover following a majority vote of approval by the Summit County Board of Commissioners.
- If an Emergency Takeover is indicated, Summit County will give notice to the provider agency that the County will assume the provision of medical transport services; which will include the date and time that the takeover will be effective.
- The terms should require that the agency must promptly and fully cooperate with Summit County during the takeover process so as to effectuate an orderly transition.
- Upon notice of an Emergency Takeover, the agency will immediately deliver to Summit County, or its designee, all emergency vehicles; capital equipment; communications equipment; durable and disposable medical supplies; and any other equipment and supplies necessary for the effective and uninterrupted operation EMS transport services.
 - Summit County should be provided with full access and use of any stations, facilities, or other locations utilized for EMS transport services.
- Summit County should be provided access to all billing and accounts receivables information.
- Once a permanent solution to EMS transport services has been determined and implemented, and following the end of the Emergency Takeover, Summit County will return—in good working order, less normal wear and tear—all vehicles, equipment, and supplies back to the original agency.
- Qualified EMS personnel employed by the EMS transport agency will be given the option of temporary employment with Summit County during the Emergency Takeover, at their current wage and similar benefits.

Performance Bond

Consider requiring the EMS transport agencies (excluding Centura Health) to maintain a performance bond—payable to Summit County by a licensed surety—at an amount sufficient to provide enough capital for maintenance and operations for a period of at least 12 months. An alternative could be to provide a performance security instrument in the form of an irrevocable “Letter of Credit” from an acceptable bank or financial institution.

It is evident that should any of the organizations consistently fail to provide ambulance service in accordance with regulations or contractual obligations, that Summit County would have a range of corrective options, other than monetary penalties. However, both SFE and RWB function under the oversight of a Board of Directors placed in those positions by their respective constituents. Should either organization provide substandard service, or substantially degrade services to their communities, they would be held accountable to their citizens and the electorate. ESCI believes that both SFE and RWB desire to provide high-quality ambulance service and EMS, and that it would *not* be in their best interest to jeopardize the quality of services.

Option B: Status Quo with System Improvements

The basic elements of Option B are described below.

- The current infrastructures and operations of the existing Summit County provider agencies would remain the same: Summit County Ambulance Service; Summit Fire & EMS; Red, White & Blue Fire District; and Flight for Life/Terra Two.
- Summit County government would issue an independent license to operate ambulance service to RWB, and Terra Two; each of whom would operate in accordance with a County ordinance or intergovernmental agreements.
- Each agency would be responsible for their organization's patient billing and collections, and will retain 100% of the revenue they collect.
- SCAS and RWB would continue to share the responsibility for out-of-county transports, but would have to determine an equitable arrangement.
- OOC transports could be reduced, depending on Centura Health's willingness to establish an ALS ground transport unit(s) in Summit County (discussed later in the report).

Recommended Service-Delivery Option

ESCI recommends **Option A** as the best solution for the delivery of prehospital emergency medical services and transportation in Summit County. In this model, emergency services would be consolidated into two (SFE and RWB) distinct full-service, all-hazards organizations serving the entire County. ESCI believes this can be effectively accomplished within 6–12 months.

Out-of-County Transports by Centura Health

Representatives of Centura Health and Flight for Life have expressed an interest in potentially staffing a 24-hour ALS medic unit year-round to provide OOC interfacility transports, and possibly a second unit during the high seasons. One or both units would be stationed at the St. Anthony Summit Medical Center. When not transporting patients, EMS personnel from these units could provide assistance in the hospital's Emergency Department.

If structured accordingly, there could be added benefits to the EMS system. In times of extreme system demand or large multiple casualty incidents, the Centura Health medic unit(s) could be utilized as an additional resource.

Financial Impact

As discussed previously, interfacility transports represent the major source of patient-transport revenue in Summit County. Unfortunately, cash collections from 911 scene transports alone are insufficient to support the current emergency medical transport system. Even if the current collection rates were to be increased to 50%, 911 calls would only generate an amount just over \$500,000 annually.

Should Centura Health establish one or two medic units in Summit County, this would undoubtedly reduce the demand on local agencies to conduct OOC IFTs. However, given the historical service-demand for these IFTs, and the occurrence of concurrent calls, the local Summit County transport providers would need to augment the Centura Health unit(s) and still provide some portion of the out-of-county IFTs.

Costs & Revenue Requirements of Centura Health

Centura Health has prepared a pro forma in response to potentially providing an ALS ground unit(s) for OOC IFTs. They estimate an initial capital outlay to purchase a transport unit with associated equipment and supplies at \$225,000 per ambulance. The following represents the amount of revenue (cash collected) to staff and operate a *single* unit in one of two options:

- Option 1—Scheduled 24 hours daily, year-round: **\$819,465**
- Option 2—Scheduled 24 hours daily, four months a year: **\$272,625**

Using a three-year (2015–2017) average cash-collection rate of \$1,739 per OOC transport, Option 1 above represents about 471 transports annually. In Option 2, this would entail approximately 157 transports per year. The preceding average cash-collection rate was based on OOC transports by SCAS and RWB only. If the three-year average cash-collection rate of OOC transports by Terra Two only is applied, the result is \$1,602 per transport. Using that figure, Option 1 would require 512 transports, and Option 2 would need 170 transports annually.

With either of the preceding options, RWB and SFE (or SCAS), will need to continue providing a certain share of the OOC IFTs. This presents a dichotomy for the Summit County EMS system. If one or more medic units are established to provide OOC interfacility transports, the agencies would need to determine the answer to the following:

1. *What amount of potential OOC IFT revenue reduction are the local agencies capable or willing to tolerate in order to reduce the frequency of out-of-county interfacility transports?*
2. *What is the preferred schedule? Year-round, four months per year, or other configuration?*
3. *When the Centura Health unit is unavailable, what would be a fair and equitable method for rotating OOC IFTs between RWB and SFE (or SCAS)?*

Ultimately, these questions will need to be addressed and negotiated by the policymakers and leadership of each of the participating jurisdictions and organizations.

Dispatch of OOC Interfacility Transports

Once a system has been determined for equitably distributing the OOC IFTs between the two fire districts, a procedure should be developed for tracking these at the Summit County 911 Center. The Center should have the responsibility of dispatching the appropriate medic unit for *all* out-of-county IFTs.

It will be important to establish a policy in which requests for OOC IFTs must be initiated by contacting the Summit County 911 Center. The policy should clearly state that SMC is prohibited from directly contacting any medic unit crew to request an OOC IFT.

Alternative Schedule

An alternative to Centura Health staffing a 24-hour medic unit(s) may be to staff an ALS transport unit on a 12-hour basis from 1000–2200 hours (10 am–10 pm), as historical data indicated the majority of OOC IFTs occurred during this time. In this model, a second unit could be scheduled during the same 12-hour period. However, this would need further analysis to determine the impact on salaries and benefits of staff scheduled for 12-hour versus 24-hour shifts.

RECOMMENDED SYSTEM IMPROVEMENT GOALS

The following section outlines various proposed EMS system improvement goals. Some of these may be applied to either or both of the preceding future service-delivery options. In some cases, implementation of the improvement goals described in this report may have begun during the term of this study. Improvement goals have been categorized as short-term (6–12 months); mid-term (12–24 months); and long-term (24 months or longer). It is important to note that these are *estimates*, and some may be accomplished in a shorter or longer time.

Short-Term Improvement Goals

Improvement Goal A-1: Medic Unit Deployment

- Emergency medical services in Summit County should function as a countywide *system*.
- Regardless of geopolitical boundaries, the closest medical first-response unit (i.e., fire apparatus) and closest medic unit should be dispatched to EMS incidents.
 - This could be developed in an “automatic aid” format, which may also contribute towards the ISO rating of SFE and RWB.
 - The Summit County 911 Center should develop protocols and standards to implement this process.
- With the addition of automatic vehicle location technology, all medic units should be equipped accordingly, and AVL utilized to dispatch the unit nearest the incident.
- Medical transport providers should work with Summit County 911 to develop a dynamic deployment system that, during periods of substantial EMS service-demand, medic units are moved into fire stations that are located in the areas with a history of higher call volumes.

Improvement Goal A-2: Medical Direction

The current Medical Director is considering retirement in the near future. This will require the appointment of a new Medical Director to oversee the EMS providers in Summit County. With the opportunity to acquire a new Medical Director, there are some important aspects to consider.

It will be critical for the Medical Director to aggressively engage and support all elements of the EMS delivery system; not just clinical performance and protocol development. Substantial investment in a new Medical Director can produce numerous benefits to the agencies and EMS system. The Medical Director should be involved in EMS strategic planning; community outreach projects; and participation in the selection of new personnel that may be hired in key EMS-related positions.

Summit County should consider the following:

- A new Medical Director should be appointed when indicated, and in accordance with Colorado regulations (6 CCR 1015-3, Chapter 2, Sections 1 & 4).
- Appoint a *local* emergency physician who works and resides in or near Summit County.

- Consider developing a contractual relationship between Summit County government and the Medical Director. The terms of this agreement should require additional responsibilities beyond the requirements as outlined in 6 CCR 1015-3, Chapter 2, Section 4.2, and include at least:
 - Regular ride-alongs and/or scene responses with fire and EMS personnel; participation in both continuing education and EMS quality management, and other EMS-related activities.
 - The agreement should be as flexible as possible, allowing for consideration of the Medical Director’s regular work schedule and personal activities.
 - The Medical Director should be adequately compensated by Summit County.
 - Provide the Medical Director with a portable radio and outerwear (or uniform) that clearly displays and indicates their role as “Physician Medical Director.” The radio should be carried, and the uniform worn during ride-a-longs.
- The Medical Director should maintain an ongoing relationship and participation in the Denver Metro EMS Medical Directors group (include in the agreement).
- Pay the costs of the Medical Director to attend the National Association of EMS Physicians’ Medical Directors Course.
- Communicate regularly with the Medical Director, and involve him or her early in the process when issues or problems arise.
- Once appointed—especially in the beginning—it will not only be important, but valuable for the EMS field providers to get to know the new Medical Director. Consider hosting (at no cost to the attendees) lunches or “Breakfast with the Medical Director” meetings in which all firefighters, EMTs, Paramedics, flight crews, and any other interested individuals are invited. This may require more than one meeting to ensure personnel from all shifts can attend. A breakfast meeting scheduled immediately after the morning shift change may be the best option for allowing field providers to attend.
 - Consider similar quarterly or bimonthly meetings that involve continuing medical education and/or case presentations of significant local EMS incidents.
- It will be important for the Medical Director to be completely independent financially from the provider organizations. He or she must be in a position in which all EMS-related decisions are unbiased and in the best interests of the community, and without undue influence by any particular prehospital provider organization.

Improvement Goal A-3: Patient Billing & Collections

- Summit County should retain a third-party firm to conduct a detailed audit of the billing, collection, and records management processes used by SCAS. This should also include an analysis to determine compliance with the requirements of the Office of the Inspector General.
- SCAS and RWB management, billing personnel, and finance staff from the respective organizations should meet and identify issues, misunderstandings, and ultimately come to a consensus to achieve resolutions. These should be documented.

- There may be advantages in outsourcing billing and collection services. This should be evaluated in detail to determine costs versus benefits, and whether it would be beneficial or not.
- Regardless of whether billing services continues internally or outsourced, consider the following action steps:
 - Determine the ALS-BLS ratio to determine if there is a potential billing issue that may be subject to federal investigation. An annual Medicare mix of 70% ALS and 30% BLS is a general rule of thumb. If ALS billing ratios consistently exceed 70%, the agency(s) may be subject to investigation.
 - Regardless if billing and collection is outsourced or continued internally, retain an independent, third-party agency to audit Medicare and Medicaid claims on an annual basis. The audit should include a review of all billing practices and compliance with federal and state requirements.
 - Ensure Medicare overpayments are refunded in a timely manner. Failure to comply with Medicare's 60-day overpayment rule could result in a violation of the False Claims Act.

Patient Transport Fees

- Patient transport fees were not evaluated in detail, as ESCI believes that issues with current billing and collection practices must be addressed first.
- Once the issues have been addressed, consider the following:
 - Determine the validity of increasing patient transport fees (current fees may already be among the highest in Colorado).
 - If an increase in fees is indicated, consider lower rates for Summit County residents (this is common practice by publicly owned ambulance services).

Improvement Goal A-4: Establish Medic Unit Response-Time Goals

- Medic unit response-time performance goals should be established through ordinance, IGA, or internally by the individual agencies (see more detail in "*Appendix D: Other Performance Standards*").
- Additionally, medical first-response unit performance goals should be established internally by the individual agencies.

Improvement Goal A-5: Create an EMS Officer within each Fire District

Currently, neither RWB nor SFE have a chief officer assigned to oversee Emergency Medical Services, even though EMS comprises the major portion of each department's service demand.

- RWB should promote a qualified firefighter or officer certified as a Paramedic to a Captain or Battalion Chief responsible for EMS administration.
- Depending on which of the service-delivery options are selected, SFE should also consider promoting an individual into a similar position.

Mid-Term Improvement Goals

Improvement Goal B-1: Emergency Communications & CAD Data

(Note: some of the following may have been implemented by the time this report is published)

- With the upgrade of the Motorola CAD, the application should be modified to assign one unique identification number for each individual EMS (and other call-types) incident. The numbers should not be duplicated in future incidents.
- Utilizing the Medical Priority Dispatch System, the Summit County 911 CAD interface should allow dispatchers the ability to assign EMS calls in accordance with the Alpha, Bravo, Charlie, Delta, or Echo classification on a consistent basis.
 - Effective application of MPDS can reduce unnecessary “lights & sirens” responses to EMS incidents, and improve the safety of EMS personnel and citizens.
- The CAD system should be developed to accurately record call-processing times. The following timestamps should be recorded, which together represent the total call-processing (or alarm-processing) time.
 - Alarm Answering Time (when the 911 call is first received at the dispatch center).
 - Alarm Handling Time (time the first unit is dispatched).
 - A monthly or quarterly report should be published on the total call-processing times, and distributed to Summit County government and emergency services provider agencies.
 - Consider documenting the “With-Patient Time” (EMS unit notifies dispatch that they have made patient contact; arrived at the patient’s side).
- Beginning in 2019 (in order not to have mixed data elements in a calendar year), clearly defined “Call Type Codes” and “Call Type Descriptions” in the CAD interface, for the following:
 - Emergent out-of-county transports.
 - Non-emergent out-of-county transports.
 - Emergent mountain clinic transports.
 - Non-emergent mountain clinic transports.
 - Emergent interfacility transports.
 - Non-emergent interfacility & other transports (e.g., transports home, etc.).

Improvement Goal B-2: Interagency Partnerships & Committees

By all accounts, RWB and SFE work well together in the operational environment. Further, both districts have interagency agreements to share resources and costs of certain support services, along with participating in regular meetings and joint committees. A good example of this is the shared High Country Training Center. This relationship should continue, and they should explore other potential options for shared services and costs. Currently, there are several EMS-related joint committees. Reportedly, some of these meet sporadically, and may not be working effectively.

ESCI recommends the following joint committees, which should include, at a minimum, representation from RWB, SFE, Terra Two, and the Medical Director. Regular interagency communication will be important towards the success of the EMS system:

- *Protocol Development Committee (PDC)*—annually reviews the patient-care protocols to determine updates and changes that may be indicated by industry best practices and evidence-based medicine.
- *EMS Equipment Standards Committee*—develops countywide standards for capital medical equipment; durable goods; medications; and disposable supplies. The intended goal would be that all agencies utilize standard EMS equipment and supplies. In addition, the committee would pursue joint purchasing agreements and logistical methods for replacing and re-stocking medic units and first-response apparatus. Meets ad hoc.
- *EMS Quality Management Committee*—a group comprised of EMS provider representatives from each of the organizations (including Flight for Life), that meets monthly to conduct peer-reviews of ePCRs involving major cases, patient refusals, and other cases. This group should develop key performance indicators (KPI) for prehospital clinical care, along with a process to provide feedback to EMS personnel.
- *Fire & EMS Training Committee*—meets with the fire and EMS training staff at the HCTC to provide recommendations on training and continuing education needs. At a minimum, meets quarterly.
- To some extent, some of the following are in place. However, ESCI emphasizes that SFE and RWB consider consolidating and/or sharing the costs of the following:
 - Joint EMS trainer; joint fire training staff; joint Public Information Officer (PIO); joint IT support; joint fleet maintenance.
 - Single, shared records management system.
 - Improve countywide public education about the role of all agencies that provide EMS.

Improvement Goal B-3: Utilize Patient Satisfaction Surveys

- Consider the use of paper-based or software applications to conduct satisfaction surveys of patients transported by the Summit County agencies (see *Appendix E: Sample Patient Satisfaction Survey*).
- Surveys can help pinpoint problems in patient satisfaction so they can be fixed, and shows patients, the community, and employees that improvement matters.
- Patient satisfaction surveys can satisfy a portion of Triple Aim, and contributes to CAAS accreditation (see Improvement Goal C-1).

Long-Term Improvement Goals

Improvement Goal C-1: Pursue Accreditation & Other Standards

- Summit Fire & EMS (or SCAS if a merger does not occur) should eventually pursue accreditation with the *Commission on Accreditation of Ambulance Services* (RWB and SCAS are currently preparing for CAAS accreditation).

The “Triple Aim Initiative”

The *Institute for Healthcare Improvement* (IHI) has developed a framework that describes an approach to optimizing health system improvement, referred to as the “Triple Aim Initiative.” This concept has been adopted by high-performance EMS systems around the U.S. When adapted to the EMS environment, the three elements of Triple Aim include:

- A continuous improvement of quality prehospital clinical care.
- Maintenance or reduction of EMS system costs.
- Ensuring or improving patient satisfaction.

A fourth concept can be added: Assurance of long-term stability and sustainability of emergency medical transportation in Summit County. In developing the EMS system, the emergency services organizations and Summit County government should consider each of these concepts as goals. Ultimately, the goal should be a system that delivers high quality, patient-centered prehospital emergency medical care, and transportation.

As discussed in the section, “Patient Billing & Collection Discussion,” the future of Medicare and Medicaid reimbursement will be based on quality, accountability, and value. Adoption of the Triple Aim Initiative as a goal for Summit County EMS providers, will assist them achieving future reimbursement requirements.

Improvement Goal C-2: Upgrade Data Collection & Records Management

SFE and RWB should consider jointly acquiring a single, standardized records management system (RMS). The minimum features of the RMS should include:

- Cloud-based platform.
- Standardized definitions, lookup tables, and data entry fields.
- Ability to thoroughly document fire, EMS, and other incident-types.
- Individual patient documentation that tracks procedures and treatment performed by individual EMS providers.
 - Patient billing link that enables extraction and export of billable data to the billing software or billing company.
- Interface with the Summit County 911 CAD application, and ability to download key data elements (e.g., timestamps; incident location; dispatch type codes and description; etc.).
- NFIRS, NEMSIS, and HIPAA compliant.

- Modules that can track basic personnel information; training records; occupancies and inspections; and arson investigations.
- Assorted report-generating features, including compliance reports and EMS quality management reports.
- Other desired, but not necessarily mandatory, features should be considered:
 - Capable of integrating EMS records into health information exchanges at St. Anthony Summit Medical Center and other hospitals.
 - Inventory tracking and management.
 - Incident analysis of custom Summit County benchmarks.
 - Events calendar and staff scheduling roster.

The preceding list is not intended to be all-inclusive, but to outline some of the more important features of a comprehensive RMS.

Improvement Goal C-3: Modify Paramedic Staffing

- In the future, through attrition and retirements, SFE and RWB should consider reducing the Paramedic workforce (ESCI *does not* recommend reductions at present).
- SFE and RWB should consider staffing MFR fire apparatus with BLS personnel rather than Paramedics.
- Changes to the number of practicing Paramedics in Summit County must be *carefully* and *thoroughly* evaluated prior to any staffing modifications.

Improvement Goal C-4: Promote a Countywide Culture of Trust & Transparency

The Summit County EMS system is comprised of a number of individuals from various organizations and jurisdictions, all of whom must be able to collaborate and cooperate in order to successfully deliver quality emergency medical care and transportation.

The leaders of each of the key organizations must not only espouse transparency, but put it into practice. Ultimately, this can:

- Gives EMS providers and employees context that enables them to make better decisions, and perpetuates honest discourse.
- Builds trust, loyalty, and morale by eliminating gossip and correcting misinformation.
- Empowers EMS providers to participate in discussions and decision-making, and compels leadership to address issues and frustrations.

The pursuit of a culture of trust and transparency is not a simple or short-term process. However, it can ultimately contribute to a better EMS delivery system.

Improvement Goal C-5: Pursue a Single Countywide Emergency Services Organization

- Although it is beyond the scope of this project to analyze the feasibility of this in detail, ESCI recommends that RWB and SFE pursue a long-range plan to merge into a single, countywide, all-hazards emergency services organization.
- This could take the form of a new fire district, Regional Fire Authority (RFA), functional consolidation, or other option.
- In this model, there likely would be improved economies scale and elimination of unnecessary redundancies in a number of areas. This may be one of the most viable alternatives for ensuring long-term sustainability of ground emergency medical transport services in Summit County.

Community Paramedicine Recommendations

At present there are no indicators from ESCI's analysis of the Summit County EMS system to indicate the need or potential value of implementing a Mobile Integrated Healthcare-Community Paramedicine (MIH-CP) program. ESCI recommends that Summit County and the emergency services organizations first focus on addressing the various issues and recommendations described in this report. If service-demand and patient demographics and characteristics change substantially, it may be appropriate to consider an MIH-CP program in the future.

CONCLUSION

This report represents the third independent study of the Summit County EMS system by an outside consulting firm, since 2013. ESCI has approached this study from an unbiased perspective, and without any pre-conceived perceptions, in an effort to provide the key stakeholders with realistic and valid recommendations to ultimately improve the delivery of EMS, and in a configuration that will produce long-term sustainability.

ESCI found that the key stakeholders, leaders, and elected and appointed officials all have a desire to ensure what is best for the Summit County citizens and visitors—although they may disagree on how to accomplish this. It is common knowledge among the employees of the various organizations (as noted in the SWOT summary), as well as the public (through published press articles) of the ongoing contention between some of the jurisdictions.

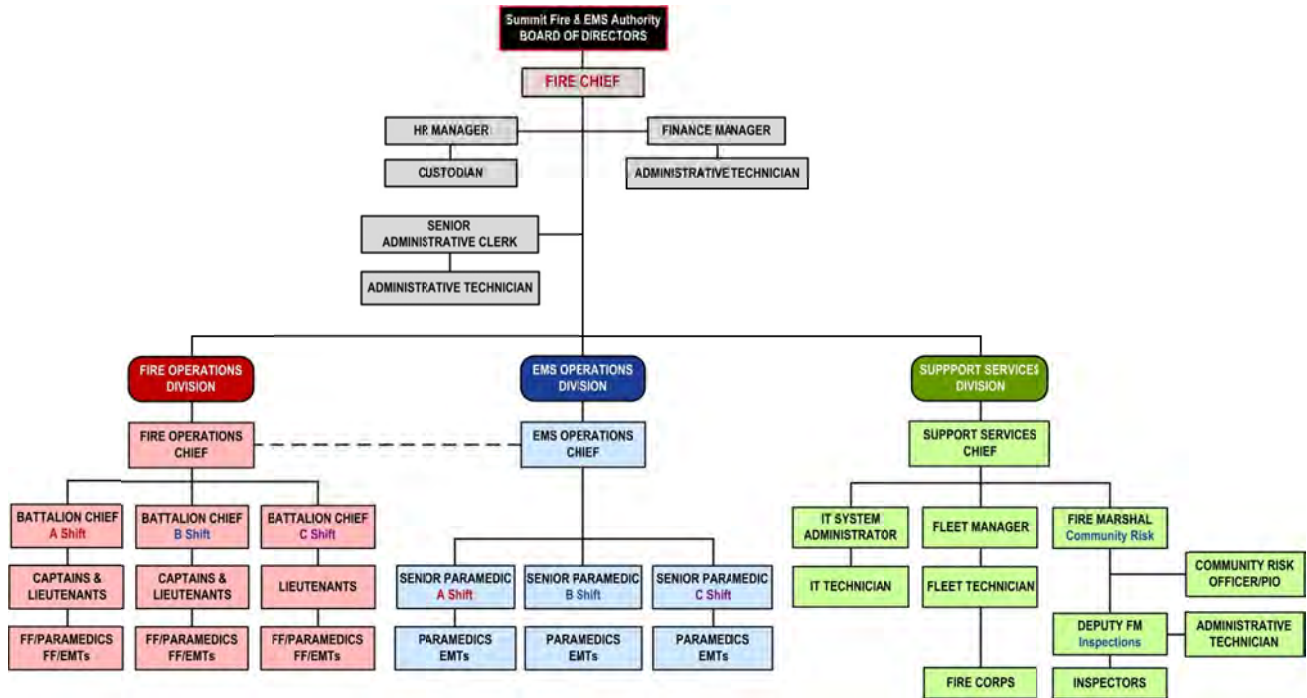
It is ESCI's hope that this will be the *last* study. If the leaders of the various organizations are willing to disregard past disputes and differences; make reasonable compromises; and pursue the development of an EMS system designed to achieve the best patient outcomes, the results could be a more effective system of prehospital emergency medical care.

APPENDIX A: PROPOSED ORGANIZATIONAL STRUCTURE OF SFE

Organizational Structure

As described in the “Recommendations & Strategies” section, ESCI recommends that the Summit County Ambulance Service be merged into Summit Fire & EMS. The following figure illustrates a *possible* new organizational chart.

Figure 123: Proposed SFE Organizational Chart with SCAS Integration



As shown, SFE would create a new EMS Operations Division (and Fire Operations Division), in which former SCAS employees would be assigned. An EMS Operations Chief would be assigned to oversee the division. The shift Battalion Chiefs would continue to oversee and manage the daily operations of both fire and EMS companies.

Former SCAS EMTs and Paramedics would serve in single-role EMS positions providing ground emergency medical transport. It would be likely that some EMS personnel, after attending mandatory training, may eventually desire to transition into a firefighter position. In turn, other SCAS EMS providers may have no desire to transition to a firefighter position.

When filling vacant firefighter positions, SFE should consider personnel assigned to the EMS Operations Division as first priority. One of the benefits of this is that the Department will have a better insight into the EMS employee’s performance within the organization. Through attrition and retirements, single-role EMS personnel could be replaced by cross-trained/dual-role firefighter/EMTs and firefighter/paramedics.

Summit County Ambulance Staff Assignments

ESCI believes that there would be a role for all current employees at Summit County Ambulance, and that integration within Summit Fire & EMS would *not* result in any layoffs. The following are recommended position assignments and proposed basic position descriptions. These could be modified accordingly, based on the needs of SFE, and are not intended to be final.

Figure 124: Recommended SCAS Position Assignments at SFE

Current SCAS Position	New Position at SFE
Director	EMS Operations Chief
Deputy Director	Training Chief ¹
Clinical Practice Manager	EMS Training Captain ¹
Office Manager	Senior Administrative Clerk
Administrative Clerk	Assigned to Finance Manager
Administrative Clerk	Assigned to Office Manager
Shift Supervisors	Senior Paramedics
Full-Time Paramedic IIs	Paramedic
Full-Time Paramedics	Same titles
Full-Time EMTs	Same titles

¹These positions to be assigned as employees of HCTC, jointly funded by RWB & SFE

The following represents suggested job descriptions, roles, and responsibilities for each of the positions within the new EMS Operations Division. These are not intended to be final, and SFE may need to adjust these accordingly. The Training Chief is an existing position at the HCTC, and is not included in the following job descriptions.

EMS Operations Chief

The former SCAS Director would transition to the EMS Operations Chief position. The primary responsibilities would include, but not be limited to:

- Overall supervision of the EMS Operations Division.
- Managing the Division budget, billing, and collections from transports.
- Functioning as a member of SFE's senior management team, in order to address all EMS-related issues and functions.
- Representing and coordinating EMS administration with Summit County government, regional, entities, Medical Director, and other healthcare providers and emergency services agencies regarding EMS issues.
- Ensuring EMS special programs are coordinated with other agencies, including Summit County Emergency Management.
- Participating in state and regional EMS coordination activities.

EMS Quality Manager (optional)

The EMS Quality Manager would be a new position assigned to the HCTC, with costs shared between SFE and RWB. This should be strongly considered for the future, as it would be a very important position. In the meantime, the responsibilities described below could be shared by some of the more experienced and qualified Paramedics, FTO's, and the EMS Training Captain. The primary responsibilities would include, but not be limited to:

- Ensuring EMS delivery is aligned with Colorado and national standards and initiatives.
- Ensuring ePCRs conform to ambulance billing, patient-care protocols, completion, and HIPAA requirements.
- Managing an EMS quality management program in association with the Medical Director.
- Occasionally works on medic units or does ride-alongs to maintain skills and experience.
- Working with the EMS Training Captain to provide to provide input on areas requiring additional training and continuing medical education.
- Working with IT staff to address and modify as necessary, the records management system utilized for generating ePCRs.
- Analyzing and generating reports on EMS operational and clinical performance.
- Working with the Summit County 911 Center on EMS-related dispatch protocols and quality management in emergency communications.
- Advising, counseling, and correcting employees in appropriate EMS clinical care and operations; to include investigating EMS-related complaints and problems.

EMS Training Captain

The former Clinical Practice Manager would be assigned to the High Country Training Center as an employee of RWB in the position of EMS Training Captain. The primary responsibilities would include, but not necessarily limited to:

- Organizing and delivering continuing medical education classes and other educational methods for all certified EMS providers at Summit Fire & EMS and the Red, White & Blue Fire District.
- Assisting certified EMS personnel at RWB and SFE in the process of recertification.
- Maintaining EMS CME and training records of all EMS providers.
- Working with the EMS Quality Manager to determine educational topics and clinical skills that need to be addressed because of issues identified through the quality management processes.
- Developing an EMS Field Training & Evaluation Program (FTEP) for new firefighters and EMS personnel.
- Assigning new firefighters and EMS personnel to Field Training Officers (FTO).
- Assisting and supporting outside agency healthcare education efforts consistent with the mission of SFE and RWB.

Senior Paramedics

Senior Paramedics (SP) would not serve in a supervisory role. The general responsibilities of all Senior Paramedics would include:

- Assignment to a medic unit (transport vehicle) as a prehospital care provider.
- May function as the initial Incident Commander on major EMS incidents and/or multiple casualty incidents until arrival of the Battalion Chief or other chief officer. May be assigned to a position within the incident command system.
- Assists the on-duty Battalion Chief with coordinating deployment of SFE medic units as necessary.
- Acts as the shift liaison with other agencies, healthcare providers and the public.
- Serves on one or more local EMS-related committees (protocols, EMS equipment, etc.).
- Promotes department EMS policies/procedures, QA programs.
- Performs inspections of EMS vehicles, equipment, and minor maintenance.
- Serves as a Field Training Officer (FTO) and mentor to new EMS personnel.

In addition to the general responsibilities, each Senior Paramedic should be assigned additional responsibilities in one of the following areas. These can be adjusted depending upon the needs of the organization.

- *Equipment Maintenance*
 - Inspects and facilitates repairs and/or replacement of medic units, capital medical and durable equipment.
 - Researches and facilitates studies and implementation of EMS equipment changes and upgrades; including outside agencies to develop countywide equipment standards.
 - Works with manufacturers and vendors to ensure proper maintenance and repair of capital equipment (e.g., cardiac monitor/defibrillators, powered stretchers, etc.).
- *Inventory Control*
 - Performs routine inspection and maintenance of minor durable and disposable medical equipment and supplies.
 - Regularly inspects ambulances to ensure adequate and appropriate stock is maintained.
 - Develops and maintains an inventory process for ordering and deploying minor durable and disposable equipment and supplies.
 - Develops and maintains policies, procedures, and security for controlled substances in accordance with state, regional, and U.S. Drug Enforcement Administration (DEA) regulations.
 - Ensures outlying supply storage areas are adequately stocked.
 - Ensures all drugs and applicable supplies are replaced before their expiration date.
 - Liaison with other EMS providers to develop countywide standardization of disposable and minor durable equipment and supplies.

- **Patient Care & Records Management**
 - Reviews all ePCRs for accuracy, completeness, obvious errors, and protocol deviations.
 - Achieves some level of technical support competency to troubleshoot software used for documentation of patient care and transport.
 - Does minor maintenance and updates of software and hardware (tablets, laptops) utilized in the medic units, including training new personnel in their use; in addition to maintaining a knowledge base on the proper use of the mobile data computers.
 - Monitor ePCR field documentation processes to ensure HIPAA compliance.
 - Regularly reports to, and coordinates with, the EMS Quality Manager patient care documentation.

There *may* be potential value in placing Senior Paramedics in a separate response unit other than a medic unit. This could enable them to more effectively carry out the suggested responsibilities described previously. Additionally, they could respond to incidents as another resource. Ultimately, SFE would need to determine the necessity and cost-effectiveness of placing Senior Paramedics in a separate vehicle.

Office Manager & Administrative Clerks

The job descriptions, roles, and responsibilities of these positions are better determined through planning and discussions among the management and administrative support staff to identify where the needs of the organization are highest.

Billing Staff

Efforts should be made to ensure current SCAS billing staff have continued employment with SFE, and utilized for billing preparations. In addition, these individuals can assist in with data analytics, administrative support, and assisting with potential accreditation management.

Field Providers

The roles and responsibilities of the EMTs and Paramedics would essentially be the same as they were with the Summit County Ambulance Service—the provision of prehospital emergency medical care, patient transports, and interfacility transports.

SCAS Part-Time Field Providers

SFE will need to determine the need for using per diem or part-time EMS field providers currently utilized by SCAS. These roles could be filled by off-duty firefighters. However, this may or may not be practical. This will require further study and discussion among senior management.

SFE Administrative Staff & HCTC Staff Schedules

ESCI recognizes that a number of employees, who may be moved into SFE administrative positions or to the HCTC, may reside in locations quite distant from Summit County. ESCI recommends that SFE and RWB consider allowing these individuals to work a 4/10 (four 10-hour days) weekly schedule; or consider another schedule that would reduce the burden of long-distance commuting, while at the same time ensuring their work can be done effectively.

Discussion

The merger of emergency services organizations can be very successful or a complete failure. Success depends on a realistic and sensitive approach to blending different organizational cultures and values. Understanding the personal values and identities of the respective agency employees should be the foundation of a successful integration effort.

Should SFE and SCAS elect to proceed with the process of integration, it will be critical for leadership to recognize the likely challenges in combining employees from different organizations with different cultures. Strong resistance by employees of both organizations may surface, requiring sensitivity, patience, and understanding by SFE leadership and staff. Mitigating this resistance will require constant, transparent, accurate, and credible conversations with the employees of both organizations *prior* to integration.

There is another important aspect critical to a successful integration. To be successful, the “rank and file” of the EMS Operations and Fire Operations Divisions must *not* operate as two independent groups. Uniforms, patches, and vehicle emblems must be standardized. Operations staff must regularly meet, train, work, and have meals together—and, when appropriate, play together. This may have been accomplished to some extent, as some of the SCAS ambulances are currently operating out of SFE fire stations.

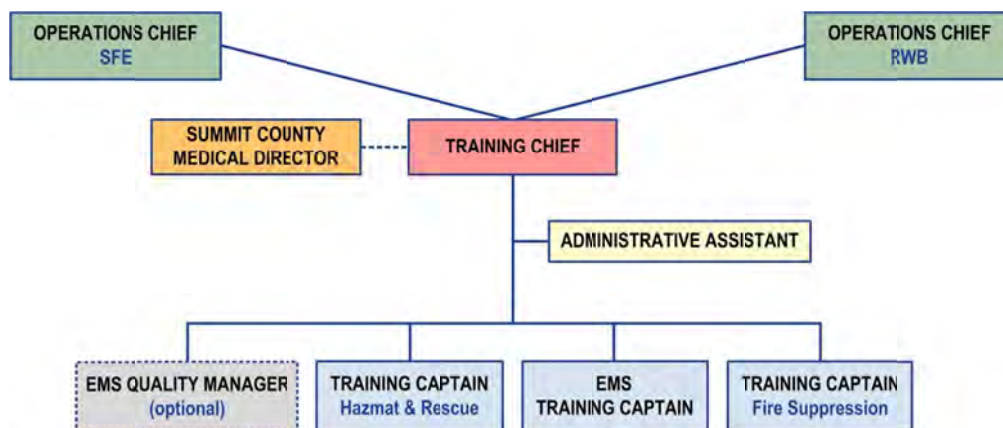
In effect, SFE and SCAS leadership must make every effort to successfully blend two different cultures and consistently promote a culture of one organization of mutual respect for each member’s role within Summit Fire & EMS.

Undoubtedly, the process of integration will be fraught with many challenges. However, ESCI is confident that leadership and employees of both Summit Fire & EMS and the Summit County Ambulance Service are capable of effectively addressing any potential adversities.

Organizational Structure of the High Country Training Center

The following figure illustrates a proposed new organizational structure for HCTC.

Figure 125: Proposed HCTC Organizational Chart following SFE/SCAS Merger



APPENDIX B: SWOT SUMMARY

A SWOT analysis was completed based on confidential "SWOT" forms submitted to ESCI, in addition to input from telephone conversations and personal interviews. A separate report containing numerous comments in detail was generated and submitted to Summit County. Based on the feedback, ESCI identified issues and concerns most frequently expressed by the various stakeholders. ESCI recognizes that there were many positive comments and strengths. However, in this section it was important to review those areas of concern that may need to be addressed.

Interagency Relationships

Nearly all of the stakeholders commented that, among several of the jurisdictions, interagency relationships were either a weakness or a threat. Operational personnel and other staff are well aware of the ongoing contention and discord between some of the organizations—which indicate an influence on employee morale.

Personnel & Staffing

There were many concerns regarding the loss of qualified employees to other agencies paying more; sleep deprivation; and excessive workload. There appeared to be apprehension among the SCAS employees because of discussions of an SFE "takeover" of Summit County Ambulance.

EMS Operations

With regard to EMS operations, the overwhelming issue among the stakeholders was the considerable number of out-of-county interfacility transports. Although the comments varied slightly, most agreed that the OOC transports contributed negatively to the work environment. However, some believed that participation in these transports has led to a greater depth of experience and skill performance among the EMTs and Paramedics.

Miscellaneous

- Pursue countywide consolidation of all emergency services organizations into a single agency.
- Potential loss of future revenue due to a variety of Colorado laws and other regulations.
- Concern that the quality of service and patient care may decline due to the inability of agencies to compromise and work cooperatively.
- Lack of public information, education, and community outreach; including a Public Information Officer within some of the agencies.
- Ongoing problems with information technology and records management software.
- Limited preventative maintenance of apparatus; limitations in regular apparatus maintenance.
- Lack of wildland equipment, resources, and training that could jeopardize the communities and tourist industry throughout Summit County.

APPENDIX C: DENVER EMS REGULATIONS

The following section is presented as an example of the adopted EMS regulations in Denver. Portions of this could be used to make modifications to the Summit County EMS regulations, or utilized and modified to generate a new ordinance for application in Summit County.

City and County of Denver
Rules and Regulations Governing Emergency Medical Vehicles
Chapter 17 DRMC

Adopted by the Board of Environmental Health on May 10, 2007
Repeals and replaces the Rules and Regulations Governing Emergency Medical Vehicles adopted
October 9, 1997

Chapter 1 Authority and Definitions

Section 1-101 Authority
Section 1-102 Definitions

Chapter 2 Minimum Standards

Section 2-201 Advanced Life Support Emergency Medical Vehicle
Section 2-202 Basic Life Support Emergency Medical Vehicle
Section 2-203 Emergency Medical Vehicle Crew Members
Section 2-204 Emergency Medical Vehicle Specifications
Section 2-205 Emergency Medical Vehicle Equipment
Section 2-206 Delivery to Emergency Facilities
Section 2-207 Operations Locations
Section 2-208 Reporting
Section 2-209 Use of Sirens and Emergency Equipment

Chapter 3 Records, Insurance, Quality Assurance

Section 3-301 Records
Section 3-302 Insurance
Section 3-303 Emergency Resources Profile
Section 3-304 Medical Oversight and Quality Improvement

Chapter 4 Non-Emergency Medical Vehicle

Section 4-401 General
Section 4-402 Crew Members

Chapter 5 Licenses

Section 5-501 License and permits required
Section 5-502 Emergency Medical Vehicle Service License and Vehicle Permit Renewal
Chapter 6 Revocation and Suspension
Section 6-601 General

Chapter 1 Authority and Definitions

Section 1-101 Authority

The Board of Environmental Health and the Manager of Environmental Health adopts these rules and regulations pursuant to the authority granted by the Charter and Section 17-17 of the Denver Revised Municipal Code (DRMC) and supplements the provisions of Chapter 17, DRMC.

Section 1-102 Definitions

The following words and phrases, when used in this article, shall have the meanings respectively ascribed to them:

A. **Advanced Cardiac Life Support (ACLS)** means a course of instruction sponsored by the American Heart Association designed to prepare students in the practice of advanced emergency cardiac care.

B. **Advanced Life Support Emergency Medical Vehicle** means an emergency medical vehicle, in addition to meeting the basic requirements for equipment, must have on board the equipment and medications as required by the physician's advisor's protocol and operating with advanced life support personnel.

C. **Advanced Life Support Personnel** means a minimum of one Colorado state Certified Emergency Medical Technician-Paramedic (EMT-P), or Emergency Medical Technician-Intermediate (EMT-I), or registered nurse with advanced cardiac life support certification, or a physician with advanced cardiac life support certification, and a driver with a valid Colorado driver's license and a current Colorado State certified Emergency Medical Technician-Basic (EMT-B) certification.

D. **Ambulance** means an emergency medical vehicle.

E. **Ambulance Transport Agency** means any public agency, volunteer organization or commercial enterprise licensed as an ambulance service.

F. **Ambulance Validation Sticker** means a sticker displayed on the upper left side of the windshield of an ambulance unit indicating that it has been inspected and issued a permit to operate in the County. The sticker shall indicate the month and year of validation.

G. **Based** means a medical vehicle headquartered in or having a substation or office or a permanent station in the city, and whose primary response is dedicated to transporting patients originating in the city.

H. **Basic Life Support Emergency Medical Vehicle** means an emergency medical vehicle that meets the requirements for equipment as established by the Board and is staffed by at least one Emergency Medical Technician-Basic (EMT-B) currently certified by the State of Colorado, and a driver that as a minimum has a current American Red Cross Advanced First Aid card, a Cardiopulmonary resuscitation card, or the equivalent of both as established by the State Advisory Council on Emergency Medical Services, and a valid Colorado Driver's license.

I. **Board** means the Board of Environmental Health.

J. **Board of Medical Examiners Rules** means the rules adopted by the Board of Medical Examiners that establish responsibilities of physician advisors and all authorized acts of emergency medical technicians.

K. **Call Jumping** means a response to a call for emergency medical service by an emergency medical vehicle service company with the knowledge that another emergency medical vehicle service company has been notified to respond to the call or is actually responding to the call.

L. **Council** means the State Emergency Medical and Trauma Services Advisory Council.

M. **Department** means the Denver Department of Environmental Health.

N. Emergency means any actual or self-perceived event which threatens life, limb or well-being of an individual in such a manner that immediate medical care is needed.

O. Emergency Call means a real or self-perceived event where the EMS system is accessed by the 9-1-1 emergency access number or its local equivalent, or an interfacility transfer where the patient's health or well-being could be compromised if the patient is held at the originating facility indefinitely.

P. Emergency Facility means a general hospital with an emergency department staffed twenty-four (24) hours a day, seven days per week, with a licensed physician or an emergency medical outpatient facility staffed twenty-four (24) hours a day, seven days per week with a licensed physician or registered nurse with direct medical supervision by a licensed physician.

Q. Emergency Medical Technician means any individual who, in accordance with Section 25-3.5-101 et seq., C.R.S., and its implementing regulations, holds a valid certificate as a Paramedic, emergency medical technician-intermediate, or emergency medical technician-basic issued by the Colorado Department of Health.

R. Emergency Medical Technician-Basic (EMT-B) means an individual who holds a current and valid Emergency Medical Technician-Basic (EMT-B) certificate issued by the State.

S. Emergency Medical Technician-Intermediate (EMT-I) means an individual who holds a current and valid Emergency Medical Technician-Intermediate (EMT-I) certificate issued by the Department.

T. Emergency Medical Technician-Paramedic (EMT-P) means an individual who holds a current and valid Emergency Medical Technician-Paramedic (EMT-P) certificate issued by the Department

U. Emergency Medical Vehicle means any privately or publicly owned land or airborne vehicle, especially constructed or modified and equipped, intended to be used and maintained or operated for the transportation upon the streets and highways in the city, of individuals who are sick, or injured or otherwise incapacitated or helpless; except fixed wing aircraft operating between the city and locations outside the city.

V. Emergency Medical Vehicle-advanced life support means an emergency medical vehicle equipped in accordance with Section 12.9 of the rules pertaining to emergency medical services, 6 CCR 1015-3, and operated by an ambulance service authorizing the vehicle to be used to provide ambulance service limited to the scope of practice of the emergency medical technician-Intermediate or emergency medical technician-paramedic as defined in the Colorado Board of Medical Examiners rules, 3 CCR 713-6, Rule 500, Sections 5 and 6.

W. Emergency Medical Vehicle-basic life support means an emergency medical vehicle equipped in accordance with Section 12.9 of the rules pertaining to emergency medical services, 6 CCR 1015-3, and operated by an ambulance service authorizing the vehicle to be used to provide ambulance service limited to the scope of practice of the emergency medical technician-basic as defined in the Colorado Board of Medical Examiners rules, 3 CCR 713-6, Rule 500, Sections 4.

X. Emergency Medical Vehicle-basic life support with advanced life support capabilities means an emergency medical vehicle equipped in accordance with 12.9 of the rules pertaining to emergency medical services, 6 CCR 1015-3 and operated by an ambulance service authorizing the vehicle to be used to provide ambulance service limited to the scope of practice of the emergency medical technician–basic as defined in the Colorado Board of Medical Examiner Rules, 3 CCR 713-6, Rule 500 Section 4. The vehicle may operate as an advanced life support transport when it contains both the additional required equipment and supplies and is properly staffed with an emergency medical technician-immediate or emergency medical technician-paramedic.

Y. Emergency Medical Vehicle Service means the furnishing, operating, conducting, maintaining, advertising, or otherwise engaging in or professing to be engaged in the business of transportation of patients by emergency medical vehicle. Taken in context, it also means the person so engaged or professing to be so engaged. The person so engaged and the vehicles used for the emergency transportation of persons injured at a mine are excluded from this definition when the personnel utilized in the operation of said vehicles are subject to the mandatory safety standard of the Federal Mine Safety and Health Administration, or its successor agency.

Z. Emergency Medical Vehicle Transport means the transportation of patients originating in the City by Emergency Medical Vehicles licensed by the City.

AA. Graduate EMT-Intermediate—an individual who has successfully completed a State of Colorado recognized Emergency Medical Technician-Intermediate training course but has not yet successfully completed the certification requirements set forth in these rules.

BB. Graduate EMT-Paramedic means an individual who has successfully completed a State of Colorado recognized EMT-Paramedic training course but has not yet successfully completed the certification requirements set forth in these rules.

CC. License means the authorization issued by the director of excise and licenses to operate a medical vehicle service in the city.

DD. Licensee means the person or entity that has been issued a license by the city to provide medical vehicle service in the city.

EE. Medical Director means a physician who holds an active Colorado medical license, who establishes protocols and standing orders for medical acts performed by department-certified EMTs of a pre-hospital EMS service agency and who is specifically identified as being responsible to assure the competency of the performance of those acts by such department-certified EMTs as described in the physician's medical continuous quality improvement program. Any reference to a "physician advisor" in the City EMS rules or in the Board of Medical Examiners previously adopted rules shall apply to a "medical director" as defined in these rules.

FF. Medical quality improvement program means a process consistent with Colorado Board of Medical Examiners rules, 3 CCR 713-6, Rule 500, Section 3.2 (b), used to objectively, systematically and continuously monitor, assess, and improve the quality and appropriateness of care provided by the medical care providers operating on an ambulance service.

GG. Medical Facility means licensed hospitals and nursing homes.

HH. Medical Vehicle means an emergency or non-emergency medical vehicle.

II. Medical Vehicle Permit means the authorization issued by the Director of Excise and Licenses and approved by the Manager of Environmental Health with respect to a medical vehicle used or to be used to provide medical vehicle service in the City.

JJ. Medical Vehicle Service means any person or entity that operates emergency medical vehicles or non-emergency medical vehicles.

KK. Medical Vehicle Validation Sticker means a sticker displayed on the left side of the windshield of a medical vehicle unit that has been inspected and issued a permit to operate in the City. The sticker shall indicate the year of validation and shall be provided by the Director of Excise and Licenses.

LL. **Non-emergency Medical Vehicle** means any surface vehicle for hire equipped to transport sick or disabled persons and to provide non-emergency medical service.

MM. **Non-emergency medical vehicle operator** means an individual who holds a current and valid non-emergency medical vehicle operator's license issued by the Department of Excise and Licenses.

NN. **Patient** means any individual who is sick, injured or otherwise incapacitated or helpless.

OO. **Patient Care Report** means a medical record of an encounter between any patient and a provider of medical care.

PP. **Physician advisor** means Medical Director.

QQ. **To Operate in the City** means the providing of medical vehicle service or transport of patients originating within the boundaries of the City and County of Denver.

Chapter 2 Minimum Standards

Section 2-201 Advanced Life Support Emergency Medical Vehicle.

When an emergency medical vehicle service operates, or charges, as a paramedic or advanced life support emergency medical vehicle service, the staffing must comply with the definition of advanced life support emergency medical vehicle.

Section 2-202 Basic Life Support Emergency Medical Vehicle.

Any emergency medical vehicle staffed and operating as a basic life support emergency medical vehicle service, shall in no way advertise, display, or claim to be an advanced life support emergency medical vehicle service unless they are licensed as such.

Section 2-203 Emergency Medical Vehicle Crew Members.

- A. No patient shall be transported in an emergency medical vehicle which is based in the City unless there are two (2) or more persons in the emergency medical vehicle as required by the definitions for advanced life support emergency medical vehicle or basic life support emergency medical vehicle.
- B. The minimum requirements for the person providing direct emergency medical care to patients transported in the vehicle shall be a certified emergency medical technician-basic as defined in Emergency Medical Rules, 6CCR 1015-3.
- C. The minimum requirement for the driver of the vehicle will be a valid Colorado driver's license
- D. In the case of an emergency where no person possessing the qualifications required by this section is present or available to respond to a call for the emergency treatment and transportation of patients by emergency medical vehicle, any person may operate such emergency medical vehicle to transport any sick, injured or otherwise incapacitated or helpless person in order to stabilize the medical condition of such person pending the availability of personnel meeting these minimum requirements.

Section 2-204 Emergency Medical Vehicle Specifications.

- A. Ground vehicles obtained, licensed and placed in use as emergency medical vehicles, shall meet the requirements adopted by the State of Colorado.
- B. Variances of the above-mentioned specifications may be granted at the discretion of the board.
- C. All emergency medical vehicles shall have the name of the emergency medical vehicle clearly visible on the vehicle.

Section 2-205 Emergency Medical Vehicle Equipment.**A. General**

1. Each emergency medical vehicle basic life support shall contain the equipment and supplies cited in 12.9.2 of the State Rules and Regulations, as may be amended.
2. Each emergency medical vehicle advanced life support shall contain the equipment and supplies cited in 12.9.3 of the State Rules and Regulations, as may be amended.
3. Each emergency medical vehicle basic life support and emergency medical vehicle advanced life support shall contain the equipment and supplies as specified below.
4. Each emergency medical vehicle shall contain any other equipment or supplies established by the State Advisory Council on Emergency Medical Services and approved by the State Board of Health that is otherwise not set forth in the above referenced rules and regulations or specifically set forth. The Board of Environmental Health may add to this list at its discretion as other needs or new methodology becomes known. The list of required equipment is available from The Manager; however, the applicant has the responsibility to comply with all the requirements set forth herein.
5. All equipment and supplies shall be maintained in good working order.

B. Basic Life Support. The additional requirements for emergency medical vehicles basic life support are:

1. Patient Assessment Equipment
 - a. Thermometer adult and pediatric
 - b. Automatic External Defibrillator
 - c. Pulse oximeter with adult and pediatric probes.
 - d. Electronic blood glucose measuring device.
2. Dressing Materials
 - a. Bandages – Sterile 4x4's, ABD pads, triangular bandages, sterile eye pads, roller type, self-adhesive and various types and sizes per agency needs and medical director protocol.
 - b. Multiple dressings, occlusive dressings, multi-trauma dressing (10X36), and various sizes per ambulance service requirements, needs and medical director protocol.
 - c. Citing 12.9.2 (D) (4) of the State Rules and including 1 and 2-inch tape.
3. Extrication Equipment. Each ambulance shall carry extrication equipment appropriate for the level of extrication the ambulance service provides.
4. Personal Protective Equipment (PPE) Properly Sized To Fit All Personnel
5. Safety Equipment. Safe tires, and in addition, adequate snow tires or chains when weather conditions demand.

C. Advanced Life Support. The additional requirements for emergency medical vehicles Advance life support are:

1. Ventilation Equipment.
 - a. Endotracheal tube holder.
 - b. Nebulizer, both adult and pediatric.

2. Intravenous Equipment.

- a. Adult and pediatric intravenous solutions and administration equipment as required in 12.9.3 (D) (1) as well as sterile irrigation solution and volume expander.
- b. Constricting bands.
- c. Intravenous administration sets and venipuncture needles.
- d. Skin surface preparation (prep pads) for disinfecting the skin.

Section 2-206 Delivery to Emergency Facilities.

- A. All emergency medical vehicles shall deliver patients to the licensed emergency facility of the patient's choosing, or as directed by the patient's physician or member of the patient's immediate family, provided however, when the patient's condition is determined to be emergent or unstable, the emergency medical vehicle service shall deliver the patient to the closest licensed emergency facility, or the facility as designated by the physician advisor.
- B. In all cases where a preference is not expressed, the emergency medical vehicle service should deliver the patient to the nearest licensed emergency facility.
- C. For the public good in the case of emergency medical vehicles owned by public entities, previously defined boundaries of an emergency medical vehicle service area and its delivery destination may override the patient's choice.

Section 2-207 Operations Locations.

No licensed emergency medical vehicle service shall operate from locations other than those on file with the Manager of Environmental Health not shall such licensed emergency medical vehicle service abandon said location without prior notification to the Public Health Inspections Division of the Department of Environmental Health.

Section 2-208 Reporting.

All City and County of Denver licensed emergency medical vehicle services will utilize the statewide emergency medical services uniform pre-hospital care reporting system operated by the Colorado Department of Public Health and Environment.

Section 2-209 Use of Sirens and Emergency Equipment.

All emergency equipment-warning devices shall be used in accordance with all Colorado traffic statutes, rules, and regulations (C.R.S. 42-4-213).

Chapter 3 Records, Insurance, Quality Assurance

Section 3-301 Records.

A. An emergency medical vehicle service shall maintain all records relating to the transportation of patients as deemed necessary by the manager of environmental health.

B. Upon request by the department the following documentation will be made available to the department:

1. Copies of the ambulance service's written policy and procedure manual.
2. Copies of the ambulance service's written operational or medical protocols.
3. Documentation that information regarding the amount of professional liability insurance the ambulance service carries was provided to employees.
4. Copies of the ambulance service's ongoing medical continuous quality improvement program.
5. Current base rates and hours of availability.
6. Other documentation the City deems necessary.

Section 3-302 Insurance.

A. No ambulance shall operate in the City unless it is covered by insurance as set forth in this paragraph.

B. Each ambulance service shall maintain insurance coverage for each and every ambulance owned, operated or leased by the ambulance service, providing coverage for injury to or death of persons in accidents resulting from any cause for which the owner of the said vehicle would be liable on account of any liability imposed on him or her by law, regardless of whether the ambulance was being driven by the owner, his or her agent or lessee, or any other person and coverage as against damage to the property of another, including personal property, under like circumstances, in the following amounts:

1. Statutory Worker's Compensation Insurance
2. Public Liability and Property Damage, Bodily Injury
 - Each Person \$ 1,000,000
 - Each Accident \$ 2,000,000
3. Property Damage
 - Each Accident \$1,000,000
4. Professional Liability Coverage
 - Each Person \$ 1,000,000
 - Each Accident \$ 2,000,000

C. Proof of insurance shall be filed with the application for an ambulance service license as required in these regulations.

D. Every insurance policy required shall contain a provision for continuing liability there under to the full amount thereof, notwithstanding any recovery thereon, that the liability of the insured shall not be affected by the insolvency or bankruptcy of the insured, and that until a policy is revoked, the insurance company will not be relieved from liability on account of nonpayment of premiums, failure to renew license at the end of the year, or any act of omission of the named insured.

E. At any time said insurance is required to be renewed, proof of renewal shall be provided to the Manager of the Department of Environmental Health, or their authorized representative.

F. Any change in the status of vehicles listed on the certificate of insurance during the licensing cycle, shall be noted on a new certificate of insurance, and forwarded to the Manager of the Department of Environmental Health or their authorized representative within thirty (30) days of the changes.

G. Notification of any changes in insurance shall be made in writing within thirty (30) days of such changes to the Manager of the Department of Environmental Health, or their authorized representative by the Licensee, to be followed with a certificate of insurance as outlined in previous paragraphs.

H. The Board of Environmental Health may require additional proof of insurance at any time as needed in order to promote health, safety, and welfare of residents of the City.

Section 3-303 Emergency Resources Profile.

All City and County of Denver licensed emergency medical vehicle services shall submit annually to the department, an agency profile providing information on resource availability for planning and coordination of metro area emergency medical and trauma services, as defined by State Emergency Medical and Trauma Services Advisory Council.

Section 3-304 Medical Oversight and Quality Improvement

A. All City and County of Denver licensed emergency medical vehicle services shall have a primary medical director that meets the requirements established by the Colorado Board of Medical Examiners as defined in the Colorado Board of Medical Examiners 3CCR 7 13-6, Rule 500 to supervise the medical acts performed by all personnel on the ambulance service.

B. All City and County of Denver licensed emergency medical vehicle services shall report in writing to the department within 15 calendar days of any changes in medical oversight of the emergency medical vehicle service and/or the medical director of record.

C. All City and County of Denver licensed emergency medical vehicle services shall develop, implement and maintain a medical continuous quality improvement program consistent with the requirements defined in the Colorado Board of Medical Examiners rules 3 CCR 713-6, Rule 500, 3.2,b.

Chapter 4 Non-Emergency Medical Vehicle

Section 4-401 General

Each non-emergency medical vehicle shall be maintained in good condition and shall have a minimum of the following safety equipment:

- A. Safe tires and in addition, adequate snow tires or chains when weather conditions demand.
- B. Properly secured patient transport system.
- C. Adequate two-way communication capabilities.

Section 4-402 Crew Members.

The minimum requirements for the driver of a non-emergency medical vehicle are the following:

- A. The driver has reached the age of eighteen (18),
- B. A valid Colorado driver's license,
- C. A valid non-emergency medical vehicle operator's license issued by the Department of Excise and Licensing,

- D. Completion of a department approved course in cardio pulmonary resuscitation and a standard first aid course,
- E. A licensed physician's statement reciting that the driver has been examined within sixty (60) days preceding the date of license application and has been found free of any physical or mental defect that would affect the ability of the driver to perform satisfactorily the functions set forth in these regulations, and
- F. Met the department's standards for safe and proper operation of a non-emergency medical vehicle.

Chapter 5 Licenses

Section 5-501 License and permits required

It shall be unlawful for any person to operate an emergency medical vehicle service, to operate a business engaged in transporting patients, or to operate a medical vehicle anywhere in the city without first obtaining the required licenses and permits from the Director of Excise and Licenses as set forth in Chapter 17, DRMC.

Section 5-502 Emergency Medical Vehicle Service License and Vehicle Permit Renewal.

- A. Emergency medical vehicle service licenses may be renewed as provided in Section 32-20, DRMC as that provision may be amended from time to time.
- B. The standards for approval or disapproval of applications for renewal of licenses and permits shall be the same as for new applications.

Chapter 6 Revocation and Suspension

Section 6-601 General

- A. Medical vehicle service licenses and medical vehicle permits may be revoked and suspended by the Director of Excise and Licenses in accordance with standards and procedures established by Chapter 32, D.R.M.C. and regulations adopted pursuant thereto.
- B. It shall be the duty of the Manager to notify local law enforcement authorities, fire departments, hospitals, and the physician advisor(s) of revocation or suspension.
- C. The following practices shall be unlawful and may be grounds for a suspension or revocation of licenses:
 - 1. Willful and deliberate failure to respond to any call in the absence of good cause shown.
 - 2. Willful and deliberate failure to transport a patient when required by the nature of the injury in the absence of a competent patient denial of emergency care.
 - 3. Administration of any substances considered a drug or intravenous fluid unless under direct order of a physician, either present or by radio or telephone, except as permitted by protocol.
 - 4. Administering unnecessary treatment or supplies to a patient for the purpose of increasing the patient's bill.
 - 5. Charging for treatment or supplies not actually provided.
 - 6. Call jumping.

7. Non-compliance with any rule or regulation promulgated by the Colorado State Board of Medical Examiners, or the Colorado Department of Public Health and Environment, or the Board of Environmental Health, or the Department of Excise and Licenses.
8. Conduct that constitutes a significant threat to the health or safety of the individuals receiving emergency care from a licensed emergency medical vehicle service. Such conduct may include but not limited to: persons who have been convicted of felonies or crimes involving moral turpitude and individuals engaged in substance abuse. Such persons shall be subject to investigation to determine whether the applicant has sufficiently rehabilitated to accept the responsibilities incumbent on a holder of such license.
9. Failure to deliver a patient to the appropriate emergency facility, medical facility, or medical services provider as set forth in these regulations.
10. Driving an emergency medical vehicle in a reckless manner, or while under the influence of alcohol or other performance altering drugs.
11. Requiring any employee of an emergency medical vehicle service company to be on duty for any period in excess of forty-eight (48) hours. Volunteer emergency medical vehicle services are exempt.
12. Making a false or fraudulent statement on any application for a license or permit issued pursuant to these regulations.

APPENDIX D: SAMPLE PATIENT SATISFACTION SURVEY

The following is a sample patient satisfaction survey form that could be adapted for use by the medical transport agencies in Summit County.

Patient Satisfaction Survey

As a recent patient (or family member) of [insert agency name], we would greatly appreciate you taking a few minutes to complete and return this survey. Our organization provides emergency medical services and ambulance transportation to residents and visitors throughout Summit County, Colorado.

Your input will help us to better serve our patients through continuous quality improvement. Please rate the service you received while being treated and transported by our organization.

AMBULANCE VEHICLE

Promptness with which the ambulance responded and arrived?

Very poor Poor Fair Good Excellent

Cleanliness of the ambulance and equipment?

Very poor Poor Fair Good Excellent

Comfort of the ambulance (warmth, lighting, etc.)?

Very poor Poor Fair Good Excellent

AMBULANCE CREW

Courtesy of the [insert agency name] ambulance personnel?

Very poor Poor Fair Good Excellent

Degree to which the ambulance crew kept you informed?

Very poor Poor Fair Good Excellent

Knowledge and technical skills of the ambulance crew?

Very poor Poor Fair Good Excellent

How would you rate the ambulance crew's professionalism?

Very poor Poor Fair Good Excellent

TREATMENTS

How was your pain treated (if applicable to your condition)?

Very poor Poor Fair Good Excellent

How were any other of your symptoms treated?

- Very poor Poor Fair Good Excellent

Do you feel that the treatment you were provided made a difference?

- Yes No Maybe

OVERALL SERVICE

Quality of service provided by [insert agency name]?

- Very poor Poor Fair Good Excellent

Quality of the ambulance-crew members (Paramedics & Emergency Medical Technicians)?

- Very poor Poor Fair Good Excellent

What could we do to improve our service?

Comments:

Optional:

First Name: _____ Last Name: _____

E-Mail: _____ Phone: _____

I am the patient I am a family member or friend

I would like a representative from [insert agency name] to contact me.

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