CENTER FOR PUBLIC SAFETY MANAGEMENT, LLC

# Fire and EMS Assessment and Service Plan

## Shenandoah County, VA
## Fire and EMS System

CPSM®

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International City/County Management Association

# THE ASSOCIATION & THE COMPANY

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The International City/County Management Association (ICMA) is a 110-year-old, non-profit professional association of local government administrators and managers, with approximately 13,000 members located in 32 countries.

Since its inception in 1914, ICMA has been dedicated to assisting local governments and their managers in providing services to their citizens in an efficient and effective manner. ICMA advances the knowledge of local government best practices with its website, www.icma.org, publications, research, professional development, and membership.

## Center for Public Safety Management

The ICMA Center for Public Safety Management (ICMA/CPSM) was launched by ICMA to provide support to local governments in the areas of law enforcement, fire, Emergency Medical Services (EMS), emergency management, and 911-Communication Centers. CPSM also represents local governments at the federal level and has been involved in numerous projects with the Department of Justice and the Department of Homeland Security. Further, CPSM provides training and research for ICMA members and represents ICMA in its dealings with public safety professional associations such as CALEA, PERF, IACP, IAFC, PSHRA, DOJ, BJA, COPS, and NFPA.

In 2014 as part of a restructuring at ICMA, CPSM spun out of ICMA as a separate company and is now the exclusive provider of public safety technical assistance for ICMA. The *Center for Public Safety Management, LLC,* maintains the same team of individuals performing the same level of service that it had as an ICMA internal program.

As an organization, CPSM has more than 15 years of experience performing fire, EMS, law enforcement, and 911 Communication Center agencies nationwide using our unique methodology of aligning our comprehensive workload and response analysis with industry standards and best practices, and our client's issues and challenges. Our overall experience includes more than 500 such public safety studies in 46 states and provinces and 450+ communities ranging in population size from 269 (Bald Head, NC) to 4.4 million (Maricopa County, AZ).

The CPSM project teams offer years of practitioner, first line supervisory, middle management, and senior leadership experience in the fire, rescue, EMS, emergency management, law enforcement, and 911-Center disciplines; and a record of research, academic, teaching and training. Our team comprises true industry subject matter experts, not research assistants, interns, or generic management consultants.

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# SECTION 1. EXECUTIVE SUMMARY

Shenandoah County, VA retained the Center for Public Safety Management (CPSM) to complete a Fire and EMS Analysis that leads to outlining levels of service for the Shenandoah County Fire -Rescue (SCFR) system. A Fire and EMS analysis provides a systematic platform of examining the basic services provided by a Fire and EMS system and how these services are provided, the risks they face and must prepare for, and the levels of service the governing body will contemplate when assessing overall funding.

### Methodology

The key elements in this Fire and EMS analysis document include:

- A community risk assessment identifying the population, building, transportation, environment, fire and EMS, and other risks in the community the SCFR system serves is exposed to.
- A determination of levels of service to be provided to the areas protected by the Fire and EMS system.
- An analysis of the agency's current response capability in terms of staffing, equipment, and response time issues and challenges.
- A development of service level options developed to maximize emergency response effectiveness.

Also, this Fire and EMS assessment provides a historical analysis of the workload and performance of SCFR system resources for the three-year period 7/1/2021 to 6/30/2024.

To begin the Fire and EMS assessment, CPSM project staff requested certain documents, data, and information from the SCFR system. The project staff used this information/data to familiarize themselves with system staffing structure, assets, and operations. The information provided was supplemented with information collected during an on-site visit in September and November 2024, where CPSM interacted with system members and county staff, the Board of Supervisors, visited each fire facility and each volunteer company, reviewed fleet, equipment, and completed an extensive tour of the county visualizing building, transportation, and other community risks.

Our report includes comprehensive operational data and GIS analysis. The data and GIS analysis performed for this project provided technical support to recommendations and deployment strategies based on call demand, call type and station workload, resiliency, current and projected resource needs, and response travel times. ***Enlarged GIS mapping is included in Appendix A.***

Throughout our assessment, and more specifically when analyzing the operational deployment of resources, CPSM utilized the NFPA 1720 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2020 edition (National Fire Protection Association, Quincy, Mass.). This standard outlines organization and deployment of operations by volunteer and combination fire and rescue organizations (organizations that are majority volunteer). It serves as a benchmark to measure staffing and deployment of resources to certain fire incidents and emergencies.

## Background

**Unincorporated Population: 27,252 (62% of the population overall)**

**Town Populations (2020 Census)**

**Strasburg: 6,398**
**Toms Brook: 258**
**Woodstock: 5,097**
**Edinburg: 1,041**
**Mount Jackson: 1,994**
**New Market: 2,146**

**Town population represents 38% of the population overall.**

Shenandoah County is located in northwestern Virginia and is part of the Shenandoah Valley region. The County amasses 512 square miles of which 509 are land. Included within the boundaries of the County are the independent towns of Edinburg, Mount Jackson, New Market, Strasburg, Toms Brook, and Woodstock, which serves as the county seat. Each of the towns are serviced by a volunteer fire or fire and EMS station, which also responds into unincorporated areas as part of their response district. Town stations may be supplemented by career staff.

The county also includes within its boundaries several census-designated places that include Bayse, Bowmans Crossing, Clary, Columbia Furnace, Conicville, Fishers Hill, Forestville, Lebanon Church, Locust Grove, Hudson Crossroads, Maurertown, Mount Clifton, Mount Olive, Orkney Springs, Quicksburg, and Saumsville. Those highlighted are serviced by a volunteer fire or fire and EMS station, which are supplemented by career staff. In addition to the census-designated areas as outlined above, Shenandoah County has twenty-nine other unincorporated communities.

The Shenandoah County Fire and Rescue system represents an evolving hybrid model that combines the dedication of volunteers with career personnel. Over the years, this model has expanded significantly, particularly in 2017, when the integration of career staffing at several of the volunteer stations occurred. At the time of this assessment, Shenandoah County Fire and Rescue includes a combination of 75 career operational staff and eleven volunteer companies with 319 administrative and operational members that collectively serve the County's population.

The Shenandoah County Fire and Rescue Department, established in 1998, was created with foresight by the County Board of Supervisors, recognizing the future need for county staff to complement the volunteer organizations. Initially formed with a focus on providing support for fire and rescue coordination and training, the system has evolved over the years.

The current system relies on a combination of career staff at six stations and the volunteer organizations that operate across the county. Volunteer agencies remain a vital component of the system, providing infrastructure, equipment, and personnel.

There are eleven volunteer departments in Shenandoah County. This is further broken out as:

- Rescue Squad (EMS Only): 2 - Strasburg Volunteer Rescue Squad; Woodstock Volunteer Rescue Squad.
- Fire Department (Fire protection and technical rescue services): 5 - Conicville Volunteer Fire Department; Edinburg Volunteer Fire Company; Strasburg Volunteer Fire Department; Toms Brook Volunteer Fire Department; and Woodstock Volunteer Fire Department.
- Fire and Rescue Department: 4 - Fort Valley Volunteer Fire Department; Mt. Jackson Volunteer Rescue and Fire Department; New Market Volunteer Fire and Rescue Department; and Orkney Springs Volunteer Fire and Rescue Department.
- The Shenandoah County Fire-Rescue Department (SCFR) provides fire protection, technical and specialty services response, and EMS transport services as a department of the County.

SCFR is a career fire department that employs full-time administrative, training, community risk reduction, support staff, and operational officers and firefighters.

The SCFR is led by a ***Fire Chief*** who has overall responsibility for the management and leadership of the department. The SCFR Fire Chief, through the Code of Shenandoah County, § 20-2, *shall have supervision and operational control over the Department* and *shall be the County Chief as specified in Code of Virginia, § 27-6.1, and County EMS Chief as specified in Code of Virginia, § 32.1-111.4:6.*

**SCFR Department Daliy Minimum Staffing**

| | |
|---|---|
| Shift Commander | Staffing: 1 |
| Woodstock Rescue | Staffing: 2 |
| Woodstock Floating Unit | Staffing: 2 |
| Conicville | Staffing: 2 |
| Orkney Springs | Staffing: 2 |
| Mt. Jackson | Staffing: 2 |
| New Market | Staffing: 4 |
| Strasburg | Staffing: 4 |
| Minimum Staffing | 19 |
| Leave Positions/shift | 6 |
| Total Staffing/shift | 25 |

Max Staffing: 1 ALS – 1 BLS staff per EMS Unit
Min Staffing: 2 BLS staff per EMS Unit
1 Officer assigned per station/per shift

The Fire Chief, who also serves as the Emergency Management Coordinator for the County, is directly assisted by a Deputy Fire Chief of Operations, a Deputy Chief of Training, a Deputy Chief-Fire Marshal, a Service Assistant who also serves as the Deputy Emergency Management Coordinator, a Recruitment and Retention Officer, and the EMS Billing Technician.

### Recruitment and Retention

CPSM reviewed the recruitment and retention of system members. During discussions with SCFR system volunteers and SCFR command staff, recruiting new and retaining volunteer members is and has been a challenge. Overall, the initial and ongoing training and volunteer obligation demands are not as appealing to the current generation of working adults, who seek a greater work-life balance.

The retention of volunteers in fire departments is a nationwide issue where participation and retention appear to be steadily declining. Results from a survey conducted from the *Volunteer Retention Research Report Prepared for the National Volunteer Council, August 2020* of current and former volunteer fire department members show that over two thirds of respondents feel their departments have (or had) a problem with volunteer retention. This includes nearly 70% of report-current department leadership. Additionally, nearly half of all report-current volunteers have considered leaving the fire service at some point.

Currently the USFA lists 27,053 registered fire departments, which constitute about 91 percent of the departments estimated to be in the United States.[1] Overall, 36 percent of all fire departments are located in the South (highest percent overall in the country). The registered fire departments are further broken down as:

- 69.8% are volunteers.
- 15.4% are mostly volunteers.
- 9.6 % are career.
- 5.1% are mostly career.

Overall, Virginia has 557 registered fire departments and are broken down as follows:

1. The U.S. Fire Administration's National Fire Department Registry is a voluntary program, and it does not include all fire departments in the U.S. or its territories.

| | Volunteer | Mostly Volunteer | Mostly Career | Career |
|---|---|---|---|---|
| **Virginia** | **70.6%** | **16.9%** | **5.6%** | **7.0%** |
| **National Average** | **69.8%** | **15.4%** | **5.1%** | **9.6%** |

Similar to Fire and EMS departments in rural counties in Virginia, the career system equally has recruitment issues. For Shenandoah County there is organic competition with Frederick County to the north, Rockingham, and the City of Harrisonburg to the south, and as well Northern Virgina jurisdictions to the east.

The system overall, does have a natural recruitment pipeline through Triplett Tech. Although students enrolled in the Fire and EMS programs do join volunteer departments, many of the graduates from the Fire and EMT programs are looking for a career in Fire and EMS and migrate to the SCFR department or other opportunities in the region. Relying on Triplett Tech, however, creates younger experience levels in the SCFR department and system.

The SCFR department has a budgeted Recruitment and Retention Officer position. The position serves primarily to coordinate and develop contemporary recruitment and retention programs for the SCFR system, to include both career and volunteer members. This position collaborates with the volunteer Recruitment & Retention Committee, the SCFR Fire Chief and command staff, as well as the community and public and private groups regarding the recruitment of system members.

The Recruitment & Retention Officer position is one of great importance for the SCFR system. The position was recently vacant due to the separation of the former officer. The position was filled and the new Recruitment & Retention Officer started on February 2, 2025. CPSM has outlined in this report areas this new staff member should be focused on.

CPSM assesses that effective recruitment and retention are critical to maintaining the operational readiness and service quality of a combination fire and rescue system. However, the current efforts exhibit shortcomings that impact both volunteer and career staffing. The system has not had a structured and proactive approach to career and volunteer recruitment, relying on Triplett Tech as a short-term solution.

Without targeted outreach programs, community engagement, or active promotion of career and volunteer opportunities, the system will struggle to attract new personnel. A 13 percent turnover rate among career Firefighters and EMTs in the most recent three-year period is concerning, as turnover disrupts continuity, increases training costs, and places additional stress on remaining staff. With two-thirds of career personnel having less than three years of service, institutional knowledge and operational experience are significantly lacking. This impacts leadership development, response effectiveness, and mentorship opportunities for incoming members.

### Training and Education

Training in the SCFR system is managed by a full-time Deputy Chief, two Training Captains, and an assortment of part-time/overtime SCFR staff. There is some volunteer instructor participation in Fire and EMS programs when these members are available, and when they may be asked to participate. Together, these positions develop and deliver Fire and EMS training for and to the SCFR system and for Triplett Tech. The SCFR system has a progressive training matrix for fire staff

(volunteer and career) from entry level to chief officer. The Virginia Department of Fire Programs (VDFP) provides certification guidelines for fire service in the state and the Virginia Office of EMS provides certification guidelines for EMS providers.

CPSM assesses that the SCFR system has guidelines and requirements in place that provides on-boarding and incumbent staff development. ***Every effort should be made to make the completion of required and periodic training an SCFR system priority.*** It is incumbent that all course development and delivery for new and incumbent staff be directed to required training/certification achievement by position and on-going professional development that satisfies medical direction for EMS providers and individual department and system operational requirements.

CPSM further assesses through systemwide career and volunteer stakeholder meetings, the SCFR training staff is taxed with current program development and delivery, which directly affects recruit and incumbent training. This includes position requirement training for system staff, particularly volunteer members. While the SCFR training division offers position requirement classes, a more flexible schedule may be required to ensure inclusion of all system members, particularly adjusting the EMS precepting/provider release schedule, volunteer Firefighter I & II academy to Firefighter I one year, and Firefighter II the next year, fire instructor and officer courses for positional requirements. Additional volunteer stakeholder concern includes limited development and encouragement of volunteer instructors.

Additional assessment includes the opportunity for SCFR to partner with other counties regionally, who share the same issues and challenges of hiring small numbers of career staff, and have a need to train new recruits, some with no training. This opportunity is very similar to the *Central Shenandoah Criminal Justice Academy*, where regional law enforcement agency staff receive certification training through a regional effort.

Lastly, CPSM assesses the requirements to don self-contained breathing apparatus is not consistent across the system. Volunteer members are required to complete the Fire Attack Series course approved by SCFR, the Association, or VDFP. Conversely, career staff are required to obtain the VDFP Firefighter I certification.

### Community Risk Reduction

Fire suppression and response, although necessary to protect property, have negligible impact on preventing fire. Rather, it is public fire education, fire prevention, and built-in fire protection systems that are essential elements in protecting citizens from death and injury due to fire, smoke inhalation, and carbon monoxide poisoning. These functions typically make up a fire department's Community Risk Reduction program. The fire prevention mission is of utmost importance, as it is the only area of service delivery that dedicates 100 percent of its effort to the reduction of the incidence of fire.

The SCFR Fire Marshal's Office is staffed by a Fire Marshal (Deputy Chief) and six SCFR operational staff working part-time - overtime. The primary tasks completed by the community risk reduction team are fire prevention occupancy inspections, fire investigations, and assisting the building official with plans review as needed. Fire inspections include the following occupancy classifications: business groups; multi-family (common areas), high hazard; public assembly; institutional; healthcare facility; and educational.

CPSM assesses the SCFR Fire Marshal's Office primary focus for fire prevention inspections is identified high hazard occupancies such as places of public assembly, institutional occupancies (vulnerable population), educational occupancies, and high hazard industry. Moderate and low risk occupancies are only inspected when a complaint is filed with the Fire Marshal—these

occupancies are not included in any inspection schedule and should be to ensure a complete fire prevention inspection system is in place, which furthers community resilience and safety.

### Fleet

The provision of an operationally ready and strategically located fleet of mission-essential fire-rescue vehicles is fundamental to the ability of a fire-rescue department to deliver reliable and efficient public safety within a community. The SCFR system has an array of response vehicles. ***The volunteer companies own the vast majority of response apparatus.***

Overall, the SCFR system has:

- 18 Pumpers (Engine apparatus)
  - Two belong to the SCFR department and are utilized primarily for training.
- 3 Rescue Engines
- 5 Tankers/ Pumper Tankers
- 3 Aerial Ladders/Aerial Towers
- 1 Heavy Squad
- 1 Lite Squad
- 8 Brush Units
- 18 Ambulances
- 1 Air/Light Unit

In addition to the Fire and EMS response apparatus listed above, the system also has an array of light response vehicles such as SERV vehicles (Special Emergency Response Vehicle) and other quick response vehicles, inflatable boats for surface and swift water responses, and all-terrain vehicles.

The County provides funding to all volunteer companies for fuel and vehicle insurance as well as maintenance costs for cardiac monitors, the power loading ambulance system and patient stretchers, hydraulic extrication tools, and mechanical CPR devices. Additionally, the County provides funding for pump and aerial ladder testing.

CPSM assesses the County does not provide direct funding to volunteer companies for the purchase of Fie and EMS apparatus. Costs for procuring new apparatus are quickly escaping the typical fund-raising efforts by the volunteer companies. The county does fund SCFR department apparatus, which is primarily ambulances.

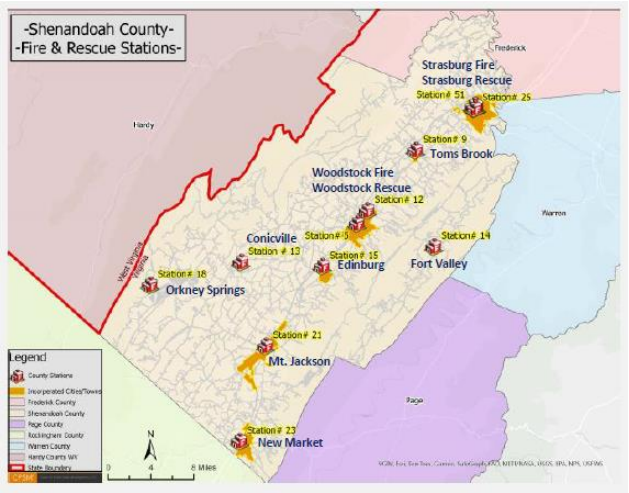
### Facilities

The SCFR system operates out of eleven operational facilities located in the incorporated towns and unincorporated county.

Each facility has emergency response units and either career staff providing 24/7/365 coverage or volunteer from home or stand-by crew coverage.

Each facility is owned and maintained by the volunteer corporation associated with the emergency services organization. The county provides property and liability insurance for each facility.

Facility maintenance is coordinated and managed by the volunteer companies utilizing external vendors or by company members and includes construction and renovation projects.




The eleven SCFR system fire facilities range in age (original building-may not include any building footprint additions) from 1931 to 2015 and in 2025 will fall into a building life cycle range as follows:

- Age 10-16 years: 1 - Mt. Jackson

-Age 17-29 years: 1 – New Market

-Age 30-49 years: 4 – Conicville, Toms Brook, Edinburg, Orkney Springs

-Age 50+: 5 – Woodstock Rescue, Woodstock Fire, Strasburg Fire, Strasburg Rescue, Fort Valley

Overall, CPSM assesses the SCFR system does have aging fire facilities, which requires strategic planning at the system and Board level regarding a funding mechanism for renovations (interior and exterior) and maintenance as described above, and which should be included in near, mid, and longer term SCFR system planning initiatives. Additionally, many facilities lack contemporary fire facility health and safety components such as vehicle CO capture systems and decon areas or separate decon rooms for equipment and personnel. Several stations would need renovation to sustain career staff and/or volunteer duty crews. Additionally, five of the eleven stations house career staff 24/7/365. There is always the potential there will be career staffing in other facilities in the future.

### Funding for the SCFR System

Funding Fire and EMS departments can be difficult, particularly in large and primarily rural counties who have many competing services and programs to fund. In Shenandoah County Fire and EMS funding affords resources for:

***FY 25 Approved Career Budget: $9,158,328***

***FY 25 Volunteer Budget: $1,343,163***

Fire and EMS funding will not decrease over time. In fact, and as outlined herein, costs will continually increase each year as there are many needs in Fire and EMS that include career staffing, and as volunteer fund raising cannot compete in today's apparatus and construction cost environment, assistance to volunteer companies for apparatus purchases and facility improvements will eventually become a reality if for no other reason a healthy and safe environment for volunteers and career staff stationed in volunteer stations and operating volunteer apparatus is critical to the success of the system.

One solution to the funding decisions CPSM offers is the creation of a Shenandoah County Fire and EMS District and levy a tax specific to the district to fund the needs of the district (§27-23.1 of the Code of Virginia). The establishment of a district and separate Fire and EMS tax levy would establish a separate means by which the County can meet existing needs and costs of the Fire and EMS system, but also future needs and enhancement of services, which are inevitable.

Managing the effects of growth on fire and EMS services requires careful planning, investment, and community collaboration to ensure these essential services keep pace with the community's needs. This includes budgetary pressure as expanding services requires increased funding for personnel, facilities, and equipment. As always, Shenandoah County must balance these needs with tax revenue, other funding sources such as grants, and against the needs of other services.

CPSM assesses the County will have to expand Fire and EMS resources for career and volunteer services as population and community growth continues. Expansion of services will be necessary to maintain adequate response times, deploy adequate resources with an adequate career and volunteer staff to respond to an increase in demand for services.

***One expense that is looming***, and worth mentioning is the replacement of SCFR system self-contained breathing apparatus (SCBA). The SCFR department has requested $3,255,809.62 through FEMA's Assistance to Firefighter Grant program to replace the SCFR system SCBA equipment and masks. The grant requires a local match, which in this case is $325,580.96 for a total grant amount of $3,581,390.58. Should the SCFR department not receive the FEMA grant, funding will have to be considered for allocation to purchase the new units in the near term.

### Community Risk

A significant component of this report is the completion of an *All-Hazard Risk Assessment of the Community*. The *All-Hazard Risk Assessment of the Community* contemplates many factors that cause, create, facilitate, extend, and enhance risk in and to a community. The service demands of Shenandoah County are numerous for the fire department and include Advanced Life Support (ALS) EMS first response and ground transport; fire, technical rescue, and hazardous materials response; density challenges; transportation emergencies to include vehicle and rail traffic; commercial and mercantile buildings and processes; nursing homes and assisted living facilities; and a hospital and schools.

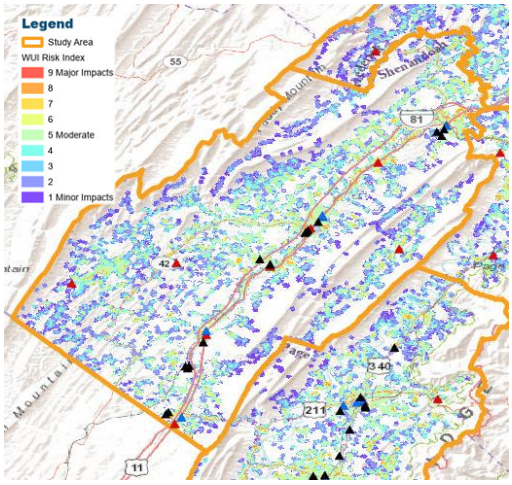
The largest percentage of building risk in Shenandoah County is single family dwellings (low risk as classified by the National Fire Protection Association-Fire Protection Handbook, 20th edition). These buildings are primarily wood frame construction, and many have basements and are built with lightweight wood construction materials, which increases the building risk.

Shenandoah County also has thirty (30) facilities/businesses that are required under the federal *Emergency Planning and Community Right-to-Know Act* (EPCRA) law to report hazardous or toxic substances that are stored at their facilities and that meet specified thresholds at any given point in the reporting year. Tier II reporting is submitted to the Virgina Department of Environmental Quality and to the Local Emergency Planning Committee (LEPC). ***CPSM assessed that Shenandoah County does not have a LEPC so Tier II submissions on the local level go to SCFR administration. Additionally, and because there is no LEPC, Tier II reporting is not mandatory.***

| Hazard (Risk) | Threat level Ranking |
|---|---|
| Flooding | 1 |
| Winter Storm/Extreme Cold | 2 |
| High Wind/Hurricanes | 2 |
| Tornado | 3 |
| Lightning | 4 |
| Thunderstorms | 5 |
| Hazardous Materials Spills | 6 |
| Pipeline Eruptions/Explosions | 6 |

Additionally, Shenandoah County is prone to and will continue to be exposed to certain environmental hazards and risks that may impact on the community. These risks can be life-threatening and can destroy property, disrupt the economy, lower the overall quality of life for individuals, and create significant call demand for the SCFR system.

An additional environmental risk includes wildland or brush fires. Uncontrolled wildland and brush fires can be a significant risk in the county as a whole, particularly around areas that are built upon such as the towns. Shenandoah is prime for fast-moving wildfires as it has a high natural fuel load that includes natural vegetation and agricultural crops. ***Overall, the county is at a low-moderate risk for wildland fires.***

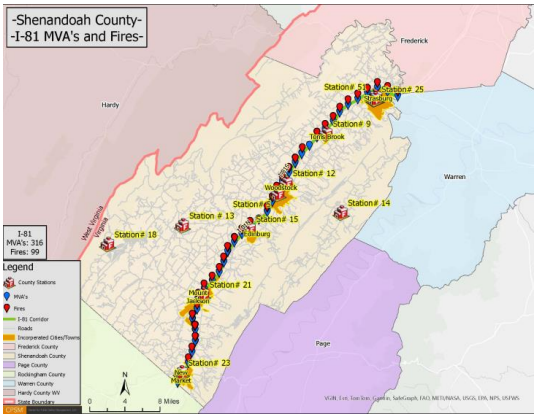



The wildland-urban interface is another challenge in Shenandoah County. When a wildland fire moves from unoccupied and open land to an area with development, property and life in this space are at risk.

***The wildland-urban interface risk is increased in many areas of the county (levels of 6,7,8) as indicated in the map to the upper left***.

Community wildfire protection planning is one of the most important components of a wildfire safety strategy. A national best practice is the implementation of coordinated Community Wildfire Preparedness Plans (CWPPs) for those areas in the county identified as Wild-Urban Interface risks. Communities that understand the wildland-urban interface and create defensible spaces around vulnerable property through vegetation mitigation will reduce wildland fire risks. ***CPSM assessed that there are limited CWWP plans in place throughout the county.***

Shenandoah County also has ten small private airports. Two airports are general aviation and eight are private use. Sky Bryce and New Market airports are general aviation and therefore will have more activity than privately owned.




A higher transportation risk in Shenandoah County is Interstate 81 due to its heavy traffic volume (higher than local county traffic volume on intra-county roads) and high speeds. The next figure outlines motor vehicle accidents and fire responses on Interstate 81 (by mile marker).

In the three-year workload analysis CPSM performed, there were 316 motor vehicle accidents and 99 fire responses such as vehicle fires and hazardous materials spills.

## Fire and EMS Demand

An indication of the community's fire risk is the type and number of fire related, non-fire related, EMS, technical rescue, and hazard incidents the fire department responds to. The entire SCFR service area is subject to these types of calls for service.

The next tables illustrate calls in the county from July 1, 2023, to June 30, 2024, by call type. The first table outlines calls dispatched to Fire units. The second table outlines calls dispatched to EMS units.

### SCFR System Fire Unit Calls by Type

| Call Type | Total Calls | Call Percentage |
|---|---|---|
| EMS assist | 952 | 38.4 |
| MVA | 249 | 10.1 |
| **EMS Subtotal** | **1,201** | **48.5** |
| False alarm | 187 | 7.6 |
| Good intent | 123 | 5.0 |
| Hazard | 122 | 4.9 |
| Outside fire | 185 | 7.5 |
| Public service | 213 | 8.6 |
| Structure fire | 68 | 2.7 |
| Technical rescue | 40 | 1.6 |
| **Fire Subtotal** | **938** | **37.9** |
| Canceled | 188 | 7.6 |
| Mutual aid | 149 | 6.0 |
| **Total** | **2,476** | **100.0** |

**Overall, this table tells us:**

**38.4% of all Fire calls were EMS assist (largest response category for Fire units).**

**10.2% of all Fire calls were structure or outside fire responses.**

**37.8% of Fire calls were non-fire responses (includes MVA responses).**

**6% of Fire calls were outside of the county and classified as Mutual Aid.**

**7.6% of Fire calls were cancelled either before units left the station or while enroute.**

### SCFR System EMS Calls by Type

| Call Type | Total Calls | Call Percentage |
|---|---|---|
| Breathing difficulty | 740 | 9.0 |
| Cardiac and stroke | 767 | 9.4 |
| Cardiac arrest | 89 | 1.1 |
| Fall and injury | 1,672 | 20.4 |
| Illness and other | 2,293 | 28.0 |
| MVA | 426 | 5.2 |
| Overdose and psychiatric | 128 | 1.6 |
| Seizure and unconsciousness | 721 | 8.8 |
| **EMS Subtotal** | **6,836** | **83.5** |
| Non-EMS | 1,072 | 13.1 |
| Mutual aid | 277 | 3.4 |
| **Total** | **8,185** | **100.0** |

**Overall, this table tells us:**

**48.4% of all EMS calls are either fall, injury, illness or other, which are typically lower acuity calls.**

**27.2% of all EMS calls are either breathing difficulty, cardiac, stroke, or seizure and unconscious which are typically higher acuity calls needed ALS intervention.**

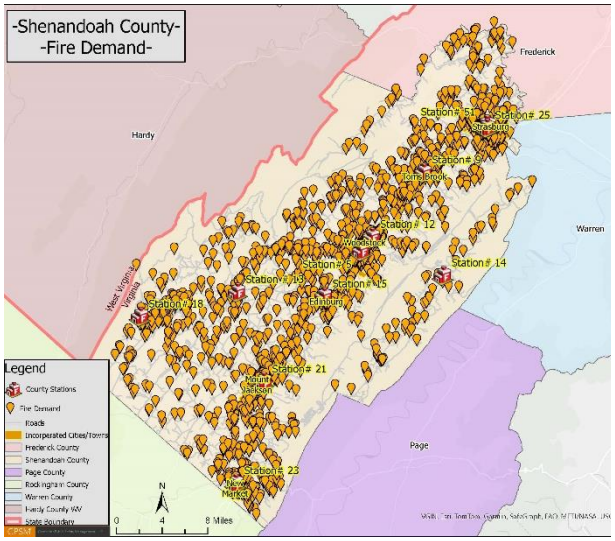
**1.1% of all EMS calls are cardiac arrest, which are high acuity and typically take one or more ALS technicians.**

**MVA, overdose and psychiatric make up 6.8% of all EMS calls. These calls are typically low acuity but may need ALS intervention.**

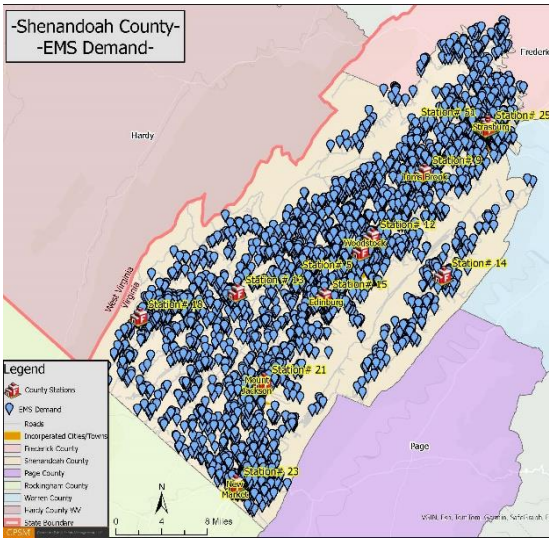
**13.1% of all EMS calls are non-EMS responses and include fire and non-fire responses (*public service calls are the highest percentage of non-EMS calls*).**

CPSM analyzed demand using ArcGIS software, which illustrates the concentration of Fire and EMS calls (includes the aggregate of the three-year study periods). Analysis of these maps tell us the greatest Fire and EMS demand is along the Route 11 corridor where the towns are located. This includes the towns and the unincorporated areas around the towns. Additional concentration of demand (particularly EMS) includes unincorporated areas of Bayse, Forestville, Mount Clifton, Columbia Furnace, Maurertown, Mount Olive, Lebanon Church, and Fort Valley.

**Fire Demand**




**EMS Demand**




## SCFR System Resiliency

Resiliency is an organization's ability to quickly recover from an incident or event, or to adjust easily to changing needs or requirements. Greater resiliency can be achieved by constant review and analysis of the response system and focuses on three key components:

CPSM assessed that the SCFR system has resiliency challenges created by demand on current units and how the system operates as a predominately volunteer fire response force. Through our analysis:

- Based on the Fire and EMS unit response matrix, ***CPSM assesses the SCFR has resistance challenges*** with EMS units as they respond to many fire and fire related calls (13 percent of all EMS calls), sometimes in lieu of a fire unit or with a fire unit that may have driver only.
- Fire units have organic resistance challenges as they are a predominately volunteer response system and members respond from home, work, or when mobile. Where there are SCFR department career personnel who cross staff Fire and EMS apparatus at volunteer stations, and because the EMS system overall is busy, averaging 22-calls/day, guaranteed fire staffing may not occur in these cross-staffed stations at certain times of the day.
- Overall, overlapping calls do not create continuance absorption challenges for SCFR fire system companies. However, overlapping calls do create absorption challenges for SCFR system EMS deployment, particularly when there are three or more calls in an hour and based on the current deployment model where not all of the higher demand areas have a staffed

EMS unit. This also creates response time challenges based on the size of the county and where the available EMS units are responding from.

- Time on task, which has an effect on absorption and restoration was analyzed and tells us that 40% of EMS calls take one to two hours. This is due to transport and hospital turnover times (analyzed next page). Overall, EMS transport calls average 76 minutes per call and represents 75% of all EMS unit calls. ***This exacerbates absorption and restoration ability for EMS units.***
- 66% of Fire calls take less than 30 minutes to complete, which overall does not create absorption and restoration challenges.

### Fire and EMS Deployment

The variables of how and where personnel and companies are located, and how quickly they can arrive on scene, play major roles in controlling and mitigating emergencies. ***The reality is that the SCFR system relies on volunteer response from home or work to make up the teams and crews of the fire Effective Response Force.*** SCFR system's volunteer availability at any time of the day may have an impact on assembling enough personnel and resources on the scene. This factor has to be considered at all times by those responding to the scene, those responding to the station to pick up apparatus, and command officers responding who must manage and coordinate available responding and on-scene resources.

| Demand Zone | Demographics | Minimum Staff to Respond to Scene* | Response Time Standard to Collect Minimum Staff |
|---|---|---|---|
| Urban Area | >1000 people/mi² | 15 | Within 9 minutes 90 percent of the time |
| Suburban Area | 500-1000 people/mi² | 10 | Within 10 minutes 80 percent of the time |
| Rural Area | <500 people/mi² | 6 | Within 14 minutes 80 percent of the time |
| Remote Area | Travel Distance ≥ 8 miles | 4 | Directly dependent on travel distance, determined by AHJ, 90 percent of the time |

NFPA 1720 establishes the minimum response staffing for a predominantly volunteer department for low-hazard structural firefighting incidents. Each demand zone takes into consideration certain risk elements such as population density, exposed occupied buildings (more predominant in urban and suburban demand zones), water supply, and proximity to responding apparatus and members (incident and fire station).

CPSM assesses that when benchmarked against NFPA 1720, Station 5, 12, 25, and 51 reside in urban demand zones and should follow the SCFR system urban turnout time standard; Stations 9, 15, 21, and 23 reside in suburban demand zones and should follow the SCFR system suburban turnout time standard; Stations 13, 14, and 18 reside in rural demand zones and should follow the SCFR system rural turnout time standard.

The SCFR system deployment of personnel includes 75 full-time operational shift employees who work 24-hour shifts (minimum staffing of 19/shift), 145 volunteer combat firefighters (have received all required training to don self-contained breathing apparatus), and additional volunteer firefighters who can drive and operate on scenes outside of hot zones that require self-contained breathing apparatus. There are also 81 volunteer members that are released to practice EMS. Additionally, there is one on-duty career shift commander and volunteer officers who respond and can serve as incident command officers on emergency responses.

There are eleven overall response stations, two of which are EMS only (nine fire deployment stations). The SCFR department staffs six stations, one which is EMS only with two units (Station 5), and five others where staff cross-staffs Fire and EMS units depending on the first call (Orkney Springs, Conicville, New Market, Mt. Jackson, and Strasburg Fire-two Strasburg Rescue units). Station 23 (New Market) has two, two person crews. One crew primarily staffs an ambulance and the other cross staffs Fire and EMS units.

The SCFR system response matrix for fire boxes is designed to deploy a certain number of apparatus for firefighting, water, equipment, and tools, as well as staffing. There are system guidelines and protocols that refer to staffing and deployment of resources, which CPSM reviewed.

An important consideration when deploying fire crews, and one that links to critical tasking and assembling an Effective Response Force, is that of two-in/two-out regulations. Essentially, prior to starting any fire attack in an immediately dangerous to life and health (IDLH) environment [with no confirmed rescue in progress], the initial two-person entry team shall ensure that there are sufficient resources on- scene to establish a two-person initial rapid intervention team (IRIT) located outside of the building.

As is common with many volunteer/combination fire departments, SCFR system does not respond to structural fires with a pre-determined staffing regimen, only pre-determined response apparatus. As there is a SCFR Shift Commander, a command officer is dispatched on the initial alarm as well as available volunteer command officers, if available, will respond. Under this response model, SCFR system may or may not have the minimum number of firefighters on the initial response in order to comply with CFR 1910.134(g)(4), regarding two-in/two-out rules and initial rapid intervention team (IRIT). Responding members must be mindful of who and what apparatus is on scene and the Two-In/Two-Out concept.

CPSM assesses the SCFR system has established response and on-scene guidelines for the various responses they may be tasked with to mitigate. CPSM further assess there is a separate fireground and emergency scene staff accountability system guideline, which details the use of a standardized on-scene accountability system, and which would align with NFPA 1500 and 1561 as outlined herein. CPSM further assesses there are no guidelines that specifically addresses the two-in-two-out national benchmark, which would detail this standard as outlined in OSHA 1910.134 and the NFPA 1500 standard.

The SCFR staffs Stations 23 and 25 ambulances (25's respond from Station 51) with Advanced Life Support (ALS) level certified crew members (one per ambulance) when this staffing is available. When staffed such as this, an ambulance can handle most calls as a single resource. There are times (higher acuity patients requiring a higher acuity of care) when additional units may be needed. In the case of a cardiac or respiratory arrest, several volunteer fire apparatus are licensed Basic Life Support (BLS) EMS response vehicles and respond to assist as needed (about 10 percent of all EMS calls).

In the case where ALS services are needed to treat a patient, a BLS ambulance relies on an ambulance staffed with an ALS provider to respond, or a volunteer who may be certified to this level who may respond (an ALS certified provider is more likely to respond in the Strasburg district from Station 25 volunteer staff).

The remaining stations (5, 13, 18, 21) may not have ALS staffed ambulances, and when this resource is needed, these BLS units rely on ALS staffed units primarily from Stations 23 and 51. When this occurs, ALS level care is delayed, and two ambulances are committed to a single call that likely can be handled by the single ambulance and crew.

Currently there is no requirement for SCFR department staff to train at the ALS level. Advancing to this level is voluntary and those certified and who practice receive an ALS provider bonus (approved in the FY 25 budget).

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CPSM reviewed ALS availability for a three-year period. The following represents the percentage of time in a one-year period SCFR staffed ambulances were staffed to the ALS level for CYs 2022, 2023, 2024.

| Year: 2022 | |
|---|---|
| **Station 5-SCFR Unit** | 50.10% |
| **Station 5** | 2.50% |
| **Station 13** | 4.10% |
| **Station 18** | 14.30% |
| **Station 21** | 4% |
| **Station 23** | 74% |
| **Station 25** | 74% |

| Year: 2023 | |
|---|---|
| **Station 5-SCFR Unit** | 54.4% |
| **Station 5** | 2.20% |
| **Station 13** | 1.20% |
| **Station 18** | 2.60% |
| **Station 21** | 4.60% |
| **Station 23** | 67.10% |
| **Station 25** | 80.60% |

| Year: 2024 | |
|---|---|
| **Station 5-SCFR Unit** | 52.20% |
| **Station 5** | 6.50% |
| **Station 13** | 3.40% |
| **Station 18** | 3.10% |
| **Station 21** | 4.70% |
| **Station 23** | 79.90% |
| **Station 25** | 66.30% |

CPSM's assesses the current deployment of ALS providers through available SCFR staffing is deficient for the coverage area and should be expanded through continued incentives for incumbent staff and encouragement of staff to obtain advanced levels of EMS of certification; requiring advanced EMS certification of new firefighter staff and incentivizing same upon hire; and through expansion of EMS services with a quick response vehicle staffed 24/7/365. CPSM further assesses the SCFR does not have EMS supervisory staff on duty managing EMS operations to include EMS incidents, pharmaceutical exchange, supply, and inventory (this program shifted in 2024 from a hospital-based supply system to an agency-based supply system), liaison with hospital and assisted living/nursing home staff, monitoring of ambulance and crew resources, and assisting with EMS crew issues and challenges.

### Response Times

CPSM met with and conducted a cursory review of the Emergency Communications Center in Shenandoah County as these services relate to Fire and EMS.

Public safety response begins in the Emergency Communications Center. Emergency Communications Centers are the critical link to the public and public safety services and ensure that emergency calls are received, processed, and dispatched efficiently. These centers serve as the first point of contact for individuals in crisis, providing critical instructions and coordinating response efforts with police, fire, and emergency medical services.

The 911-center, when fully staffed, is budgeted for eighteen full-time positions and two part-time positions. 911-Center operational staff work twelve-hour shifts that are either 6:00 am to 6:00 pm or 6:00 pm to 6:00 am.

There is one peak-time position that works 12:00 noon to 12:00 midnight and provides assistance with call-taking, radio channel monitoring and communication, and research and assistance to law enforcement with National Crime Information Center (NCIC) and other databases to run background checks, verify warrants, check stolen property, and gather crucial information for officers in the field. They also communicate with state and federal systems like CJIS (Criminal Justice Information Services).

When staffing allows, each shift in the 911-Center is maximally staffed with four telecommunicators and one peak time telecommunicator. The 911-Center minimum staffing level is two telecommunicators and one peak time telecommunicator. Due to vacancies and recruitment and retention issues, minimal staffing is becoming more of the norm for the center.

The 911-Center does not utilize Emergency Medical Dispatch call processing software at this time. The center does utilize a system that provides the telecommunicator with pre-arrival instructions that are communicated to the caller regarding the medical or injury emergency.

Emergency Medical Dispatch (EMD) call processing software involves systematically handling emergency calls to assess the situation through the 911 call, establish a call determinant, which is typically high acuity or low acuity (some systems create call determinants of varying degrees of high, mid, and low acuity) and then dispatch the most appropriate resources. A system such as this also allows for the stacking of multiple calls by call determinant (acuity), which ensures to a higher degree, the higher acuity EMS calls are handled before lower acuity EMS calls with available EMS units.

CPSM assesses as the SCFR system has limited ambulances and ALS resources, and as call typing is not currently performed for EMS calls in the 911-Center, the SCFR system can benefit from having the 911-Center filter EMS 911 calls through Emergency Medical Dispatch software and at a minimum determine a call to be low acuity or high acuity and further determine which calls are dispatched with an ALS unit and which are dispatched with a BLS unit. CPSM understands this is a change in the 911-Center's platform, and that the center is short-staffed at times and also has recruitment and retention issues and challenges, however dispatching the most appropriate resource (ALS or BLS), and distinguishing which of the lowest acuity calls can hold when most or all units are committed to calls, ensures a greater chance that the most appropriate resource is dispatched to an EMS call.

***The focus of EMS response times*** should be directed to the evidence-based research relationship between clinical outcomes and response times. Much of the current research suggests response times have little impact on clinical outcomes of low acuity calls.

Higher acuity calls such as cerebrovascular accidents (stroke), injury or illness compromising the respiratory system, injury or illness compromising the cardiovascular system to include S-T segment elevation emergencies, certain obstetrical emergencies, and certain other medical emergencies that affect cardiovascular, neurological, and respiratory systems require rapid response times, rapid basic and advanced life support on-scene treatment and packaging for transport, and rapid transport to the hospital.

EMS in Shenandoah County is delivered through a single tier system of SCFR system staffed ambulances (primarily staffed by SCFR department staff), which also provides ground transport to the hospital. CPSM analyzed response times of the single-tier response SCFR ambulance units for the period July 1, 2023, to June 30, 2024 (calls with complete time stamps). Response times are measured at the 80th (suburban and rural based on NFPA 1720) 90th percentile (urban based on NFPA 1720) for statistical and standard consistency.

**EMS Response Times by Call Type**

| Call Type | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| Breathing difficulty | 2.0 | 2.5 | 8.3 | 12.2 | 2.3 | 3.2 | 10.9 | 14.7 |
| Cardiac and stroke | 2.0 | 2.8 | 8.6 | 12.6 | 2.4 | 3.4 | 11.2 | 15.3 |
| Cardiac arrest | 2.1 | 2.3 | 8.2 | 11.5 | 2.5 | 2.8 | 10.8 | 13.4 |
| Fall and injury | 2.0 | 2.5 | 8.2 | 11.7 | 2.4 | 3.1 | 10.7 | 14.7 |
| Illness and other | 2.3 | 2.7 | 8.3 | 12.3 | 2.7 | 3.4 | 10.8 | 15.2 |
| MVA | 3.3 | 2.4 | 8.6 | 13.4 | 4.1 | 3.1 | 10.6 | 15.8 |
| OD | 2.1 | 2.5 | 8.4 | 12.0 | 2.7 | 2.9 | 10.3 | 13.9 |
| Seizure and UNC | 1.9 | 2.5 | 7.4 | 10.8 | 2.4 | 3.0 | 10.2 | 14.2 |
| **EMS Total** | **2.1** | **2.6** | **8.3** | **12.1** | **2.7** | **3.2** | **10.7** | **14.9** |

### EMS Response Times by Station

| First Due Area | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| 13 - Conicville | 2.3 | 3.1 | 11.5 | 15.8 | 3.0 | 3.6 | 13.4 | 17.1 |
| 14 - Fort Valley | 2.6 | 8.2 | 15.2 | 23.3 | 3.3 | 8.9 | 17.9 | 25.5 |
| 17 - Star Tannery | 2.3 | 5.2 | 13.0 | 19.5 | 2.8 | 5.8 | 14.8 | 23.0 |
| 18 - Orkney Springs | 2.1 | 3.0 | 10.7 | 15.0 | 2.6 | 3.4 | 13.1 | 17.4 |
| 21 - Mt. Jackson | 2.4 | 2.9 | 8.8 | 12.8 | 2.8 | 3.4 | 11.1 | 15.5 |
| 23 - New Market | 2.2 | 2.7 | 6.5 | 10.3 | 2.6 | 3.2 | 8.8 | 12.8 |
| CO5 - Woodstock | 2.2 | 2.2 | 8.3 | 12.0 | 2.7 | 2.8 | 10.7 | 14.4 |
| CO25 - Strasburg | 2.1 | 2.5 | 7.0 | 10.8 | 2.7 | 3.2 | 9.0 | 13.1 |
| **Total** | **2.2** | **2.6** | **8.3** | **12.1** | **2.7** | **3.3** | **10.8** | **15.1** |

CPSM asses that:

Dispatch times (time to process calls from the time the calls are received to dispatching stations) are above the NFPA 1225 *Standard for Emergency Services Communications, 2022 edition*, which is within 60 seconds, 90 percent of the time for the highest prioritization level of calls.

Turnout times, which are predominantly career turnout times and are in excess of NFPA 1710 standards of ≤ 60 seconds for EMS responses. Turnout times for Fort Valley are the highest at 12.5 minutes at the 80th percentile (NFPA 1720 rural response standard and above the 10-minute SCFR system standard for rural station turnout times).

Travel times to EMS calls at the 80th and 90th percentile represent the vast area the SCFR system must cover with limited resources and high demand along the Route 11 corridor, and to areas that lack EMS transport resources such as Toms Brook, Edinburg, Fort Valley, and the unincorporated area west of I-81.

Overall, 28 percent of all EMS ambulance responses are outside of the first due district. Station 13-Conicville has the highest percentage of out of district responses (80 percent). This reduces district resiliency and increases response times. Station 14 has the lowest at 2.6%. The remaining include Station 17-21%; Station 18-28%; Station 21-20%; Station 23-28%; Station 5-7% (two units); Station 25/51-12% (two units).

Of significance, Fort Valley has the longest travel times at 15.2 minutes (80th percentile NFPA 1720 rural response standard). Coupled with an 8.2-minute turnout time, once the call is dispatched it takes an average at the 80th percentile, 23 minutes for the first EMS unit to arrive.

***Response times for fire incidents*** are based on the concept of "flashover." A flashover is the near-simultaneous ignition of directly exposed combustible material in an enclosed area. When certain organic materials are heated, they undergo thermal decomposition and release of flammable gases. Flashover occurs when the majority of the exposed surfaces in a space are heated to their auto ignition temperature and ignite.

As discussed, Fire Services in Shenandoah County are delivered primarily through volunteer resources. Although the SCFR department cross-staffs in fire apparatus with EMS units in five of eleven volunteer stations, because of EMS demand, they may not be in the station when a fire call comes in. CPSM analyzed response times for the SCFR system for the period July 1, 2023, to June 30, 2024 (calls with complete time stamps). Response times are measured at the 80th percentile (rural and suburban areas of the county) and at the 90th percentile (urban areas of the county). These are the response time metrics for benchmarking against the NFPA 1720

*Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2020 edition, as previously outlined.

### Fire Response Times by Call Type

| Call Type | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| EMS assist | 2.2 | 6.0 | 8.3 | 16.0 | 2.8 | 9.9 | 10.3 | 19.3 |
| MVA | 3.3 | 4.9 | 8.4 | 14.7 | 4.0 | 6.0 | 9.8 | 17.1 |
| **EMS Subtotal** | **2.5** | **5.7** | **8.3** | **15.7** | **3.1** | **8.8** | **10.1** | **18.8** |
| False alarm | 2.3 | 5.3 | 6.2 | 12.6 | 2.7 | 5.9 | 8.7 | 15.8 |
| Good intent | 3.7 | 5.1 | 8.1 | 15.3 | 5.2 | 5.7 | 10.1 | 18.7 |
| Hazard | 3.5 | 5.3 | 8.9 | 14.6 | 4.2 | 5.8 | 11.4 | 17.0 |
| Outside fire | 3.7 | 4.5 | 9.6 | 15.8 | 4.4 | 5.0 | 12.6 | 19.9 |
| Public service | 2.7 | 5.4 | 6.9 | 14.1 | 4.1 | 7.0 | 8.8 | 17.2 |
| Structure fire | 2.6 | 3.1 | 8.5 | 12.2 | 3.2 | 4.2 | 10.6 | 16.2 |
| Technical rescue | 2.8 | 4.4 | 7.4 | 13.6 | 3.9 | 5.2 | 13.4 | 19.4 |
| **Fire Subtotal** | **3.1** | **5.0** | **8.2** | **14.4** | **4.0** | **5.7** | **10.5** | **17.4** |
| **Total** | **2.8** | **5.3** | **8.3** | **15.3** | **3.5** | **6.8** | **10.3** | **18.3** |

### Fire Response Times by Station

| First Due Area | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| 9 - Toms Brook | 3.1 | 5.2 | 7.9 | 14.7 | 4.1 | 7.2 | 9.8 | 16.7 |
| 12 - Woodstock | 2.9 | 5.5 | 7.3 | 14.2 | 3.7 | 6.0 | 9.3 | 16.7 |
| 13 - Conicville | 2.3 | 5.5 | 10.3 | 17.0 | 3.1 | 6.5 | 11.6 | 18.9 |
| 14 - Fort Valley | 3.5 | 12.3 | 12.5 | 24.3 | 4.1 | 15.7 | 13.1 | 27.2 |
| 15 - Edinburg | 3.0 | 5.9 | 7.5 | 15.5 | 3.8 | 6.6 | 9.9 | 17.4 |
| 17 - Star Tannery | 3.4 | 5.8 | 12.8 | 22.3 | 4.5 | 7.5 | 14.7 | 24.6 |
| 18 - Orkney Springs | 3.1 | 5.3 | 15.1 | 23.1 | 4.4 | 7.4 | 16.9 | 26.6 |
| 21 - Mt. Jackson | 2.6 | 4.8 | 7.3 | 13.7 | 3.1 | 6.0 | 9.2 | 15.5 |
| 23 - New Market | 2.3 | 4.5 | 5.6 | 12.7 | 3.0 | 8.9 | 8.2 | 16.7 |
| 51 - Strasburg | 3.0 | 4.8 | 6.3 | 12.7 | 3.5 | 5.7 | 8.2 | 15.3 |
| 60 - Timberville | 2.0 | 4.8 | 14.3 | 18.5 | 2.0 | 4.8 | 14.3 | 18.5 |
| **Total** | **2.8** | **5.3** | **8.3** | **15.3** | **3.5** | **6.8** | **10.3** | **18.3** |

CPSM assesses that:

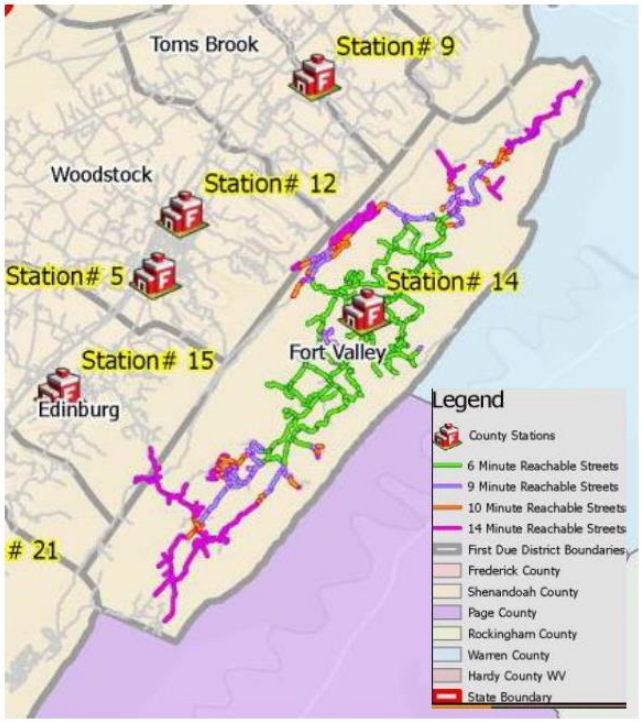
Dispatch times (time to process calls from the time the calls are received to dispatching stations) are above the NFPA 1225 *Standard for Emergency Services Communications, 2022 edition*, which is within 60 seconds, 90 percent of the time for the highest prioritization level of calls.

Overall turnout times for fire related calls are combined 5.7 minutes and for structure fires turnout times are 4.2 minutes and for outside fires turnout times are 4.2 minutes. Turnout times for Fort Valley are the highest at 12.5 minutes at the 80th percentile (NFPA 1720 rural response standard and above the 10-minute SCFR system standard for rural station turnout times).

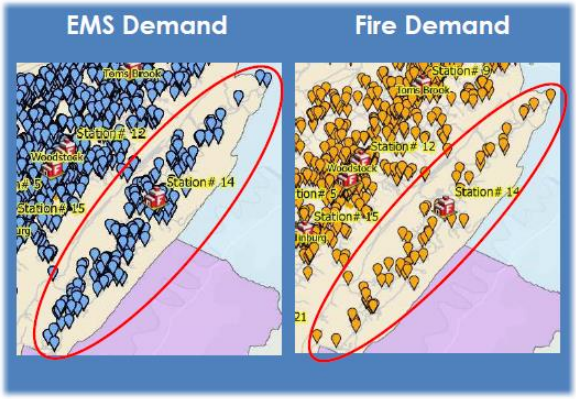
Travel times to fire calls at the 80th and 90th percentile represent the vast area the SCFR system must cover with limited career and volunteer resources. Of significance, Fort Valley has the longest travel times at 12.5 minutes (80th percentile NFPA 1720 rural response standard). Coupled with a 12.5-minute turnout time, once the call is dispatched it takes on average at the 80th percentile, 24 minutes for the first fire unit to arrive.

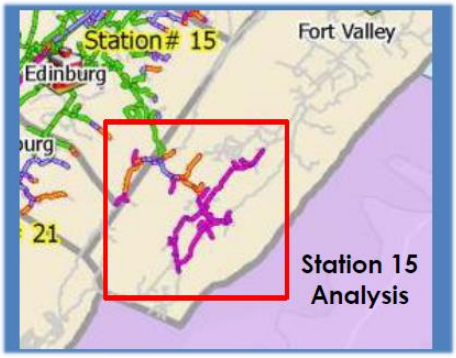
The next figures will illustrate travel time bleeds for all SCFR system stations. Travel time bleeds are measured at 6-, 9-, 10-, and 14-minute intervals. The first maps illustrate the time and distance issues and challenges in the Fort Valley District. After that we analyze each district travel time bleeds.

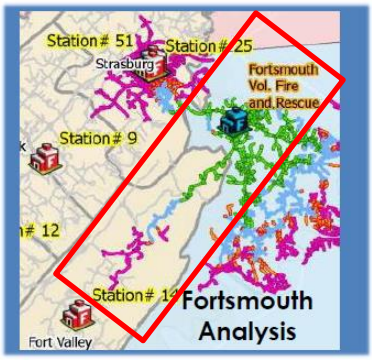
## Fort Valley

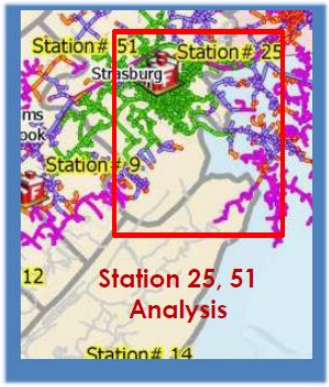



9-10- and 14-minute travel times are prominent to the north and south of the station and occur where Fire and EMS demand populates. The bleeds also align with the 80th percentile travel time of 12.5 minutes as outlined herein.



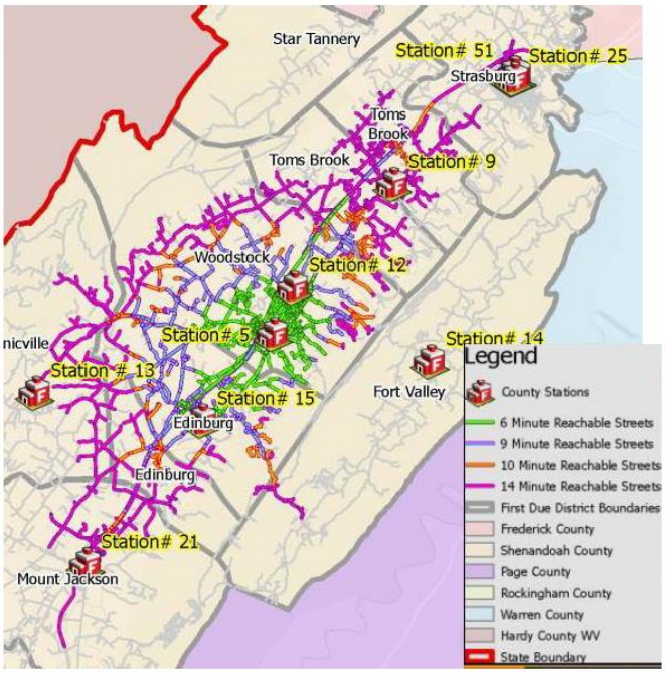



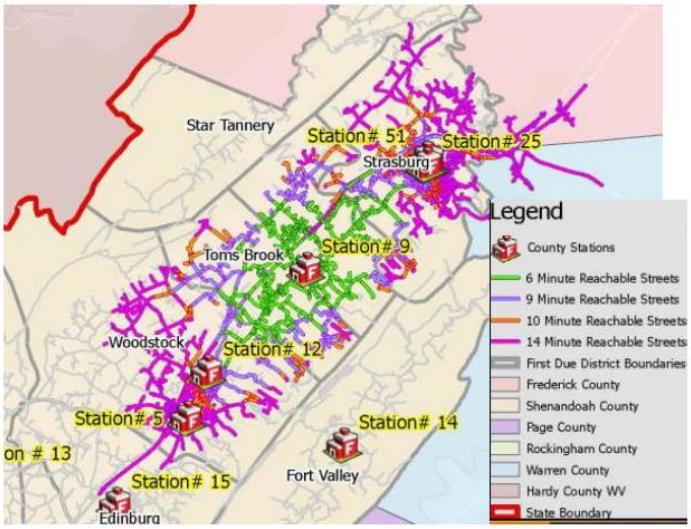

Overall, when benchmarked against the NFPA 1720 standard of 14-minutes (rural response zone) there is limited travel time saturation into the southern end of the Fort Valley district from Station 15, and limited travel time saturation into the northern end of the Fort Valley district from Station 51. The Fortsmouth station in Warren County offers better coverage overall in the northern area of Fort Valley. *These maps illustrate the time and distance challenges the Fort Valley district has.*

### Woodstock Rescue



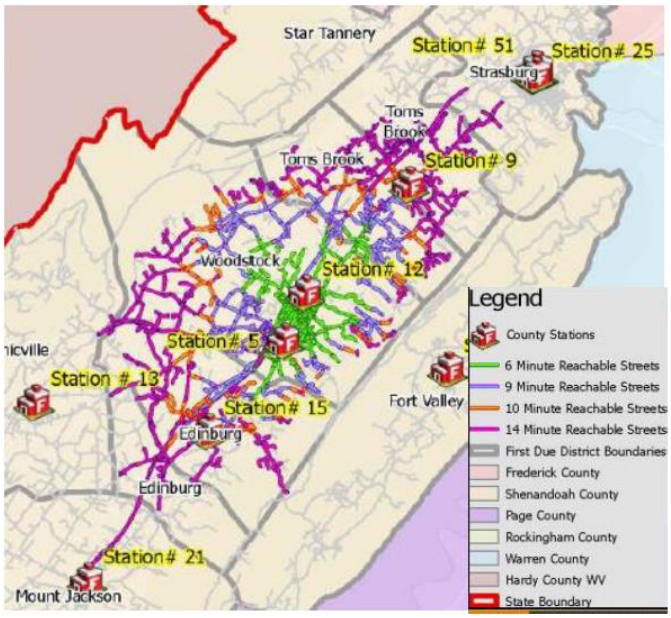

A good portion of the district is covered in 6- and 9-minute travel time. There are areas in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 15 district with extended travel time into the Station 9, 13, 21, and 25 station districts.

### Toms Brook



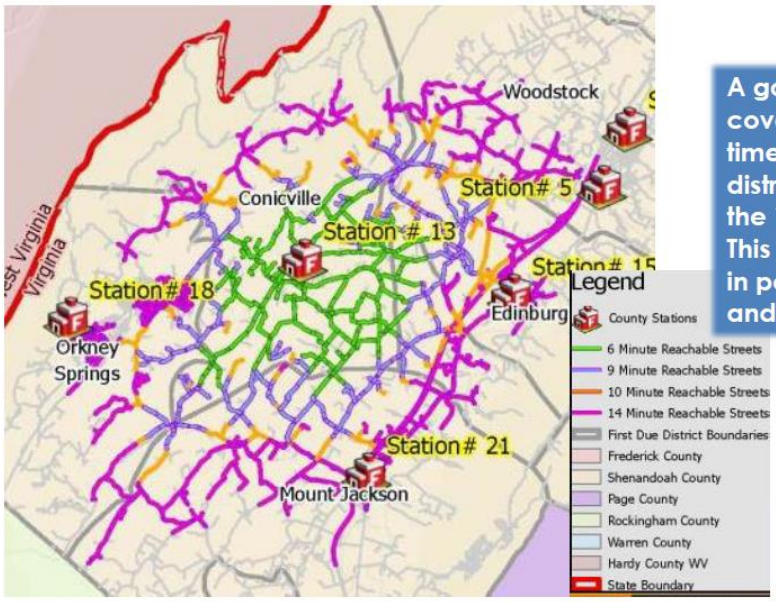

A good portion of the district is covered in 6- and 9-minute travel time. There are only small pockets of area in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time into portions of the Station 12 and 51 district with extended travel time into the remaining areas of the Station 12 and 51 districts.

### Woodstock Fire



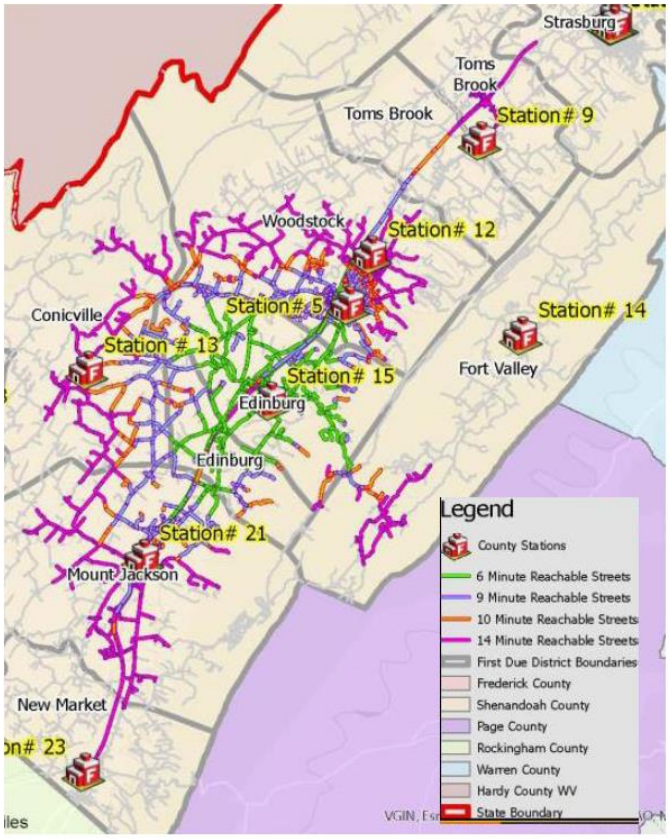

A good portion of the district is covered in 6- and 9-minute travel time. There are areas in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time into portions of the Station 9 and 15 districts.

### Conicville



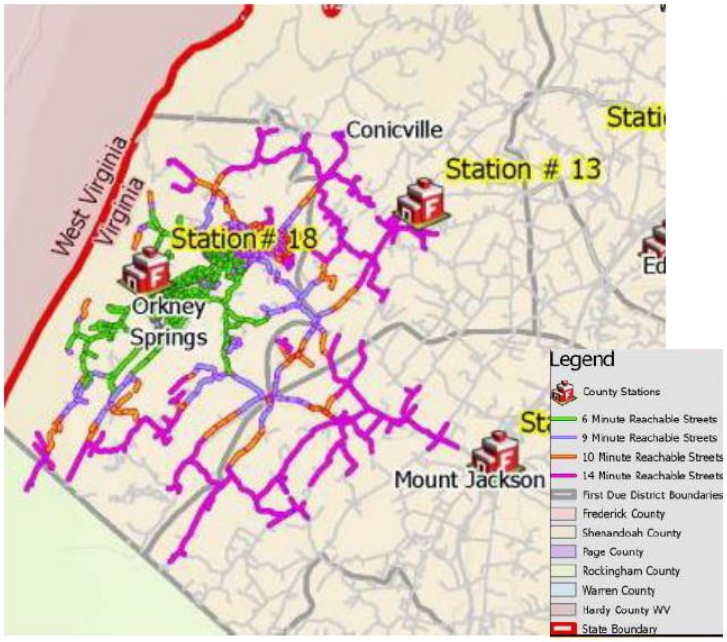

A good portion of the district is covered in 6- and 9-minute travel time. There are areas in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 5, 12, 15, 18, and 21 districts.

### Edinburg



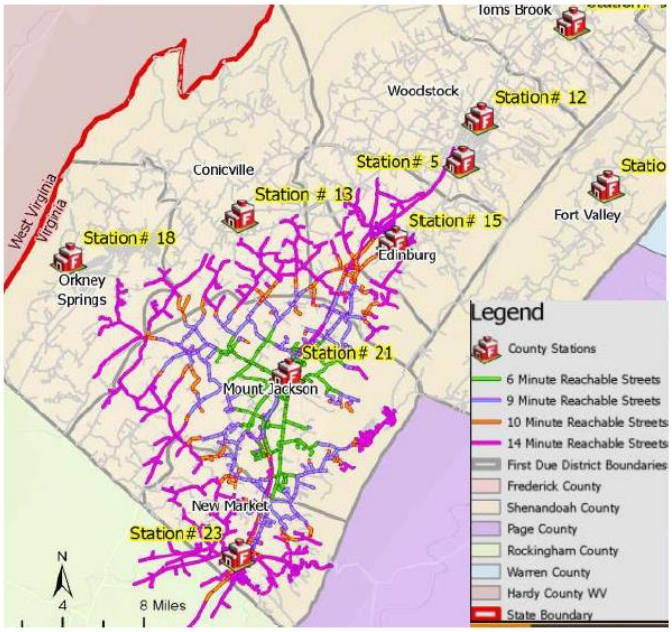

The majority of the district is covered in 6- and 9-minute travel time. There are small areas in the district boundaries that are at the 10-minute travel time. This station has fairly good travel time in portions of the Station 5, 12, 13, and 21 districts.

### Orkney Springs



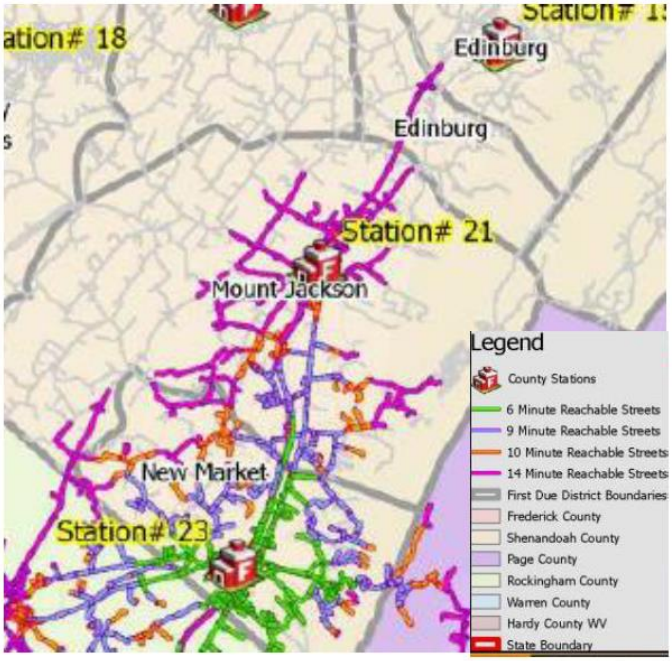

The core of the district is covered in 6-minute travel time. The remainder of the district is at the 9-, 10- and 14-minute travel time. There are also areas in the district boundaries that are beyond the 14-minute travel time standard. This station has extended travel time in portions of the Station 13 and 21 districts.

### Mt. Jackson



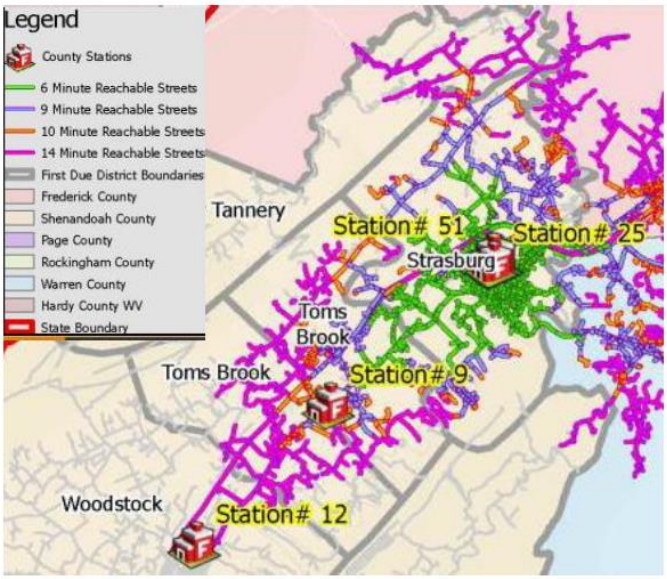

The core of the district is covered in 6 and minute travel time. The remainder of the district is at the 9-, 10- and 14-minute travel time. There are also areas in the district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 13, 15 and 23 districts.

### New Market



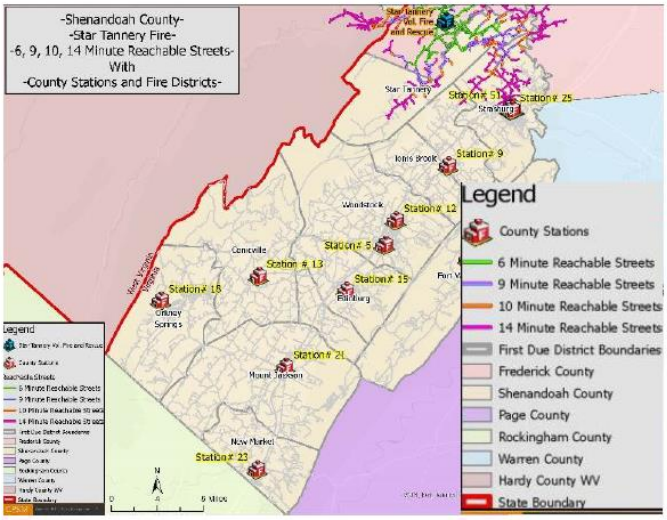

The core of the district is covered in 6-minute travel time. The remainder of the district is at the 9-, 10- and 14-minute travel time. There is also a small area in the western district boundary that is beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 21 district.

### Strasburg Fire and Rescue




**The core of the district is covered in 6-minute travel time. The remainder of the district is at the 9 and some 10-minute travel time. There is also small areas in the west and northwest district boundary that is at the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 9 district.**

### Star Tannery




**The core of the district to the east of the Star Tannery station in Shenandoah County is covered in 6- to 9-minute travel time. The remainder of the district is at the 10- and 14-minute travel time. There are areas that are beyond the 14-minute travel time standard in the southern part of the district. This station has fairly good travel time in portions of the Stations 25 and 51 district.**

Overall, CPSM assesses there are gaps in travel time for EMS service in the Edinburg and Toms Brook districts along the heavy demand Route 11 corridor. Also, and due to time and distance, there is a coverage gap (in terms of time and travel time) in the Fort Valley district. Additionally districts 5, 9, 12, 13, 14, 18, 21, 25, 51 and Star Tannery have areas in the district boundary beyond the 14-minute rural travel time standard. Some of these areas are remote.

### Community Survey

In order to assess the perspectives of the community members of Shenandoah County, VA conducted a survey drafted specifically for the interests of Shenandoah County and the Fire and EMS system. ***The details of this survey are included in Section 6 of this report.***

The survey distributed to the community focused on the perceptions of services provided to the public by all fire departments/stations in the County, use of services provided, knowledge of services provided and community engagement opportunities, and willingness to expand fire services in the future. The summary report will be broken into five main sections:

1) Perceptions of Shenandoah County Fire & Rescue;
2) Community engagement;
3) Assessment of emergency services priorities;
4) Perceptions of emergency medical transport (ambulance) services; and
5) Service level knowledge and opinion.

The purpose of this report is to provide a summary of survey responses that may assist county management in their decision-making process. Key findings emerged from the survey and are listed below:

**78%**

**have good overall perception of Shenandoah County Fire and Rescue**

1) Overall approval of Fire Rescue and Emergency Medical Transport performance.

2) Community members perceived staff to be professional in their actions.

3) Emergency response and preparedness were seen as most crucial for the Shenandoah County Fire Rescue while community engagement was not rated as highly in terms of importance.

4) Most respondents considered the Shenandoah County Fire and Rescue system to be engaged in the community and saw them frequently.

5) Most respondents were satisfied with the current level of service and believed it to be sufficient.

6) While the average score regarding willingness to support additional taxes to ensure service levels skewed toward a positive response, only 48% demonstrated support for the statement.

A detailed community survey analysis can be found in Appendix A.

### Service Level Considerations

CPSM developed service level considerations based on the information received, our observations, input from stakeholders, national benchmarking, commonwealth standards, GIS analysis, and response data we analyzed and have included in this report. Service levels are as much recommendations as they are considerations for service and operational enhancements.

Service level considerations are listed here as they appear in the report.

## Recruitment and Retention

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Increased Incentives to Retain Volunteer Fire and EMS Members. | Maintain current volunteer incentive program of $250 or $500 annualized incentive payment to volunteer members based on hours of volunteer contribution.<br><br>Maintain volunteer members exemption from one County vehicle license fee. | Establish a per-call stipend for members who respond to calls, with payments allocated on an established timeframe (monthly, quarterly, or bi-annually).<br><br>Establish a station-standby stipend to encourage members to stand-by for a more ready response, with payments allocated on an established timeframe (monthly, quarterly, or bi-annually).<br><br>Requires funding. | Establish a Length of Service Awards Program or LOSAP pension-like program to be designed around a volunteer member's length of service to the community.<br><br>If established, consider funding up to ten years' service for those current members who qualify with ten or more years of service.<br><br>Requires funding. |
| R&R Funding. | Maintain current recruitment and retention funding for volunteer and career programs. | Increase funding that is aimed at marketing the SCFR system volunteer and career opportunities.<br><br>Marketing funding should include social media, re-branding the system to include a combined system logo, attendance at local and regional community and hiring events, recruitment identification and promotional items with the SCFR system logo.<br><br>Requires funding. | Seek a FEMA-Staffing for Adequate Fire and Emergency Response grant for the recruitment and retention of career and volunteer members.<br><br>Grant funds expand the use of radio, television, and signage to include billboards, and retention recognition programs and incentives.<br><br>May require a local funding match. |

## Training

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| SCFR Department Instructor Staffing. | Maintain current SCFR instructor staffing.<br><br>Encourage and utilize more volunteer instructor participation.<br><br>Increase flexibility in position requirement training for increased volunteer participation. | Add one instructor staff that has a concentration on volunteer Fire and EMT recruit programs.<br><br>Add one instructor staff that has a concentration on career and volunteer incumbent Fire and EMT programs.<br><br>Requires funding. | Add additional instructors (*over the longer term*) that matches SCFR system member growth to sustain successful coordination and development of recruit and incumbent training.<br><br>Requires funding. |
| FFI certification for all members utilizing self-contained breathing apparatus on emergency scenes. | Maintain inconsistency with training that determines who can use self-contained breathing apparatus on an emergency scene where this equipment is required. | Establish a guideline that requires any SCFR system member who participates on an emergency scene that requires self-contained breathing apparatus to have successfully completed the VDFP Firefighter I certification course prior to utilizing this equipment.<br><br>Provide required training.<br><br>May require additional funding. | |

## Training

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Obtain Advanced-EMT Program Accreditation status to support Advanced-EMT training in-house. | Maintain current practice of sending system members outside of the county for Advanced-EMT level training. | Complete all requirements that leads to SCFR accreditation by the VAOEMS and which allows the SCFR Training Division to offer Advanced-EMT certification courses.<br><br>Serves also as a recruitment and retention component.<br><br>May require funding. | Fund a VAOEMS Education Coordinator position (over the mid-longer term) who manages all Advanced-EMT initial and recertification training.<br><br>Requires funding. |
| Career Recruit Training Academy. | Maintain current practice of recruit training as a stand-alone County. | Analyze the opportunity for SCFR to partner with other counties regionally, who share the same issues and challenges of hiring small numbers of career staff, but have a need to train new recruits, some with no training. Concept is similar to the *Central Shenandoah Criminal Justice Academy*.<br><br>May require funding. | |

## Community Risk Reduction

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Develop a digital system that identifies all inspectable properties in the incorporated towns and unincorporated county. | Maintain current practice of complaint driven and higher hazard inspections (58 inspectable properties). | Develop and implement a digital system that identifies all current and new properties and occupancies that require fire prevention inspections in the incorporated towns and unincorporated county in accordance with the Statewide Fire Prevention Code (approximately 2,475).<br><br>Requires funding. | |
| Develop and implement an inspection plan that identifies minimum inspection frequency for High, Medium, Low Hazards, and Critical Infrastructure. | Maintain current inspection list (58 inspectable properties). | Adopt NFPA 1730 as a fire prevention inspection guide for High Hazard, Medium Hazards, Low Hazard, and Critical Infrastructure. | |
| Staff office appropriately with full and part-time staff based on the inspection schedule. | Maintain current staff that consists of a Fire Marshal (Deputy Chief) and six SCFR operational staff working part-time - overtime. | Add one full-time fire prevention inspector to meet the growth of fire prevention inspections after all inspectable properties are identified and classified.<br><br>Maintain part-time staff.<br><br>Requires funding. | Add additional fire prevention inspectors, full and part-time, (over the mid-to-long term) as appropriate, to manage identified occupancies and frequency of inspections by hazard classification as outlined in the NFPA 1730 compliant fire prevention inspection plan.<br><br>Requires funding. |

## Community Risk Reduction

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Establish a Local Emergency Planning Committee. | Maintain current *Emergency Planning and Community Right-to-Know Act* (EPCRA) reporting of hazardous or toxic substances that meet specified thresholds. Current reporting is directed to SCFR administration and is not mandatory. | Working with the State Department of Environmental Quality, formalize a Local Emergency Planning Committee that includes representatives from the Towns. The purpose of this committee is to work with businesses and formalize compliance with *Emergency Planning and Notification* regulations through submittal of *Emergency Planning Notifications* for extremely hazardous substances above the threshold planning quantity.<br><br>May require limited funding. | |
| Establish a County-Wide Community Wildfire Protection Plan (CWWP). | Maintain limited CWWP program. | Implement a County-Wide CWWP program that includes community overview and risk assessment; community preparedness and mitigation strategies; emergency response and evacuation planning; public education and community engagement; and monitoring.<br><br>May require funding. | |

## Fleet

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Number of Engine Apparatus. | Maintain the current number of engine apparatus at each of the volunteer stations. | Implement a work group of system Fire and EMS leadership (volunteer and SCFR department) to develop fire apparatus fleet life-cycle objectives that consider:<br>□ One Engine Apparatus per SCFR system station that serves as the frontline Engine and that is not older than 25-years.<br>□ One Engine Apparatus reserve that is not older than 25-years.<br>Engine apparatus are not older than 25-years and if they are, they have undergone refurbishment in accordance with the most recent edition NFPA 1900. | The County maintains a fleet of one-two engines that are not older than 25-years, and which are used primarily for reserve engines in any volunteer station.<br>When not in use, engines may be used in training classes.<br>The purpose of this service level is to reduce the number of engines in volunteer stations, which reduces capital expenditures for volunteer departments but shifts same to the county.<br>Requires funding. |
| Number or Aerial Apparatus. | Maintain the current number of aerial ladder apparatus at each of the volunteer stations where these apparatus are located (Stations 12, 23, 51). | Based on current risk and current placement of aerial ladder trucks, there is no mid-level recommendation.<br>Aerial ladder trucks are not older than 25-years and if they are, they have undergone refurbishment in accordance with the most recent edition NFPA 1900.<br>Maintain three aerial ladder trucks strategically positioned along the Route 11 corridor. | The county works with the Towns and assists volunteer companies with the purchase of or refurbishment of aerial ladder trucks and ensures the aerial trucks are constructed or refurbished to meet the most recent edition NFPA 1900.<br>Requires funding. |

## Fleet

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Number of Tanker Apparatus. | Maintain the current number of tanker apparatus at each of the volunteer stations where these apparatus are located. | Based on current risk and current placement of tanker apparatus, there is no mid-level recommendation.<br><br>Tanker apparatus are not older than 25-years and if they are, they have undergone refurbishment in accordance with the most recent edition NFPA 1900.<br><br>Maintain tanker apparatus strategically positioned for a reasonable response in non-hydrant areas. | The county works with the Towns and assists volunteer companies with the purchase of or refurbishment of tanker apparatus and ensures the tanker trucks are constructed or refurbished to meet the most recent edition NFPA 1900.<br><br>Requires funding. |
| Number of Ambulances. | Maintain the current number of ambulances at each of the volunteer stations where they are located. | Maintain an ambulance fleet (minimum two per volunteer station) that has no ambulances older than 10-years. | The County maintains a fleet of 2-4 ambulances (number to be determined by the Fire Chief) that are not older than 10-years, and which are used primarily for reserve ambulances.<br><br>Requires funding. |

## Facilities

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Facility Funding. | Maintain current funding for facility renovation and small construction at the volunteer level. | Develop a funding mechanism that will assist volunteer companies with renovation and small construction projects.<br><br>Requires funding. | |
| Carbon Monoxide Capture Systems. | Most volunteer stations do not have Carbon Monoxide Capture Systems. | SCFR department works with a volunteer fire company or applies for the system for an Assistance to Firefighters Grant on behalf of the volunteer stations that do not have Carbon Monoxide Capture Systems. Grant funding sought to purchase and install systems in the nine stations identified that do not have these systems.<br><br>Will require a funding match. | |

## Fire and EMS Funding

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Fire and EMS Funding. | Maintain current funding source (general fund) for Fire and EMS services. | Provide additional funding, as can be allocated through the annual budget process, for staffing, programs, equipment, facilities, fleet, and day-to-day operational expenses through the current general fund platform. | In accordance with §27-23.1 of the Code of Virginia, establish a Fire and EMS district and separate Fire and EMS tax levy that would establish a separate means by which the County can meet existing needs and costs of the Fire and EMS system, but also future needs and enhancement of services, which are inevitable. |
| Self-Contained Breathing Apparatus (SCBA) funding. | Maintain current cache of SCBA equipment, the bulk of which was purchased in 2011-2012. | Provide matching funding for an SCFR submitted Assistance to Firefighters Grant that replaces each current SCBA harness, air cylinder, and mask.<br><br>Requires a matching grant funding of up to $325,580.96. | Provide full funding for the replacement of the current cache of SCBA equipment should the SCFR department not be awarded the grant.<br><br>Requires funding of up to $3,581,390.58. |

## Fire and EMS Operations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Adjust response policies so that they align with NFPA 1720 regarding Urban, Suburban, and Rural district designations. | Maintain districts 5, 9, 12, 15, 21, 23, 25, 51 as SCFR Urban response districts.<br><br>Maintain districts 14,18,17 as SCFR Rural response districts. | Align districts 5, 12, 25, and 51 with NFPA 1720 as Urban demand zones. These district stations should then follow the SCFR system urban turnout time standard of 5-minutes.<br><br>Align districts 9, 15, 21, and 23 with NFPA 1720 as suburban demand zones. These stations should then follow the SCFR system turnout time standard of 5-minutes.<br><br>Align districts 13, 14, and 18, with NFPA 1720 as rural demand zones. These stations should then follow the SCFR system rural turnout time standard of 10 minutes. | |
| Align with NFPA 1720 for Effective Response Force in Urban, Suburban, and Rural responses. | There is no current number of designated responders for building fires. | At a minimum, align the minimum staff to respond to the scene for building fires in the Urban, Suburban, and Rural demand zones with NFPA 1720. | |

## Fire and EMS Operations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Align with NFPA 1710 for Fire and EMS turnout times for career staffed EMS units. | There are no current turnout time performance standards for career staff for Fire or EMS calls at Stations 5, 13, 18, 21, 23. | Align career staffed stations with NFPA 1710 turnout times as:<br><br>≤ 80 seconds for fire and special operations<br><br>≤ 60 seconds for EMS responses | |
| Establish Response Travel Time Goals. | There are currently no system guidelines or policies for the arrival of the first fire suppression apparatus or ambulance. | Align turnout and travel time response time goals of the first arriving fire suppression apparatus on fire calls and first arriving EMS unit on EMS calls with NFPA 1720 assembling of an Effective Force benchmarks as follows:<br><br>Urban Demand Zone: 9 minutes<br><br>Suburban Demand Zone: 10 minutes<br><br>Rural Demand Zone: 14 minutes<br><br>*Town based stations include rural demand zones.* | |

## Fire and EMS Operations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Include in all appropriate response guidelines language that aligns with OSHA 1910.134 and NFPA 1500 regarding two-in-two-out. | There are currently no system guidelines or policies that directly discuss the two-in-two-out benchmark when operating on emergency scenes where an IDLH (Immediately Dangerous to Life and health) atmosphere exists. | Align response policies and emergency scene activities with NFPA 1500 standard on *Fire Department Occupational Safety, Health, and Wellness* and OSHA 1910.134 so that they directly address the two-in-two-out benchmark | |

## Fire and EMS Operations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Expand career staffing to the following stations based on call demand and/or time and distance for Fire and EMS responses: Toms Brook, Edinburg, Fort Valley (2 per shift/per station). | Maintain current career staffing levels at Stations 5, 13, 18, 21, 23, 25/51. | Over the near term:<br><br>Relocate one crew from Station 5 or Station 23 to Station 15 to close the response gap between Woodstock and Mt. Jackson where there is heavy EMS demand. Edinburg also serves as a more direct route to Fort Valley, which can reduce overall response times to this district in the short-mid-term through a 24/7/365 career crew at Station 15.<br><br>Requires funding for an SCFR ambulance.<br><br>Relocate one crew from Station 5 or Station 51 to Station 9 to close the response gap between Strasburg and Woodstock where there is heavy EMS demand.<br><br>Requires funding for an SCFR ambulance. | Over the longer term:<br><br>Implement a 2-person crew at Fort Valley station. Although there is low demand in the district, there is a time and distance response challenge. The time and distance challenges are both turnout and response travel time by the Station 14 volunteer crews, and time and distance from assisting units from SCFR Stations 15 and 25/51, or Fortsmouth in Warren County.<br><br>Requires funding for seven FTEs. SAFER Grant available. SAFER Grant funding available.<br><br>Implement a 2-person crew at the Toms Brook station. Current demand requires an ambulance to respond from Woodstock or Strasburg.<br><br>Implement a 2-person crew at the Edinburg station. Current demand requires an ambulance to respond from Woodstock, Mt. Jackson, or New Market.<br><br>Requires funding for seven FTEs. SAFER Grant funding available. |

## Fire and EMS Operations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Expand EMS service delivery with an Advanced Life Support Certified EMS Officer (Captain Level) on each career shift (3 total with one additional to backfill leave). | Currently, the SCFR department, which is the primary EMS response agency in the county, does not staff all units 100% of the time at the Advanced Life Support (ALS) level. Stations 23 and 25/51 maintain on average close to ¾ of the time at the ALS level; Station 5 maintains on average ALS staffing 50% of the time; the remaining stations (13, 18, 21) below 10% of the time. | Implement an EMS Officer level (Captain) that is trained to the ALS level (Paramedic) who is available to respond countywide and serve as an ALS provider on BLS ambulances when needed. This reduces the need to send two ambulances (one ALS, one BLS) to a single call when ALS care is needed.<br><br>This position should also be designated as the on duty EMS operations supervisor with duties to include managing EMS incidents, pharmaceutical exchange, supply, and inventory (this program shifted in 2024 from a hospital-based supply system to an agency-based supply system), liaison with hospital and assisted living/nursing home staff, monitoring of ambulance and crew resources, and assisting with EMS crew issues and challenges.<br><br>Requires funding-four FTEs. | Over the mid-longer terms as EMS calls may increase, implement an additional ALS provider in a quick response vehicle to respond countywide and serve as an ALS provider on BLS ambulances when needed.<br><br>As with the mid-level enhancement, this resource reduces the need to send two ambulances (one ALS, one BLS) to a single call when ALS care is needed.<br><br>This enhancement should be evaluated to determine the organizational level (EMS Officer at the Captain or Lieutenant level) at the time the enhancement is considered. |

## Fire and EMS Operations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Implement an Emergency Medical Dispatch Software System in the 911-Center. | Currently the 911-Center does not have an Emergency Medical Dispatch system in place that determines EMS calls as high or low acuity (based on protocols or commercial software), or whether the response should be Advanced Life Support or Basic Life Support. | | Work with the SCFR department and Medical Director and research the most appropriate Emergency Medical Dispatch system software for Shenandoah County. At a minimum, the system should, through call-taker interview, be able to create an EMS call determinant that is either low or high acuity, and if it requires Advanced Life Support or Basic Life support response.<br><br>Requires funding. |
| Expand SCFR career staffing at stations as needed by 2 career staff to staff fire apparatus separate from EMS units. | Currently only two stations have two career crews-Stations 23 and 51. Under this arrangement, one crew responds to initial EMS calls, and if a fire call is dispatched to the same station, the second crew responds the fire apparatus. Additionally, the second crew may respond on an ambulance if a second EMS call is dispatched. | | Over the longer term, and if volunteer membership diminishes, it may be necessary to add an additional 2-person crew to current stations where there is only one crew, and potentially at additional stations as needed-based on call demand and reduced volunteer participation. Much of this depends on volunteer recruitment and retention over the longer term.<br><br>Requires funding. SAFER Grant funding available. |

## Community Characteristics

Shenandoah County is located in northwestern Virginia and is part of the Shenandoah Valley region. The County amasses 512 square miles of which 509 are land. Included within the boundaries of the County are the independent towns of Edinburg, Mount Jackson, New Market, Strasburg, Toms Brook, Woodstock, which serves as the county seat. Each of the towns are serviced by a volunteer fire or fire and EMS station, which also responds into unincorporated area as part of their response district. Town stations may be supplemented by career staff

The county also includes within its boundaries several census-designated places that include Bayse, Bowmans Crossing, Clary, Columbia Furnace, Conicville, Fishers Hill, Forestville, Lebanon Church, Locust Grove, Hudson Crossroads, Maurertown, Mount Clifton, Mount Olive, Orkney Springs, Quicksburg, and Saumsville. Those highlighted are serviced by a volunteer fire or fire and EMS station, which are supplemented by career staff. In addition to the census-designated areas as outlined above, Shenandoah County has twenty-nine other unincorporated communities.

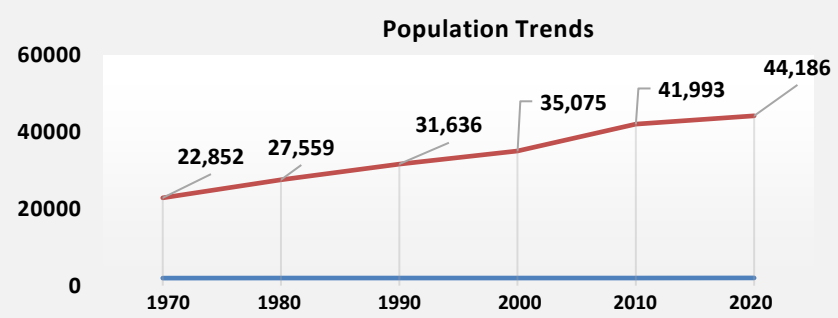
The County is bordered by several counties that includes Hardy County, WV to the northwest, Frederick County, VA to the northeast, Warren County, VA to the east, Page County, VA to the southeast, and Rockingham County to the southwest.

National protected areas in the county include Cedar Creek and Belle Grove National Historic Park and George Washington National Forest, both of which are part of the U.S. National Park Service.

The 2020 U.S. Census population for the entire county, to include incorporated towns was 44,186. When segregated, 62 percent of the population resides in the unincorporated areas of the county with the remaining 38 percent residing in the incorporated towns. Geographically, the six incorporated towns are situated north to south primarily along U.S. Route 11 and Interstate 81. Town populations range from 258 (Toms Brook) to 6,398 (Strasburg).[2]

Since 1970, Shenandoah County has grown in population 93 percent. From 2000 to 2020, the population increased 26 percent. Over the fifty-year period (1970-2020), Shenandoah County experienced two growth spurts. From 1970-1980, the county grew in population by almost 21 percent. The second significant growth period was from 2010 to 2020, when the county grew almost 20 percent in population.

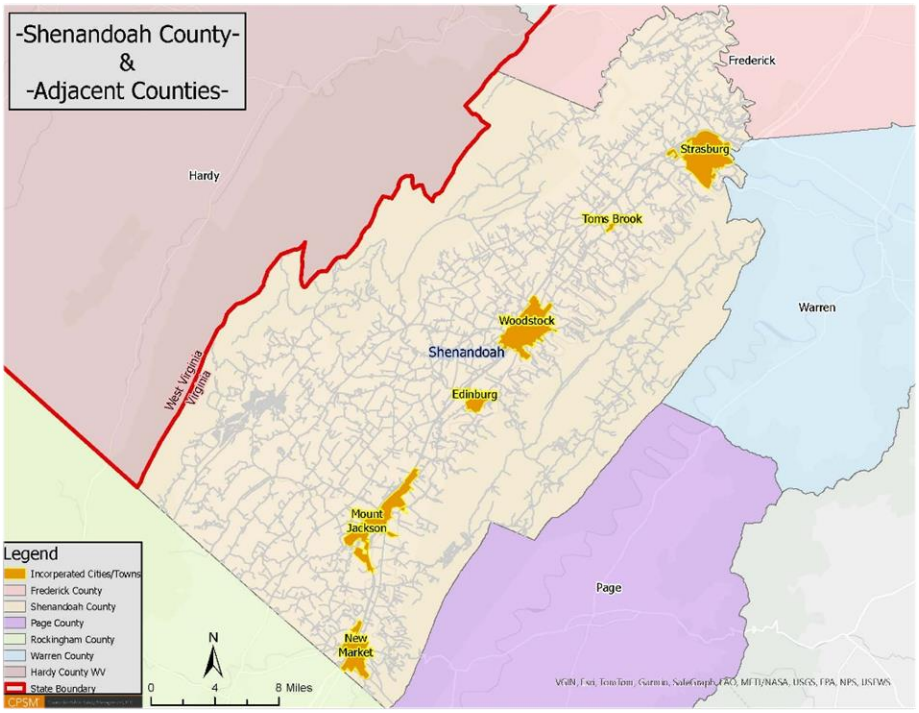
### Figure 1: Shenandoah County Population Growth: 1970-2020




2. U.S. Census, 2020.

The next figure illustrates Shenandoah County boundaries, the incorporated towns and town population (2020 U.S. Census), and adjacent counties in Virginia and West Virginia.

## Figure 2: Shenandoah County and Surrounding Area




**Unincorporated Population: 27,252 (62% of the population overall)**

**Town Populations (2020 Census)**

**Strasburg: 6,398**
**Toms Brook: 258**
**Woodstock: 5,097**
**Edinburg: 1,041**
**Mount Jackson: 1,994**
**New Market: 2,146**

**Town population represents 38% of the population overall.**

## Governance

A six-member Board of Supervisors governs Shenandoah County. Each Board member represents a magisterial district and is elected for a four-year term. The Board of Supervisors serves as the governing body for the County. The county utilizes the council-manager form of government and appoints a County Administrator to manage the day-to-day operations of county departments and services and act as a liaison to the Board on policy development and other relevant matters.[3]

Article 1, Chapter 20 of the Shenandoah County Code outlines the county's Fire and EMS system governance and related laws. More specifically:

- Article 1, §20-1 defines that the Shenandoah County Department of Fire and Rescue *shall include all paid and volunteer agencies as recognized in § 20-5 or those operating within the County under instances of mutual aid.*
- Article 1, §20-2 outlines that *the Chief shall have supervision and operational control over the Department. The Chief shall have the authority to enforce Department standard operating guidelines (SOGs) and standard operating procedures (SOPs). The Chief shall be the County Chief as specified in Code of Virginia, § 27-6.1, and County EMS Chief as specified in Code of Virginia, § 32.1-111.4:6.*

3. Shenandoah County Government.

- Article 1, §20-4 (A) outlines that *the Chief shall establish SOPs, SOGs, rules and regulations in collaboration with the Chiefs and Captains' Advisory Group for the Department's effective operation throughout the County. The Chief retains all operational and policy control with respect to matters affecting only Shenandoah County Fire and Rescue.*
- Article 1, §20-4 (B) outlines that *all companies operating in Shenandoah County and all members of such companies shall operate in accordance with the standard operational procedures/policies and guidelines.*

The overall public safety system in Shenandoah County also includes:[4]

- Law Enforcement: The Shenandoah County Sheriff's Office provides law enforcement services, criminal investigations, safety and crime prevention in Shenandoah County public schools, security in Shenandoah County courts, animal control services, and deploys various specialty teams.
- Emergency Communications: The Shenandoah County Emergency Communications Center serves as the Public Safety Answering Point (PSAP) for all 911 calls for service in the county (emergent and non-emergent), as well serving as the radio communications center for all public safety agencies in the County.
- Emergency Management: Emergency Management preparation, mitigation, preparedness, response, and recovery efforts are coordinated within the Shenandoah County Fire and Rescue department. Pursuant to § 44-146-19(2)(4) the County Administrator serves as the Emergency Manager and the Fire Chief serves as the Emergency Coordinator.

## Community Development and Impacts on Fire and EMS

Shenandoah County as a whole (incorporated and unincorporated areas) will continue to experience development and population growth over the next decennial census and beyond. This is due largely because of its location, natural beauty, way-of-life for residents, and access to transportation networks that this region larger work centers such as Northern Virgina.

Earlier we looked at population growth from 1970-2020 in the County (93-percent increase from 1970-2020 and 26-percent increase from 2000-2020). The next table outlines growth from 2000 to 2020 in the unincorporated area and each incorporated town.

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4. Ibid.

## Table 1: 2000-2020 Population Growth: Unincorporated and Incorporated County Areas [5]

| Area | 2000 Census Population | 2010 Census Population | 2020 Census Population | % Increase/Decrease 2000-2020 Census |
|---|---|---|---|---|
| **Shenandoah County- Incorporated and Unincorporated** | 35,075 | 41,993 | 44,186 | **26% Increase** |
| **Unincorporated County Only** | 22,737 | 25,059 | 25,725 | **13% Increase** |
| **Edinburg** | 813 | 1,041 | 1,185 | **46% Increase** |
| **Mount Jackson** | 1,664 | 1,994 | 1,959 | **18% Increase** |
| **New Market** | 1,637 | 2,146 | 2,146 | **31% Increase** |
| **Strasburg** | 4,017 | 6,398 | 7,093 | **77% Increase** |
| **Toms Brook** | 255 | 258 | 274 | **7% Increase** |
| **Woodstock** | 3,952 | 5,097 | 5,804 | **47% Increase** |

As outlined above, there have been population increases in the unincorporated county areas (13%) and each of the incorporated towns. Strasburg had the largest increase in population from 2000-2020 (77%) followed by Woodstock (47%), Edinburg (46%), New Market (31%), Mount Jackson (18%), and Toms Brook (7%). This illustrates growth in all areas of the County.

Shenandoah County and each of the incorporated towns have a comprehensive plan that includes discussion on growth and community development. This includes residential development of various types that will grow and potentially shift population, both of which will have effects on Fire and EMS demand for services. Commercial development, dependent on type, potentially increases community risk, which has an effect on resource deployment dependent on building design and layout, electrical systems, if any cooking equipment is included, storage of hazardous and/or flammable materials, occupancy levels (life-safety), and potential human-error.

The next table outlines potential growth as outlined in the Shenandoah County and individual town comprehensive plans.

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5. U.S. Census Quick Facts 2000-2020; Weldon Cooper Center for Public Service

## Table 2: Potential Growth by Area

| Area | Comprehensive Plan Year | Outlined Potential Growth |
|---|---|---|
| **Unincorporated Shenandoah County** | 2024 | The current Comprehensive Plan's future land use includes commercial and industrial, village and hamlet development that includes residential and mixed use, and residential (settlement) that may develop into a village or hamlet. This development is identified in all unincorporated areas where development is allowable under the plan. Villages and Hamlets are the primary development types. |
| **Edinburg** | 2005 | The current Comprehensive Plan's Existing land use map outlines land use for commercial, industrial, institutional, multi-family, mixed use, single and two family residential on undeveloped existing land within town boundaries. Not all of the land was developed at the time the plan was implemented. The plan also outlines policies and goals regarding current and future development and land use. There are areas outside of town boundaries designated as areas that have town utilities and future adjustment. Residential remains the highest land use in the town. |
| **Mount Jackson** | 2017 | The current Comprehensive Plan's future land use outlines land use for low, medium, and high-density residential units, commercial, industrial, institutional, and government designations. Not all of the land was developed at the time of the plan. There are areas outside of town boundaries designated as proposed town growth boundary. Low density residential remains the highest land use in the town. |
| **New Market** | 2012 | The current Comprehensive Plan's future land use outlines land use for low, medium, and traditional residential neighborhoods with some high-density residential area identified. Current and future land use includes commercial, industrial, retail, and business designations. Not all of the land was developed at the time of the plan. There are areas outside of town boundaries designated as proposed town growth areas in both Shenandoah and Rockingham counties. Residential remains the highest built on land use in the town. A plan goal is to grow the population at a moderate rate. |

| Area | Comprehensive Plan Year | Outlined Potential Growth |
|---|---|---|
| **Strasburg** | 2018 | The current Comprehensive Plan's future land use outlines primarily residential growth in the core town boundaries that will coexist with current residential land use and rural residential designated for areas along the perimeter of the town (largest land use acreage areas). Additional land use identifies mixed use, commercial, institutional, business park, and industrial current and future development. The largest acreage for future land use is residential. |
| **Toms Brook** | 2012 | Current land use in Toms Brook includes low and medium density residential, business, and industrial land use. The current Comprehensive Plan's future land use outlines growth within the town boundaries as managing its vacant and for-sale parcels and encouraging development compatible with the residential nature of the town. The future land use map proposes exploration of future development areas such as West Toms Brook in the northwest area of the town and the Route 11/I-81, Hahns Lane, Brook Village, Toms Brook School, Old Quarry, South Toms Brook, and West Toms Brook as growth areas outside of the town boundaries. |
| **Woodstock** | 2007<br><br>Draft Update 2024 | The current and draft Comprehensive Plan future land use outlines primarily residential growth to include low, medium, and high-density residential development. This is the primary land use regarding current and future growth. Other growth includes mixed use, commercial, light industrial, and institutional. The 2007 plan includes an urban growth area around the town where town services can be extended. Potential growth in these areas includes residential and commercial. |

**Land Use and Growth**, which links to population growth, and by the type of growth (residential, commercial, mixed use etc.), increases community risk and will impact SCFR system response by the types of buildings built (residential over commercial, large square footage single family dwellings, multi-level residential, large footprint commercial buildings, commercial processes using hazardous materials, vulnerable population housing), as well as density.

To further the population discussion in terms of Fire and EMS risk, the age and socio-economic profiles of the population can have an impact on the number of requests for Fire and EMS services. Evaluation of the number of seniors and children by fire districts can provide insight into trends in service delivery and quantitate the probability of future service requests. In a 2021

National Fire Protection Association (NFPA) report on residential fires, the following key findings were identified for the period 2015-2019: [6]

- Males were more likely to be killed or injured in home fires than females and accounted for larger percentages of victims (57 percent of the deaths and 55 percent of the injuries).
- The largest number of deaths (20 percent) in a single age group was among people aged 55 to 64.
- 48 percent of the victims of fatal home fires were between the ages of 25 and 64, and three of every five (62 percent) of the non-fatally injured were between the ages of 25 and 64.
- Slightly over one-third (37 percent) of the fatalities were age 65 or older; only 17 percent of the non-fatally injured were in that age group.
- Children under the age of 15 accounted for 11 percent of the home fire fatalities and 9 percent of the injuries. Children under the age of 5 accounted for 5 percent of the deaths and 4 percent of the injuries.
- Adults of all ages had higher rates of non-fatal fire injuries than children.
- Smoking materials were the leading cause of home fire deaths overall (23 percent) with cooking ranking a close second (20 percent).
- The highest percentage of fire fatalities occurred while the person was asleep or physically disabled and not in the area of fire origin - key factors to vulnerable populations.

In Shenandoah County (as a whole), the following age and socioeconomic factors are considered herein when assessing and determining risk for Fire and EMS preparedness and response:[7]

- Children under the age of five represent 5.6 percent of the population.
- People under the age of 18 represent 21.1 percent of the population.
- People over the age of 65 represent 22.3 percent of the population.
- Female persons represent 50.6 percent of the population.
- There are 2.49 people per household in Shenandoah County, (2019-2023).
- The median household income (in 2023 dollars), 2019-2023 was $64,437.
- People living in poverty make up 9.9 percent of the population.

Black or African American alone represents 3.6 percent of the population. The remaining percentage of population by race includes White alone (not Hispanic or Latino) at 92.3 percent, American Indian or Alaska Native alone at 0.6 percent, Asian alone at 1.2 percent, two or more races at 2.2 percent, and Hispanic or Latino at 9.6 percent.

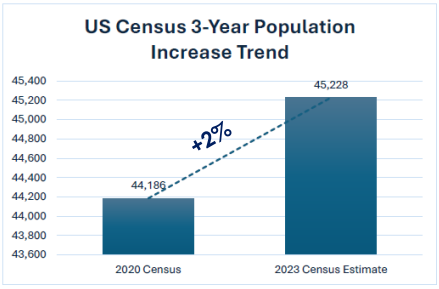
**The demographics in Shenandoah County overall pose a moderate risk in totality.** While not elevated, a single call involving a vulnerable population (Fire or EMS) poses a higher risk on that particular response. Additionally, people living in poverty may have access to health, nutrition, adequate housing, transportation, and other social needs challenges, which drive EMS demand.

6. M. Ahrens, R. Maheshwari "Home Fire Victims by Age and Gender," Quincy, MA: NFPA, 2021.
7. U.S. Census Bureau QuickFacts: Shenandoah County, VA.

***Population count has a direct correlation to workload for Fire and EMS agencies, and as well as other public safety services such as law enforcement and 911-dispatch centers.*** CPSM analyzed workload for three one-year periods that included July 1, 2021-June 30, 2022, July 1, 2022-June 30, 2023, July 1, 2023-June 30, 2024. The next two tables outline Fire and EMS workload for these one-year analysis periods and corresponding increases over the three-year period.

## Table 3: SCFR Three-Year Call Workload Analysis

| Start | End | Service | Total Calls |
|---|---|---|---|
| July 1, 2021 | June 30, 2022 | Fire | 2,184 |
| | | Rescue | 7,964 |
| | | **Subtotal** | **8,504** |
| July 1, 2022 | June 30, 2023 | Fire | 2,387 |
| | | Rescue | 8,152 |
| | | **Subtotal** | **8,736** |
| July 1, 2023 | June 30, 2024 | Fire | 2,476 |
| | | Rescue | 8,185 |
| | | **Subtotal** | **8,832** |




***Overall, call workload increased 4% over the three-year data analysis period July 2021-June 2024.***

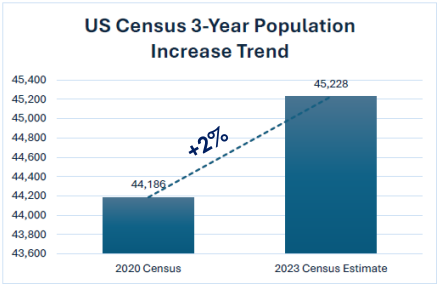
Another method CPSM utilizes to analyze workload is by runs. Where a call is the dispatch for service (either Fire or EMS) a run is the unit count to the call for service. A run includes one or more units responding to the single call for service. As an example, a building fire is dispatched as a single call. Each unit that responds is counted in the workload for that unit as a run. So, for a building fire that has a response of three engines, one ladder truck, one tanker, and one ambulance, the total workload for that single call is six runs.

***Run workload is the true measurement of a Fire and EMS system workload and demand for services.***

The next table outlines runs for the same three-period as outlined in the call count table.

## Table 4: SCFR Three-Year Run Workload Analysis

| Period | Service | Total Runs |
|---|---|---|
| July 1, 2021-June 30, 2022 | Fire | 3,576 |
| | EMS | 9,679 |
| | **Total** | **13,255** |
| July 1, 2022-June 30, 2023 | Fire | 3,934 |
| | EMS | 9,707 |
| | **Total** | **13,641** |
| July 1, 2023-June 30, 2024 | Fire | 4,028 |
| | EMS | 9.747 |
| | Total | **13,775** |




***Overall, run workload increased 4% over the three-year data analysis period July 2021-June 2024.***

In summary, there will be some levels of residential, commercial, industrial, mixed use, and institutional growth in the unincorporated area of the county as well as in the incorporated towns. As discussed above, community development and future growth whether it is population

growth, urban expansion, or economic development—will impact fire and emergency medical services (EMS). Impacts include, and are not limited to:

- Increased Demand for Services
  - Population Growth: More people mean more emergencies, from medical incidents to fires. EMS calls often increase proportionally with population size.
  - Commercial and Industrial Growth: New businesses, warehouses, or factories can increase the complexity and frequency of fire and safety risks.
  - Urban Sprawl: Geographic expansion can lead to longer response times if stations are not added or relocated to cover new areas effectively.
  - Increased demands on fire prevention and community risk reduction services.
- Staffing and Resources
  - Staffing Needs**:** More calls for service may require hiring additional personnel, increasing training demands, and diversifying skill sets.
  - Equipment and Apparatus**:** Additional or specialized vehicles and tools may be needed to address higher call volumes or specific risks that commercial, industrial, and institutional occupancies may present.
  - Station Placement: Growth may necessitate building new fire stations to maintain acceptable response times.

Managing the effects of growth on fire and EMS services requires careful planning, investment, and community collaboration to ensure these essential services keep pace with the community's needs. This includes budgetary pressure as expanding services requires increased funding for personnel, facilities, and equipment. As always, Shenandoah County must balance these needs with tax revenue, other funding sources such as grants, and against the needs of other services.

CPSM assesses the County will have to expand Fire and EMS resources for career and volunteer services as population and community growth continues. Expansion of services will be necessary to maintain adequate response times, deploy adequate resources with an adequate career and volunteer staff to respond to an increase in demand for services.

## Community Risk Profile and Impacts on Fire and EMS

The SCFR and volunteer companies recognize there are hazards and risks that exist currently in the SCFR service area. Current and future risks bring with them an inherent risk to the citizens and visitors of the SCFR service area, including property and the environment itself. In less technical terms, hazards are the causes of danger and peril in the community and risk quantify the degree of potential danger that the hazard presents. Contemporary risk assessing utilizes three factors when analyzing risk.[8] [9] These are:

- **Probability** or likelihood of an incident occurring, which defines the frequency of the various incidents fire departments respond to.

8. NFPA 1300, Standard on Community Risk Assessment and Community Risk Reduction.
9. https://www.usfa.fema.gov/prevention/community-risk-reduction.

- **Consequence** (magnitude) of an incident on the community, which is the measure of the outcome of a fire, fire related, EMS, technical rescue, or Haz-Mat incident on the community.
- **Probability and Consequence** combined identifies the risk based on the probability of an incident and the consequence on the community.
- **Impact** of an incident on the SCFR system as an emergency response agency and its ability to provide ongoing services to the remaining areas for service.

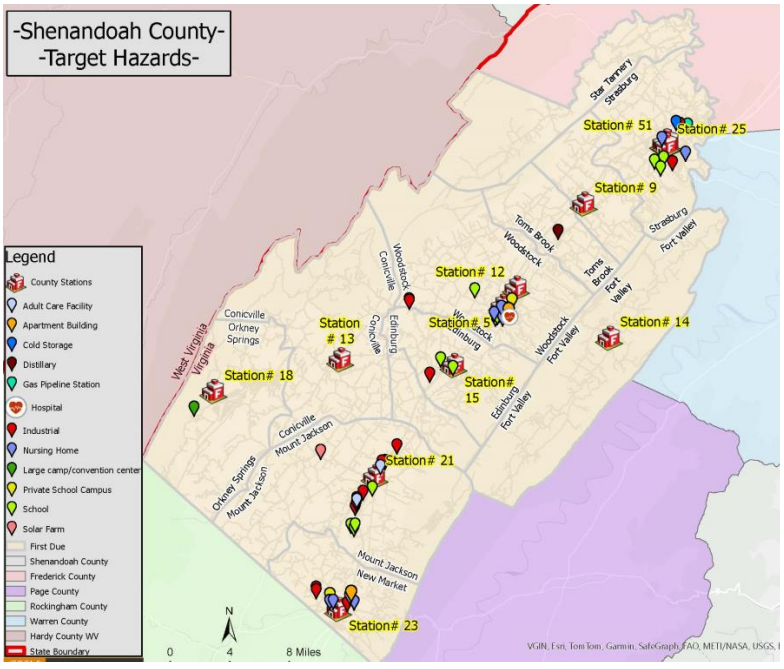
## Building and Target Hazard Factors

Building risk includes building types such as residential, mixed-use (residential over commercial), apartments and townhomes, hotels, condominiums, industrial, commercial, institutional such as assisted living, hospital, and nursing homes, general businesses, and schools.

The largest percentage of building risk in Shenandoah County is single family dwellings (low risk as classified by the National Fire Protection Association-Fire Protection Handbook, 20th edition). These buildings are primarily wood frame construction, and many have basements and are built with lightweight wood construction materials, which increases the building risk. ***As a note here, single family detached homes of 3,000 square feet and higher with a basement should be pre-planned as moderate risks due to the open floor plan, construction materials, and potential fire load.***

Shenandoah County does have medium and high risk occupancies to include schools (elementary, middle, high), two private academies that include on-site housing, skilled nursing and adult care facilities, a hospital, places of public assembly, multi-family residential to include buildings of more than two floors, strip malls, natural gas pipeline and sub-station, retreat center (Shrine Mont that has seasonal high occupancy load), and industrial, commercial, and mercantile buildings that use or may store hazardous materials.

Target hazards are defined as significant hazards that can stress the fire department response capability, a plausible scenario in which a fire department could quickly become overwhelmed and for which additional resources would be needed to mitigate the incident.

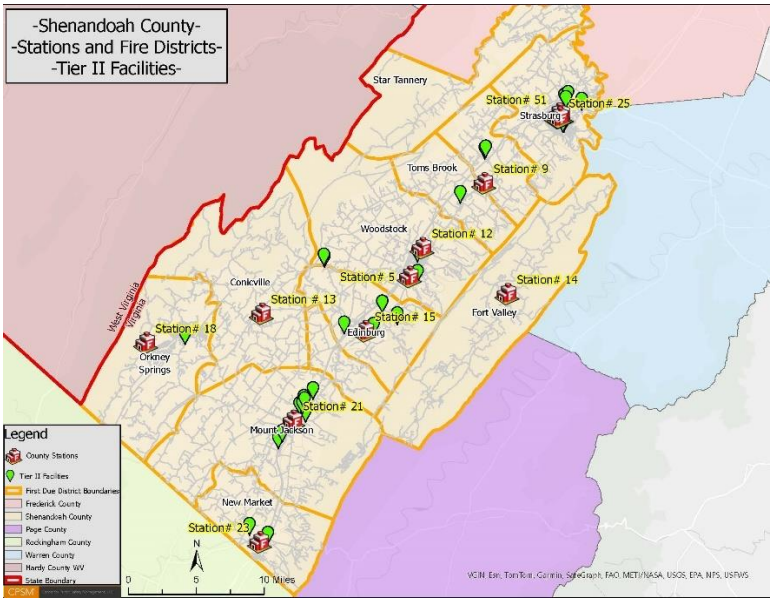



Target hazard locations are illustrated on the map to the left. Only a small number of target hazards are located outside of the incorporated town limits.

Target hazards include places of public assembly, the hospital, schools, industrial and commercial facilities, mercantile facilities, and other facilities deemed a target hazard by SCFR.

Shenandoah County also has thirty (30) facilities/businesses that are required under the federal *Emergency Planning and Community Right-to-Know Act* (EPCRA) law to report hazardous or toxic substances that are stored at their facilities and that meet specified thresholds at any given point in the reporting year. Tier II reporting is submitted to the Virgina Department of Environmental Quality and to the Local Emergency Planning Committee (LEPC). ***CPSM assessed that Shenandoah County does not have a LEPC so Tier II submissions on the local level go to SCFR administration.*** **Additionally, and because there is no LEPC, Tier II reporting is not mandatory.**

Tier II locations are illustrated on the next map. Only a small number of Tier II locations are located outside of the incorporated town limits.




Tier II facilities include fueling stations, critical infrastructure such as water and wastewater treatment facilities, and commercial, industrial, and mercantile facilities that store and use reportable quantities of toxic and/or hazardous materials.

Almost all Tier II facilities are located along the I-81/Route 11 corridor and located in or around the towns. There are just two outside of the towns as noted on the map and include Mountain View Rendering and Stoney Creek Sanitary District.

## Environmental Risks

Shenandoah County is prone to and will continue to be exposed to certain environmental hazards and risks that may impact on the community. These risks can be life-threatening and can destroy property, disrupt the economy, lower the overall quality of life for individuals, and create significant call demand for the SCFR system.

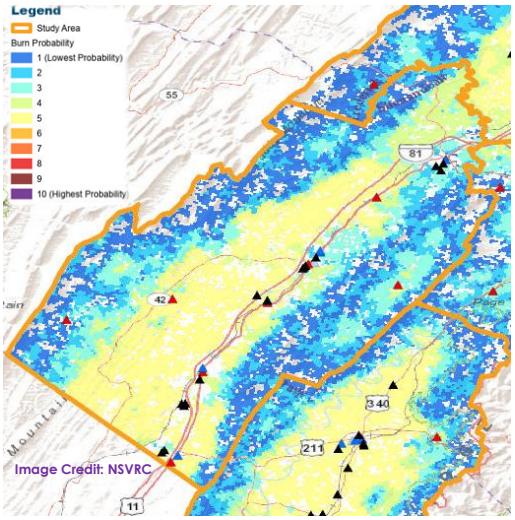
Environmental risks include a wide range of natural hazards, including but not limited to snowstorms, tornados, flooding, ice and sleet storms, and summer storms with lightning. Other risks include tropical system remnants, wildfire, tornadoes, and dam failure.

| Hazard (Risk) | Threat level Ranking |
|---|---|
| Flooding | 1 |
| Winter Storm/Extreme Cold | 2 |
| High Wind/Hurricanes | 2 |
| Tornado | 3 |
| Lightning | 4 |
| Thunderstorms | 5 |
| Hazardous Materials Spills | 6 |
| Pipeline Eruptions/Explosions | 6 |

The threat level for natural and hazardous materials release or spill risks are identified and ranked in the *Shenandoah County Emergency Operations Plan*.

Threat levels range from 1-6 with Threat Level 1 the most severe or most common/expected threat and Threat Level 6 the least expected, but not necessarily the least severe, as a Hazardous Materials spill of release can be a severe threat to the environment and to the health of the public.

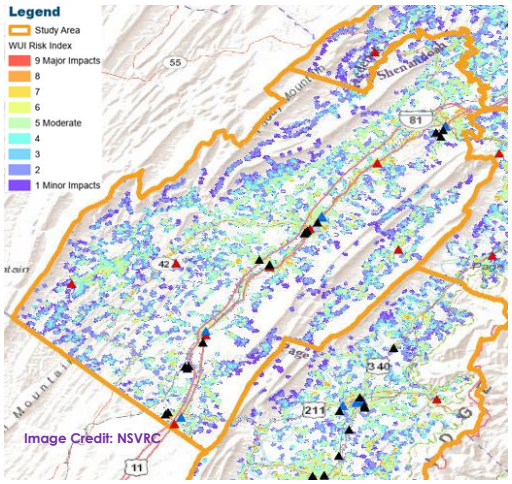
**Wildland -Brush Fire Risks**




An additional environmental risk includes wildland or brush fires. Uncontrolled wildland and brush fires can be a significant risk in the county as a whole, particularly around areas that are built upon such as the towns.

These fires can burn uncontrolled through available fuel that includes natural vegetation and anything that burns, including structures. These fires also require significant resources to control. Generally, the county as a whole has a moderate burn probability.

Shenandoah is prime for fast-moving wildfires as it has a high natural fuel load that includes natural vegetation and agricultural crops. ***Overall, the county is at a low-moderate risk for wildland fires.***




The wildland-urban interface is another challenge in Shenandoah County. When a wildland fire moves from unoccupied and open land to an area with development, property and life in this space are at risk.

***The wildland-urban interface risk is increased in many areas of the county (levels of 6,7,8) as indicated in the map to the upper left.***

Community wildfire protection planning is one of the most important components of a wildfire safety strategy. A national best practice is the implementation of coordinated Community Wildfire Preparedness Plans (CWPPs) for those areas in the county identified as Wild-Urban Interface risks. The purpose of these plans is to:

- Enhance levels of fire resilience and protection to the communities and infrastructure.
- Identify the threat of wildland fires in the area.
- Identify strategies to reduce the risks to structures, infrastructure, and commerce in the community during a wildfire.
- Identify wildfire hazards, education, and mitigation actions needed to reduce risk.
- Transfer practical knowledge through collaboration between stakeholders toward common goals and objectives.

Communities that understand the wildland-urban interface and create defensible spaces around vulnerable property through vegetation mitigation will reduce wildland fire risks. ***CPSM assessed that there are limited CWWP plans in place throughout the county.***

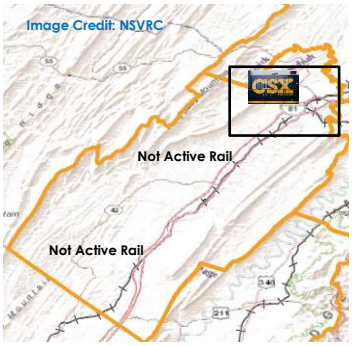
## Transportation Risks

Transportation risks include roads, rail, and air traffic. Shenandoah County has an array of typical road classifications within the county. The current road network consists of an interstate highway; major collector roads; minor collector roads; minor arterial roads; and local roads. [10] [11]

Additionally, Shenandoah County has a mass transit system provided by buses through the Virgina Regional Transit operating as ShenGo. ShenGo operates buses Monday through Saturday from 6:00 am to 6:00 pm with two routes. The North Loop route includes stops in Strasburg, Toms Brook, and Woodstock. The South Loop includes stops in Edinburg, Mount Jackson, and New Market.

The road and transportation network described herein for the Shenandoah County poses risks for a vehicular accident, some at medium to fast speeds, as well as vehicular-versus-pedestrian risks. There are additional transportation risks since tractor-trailers and other commercial vehicles traverse the roadways of Shenandoah County to deliver mixed commodities to business locations. Fires involving these products can produce smoke and other products of combustion that may be hazardous to health. An additional risk is the release or spill of a hazardous product (hazardous material), which may be harmful to and hazardous to health and the environment. Lastly, there is a mass casualty risk should a bus be involved in an accident carrying passengers.

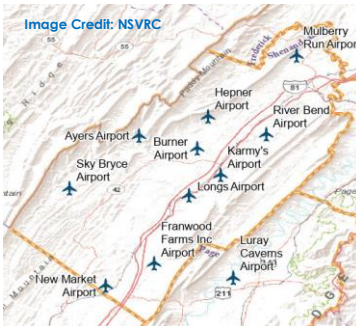
### Freight Rail




Shenandoah County has freight rail that is located in the northeast part of the county to include the Town of Strasburg. CSX Railroad hauls various commodities of freight between Strasburg and Winchester and beyond. Commodities may include agricultural products, chemicals, minerals, and wood products.

Risks include fires involving commodities that produce smoke and other products of combustion that may be hazardous to health. An additional risk is the release or spill of a hazardous product, which may be harmful to and hazardous to health and the environment.

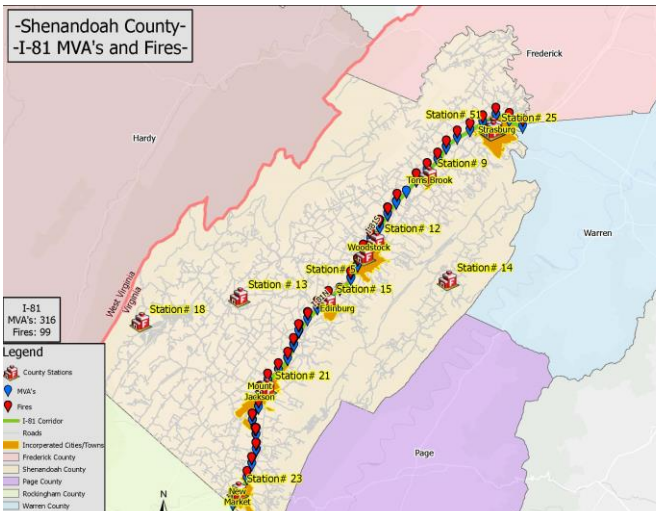
### Air Traffic/Airports




Shenandoah County has ten small private airports. Two airports are general aviation and eight are private use. Sky Bryce and New Market airports are general aviation and therefore will have more activity than privately owned.

Airport risks are minimal and may increase dependent on air traffic and fueling operations. Any aircraft accident in a populated area will create a higher risk for life and property.

10. Shenandoah County Comprehensive Plan.
11. Virginia Department of Transportation.




A higher transportation risk in Shenandoah County is Interstate 81 due to its heavy traffic volume (higher than local county traffic volume on intra-county roads) and high speeds. The next figure outlines motor vehicle accidents and fire responses on Interstate 81 (by mile marker).

In the three-year workload analysis CPSM performed, there were 316 motor vehicle accidents and 99 fire responses such as vehicle fires and hazardous materials spills.

## Historical Property Loss Review

Fire loss is an estimation of the total loss from a fire to the structure and contents in terms of replacement. Fire loss includes building contents damaged by fire, smoke, water, and overhaul. Fire loss does not include indirect loss, such as business interruption.

In 2022, local fire departments responded to an estimated 1.5 million fires in the United States. These fires caused 3,790 civilian fire deaths and 13,250 reported civilian fire injuries. The property damage caused by these fires was estimated at $18 billion. On average, a fire department responds to a fire somewhere in the US every 21 seconds. A home structure fire was reported every 88 seconds, a home fire death occurred every three hours and fourteen minutes, and a home fire injury occurred every 53 minutes.[12] Key findings from this report include:

- Public fire departments in the U.S. responded to 1,504,500 fires in 2022, a 11.2 percent increase from the previous year.
- 522,500 fires occurred in structures (35 percent of the reported fires). Of these fires, 382,500 occurred in residential structures and 80,000 occurred in apartments or multifamily structures. 2,760 civilian fire deaths occurred in residential fires, and 470 deaths occurred in apartments or multifamily structures.
- Home fires were responsible for 10,320 civilian injuries.

The following table shows overall fire and property loss in Shenandoah in terms of dollars for the year as assessed and estimated by the SCFR system. This information should be reviewed regularly and discussed in accordance with response times to actual fire incidents, company level training, effectiveness on the fire ground, and effectiveness of incident command. Property loss information should also be included in any strategic planning discussions regarding response times, training, incident command, staffing, and deployment of resources.

### Table 5: Historical Property and Content Loss in Shenandoah County[13]

| 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| $1,485,000 | $5,964,000 | $5,500,000 | $8,377,000 | $10,250,000 |

12. US Fire Problem -- Fire Loss in the United State, Shelby Hall (2023).
13. Based on SCFR system reporting – reflects estimates from NFIRS fire reports.

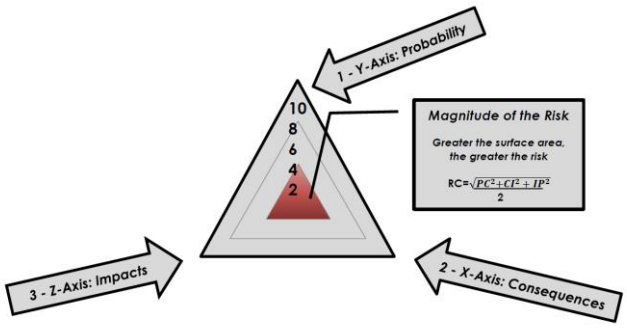
When assessing environmental, natural, transportation, and building risks, Fire-Rescue agencies must account for a variety of potential impacts. Impacts on the SCFR system include increased demand for services; increased demand on personnel needed to mitigate a single or multiple emergencies; need for specialized training; prolonged incidents impacting the ability to respond to multiple calls for service; the potential for mass casualties overwhelming EMS units; reliance on mutual aid to assist in the mitigation of one or more emergencies or backfilling stations for other responses.

## Three Axis Risk Analysis

A comprehensive risk assessment is a critical aspect of assessing and creating a deployment analysis to meet the community's risk and can assist a fire department in quantifying the risks that it faces. Once those risks are known and understood, the department is better equipped to determine if the current response resources are sufficiently staffed, equipped, trained, and positioned.

Risk is often categorized in three ways: the probability the event will occur in the community, the impact on the fire department, and the consequence of the event on the community. The following three tables look at the probability of the event occurring, which ranges from unlikely to frequent; consequence to the community, which is categorized as ranging from insignificant to catastrophic, and the impact to the organization, which ranges from insignificant to catastrophic.

Prior risk analyses have only evaluated two factors of risk: probability and consequence. In alignment with the Commission of Fire Accreditation's Standards of Cover analysis, CPSM utilizes the three-axis risk assessment formula, which uses three parameters to evaluate the probability, consequence, and impact of an incident. The figure below outlines this.




**P = Probability (Y-Axis):** Probability is associated with the frequency of an incident type.

**C = Consequences (X-Axis):** Consequence is the measure of the outcome of an incident type by identifying and categorizing community hazards. Risk factors then quantify the degree of potential danger the hazard presents.

**I = Impact (Z-Axis):** Impact describes a fire department's ability to provide ongoing services to the remaining areas of a community and what plan is in place for both the current incident, but also overall high-volume demand areas. It is important to have a plan in place to relocate response resources, use mutual or automatic aid, as an example, to ensure the best coverage possible.

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The next three tables outline the categories, descriptions, and risk scoring for the probability of an event occurring, the impact of the event on the Fire-Rescue system, and the consequences on the community. Scoring considers all factors/hazards as assessed in the jurisdiction. Scoring then determines what factors/hazards are classified as low, medium, high, or a special risk.

### Table 6: Event Probability

| Probability | Chance of Occurrence | Description | Risk Score |
|---|---|---|---|
| **Unlikely** | 2%-25% | Events may occur only in exceptional circumstances. | **2** |
| **Possible** | 26%-50% | Event could occur at some time and/or no recorded incidents. Little opportunity, reason, or means to occur. | **4** |
| **Probable** | 51%-75% | Events should occur at some time and/or few, infrequent, random recorded incidents, or little anecdotal evidence. Some opportunity, reason, or means to occur; may occur. | **6** |
| **Highly Probable** | 76%-90% | Events will probably occur and/or regular recorded incidents and strong anecdotal evidence. Considerable opportunity, means, reason to occur. | **8** |
| **Frequent** | 90%-100% | An event is expected to occur. High level of recorded incidents and/or strong anecdotal evidence. | **10** |

### Table 7: Impact on SCFR System

| Impact | Impact Categories | Description | Risk Score |
|---|---|---|---|
| **Insignificant** | Personnel and Resources | One apparatus out of service for a period not to exceed one hour. | **2** |
| **Minor** | Personnel and Resources | More than one but not more than two apparatus out of service for a period not to exceed one hour. | **4** |
| **Moderate** | Personnel and Resources | More than 50 percent of available resources committed to an incident over 30 minutes. | **6** |
| **Significant** | Personnel and Resources | More than 75 percent of available resources committed to an incident over 30 minutes. | **8** |
| **Catastrophic** | Personnel, Resources, and Facilities | More than 90 percent of available resources committed to an incident for more than two hours or event which limits the ability of resources to respond. | **10** |

## Table 8: Consequence to Community

| Impact | Consequence Categories | Description | Risk Score |
|---|---|---|---|
| **Insignificant** | Life Safety | 1 or 2 people were affected, minor injuries, minor property damage, and no environmental impact. | **2** |
| **Minor** | Life Safety<br><br>Economic and Infrastructure<br><br>Environmental | ■ A small number of people were affected, no fatalities, and a small number of minor injuries with first aid treatment. Minor displacement of people for <6 hours and minor personal support required.<br>■ Minor localized disruption to community services or infrastructure for <6 hours. Minor impact on environment with no lasting effects. | **4** |
| **Moderate** | Life Safety<br><br>Economic and Infrastructure<br><br>Environmental | ■ Limited number of people affected (11 to 25), no fatalities, but some hospitalization and medical treatment required. Localized displacement of small numbers of people for 6 to 24 hours. Personal support satisfied through local arrangements. Localized damage is rectified by routine arrangements.<br>■ Normal community function with some inconvenience. Some impact on environment with short-term effects or small impact on environment with long-term effects. | **6** |
| **Significant** | Life Safety<br><br>Economic and Infrastructure<br><br>Environmental | ■ Significant number of people (>25) in affected area impacted with multiple fatalities, multiple serious or extensive injuries, and significant hospitalization.<br>■ A large number of people were displaced for 6 to 24 hours or possibly beyond. External resources required for personal support. Significant damage that requires external resources. Community only partially functions, some services unavailable. Significant impact on environment with medium- to long-term effects. | **8** |
| **Catastrophic** | Life Safety<br><br>Economic and Infrastructure<br><br>Environmental | ■ A very large number of people in affected area(s) impacted with significant numbers of fatalities, large number of people requiring hospitalization, serious injuries with long-term effects. General and widespread displacement for prolonged duration; extensive personal support required. Extensive damage to properties in affected area(s) requiring major demolition.<br>■ Serious damage to the infrastructure. Significant disruption to, or loss of, key services for a prolonged period.<br>■ Community unable to function without significant support.<br>■ Significant long-term impact on the environment and/or permanent damage. | **10** |

The following factors/hazards are identified and considered when calculating community risk:

- **Demographic factors** such as age, socio-economic, vulnerability.
- **Environmental hazards** such as major weather events, snow and ice events, wind events.
- **Manufactured hazards** such as rail lines, roads and intersections, target hazards.
- **Structural/building** risk such as size (height and footprint), access, water supplies (fire flow), and construction type and materials.
- **Fire and EMS incident numbers and density** such as concentration of calls, call types, priority calls.
- **Resiliency, which is** the ability to adapt to changing conditions and recover from emergencies.

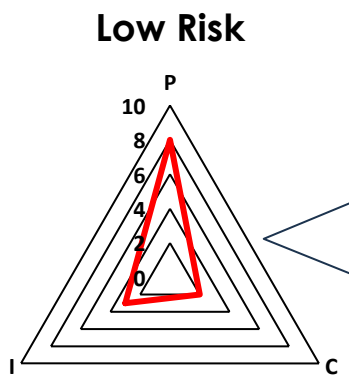
The assessment of each factor and hazard discussed herein took into consideration the likelihood of the event, the impact on the jurisdiction, and the impact on the Fire-Rescue department's ability to deliver emergency services. The list is not all inclusive but includes categories that are most common or that may present to the jurisdiction studied.

The following context and graphs illustrate the basic risk in Shenandoah County for low, medium, high, and special risks that exist in the community.

## Low Risk

- Automatic fire/false alarms.
- Low acuity-BLS EMS Incidents.
- Low-risk environmental events.
- Motor vehicle accident (MVA), with no entrapment or multiple patients.
- Good intent/hazard/public service fire incidents with no life-safety exposure.
- Outside fires such as grass, rubbish, dumpster, vehicle with no structural/life-safety exposure.

**Figure 4: Low Risk**




Low Risk considers:

- 93% of all calls are EMS-a large percentage are lower acuity.
- 21%% of fire call types are non-fire calls such as fire alarms, good intent, and public service.
- 30% of fire calls are Structure or Outside Fires.

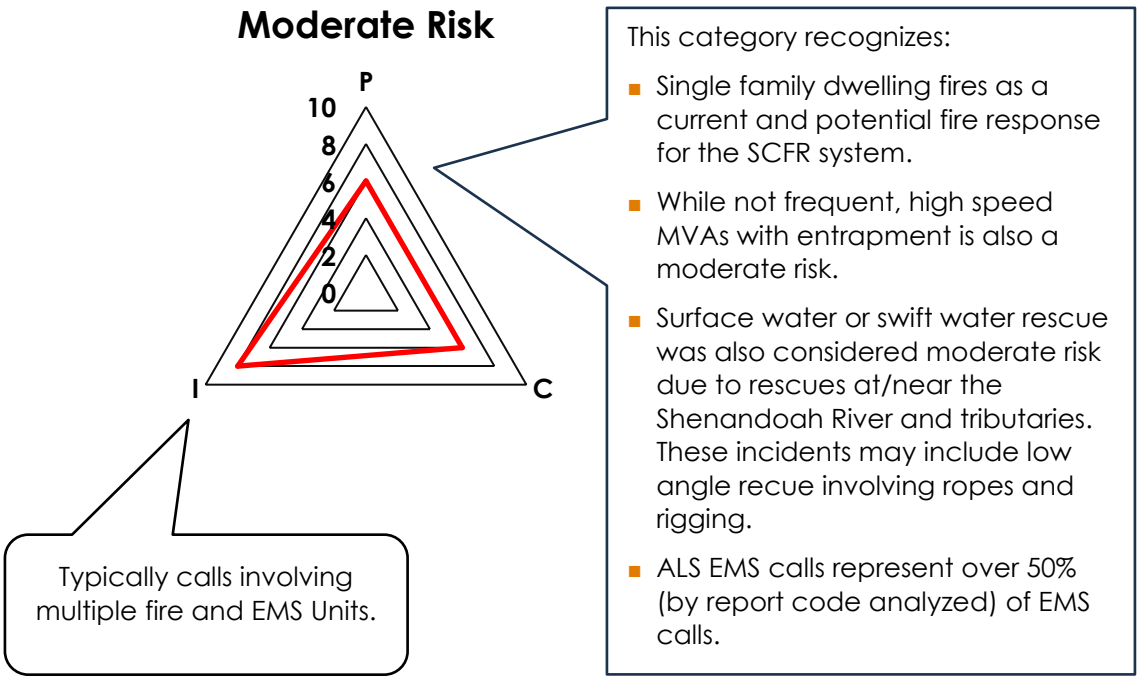
Typically calls involving one fire and/or one EMS Unit.

Some include two fire or two EMS Units.

**Moderate Risk**

- Fire incidents in a single-family dwelling where fire and smoke or smoke are visible, indicating a working fire.
- Suspicious substance investigation involving multiple fire companies and law enforcement agencies.
- ALS EMS incident.
- MVA with entrapment.
- Small aircraft incident.
- Low-angle rescue involving ropes and rope rescue equipment and resources.
- Surface or Swiftwater water rescue.
- Good intent/hazard/public service fire incidents with life-safety exposure.
- Rail event with no release of product or fire, and no threat to life safety.
- Wildland-Urban Interface incidents.

**Figure 5: Moderate Risk**

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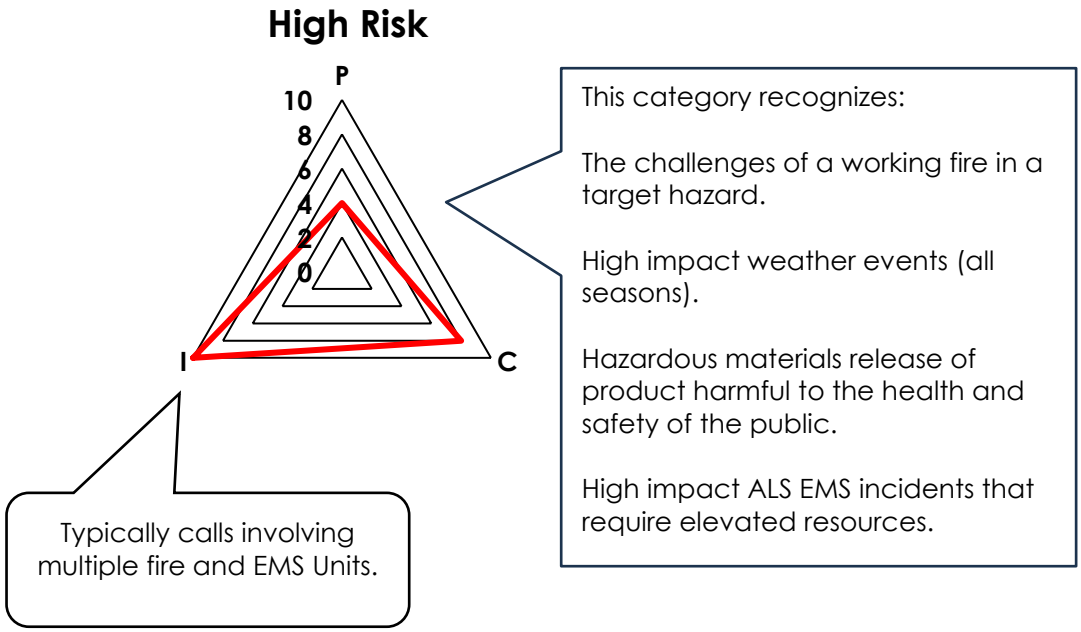
**High Risk**

- Working fire in a target hazard.
- Cardiac arrest or other high impact ALS-EMS incidents requiring elevated resources.
- Mass casualty incident of more than 10 but less than 24 patients (bus, plane crash)
- Confined space rescue.
- Structure collapses involving life-safety exposure.
- High-angle rescue involving ropes and rope rescue equipment (Lake Shenandoah County)
- Trench rescue.
- Suspicious substance incident with multiple injuries.
- Industrial leaks of hazardous materials that cause exposure to people or threatens life safety.
- Weather events that create widespread flooding, heavy winds, building damage, and/or life-safety exposure.
- Hazardous materials spill or leak.

**Figure 6: High Risk**

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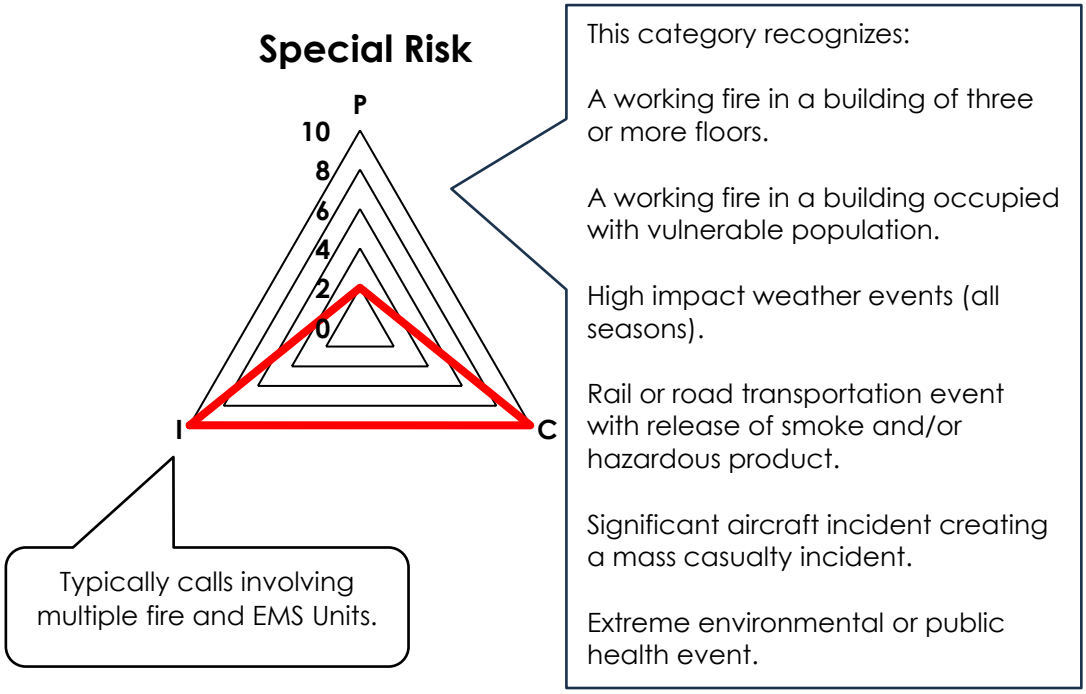
## Special Risk

- Working fire in a structure of more than three floors.
- Fire at an industrial building or complex with hazardous materials.
- Fire in an occupied targeted hazard with special life-safety risks such as age, medical condition, or other identified vulnerabilities.
- Mass casualty incident of more than 25 patients.
- Aircraft incident in a populated area.
- Rail or transportation incidents that cause life-safety exposure or threaten life safety through the release of hazardous smoke or materials and evacuation of residential and business occupancies.
- Explosion in a building that causes exposure to people or threatens life safety or outside of a building that creates exposure to occupied buildings or threatens life safety.
- Massive river/estuary flooding, high impact environmental events, pandemic.
- Mass gathering with threat fire and threat to life safety or other civil unrest, weapons of mass destruction release.
- Wildland-Urban Interface incident with multiple buildings threatened and involved or that is rapidly exposing incorporated areas with densely built upon area.

**Figure 7: Special Risk**



## Workload and Demand

Workload and demand include the types of calls to which Fire and EMS units are responding to, the frequency, and the location of the calls. Demand drives workload, staffing and station distribution considerations. Higher population centers with increased demand require greater resources. Higher demand affects the resiliency of Fire and EMS departments, which can translate into longer response times.

EMS demand presents additional considerations, such as: the demand for available EMS units and crews, which is typically higher than fire units and crews; demand on non- EMS units responding to calls for service (fire/police units); and availability of EMS crews in departments that utilize cross-trained EMS staff to perform fire suppression critical tasks.

An indication of the community's fire risk is the type and number of fire related, non-fire related, EMS, technical rescue, and hazard incidents the fire department responds to. The entire SCFR service area is subject to these types of calls for service.

Statistically, fires are more likely to occur in residential structures and are more likely due to human causes. Historical CPSM statistics tell us that EMS calls for service typically involve one patient whose symptoms are such that the capabilities of the initial arriving unit(s) can manage the call. Mass casualty incidents may occur in Shenandoah County, and the impact on the department may be overwhelming, possibly triggering the need for mutual aid.

The next tables illustrate calls in the county from July 1, 2023, to June 30, 2024, by call type. The first table outlines calls dispatched to Fire units. The second table outlines calls dispatched to EMS units.

### Table 9: SCFR System Fire Unit Calls by Type

| Call Type | Total Calls | Call Percentage |
|---|---|---|
| EMS assist | 952 | 38.4 |
| MVA | 249 | 10.1 |
| **EMS Subtotal** | **1,201** | **48.5** |
| False alarm | 187 | 7.6 |
| Good intent | 123 | 5.0 |
| Hazard | 122 | 4.9 |
| Outside fire | 185 | 7.5 |
| Public service | 213 | 8.6 |
| Structure fire | 68 | 2.7 |
| Technical rescue | 40 | 1.6 |
| **Fire Subtotal** | **938** | **37.9** |
| Canceled | 188 | 7.6 |
| Mutual aid | 149 | 6.0 |
| **Total** | **2,476** | **100.0** |

**Overall, this table tells us:**

**38.4% of all Fire calls were EMS assist (largest response category for Fire units).**

**10.2% of all Fire calls were structure or outside fire responses.**

**37.8% of Fire calls were non-fire responses (includes MVA responses).**

**6% of Fire calls were outside of the county and classified as Mutual Aid.**

**7.6% of Fire calls were cancelled either before units left the station or while enroute.**

## Table 10: SCFR System EMS Calls by Type

| Call Type | Total Calls | Call Percentage |
|---|---|---|
| Breathing difficulty | 740 | 9.0 |
| Cardiac and stroke | 767 | 9.4 |
| Cardiac arrest | 89 | 1.1 |
| Fall and injury | 1,672 | 20.4 |
| Illness and other | 2,293 | 28.0 |
| MVA | 426 | 5.2 |
| Overdose and psychiatric | 128 | 1.6 |
| Seizure and unconsciousness | 721 | 8.8 |
| **EMS Subtotal** | **6,836** | **83.5** |
| Non-EMS | 1,072 | 13.1 |
| Mutual aid | 277 | 3.4 |
| **Total** | **8,185** | **100.0** |

**Overall, this table tells us:**

**48.4% of all EMS calls are either fall, injury, illness or other, which are typically lower acuity calls.**

**27.2% of all EMS calls are either breathing difficulty, cardiac, stroke, or seizure and unconscious which are typically higher acuity calls needed ALS intervention.**

**1.1% of all EMS calls are cardiac arrest, which are high acuity and typically take one or more ALS technicians.**

**MVA, overdose and psychiatric make up 6.8% of all EMS calls. These calls are typically low acuity but may need ALS intervention.**

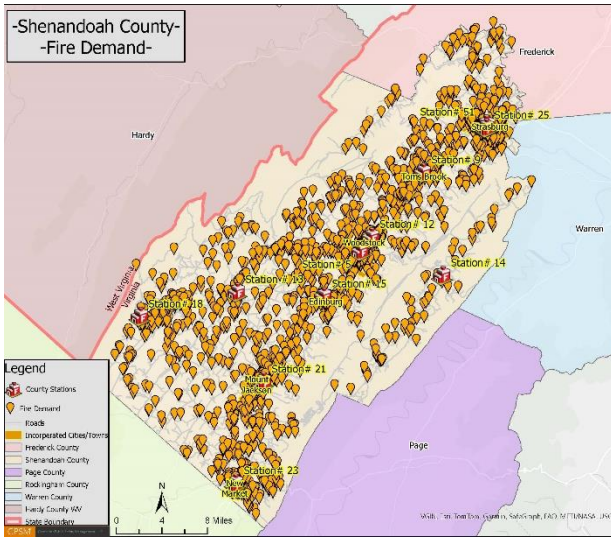
**13.1% of all EMS calls are non-EMS responses and include fire and non-fire responses (*public service calls are the highest percentage of non-EMS calls*).**

**3.4% of Fire calls were outside of the county and classified as Mutual Aid.**

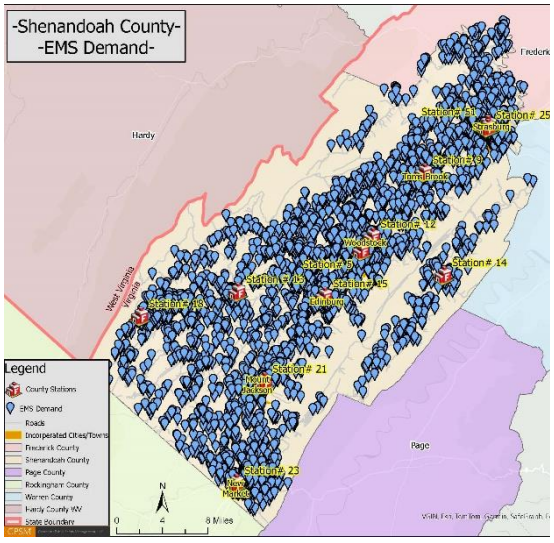
The next set of maps look at the concentration of Fire and EMS calls (separate maps) that includes the aggregate of the three-year study periods. Analysis of these maps tell us the greatest Fire and EMS demand is along the Route 11 corridor where the towns are located. This includes the towns and the unincorporated areas around the towns. Additional concentration of demand (particularly EMS) includes unincorporated areas of Bayse, Forestville, Mount Clifton, Columbia Furnace, Maurertown, Mount Olive, Lebanon Church, and Fort Valley.

## Figure 8: Fire and EMS Demand: Shenandoah County

**Fire Demand**




**EMS Demand**



The next set of tables outlines the workload (demand) of each station regarding Fire and EMS unit responses (links to the demand maps above). The largest percentage of Fire unit call responses are in the first due area. Runs include multi-unit responses to other fire districts.

EMS unit responses include first due and other district response areas based on availability of EMS units. EMS has a higher demand and EMS units often respond outside of their first due area, particularly in districts that do not have an EMS unit (Toms Brook, Fort Valley, and Edinburg).

The responses are measured in calls and runs (calls are a single dispatch and a run represents when a unit participates in a multi-unit incident response).

## Table 11: Workload of Fire Units by Response

| First Due Area | Calls | Runs |
|---|---|---|
| 9 - Toms Brook | 177 | 362 |
| 12 - Woodstock | 396 | 774 |
| 13 - Conicville | 205 | 311 |
| 14 - Fort Valley | 95 | 168 |
| 15 - Edinburg | 183 | 349 |
| 17 - Star Tannery* | 29 | 51 |
| 18 - Orkney Springs | 98 | 180 |
| 21 - Mt. Jackson | 347 | 571 |
| 23 - New Market | 385 | 474 |
| 51 - Strasburg | 407 | 604 |
| 60 – Timberville* | 5 | 7 |
| **Total** | **2,327** | **3,851** |

*Timberville (Rockingham County) and Star Tannery (Frederick County) have response areas in Shenandoah County.

**Overall, Station 51 (Strasburg) has the highest Fire demand, which makes sense as it the most populated and most built upon of the towns and fire districts.**

**Station's 12, 21, and 23 are the next busiest fire districts.**

## Table 12: Workload of EMS Units by Response

| First Due Area | Calls | Runs |
|---|---|---|
| 13 – Conicville* | 214 | 262 |
| 14 - Fort Valley | 151 | 235 |
| 17 - Star Tannery | 83 | 106 |
| 18 - Orkney Springs* | 340 | 398 |
| 21 - Mt. Jackson*# | 898 | 1,094 |
| 23 - New Market*# | 1,389 | 1,529 |
| CO5 – Woodstock*^+ | 2,662 | 3,263 |
| CO25 – Strasburg*#+ | 2,171 | 2,573 |
| **Total** | **7,908** | **9,460** |

*Primarily SCFR career staffed EMS units.
^SCFR staffs a roving EMS unit at Woodstock Rescue Station 5.
#Volunteer intermittently staffs EMS units.
+Woodstock includes Edinburg and Toms Brook district call counts.
+Strasburg includes Toms Brook district call counts.
All stations respond into the unincorporated area and these calls are included in the call count.

**Overall, Station 5 (Woodstock) has the highest EMS demand, which makes sense as it has two staffed SCFR EMS units and the response district extends to the Toms Brook and Edinburg districts, and beyond. Woodstock also is the second highest populated Town in the County.**

**Station 25 (Strasburg) is the next busiest EMS district as Strasburg is the most populated Town in the county and units from Station 25 also cover the Toms Brook and Fort Valley districts as needed.**

**Station 23 (New Market) has a high demand due to the Town's population (3rd highest in the County) and overall demand in district and beyond during heavy demand periods.**

### Temporal Demand Variation

A temporal variation examines how fire incidents and emergency calls vary over time and focuses on identifying patterns and trends.

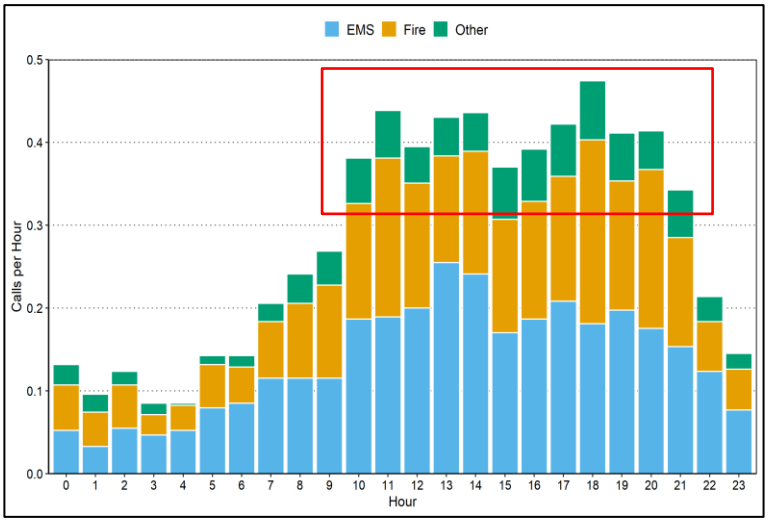
Temporal patterns influence the demand for resources and the effectiveness of emergency response strategies. This section aims to analyze the temporal variation of Fire and EMS calls for Shenandoah County by identifying peak periods and patterns of call activity. By recognizing these patterns, the SCFR can better allocate personnel and equipment, optimize response times, and ultimately improve service delivery.

The following figures show the temporal variations of calls managed by SCFR between July 1, 2023, to June 30, 2024. These include calls by month, calls by hour of the day, and calls by day of the week.

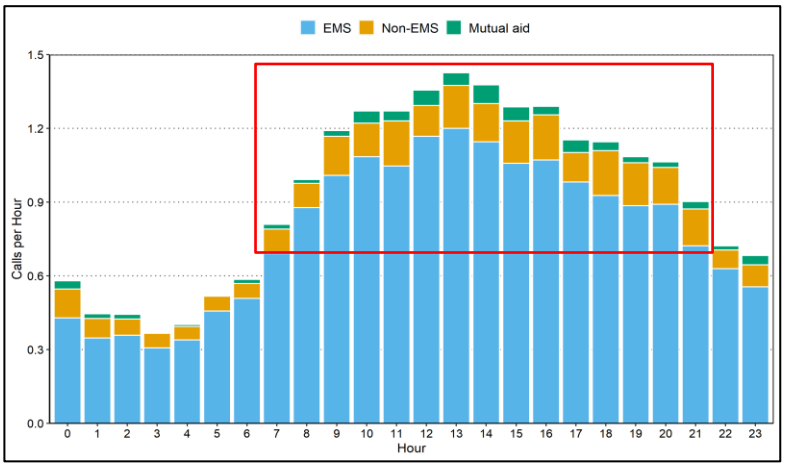
The first figure shows calls by hour of day. This figure illustrates:

## Figure 9: Calls by Hour of Day: Fire and EMS

**Fire**




**EMS**




**Overall, SCFR system Fire unit demand generally peaks between the hours of 10:00 am and 9:00 pm.**

**The trend to peak call times begins at 7:00 am and drops off significantly at 10:00 pm. Workload remains low between 11:00 pm and 10:00am the next day.**

**Fire unit demand includes response to Fire and Fire Related, EMS, Mutual Aid and Cancelled classified calls.**

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**Overall, SCFR system EMS unit demand generally peaks between the hours of 7:00 am and 9:00 pm.**

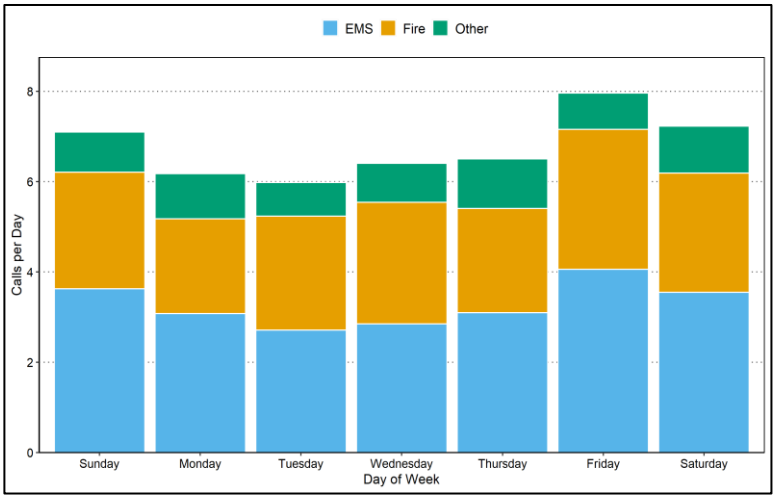
**The trend to peak call times begins at 5:00 am and begins to trend down at 10:00 pm. Workload remains low between 1:00 am and 5:00 am.**

**EMS unit demand includes response to EMS, Fire and Fire Related, Mutual Aid and Cancelled classified calls.**

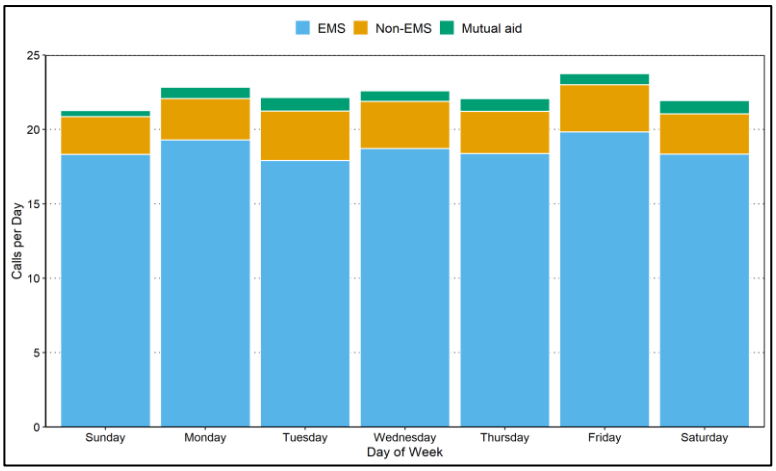
Next, CPSM looks at responses by day of the week.

## Figure 10: Calls by Day by Week: Fire and EMS

**Fire**




**EMS**




**Overall, SCFR system Fire units are busiest of Friday, Saturday, and Sunday. Monday and Tuesday are the least busy with Wednesday and Thursday only slightly busier.**

**Fire unit responses average between 6-8 calls/day (8 calls/day on the busiest day of the week).**

**Fire unit demand includes response to EMS, Fire and Fire Related, and Mutual Aid and Cancelled classified calls.**

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**SCFR system EMS units are busiest on Monday and Friday, and only slightly less busy the remaining days of the week.**

**From a broader perspective, SCFR system EMS units are busy consistently across all seven days of the week averaging between 20-24 calls/day.**

**EMS unit demand includes response to EMS, Fire and Fire Related, and Mutual Aid and Cancelled classified calls.**

Next, CPSM analyzed the fire and EMS demand by month of the year (calls per day).

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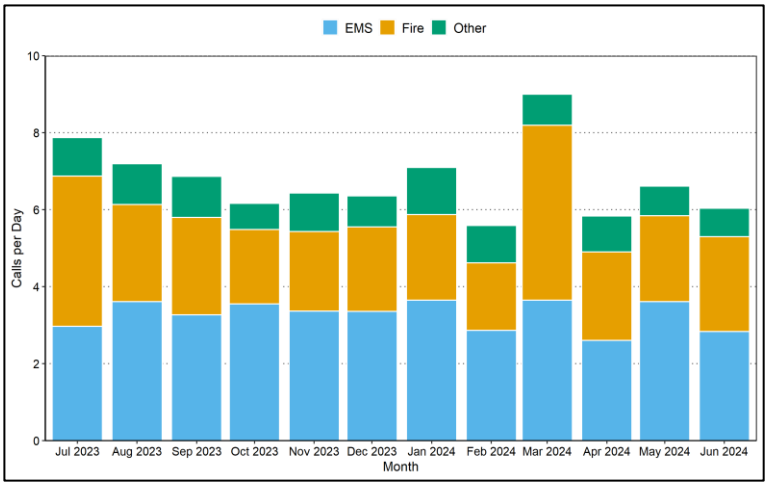
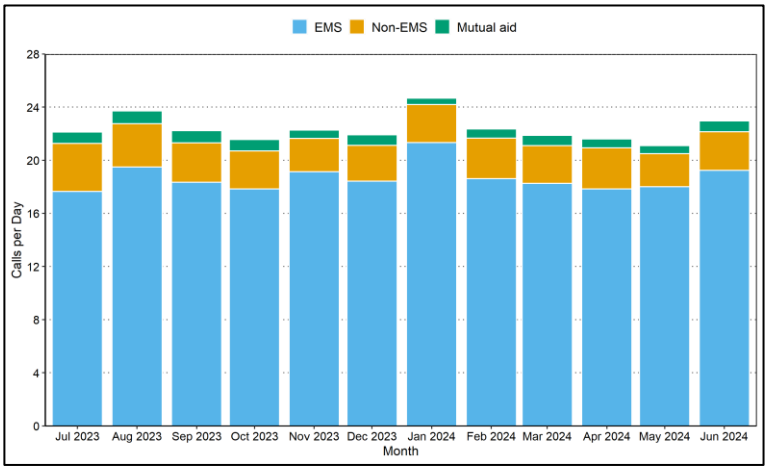
## Figure 11: Calls per Day by Month: Fire and EMS

**Fire**




**EMS**




**SCFR system Fire units are busiest during the month of March and busier during the months of January, July, August, and September.**

**The remaining months (October, November, December, May, June) are consistent but less busy, with February and April the least busy months.**

**Fire unit demand includes response to EMS, Fire and Fire Related, and Mutual Aid and Cancelled classified calls.**

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**SCFR system EMS units are busiest during the months of January, June, and August and only slightly less busy during the remaining months.**

**The remaining months (February, March, April, May, July, September, October, November, and December) are consistently only slightly less busy than the busiest two months.**

**EMS unit demand includes response to EMS, Fire and Fire Related, and Mutual Aid and Cancelled classified calls.**

## SCFR Resilience and Reliability

Resiliency is an organization's ability to quickly recover from an incident or event, or to adjust easily to changing needs or requirements. Greater resiliency can be achieved by constant review and analysis of the response system and focuses on three key components:

- Resistance: The ability to deploy only resources necessary to control an incident and bring it to termination safely and effectively.
- Absorption: The ability of the agency to quickly add or duplicate resources necessary to maintain service levels during heavy call volume or incidents of high resource demand.
- Restoration: The agency's ability to quickly return to a state of normalcy.

For the CPSM data analysis study period (July 1, 2023, to June 30, 2024), SCFR Fire and EMS units responded to 8,185 calls for service. The following tables will analyze SCFR resiliency. In this analysis, CPSM included all calls that occurred inside and outside Shenandoah County (to include cancelled calls). We did this because responses outside of the county (although few) and canceled calls impact on the resilience of the department to respond to concurrent calls.

The first resiliency measure we review is the matrix for various incident responses, which links to ***resistance***, which is the system's ability to deploy only resources necessary to control an incident and bring it to termination safely and effectively.

Based on the response matrix, ***CPSM assesses the SCFR has resistance challenges*** with EMS units as they respond to many fire and fire related calls (13 percent of all EMS calls), sometimes in lieu of a fire unit or with a fire unit that may have driver only (according to SCFR).

Fire units have organic resistance challenges as they are a predominately volunteer response system and members respond from home, work, or when mobile. Where there are SCFR department career personnel who cross staff Fire and EMS apparatus at volunteer stations, and because the EMS system overall is busy, averaging 22-calls/day,100% fire staffing is not guaranteed in these cross-staffed stations at certain times of the day.

## Table 13: SCFR Standard Response Matrix

| Incident Type | Response Matrix |
|---|---|
| **Fire Box-1**<br>■ Residential, commercial, or multi-family residential building fire.<br>■ Chimney fire.<br>■ Appliance fire.<br>■ Inside Hazmat/Smoke in a structure.<br>■ Building Explosion. →<br>■ Terrorist Attack. →<br>■ Hospital / Institution / Nursing/Industrial Home Fire.<br>■ Electrical arcing inside a structure. | Engine: 3<br>Ladder (Truck Company): 1<br>Rescue (Ambulance): 1<br><br>Add Squad or Rescue Engine<br>Add Squad or Rescue Engine and 2nd Truck. |
| **Fire Box-2**<br>■ Small shed or outbuilding fire.<br>■ Large Vehicle Fire (i.e., Tractor Trailer).<br>■ CO Alarm with health complaints.<br>■ Search for or injured hiker on trail. | Engine: 2<br>Rescue (Ambulance): 1 |
| **Fire Box-3**<br>■ Outside fire threatening a structure.<br>■ Large Outside Fire (approximately 5 acres or more). | Engine: 1<br>Brush Unit: 2<br>Tanker or Pumper: 1<br>Rescue (Ambulance): 1 |

| Incident Type | Response Matrix |
|---|---|
| **Fire-EMS Local**<br>■ Vehicle fire - for interstate add additional engine company.<br>■ Cardiac Arrest.<br>■ EMS Emergency along roadway.<br>■ Lock Out with Life Hazard. | Rescue Company: 1<br>Engine Company: 1 |
| **EMS Local**<br>■ All EMS emergencies. | Rescue (Ambulance): 1 |
| **Motor Vehicle Accident**<br>■ Motor vehicle accidents non-Interstate.<br>■ Motor vehicle accidents on Interstate 81. | Rescue Company: 1<br>Engine Company: 1<br>Squad Company: 1<br>Rescue Company: 2<br>Engine Company: 2<br>Squad Company: 1<br>*On all motor vehicle accident incidents, if dispatcher can confirm there is no entrapment, the Squad can be cancelled.* |
| **Rescue Box**<br>■ Place Helicopter on Stand-by.<br>■ Plane crash.<br>■ Train crash.<br>■ Industrial accident with entrapment.<br>■ Construction accident with entrapment.<br>■ Multi-passenger vehicle accident with entrapment.<br>■ Farm machinery accidents with entrapment.<br>■ Building Collapse. | Rescue Company: 2<br>Engine Company: 1<br>Squad Company: 2 |

In addition to the standard day-to-day response matrix, the SCFR system also has a response matrix for greater alarm (beyond the standard response) incidents. This matrix includes:

- Structural Task Force (creates automatic condition red and station fills across county).
  - 2 Engine Companies.
  - 1 Truck Company.
  - 1 EMS Transport Unit.

- Tanker Task Force
  - 2 Tankers or Pumpers *(water transporting units)*.
  - 1 Engine.
- Brush Task Force 2 Brush Trucks
  - 1 Tanker or Pumper.
  - 1 Engine.
- Working Fire Dispatch
  - 1 Engine Company.
  - 1 Rescue Company.
  - 1 Tanker - in non-hydrant area.
  - 1 Truck if Institutional/Nursing Home/Hospital/Industrial.
- EMS Task Force
  - 3 EMS Transport Units.
  - 1 Squad or Rescue Engine.
  - Mass Casualty Unit.
- Extrication Task Force
  - 2 Squads or Rescue Engines.

The next resiliency measure is the frequency distribution of calls, or how many calls occur in an hour and the frequency of overlapping calls (high demand times). This measures ***absorption***, or ability to quickly add or duplicate resources necessary to maintain service levels during heavy call volume or incidents of high resource demand.

## Table 14: Frequency Distribution of the Number of Calls

**Fire**

| Calls in an Hour | Frequency |
|---|---|
| 0 | 6,751 |
| 1 | 1,707 |
| 2 | 259 |
| 3 | 48 |
| 4+ | 19 |
| **Total** | **8,784** |

**EMS**

| Calls in an Hour | Frequency |
|---|---|
| 0 | 3,707 |
| 1 | 2,951 |
| 2 | 1,406 |
| 3 | 524 |
| 4 | 143 |
| 5+ | 53 |
| **Total** | **8,784** |

**The table above tells us:**

- **77% of the time there are no calls in an hour.**
- **19% of the time there is one call in an hour.**
- **4% of the time there are 2 or more calls in an hour.**

**Overall, overlapping calls do not create continuance absorption challenges for SCFR system fire companies.**

**The table above tells us:**

- **42% of the time there are no calls in an hour.**
- **34% of the time there is one call in an hour.**
- **16% of the time there are 2 or more calls in an hour.**
- **8% of the time there are 3 or more calls in an hour.**

**Overall, overlapping calls do create absorption challenges for SCFR system EMS deployment, particularly when there are three or more calls in an hour.**

Overall, CPSM assesses the SCFR does not have fire absorption issues based on the annualized call totals and the overlapping call data. However, there are organic absorption challenges as the SCFR system is predominately a volunteer staffed response system, and the ability to respond with full crews at certain times of the day may be challenging. This is expected in these types of systems.

The system will experience EMS absorption challenges based on the annualized call totals and overlapping call data. This also creates response time challenges based on the size of the county and where the available EMS units are responding from.

The next tables look at the duration of calls and number of units that arrived on scene, which are measures that contribute to overlapping calls in a Fire and EMS system (particularly EMS), specifically those that last one or more hours. This analysis links to ***restoration***, which is the system's ability to quickly return to a state of normalcy.

## Table 15: Calls by Type and Duration: EMS Units

| Call Type | Less than 30 Minutes | 30 Minutes to One Hour | One to Two Hours | Two or More Hours | Total |
|---|---|---|---|---|---|
| Breathing difficulty | 88 | 217 | 401 | 34 | 740 |
| Cardiac and stroke | 84 | 196 | 413 | 74 | 767 |
| Cardiac arrest | 30 | 21 | 27 | 11 | 89 |
| Fall and injury | 414 | 483 | 696 | 79 | 1,672 |
| Illness and other | 406 | 625 | 1,154 | 108 | 2,293 |
| MVA | 212 | 86 | 102 | 26 | 426 |
| Overdose and psychiatric | 43 | 36 | 45 | 4 | 128 |
| Seizure and unconsciousness | 123 | 224 | 331 | 43 | 721 |
| **EMS Subtotal** | **1,400** | **1,888** | **3,169** | **379** | **6,836** |
| Non-EMS | 828 | 171 | 57 | 16 | 1,072 |
| Mutual aid | 120 | 36 | 92 | 29 | 277 |
| **Total** | **2,348** | **2,095** | **3,318** | **424** | **8,185** |

## Table 16: Calls by Type and Duration: Fire Units

| Call Type | Less than 30 Minutes | 30 Minutes to One Hour | One to Two Hours | Two or More Hours | Total |
|---|---|---|---|---|---|
| EMS assist | 677 | 206 | 59 | 10 | 952 |
| MVA | 102 | 84 | 57 | 6 | 249 |
| **EMS Subtotal** | **779** | **290** | **116** | **16** | **1,201** |
| False alarm | 152 | 31 | 4 | 0 | 187 |
| Good intent | 99 | 18 | 5 | 1 | 123 |
| Hazard | 74 | 25 | 20 | 3 | 122 |
| Outside fire | 86 | 51 | 23 | 25 | 185 |
| Public service | 167 | 33 | 7 | 6 | 213 |
| Structure fire | 17 | 27 | 11 | 13 | 68 |
| Technical rescue | 20 | 7 | 10 | 3 | 40 |
| **Fire Subtotal** | **615** | **192** | **80** | **51** | **938** |
| Canceled | 152 | 36 | 0 | 0 | 188 |
| Mutual aid | 90 | 34 | 12 | 13 | 149 |
| **Total** | **1,636** | **552** | **208** | **80** | **2,476** |

**The EMS table tells us:**

**40% of EMS calls take one to two hours. This is due to transport and hospital turnover times (analyzed next page). Overall, EMS transport calls average 76 minutes per call and represent 75% of all EMS unit calls. *This exacerbates absorption and restoration ability for EMS units.***

**55% of EMS unit calls take less than thirty minutes to one hour to complete.**

**5% of EMS unit calls take two or more hours (typically transports outside of the County to Rockingham, Winchester, Warren, and Page).**

**The Fire table tells us:**

---

**66% of Fire calls take less than 30-minutes to complete.**

**34% of Fire calls take 30-minutes to more than two hours to complete with the largest number of calls only taking 30 minutes to one hour to complete.**

The next set of tables reviews EMS transport resiliency. The first table looks at ambulance transport conversion rate (rate of calls that resulted in a transport). Transport times affects EMS absorption and restoration ability.

## Table 17: EMS Call to Transport Conversion Rate

| Call Type | Number of Calls | | | Conversion Rate |
|---|---|---|---|---|
| | Non-transport | Transport | Total | |
| Breathing difficulty | 99 | 641 | 740 | 86.6 |
| Cardiac and stroke | 124 | 643 | 767 | 83.8 |
| Cardiac arrest | 54 | 35 | 89 | 39.3 |
| Fall and injury | 461 | 1,211 | 1,672 | 72.4 |
| Illness and other | 443 | 1,850 | 2,293 | 80.7 |
| MVA | 301 | 125 | 426 | 29.3 |
| Overdose and psychiatric | 58 | 70 | 128 | 54.7 |
| Seizure and unconsciousness | 151 | 570 | 721 | 79.1 |
| **Totals** | **1,691** | **5,145** | **6,836** | **75.3** |

*Overall call to transport conversion rate is 75%.*

## Table 18: Transport Call Duration by Call Type

| First Due Area | Non-transport | | Transport | |
|---|---|---|---|---|
| | Average Duration | Number of Calls | Average Duration | Number of Calls |
| 13 - Conicville | 33.5 | 99 | 97.4 | 115 |
| 14 - Fort Valley | 44.2 | 48 | 99.3 | 103 |
| 17 - Star Tannery | 44.5 | 33 | 134.9 | 50 |
| 18 - Orkney Springs | 41.2 | 133 | 119.9 | 207 |
| 21 - Mt. Jackson | 27.0 | 355 | 85.6 | 543 |
| 23 - New Market | 23.3 | 444 | 89.4 | 945 |
| CO5 - Woodstock | 24.0 | 833 | 50.7 | 1,829 |
| CO25 - Strasburg | 24.9 | 791 | 83.1 | 1,380 |
| Out of County | 57.9 | 268 | 97.7 | 9 |
| **Total** | **29.1** | **3,004** | **75.7** | **5,181** |

## Table 19: Transport Destinations

| Destination | Transport | Percentage |
|---|---|---|
| Shenandoah Memorial Hospital | 3,728 | 71.0 |
| Sentara RMH Medical Center | 711 | 13.5 |
| Winchester Medical Center | 625 | 11.9 |
| Warren Memorial Hospital | 114 | 2.2 |
| Page Memorial Hospital Medical Center | 6 | 0.1 |
| Sentara South Main Health | 1 | 0.0 |
| Other | 68 | 1.3 |
| **Total** | **5,253** | **100.0** |

**These tables tell us:**

**The average duration was 29 minutes for non-transport EMS calls and 76 minutes for EMS calls where one or more patients were transported to a hospital.**

**Station 5, Woodstock's service area, had the shortest transport duration time at 51 minutes, which makes sense as Shenandoah Memorial Hospital is located in Woodstock.**

**Orkney Springs has the highest SCFR system transport time followed by - Fort Valley, SCFR upstaffed units, Out of County Mutual Aid calls with transports, New Market, Mt. Jackson, and Strasburg.**

**Overall Star Tannery has the highest transport time, which affects overall SCFR system resiliency.**

**Shenandoah Memorial Hospital has the highest percent of transports by SCFR system units.**

One additional resiliency component includes analysis of more frequent users of the system. The next table outlines responses to the nine assisted living/nursing home facilities in the county.

## Table 20: Workload of Rescue Service to Senior Nursing Facility (7/1/23-6/30/24)

| First Due | Calls | Calls Per Day | Minutes Per Run |
|---|---|---|---|
| Cambridge Landing Memory Care of Strasburg | 48 | 0.1 | 65.5 |
| Consulate Health Care of Woodstock | 172 | 0.5 | 36.4 |
| Greenfield Reflections of Woodstock | 103 | 0.3 | 36.2 |
| Life Care Center of New Market | 224 | 0.6 | 86.3 |
| Shenandoah Place: New Market | 39 | 0.1 | 71.3 |
| Shenandoah Terrace: New Market | 37 | 0.1 | 72.5 |
| Skyline Terrace/Memory Lane Assisted Living: Woodstock | 58 | 0.2 | 37.5 |
| The Maynard of Strasburg | 118 | 0.3 | 70.5 |
| The Warren of Woodstock | 152 | 0.4 | 36.0 |
| **Total** | **951** | **2.6** | **56.6** |

**Analysis of this table tells us:**

**There were 951 calls to these facilities, which is 12% of all EMS calls.**

**Total calls per day to these facilities is 2.6.**

**233 calls were coded as Illness or other.**

**231 calls were coded as Fall and Injury.**

**The most frequent users of the system are Consulate Health Care of Woodstock, Life Care Center of New Market, and The Warren of Woodstock. In total these facilities average 1.5 calls/day.**

**Minutes per run averages 56.6 minutes, which is almost 20-minutes lower than the average transport time, however those with higher minutes per run align with transport times for the EMS district they are in.**

In summary, the SCFR system has resiliency challenges created by demand on current units and how the system operates as a predominately volunteer fire response force. Through our analysis:

- Based on the Fire and EMS unit response matrix, ***CPSM assesses the SCFR has resistance challenges*** with EMS units as they respond to many fire and fire related calls (13 percent of all EMS calls), sometimes in lieu of a fire unit or with a fire unit that may have driver only.
- Fire units have organic resistance challenges as they are a predominately volunteer response system and members respond from home, work, or when mobile. Where there are SCFR department career personnel who cross staff Fire and EMS apparatus at volunteer stations, and because the EMS system overall is busy, averaging 22-calls/day, guaranteed fire staffing may not occur in these cross-staffed stations at certain times of the day.
- Overall, overlapping calls do not create continuance absorption challenges for SCFR fire system companies. However, overlapping calls do create absorption challenges for SCFR system EMS deployment, particularly when there are three or more calls in an hour and based on the current deployment model where not all of the higher demand areas have a staffed EMS unit. This also creates response time challenges based on the size of the county and where the available EMS units are responding from.
- Time on task, which has an effect on absorption and restoration was analyzed and tells us that 40% of EMS calls take one to two hours. This is due to transport and hospital turnover times (analyzed next page). Overall, EMS transport calls average 76 minutes per call and represents 75% of all EMS unit calls. ***This exacerbates absorption and restoration ability for EMS units.***
- 66% of Fire calls take less than 30 minutes to complete, which overall does not create absorption and restoration challenges.

## Shenandoah County Fire and EMS System

The Shenandoah County Fire and Rescue system represents an evolving hybrid model that combines the dedication of volunteers with career personnel. Over the years, this model has expanded significantly, particularly in 2017, when the integration of career staffing at several of the volunteer stations occurred. At the time of this assessment, Shenandoah County Fire and Rescue includes a combination of 75 career operational staff and eleven volunteer companies with 319 administrative and operational members that collectively serve the County's population.

The Shenandoah County Fire and Rescue Department, established in 1998, was created with foresight by the County Board of Supervisors, recognizing the future need for county staff to complement the volunteer organizations. Initially formed with a focus on providing support for fire and rescue coordination and training, the system has evolved over the years.

The current system relies on a combination of career staff at six stations and the volunteer organizations that operate across the county. Volunteer agencies remain a vital component of the system, providing infrastructure, equipment, and personnel.

The primary function of volunteer agencies in Shenandoah County is fire suppression. Volunteers respond to fires, providing direct firefighting efforts, rescue operations, and other emergency operations. While career staff also play a significant role through the cross-staffing of fire apparatus in five of eleven stations, the career staff provide the larger percentage of EMS transport responses.

> *National Context: Volunteer fire services remain essential in rural and suburban areas, where they often provide the majority of fire suppression resources. According to the National Fire Protection Association (NFPA), volunteer firefighters account for nearly 70% of all fire departments in the U.S., serving communities that might otherwise struggle to fund full-time staffing.*
>
> *The same holds true for Shenandoah County, where volunteer fire departments strive to provide coverage across the county's towns and rural expanse.*

Volunteer agencies also provide EMS response. Volunteers with EMS certifications, such as Emergency Medical Technicians (EMTs) and paramedics, respond to medical emergencies, provide transport to medical facilities, and deliver on-scene care. In many cases, these volunteers are trained to provide advanced life support, triage, and critical care during emergencies.

In addition to responding to emergencies, volunteer agencies in Shenandoah County are heavily involved in public education and community outreach. This includes safety demonstrations, open houses, and other educational efforts to raise awareness about fire safety and life safety.

Many volunteer organizations in Shenandoah County also play a pivotal role in fundraising to support fire and EMS operations. Volunteers organize events such as bingo nights, breakfast, and dinner events to raise funds for necessary equipment, apparatus, and operational expenses. These efforts are essential for ensuring that the volunteer agencies remain financially sustainable. However, with the cost of fire and EMS apparatus today, fundraising efforts such as these

frequently come up short when volunteer departments consider apparatus and equipment replacement. As a note, some volunteer organizations receive funding from towns for apparatus and/or equipment replacement.

According to a National Volunteer Fire Council (NVFC) report, successful volunteer systems often leverage community relationships to build operational synergies between different service providers. This level of communication and integration strengthens both fire suppression and EMS responses, improving overall system resilience.

While Shenandoah County's volunteer system is the backbone of the fire and rescue operations, the SCFR department serves as the backbone for operational coordination, training, and community risk reduction. The integration of career and volunteer personnel within the Shenandoah County Fire and Rescue (SCFR) system has proven to be a key strength in providing comprehensive, effective emergency services to the community. Career staffing in the six volunteer stations ensures that there is a consistent, trained, and ready workforce to supplement the volunteers during high-demand situations and when less volunteers are available, thus improving overall service delivery. As noted by several volunteer stakeholders, having career staff available helps relieve the pressure on limited volunteer personnel.

The combination of these two sectors ensures that the County benefits from the unique strengths of both entities, offering a timely response to fire and EMS needs in those stations that SCFR staffs. According to the NVFC, a hybrid fire-rescue system improves operational flexibility by allowing agencies to adjust staffing levels based on call volume, geographic needs, and the nature of the emergency.

One of the most consistent strengths cited by stakeholders across the county was the community support that exists for both the career and volunteer components of the system. Stakeholders emphasized the role of local volunteers who continue to play a vital role in fundraising and community outreach. The volunteer model ensures that local residents remain vested in their fire and EMS services, fostering strong ties between the County, the volunteers, and the community they serve.

The Shenandoah County Fire-Rescue system response platform includes:

- Shenandoah County Fire and Rescue Department
- Conicville Volunteer Fire Department - Station 13
- Edinburg Volunteer Fire Company - Station 15
- Fort Valley Volunteer Fire Department - Station 14
- Mt. Jackson Volunteer Rescue and Fire Department - Station 21
- New Market Volunteer Fire and Rescue Department - Station 23
- Orkney Springs Volunteer Fire and Rescue Department - Station 18
- Strasburg Volunteer Fire Department - Station 51
- Strasburg Volunteer Rescue Squad - Station 25
- Toms Brook Volunteer Fire Department - Station 9
- Woodstock Volunteer Fire Department - Station 12
- Woodstock Volunteer Rescue Squad - Station 5

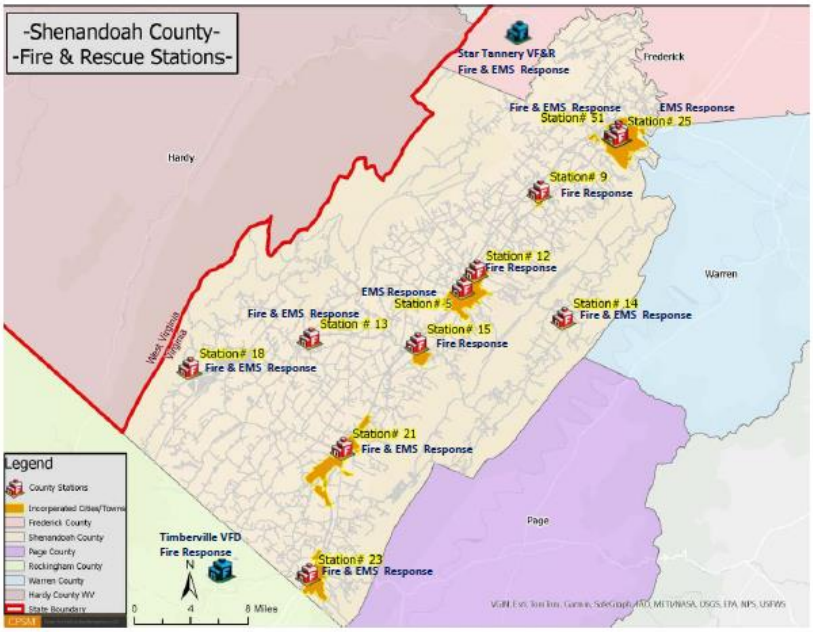
In addition to the above Shenandoah County response agencies, Star Tannery Volunteer Fire & Rescue Department in Frederick County has a first due response area in northwest Shenandoah County and is considered part of the overall Fire and EMS response platform. Also, Timberville Volunteer Fire Department in Rockingham County has a first due response area in southern Shenandoah County and is considered part of the overall Fire and EMS response platform.

As a combination emergency response system, station and unit staffing is provided through a combined effort of volunteer and career staff. Those stations that can provide regular volunteer responses do so around the clock either through assigned crew schedules and/or when at the station, or response from home, work, or when out and about in the county and an alarm comes in. This is the typical model across the country.

Career staffing is 24/7/365 at the following stations:

| | |
|---|---|
| **Woodstock Rescue Station 5**<br>■ One two-person crew.<br>■ One two-person crew that is utilized as a peak volume - dynamic response unit to all other districts in the county as needed utilizing SCFR EMS unit. | **Strasburg Fire Station 25**<br>■ One two-person crew: primary EMS unit response utilizing Strasburg Rescue Squad EMS unit.<br>■ One two-person crew: cross staffs Strasburg Fire and Strasburg Rescue Squad EMS unit. |
| **New Market Fire & Rescue Station 23**<br>■ One two-person crew: primary EMS unit response utilizing New Market EMS unit.<br>■ One two-person crew: cross staffs New Market Fire and EMS unit. | **Orkney Springs Fire & Rescue Station 18**<br>■ One two-person crew: cross staffs Orkney Springs Fire and Orkney Springs EMS unit. |
| **Conicville Fire Station 13**<br>■ One two-person crew: cross staffs Conicville Fire and SCFR EMS unit. | **Mt. Jackson Rescue & Fire Station 21**<br>■ One two-person crew: cross staffs Mt. Jackson Fire and Mt. Jacson EMS unit. |

## Figure 12: Shenandoah County Fire-Rescue System Station and Resource Map



In addition to the traditional fire, fire related, and EMS services, the system also provides some technical rescue (vehicle and machinery extrication, rope rescue), hazardous materials operations response services, swift water rescue, wildland fire suppression, and tactical medical team response with the SCSO. ***The County relies on regional Technical Rescue and Hazardous Materials response teams for incidents that are beyond SCFR system capabilities.***

## Volunteer Departments

As discussed above, there are eleven volunteer departments in Shenandoah County. This is further broken out as:

- Rescue Squad (EMS Only): 2 - Strasburg Volunteer Rescue Squad; Woodstock Volunteer Rescue Squad.
- Fire Department (Fire protection and technical rescue services): 5 - Conicville Volunteer Fire Department; Edinburg Volunteer Fire Company; Strasburg Volunteer Fire Department; Toms Brook Volunteer Fire Department; and Woodstock Volunteer Fire Department.
- Fire and Rescue Department: 4 - Fort Valley Volunteer Fire Department; Mt. Jackson Volunteer Rescue and Fire Department; New Market Volunteer Fire and Rescue Department; and Orkney Springs Volunteer Fire and Rescue Department.


Each of the volunteer departments has an administrative side, who runs the volunteer corporation. Officers of the administrative side typically include a President, Vice President, Secretary, Treasurer and Board of Director members. The administrative side may include administrative members who assist with membership recruitment, fund raising, accounting, training, and other non-operational tasks and duties.

There is also an operational side for each department that includes operational members who go through initial and continuing training and respond to calls, typically from home, work, or when they are at the station and an alarm comes in. Some departments coordinate standby duty as well. Officers on the operational side will typically include a Fire Chief and or Rescue Captain or Chief, Deputy Chiefs, Assistant Chiefs, Captains, and Lieutenants. These members are the responders who work with other system members to mitigate emergencies. Volunteer operational responders include Fire, EMS, and technical/special rescue trained members.

At the time of this report, CPSM assessed volunteer membership as total members (operational & administrative) and operational members released (have completed all necessary training and protocol clearance) to participate in EMS and can serve on an EMS transport unit, and

operational fire protection members who have been released (have completed all necessary training) to participate as a combat firefighter and who can don self-contained breathing apparatus and operate on incidents requiring same. CPSM recognizes also there are members who cannot wear self-contained breathing apparatus but contribute as drivers and support staff functioning on scene in areas not requiring the use of self-contained breathing apparatus.

### Table 21: Volunteer System Members

| | |
|---|---|
| **Woodstock Rescue**<br><br>Total members: 6<br>Released-EMS: 0 | **Orkney Springs Fire & Rescue**<br><br>Total members: 14<br>Released-EMS: 5<br>SCBA Qualified: 9 |
| **Toms Brook Fire**<br><br>Total members: 60<br>Released-EMS: 0<br>SCBA Qualified: 22 | **Mt. Jackson Fire & Rescue**<br><br>Total members: 42<br>Released-EMS: 30<br>SCBA Qualified: 29 |
| **Woodstock Fire**<br><br>Total members: 37<br>Released-EMS: 5<br>SCBA Qualified: 30 | **New Market Fire & Rescue**<br><br>Total members: 25<br>Released-EMS: 6<br>SCBA Qualified: 10 |
| **Conicville Fire**<br><br>Total members: 50<br>Released-EMS: 3<br>SCBA Qualified: 15 | **Strasburg Rescue**<br><br>Total members: 22<br>Released-EMS: 10 |
| **Fort Valley Fire & Rescue**<br><br>Total members: 23<br>Released-EMS: 5<br>SCBA Qualified: 9 | **Strasburg Fire**<br><br>Total members: 17<br>Released-EMS: 3<br>SCBA Qualified: 10 |
| **Edinburg Fire**<br><br>Total members: 23<br>Released-EMS: 4<br>SCBA Qualified: 11 | |

## Shenandoah County Fire Rescue Department

The Shenandoah County Fire-Rescue Department (SCFR) provides fire protection, technical and specialty services response, and EMS ground transport services as a department of Shenandoah County. SCFR is a career fire department that employs full-time administrative, training, community risk reduction, support staff, and operational officers and firefighters.

Operationally, the SCFR deploys career staffing in support of volunteer department Fire and EMS operations. In most cases as outlined previously, SCFR staff volunteer Fire and EMS fleet (SCFR provides the ambulance at Station 13 in Conicville and the peak time ambulance at Station 5).

Operational staffing, as outlined above, occurs 24/7/365 at six locations, all volunteer facilities. In addition to on-duty operational crews and supervisory officers there is one operational Shift Commander on duty for each of the 24-hour shifts. The operational Shift Commander serves as the County-Wide on-duty operational command officer providing day-to-day operational supervision to each career staff crew, as well as serving as the incident commander on assigned incident responses.

Organizationally, the SCFR has established the following five ***Core Values***.

***Professionalism*** - In our actions, conduct, and job performance; and constantly striving to set a positive example.

***Respect*** - To have high regard for all citizens and each other; and to honor differences of opinions and points of view.

***Integrity*** - To be truthful and honest; and to be ethical; always striving to do what is right; and to be guided by fundamental fairness in everything we do.

***Dedication*** - To be committed to the system, organization, each other, our families and the community we serve.

***Excellence*** - Strive for the highest level in everything we do; and always seeking to improve and excel.

**SCFR Mission Statement**

***The Shenandoah County Department of Fire and Rescue is committed to providing a safe community, protecting the life, property and welfare of residents and visitors to our County.***

***We accomplish this by delivering quality emergency services to our community. In meeting this objective, we demand of ourselves the highest professional standards and dedication to our Core Values.***

**SCFR Department Daliy Minimum Staffing**

| | |
|---|---|
| Shift Commander | Staffing: 1 |
| Woodstock Rescue | Staffing: 2 |
| Woodstock Floating Unit | Staffing: 2 |
| Conicville | Staffing: 2 |
| Orkney Springs | Staffing: 2 |
| Mt. Jackson | Staffing: 2 |
| New Market | Staffing: 4 |
| Strasburg | Staffing: 4 |
| Minimum Staffing | 19 |
| Leave Positions/shift | 6 |
| Total Staffing/shift | 25 |

Max Staffing: 1 ALS – 1 BLS staff per EMS Unit
Min Staffing: 2 BLS staff per EMS Unit
1 Officer assigned per station/per shift

The operational deployment model includes a normal daily staffing of two personnel assigned to the Conicville, Orkney Springs, and Mt. Jackson stations, and 2-two person crews assigned to the Woodstock Rescue, New Market, and Strasburg Fire stations. The assigned Shift Commander's office and bunking facility is located in Woodstock at the County Administration Building-SCFR offices. The minimum daily staffing model therefore is nineteen.

The maximum daily staffing is twenty-five, which allows six daily staffing positions to be used to cover scheduled leave (six-line positions are floated to cover leave vacancies to minimize overtime).

The SCFR is led by a ***Fire Chief*** who has overall responsibility for the management and leadership of the department. The SCFR Fire Chief, through the Code of Shenandoah County, § 20-2, *shall have supervision and operational control over the Department* and *shall be the County Chief as specified in Code of Virginia, § 27-6.1, and County EMS Chief as specified in Code of Virginia, § 32.1-111.4:6.*

The Fire Chief, who also serves as the Emergency Management Coordinator for the County, is directly assisted by a Deputy Fire Chief of Operations, a Deputy Chief of Training, a Deputy Chief-Fire Marshal, a Service Assistant who also serves as the Deputy Emergency Management Coordinator, a Recruitment and Retention Officer, and the EMS Billing Technician.

The ***Deputy Chief of Operations*** directly supervises the operational branch of the department to include day-to-day operations, employee relations, logistics, planning, service delivery, and liaison with volunteer company operational aspects. The three Shift Commanders are direct reports to the Deputy Chief of Operations. The operational branch is the largest in the department and includes six Station Captains, six Lieutenants, fifteen Master Firefighters, and forty-five Firefighters. There are a total of seventy-six uniform operational staff.

The role of the Shift Commander includes coordination of all on-shift programs and response personnel to include daily staffing, coordination, and oversight of emergency response crews, ensuring coverage is balanced across the County, assuming command of larger incidents, and plays a critical role in the development, implementation, and oversight of SCFR guidelines and policies. Additional ancillary duties are assigned to each Shift Commander to support the operational component of the department and system.

***Fire stations are decentralized from the management and command staff, which are typically located together at fire administration.*** The role of a company officer ensures a first-line supervisor on each unit that provides supervision of and holds assigned crew members accountable to established County and SCFR policies and guidelines; ensures the efficacy of SCFR Fire and EMS training ensuring it translates to incident scene effectiveness; ensures that station, fleet, and equipment are maintained in a readiness state for response; manages and supervises all company assignments and activities to include training; and facilitates company communications to name a few of the more critical company officer functions.

The ***Deputy Chief of Training*** manages all aspects of training (incumbent and recruit; Fire and EMS; career and volunteer. This includes organizing and delivering educational and certification programs for the Fire and EMS system, Triplett Tech Fire and EMT programs (Triplett Tech is a career and technical education center located in Mt. Jackson), and assisting system members with advanced EMS certification training, clinical and precepting time. Assisting the Chief of Training is two Training Captains who are responsible for direct instruction and course coordination and implementation of system training programs. Because of the demands on the division for training and education programs, the use of off-duty SCFR staff who are certified as instructors in the Fire and EMS disciplines are utilized regularly.

The ***Deputy Chief-Fire Marshal*** manages the community risk reduction program. In Shenandoah County this is primarily fire prevention inspection and fire investigation activities. Additionally, the Fire Marshals Office maintains SCFR 4-gas detection meters, the Knox-Box program initiative for the County, and the Juvenile Fire-Setter program (both the Knox-Box and Juvenile Fire Setter programs are national best practices). The Fire Marshal is the lone full-time position in this division but is assisted by six regular part-time positions. The part-time positions are off-duty SCFR staff who are certified as fire prevention inspectors or dual certified fire inspector/fire investigator with law enforcement certification (this is typical in Virginia Fire Department).

The SCFR system operates under the guidance of an ***Operational Medical Director*** Dr. Nazir Adam, a highly experienced and dedicated medical director. Dr. Nazir, who is associated with the Emergency Medicine Services of VA and who has served as an Operational Medical Director regionally, ensures standardized and high-quality EMS care across the SCFR system. His commitment to excellence in patient care and clinical oversight ensures that SCFR EMS services maintain the highest standards.

As the Medical Director for SCFR, Dr. Nazir plays a pivotal role in shaping SCFR's EMS operations providing clinical oversight, participating in the development and refinement of regional clinical protocols, and ensuring the SCFR system maintains a rigorous training and quality assurance program.

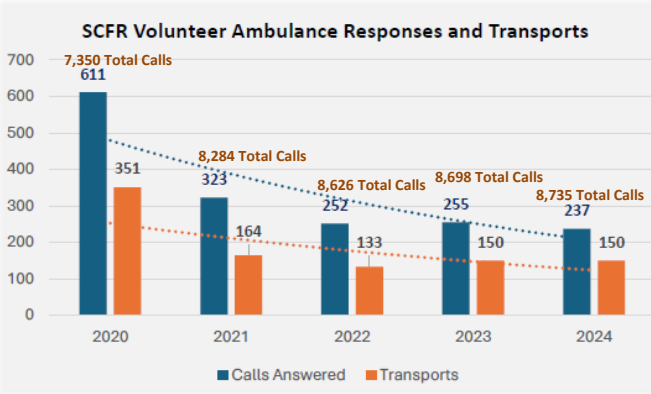
## Recruitment and Retention

### Volunteer System

Volunteerism as a whole in the United States is in decline. This includes non-profit volunteering (churches, schools, food banks etc.), some service groups, and volunteer Fire and EMS. A January 2023 report released by the U.S. Census Bureau reported that a smaller share of the U.S. population participates in volunteer opportunities than the previous two decades.

According to this report, the national annual volunteer hours took a sharp dip from fifty-two hours in 2002 to twenty-six hours annually in pre-pandemic 2019, or a 50-percent reduction in volunteer hours.[14]

Decline in volunteer firefighter participation is also outlined in the *2020 US Fire Department Profile* report from the National Fire Protection Association (NFPA). This report outlines that there were approximately 1,041,200 career and volunteer firefighters in the US in 2020. This total is down 4 percent from the previous year and is the lowest total since 1991.




***A decrease in volunteer firefighters played a role in this downward trend and the report further outlines Volunteer numbers are further declining from what was reported in 2016 and 2017.*** [15]

An example of the decline in volunteer EMS availability in Shenandoah County is exhibited in a downward trend of EMS ambulance responses and transports by volunteer EMS agencies in the County, as illustrated left.

Results from a survey conducted from the *Volunteer Retention Research Report Prepared for the National Volunteer Council, August 2020* of current and former volunteer fire department members show that over two thirds of respondents feel their departments have (or had) a problem with volunteer retention. This includes nearly 70% of report-current department leadership. Additionally, nearly half of all report-current volunteers have considered leaving the fire service at some point.

The retention of volunteers in fire departments is a nationwide issue where participation and retention appear to be steadily declining. The *Volunteer Retention Research Report* lists some reasons that volunteers may have regarding retention in the fire service. The report surveyed current and former volunteers in their report.[16] *Former volunteers* cited a lack of department cohesion and unsupportive leadership as their main reasons for leaving the service, which

14. Volunteering in America: New U.S. Census Bureau, AmeriCo Research, January 2023.
15. US Fire Department Profile 2020, NFPA

reinforces feedback received in the qualitative phase of research. The specific reasons for leaving (most selected by former volunteers in the survey) were:

- The department atmosphere is full of cliques and groups that exclude others.
- Leadership that does not focus on or support the needs of members.
- Department atmosphere where members of different generations do not get along.
- Lack of camaraderie or sense of community among everyone in the department.

Remarkably, the survey revealed *report-current volunteers* have a mostly different list of top reasons for why they think formers volunteers left, focusing more on unclear expectations and how volunteering fits in with the rest of an individual's life. The top reasons cited by current volunteers were:

- Lack of support and flexibility in juggling volunteer responsibilities with other life commitments.
- The realities of volunteering changed or did not meet the expectations that were explained before signing up.
- Lack of clear expectations of how much time and effort will be required each week or month for meetings and training.
- The department atmosphere is full of cliques and groups that exclude others.

It is worth noting that on the two most frequently mentioned reasons for leaving among former volunteers, (department cliques and leadership that does not focus enough on member needs), there are significant differences between how big an issue these are among report-current volunteers and current leadership. The retention report discusses that current non-leaders are much more likely to cite the reasons compared to leadership. Additionally, volunteer fire leadership were more likely to think juggling volunteering responsibilities was more a problem than non-leadership and former volunteers.

Currently the USFA lists 27,053 registered fire departments, which constitute about 91 percent of the departments estimated to be in the United States.[17] Overall, 36 percent of all fire departments are located in the South (highest percent overall in the country). The registered fire departments are further broken down as:

- 69.8% are volunteers.
- 15.4% are mostly volunteers.
- 9.6 % are career.
- 5.1% are mostly career.

The registered fire departments in the country are staffed by 1,206,300 personnel (as reported). This figure includes career, volunteer, and paid-per-call firefighters, as well as civilian staff and nonfirefighting personnel. There are a total of 1,054,000 active career, volunteer and paid-per-call firefighters representing 87% of the registered departments' personnel. Of the active firefighting personnel:

17. The U.S. Fire Administration's National Fire Department Registry is a voluntary program, and it does not include all fire departments in the U.S. or its territories.

- 52% were volunteer firefighters.
- 35% were career firefighters.
- 13% were paid-per-call firefighters.

The next table benchmarks Virginia fire department types against the national average.[18] Overall, Virginia has 557 registered fire departments.

### Table 22: Virginia Fire Department Type: Compared Against National Data

| | Volunteer | Mostly Volunteer | Mostly Career | Career |
|---|---|---|---|---|
| **Virginia** | **70.6%** | **16.9%** | **5.6%** | **7.0%** |
| **National Average** | **69.8%** | **15.4%** | **5.1%** | **9.6%** |

During discussions with SCFR system volunteers and SCFR command staff, recruiting new and retaining volunteer members is and has been a challenge. The initial and ongoing training and volunteer obligation demands are not as appealing to the current generation of working adults, who seek a greater work-life balance.

When considering work-life balance as a recruitment and retention issue for volunteers, an initial consideration is where the current Shenandoah County population works, and what the potential travel time to and from work may be, which directly impacts work-life balance.

A *Shenandoah County 2019 Strategic Economic Development Plan Update* tells us the County is a net exporter of workers, especially along Interstate 81. Those who might travel to the north or south and also to other employment centers in Northern Virginia have longer commute times, which has the potential to affect their ability to attend weeknight and weekend training, meetings, and responses. The 2019-2023 *U.S. Census -American Community Survey* outlines that 43.9 percent of Shenandoah County residents work outside of the County.[19] Lastly, current NSVRC data tells us that 4 percent of the County's workforce works from home, further decreasing the availability of potential volunteer members to train, stand-by, and respond.

Overall, the synergism of work-life balance and training, response, and attendance requirements has an effect of recruiting and retaining volunteer Fire and EMS members.

In an effort to reward and incentivize volunteer retention, in FY 2024 the Board approved a new incentive program for volunteers. This program provides either a $250.00 or $500.00 annual incentive payment to volunteer members based on hours of volunteer contribution, which includes calls, training, and company operational or administrative hours. Additionally, volunteer members are exempt from one County vehicle license fee §146-56, Code of Shenandoah County, VA. There are no other County incentive programs for volunteer members.

One retention tool utilized across the country for volunteer Fire and EMS agencies is the Length of Service Awards Program or LOSAP. LOSAP programs are typically pension-like programs designed around a volunteer member's length of service to the community. A program such as

18. USFA *National Fire Department Registry Summary*
19. U.S. Census American Community Survey Data

this has a purpose of recruiting and retaining volunteer members, and of course rewarding these members for their service, over time, without direct compensation.

LOSAP programs are typically set up to compensate volunteers upon their retirement from service, and after the member has vested in the system and reached LOSAP retirement years of service. These programs usually stipulate a vesting of five years and generally cap at thirty years. Members participating in the program are credited a monthly benefit for every year of qualifying service up to thirty years (typically $10.00/service year maximized at $300.00 annually for 30-years of service). Normal retirement age is typically set at 65 years of age. Some jurisdictions include a benefit provision should an individual become disabled while volunteering or if death occurs while operating as a volunteer. To qualify for a year of service towards the LOSAP years of service, members must achieve a minimum number of recorded hours contributed to operational, administrative, training, and community programs.

In Virginia, Bedford County, Fairfax County, Loudoun County, Prince William County, and Hanover County to name a few, have this type of LOSAP program in place. Funding for LOSAP is generally allocated by the local government.

Ideally, LOSAP programs are implemented to recruit and retain volunteer members. Further, LOSAP programs aimed at retaining volunteer members aligns with organizational goals of increased experience levels and volunteer member longevity, which may translate to a reduction in the need for full-time funded positions.

A similar program in Virgina, *Volunteer Service Award Program* (VOLSAP) was created by state statute, specifically §51.1-1200 – 51.1-1211 of the Code of Virginia. Under VOLSAP, a member's account is funded through member contributions and the individual volunteer department or local government.

**Career System**

Similar to Fire and EMS departments in rural counties in Virginia, the career system equally has recruitment issues. For Shenandoah County there is organic competition with Frederick County to the north, Rockingham, and the City of Harrisonburg to the south, and as well Northern Virgina jurisdictions to the east.

The system does have a natural recruitment pipeline through Triplett Tech. Although students enrolled in the Fire and EMS programs do join volunteer departments, many of the graduates from the Fire and EMT programs are looking for a career in Fire and EMS and migrate to the SCFR department or other opportunities in the region. Relying on Triplett Tech, however, creates younger experience levels in the SCFR department and system.

Since the 21-22 school year, the following training has occurred at Triplett Tech:

- 21-22: 6 students - EMT curriculum
- 22-23: 14 students - Fire curriculum
- 23-24: 20 students - EMT curriculum
- 24-25: 23 students - Fire curriculum

According to data received from the SCFR department, ***66 percent*** of the Firefighter/EMT workforce have 3-years or less experience. This is high when considering the overall count of SCFR staff.

Retaining career members can be equally challenging for the same organic reasons as outlined above. The SCFR department does, however, have a built-in retention incentive with the

schedule career staff work, which is on average a 48-hour workweek. Not all fire departments in the region have this type of work schedule with some averaging a 53-hour work week. Other retention includes job satisfaction, ability to promote, ability to expand career knowledge, skills, and abilities by assisting with training courses, the possibility of assisting the Fire Marshal as a part-time inspector or inspector/investigator, and organizational support to gain advanced EMT training and certifications.

SCFR also deals with turnover, which includes staff separating from Shenandoah County for positions with other Fire and EMS departments, separation for disciplinary reasons and retirement, and a change in careers. Since 2014, 62 members have separated from the SCFR department; most transitioned to other fire departments in the region or state. These separations are outlined next - by year and number of separations in the year.

- 2014: 1
- 2015: 4
- 2016: 6
- 2017: 6
- 2018: 6
- 2019: 2
- 2020: 2
- 2021: 3
- 2022: 10
- 2023: 11
- 2024:11

***13% turnover rate in the most recent three-year period.***

Potential turnover over the next three years includes those eligible for retirement as follows:

CY 2025

- 2 Senior Staff
- 1 Shift Commander
- 3 Captains
- 1 Lieutenant

CY 2026

- 1 Shift Commander
- 1 Captain
- 1 Master Firefighter

CY 2027

- 1 Senior Staff
- 1 Captain
- 1 Lieutenant
- 3 Master Firefighters

***These potential retirements will further affect the overall experience level in the SCFR and is something the department should be planning for.***

**SCFR Recruitment & Retention Officer Position**

The SCFR department has a budgeted Recruitment and Retention Officer position. The position serves primarily to coordinate and develop contemporary recruitment and retention programs for the SCFR system, to include both career and volunteer members. This position collaborates with the volunteer Recruitment & Retention Committee, the SCFR Fire Chief and command staff, as well as the community and public and private groups regarding the recruitment of system members.

The Recruitment & Retention Officer position is one of great importance for the SCFR system. The position was recently vacant due to the separation of the former officer. The position was filled and the new Recruitment & Retention Officer started on February 2, 2025. ***Some items the new Recruitment & Retention Officer should be focused on include:***

- Ensuring that both career and volunteer firefighters are consistently recruited and retained, which aligns with maintaining adequate staffing levels for emergency response.
- Recognizing the factors that have led to the decline in volunteer recruitment and retention nationwide due to time commitments, training requirements, economic factors, and work-life balance.
- A focus on outreach, making career and volunteer service more accessible and attractive.
- Building strong relationships with the community with a goal of encouraging participation in the SCFR system and volunteerism.
- Analyzing system turnover rates and recognizing high system turnover rates that potentially result in wasted resources and training investments.
- Developing retention efforts, such as mentorship programs, incentives, and career development opportunities designed to keep system members engaged and retained.
- Recognizing and addressing system member needs (e.g., mental health support, incentives, work-life balance) with a goal of improving retention.
- Securing funding and grants (e.g., FEMA's SAFER grant), which will provide funding for recruitment and retention efforts.

To summarize, a Recruitment and Retention Officer is key to sustaining a combination fire department by ensuring a steady influx of new firefighters while keeping experienced personnel engaged. Their work directly impacts department readiness, efficiency, and community trust.

CPSM assesses that effective recruitment and retention are critical to maintaining the operational readiness and service quality of a combination fire and rescue system. However, the current efforts exhibit shortcomings that impact both volunteer and career staffing. The system has not had a structured and proactive approach to career and volunteer recruitment, relying on Triplett Tech as a short-term solution.

Without targeted outreach programs, community engagement, or active promotion of career and volunteer opportunities, the system will struggle to attract new personnel. A 13 percent turnover rate among career Firefighters and EMTs in the most recent three-year period is concerning, as turnover disrupts continuity, increases training costs, and places additional stress on remaining staff. With two-thirds of career personnel having less than three years of service, institutional knowledge and operational experience are significantly lacking. This impacts leadership development, response effectiveness, and mentorship opportunities for incoming members.

The demands of training, emergency response, and attendance expectations create a significant burden on volunteers, making it difficult to balance Fire and EMS service commitments with personal and professional responsibilities. This challenge discourages new recruits and leads to attrition among existing members. Without tangible incentives, volunteers may lack motivation to stay engaged over time.

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## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Increased Incentives to Retain Volunteer Fire and EMS Members. | Maintain current volunteer incentive program of $250 or $500 annualized incentive payment to volunteer members based on hours of volunteer contribution.<br><br>Maintain volunteer members exemption from one County vehicle license fee. | Establish a per-call stipend for members who respond to calls, with payments allocated on an established timeframe (monthly, quarterly, or bi-annually).<br><br>Establish a station-standby stipend to encourage members to stand-by for a more ready response, with payments allocated on an established timeframe (monthly, quarterly, or bi-annually).<br><br>Requires funding. | Establish a Length of Service Awards Program or LOSAP pension-like program to be designed around a volunteer member's length of service to the community.<br><br>If established, consider funding up to ten years' service for those current members who qualify with ten or more years of service.<br><br>Requires funding. |
| R&R Funding. | Maintain current recruitment and retention funding for volunteer and career programs. | Increase funding that is aimed at marketing the SCFR system volunteer and career opportunities.<br><br>Marketing funding should include social media, re-branding the system to include a combined system logo, attendance at local and regional community and hiring events, recruitment identification and promotional items with the SCFR system logo.<br><br>Requires funding. | Seek a FEMA-Staffing for Adequate Fire and Emergency Response grant for the recruitment and retention of career and volunteer members.<br><br>Grant funds expand the use of radio, television, and signage to include billboards, and retention recognition programs and incentives.<br><br>May require a local funding match. |

## Training and Education

Training and educating the Fire and EMS workforce is one of the most important functions that a fire department should plan for and should be performed on a regular basis. Education and training programs help to create the character and culture of a Fire and EMS service organization. Agencies that place emphasis on their training tend to be more proficient in conducting the successful mitigation of emergency and non-emergency calls and events. The prioritization of training fosters a culture of readiness, an image of professionalism, and instills pride in the organization.

An effective Fie and EMS training program should be comprehensive and diverse and must cover all of the essential elements of the Fire and EMS department's core missions and responsibilities. The annualized training program must ensure compliance with state and local certification requirements, NFPA and ISO benchmarks, and should include an appropriate combination of classroom training and manipulative or hands-on/practical evolutions. Most of the training, but particularly the practical, hands-on training evolutions, should be developed based upon the department's own operating procedures while remaining cognizant of widely accepted practices and standards, and those of mutual aid departments.

As outlined above, training in the SCFR system is managed by a full-time Deputy Chief, two Training Captains, and an assortment of part-time/overtime SCFR staff. There is some volunteer instructor participation in Fire and EMS programs when these members are available, and when they may be asked to participate. Together, these positions develop and deliver Fire and EMS training for and to the SCFR system and for Triplett Tech. (It should be noted here, during stakeholder meetings the volunteer system communicated they would like to participate more in Fire and EMS training and would like more instructor development course offerings).

The SCFR system has a progressive training matrix for fire staff (volunteer and career) from entry level to chief officer. The Virginia Department of Fire Programs (VDFP) provides certification guidelines for fire service in the state and includes firefighter, hazardous materials operations, driver operator, technical rescue, and officer certifications.

Additionally, the Virginia Department of Emergency Management provides certification guidelines for advanced Haz-Mat certifications, which are typically provided to those who operate on these specialized teams.

Currently, the state does not require a specific certification for fire service response or officer level participation. The Authority Having Jurisdiction is responsible for oversight of minimum training requirements for both volunteer and career members and therefore may establish certification standards. This is the case in the SCFR system.

EMS staff (volunteer and career also has a progressive training matrix, however there is a stricter standard that must be followed, which is outlined under the Virginia Office of EMS (VAOEMS) guidelines. VAOEMS provides certification guidelines for EMS providers (allowing those that respond the ability to provide patient care to include continuum of care during ground transport as an attendant) to include Emergency Medical Responder, Emergency Medical Technician, Advanced Emergency Medical Technician, and Paramedic levels. To obtain certification, candidates must successfully complete an approved certification course to include final certification written and practical examination. EMS providers must also complete continuing education requirements to be recertified as outlined for their specific certification.

Virginia Emergency Medical Services Regulations set general and specific requirements and standards of conduct for personnel to affiliate with EMS agencies and to practice as an EMS provider. Applicable regulatory sections include, but are not limited to:

- 12VAC5-31-300. Requirements for EMS agency licensure and EMS certification.

Each agency in the state may as well apply greater requirements on staff regarding response and attendant functionality.

The next table outlines SCFR system training requirements as outlined for the SCFR system through administrative policy. This policy is primarily for volunteer members.

**Entry Level**

**Operational Support/Probationary Members**

Must complete within 1 year

**Training**

- Association approved county SOG/SOP training.
- Individual Agency SOG/SOP trainings.
- Association orientation program.
- NIMS 100, 200, 700, 800.
- Department PPE orientation.
- Department approved communications training course.
- Department approved highway safety training course.
- Agency specific probationary training.
- CPR

**Company Officer**

- Fire Captain, Fire Lieutenant, Fire Sergeant EMS Lieutenant, EMS Sergeant.

**Training**

- All training listed under Providers or meet criteria of the exception clause.
- NFA Leadership course, leadership course from a firefighter's place of employment, leadership course conducted as part of local training, or a college degree demonstrating leadership capabilities. The Shenandoah County Fire and Rescue Association, in conjunction with SCFR may approve additional leadership courses.
- 8 hours of documented vehicle extrication training, excluding farm machinery extrications, which is conducted by a qualified instructor.

**Provider Level**

Volunteer Staff who successfully complete Entry Level Requirements

**Training**

- All training listed under Support / Probationary Staff.
- Haz-Mat Awareness Certification.

**For Firefighter**

- Fire Attack Series course approved by SCFR, the Association, or VDFP.
- ***Firefighter I is preferred.***
- May-Day Awareness.

**For EMT**

VAOEMS EMT-B.

**General Staff**

Assistant Fire Chiefs, Deputy Fire Chiefs.

Assistant Rescue Chiefs, Deputy Rescue Chiefs, EMS Captains, EMS Lieutenants.

SCFR Training Chief, SCFR Fire Marshal.

**Training**

All training listed under Company Officer or meet criteria of the exception clause.

- NFA Incident Safety Officer Training.
- Mass Casualty Training (EMT-B or documented company level training).

**For Fire Officer**

- VDFP Firefighter II Certification.

**For EMS Officer**

- VAOEMS EMT-B Certification.

**For Fire Officer**

- VDFP Officer I Certification.

**For EMS Officer**

- Instructor certification in some discipline (VDFP Fire or VAOEMS EMS).

**Command Staff**

Fire Chief, Rescue Chief*, Rescue Captain*, SCFR Operations Chief.

**Training**

- All training listed under General Staff or meet criteria of the exception clause.

**For Fire Officer**

- VDFP Instructor I.

**For EMS Officer**

- Leadership Management Series.

Position identifies the top operational rank within the EMS agency.

*If the EMS agency does not have a Chief position the Rescue Captain will fill the position with the Command Staff.

**Chief**

**Training**

- All training listed under Command Staff.
- Education and background with combined or complete emphasis on:
  - Human Resources.
  - Public Administration.
  - Business Management.
  - Budget and Finance.
  - Emergency Management.
  - VDFP Fire Officer II.
  - VAOEMS EMT-B.

In addition to the above training requirements, the administrative policy also outlines an alternate route to officer qualifications. The alternative route only applies to those staff members who have fulfilled the operational support/probationary and provider level requirements.

SCFR career staff have positional training requirements as well, which aligns more with state certifications. These are outlined next by position.

**Firefighter**

- High school diploma or equivalency.
- Emergency Vehicle Operations certification.
- VDFP State Firefighter I certification.
- Hazardous Materials Operations certification.
- VAOEMS EMT-B certification.

**Captain**

- Requires same training/certifications as Lieutenant.
- ICS 300.
- NFA Leadership I.
- VDFP Officer I.

**Master Firefighter**

- All firefighter courses/certifications to include FFII.
- Vehicle Extrication certification.
- EVOC Class 3.
- Released EMS Preceptor .
- VDFP Driver Pump Operator certification.

**Lieutenant**

- Requires same training/certifications as Master Firefighter.
- VDFP Instructor I.

**Deputy Chief Training**

- Associate Degree in related field.
- Requires same training/certifications as Shift Commander.
- VDFP Instructor III.
- Incident Safety Officer certification.
- VAOEMS Education Coordinator.

**Deputy Chief-Fire Marshal**

- Associate Degree in related field.
- Requires same training/certifications as Shift Commander.
- VDFP Fire Inspector 1031 certification.
- VDFP Fire Investigation 1033 certification.
- Virgina Department of Criminal Justice Services compliant law enforcement certification.

**Shift Commander**

- Requires same training/certifications as Captain.
- VDFP Officer II.
- NFA Leadership II.
- ICS 400.

**Deputy Chief-Operations**

- Associate Degree in related field.
- Requires same training/certifications as Shift Commander.
- FEMA-Emergency Management Institute Professional Development Series.

**Fire Chief**

- Associate Degree in related field.
- Requires same training/certifications as Shift Commander.
- FEMA-Emergency Management Institute Professional Development Series.

SCFR system training occurs in each station and is typically scheduled by a volunteer department training and/or operational officer. Career staff company training is organized and coordinated by the shift company officer and/or Shift Commander. Multi-company drills are organized at a centrally located company's station. This includes classroom and hands-on practical training.

Training is also conducted at the SCFR Department offices and the SCFR system training complex located on Backdraft Lane in Edinburg. Ther training complex includes a 3-level burn building, a classroom (portable building), various training props, and equipment storage buildings. The FY 25 budget includes renovations to this site. The current needs are bathrooms and storage.

The SCFR department prefers to hire candidates that are certified as Firefighter 1 and EMT-B, or a candidate that may have one or the other certification (Firefighter 1 or EMT-B). As a small agency that generally does not hire a large pool of staff at one time, this is a more efficient method. Once hired these new staff members attend an eight-to-ten-week new employee class where they are introduced to SCFR guidelines, polices, principles and practices, and they are evaluated to ensure they can meet the general performance standards of their Fire and EMS certifications.

The potential that the pool of experienced-certified candidates drying up is real. Understanding this, the department is developing a program that recruits individuals with no training and who may be interested in changing careers and provide the new recruits the required, basic firefighter and EMT training. There is also an opportunity for SCFR to partner with other counties regionally, who share the same issues and challenges, and have a need to train new recruits, some with no training. This opportunity is very similar to the *Central Shenandoah Criminal Justice Academy*, where regional law enforcement agency staff receive certification training.

The SCFR department also offers a Firefighter I & Firefighter II fire academy for volunteer members as well as an EMT-B academy. This course offering typically takes place between October and June each year. The Firefighter I & Firefighter II academy is offered Monday and Wednesday evenings and every other Saturday. The EMT-B program is offered Tuesday and Thursday evenings and every other Saturday. Fire and EMS Saturday classes typically alternate to ensure instructor availability.

Overall, the SCFR training division has conducted training for new career and volunteer academy students regularly, as outlined here.

- Volunteer Fire Academies
  - 2021: 16 Students
  - 2022: 24 Students
  - 2023: 22 Students
  - 2024: 13 Students
- Career Recruit Schools
  - 2021: 3 Recruit Schools- 24 students
  - 2022: 2 Recruit Schools- 11 students
  - 2023: 3 Recruit Schools- 10 students
  - 2024: 3 Recruit Schools- 11 students
- Volunteer EMT Academies
  - 2021: 23 Students
  - 2022: 21 Students
  - 2023: 11 Students
  - 2024: 20 Students

As already discussed above, the SCFR department training staff provides coordination and instruction in partnership with Shenandoah County Public Schools for a Firefighter I & Firefighter II, and EMT-B programs at Triplett Tech. These programs are offered in alternating years (Firefighter I & Firefighter II offered one year, EMT-B program during the following year). This program is a recruitment pipeline for the system (career and volunteer).

Advanced EMS training and certification (Advanced-EMT and Paramedic) is obtained through the Associate in Emergency Care program (private sector EMS instruction), which is offered in proximity to Shenandoah County, Laurel Ridge Community College, Blue Ridge Community College, and Frederick County Fire-Rescue to name a few opportunities in the region.

Additional training classes occur throughout the year at the SCFR department offices and include EMS and Fire oriented sessions such as EMS protocol training, medic skills training and assessment, driver-pump operator certification, EVOC, mass casualty, incident command for various emergencies, Officer 1 certification, and leadership training. These classes are communicated to the masses through email notification, social media, the SCFR department website, station postings, and the SCFR Chiefs and Captains monthly meeting.

For CY 2025, the SCFR Training Division has a robust schedule that outlines quarterly training for all system members. This training will be conducted by geographic battalion regions and includes required infectious control training, as well as live fire, wildland-urban interface training, and EMS skills training and assessment. Additional training is being offered as well for all system members and is focused on fire suppression, EMS skills, driver operator, live fire, Haz-Mat response, and leadership/officer development.

Overall, the SCRFR Training Division offer both training and attendance courses to support the volunteer partners and career staff. Training is scheduled to accommodate work schedules and has been offered in the evenings and weekends. The SCFR Training Division responds to training requests from volunteer partners through the system's Volunteer/Career Strategic Planning Training Committee.

Since 2022, the SCFR Training Division has hosted sixty-eight VDFP training courses, covering areas such as initial certification, company-level training, officer development, leadership, and technical courses. Records indicate that not all eligible volunteer members take advantage of these courses even though these classes were offered on weeknights and weekends.

CPSM assesses that the SCFR system has guidelines and requirements in place that provides on-boarding and incumbent staff development. ***Every effort should be made to make the completion of required and periodic training an SCFR system priority.*** It is incumbent that all course development and delivery for new and incumbent staff be directed to required training/certification achievement by position and on-going professional development that satisfies medical direction for EMS providers and individual department and system operational requirements.

CPSM further assesses through systemwide career and volunteer stakeholder meetings, the SCFR training staff is taxed with current program development and delivery, which directly affects recruit and incumbent training. This includes position requirement training for system staff, particularly volunteer members. While the SCFR training division offers position requirement classes, a more flexible schedule may be required to ensure inclusion of all system members, particularly adjusting the EMS precepting/provider release schedule, volunteer Firefighter I & II academy to Firefighter I one year and Firefighter II the next year, fire instructor and officer courses for positional requirements. Additional volunteer stakeholder concern includes limited development and encouragement of volunteer instructors.

Additional assessment includes the opportunity for SCFR to partner with other counties regionally, who share the same issues and challenges of hiring small numbers of career staff, and have a need to train new recruits, some with no training and create a regional training academy. This opportunity is very similar to the *Central Shenandoah Criminal Justice Academy*, where regional law enforcement agency staff receive certification training through a regional effort.

Lastly, CPSM assesses the requirements to don self-contained breathing apparatus is not consistent across the system. Volunteer members are required to complete the Fire Attack Series course approved by SCFR, the Association, or VDFP. Conversely, career staff are required to obtain the VDFP Firefighter I certification.

## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| SCFR Department Instructor Staffing. | Maintain current SCFR instructor staffing.<br><br>Encourage and utilize more volunteer instructor participation.<br><br>Increase flexibility in position requirement training for increased volunteer participation. | Add one instructor staff that has a concentration on volunteer Fire and EMT recruit programs.<br><br>Add one instructor staff that has a concentration on career and volunteer incumbent Fire and EMT programs.<br><br>Requires funding. | Add additional instructors (***over the longer term***) that matches SCFR system member growth to sustain successful coordination and development of recruit and incumbent training.<br><br>Requires funding. |
| FFI certification for all members utilizing self-contained breathing apparatus on emergency scenes. | Maintain inconsistency with training that determines who can use self-contained breathing apparatus on an emergency scene where this equipment is required. | Establish a guideline that requires any SCFR system member who participates on an emergency scene that requires self-contained breathing apparatus to have successfully completed the VDFP Firefighter I certification course prior to utilizing this equipment.<br><br>Provide required training.<br><br>May require additional funding. | |

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| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Obtain Advanced-EMT Program Accreditation status to support Advanced-EMT training in-house. | Maintain current practice of sending system members outside of the county for Advanced-EMT level training. | Complete all requirements that leads to SCFR accreditation by the VAOEMS and which allows the SCFR Training Division to offer Advanced-EMT certification courses.<br><br>Serves also as a recruitment and retention component.<br><br>May require funding. | Fund a VAOEMS Education Coordinator position (over the mid-longer term) who manages all Advanced-EMT initial and recertification training.<br><br>Requires funding. |
| Career Recruit Training Academy. | Maintain current practice of recruit training as a stand-alone County. | Analyze the opportunity for SCFR to partner with other counties regionally, who share the same issues and challenges of hiring small numbers of career staff, but have a need to train new recruits, some with no training. Concept is similar to the *Central Shenandoah Criminal Justice Academy*.<br><br>May require funding. | |

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## Community Risk Reduction

Community Risk Reduction activities are important undertakings of a modern-day fire department. A comprehensive fire protection system in every jurisdiction should include, at a minimum, the key functions of fire prevention, code enforcement, inspections, and public education. Preventing fires before they occur, and limiting the impact of those that do, should be the priority objectives of every fire department.

Fire suppression and response, although necessary to protect property, have negligible impact on preventing fire. Rather, it is public fire education, fire prevention, and built-in fire protection systems that are essential elements in protecting citizens from death and injury due to fire, smoke inhalation, and carbon monoxide poisoning. The fire prevention mission is of utmost importance, as it is the only area of service delivery that dedicates 100 percent of its effort to the reduction of the incidence of fire.

Fire prevention should be approached in a systematic manner, and many community stakeholders have a personal stake and/or responsibility in these endeavors. It has been estimated that a significant percentage of all the requirements found in building/construction and related codes are related in some way to fire protection and safety. Various activities such as plan reviews, permits, and inspections are often spread among different departments in the municipal government and are often not coordinated nearly as effectively as they should be. Every effort should be made to ensure these activities are managed effectively between departments.

As indicated above, the SCFR Fire Marshal's Office is staffed by a Fire Marshal (Deputy Chief) and six SCFR operational staff working part-time - overtime.

The primary tasks completed by the community risk reduction team are fire prevention occupancy inspections, fire investigations, and assisting the building official with plans review as needed. Fire inspections include the following occupancy classifications: business groups; multi-family (common areas), high hazard; public assembly; institutional; healthcare facility; and educational.

The SCFR fire prevention team utilizes the following codes:

- 2021 Virgina Statewide Fire Prevention Code
- 2021 Virgina Uniform Statewide Building Code

Currently, the SCFR Fire Marshal's Office has listed fifty-eight occupancies on their current fire prevention inspection list. The next table outlines the number of inspections completed for the years 2020-2024. The inspection count includes initial inspections, re-inspections (required if violations are found) and complaint inspections. There are an estimated 2,475 businesses/occupancies that require inspection at some interval based on their hazard classification.

***According to the Fire Marshal, the current inspection list does include all inspectable properties in the County and not all occupancies requiring inspection are inspected.***

### Table 23: Completed Fire Inspections

| 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| 204 | 188 | 115 | 149 | 219 |

There are a few considerations the SCFR system may consider to ensure all properties for a given inspection year are captured.

**NFPA 1730**

The NFPA has guidance for community risk reduction through the NFPA 1730 standard -*Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operations, 2019 Edition*. This standard provides guidelines for fire prevention activities in a community. One of the key aspects addressed in NFPA 1730 is the minimum inspection frequency for several types of occupancies. NFPA 1730 outlines fire inspection frequency as such:

- High Hazards: **Annually**
- Moderate Hazards: **Biennially**
- Low Hazards: **Triennially**
- Critical Infrastructure: As assigned by the Authority Having Jurisdiction (AHJ)

NFPA 1730 defines these hazards as:

- High-Risk Occupancy. An occupancy that has a history of high frequency of fires, high potential for loss of life or economic loss, or that has a low or moderate history of fires or loss of life, but the occupants have a high dependency on the built-in fire protection features or staff to assist in evacuation during a fire or other emergency.
    - Examples of high-risk occupancies could include multiple-family dwellings, high-rise buildings, hotels, dormitories, lodging and rooming, public assembly, childcare, detention, educational, health care, and industrial.
- Moderate-Risk Occupancy. An occupancy that has a history of moderate frequency of fires or a moderate potential for loss of life or economic loss.
    - Examples of moderate-risk occupancies could include ambulatory health care and industrial occupancies that do not maintain, store, use, or handle hazardous materials in excess of exempt amounts.
- Low-Risk Occupancy. An occupancy that has a history of low frequency of fires and minimal potential for loss of life or economic loss.
    - Examples of low-risk occupancies could include storage, mercantile, and business groups.
- Critical Infrastructure. The assets, systems, and networks, whether physical or virtual, that are so vital to the community that their damage or destruction would have a debilitating effect.
    - Examples of critical infrastructures could include water treatment plants, special structures, public safety buildings, and power plants.

**NFPA 915**

Another opportunity the SCFR system could engage in is the transition to remote fire prevention inspections ***where applicable***. The National Fire Protection Association (NFPA) recently released NFPA 915 *Standard for Remote Inspections and Testing*, 2024 edition. Through this standard fire prevention inspections can be conducted off site through remote capabilities using wireless devices such as cellular phones or cellular tablets/pads, digital devices such as digital cameras and computers, non-digital devices such as film cameras, audio cassette recorders and staffed or unstaffed aerial devices such as drones.

In accordance with NFPA 915:

- *The provisions of the standard shall apply to all types of inspections and tests, automated inspections and testing, and distance monitoring as allowed by the authority having jurisdiction.*
- *The authority having jurisdiction shall determine applicability of the inspection or test, automated inspection and testing, and distance monitoring categories and conditions that will be allowed.*

The intent of the standard is to leverage remote capabilities for inspectors, fire protection system contractors, and occupancy owners and/or tenants greater flexibilities and a more efficient fire prevention system overall.

In summary, a well-developed fire inspection plan is essential for proactively managing fire safety within a community. It contributes to risk reduction, emergency preparedness, and the overall safety and resilience of the community. Additionally, incorporating the essential components of NFPA 1730 and its recommended minimum inspection frequencies will be important when creating a comprehensive and effective fire prevention program for the county. A focus of life safety, property conservation, and the overall well-being of the community are the primary drivers of such a program.

The investigation of the cause and origin of fires is also an important part of a comprehensive fire prevention system. Determining the cause of fires can help with future prevention efforts. Officers on scene initiate the fire origin and cause determination process. When needed, particularly when the on-scene officers cannot determine the origin and cause of the fire, or they believe a crime has been committed, the Fire Marshals office will respond to determine the cause and origin of the fire. The next table provides a historical analysis of SCFR investigations. Data gathered includes records and cases the Fire Marshal is able to identify based on recordkeeping and accessibility to former employee records.

### Table 24: Completed Fire Investigations

| 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|
| 21 | 46 | 46 | 40 | 32 |

CPSM assesses that a well-developed fire inspection plan is essential for proactively managing fire safety within a community. It contributes to risk reduction, emergency preparedness, and the overall safety and resilience of the community. Additionally, incorporating the essential components of NFPA 1730 and its recommended minimum inspection frequencies will be important when developing a more comprehensive and effective fire prevention program for the county. A focus on life safety, property conservation, and the overall well-being of the community are the primary drivers of such a program.

CPSM further assesses the SCFR Fire Marshal's Office primary focus for fire prevention inspections is identified high hazard occupancies such as places of public assembly, institutional occupancies (vulnerable population), educational occupancies, and high hazard industry. Moderate and low risk occupancies are only inspected when a complaint is filed with the Fire Marshal—these occupancies are not included in any inspection schedule and should be to ensure a complete fire prevention inspection system is in place, which furthers community resilience and safety.

## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Develop a digital system that identifies all inspectable properties in the incorporated towns and unincorporated county. | Maintain current practice of complaint driven and higher hazard inspections (58 inspectable properties). | Develop and implement a digital system that identifies all current and new properties and occupancies that require fire prevention inspections in the incorporated towns and unincorporated county in accordance with the Statewide Fire Prevention Code (approximately 2,475).<br><br>Requires funding. | |
| Develop and implement an inspection plan that identifies minimum inspection frequency for High, Medium, Low Hazards, and Critical Infrastructure. | Maintain current inspection list (58 inspectable properties). | Adopt NFPA 1730 as a fire prevention inspection guide for High Hazard, Medium Hazards, Low Hazard, and Critical Infrastructure. | |
| Staff office appropriately with full and part-time staff based on the inspection schedule. | Maintain current staff that consists of a Fire Marshal (Deputy Chief) and six SCFR operational staff working part-time - overtime. | Add one full-time fire prevention inspector to meet the growth of fire prevention inspections after all inspectable properties are identified and classified.<br><br>Maintain part-time staff.<br><br>Requires funding. | Add additional fire prevention inspectors, full and part-time, (over the mid-to-long term) as appropriate, to manage identified occupancies and frequency of inspections by hazard classification as outlined in the NFPA 1730 compliant fire prevention inspection plan.<br><br>Requires funding. |

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Establish a Local Emergency Planning Committee. | Maintain current *Emergency Planning and Community Right-to-Know Act* (EPCRA) reporting of hazardous or toxic substances that meet specified thresholds. Current reporting is directed to SCFR administration and is not mandatory. | Working with the State Department of Environmental Quality, formalize a Local Emergency Planning Committee that includes representatives from the Towns. The purpose of this committee is to work with businesses and formalize compliance with *Emergency Planning and Notification* regulations through submittal of *Emergency Planning Notifications* for extremely hazardous substances above the threshold planning quantity.<br><br>May require limited funding. | |
| Establish a County-Wide Community Wildfire Protection Plan (CWWP). | Maintain limited CWWP program. | Implement a County-Wide CWWP program that includes community overview and risk assessment; community preparedness and mitigation strategies; emergency response and evacuation planning; public education and community engagement; and monitoring.<br><br>May require funding. | |

## Infrastructure

### Fleet

The provision of an operationally ready and strategically located fleet of mission-essential fire-rescue vehicles is fundamental to the ability of a fire-rescue department to deliver reliable and efficient public safety within a community.

The procurement, maintenance, and eventual replacement of response vehicles is one of the largest expenses incurred in sustaining a community's fire-rescue department. While it is the personnel of the SCFR system who provide emergency services within the community, the department's fleet of response vehicles is essential to operational success. Reliable vehicles are needed to deliver responders and the equipment/materials they employ to the scene of dispatched emergencies within the county.

The SCFR system has an array of response vehicles. ***The volunteer companies own the vast majority of response apparatus.*** The County provides funding to all volunteer companies for fuel and vehicle insurance as well as maintenance costs for cardiac monitors, the power loading ambulance system and patient stretchers, hydraulic extrication tools, and mechanical CPR devices. Additionally, the County provides funding for pump and aerial ladder testing.

The next table outlines the apparatus inventory in the SCFR system.

### Table 25: SCFR System Apparatus

| | | |
|---|---|---|
| **Woodstock Rescue** | 2008 | ALS Ambulance |
| | 2016 | ALS Ambulance |
| | 2024 | ALS Ambulance |
| **Strasburg Fire** | 1995 | Brush Unit |
| | 2002 | 100' Aerial (Truck) |
| | 2005 | Rescue Engine |
| | 2016 | Pumper |
| **Toms Brook Fire** | 2006 | Tanker |
| | 2011 | First Response Unit |
| | 2020 | Pumper |
| | 2004 | Brush Unit |
| | 2012 | Rescue Engine |
| **SCFR Department** | 2012 | ALS Ambulance |
| | 2014 | ALS Ambulance |
| | 2017 | ALS Ambulance |
| | 2022 | ALS Ambulance |
| | 2022 | ALS Ambulance |
| | 1991 | Pumper |
| | 1994 | Pumper |
| | 1991 | Light/Air Unit |

| | | |
|---|---|---|
| **Woodstock Fire** | 2007 | Rescue Engine |
| | 2013 | Pumper LDH |
| | 2015 | Brush Unit |
| | 2017 | First Response Unit |
| | 2021 | Pumper |
| | 2017 | 105' Aerial (Truck) |
| **Conicville Fire** | 1985 | Pumper |
| | 2004 | Pumper |
| | 2005 | Brush Unit |
| | 2021 | Tanker |
| | 2004 | Pumper |
| **Fort Valley Fire** | 1997 | Pumper |
| | 2019 | Pumper |
| | 2009 | ALS Ambulance |
| | 2012 | Brush Unit |
| **Edinburg Fire** | 1989 | Pumper Tanker |
| | 2004 | Pumper |
| | 2004 | Brush Unit |
| | 2009 | Pumper LDH |
| **Orkney Springs Fire & Rescue** | 2000 | ALS Ambulance |
| | 2003 | Light Squad Truck |
| | 2003 | Pumper Tanker |
| | 2009 | Pumper |
| | 2015 | ALS Ambulance |
| | 2024 | Brush Unit |
| **Mt. Jackson Rescue & Fire** | 1996 | Heavy Squad Truck |
| | 2019 | First Response Unit |
| | 2020 | Pumper |
| | 2019 | ALS Ambulance |
| | 1996 | Pumper |
| | 1995 | Brush Unit |
| | 2015 | ALS Ambulance |
| **New Market Fire & Rescue** | 2006 | First Response Unit |
| | 2021 | ALS Ambulance |
| | 2020 | Pumper |
| | 2017 | ALS Ambulance |
| | 2021 | Tanker |
| | 1995 | 75' Aerial Tower |
| | 1992 | Pumper |
| **Strasburg Rescue** | 2022 | ALS Ambulance |
| | 2016 | ALS Ambulance |
| | 2019 | ALS Ambulance |

**Apparatus Definitions**

**Pumper – Class A pumper with a tank capacity of 1000 gallons or more and meets the minimum equipment list. (Pumper LDH—carries large diameter supply hose).**

**Rescue Engine: Class A pumper and squad combination that meets minimum equipment list of both engines as well as squads.**

**Truck – Minimum of 75' aerial ladder that meets the minimum equipment list.**

**Tower or Tower Ladder – Minimum of 75' adder tower, elevated platform that meets the minimum equipment list.**

**Tanker – Carries 1500 gallons of water or greater with a quick dump and portable tank-Pumper Tanker includes a fire pump equivalent to a Pumper.**

**Brush Unit – All wheel drive vehicle with a pump and tank used primarily for brush fires.**

**Squad – A vehicle whose primary mission is vehicle extrication and incident support. This unit must meet the minimum equipment list.**

**Light/Air – A specialized unit designed to supply lighting and breathing air.**

Overall, the SCFR system has:

- 18 Pumpers (Engine apparatus)
  - Two belong to the SCFR department and are utilized primarily for training.
- 3 Rescue Engines
- 5 Tankers/ Pumper Tankers
- 3 Aerial Ladders/Aerial Towers
- 1 Heavy Squad
- 1 Lite Squad
- 8 Brush Units
- 18 Ambulances
- 1 Air/Light Unit

In addition to the Fire and EMS response apparatus listed above, the system also has an array of light response vehicles such as SERV vehicles (Special Emergency Response Vehicle) and other quick response vehicles, inflatable boats for surface and swift water responses, and all-terrain vehicles.

Replacement of fire-rescue response vehicles is a necessary, albeit expensive, element of fire department budgeting that should reflect careful planning. A well-planned and documented emergency vehicle replacement plan ensures ongoing preservation of a safe, dependable, and operationally capable response fleet. A plan must also include a schedule for future capital outlay in a manner that is affordable to the community.

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2016 edition (consolidated with other standards into NFPA 1900, *Standard for Aircraft Rescue and Firefighting Vehicles, Automotive Fire Apparatus, Wildland Fire Apparatus, and Automotive Ambulances,* 2024 edition) serves as a guide to the manufacturers that build fire apparatus and the fire departments that purchase them.

Annex F.1 of NFPA 1900 contains guidelines for front-line and reserve fire apparatus (NFPA 1901 standard) regarding service life. With respect to the recommended vehicle service life, the following excerpt is noteworthy:

> *To maximize firefighter capabilities and minimize risk of injuries, it is important that fire apparatus be equipped with the latest safety features and operating capabilities. In the last 10 to 15 years, much progress has been made in upgrading functional capabilities and improving the safety features of fire apparatus. Apparatus more than 15 years old might include only a few of the safety upgrades required by the recent editions of the NFPA fire department apparatus standards or the equivalent Underwriters Laboratories of Canada (ULC) standards. Because the changes, upgrades, and fine tuning to NFPA 1901 (now 1900) have been truly significant, especially in the area of safety, fire departments should seriously consider the value (or risk) to firefighters of keeping fire apparatus more than 15 years old in first-line service.*
>
> ***Apparatus that were not manufactured to the applicable NFPA fire apparatus standards or that are over 25 years old should be replaced.***

The impetus for these service life threshold guidelines is continual advances in occupant safety and construction enhancements. Despite good stewardship and maintenance of emergency vehicles in sound operating condition, there are many advances in occupant safety, such as fully enclosed cabs, enhanced rollover protection and air bags, three-point restraints, antilock brakes, higher visibility, cab noise abatement/hearing protection, carcinogen exposure reduction, and a host of other improvements as reflected in each revision of NFPA 1901 (and now NFPA 1900). These improvements provide safer response vehicles for those providing emergency services within the community, as well those "sharing the road" with these responders.

Currently the system has the following numbers of fire apparatus that are currently more than 25 years in age.

- 5 Pumpers (Engine apparatus)
  - Two belong to the SCFR department and are utilized primarily for training.
- 1 Tankers/ Pumper Tankers
- 1 Aerial Towers
- 1 Heavy Squad

The system has the following numbers of heavy fire apparatus that will be more than 25 years in age over the next three years.

- 1 Tankers/ Pumper Tankers
- 1 Aerial Towers

Currently the SCFR system as a whole does not have a defined heavy fire fleet replacement plan. Volunteer companies typically replace apparatus dependent on use, wear and tear, maintenance costs, and ability to fund. Volunteer Fire and EMS departments either raise funds internally through various fund-raising programs or those located in an incorporated town may receive funding in whole or part when replacing heavy fire apparatus. One concern the volunteer companies voiced to CPSM is the current cost of heavy fire apparatus when compared to available fund-raising funds or allotments received from the towns. For instance, current custom chassis engine apparatus can range between $700,000 to 1.2 million depending on manufacturer.[20] That said, many volunteer companies will keep apparatus beyond 25 years in age as they cannot raise the necessary funds to purchase new apparatus, or they may procure used fire apparatus, which is less costly, however these apparatus dependent on age are already years into their life cycle.

CPSM does not recommend heavy fire apparatus use beyond the 25-year mark for reasons stated in the NFPA 1900 standard, which has a focus on the safety of firelighters driving and riding on the vehicles and for the safety of the public who share the road with these apparatus. Additionally, NFPA 1910 *Standard for the Inspection, Maintenance, Refurbishment, Testing, and Retirement of In-Service Emergency vehicles and Marine Firefighting Vessels, 2024 edition* maintains consistent language and states *The fire department shall consider safety as the primary concern in the retirement of emergency vehicles.*

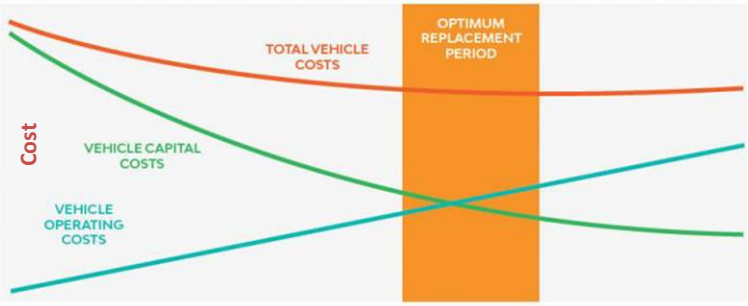
Regardless of the replacement plan for heavy fire fleet, the reality is that it may be best to establish a life cycle for fire apparatus that would match the development of replacement funding, while applying the methodology of determining the replacement date in real life, in an

20. Review of Houston-Galveston Area Fire Apparatus Cooperative Contracts (National Cooperative Purchasing Program).

effort to achieve greater planning and cost efficiency where possible. In the case of SCFR system heavy fire fleet, a 20-25-year service life seems prudent and efficient based on current use. Of course, as the department's response demand increases, this model may be shifted back dependent on the apparatus and maintenance costs. Ladder, Tanker, and Heavy Squad trucks generally follow the same replacement as that suggested for SCFR system engines.

Furthering the efficiency of vehicle grading and to some extent the real-life replacement time of fire apparatus, one could consider the Economic Theory of Vehicle Replacement.

Figure : Economic Theory of Vehicle Replacement




The Economic Theory of Vehicle Replacement states that, as a vehicle ages, the cost of capital diminishes and its operating cost increases. The resultant combination of these two costs produces a total cost curve and suggests the optimal time to replace any piece of apparatus is when the operating cost begins to exceed the capital costs.

This optimal time may not be a fixed point, but rather a range over time, such as a 20–25-year period heavy fire apparatus is in service.

Deferring replacement purchases may be a good strategy at the time for balancing the budget, however this typically leads to the following:

- Costs are transferred from the capital budget to the operating budget to pay for maintenance and repair of the ageing vehicle.
- Deferral of capital costs may increase overall fleet costs in future years as more than one apparatus or ambulance may have to be replaced in a given budget year rather than spread out over several budget years.

One additional note here. Since the pandemic, heavy fire apparatus (engines, ladders, rescues) typically takes 36-42 months to deliver after an order is placed, depending on the manufacture. There are some circumstances that can shorten this time frame; however, these are stock units that may not fit the department's needs and response profile. ***These lead times have to be considered in any fleet replacement program methodology and will require considerable forecasting.***

An additional avenue the SCFR system may consider is apparatus refurbishment. NFPA 1910 (*Standard for Inspection, Maintenance, Refurbishment, Testing, Retirement of In-Service Emergency Vehicles, and Requirements for Marine Firefighting Vessels*, 2024 edition ) outlines two levels of refurbishment, which are:

- Level I Refurbishment, which is the most comprehensive is intended to upgrade major components and systems focused on improving safety, performance, and significantly extending the service life of the vehicle. This is the most comprehensive refurbishment, and all upgrades are performed in accordance with the most recent edition of the NFPA automotive fire apparatus standard (NFPA 1900).

- Level II Refurbishment is intended to address specific issues or components, is more limited in scope (and cost), and is performed in accordance with the NFPA automotive fire apparatus standard in place at the time of its construction (NFPA 1901). The outcome typically extends the apparatus's usability but does not necessarily ensure compliance with the latest NFPA standards.

**Ambulance Replacement**

Given that NFPA 1901 targets specifications for fire suppression vehicles, NFPA 1917, *Standard for Automotive Ambulances*, was published in 2013 (updated in 2019) to provide similar recommendations governing the design and construction of ambulances. The U.S. General Services Administration also promulgates ambulance standards under KKK-A-1822. Additionally, the Commission on Accreditation of Ambulance Services (CAAS) has established a Ground Vehicle Standard (2016).

While NFPA 1917, KKK, and CAAS standards do not include recommended service-life replacement standards for EMS vehicles, common industry practice suggests typical replacement intervals of four to eight years (busy systems), with some implementing replacement schedules of ten years (less busy systems). This schedule depends on a number of variables, most notably vehicle mileage, escalation of annualized repair expenses, and frequency with which the subject vehicle is out of service. After replacement, serviceable vehicles may be retained in ready-reserve status for an additional two to four years.

Currently the SCFR system has five ambulances that are ten or more years old.

***Service Level Considerations begin on the next page.***

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## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Number of Engine Apparatus. | Maintain the current number of engine apparatus at each of the volunteer stations. | Implement a work group of system Fire and EMS leadership (volunteer and SCFR department) to develop fire apparatus fleet life-cycle objectives that consider:<br>□ One Engine Apparatus per SCFR system station that serves as the frontline Engine and that is not older than 25-years.<br>□ One Engine Apparatus reserve that is not older than 25-years.<br>Engine apparatus are not older than 25-years and if they are, they have undergone refurbishment in accordance with the most recent edition NFPA 1900. | The County maintains a fleet of one-two engines that are not older than 25-years, and which are used primarily for reserve engines in any volunteer station.<br>When not in use, engines may be used in training classes.<br>The purpose of this service level is to reduce the number of engines in volunteer stations, which reduces capital expenditures for volunteer departments but shifts same to the county.<br>Requires funding. |
| Number or Aerial Apparatus. | Maintain the current number of aerial ladder apparatus at each of the volunteer stations where these apparatus are located (Stations 12, 23, 51). | Based on current risk and current placement of aerial ladder trucks, there is no mid-level recommendation.<br>Aerial ladder trucks are not older than 25-years and if they are, they have undergone refurbishment in accordance with the most recent edition NFPA 1900.<br>Maintain three aerial ladder trucks strategically positioned along the Route 11 corridor. | The county works with the Towns and assists volunteer companies with the purchase of or refurbishment of aerial ladder trucks and ensures the aerial trucks are constructed or refurbished to meet the most recent edition NFPA 1900.<br>Requires funding. |

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Number of Tanker Apparatus. | Maintain the current number of tanker apparatus at each of the volunteer stations where these apparatus are located. | Based on current risk and current placement of tanker apparatus, there is no mid-level recommendation.<br><br>Tanker apparatus are not older than 25-years and if they are, they have undergone refurbishment in accordance with the most recent edition NFPA 1900.<br><br>Maintain tanker apparatus strategically positioned for a reasonable response in non-hydrant areas. | The county works with the Towns and assists volunteer companies with the purchase of or refurbishment of tanker apparatus and ensures the tanker trucks are constructed or refurbished to meet the most recent edition NFPA 1900.<br><br>Requires funding. |
| Number of Ambulances. | Maintain the current number of ambulances at each of the volunteer stations where they are located. | Maintain an ambulance fleet (minimum two per volunteer station) that has no ambulances older than 10-years. | The County maintains a fleet of 2-4 ambulances (number to be determined by the Fire Chief) that are not older than 10-years, and which are used primarily for reserve ambulances.<br><br>Requires funding. |

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**Facilities**

Fire facilities must be designed and constructed to accommodate both current and forecast trends in fire service vehicle type and manufactured dimensions. A facility must have sufficiently sized bay doors, circulation space between garaged vehicles, departure and return aprons of adequate length and turn geometry to ensure safe response, and floor drains and oil separators to satisfy environmental concerns. Station vehicle bay areas should also consider future tactical vehicles that may need to be added to the fleet to address forecast response challenges, even if this consideration merely incorporates civil design that ensures adequate parcel space for additional bays to be constructed in the future.

Personnel-oriented needs in fire facilities must enable performance of daily duties in support of response operations. For personnel, fire facilities must have provisions for vehicle maintenance and repair; storage areas for essential equipment and supplies; space and amenities for administrative work, training, physical fitness, laundering, meal preparation, and personal hygiene/comfort; and—where a fire department is committed to minimize "turnout time"—bunking facilities.

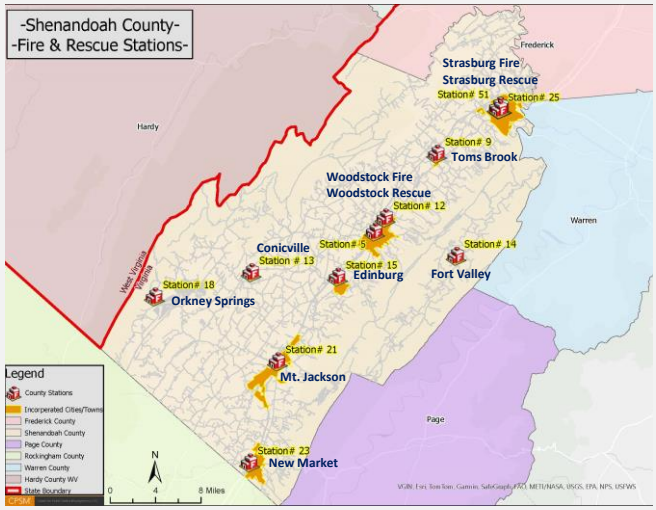
A fire department facility may serve as a de facto "safe haven" during local community emergencies and also serve as a likely command center for large-scale, protracted, campaign emergency incidents. Therefore, design details and construction materials and methods should embrace a goal of having a facility that can perform in an uninterrupted manner despite prevailing climatic conditions and/or disruption of utilities. Programmatic details, such as the provision of an emergency generator connected to automatic transfer switching—even going as far as to provide tertiary redundancy of power supply via a "piggyback" roll-up generator with manual transfer (should the primary generator fail)—provide effective safeguards that permit the fire department to function fully during local emergencies when response activity predictably peaks.

Personnel/occupant safety is a key element of effective station design. This begins with small details such as the quality of finish on bay floors and nonslip treads on stairwell steps to decrease tripping/fall hazards, or use of hands-free plumbing fixtures and easily disinfected surfaces/countertops to promote infection control. It continues with the installation of specialized equipment such as an exhaust recovery system to capture and remove cancer-causing by-products of diesel fuel exhaust emissions. A design should thoughtfully incorporate best practices for achieving a safe and hygienic work environment.

An ergonomic layout and corresponding space adjacencies in a fire station should seek to limit the travel distances between occupied crew areas to the apparatus bays. Likewise, facility design should carefully consider complementary adjacencies, such as lavatories/showers in proximity of bunk rooms, desired segregations, and break rooms or fitness areas that are remote from sleeping quarters. Furnishings, fixtures, and equipment selections should provide thoughtful consideration of the around-the-clock occupancy inherent to fire facilities. Durability is essential, given the accelerated wear and life cycle of systems and goods in facilities that are constantly occupied and operational.

Sound community fire-rescue protection requires the strategic distribution of fire station facilities to ensure that effective service area coverage is achieved, that predicted response travel times satisfy prevailing community goals and national best practices, and that the facilities are capable of supporting mission-critical personnel and vehicle-oriented requirements and needs. Additionally, depending on the fire-rescue department's scope of services, size, and complexity, other facilities may be necessary to support emergency communications, personnel training, fleet and essential equipment maintenance and repair, and supply storage and distribution.

National standards such as NFPA 1500, *Standard on Fire Department Occupational Safety, Health, and Wellness Program*, outlines standards that transfer to facilities such as infection control, personnel and equipment decontamination, cancer prevention, storage of protective clothing, and employee fitness. NFPA 1851, *Standard on Selection, Care, and Maintenance of Protective Ensembles for Structural Firefighting and Proximity Fire Fighting*, further delineates laundering standards for protective clothing and station wear. Laundry areas in fire facilities continue to evolve and are being separated from living areas to reduce contamination. Factors such as wastewater removal and air flow need to be considered in a facility design.




The SCFR system operates out of eleven operational facilities located in the incorporated towns and unincorporated county as indicated in the image to the left.

Each facility has emergency response units and either career staff providing 24/7/365 coverage or volunteer from home or stand-by crew coverage.

Each facility is owned and maintained by the volunteer corporation associated with the emergency services organization. The county provides property and liability insurance for each facility.

Facility maintenance is coordinated and managed by the volunteer companies utilizing external vendors or by company members and includes construction and renovation projects.

The next table outlines specific facility information.

### Table 26: SCFR System Facility Information

| Company Name | Year Built | Square Footage | # Apparatus Bays | Accommodate Overnight Crews | Renovation |
|---|---|---|---|---|---|
| **New Market Fire & Rescue** | 1997 | 17,000 | 4 drive thru<br>2.5 non-drive thru | Yes<br>14 Total | |
| **Mt. Jackson Rescue & Fire** | 2015 | 15,000 | 5 bays (2 vehicle) | Yes<br>6 Total | |
| **Conicville FD** | 1992<br>2005 | 10,400 | 5 | Yes<br>2 Total | 2013-2017 |
| **Toms Brook FD** | 1983 | 11,200 | 2 bays (2 vehicle) | Yes<br>5 Total | 2018 |
| **Woodstock Rescue** | 1969 | 15,200 | 6 bays | Yes<br>10 Total | |

| | | | | | |
|---|---|---|---|---|---|
| **Strasburg FD** | 1951 | 10,496 | 5 bays<br>3 (2 vehicles)<br>2 (1 vehicle) | Yes<br>9 Total | 1991<br>2019 |
| **Strasburg Rescue** | 1972 | 5,288 | 4 bays | Yes<br>6 Total | 2012-2013 |
| **Woodstock FD** | 1931 | 17,000 | 4 bays | Yes<br>6 Total | 1983 |
| **Fort Valley FD** | 1964 | 5,400 | 4 bays | Yes<br>4 Total | 1966<br>1973 |
| **Edinburg FD** | 1977 | 10,304 | 3 bays | No<br>Accommodations | |
| **Orkney Springs** | 1985 | 12,500 | 8 bays | Yes<br>4 Total | 2010 |

CPSM visited each fire facility during our site visit in November 2024. Facility visits included a walk-around and walk-through of each facility with a focus on living space, safety features such as CO capture systems, decon areas, separation from living areas and the apparatus bays, and any visible issues. ***This was not an engineering assessment of mechanical systems or building construction.*** Findings included:

- Conicville: No CO capture system; no identified decon area.
- Edinburg: No identified decon area; no CO capture system; no accommodation for overnight crews; no generator; would need renovation for duty or career staffing crews.
- Fort Valley: No identified decon area; no CO capture system; no washer/dryer; would need renovation for duty or career staffing crews.
- New Market: No identified decon area; no CO capture system.
- Orkney Springs: No identified decon area; no CO capture system; limited living space expansion.
- Strasburg Fire: No identified decon area; no CO capture system for small response units (brush and service units).
- Strasburg Rescue: No identified decon area; no CO capture system; generator in disrepair.
- Toms Brook: No identified decon area; no CO capture system; would need renovation for duty or career staffing crews and apparatus bay expansion for ambulance and/or additional fire apparatus.
- Woodstock Fire: No identified decon area.
- Woodstock Rescue: No identified decon area; no CO capture system.

**Long Range Facility Planning**

Decisions on renovating and/or replacing facilities (those not recommended to be re-located) are better made by an engineer who specializes in facility assessments to include mechanical systems and structural components. In general however, a building goes through a life cycle that includes general maintenance/repair and some mechanical component replacement in

the first 16 years of facility life; the next phase in the building life cycle (age 17-29) goes beyond the general maintenance and repair and includes larger replacement items such as roofs and HVAC systems, windows, apparatus aprons, exterior finish upgrades, obsolete electrical components, and major living space renovation due to expansion of services; the next phase (age 30-49) include replacement of building components that were replaced in earlier years (1-16), interior and exterior renovations, and continuation of replacement of mechanical system components (plumbing, electrical, HVAC).

Facilities that remain active after 50 years of age, while still functional, will continue to need regular maintenance and repair, continued cosmetic updating, and replacement of mechanical and structural components that were replaced in previous life cycle segment years.[21]

The eleven SCFR system fire facilities range in age (original building-may not include any building footprint additions) from 1931 to 2015 and in 2025 will fall into a building life cycle range as follows:

Age 10-16 years: 1 - Mt. Jackson

Age 17-29 years: 1 – New Market

Age 30-49 years:  4 – Conicville, Toms Brook, Edinburg, Orkney Springs

Age 50+: 5 – Woodstock Rescue, Woodstock Fire, Strasburg Fire, Strasburg Rescue, Fort Valley

Overall, CPSM assesses the SCFR system does have aging fire facilities, which requires strategic planning at the system and Board level regarding a funding mechanism for renovations (interior and exterior) and maintenance as described above, and which should be included in near, mid, and longer term SCFR system planning initiatives. Additionally, many facilities lack contemporary fire facility health and safety components such as vehicle CO capture systems and decon areas or separate decon rooms for equipment and personnel. Several stations would need renovation to sustain career staff and/or volunteer duty crews.  Additionally, five of the eleven stations house career staff 24/7/365.  There is always the potential there will be career staffing in other facilities in the future.

All renovation and new Fire and EMS facilities planning should contemplate the following:

- Maximization of access from the living space to the apparatus bay space to reduce turnout times.
- Attention to the health and safety of all staff and visitors to include security; carcinogen exposure; decon rooms for staff, gear, station wear, PPE, and equipment; efficient HVAC systems that provide maximum ventilation and air movement; porous free surfaces throughout; living spaces free of contaminants; contemporary physical training space and equipment located away from the apparatus bays and well ventilated; and gender separate bathroom, shower, and bunking areas.
- Auxiliary power (generator) that will power the entire facility.
- Separate and ventilated room for structural/wildland protective clothing.
- Decon room for staff that has an exterior entry point to reduce contamination and gross decon shower.

21. What happens over the life of a building, Albrice, 2010.

- Ice machine that is placed in a room separate from the apparatus bays and industrial/shop areas.
- Apparatus bay space that accommodates the current and future department Fire and EMS mission, and that are drive through to reduce backing apparatus.
- Living space that will accommodate current and future Fire and EMS personnel.
- An adequate day room that can also accommodate training.
- EMS supply storage that is separated from apparatus bays to avoid contamination.
- Incorporated engineering for the proper disposal of medical waste generated during EMS operations.
- Controlled entry onto public roads from the apparatus bay ramp (where necessary).
- Site security such as keypad entry into the building; security cameras; site fencing, and other safeguards for building occupants either department or public.
- Low maintenance construction and finish materials.

***Service Level Considerations begin on the next page.***

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## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Facility Funding. | Maintain current funding for facility renovation and small construction at the volunteer level. | Develop a funding mechanism that will assist volunteer companies with renovation and small construction projects.<br><br>Requires funding. | |
| Carbon Monoxide Capture Systems. | Most volunteer stations do not have Carbon Monoxide Capture Systems. | SCFR department works with a volunteer fire company or applies for the system for an Assistance to Firefighters Grant on behalf of the volunteer stations that do not have Carbon Monoxide Capture Systems. Grant funding sought to purchase and install systems in the nine stations identified that do not have these systems.<br><br>Will require a funding match. | |

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## Funding for Fire and EMS Services

Funding Fire and EMS departments can be difficult, particularly in large and primarily rural counties who have many competing services and programs to fund. In Shenandoah County Fire and EMS funding affords resources for:

***FY 25 Approved Career Budget: $9,158,328***

***FY 25 Volunteer Budget: $1,343,163***

- Career staffing in six of eleven volunteer stations and all supportive operating and maintenance costs for the department.
- Funding for all system self-contained breathing apparatus (SCBA) equipment to include individual masks for volunteers and annualized mask fit testing.
- Funding for all system radios and pagers (managed by the 911-Center).
- Funding for the maintenance of system 4-gas meters.
- Funding for the maintenance of system cardiac monitors, power loading stretchers and loading systems, CPR devices, hydraulic tools.
- Funding for system apparatus annual fire pump and aerial ladder testing.
- Funding volunteer for fire apparatus and EMS unit fuel, and all volunteer vehicle, property, workers compensation, liability, and accident insurance.
- Annual stipends to each volunteer company equally $39,000 per service (Fire, EMS, or Fire and EMS)—those volunteer agencies with two services then get $78,000.
- As already discussed, the County does not provide direct funding for Fire and EMS apparatus or facility renovations and construction.

Fire and EMS funding will not decrease over time. In fact, and as outlined herein, costs will continually increase each year as there are many needs in Fire and EMS that include career staffing, and as volunteer fund raising cannot compete in today's apparatus and construction cost environment, assistance to volunteer companies for apparatus purchases and facility improvements will eventually become a reality if for no other reason a healthy and safe environment for volunteers and career staff stationed in volunteer stations and operating volunteer apparatus is critical to the success of the system.

One solution to the funding decisions is the creation of a Shenandoah County Fire and EMS District and levy a tax specific to the district to fund the needs of the district. The establishment of a district and separate Fire and EMS tax levy would establish a separate means by which the County can meet existing needs and costs of the Fire and EMS system, but also future needs and enhancement of services, which are inevitable.

§27-23.1 of the Code of Virginia states the following regarding the establishment of fire districts and tax levies:

> *The governing bodies of the several cities or counties of the Commonwealth may create and establish, by designation on a map of the city or county showing current, official parcel boundaries, or by any other description which is legally sufficient for the conveyance of property or the creation of parcels, fire zones or districts in such cities or counties, within which may be located and established one or more fire departments, to be equipped with apparatus for fighting fires and protecting property and human life within such zones or districts from loss or damage by fire, illness or injury.*

*To raise funds for the purposes aforesaid, the governing body of any city or county in which such zones or districts are established may levy annually a tax on the assessed value of all property real and personal within such zones or districts, subject to local taxation, which tax shall be extended and collected as other city or county taxes are extended and collected.*

*The amount realized from such levy shall be kept separate from all other moneys of the city or county and shall be applied to no other purpose than the maintenance and operation of the fire departments and companies established under the provisions of this section.*

***One expense that is looming***, and worth mentioning here is the replacement of SCFR system self-contained breathing apparatus (SCBA). The SCFR department has requested $3,255,809.62 through FEMA's Assistance to Firefighter Grant (AFG) program to replace the SCFR system SCBA equipment and masks. The grant requires a local match, which in this case is $325,580.96 for a total grant amount of $3,581,390.58. The units requiring replacement were purchased in 2011 and 2012 through a former FEMA AFG grant and were built to the specifications of the NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus (SCBA) for Emergency Services* 2007 year standard (the 2013 edition became effective 12/31/2012). It should be noted that during career and volunteer stakeholder meetings, the need to replace and upgrade current SCBA equipment was strongly recommended by system users and necessary at this time due to age, wear and tear, and inconsistent models in use.

Self-Contained Breathing Apparatus (SCBA) is one of the most critical pieces of equipment in the fire service, ensuring firefighter safety in hazardous environments. Consistency in SCBA equipment across the system can significantly improve operational efficiency, safety, and training effectiveness. Also, units purchased under the current NFPA standard will include many upgrades that enhance firefighter safety such as:

- Increased Facepiece Lens Strength
- Enhanced Communication Systems
- Universal Emergency Breathing Safety Systems (EBSS)
- Improved HUD (Heads-Up Display) and Low Air Alarm
- Longer Battery Life for Electronics
- Enhanced Durability and Performance Testing
- Improved PASS (Personal Alert Safety System) Integration

These enhancements are designed to improve firefighter survivability, usability, and interoperability, addressing critical issues identified through past incidents and technological advancements.

***Should the SCFR department not receive the FEMA grant, funding will have to be considered for allocation to purchase the new units in the near term.***

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## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Fire and EMS Funding. | Maintain current funding source (general fund) for Fire and EMS services. | Provide additional funding, as can be allocated through the annual budget process, for staffing, programs, equipment, facilities, fleet, and day-to-day operational expenses through the current general fund platform. | In accordance with §27-23.1 of the Code of Virginia, establish a Fire and EMS district and separate Fire and EMS tax levy that would establish a separate means by which the County can meet existing needs and costs of the Fire and EMS system, but also future needs and enhancement of services, which are inevitable. |
| Self-Contained Breathing Apparatus (SCBA) funding. | Maintain current cache of SCBA equipment, the bulk of which was purchased in 2011-2012. | Provide matching funding for an SCFR submitted Assistance to Firefighters Grant that replaces each current SCBA harness, air cylinder, and mask.<br><br>Requires a matching grant funding of up to $325,580.96. | Provide full funding for the replacement of the current cache of SCBA equipment should the SCFR department not be awarded the grant.<br><br>Requires funding of up to $3,581,390.58. |

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## Fire and EMS Deployment

When exploring staffing and deployment of fire departments it is prudent to design an operational strategy around the actual circumstances that exist in the community and the fire and risk problems that are identified. The strategic and tactical challenges presented by the varied hazards that a department protects against need to be identified and planned for through a community risk analysis planning and management process *as completed in this report.*

Effectively managing a fire department requires an understanding of and an ability to demonstrate how changes to resources will affect community outcomes. It is imperative that fire department leaders, as well as policy makers, know how fire department resource deployment in their local community affects community outcomes in three important areas: firefighter injury and death; civilian injury and death; and property loss. If fire department resources (both mobile and personnel) are deployed to match the risk levels inherent to hazards in the community, it has been scientifically demonstrated that the community will be far less vulnerable to negative outcomes in all three areas.[22]

Staffing and deployment of fire services is not an exact science. While there are many benchmarks that communities and management utilize in justifying certain staffing levels, there are certain considerations that are data driven and reached through national consensus (NFPA Standards, Fire Accreditation through the Commission of Fire Accreditation International, and ISO-PPC benchmarking that serve this purpose as well.

In addition to these considerations, staffing is also linked to station location, demand for service, and what type of apparatus is responding such as an engine, ladder, ambulance, or specialty apparatus. CPSM takes a wholistic approach when evaluating staffing and deployable resources, and when making staffing and deployment recommendations. These include:

**Fire Risk and Vulnerability of the Community:** The community risk and vulnerability assessment are used to evaluate potential risks, hazards, and community vulnerabilities, to include those evaluated in a community's Hazard Mitigation Planning. With regard to individual or groups of buildings, the assessment is used to measure the risk associated with the building(s) and then segregate the building(s) as either a high, medium, or low hazard depending on factors such as the life and building content hazard, the potential fire flow required to mitigate a fire, and the staffing and apparatus types required to mitigate an emergency at the specific property. Included in the community risk assessment should be both a structural and nonstructural (weather, wildland-urban interface, transportation routes, and community infrastructure) analysis that again segregates risk into a high, medium, or low risk category.

**Population and Demographics of a Community:** Population, demographics, and population density drive calls for local government service, particularly public safety. The risk from fire is not the same for everyone, with studies telling us age, gender, race, economic factors, and what region in the country one might live, all contribute to the risk of death from fire. Studies also tell us these same factors affect demand for EMS, particularly population increase and access to care challenges for vulnerable population. Many uninsured or underinsured patients rely on

22. Fire Service Deployment, Assessing Community Vulnerability, Metropolitan Chiefs, 2011.

emergency departments for their primary and emergent care, utilizing pre-hospital EMS transport systems as their entry point.

**Call Demand:** Demand includes the types of calls to which fire and EMS units are responding to, the frequency, and the location of the calls. Demand drives workload and station staffing and location considerations. Higher population centers with increased demand require greater resources. High demand affects the resiliency of fire and EMS departments, which can translate into longer response times.

**Workload of Units:** The types of calls to which units are responding and the workload of each unit in the deployment model. This tells us what resources are needed and where; it links to demand and station location, or in a dynamically deployed system, the area(s) in which to post units. The higher the workload, the more effect it has on the resiliency of the department.

**Travel Times from Fire Stations:** The ability to cover the response area/district in a reasonable and acceptable travel time when measured against national benchmarks. Links to demand, risk assessment, resiliency.

**NFPA Standards, ISO-PPC, OSHA requirements (and other national benchmarking):** CPSM considers national benchmarks, standards, and applicable laws when making recommendations or alternatives regarding the staffing and deployment of fire and EMS resources.

**EMS Demand:** Community demand; demand on available units and crews; demand on non-EMS units responding to calls for service (fire/police units); availability of crews in departments that utilize cross-trained EMS staff to perform fire suppression.

**Critical Tasking:** The ability of a fire and EMS department to collect an Effective Response Force as benchmarked against national standards when confronted with the need to perform required critical tasks on a fire or EMS incident scene defines its capability to provide adequate resources to mitigate each event. Department-developed and measured against national benchmarks. Links to risk and vulnerability analysis.

**Community Expectations:** Measuring, understanding, and meeting community expectations.

**Ability to Fund:** The community's ability and willingness to fund all local government services and understanding how the revenues are divided up to meet the community's expectations.

While each component presents its own metrics of data, consensus opinion, and/or discussion points, aggregately they form the foundation for informed decision making geared toward the implementation of sustainable, data- and theory-supported, effective fire and EMS staffing and deployment models that fit the community's profile, risk, and expectations.

## Critical Tasking, NFPA 1720, Effective Response Force

Emergency events occur at all hours, on all days, and under all conditions. The fire and EMS service's response to these unpredictable conditions has been to develop a methodology for being prepared to respond and deploy adequate resources in a timely fashion when they occur.

The rapid and effective performance of highly coordinated assigned tasks is the hallmark of a successful emergency response force whether it be Fire or EMS or combined. Time and on-scene performance expectations are the target indicators established for measuring the operational elements (individuals, crews, and work units) that comprise response-ready resources.

***Critical tasks*** are those activities that must be conducted on time and preferably simultaneously by responders at emergency incidents to control the situation and minimize/stop loss (property and life-safety).

Critical tasking for fire operations is the minimum number of personnel needed to perform the tasks needed to effectively control and mitigate a fire or other emergency.

Critical tasking for EMS operations is those activities (clinical and operational) that must be conducted, some in succession, and some simultaneously to rapidly assess the patient, determine the level of intervention needed, if any, and connect the patient with the appropriate level of pre-hospital clinical care.

To be effective, critical tasking must assign enough personnel so that all identified functions can be performed as described above. However, it is important to note that initial response personnel may manage secondary support functions once they have completed their primary assignment. Thus, while an incident may end up requiring greater commitment of resources or a specialized response, a properly executed critical tasking assignment will provide adequate resources to immediately begin bringing the incident under control.

The specific number of people required to perform all the critical tasks associated with an identified risk or incident type (Fire, EMS, and Fire/EMS) is referred to as an ***Effective Response Force*** (ERF). The goal is to deliver an ERF within a prescribed period of time as outlined in national standards.

## Fire Critical Tasking

The SCFR system as a career, volunteer response system aligns with NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2020 edition (National Fire Protection Association, Quincy, Mass.). This standard outlines organization and deployment of operations by volunteer and combination fire and rescue organizations (organizations that are majority volunteer). It serves as a benchmark to measure staffing and deployment of resources to certain fire incidents and emergencies.

NFPA 1720 is a nationally recognized standard, but it has not been adopted as a mandatory regulation by the federal government or the Commonwealth of Virginia. It is a valuable resource for establishing and measuring performance objectives for the SCFR system but should not be the only determining factor when making local decisions about the County's Fire & EMS system.

According to NFPA 1720, fire departments should base their specific role on a formal community risk management plan, as discussed earlier in this analysis, and taking into consideration:[23]

- Life hazard to the population protected. The number and type of units assigned to respond to a reported incident shall be determined by risk analysis and/or pre-fire planning.
- Fire suppression operations shall be organized to ensure that the fire department's fire suppression capability includes personnel, equipment, and other resources to deploy fire suppression resources in such a manner that the needs of the organization are met.

23. NFPA 1720

- The Authority Having Jurisdiction shall promulgate the fire department's organizational, operational, and deployment procedures by issuing written administrative regulations, standard operating procedures, and departmental orders.
- The number of members that are available to operate on an incident is sufficient and able to meet the needs of the department.
- Provisions for safe and effective firefighting performance conditions for the firefighters.
- Personnel responding to fires and other emergencies shall be organized into company units or response teams and have the required apparatus and equipment to respond.
- Initial firefighting operations shall be organized to ensure that at least four members are assembled before interior fire suppression operations are initiated in a hazardous area.
- The capability to sustain operations shall include the personnel, equipment, and resources to conduct incident specific operations.

Fire and rescue work is task-oriented and labor intensive, performed by personnel wearing heavy, bulky personal protective equipment (PPE). Many critical fireground tasks require skillful operation and maneuvering of heavy equipment.

The speed, efficiency, and safety of fireground operations are dependent upon the number of firefighters performing the tasks. If fewer firefighters are available to complete critical fireground tasks, those tasks will require more time to complete. This increased time is associated with elevated risk to both firefighters and civilians.

To ensure civilian and firefighter safety, fireground tasks must be coordinated and performed in rapid sequence. Assembling an Effective Response Force (ERF) is essential to accomplish on-scene goals and objectives safely and efficiently. Without adequate resources to control a building fire, the building and its contents continue to burn. This increases the likelihood of a sudden change in fire conditions, and thus the potential for failure of structural components leading to collapse. An inadequate ERF limits firefighters' ability to successfully perform a search and potential rescue of any occupants.

As a fire grows and leaves the room and then floor of origin, or extends beyond the building of origin, it is most probable that additional personnel and equipment will be needed, as initial response personnel will be taxed beyond their available resources. From this perspective it is critical that the SCFR system units respond quickly and initiate extinguishment efforts as rapidly as possible after notification of an incident. It is, however, difficult to determine in every case the effectiveness of the initial response in limiting the fire spread and fire damage. Many variables will impact these outcomes, including:

- The time of detection, notification, and response of fire units.
- The age and type of construction of the structure.
- The presence of any built-in protection (automatic fire sprinklers) or fire detection systems.
- The contents stored in the structure and its flammability.
- The presence of any flammable liquids, explosives, or compressed gas canisters.
- Weather conditions and the availability of water for extinguishment.

Subsequently, in those situations in which there are extended delays in the extinguishment effort, or the fire has progressed sufficiently upon the arrival of fire units, there is actually very little that

can be done to limit the extent of damage to the entire structure and its contents. In these situations, suppression efforts may need to focus on the protection of nearby or adjacent structures (exterior exposures) with the goal being to limit the spread of the fire beyond the building of origin, and sometimes the exposed building. This is often termed ***protecting exposures***. When the scope of damage is extensive, and the building becomes unstable, firefighting tactics typically move to what is called a ***defensive attack***, or one in which hose lines and more importantly personnel are on the outside of the structure and their focus is to merely discharge large volumes of water until the fire goes out. In these situations, the ability to enter the building is extremely limited and if victims are trapped in the structure, there are very few safe options for making entry.

Today's fire service is actively debating the options of interior firefighting vs. exterior firefighting. These terms are self-descriptive in that an ***interior fire attack*** is one in which firefighters enter a burning building in an attempt to find the seat of the fire and from this interior position extinguish the fire with limited amounts of water. An ***exterior fire attack***, also sometimes referred to as a ***transitional attack***, is a tactic in which firefighters initially discharge water from the exterior of the building, either through a window or door and knock down the fire before entry in the building is made. The concept is to introduce larger volumes of water initially from the outside of the building, cool the interior temperatures, and reduce the intensity of the fire before firefighters enter the building.

A transitional attack is most applicable in smaller structures, typically single-family, one-story detached units that are smaller than 2,500 square feet in total floor area. For fires in larger structures, the defensive-type, exterior attacks involve the use of master streams, typically from an elevated aerial device, and capable of delivering large volumes of water for an extended period of time.

The exterior attack limits the firefighter from making entry into those super-heated structures that may be susceptible to collapse. From CPSM's perspective, there is the probability, depending on the time of day, an SCFR system response crew of a limited number of personnel on the initial response will encounter a significant and rapidly developing fire situation. ***It is prudent, therefore, that the SCFR system builds at least a component of its training and operating procedures around the tactical concept of this occurring.***

The variables of how and where personnel and companies are located, and how quickly they can arrive on scene, play major roles in controlling and mitigating emergencies. ***The reality is that the SCFR system relies on volunteer response from home or work to make up the teams and crews of the Effective Response Force.*** SCFR system's volunteer availability at any time of the day may have an impact on assembling enough personnel and resources on the scene. This factor has to be considered at all times by those responding to the scene, those responding to the station to pick up apparatus, and command officers responding who must manage and coordinate available responding and on-scene resources.

NFPA 1720 establishes the minimum response staffing for a predominately volunteer department for low-hazard structural firefighting incidents (to include out buildings and up to a 2,000 square-foot, one- to two-story, single-family dwelling without a basement and no exposures) for specific demand zones as shown in the following table.

Each demand zone takes into consideration certain risk elements such as population density, exposed occupied buildings (more predominant in urban and suburban demand zones), water supply, and proximity to responding apparatus and members (incident and fire station).

NFPA 1720 demand zone response criterion is described in the next table.

## Table 27: NFPA 1720 Staffing for Effective Response Force, Residential Structure

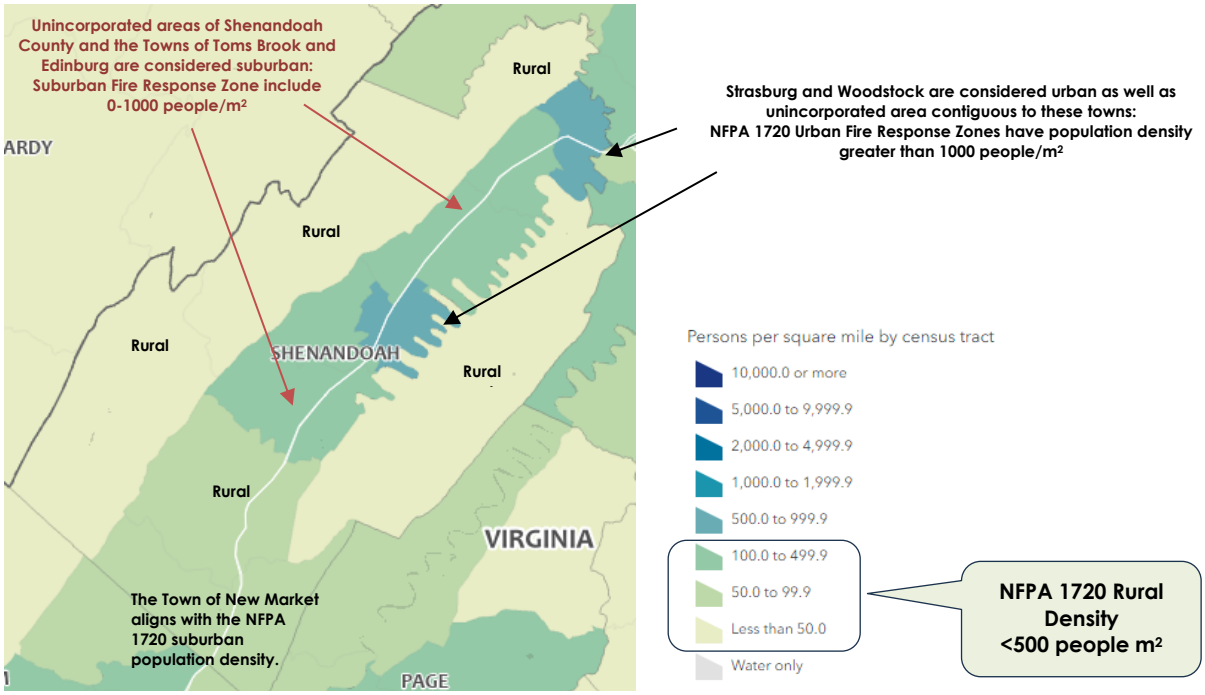
| Demand Zone | Demographics | Minimum Staff to Respond to Scene* | Response Time Standard to Collect Minimum Staff |
|---|---|---|---|
| Urban Area | >1000 people/mi² | 15 | Within 9 minutes 90 percent of the time |
| Suburban Area | 500-1000 people/mi² | 10 | Within 10 minutes 80 percent of the time |
| Rural Area | <500 people/mi² | 6 | Within 14 minutes 80 percent of the time |
| Remote Area | Travel Distance ≥ 8 miles | 4 | Directly dependent on travel distance, determined by AHJ, 90 percent of the time |

***Suburban, rural, and remote apply to Shenandoah County.***

**Note**: *Minimum staff responding includes automatic and mutual aid. Minimum staff responding to scene by apparatus and personal owned vehicle.

The next figure shows the areas of SCFR system response area that are urban, suburban, and rural as benchmarked against the NFPA 1720 demographics. The purpose of this map is to identify where the NFPA 1720 demand zones exist in the city and how this links to the Effective Response Force for each zone the SCFR system should strive to meet for building fires. The largest built-upon land area of the SCFR system response area meets the NFPA 1720 rural demand zone minimum staff to respond benchmark, which is 6 personnel. There is a significant area along Route 11 that benchmarks as a suburban demand zone, which has a response benchmark of 10 personnel. There are also urban demand zones in and around the Towns of Strasburg and Woodstock, which have a response benchmark of 15 personnel.

## Figure13: SCFR System NFPA 1720 Demand Zones



The next two tables provide examples of operational critical tasking utilizing the NFPA 1720 minimum staffing criteria. As discussed above, the urban demand zone stipulates the largest minimum staffing. In the urban demand zone, when the minimum staffing assembles, critical tasks can be completed simultaneously. ***The SCFR system has urban demand zones in its response district as defined by NFPA 1720.***

In the suburban, rural, and remote demand zones, critical tasks are combined more frequently than in the urban demand zone (particularly in the rural and remote zones ), creating circumstances where these critical tasks are completed in sequence, rather than simultaneously. ***SCFR system has suburban, rural, and some remote demand zones in its response district as defined in NFPA 1720.***

## Table 28: Critical Tasking in an Urban Demand Zone, Single-Family Dwelling

| Critical | # of Responders Assigned to Task |
|---|---|
| Attack Line (2-In) | 2 |
| Backup/Second Line | 2 |
| Ventilation | 2 |
| Search and Rescue | 2 |
| Rapid Intervention (2-out) | 2 |
| Attack Engine Pump Operator | 1 |
| Water Source Engine Pump Operator | 1* |
| Outside Crew for: utility control, hose | 2 |
| Incident Commander | 1 |
| **Total Minimum Response for Urban Demand Zone** | **15** |

**If the Water Source Engine Operator is not needed (large diameter hose may suffice for water supply), this position typically teams with another team to complete assigned Critical Tasks.

## Table 29: Critical Tasking in a Suburban Demand Zone, Single-Family Dwelling

| Critical | # of Responders Assigned to Task |
|---|---|
| Attack Line/Search and Rescue (2-In) | 2* |
| Backup/Second Line | 2 |
| Attack Engine Pump Operator | 1 |
| Water Source Engine Pump Operator | 1** |
| Outside crew for: rapid intervention crew | 2 |
| Ventilation/Utility Control | 1** |
| Incident Commander | 1 |
| **Total Minimum Response for** | **10** |

*Attack Line/Search and Rescue Critical Tasking typically combined as there are less staff on scene. Because the tasks are combined, the completion of these tasks may be slowed.

**If the Water Source Engine Operator is not needed (large diameter hose may suffice for water supply), this position typically teams with the Ventilation/Utility Control firefighter to complete these combined tasks. Because the tasks are combined, the completion of these tasks may be slowed.

## SCFR System Staffing Model

As discussed, SCFR system deployment of personnel includes 75 full-time operational shift employees who work 24-hour shifts (minimum staffing of 19/shift), 145 combat firefighters (have received all required training to don self-contained breathing apparatus), and additional volunteer firefighters who can drive and operate on scenes outside of hot zones that require self-contained breathing apparatus. Additionally, there is one on-duty career shift commander and volunteer officers who respond and can serve as incident command officers on emergency responses.

As a review, there are eleven overall response stations, two of which are EMS only (there are nine fire deployment stations). The SCFR department staffs six stations, one which is EMS only with two units (Station 5), and five others where staff cross-staffs Fire and EMS units depending on the first call (Orkney Springs, Conicville, New Market, Mt. Jackson, and Strasburg Fire-two Strasburg Rescue units). Station 23 (New Market) has two, two person crews. One crew primarily staffs an ambulance and the other cross staffs Fire and EMS units.

Response matrices were outlined above in the resiliency discussion. Here we review fire box operational response.

### Table 30: Operational Response Matrix-Building Fires

| Incident Type | Response Matrix |
|---|---|
| **Fire Box-1**<br>■ Residential, commercial, or multi-family residential building fire.<br>■ Chimney fire.<br>■ Appliance fire.<br>■ Inside Hazmat/Smoke in a structure.<br>■ Building Explosion. →<br>■ Terrorist Attack. →<br>■ Hospital / Institution / Nursing/Industrial Home Fire.<br>■ Electrical arcing inside a structure. | Engine: 3<br>Ladder (Truck Company): 1<br>Rescue (Ambulance): 1<br><br>Add Squad or Rescue Engine<br>Add Squad or Rescue Engine and 2nd Truck. |
| **Fire Box-2**<br>■ Small shed or outbuilding fire.<br>■ Large Vehicle Fire (i.e., Tractor Trailer).<br>■ CO Alarm with health complaints.<br>■ Search for or injured hiker on trail. | Engine: 2<br>Rescue (Ambulance): 1 |
| **Fire Box-3**<br>■ Outside fire threatening a structure.<br>■ Large Outside Fire (approximately 5 acres or more). | Engine: 1<br>Brush Unit: 2<br>Tanker or Pumper: 1<br>Rescue (Ambulance): 1 |

The SCFR system response matrix for fire boxes is designed to deploy a certain number of apparatus for firefighting, water, equipment, and tools, as well as staffing. There are system guidelines and protocols that refer to staffing and deployment of resources. These include:

SOG 7.17: Marking Staffing with Responses, which was developed ***to better inform companies of resources responding to emergency events, the following procedure will be followed when units mark responding.*** The focus of the guideline is to indicate ***the number of qualified providers on board the apparatus followed by the number of non-qualified and/or junior members on board the apparatus.***

SOG 7.19: POV Response, which was developed to establish that ***No POV will respond to emergency calls on roadways, unless the call is along the route to the station or at the request of the OIC.*** The emphasis of this guideline is to ensure response on apparatus to minimize road congestion.

SOG 7.24: Response Guideline for EMS Permitted Vehicles, which was developed to ensure VAOEMS licensed vehicles respond with properly credentialed staff as outlined in VAOEMS policies.

Administrative Policy: Standard Response Protocol, which was developed to establish a standard response guideline to serve as the benchmark for response to emergency calls. This policy aligns somewhat with NFPA 1720 and more importantly establishes turnout (wheels rolling) time for those companies identified in an urban or rural geographic location. Turnout Times are measured at the 100th percentile and are as follows:

- Urban: 5 Minutes (SCFR system Stations 5, 9, 12, 15, 21, 23, 25, 51).
- Rural: 10 minutes (SCFR system stations 13,14, 18, 17).

CPSM assesses that when benchmarked against NFPA 1720, Station 5, 12, 25, and 51 reside in urban demand zones and should follow the SCFR system urban turnout time standard; Stations 9, 15, 21, and 23 reside in suburban demand zones and should follow the SCFR system suburban turnout time standard; Stations 13, 14, and 18 reside in rural demand zones and should follow the SCFR system rural turnout time standard.

CPSM further assesses that Stations 5, 13, 18, 21, 23, and 51 (includes 25) have career staffing and turnout time performance should more closely follow the NFPA 1710 (standard for career fire departments) standard for turnout times as follows:

- ≤ 80 seconds for fire and special operations
- ≤ 60 seconds for EMS responses

## Two In-Two Out

Another consideration, and one that links to critical tasking and assembling an Effective Response Force, is that of two-in/two-out regulations. Essentially, prior to starting any fire attack in an immediately dangerous to life and health (IDLH) environment [with no confirmed rescue in progress], the initial two-person entry team shall ensure that there are sufficient resources on-scene to establish a two-person initial rapid intervention team (IRIT) located outside of the building.

This critical tasking model outlined above has its genesis with the Occupational Safety and Health Administration, specifically 29 CFR 1910.134(g)(4). This standard applies to the SCFR system as Federal OSHA covers issues not covered in the state plan.

*CFR 1910.134(g)(4): Procedures for interior structural firefighting*. In addition to the requirements as set forth under paragraph (g)(3), interior structural fires, the employer shall ensure that:

- 1910.134(g)(4)(i)
  - At least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times.

- 1910.134(g)(4)(ii)
  - At least two employees are located outside the IDLH atmosphere; and

- 1910.134(g)(4)(iii)
  - All employees engaged in interior structural firefighting use SCBAs.

**Note 1 to paragraph (g):** One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.

**Note 2 to paragraph (g):** Nothing in this section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.


NFPA 1500, Standard on Fire Department Occupational Health, Safety, and Wellness, 2021 Edition, has similar language as CFR 1910.134(g)(4) to address the issue of two-in/two-out, stating the initial stages of the incident where only one crew is operating in the hazardous area of a working structural fire, a minimum of four individuals shall be required consisting of two members working as a crew in the hazardous area and two standby members present outside this hazard area available for assistance or rescue at emergency operations where entry into the danger area is required.

NFPA 1500 also speaks to the utilization of the two-out personnel in the context of the health and safety of the firefighters working at the incident. The assignment of any personnel including the incident commander, the safety officer, or operations of fire apparatus, shall not be permitted as standby personnel if by abandoning their critical task(s) to assist, or if necessary, perform rescue, this clearly jeopardizes the safety and health of any firefighter working at the incident.[24]

As is common with many volunteer/combination fire departments, SCFR system does not respond to structural fires with a pre-determined staffing regimen, only pre-determined response apparatus. As there is a SCFR Shift Commander, a command officer is dispatched on the initial alarm as well as available volunteer command officers, if available, will respond. Under this

24. NFPA 1500, 8.8.2.5, 2021 Edition

response model, SCFR system may or may not have the minimum number of firefighters on the initial response in order to comply with CFR 1910.134(g)(4), regarding two-in/two-out rules and initial rapid intervention team (IRIT). Responding members must be mindful of who and what apparatus is on scene and the Two-In/Two-Out concept.

In order to meet CFR 1910.134(g)(4), and NFPA 1500, the SCFR system must utilize two personnel to commit to interior fire attack while two firefighters remain out of the hazardous area or immediately dangerous to life and health (IDLH) area to form the Initial Rapid Intervention Team (IRIT), while attack lines are charged, and a continuous water supply is established.

However, NFPA 1500 allows for fewer than four personnel under specific circumstances.[25]

> *The assembling of four members for the initial fire attack can be accomplished in many ways. In their response plan, the fire department should determine the manner in which they plan to assemble members. The four members assembled for initial fire-fighting operations can include an officer, chief officer, or any combination of members arriving at the incident. For career departments, the four members should arrive in tandem if on separate units.*
>
> *If members are going to initiate actions that would involve entering a structure because of an imminent life-threatening situation where immediate action can prevent the loss of life or serious injury and four members are not yet on the scene, the members should carefully evaluate the level of risk that they would be exposed to by taking such action. If it is determined that the situation warrants such action, incoming companies should be notified so that they will be prepared to provide necessary support and backup upon arrival.*

In the end, the ability to assemble adequate personnel, along with appropriate apparatus to the scene of a structure fire, is critical to operational success and firefighter safety. NFPA 1720 addresses this through the staffing matrix for the various demand zones.

## Staffing, Response, and Operating on Scene

There are several factors a fire department that uses volunteer on-call members to fill their initial staffing requirements must consider when implementing response policies. These considerations must ensure the effective use of resources and the safety of the public and firefighters, and are as follows:

- Accountability of responding and on-scene resources, and in the case of firefighters responding in personal vehicles, their ability to arrive safely and function safely prior to the initial arriving fire apparatus.
- Meeting the intent of NFPA 1720 standards, in particular ensuring personnel responding to fires and other emergencies are organized into company units or response teams consisting of a team of at least two.
- The avoidance of freelancing on the fireground, particularly early arriving firefighters to an incident.
- Organizing initial firefighting operations, ensuring that at least four members are assembled before interior fire suppression operations are initiated in a hazardous area.
- It is of the highest importance that firefighters and command officers are trained and disciplined not to freelance or enter a hazardous area or building on fire without the proper

25. NFPA 1500, A.8.8.2, 2021 Edition

equipment beyond their issued personal protective clothing if they arrive at an emergency scene prior to responding fire apparatus.

- Ensuring assembled personnel have radio communication with Incident Command at all times so that they may transmit urgent messages, critical task progress, incident updates, and their team's location, accountability of their actions, and receive from Incident Command and/or other teams operating at the scene the communication of urgent messages, updates, critical task progress, other team locations, and receive new assignments.

NFPA 1720 calls attention to additional staffing/response requirements worth noting here:

- *The fire department shall identify minimum staffing requirements to ensure that the number of members that are available to operate are able to meet the needs of the department.*
  - For the volunteer component this can include scheduled staffing at a pre-determined station or pre-determined staff responding to stations to assemble and respond on apparatus. CPSM understand the SCFR system has this in place through their Squad concept.
- *Where on premises staffing is provided when determined by the authority having jurisdiction, they shall have a turnout time of 90 seconds for fire and special operations and 60 seconds for EMS incidents, 90 percent of the time.*
  - This should be measured at a staffed station.
- *Upon assembling the necessary resources at the emergency scene, the fire department shall have the capability to safety commence an initial attack within 2 minutes 90 percent of the time.*
  - This should be announced by the incident commander over the radio and measured through the computer-aided dispatch (CAD) system after the arrival of the initial arriving members, companies, and response teams.
- *Personnel responding to fires and other emergencies shall be organized into company units or response teams and have the required apparatus and equipment.*
  - This avoids freelancing by personnel before and after the arrival of the fire suppression units; enables the incident commander to size-up available on-scene resources, ensures fireground accountability, and ensures a coordinated assignment of critical tasks.

**The 2021 edition of NFPA 1500 standard on *Fire Department Occupational Safety, Health, and Wellness Program* is equally clear on the critical emergency scene function of personnel accountability.** Additionally, the 2020 edition of NFPA 1561 *Emergency Services Incident Management System and Command Safety* more specifically addresses emergency scene accountability.

Accountability systems include tracking systems where responding apparatus crews or individuals deliver accountability tags to Incident Command for use when command assigns members and companies, and forms crews and groups (interior, roof, hazard control etc.). The Incident Commander places the accountability tags on a board or other tracking instrument that he/she can constantly visualize, move when crews are reassigned, and maintain accountability awareness.

These standards include language as outlined in the following table.

## Table 31: Emergency Scene Accountability–NFPA 1500 and NFPA 1561

| NFPA 1500 | NFPA 1561 |
|---|---|
| **8.5.1:** The fire department shall establish written standard operating procedures for a personnel accountability system; this is in accordance with NFPA 1561. | **4.6.1:** The ESO shall develop and routinely use a system to maintain accountability for all resources assigned to the incident with special emphasis on the accountability of personnel. |
| **8.5.3:** It shall be the responsibility of all members operating at the emergency incident to actively participate in the personnel accountability system. | **4.6.2:** The system shall maintain accountability for the location and status condition of each organizational element at the scene of the incident. |
| **8.5.4:** The incident commander shall maintain an awareness of the location and function of all companies or crews at the scene of the incident. | **4.6.3:** The system shall include a specific means to identify and keep track of responders entering and leaving hazardous areas, especially where special protective equipment is required. |
| **8.5.8:** Members shall be responsible for following personnel accountability system procedures. | **4.6.5:** Responder accountability shall be maintained and communicated within the incident management System when responders in any configuration are relocated at an incident. |
| **8.5.9:** The personnel accountability system shall be used at all incidents. | **4.6.6:** Supervisors shall maintain accountability of resources assigned within the supervisor's geographical or functional area of responsibility. |
| **8.5.10:** The fire department shall develop, implement, and utilize the system components required to make the personnel accountability system effective. | **4.6.10:** Responders who arrive at an incident in or on marked apparatus shall be identified by a system that provides an accurate accounting of the responders on each apparatus. |
| | **4.6.11:** Responders who arrive at the scene of an incident by other means other than emergency response vehicles shall be identified by a system that accounts for their presence and their assignment at the incident scene. |
| | **4.6.14:** The system shall also provide a process for the rapid accounting of all responders at the emergency scene. |

The SCFR has several system guidelines for operating on the scene of fire and fire related incidents to include:

- SOG 8.1: Structural Fire Operations
- SOG 8.3: Swift Water Rescue Operations
- SOG 8.4: Extrication Rescue Operations
- SOG 8.6: Highway Operations
- SOG 8.7: Wildland/Outside Fires & Team Operations

***The SCFR system also has a comprehensive Incident Command/Management Policy for use on all incident types.***

***This is a best practice.***

Additionally, the system has developed a quick reference guide for specific types of building fires to include single family dwelling, townhouse, strip shopping/commercial, and apartment buildings. This guide links to SOG 8.1: Structural Fire Operations and outlines positioning of arriving fire apparatus and crew assignments.

CPSM assesses the SCFR system has established response and on-scene guidelines for the various responses they may be tasked with to mitigate to include a system wide Incident Command/management policy. CPSM further assess there is a separate fireground and emergency scene staff accountability system guideline, which details the use of a standardized on-scene accountability system, and which aligns with NFPA 1500 and 1561 as outlined herein. Additionally, CPSM assesses there are no guidelines that specifically addresses the two-in-two-out national benchmark, which would detail this benchmark as outlined in OSHA 1910.134 and the NFPA 1500 standard.

## EMS Critical Tasking

Critical tasks by specific call type for EMS response are not as well-defined as those in the fire discipline. Notwithstanding, *Critical Tasking* in EMS is typical of that in the fire service in that there are certain critical tasks that need to be completed either in succession or simultaneously. EMS on-scene service delivery is based primarily on a focused scene assessment, patient assessment, and then followed by the appropriate basic and advanced clinical care through established medical protocols. EMS critical tasking is typically developed (in fire-based EMS Standards of Cover documents) in accord with the U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS), as:

- Basic Life Support (BLS), which is an emergency response by a ground transport unit (and crew) and the provision of medically necessary supplies and services.
- Advanced Life Support, Level 1 (ALS1), which is transportation by ground ambulance vehicle and the provision of medically necessary supplies and services including the provision of an ALS assessment or at least one ALS intervention.
- Advanced Life Support, Level 2 (ALS2), which is the transportation by ground ambulance vehicle and the provision of medically necessary supplies and services including:
  - At least three separate administrations of one or more medications by intravenous push/bolus or by continuous infusion (excluding crystalloid fluids) or
  - (2) ground ambulance transport, medically necessary supplies and services, and the provision of at least one of the ALS2 procedures listed below:

    *a. Manual defibrillation/cardioversion.*

    *b. Endotracheal intubation.*

    *c. Central venous line.*

    *d. Cardiac pacing.*

    *e. Chest decompression.*

    *f. Surgical airway.*

    *g. Intraosseous line.*

The next set of tables reviews the critical tasking for the SCFR system /MMR continuum of care. As indicated above, the critical tasking is based on the current CMS ground transport definition of ambulance services.

## Table 32: BLS Critical Tasking

| Critical Task | # Responders |
|---|---|
| Primary Patient Care<br>Incident Command | 1 |
| Secondary Patient Care<br>Vehicle Operations | 1 |
| **Effective Response Force** | **2** |

**Resource Deployment**

**1 Transport Ambulance**

## Table 33: ALS1 Critical Tasking

| Critical Task | # Responders |
|---|---|
| EMS Officer-ALS Certified | 1 |
| Primary Patient Care | 1 |
| Secondary Patient Care<br>Vehicle Operations | 1 |
| **Effective Response Force** | **3** |

**Resource Deployment**

**1 EMS/ALS Officer**
**1 Transport Ambulance**

## Table 34: ALS2 Critical Tasking

| Critical Task | # Responders |
|---|---|
| EMS Officer-ALS Certified | 1 |
| Primary Patient Care | 1 |
| Secondary Patient Care | 1 |
| Tertiary Patient Care Provider/<br>Vehicle Operations | 2 |
| **Effective Response Force** | **5** |

**Resource Deployment**

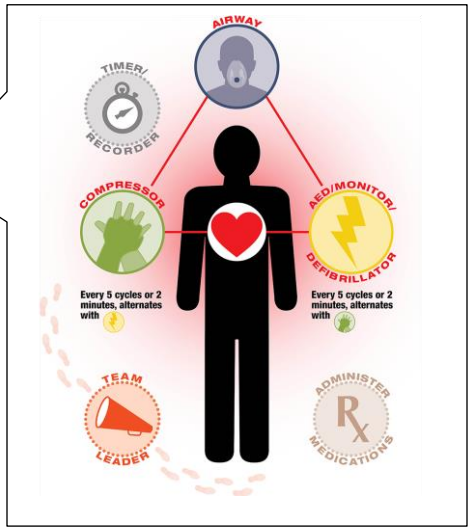
**1 EMS/ALS Officer**
**1 Transport Ambulance**
**1 additional SCFR system unit (as needed based on acuity of patient and continuum of treatment).**

## Table 35: Pulseless/Non-Breathing Critical Tasking

| Critical Task | # Responders |
|---|---|
| EMS Officer-ALS Certified | 1 |
| Primary Patient Care | 1 |
| Secondary Patient Care | 1 |
| Tertiary Patient Care Provider | 2 |
| Vehicle Operations | 1 |
| **Effective Response Force** | **6** |

**Resource Deployment**

**1 EMS/ALS Officer**
**1 Transport Ambulance**
**1-2 additional SCFR system unit (as needed based on acuity of patient and continuum of treatment).**



The SCFR staffs Stations 23 and 25 ambulances (25's respond from Station 51) with Advanced Life Support (ALS) level certified crew members (one per ambulance) when this staffing is available. When staffed such as this, an ambulance can handle most calls as a single resource. There are times (higher acuity patients requiring a higher acuity of care) when additional units may be needed. In the case of a cardiac or respiratory arrest, several volunteer fire apparatus are licensed Basic Life Support (BLS) EMS response vehicles and respond to assist as needed (about 10 percent of all EMS calls).

In the case where ALS services are needed to treat a patient, a BLS ambulance relies on an ambulance staffed with an ALS provider to respond, or a volunteer who may be certified to this level who may respond (an ALS certified provider is more likely to respond in the Strasburg district from Station 25 volunteer staff).

The remaining stations (5, 13, 18, 21) may not have ALS staffed ambulances, and when this resource is needed, these BLS units rely on ALS staffed units primarily from Stations 23 and 51. When this occurs, ALS level care is delayed, and two ambulances are committed to a single call that likely can be handled by the single ambulance and crew.

CPSM reviewed ALS availability for a three-year period. The following represents the percentage of time in a one-year period SCFR staffed ambulances were staffed to the ALS level for CYs 2022, 2023, 2024.

| Year: 2022 | |
|---|---|
| **Station 5-SCFR Unit** | 50.10% |
| **Station 5** | 2.50% |
| **Station 13** | 4.10% |
| **Station 18** | 14.30% |
| **Station 21** | 4% |
| **Station 23** | 74% |
| **Station 25** | 74% |

| Year: 2023 | |
|---|---|
| **Station 5-SCFR Unit** | 54.4% |
| **Station 5** | 2.20% |
| **Station 13** | 1.20% |
| **Station 18** | 2.60% |
| **Station 21** | 4.60% |
| **Station 23** | 67.10% |
| **Station 25** | 80.60% |

| Year: 2024 | |
|---|---|
| **Station 5-SCFR Unit** | 52.20% |
| **Station 5** | 6.50% |
| **Station 13** | 3.40% |
| **Station 18** | 3.10% |
| **Station 21** | 4.70% |
| **Station 23** | 79.90% |
| **Station 25** | 66.30% |

Currently there is no requirement for SCFR department staff to train at the ALS level. Advancing to this level is voluntary and those front-line responders certified to advanced levels and who practice receive an ALS provider bonus as follows:

- Advanced-EMT: $4,500 annually
- Intermediate-EMT: $7,000 annually
- EMT-Paramedic: $8,500 annually

Additionally, there are five SCFR staff in various stages of Paramedic training.

CPSM's assesses the current deployment of ALS providers through available SCFR staffing is deficient for the coverage area and should be expanded through continued incentives for incumbent staff and encouragement of staff to obtain advanced levels of EMS of certification; requiring advanced EMS certification of new firefighter staff and incentivizing same upon hire;

and through expansion of EMS services with a quick response vehicle staffed 24/7/365. CPSM further assesses the SCFR does not have EMS supervisory staff on duty managing EMS operations to include EMS incidents, pharmaceutical exchange, supply, and inventory (this program shifted in 2024 from a hospital-based supply system to an agency-based supply system), liaison with hospital and assisted living/nursing home staff, monitoring of ambulance and crew resources, and assisting with EMS crew issues and challenges.

## Response Times

### Emergency Communications

Public safety response begins in the Emergency Communications Center. Emergency Communications Centers are the critical link to the public and public safety services and ensure that emergency calls are received, processed, and dispatched efficiently. These centers serve as the first point of contact for individuals in crisis, providing critical instructions and coordinating response efforts with police, fire, and emergency medical services.

Highly trained emergency dispatchers and call takers utilize technology to locate callers, assess situations, and deploy appropriate resources. Their ability to remain calm under pressure and provide clear instructions can make a life-saving difference in emergencies.

Emergency Communications Centers operate 24/7, ensuring that help is always just a call away. Their role is essential in maintaining public safety and facilitating seamless coordination between emergency responders and the community.

The Shenandoah County Emergency Communications Center (911-Center) serves as the PSAP (Public Safety Answering Point) for all 911 emergency and non-emergency requests for assistance in Shenandoah County and provides the primary public safety communication services to all public safety entities in the County. These include:

- The Shenandoah County Fire – Rescue system
- The Shenandoah County Sheriff's Office
- Four Town Police Departments (Strasburg, Woodstock, Mt. Jackson, New Market)

The 911-center, when fully staffed, is budgeted for eighteen full-time positions and two part-time positions. 911-Center operational staff work twelve-hour shifts that are either 6:00 am to 6:00 pm or 6:00 pm to 6:00 am.

There is one peak-time position that works 12:00 noon to 12:00 midnight and provides assistance with call-taking, radio channel monitoring and communication, and research and assistance to law enforcement with National Crime Information Center (NCIC) and other databases to run background checks, verify warrants, check stolen property, and gather crucial information for officers in the field. They also communicate with state and federal systems like CJIS (Criminal Justice Information Services) obtaining and relaying important data, such as vehicle registrations, driver's license information, and criminal history records. This assistance is critical in ensuring officers have real-time intelligence to make informed decisions, enhance officer safety, and support public safety operations.

When staffing allows, each shift in the 911-Center is maximally staffed with four telecommunicators and one peak time telecommunicator. The 911-Center minimum staffing

level is two telecommunicators and one peak time telecommunicator. Due to vacancies and recruitment and retention issues, minimal staffing is becoming more of the norm for the center.

The 911-Center does not utilize Emergency Medical Dispatch call processing software at this time. The center does utilize a system that provides the telecommunicator with pre-arrival instructions that are communicated to the caller regarding the medical or injury emergency.

Emergency Medical Dispatch (EMD) call processing software involves systematically handling emergency calls to assess the situation through the 911 call, establish a call determinant, which is typically high acuity or low acuity (some systems create call determinants of varying degrees of high, mid, and low acuity) and then dispatch the most appropriate resources. A system such as this also allows for the stacking of multiple calls by call determinant (acuity), which ensures to a higher degree, the higher acuity EMS calls are handled before lower acuity EMS calls with available EMS units.

To the 911-Center's credit, they did initiate EMD call processing software in the past. The center discontinued use of the system for various reasons such as staffing shortages and the system itself, which was one of the more complicated EMD systems in use at the time.

Regarding the SCFR system, the 911-Center dispatches all calls by station, rather than by individual unit. In smaller systems that utilize cross-staffed units by a career force and volunteers who may not be in the station at the time of dispatch, this serves to be a better system.

CPSM assesses as the SCFR system has limited ambulances and ALS resources, and as call typing is not currently performed for EMS calls in the 911-Center, the SCFR system can benefit from having the 911-Center filter EMS 911 calls through Emergency Medical Dispatch software and at a minimum determine a call to be low acuity or high acuity and further determine which calls are dispatched with an ALS unit and which are dispatched with a BLS unit. CPSM understands this is a change in the 911-Center's platform, and that the center is short-staffed at times and also has recruitment and retention issues and challenges, however dispatching the most appropriate resource (ALS or BLS), and distinguishing which of the lowest acuity calls can hold when most or all units are committed to calls, ensures a greater chance that the most appropriate resource is dispatched to an EMS call.

## SCFR System Response Times

### EMS Response Times

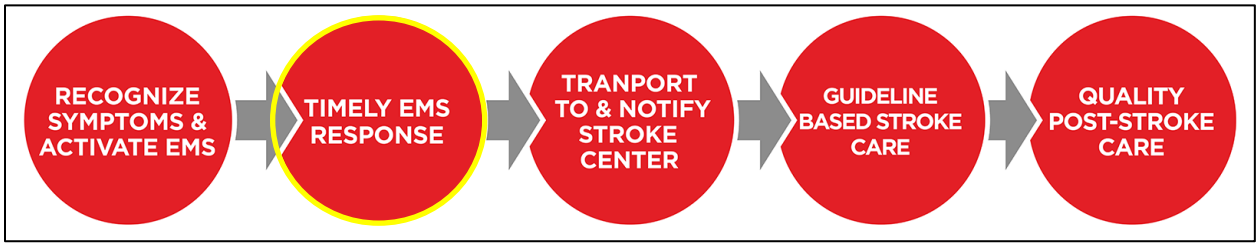
***The focus of EMS response times*** should be directed to the evidence-based research relationship between clinical outcomes and response times. Much of the current research suggests response times have little impact on clinical outcomes of low acuity calls.

Higher acuity calls such as cerebrovascular accidents (stroke), injury or illness compromising the respiratory system, injury or illness compromising the cardiovascular system to include S-T segment elevation emergencies, certain obstetrical emergencies, and certain other medical emergencies that affect cardiovascular, neurological, and respiratory systems require rapid response times, rapid basic and advanced life support on-scene treatment and packaging for transport, and rapid transport to the hospital.

There are also other EMS incidents that are truly life-threatening, and the time of response can clearly impact the outcome. These involve emergencies such as full drowning, allergic reactions, electrocutions, and severe trauma (often caused by gunshot wounds, stabbings, and severe motor vehicle accidents, etc.).

The next figure illustrates the out-of-hospital chain of survival for a stroke emergency, which is a series of actions that, when put in motion, reduce the mortality of a stroke emergency. ***A key component is timely EMS response.***

## Figure 14: Cerebrovascular Emergency (Stroke) Chain of Survival




**Source**: https://nhcps.com/lesson/acls-acute-stroke-care/

The next figure illustrates the out of hospital chain of survival, which is a series of actions that, when put in motion, reduce the mortality of sudden cardiac arrest. Adequate EMS response times coupled with community and public access defibrillator programs can positively impact the survival rate of sudden cardiac arrest victims. ***Again, timely basic and advanced EMS response is a key component of the overall patient care system.***

## Figure 15: Sudden Cardiac Arrest Out of Hospital Chain of Survival

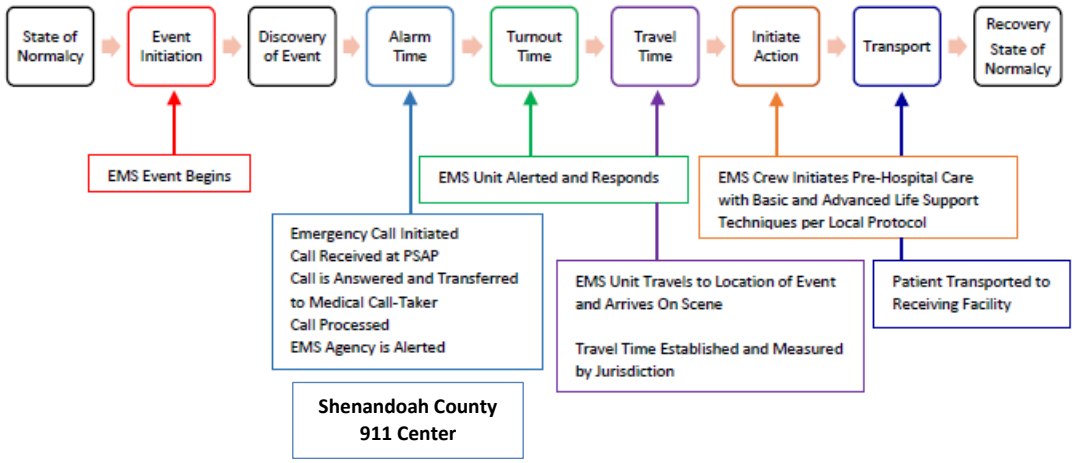

**From**: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.

Typically, a low percentage of 911 patients have time-sensitive and advanced life support (ALS) needs. But, for those patients that do, time can be a critical issue of morbidity and mortality. For the remainder of those calling 911 for a medical emergency, though they may not have a medical necessity, they still expect rapid customer service. Response times for patients and their families are often the most important measurement of the EMS department. ***Regardless of the service delivery model, appropriate response times are more than a clinical issue; they are also a customer service issue and should not be ignored.***

As discussed previously, EMS in Shenandoah County is delivered through a single tier system of SCFR system staffed ambulances (primarily staffed by SCFR department staff), which also provides ground transport to the hospital. The next table reviews response times of the single-tier response SCFR ambulance units for the period July 1, 2023, to June 30, 2024 (calls with complete time stamps). Response times are measured at the 80th (suburban and rural based on NFPA 1720) 90th percentile (urban based on NFPA 1720) for statistical and standard consistency.

Before that discussion it is important to understand the cascade of events in an EMS event, which begins with the event initiation, cascades with the response of fire and EMS units to the initiation of patient then with the transport of the patient if needed.

## Figure 16: Incident Cascade of Events: EMS Response




## Table 36: SCFR System EMS Response Times: 80th & 90th Percentile

| Call Type | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| Breathing difficulty | 2.0 | 2.5 | 8.3 | 12.2 | 2.3 | 3.2 | 10.9 | 14.7 |
| Cardiac and stroke | 2.0 | 2.8 | 8.6 | 12.6 | 2.4 | 3.4 | 11.2 | 15.3 |
| Cardiac arrest | 2.1 | 2.3 | 8.2 | 11.5 | 2.5 | 2.8 | 10.8 | 13.4 |
| Fall and injury | 2.0 | 2.5 | 8.2 | 11.7 | 2.4 | 3.1 | 10.7 | 14.7 |
| Illness and other | 2.3 | 2.7 | 8.3 | 12.3 | 2.7 | 3.4 | 10.8 | 15.2 |
| MVA | 3.3 | 2.4 | 8.6 | 13.4 | 4.1 | 3.1 | 10.6 | 15.8 |
| OD | 2.1 | 2.5 | 8.4 | 12.0 | 2.7 | 2.9 | 10.3 | 13.9 |
| Seizure and UNC | 1.9 | 2.5 | 7.4 | 10.8 | 2.4 | 3.0 | 10.2 | 14.2 |
| **EMS Total** | **2.1** | **2.6** | **8.3** | **12.1** | **2.7** | **3.2** | **10.7** | **14.9** |

The next table analyzes response time by rescue station.

## Table 37: SCFR System EMS Response Times By Station: 80th & 90th Percentile

| First Due Area | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| 13 - Conicville | 2.3 | 3.1 | 11.5 | 15.8 | 3.0 | 3.6 | 13.4 | 17.1 |
| 14 - Fort Valley | 2.6 | 8.2 | 15.2 | 23.3 | 3.3 | 8.9 | 17.9 | 25.5 |
| 17 - Star Tannery | 2.3 | 5.2 | 13.0 | 19.5 | 2.8 | 5.8 | 14.8 | 23.0 |
| 18 - Orkney Springs | 2.1 | 3.0 | 10.7 | 15.0 | 2.6 | 3.4 | 13.1 | 17.4 |
| 21 - Mt. Jackson | 2.4 | 2.9 | 8.8 | 12.8 | 2.8 | 3.4 | 11.1 | 15.5 |
| 23 - New Market | 2.2 | 2.7 | 6.5 | 10.3 | 2.6 | 3.2 | 8.8 | 12.8 |
| CO5 - Woodstock | 2.2 | 2.2 | 8.3 | 12.0 | 2.7 | 2.8 | 10.7 | 14.4 |
| CO25 - Strasburg | 2.1 | 2.5 | 7.0 | 10.8 | 2.7 | 3.2 | 9.0 | 13.1 |
| **Total** | **2.2** | **2.6** | **8.3** | **12.1** | **2.7** | **3.3** | **10.8** | **15.1** |

CPSM asses that:

Dispatch times (time to process calls from the time the calls are received to dispatching stations) are above the NFPA 1225 *Standard for Emergency Services Communications, 2022 edition*, which is within 60 seconds, 90 percent of the time for the highest prioritization level of calls.

Turnout times, which are predominantly career turnout times and are in excess of NFPA 1710 standards of ≤ 60 seconds for EMS responses. Turnout times for Fort Valley are the highest at 12.5 minutes at the 80th percentile (NFPA 1720 rural response standard and above the 10-minute SCFR system standard for rural station turnout times).

Travel times to EMS calls at the 80th and 90th percentile represent the vast area the SCFR system must cover with limited resources and high demand along the Route 11 corridor, and to areas that lack EMS transport resources such as Toms Brook, Edinburg, Fort Valley, and the unincorporated area west of I-81.

Overall, 28 percent of all EMS ambulance responses are outside of the first due district. Station 13-Conicville has the highest percentage of out of district responses (80 percent). This reduces district resiliency and increases response times. Station 14 has the lowest at 2.6%. The remaining include Station 17-21%; Station 18-28%; Station 21-20%; Station 23-28%; Station 5-7% (two units); Station 25/51-12% (two units).

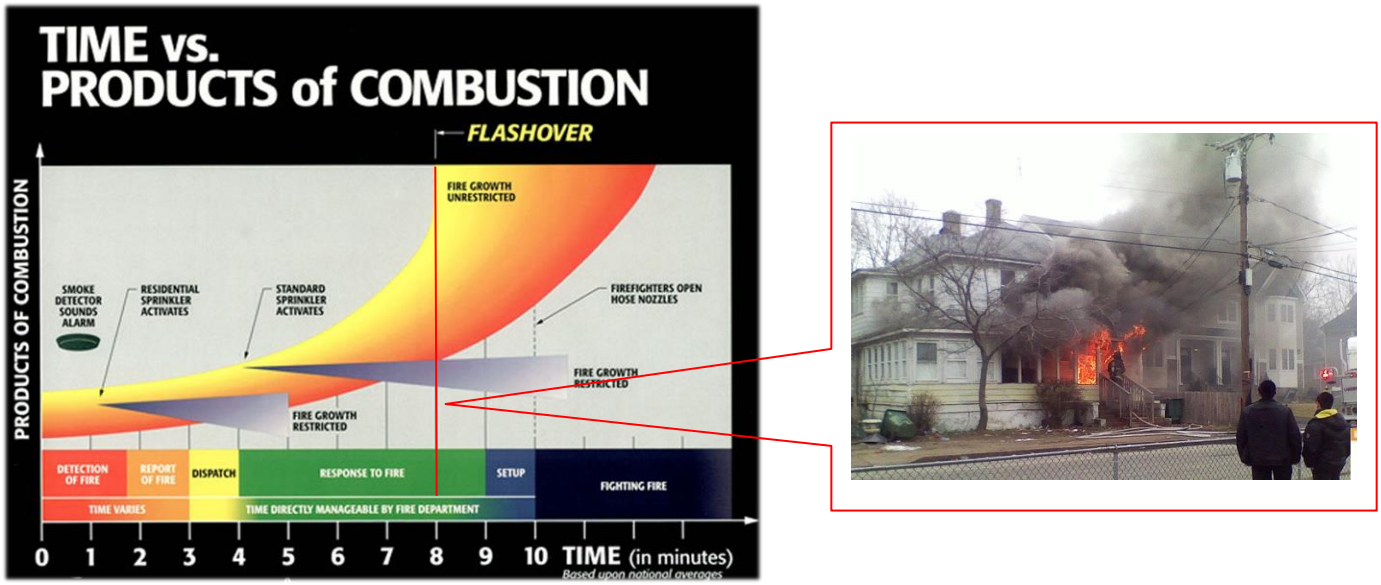
Of significance, Fort Valley has the longest travel times at 15.2 minutes (80th percentile NFPA 1720 rural response standard). Coupled with an 8.2-minute turnout time, once the call is dispatched it takes an average at the 80th percentile, 23 minutes for the first EMS unit to arrive.

***Response times for fire incidents*** are based on the concept of "flashover." A flashover is the near-simultaneous ignition of directly exposed combustible material in an enclosed area. When certain organic materials are heated, they undergo thermal decomposition and release of flammable gases. Flashover occurs when the majority of the exposed surfaces in a space are heated to their auto ignition temperature and ignite.

Flashover occurs more quickly and more frequently today and is caused at least in part by the introduction of significant quantities of plastic and foam-based products into homes and businesses (e.g., furnishings, mattresses, bedding, plumbing and electrical components, home and business electronics, decorative materials, insulation, and structural components). These materials ignite and burn quickly and produce extreme heat and toxic smoke.

When the fire does reach this extremely hazardous state, initial firefighting forces are often overwhelmed, and a larger and more destructive fire occurs. In these circumstances the fire escapes the room and even the building of origin, and significantly more resources are required to affect fire control and extinguishment. This links directly to the discussion in this report regarding the assembling of an Effective Response Force for building fires. The next figure illustrates this phenomenon in terms of fire department response and fire protection systems.

### Figure 17: Fire Growth and Flashover[26]




The illustration above shows how a fire grows over a brief period of time from inception (event initiation) through flashover. The time-versus-products of combustion curve shows activation times and effectiveness of residential sprinklers (approximately one minute), commercial sprinklers (four minutes), flashover (eight to ten minutes), and firefighters applying water first to the fire after notification, dispatch, response, and set-up (ten minutes). ***This illustrates the demand on the fire department to have a quick response to a building fire with the goal of containing the fire to the room of origin to reduce property loss and more quickly address a life-safety scenario.***

As discussed previously, Fire Services in Shenandoah County are delivered primarily through volunteer resources. Although the SCFR department cross-staffs in fire apparatus with EMS units in five of eleven volunteer stations, because of EMS demand, they may not be in the station when a fire call comes in. The next table reviews response times for the SCFR system for the period July 1, 2023, to June 30, 2024 (calls with complete time stamps). Response times are measured at the 80th percentile (rural and suburban areas of the county) and at the 90th percentile (urban areas of the county). These are the response time metrics for benchmarking against the NFPA 1720 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, 2020 edition, as previously outlined.

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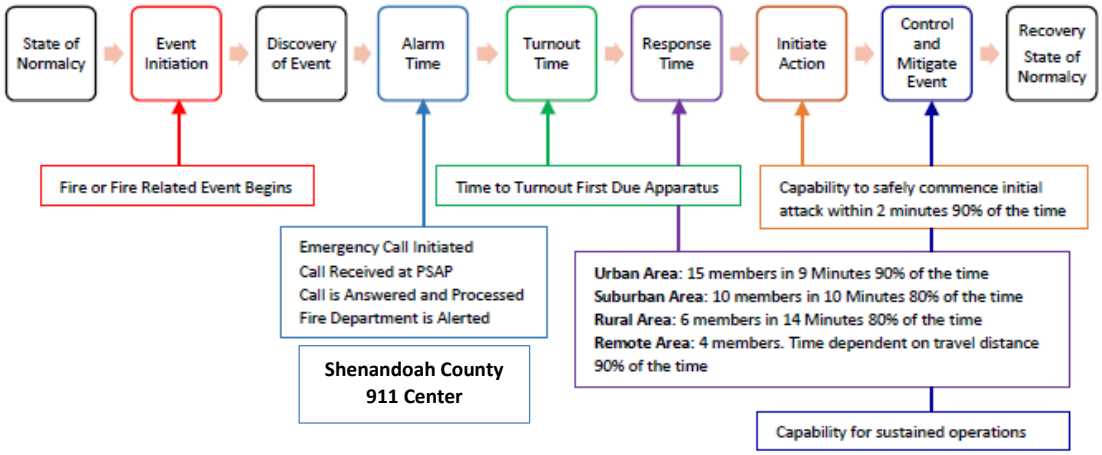
As with EMS response times, it is important to understand the cascade of events in a Fire event, which begins with the event initiation, cascades with the turnout of staff and apparatus, response of fire apparatus and staff to the scene, to the safe commencement of the initial fire attack and other initial fireground critical tasks.

## Figure 18: Incident Cascade of Events: Fire Response-NFPA 1720




## Table 38: SCFR System Response Times By Call Type: 80th & 90th Percentile

| Call Type | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| EMS assist | 2.2 | 6.0 | 8.3 | 16.0 | 2.8 | 9.9 | 10.3 | 19.3 |
| MVA | 3.3 | 4.9 | 8.4 | 14.7 | 4.0 | 6.0 | 9.8 | 17.1 |
| **EMS Subtotal** | **2.5** | **5.7** | **8.3** | **15.7** | **3.1** | **8.8** | **10.1** | **18.8** |
| False alarm | 2.3 | 5.3 | 6.2 | 12.6 | 2.7 | 5.9 | 8.7 | 15.8 |
| Good intent | 3.7 | 5.1 | 8.1 | 15.3 | 5.2 | 5.7 | 10.1 | 18.7 |
| Hazard | 3.5 | 5.3 | 8.9 | 14.6 | 4.2 | 5.8 | 11.4 | 17.0 |
| Outside fire | 3.7 | 4.5 | 9.6 | 15.8 | 4.4 | 5.0 | 12.6 | 19.9 |
| Public service | 2.7 | 5.4 | 6.9 | 14.1 | 4.1 | 7.0 | 8.8 | 17.2 |
| Structure fire | 2.6 | 3.1 | 8.5 | 12.2 | 3.2 | 4.2 | 10.6 | 16.2 |
| Technical rescue | 2.8 | 4.4 | 7.4 | 13.6 | 3.9 | 5.2 | 13.4 | 19.4 |
| **Fire Subtotal** | **3.1** | **5.0** | **8.2** | **14.4** | **4.0** | **5.7** | **10.5** | **17.4** |
| **Total** | **2.8** | **5.3** | **8.3** | **15.3** | **3.5** | **6.8** | **10.3** | **18.3** |

The next table analyzes response time by fire station.

## Table 39: SCFR System Response Times By Station: 80th & 90th Percentile

| First Due Area | 80th Percentile Response Time | | | | 90th Percentile Response Time | | | |
|---|---|---|---|---|---|---|---|---|
| | Dispatch | Turnout | Travel | Total | Dispatch | Turnout | Travel | Total |
| 9 - Toms Brook | 3.1 | 5.2 | 7.9 | 14.7 | 4.1 | 7.2 | 9.8 | 16.7 |
| 12 - Woodstock | 2.9 | 5.5 | 7.3 | 14.2 | 3.7 | 6.0 | 9.3 | 16.7 |
| 13 - Conicville | 2.3 | 5.5 | 10.3 | 17.0 | 3.1 | 6.5 | 11.6 | 18.9 |
| 14 - Fort Valley | 3.5 | 12.3 | 12.5 | 24.3 | 4.1 | 15.7 | 13.1 | 27.2 |
| 15 - Edinburg | 3.0 | 5.9 | 7.5 | 15.5 | 3.8 | 6.6 | 9.9 | 17.4 |
| 17 - Star Tannery | 3.4 | 5.8 | 12.8 | 22.3 | 4.5 | 7.5 | 14.7 | 24.6 |
| 18 - Orkney Springs | 3.1 | 5.3 | 15.1 | 23.1 | 4.4 | 7.4 | 16.9 | 26.6 |
| 21 - Mt. Jackson | 2.6 | 4.8 | 7.3 | 13.7 | 3.1 | 6.0 | 9.2 | 15.5 |
| 23 - New Market | 2.3 | 4.5 | 5.6 | 12.7 | 3.0 | 8.9 | 8.2 | 16.7 |
| 51 - Strasburg | 3.0 | 4.8 | 6.3 | 12.7 | 3.5 | 5.7 | 8.2 | 15.3 |
| 60 - Timberville | 2.0 | 4.8 | 14.3 | 18.5 | 2.0 | 4.8 | 14.3 | 18.5 |
| **Total** | **2.8** | **5.3** | **8.3** | **15.3** | **3.5** | **6.8** | **10.3** | **18.3** |

CPSM assesses that:

Dispatch times (time to process calls from the time the calls are received to dispatching stations) are above the NFPA 1225 *Standard for Emergency Services Communications, 2022 edition*, which is within 60 seconds, 90 percent of the time for the highest prioritization level of calls.

Overall turnout times for fire related calls are combined 5.7 minutes and for structure fires turnout times are 4.2 minutes and for outside fires turnout times are 4.2 minutes. Turnout times for Fort Valley are the highest at 12.5 minutes at the 80th percentile (NFPA 1720 rural response standard and above the 10-minute SCFR system standard for rural station turnout times).

Travel times to fire calls at the 80th and 90th percentile represent the vast area the SCFR system must cover with limited career and volunteer resources. Of significance, Fort Valley has the longest travel times at 12.5 minutes (80th percentile NFPA 1720 rural response standard). Coupled with a 12.5-minute turnout time, once the call is dispatched it takes on average at the 80th percentile, 24 minutes for the first fire unit to arrive.

The next figures will illustrate travel time bleeds for all SCFR system stations. Travel time bleeds are measured at 6-, 9-, 10-, and 14-minute intervals. CPSM utilizes ArcGIS software to complete this analysis. The software utilizes the district's road network, traffic control systems such as stop signs, traffic signals, round-abouts, U-turns, and speed limits.

The first maps illustrate the time and distance issues and challenges in the Fort Valley District. First, we look at travel time bleeds from the Fort Valley station then we look at the next closest SCFR system stations and travel times bleeds from these stations, which are the Edinburg and Strasburg Fire stations and also the Fortsmouth Vol. Fire and Rescue Department in Warren County.

After that we analyze each district travel time bleeds.

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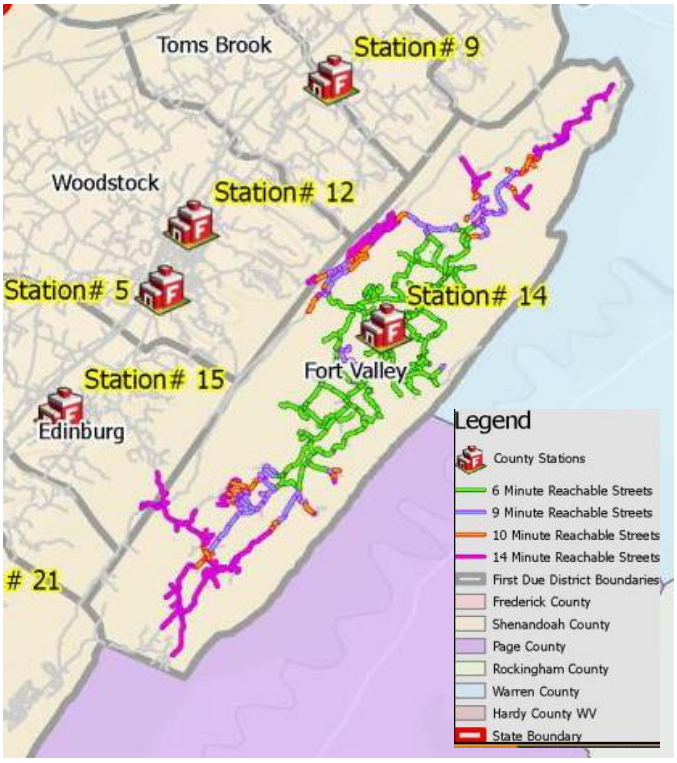
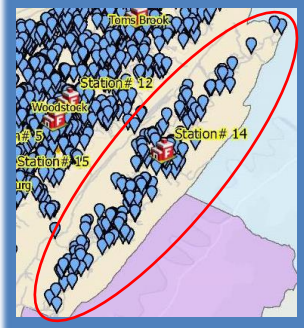
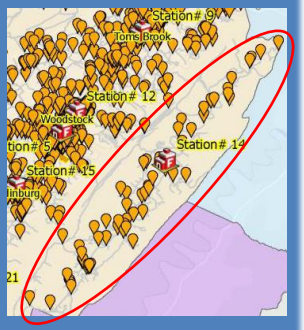
## Figure 19: Fort Valley Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds

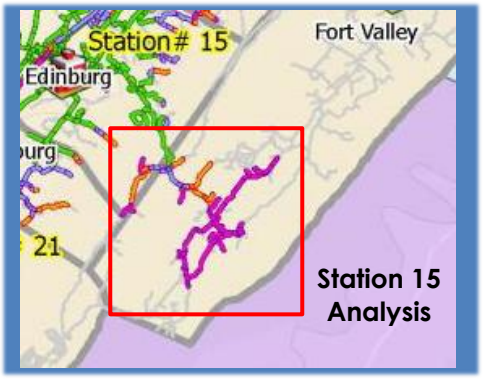


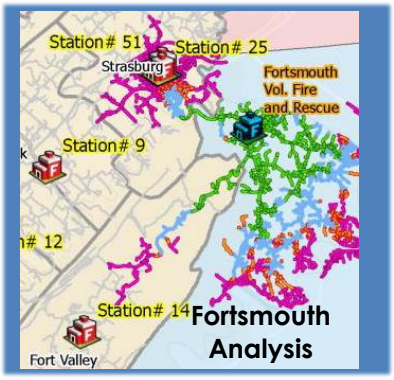

9-10- and 14-minute travel times are prominent to the north and south of the station and occur where Fire and EMS demand populates. The bleeds also align with the 80th percentile travel time of 12.5 minutes as outlined herein.

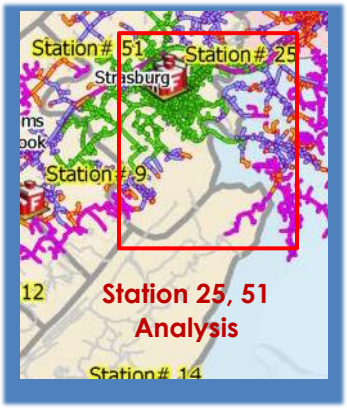
**EMS Demand** **Fire Demand**



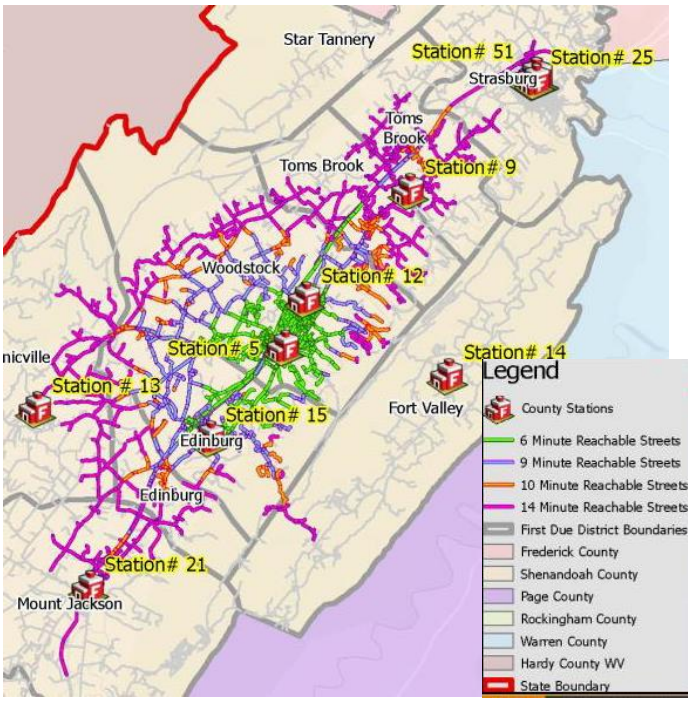



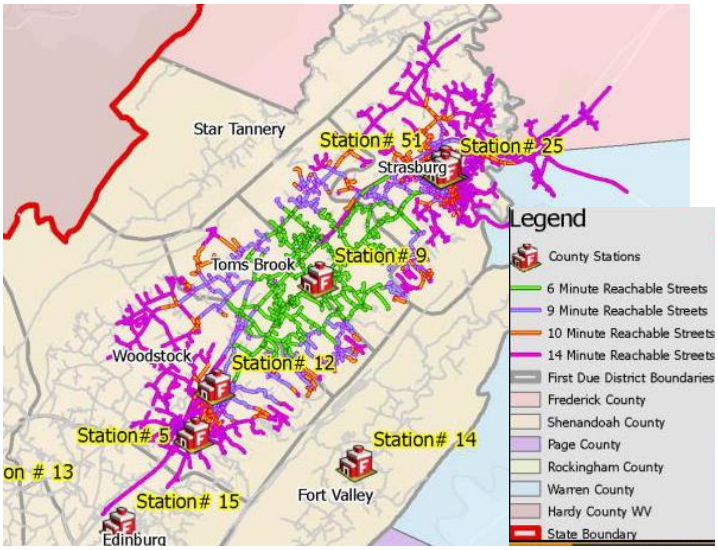

Overall, when benchmarked against the NFPA 1720 standard of 14-minutes (rural response zone) there is limited travel time saturation into the southern end of the Fort Valley district from Station 15, and limited travel time saturation into the northern end of the Fort Valley district from Station 51. The Fortsmouth station in Warren County offers better coverage overall in the northern area of Fort Valley. *These maps illustrate the time and distance challenges the Fort Valley district has.*

## Figure 20: Station 5 EMS District 6, 9, 10, 14 Minute Travel Time Bleeds



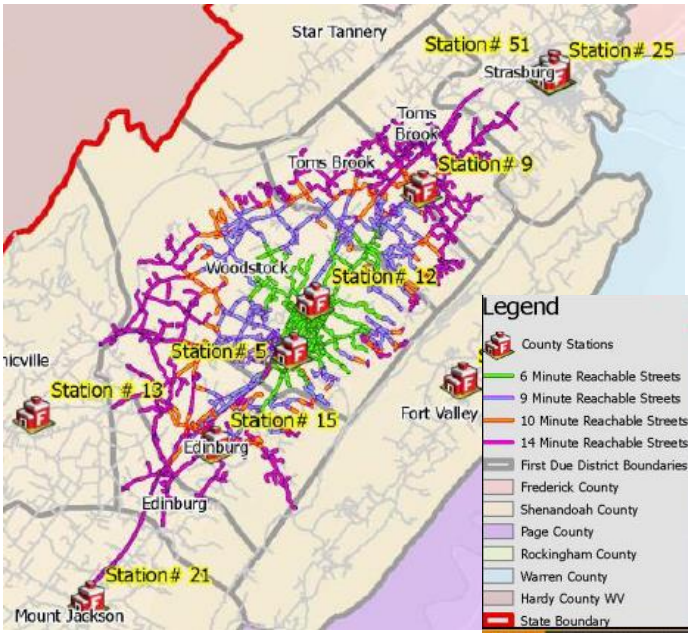

A good portion of the district is covered in 6- and 9-minute travel time. There are areas in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 15 district with extended travel time into the Station 9, 13, 21, and 25 station districts.

## Figure 21: Station 9 Fire District 6, 9, 10, 14 Minute Travel Time Bleeds



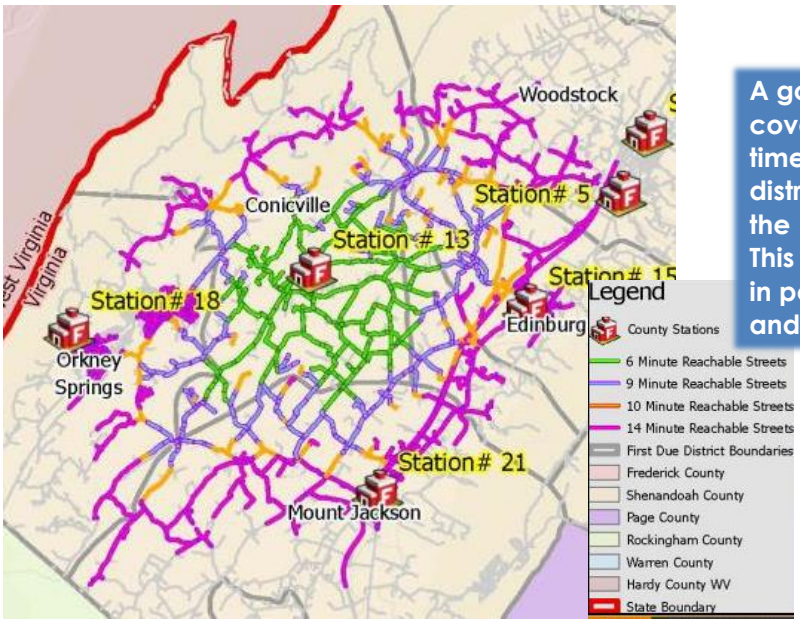

A good portion of the district is covered in 6- and 9-minute travel time. There are only small pockets of area in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time into portions of the Station 12 and 51 district with extended travel time into the remaining areas of the Station 12 and 51 districts.

## Figure 22: Station 12 Fire District 6, 9, 10, 14 Minute Travel Time Bleeds



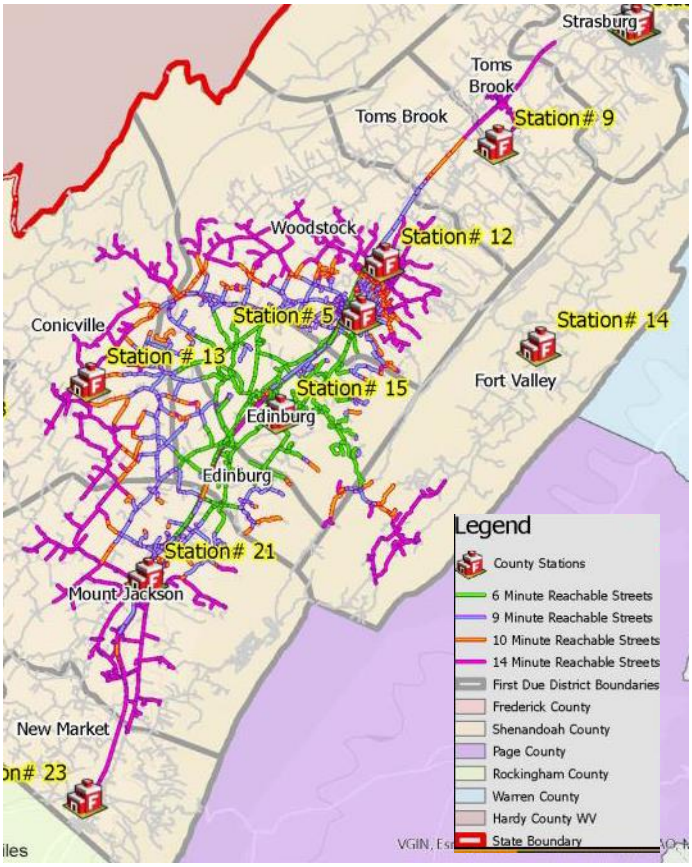

A good portion of the district is covered in 6- and 9-minute travel time. There are areas in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time into portions of the Station 9 and 15 districts.

## Figure 23: Station 13 Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds



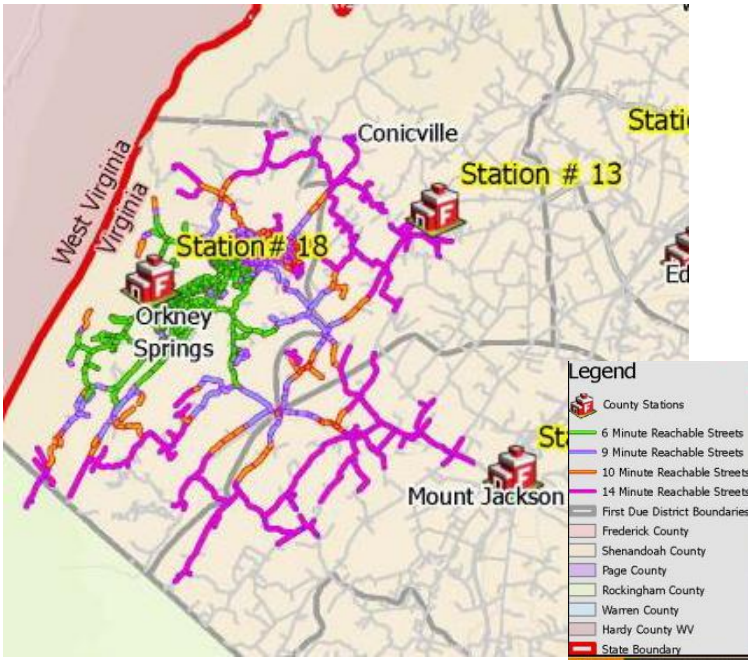

A good portion of the district is covered in 6- and 9-minute travel time. There are areas in the western district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 5, 12, 15, 18, and 21 districts.

## Figure 24: Station 15 Fire District 6, 9, 10, 14 Minute Travel Time Bleeds



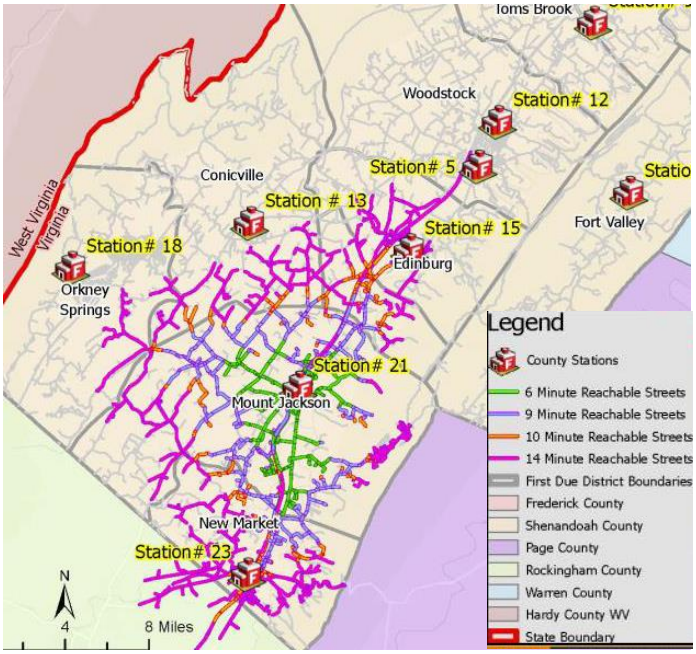

The majority of the district is covered in 6- and 9-minute travel time. There are small areas in the district boundaries that are at the 10-minute travel time. This station has fairly good travel time in portions of the Station 5, 12, 13, and 21 districts.

## Figure 25: Station 18 Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds



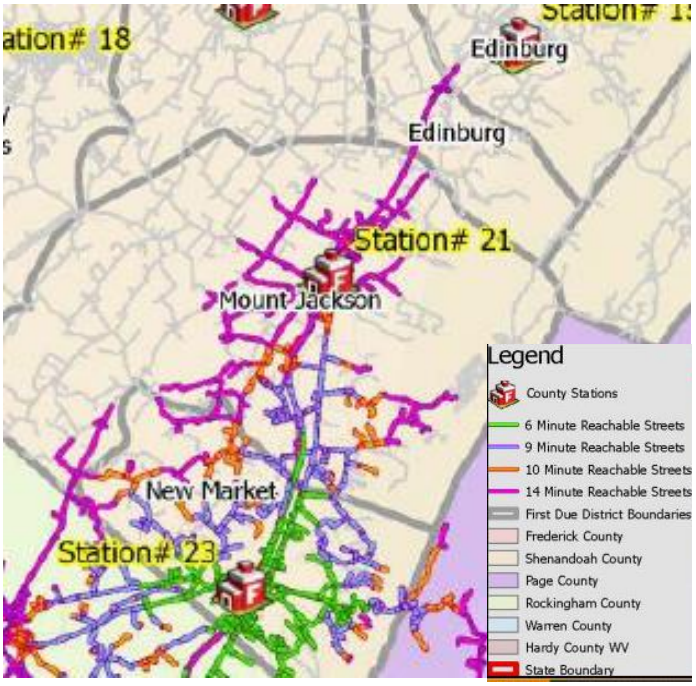

The core of the district is covered in 6-minute travel time. The remainder of the district is at the 9-, 10- and 14-minute travel time. There are also areas in the district boundaries that are beyond the 14-minute travel time standard. This station has extended travel time in portions of the Station 13 and 21 districts.

## Figure 26: Station 21 Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds



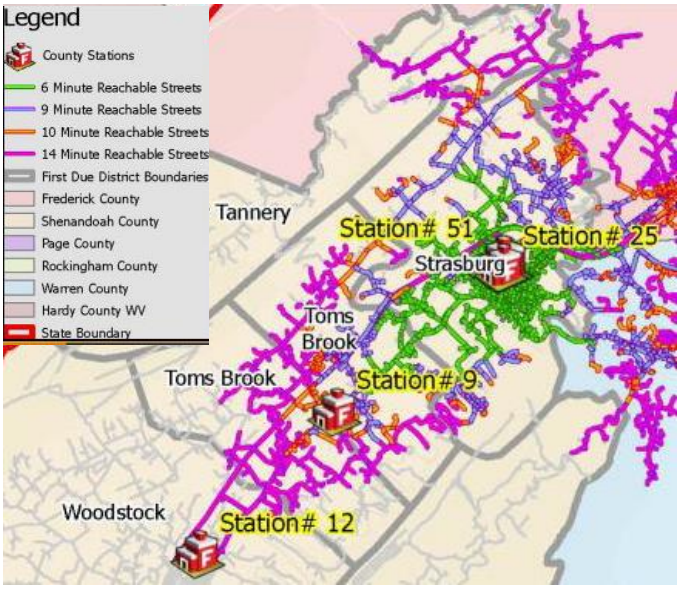

The core of the district is covered in 6 and minute travel time. The remainder of the district is at the 9-, 10- and 14-minute travel time. There are also areas in the district boundaries that are beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 13, 15 and 23 districts.

## Figure 27: Station 23 Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds



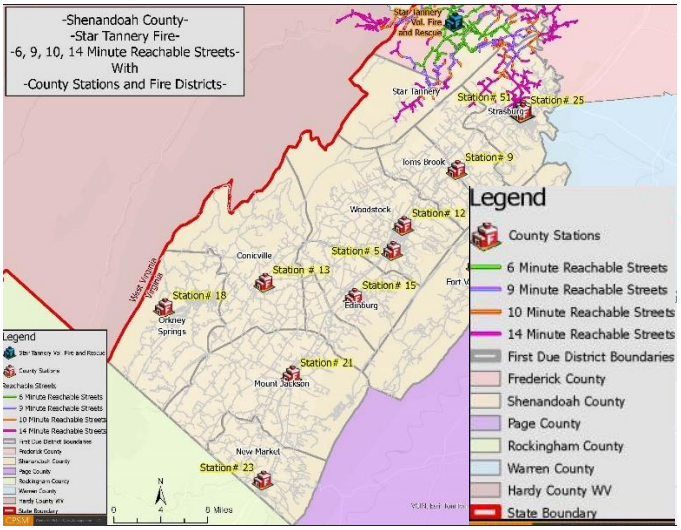

The core of the district is covered in 6-minute travel time. The remainder of the district is at the 9-, 10- and 14-minute travel time. There is also a small area in the western district boundary that is beyond the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 21 district.

## Figure 28: Station 25/51 Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds




**The core of the district is covered in 6-minute travel time. The remainder of the district is at the 9 and some 10-minute travel time. There are also small areas in the west and northwest district boundary that is at the 14-minute travel time standard. This station has fairly good travel time in portions of the Station 9 district.**

## Figure 29: Star Tannery Fire & EMS District 6, 9, 10, 14 Minute Travel Time Bleeds




**The core of the district to the east of the Star Tannery station in Shenandoah County is covered in 6- to 9-minute travel time. The remainder of the district is at the 10- and 14-minute travel time. There are areas that are beyond the 14-minute travel time standard in the southern part of the district. This station has fairly good travel time in portions of the Stations 25 and 51 district.**

CPSM assesses there are gaps in travel time for EMS service in the Edinburg and Toms Brook districts along the heavy demand Route 11 corridor. Also, and due to time and distance, there is a coverage gap (in terms of time and travel time) in the Fort Valley district. Additionally districts 5, 9, 12, 13, 14, 18, 21, 25, 51 and Star Tannery have areas in the district boundary beyond the 14-minute rural travel time standard. Some of these areas are remote.

## Service Level Considerations

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Adjust response policies so that they align with NFPA 1720 regarding Urban, Suburban, and Rural district designations. | Maintain districts 5, 9, 12, 15, 21, 23, 25, 51 as SCFR Urban response districts.<br><br>Maintain districts 14,18,17 as SCFR Rural response districts. | Align districts 5, 12, 25, and 51 with NFPA 1720 as Urban demand zones. These district stations should then follow the SCFR system urban turnout time standard of 5-minutes.<br><br>Align districts 9, 15, 21, and 23 with NFPA 1720 as suburban demand zones. These stations should then follow the SCFR system turnout time standard of 5-minutes.<br><br>Align districts 13, 14, and 18, with NFPA 1720 as rural demand zones. These stations should then follow the SCFR system rural turnout time standard of 10 minutes. | |
| Align with NFPA 1720 for Effective Response Force in Urban, Suburban, and Rural responses. | There is no current number of designated responders for building fires. | At a minimum, align the minimum staff to respond to the scene for building fires in the Urban, Suburban, and Rural demand zones with NFPA 1720. | |

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| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Align with NFPA 1710 for Fire and EMS turnout times for career staffed EMS units. | There are no current turnout time performance standards for career staff for Fire or EMS calls at Stations 5, 13, 18, 21, 23. | Align career staffed stations with NFPA 1710 turnout times as:<br><br>≤ 80 seconds for fire and special operations<br><br>≤ 60 seconds for EMS responses | |
| Establish Response Travel Time Goals. | There are currently no system guidelines or policies for the arrival of the first fire suppression apparatus or ambulance. | Align turnout and travel time response time goals of the first arriving fire suppression apparatus on fire calls and first arriving EMS unit on EMS calls with NFPA 1720 assembling of an Effective Force benchmarks as follows:<br><br>Urban Demand Zone: 9 minutes<br><br>Suburban Demand Zone: 10 minutes<br><br>Rural Demand Zone: 14 minutes | |
| Include in all appropriate response guidelines language that aligns with OSHA 1910.134 and NFPA 1500 regarding two-in-two-out. | There are currently no system guidelines or policies that directly discuss the two-in-two-out benchmark when operating on emergency scenes where an IDLH (Immediately Dangerous to Life and health) atmosphere exists. | Align response policies and emergency scene activities with NFPA 1500 standard on *Fire Department Occupational Safety, Health, and Wellness* and OSHA 1910.134 so that they directly address the two-in-two-out benchmark | |

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Expand career staffing to the following stations based on call demand and/or time and distance for Fire and EMS responses: Toms Brook, Edinburg, Fort Valley (2 per shift/per station). | Maintain current career staffing levels at Stations 5, 13, 18, 21, 23, 25/51. | Over the near term:<br><br>Relocate one crew from Station 5 or Station 23 to Station 15 to close the response gap between Woodstock and Mt. Jackson where there is heavy EMS demand. Edinburg also serves as a more direct route to Fort Valley, which can reduce overall response times to this district in the short-mid-term through a 24/7/365 career crew at Station 15.<br><br>Requires funding for an SCFR ambulance.<br><br>Relocate one crew from Station 5 or Station 51 to Station 9 to close the response gap between Strasburg and Woodstock where there is heavy EMS demand.<br><br>Requires funding for an SCFR ambulance. | Over the longer term:<br><br>Implement a 2-person crew at Fort Valley station. Although there is low demand in the district, there is a time and distance response challenge. The time and distance challenges are both turnout and response travel time by the Station 14 volunteer crews, and time and distance from assisting units from SCFR Stations 15 and 25/51, or Fortsmouth in Warren County.<br><br>Requires funding for seven FTEs.<br><br>Implement a 2-person crew at the Toms Brook station. Current demand requires an ambulance to respond from Woodstock or Strasburg.<br><br>Implement a 2-person crew at the Edinburg station. Current demand requires an ambulance to respond from Woodstock, Mt. Jackson, or New Market.<br><br>Requires funding for seven FTEs. |

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Expand EMS service delivery with an Advanced Life Support Certified EMS Officer (Captain Level) on each career shift (3 total with one additional to backfill leave). | Currently, the SCFR department, which is the primary EMS response agency in the county, does not staff all units 100% of the time at the Advanced Life Support (ALS) level. Stations 23 and 25/51 maintain on average close to ¾ of the time at the ALS level; Station 5 maintains on average ALS staffing 50% of the time; the remaining stations (13, 18, 21) below 10% of the time. | Implement an EMS Officer level (Captain) that is trained to the ALS level (Paramedic) who is available to respond countywide and serve as an ALS provider on BLS ambulances when needed. This reduces the need to send two ambulances (one ALS, one BLS) to a single call when ALS care is needed.<br><br>This position should also be designated as the on duty EMS operations supervisor with duties to include managing EMS incidents, pharmaceutical exchange, supply, and inventory (this program shifted in 2024 from a hospital-based supply system to an agency-based supply system), liaison with hospital and assisted living/nursing home staff, monitoring of ambulance and crew resources, and assisting with EMS crew issues and challenges.<br><br>Requires funding-four FTEs. | Over the mid-longer terms as EMS calls may increase, implement an additional ALS provider in a quick response vehicle to respond countywide and serve as an ALS provider on BLS ambulances when needed.<br><br>As with the mid-level enhancement, this resource reduces the need to send two ambulances (one ALS, one BLS) to a single call when ALS care is needed.<br><br>This enhancement should be evaluated to determine the organizational level (EMS Officer at the Captain or Lieutenant level) at the time the enhancement is considered. |

| Service Level Item | Status Quo | Mid-Level | High-Level |
|---|---|---|---|
| Implement an Emergency Medical Dispatch Software System in the 911-Center. | Currently the 911-Center does not have an Emergency Medical Dispatch system in place that determines EMS calls as high or low acuity (based on protocols or commercial software), or whether the response should be Advanced Life Support or Basic Life Support. | | Work with the SCFR department and Medical Director and research the most appropriate Emergency Medical Dispatch system software for Shenandoah County. At a minimum, the system should, through call-taker interview, be able to create an EMS call determinant that is either low or high acuity, and if it requires Advanced Life Support or Basic Life support response.<br><br>Requires funding. |
| Expand SCFR career staffing at stations as needed by 2 career staff to staff fire apparatus separate from EMS units. | Currently only two stations have two career crews-Stations 23 and 51. Under this arrangement, one crew responds to initial EMS calls, and if a fire call is dispatched to the same station, the second crew responds the fire apparatus. Additionally, the second crew may respond on an ambulance if a second EMS call is dispatched. | | Over the longer term, and if volunteer membership diminishes, it may be necessary to add an additional 2-person crew to current stations where there is only one crew, and potentially at additional stations as needed-based on call demand and reduced volunteer participation. Much of this depends on volunteer recruitment and retention over the longer term.<br><br>Requires funding. |

## Conclusion

The CPSM team members recognize the magnitude of undertaking a Fire and EMS combined system and commend the county and system leadership for their efforts in providing these essential services to the citizens and visitors of Shenandoah County.

Overall, CPSM found the SCFR system staff and volunteer members to be knowledgeable in contemporary Fire and EMS programs and program delivery, the organization of a Fire and EMS system, and in the provision of basic, fundamental services of a Fire and EMS system. With the current combination staffing, which is primarily fire volunteer and career EMS, the SCFR system delivers emergency services well.

This report provides a considerable amount of technical data, much of which was provided by the SCFR system and 911-Center. Additional information was provided by the county to assist with the community growth and community risk profile discussions. The comprehensive approach of this document allows the reader to gain a clear understanding of the system's infrastructure, staffing levels, the community risk, and programs a contemporary Fire and EMS combined system should be involved in.

This document is not intended to be a critical evaluation of the organization, but rather provide the SCFR system, county leadership, and Board of Supervisors members with information relevant to the system and delivery of Fire and EMS services. The report also assesses many components of the service delivery system and offers service level considerations to create a more efficient and effective Fire and EMS system.

It is CPSM's hope that the information contained within this document is found to be useful and will provide the County Leadership with the information necessary to meet current and future fire protection, community risk reduction services, and EMS service delivery systems as efficient and effective as possible.

***End of Report***

# SECTION 6: OVERTIME

CPSM often is asked to review a Fire and EMS department's overtime. CPSM reviewed SCFR's overtime use, and also conducted a staffing factor analysis to determine, based on leave, Kelly Day backfills, and vacancies, how many additional staff it will take to meet the daily minimum staffing with limited overtime.

CPSM identified, with the assistance of SCFR, that overtime is used for both operations and for non-operational staffing to perform basic services, some in lieu of full time positions and other administrative tasks performed by operational staff on their off time. The breakdown of overtime categories is generally, from year to year:

- Operations backfill: 24-Hour Shift.
  - Kelly Day.
  - Leave (all types of leave with the exception of FMLA).
  - Vacancies (due to separation from the department and FMLA).
- Operations other than direct backfill.
  - Late calls (end of shift calls where on-duty crews work past their end of shift time).
  - Emergency Backfills (overtime to staff additional units for campaign events, wild land fires, environmental events etc.).

Non Operational.

- Training Instructors (for both course coordination and assisting instructors—volunteer and career instruction).
- Fire Marshal's Office (operational staff working part-time on their off time performing fire prevention inspections and fire investigations).
- Professional Development (overtime for staff professional education, training, and career development).
- Administrative Work (committee work, officer meetings, project work, employee relations meetings conducted on operational staff off time).

SCFR overtime for the most recent fiscal years is as follows:

- FY2022 Actual: $1,013,740
- FY2023 Actual: $1,013,013
- FY 2024 Actual: $1,159,299.25
- FY 2025 Adopted: $824,985

It is not atypical for fire departments to staff operational shifts with additional personnel to cover scheduled and unscheduled leave. In some departments this is done on a large scale, such as one additional firefighter per unit per shift. These personnel are utilized to cover both short- and longer-term vacancies, thus reducing overtime expenses.

As a review here, the SCFR operational deployment model includes a normal daily staffing of two personnel assigned to each staffed station (9 total units-18 staff members) and one assigned to the shift commander position, which totals 19 personnel and represents the normal daily minimum staffing model.

The SCFR department is budgeted for an additional six personnel per operational shift to cover scheduled and unscheduled leave. In total, there are 25 operational staff assigned to each of the three operational shifts. Overall, then, the SCFR department is budgeted for 75 operational shift positions.

The use of a staffing factor allows any department in local government that requires minimum staffing to better plan the fiscal impacts of maintaining minimum staffing through full time employees or overtime funding to fill minimum staff positions. The staffing formula CPSM utilizes comes from the *Tools for Decision Making, A Practical Guide for Local Governments*. The staffing factor formula can be utilized for any government function that requires minimum staffing on a regular basis.

Staffing factor calculation: **staffing factor** $= \frac{\text{hours per year per employee (P)}}{E}$

***E = P –A***

*P* = the number of effective hours per employee per year (scheduled hours).
2,856 hours per year per employee for SCFR operational personnel.
*A* = the average number of hours of paid absences per year per employee.
Total number of leave and vacancy hours divided by 75 total personnel.
*E* = the number of effective hours per employee per year minus the average leave taken per employee. P hours minus A hours.

To determine the number of additional personnel needed to cover vacant positions due to scheduled or unscheduled leave, or because of a vacancy through separation, an operational staffing factor should be established. The following calculations show how this would apply to the SCFR department.

The SCFR department utilizes 75 full-time positions assigned to shift operations. The total number of paid hours each employee was scheduled to work in CY 2024 was 214,200 (2,856 hours x 75 personnel). During this same period (CY 2024), shift operations personnel aggregately utilized:

- 5,445 hours of leave (all leave types).
- 8,039 hours due to vacancies (separations and FMLA).
- 30,600 hours of Kelly Day backfill.

**The total leave plus vacancy and Kelly Day backfill hours that required staffing backfill was 44,084.**

Utilizing the staffing factor formula above:

*P* = 2856
*A* = 588 (average of 44,084/75)
*P* – A = 2,268
*E* = 2,268

**staffing factor** $= \frac{2856}{2{,}268} =$ **1.26**

Therefore, it would take one full-time and .26 of a full-time employee to fill each position per 24-hour shift, or aggregately 4.94 or rounded to 5 (.26 x 19) full-time equivalent employees per 24-hour shift to manage the leave and financial aspects of minimum staffing of 19 staff per shift. To achieve the additional 5 aggregate staffing per shift, the department operates already with additional staffing each shift, ***when fully staffed***, as follows:

- A-shift: 6 additional personnel
- B-Shift: 6 additional personnel
- C-Shift: 6 additional personnel

***The SCFR has the additional staffing per shift to manage minimum staffing and overtime effectively.***

When the department is fully staffed at the operational level, staffing overtime should be at a minimum. There are always days when available additional staff cannot handle all vacancies, and overtime is utilized. Also, when there are staffing vacancies due to separation, overtime will be utilized when more positions need to be filled than are available as there are less backfill staffing positions on the affected shift where the vacancy or vacancies are occurring.

**Overtime Drivers**

For the SCFR department, there are several factors that drive overtime. These include:

- Operational backfills.
  - Each operational staff member receives 408 hours of Kelly Day leave per year. This totals 30,600 hours of backfill when multiplied by 75. This averages approximately three backfill positions per day (24 hour shift).
  - Vacancies created by separation. This directly affects the number of shift staff between 19 and 25. Any reduction in the 6 additional staff per day to backfill (at or below 5 per day) will create overtime (staffing factor established the SCFR needs 5 additional staff per shift to cover backfills).
  - The unknown every fiscal year, which includes end of shift call hours, FMLA, long term worker's comp vacancies, and campaign events such as wildland fires and environmental incidents.
- Non Operational
  - Instruction of classes (volunteer and career classes). Most practical hands on training require certain number of instructors (includes EMS and Fire classes). Additionally, the use of operational staff to coordinate and manage courses in their off time in lieu of full time Training Coordinator staff.
  - The use of operational part-time positions in lieu of full time staff in the Fire Marshal's Office.
  - Career development, committee and other administrative work completed on off-time. Due to the current minimum staffing requirements, it is difficult to schedule most of these tasks on duty.

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**Overtime Solutions**

Overtime solutions include, but may not be limited to the following:

- Fill operational vacancies as quickly as possible. May require a change in current practices. This includes over-hiring for known future retirements or separations.
- Complete a staffing factor every budget year to better plan for the unknown with respect to vacancies, FMLA, long-term worker's comp, environmental emergencies and other unplanned overtime. This may project a more accurate overtime expense.
- Consider Service Plan levels that increase the FTE count of training staff that can be designated to coordinate and manage offered volunteer and career staff.
- Consider Service Plan levels that increase the FTE count in the Fire Marshal's Office with a goal of eventually reducing the need for off-duty operational staff performing this work.
- Manage career development, committee and other administrative work that is completed during off-time and that requires the payment of overtime. Will require a change in current practices.

In conclusion, overtime within the SCFR department is an inevitable aspect of operations due to the unpredictable nature of emergency response and the necessity of maintaining minimum staffing levels. Unforeseen incidents, personnel shortages due to vacancies and/or long term FMLA or on the job injuries, extended emergency calls beyond the normal shift, and campaign events often require additional staffing beyond ordinary staffing. Ensuring adequate coverage is essential to maintaining public safety and operational effectiveness, making overtime a necessary and expected component of fire department staffing.

Overtime will continue to occur as well in the Training Division, as many EMS and Fire hands-on training require additional training instructors to assist the course coordinator. As well, the use of off-duty operational staff to manage and coordinate training courses in lieu of full time staff will continue to generate overtime. Using off-duty operational staff in the Fire Marshal's Office will also continue to be a driver of overtime, as will the professional development of staff.

Given the current practice of using off-duty operational staff for program work and that vacancies will continue to occur in operational staffing, which dilutes the availability of overstaffing for leave backfills, the reliance on overtime will continue to be a fundamental part of staffing and resource management.

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# SECTION 7: COMMUNITY SURVEY

In order to assess the perspectives of the community members of Shenandoah County, VA, CPSM conducted a survey drafted specifically for the interests of Shenandoah County. This summary report provides the survey methodology as well as demographics of respondents and key findings that help in future decision making for setting service levels in Shenandoah County.

The survey distributed to the community focused on the perceptions of services provided to the public by all fire departments/stations in the County, use of services provided, knowledge of services provided and community engagement opportunities, and willingness to expand fire services in the future. The summary report will be broken into five main sections:

6) perceptions of Shenandoah County Fire & Rescue;
7) community engagement;
8) assessment of emergency services priorities;
9) perceptions of emergency medical transport (ambulance) services; and
10) service level knowledge and opinion.

The purpose of this report is to provide a summary of survey responses that may assist county management in their decision-making process. Key findings emerged from the survey and are listed below:

7) Overall approval of Fire Rescue and Emergency Medical Transport performance.
8) Community members perceived staff to be professional in their actions.
9) Emergency response and preparedness were seen as most crucial for the Shenandoah County Fire Department while community engagement was not rated as highly in terms of importance.
10) Most respondents considered the Shenandoah County Fire and Rescue Department to be engaged in the community and saw them frequently.
11) Most respondents were satisfied with the current level of service and believed it to be sufficient.
12) While the average score regarding willingness to support additional taxes to ensure service levels skewed toward a positive response, only 48% demonstrated support for the statement.

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# SURVEY METHODOLOGY AND DEMOGRAPHICS

The community survey was developed through consultation with the county administrator and CPSM staff via virtual conferencing and email to ensure the targeted concerns of Shenandoah Fire and Rescue were addressed in the survey. Capturing perceptions regarding the current staffing model (volunteer vs. career) and a potential increase in funding for Shenandoah Fire and Rescue was identified as a priority. Once the survey was finalized, it was approved by the county administrator prior to being released to the public for response.

The web-based survey was developed using the platform SurveyMonkey. Survey collection ran from November 1, 2024, though December 8, 2024. Staff of Shenandoah County were responsible for posting a link and QR code to the survey for community members to access. These were posted on Shenandoah's social media sites (e.g., Facebook). An update to the post was pushed a week before the end of the survey to increase responses. As a result, the survey received 293 total responses.

No personally identifying information was collected, but IP address is part of standard collection in Survey Monkey. This allows for a review of duplicate responses. While there were several repeat IP addresses, the responses varied, which indicates different respondents from the same household.

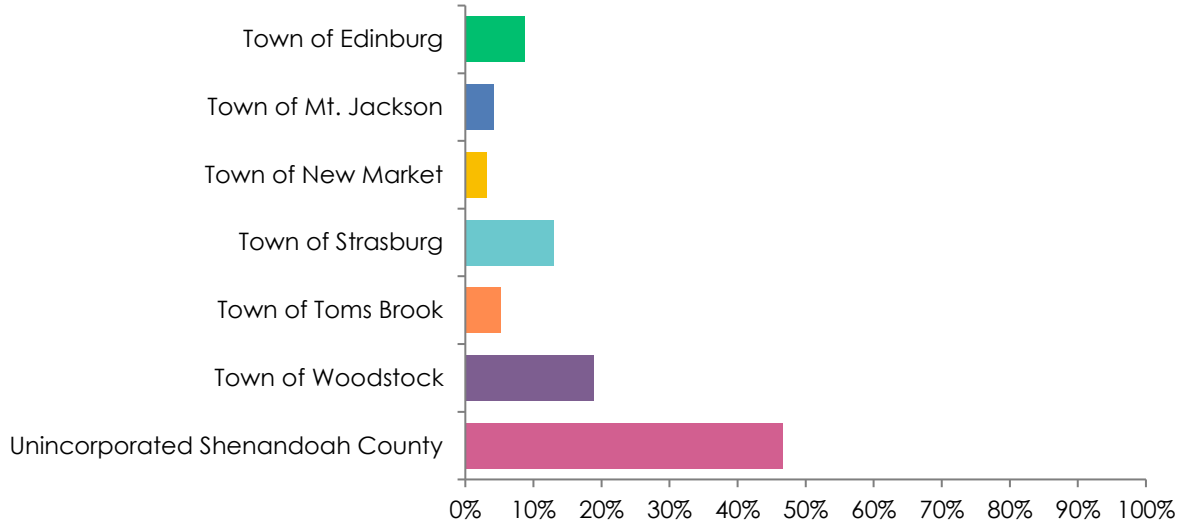
The demographic profile of survey respondents was similar to the demographic profile of Shenandoah County, Virgina as a whole. Characteristics of survey respondents are provided below:

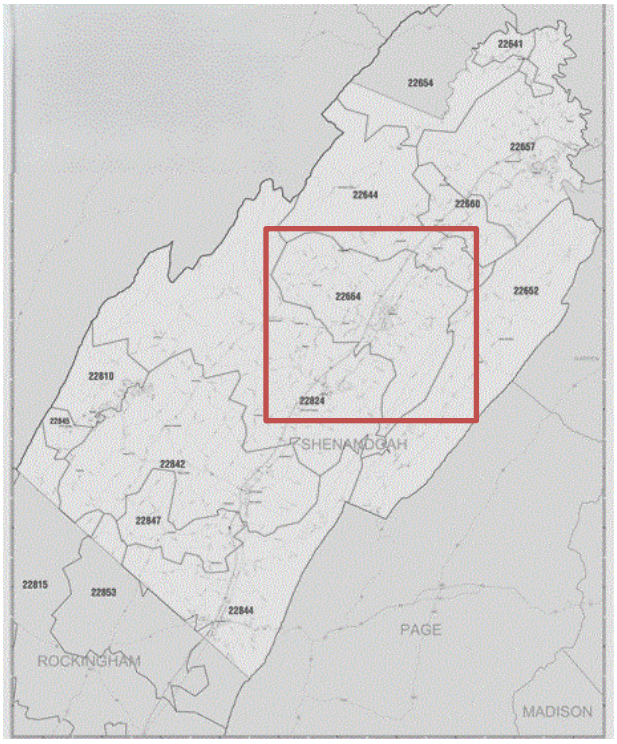
- 55% Female[27]
- Age[28]
  - 18-24: 3.8%
  - 25-34: 12.5%
  - 35-44: 21.1%
  - 45-54: 18.7%
  - 55-64: 22.2%
  - 65+: 19.4%
- 92% White [29]


Because the Shenandoah County Fire and Rescue system provides services to towns throughout the county, respondents were also asked their zip code and the town that they live in. The largest percentage of respondents reside in unincorporated Shenandoah County. Survey respondents also reported living in 16 different zip codes. For clarity, subsequent analyses grouped 11 zip codes with less than 20 responses each into one "Other" zip code category. The most common zip code of respondents was 22664 which represents the Town of Woodstock.

27. Though the sample indicated 55% female, only 40% reported as male. The remaining percent identified in another way or preferred not to respond. Census data indicates Shenandoah County is nearly 51% female (https://www.census.gov).
28. Shenandoah County was comprised of 22.3% persons 65 years or older as of 2023 estimates (https://www.census.gov).
29. 2023 Census estimates include 92.3% White residents in Shenandoah County (https://www.census.gov)

## Figure 1: Survey Respondent Town of Residence




**70** of the 293 respondents reside in the 22664 zip code.

Respondents were asked if they had ever been employed by a first responder agency as this can impact the level of understanding and perceptions of other first responder agencies as well as potentially increase the likelihood of responding to community surveys. Twenty-eight percent of respondents had worked or currently works as a first responder, with most of these having worked in fire and rescue.

Finally, respondents were asked if they ever had an emergency interaction with either a fire or medical/ambulance incident. Fifty-five percent had been involved in a fire emergency, and nearly 70% had been involved in a medical emergency involving an ambulance.

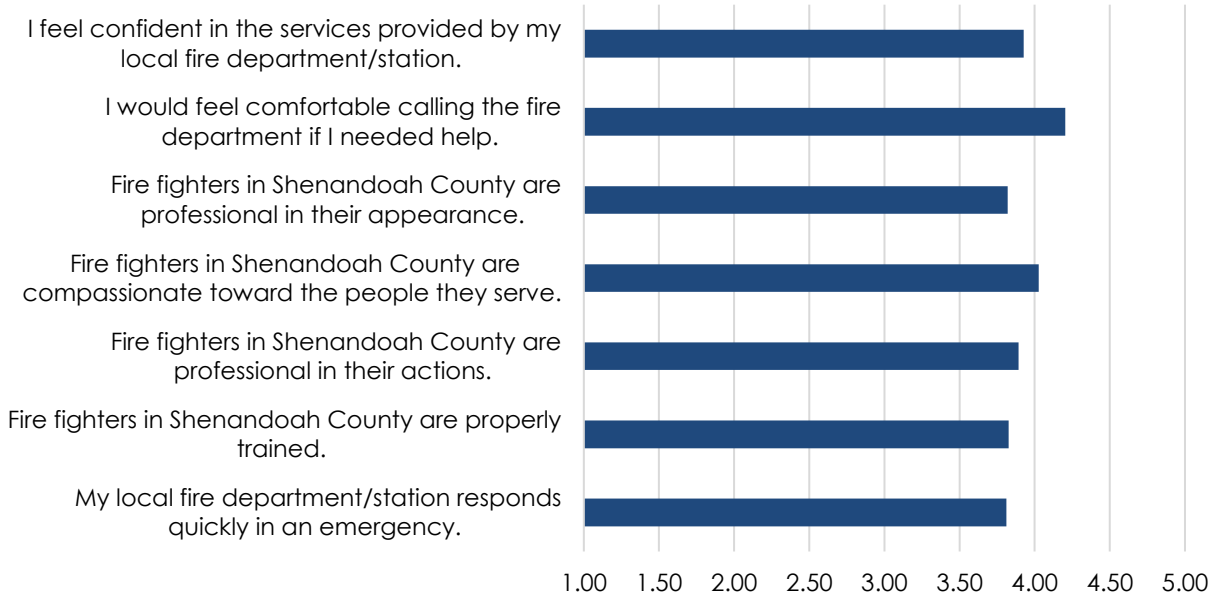
## Perceptions of Shenandoah County Fire and Rescue

Survey respondents were asked their perceptions of the Shenandoah County Fire and Rescue (SCFR) system on a scale of 1 to 5, with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree". As Figure 2 below indicates, survey respondents largely approved of the job of the SCFR. However, there were some interesting findings when perceptions are assessed by demographic characteristics and location.

Respondents living in zip code 22652 (n = 28) rated their general perceptions of SCFR on the lower end (average overall general perception = 2.6) and provided low ratings regarding the speed at which emergencies are responded to and the confidence in the services provided by SCFR. These respondents also ranked their perceived professionalism of firefighters lower than other zip codes. Differences in general perceptions were also noted by town of residence. While the Town of Woodstock expressed a positive perception of SCFR, the towns of Edinburg and Mt. Jackson demonstrated a negative general perception overall.

Gender also presented some interesting findings when it comes to those who identify some other way than male or female. This group of respondents represents just over 1% of the survey respondents as a whole (n = 3), which is close to their representation in the general population (approximately 1.6%). This group ranked SCFR lower than those who identify as male or female (2.7 out of 5). Professionalism and proper training were both rated below 3, indicated a negative perception of firefighters by this group. Also interestingly, current or former first responders provided an overall lower general perception of SCFR than those who had not worked in the field, though not extreme (2.9 vs. 3.2 out of 5).

### Figure 2: Average Perception of Shenandoah County Fire and Rescue Department



While there were some distinctions in perceptions based on demographic information and location, it is important to note that overall, SCFR was generally perceived in a positive light. When asked what their general perceptions of SCFR were, over 78% of respondents selected either "good" or "excellent" which indicates support for the SCFR and the services it provides. Only 64 of the 291 responses on this question provided a negative assessment of SCFR.

**78%**

**have good overall perception of Shenandoah County Fire and Rescue**

## Community Engagement

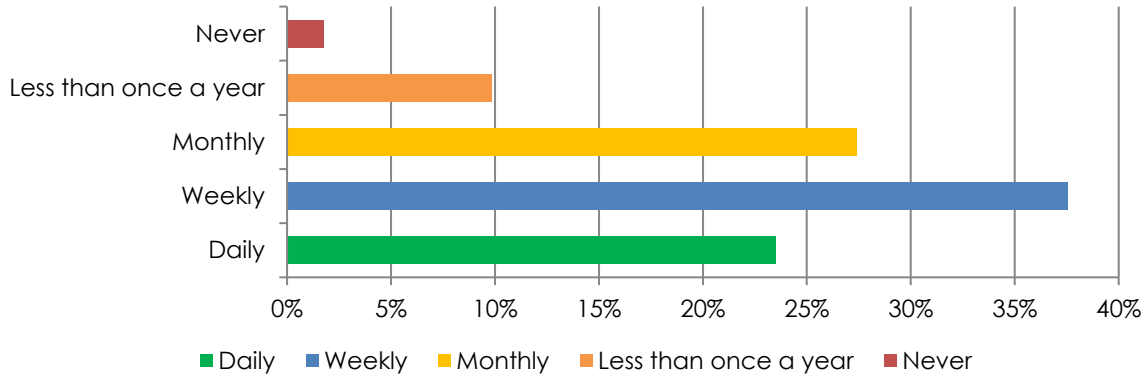
An important aspect of many local fire departments is community engagement, often in the form of community education opportunities or other positive outreach or interactions. Most respondents perceived SCFR to be actively engaged in the community through attendance at community events, community education, and more. Out of 288 responses on this question, 228 agreed or strongly agreed.

*Picture retrieved from SCFR Facebook page.*

Impressively, almost half (46%) of respondents had attended a community event hosted by SCFR. However, 73% had never received a smoke detector from a SCFR station. Respondents from zip code 2264, the Town of Woodstock, those reporting a history of emergency response with SCFR, respondents 65 and older and current/former first responders were most engaged, most frequently attending events. It should be noted here that non-White respondents were least likely to be aware of community events hosted by SCFR. Important findings regarding smoke detectors include zip codes 22652 and 22824, the Town of Edinburg, and non-White respondents were least likely to be aware that they are available through SCFR.

One of the most common forms of community outreach for first responder agencies is mere presence. According to survey responses, the SCFR was seen relatively frequently in the community. Over 88% of respondents reported seeing SCFR in the community at least monthly, with over 60% reporting seeing SCFR at least weekly as Figure 3 shows below.

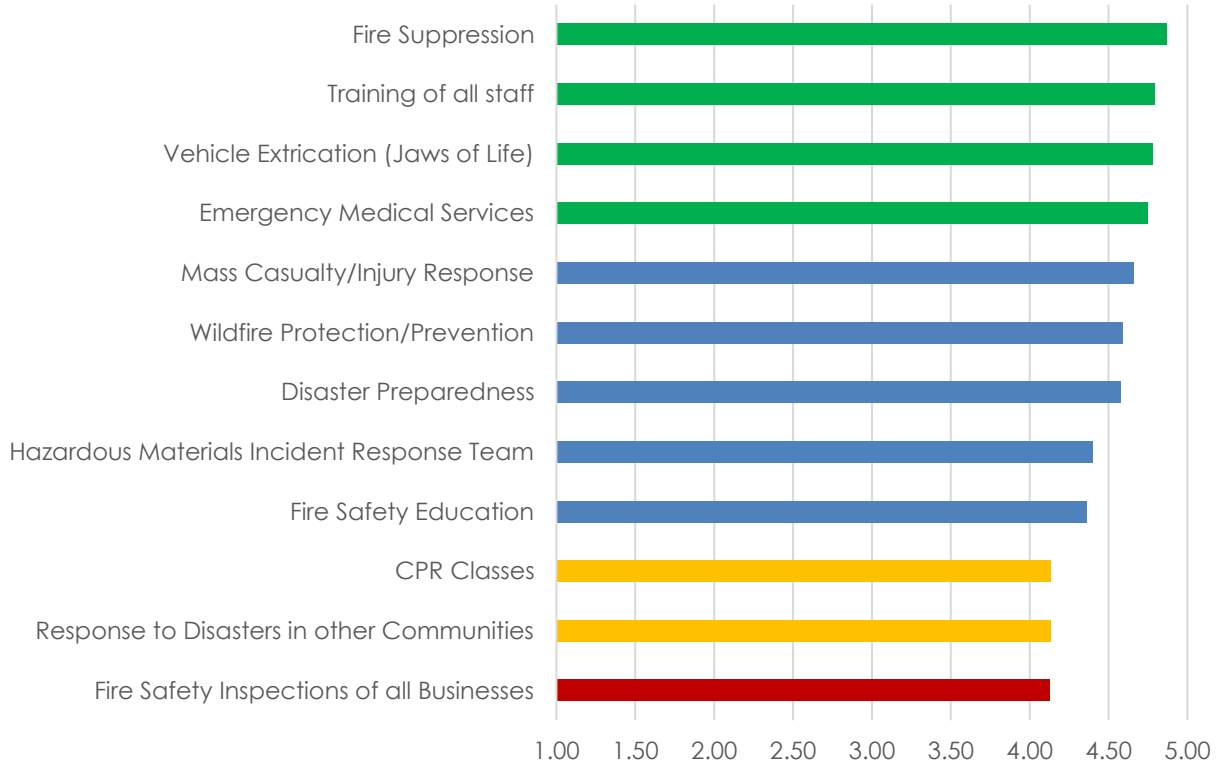
**Figure 3: Percent Responses for "How often do you see the fire department in the community?"**



## Assessment of Emergency Services Priorities

Fire departments, whether career or volunteer, are relied upon by the residents of a community to provide emergency services and other public safety services. While it seems commonsensical that residents will prioritize emergency medical services or fire suppression as necessary and important services provided by a fire department, other services might not be as important. Figure 4 below demonstrates the ranking of importance for various services typically provided by fire departments. Respondents were asked to rate the services listed below on a scale of 1 to 5 (1 = Not important at all; 5 = Very important).

### Figure 4: Ranked Average Responses for Importance of Services



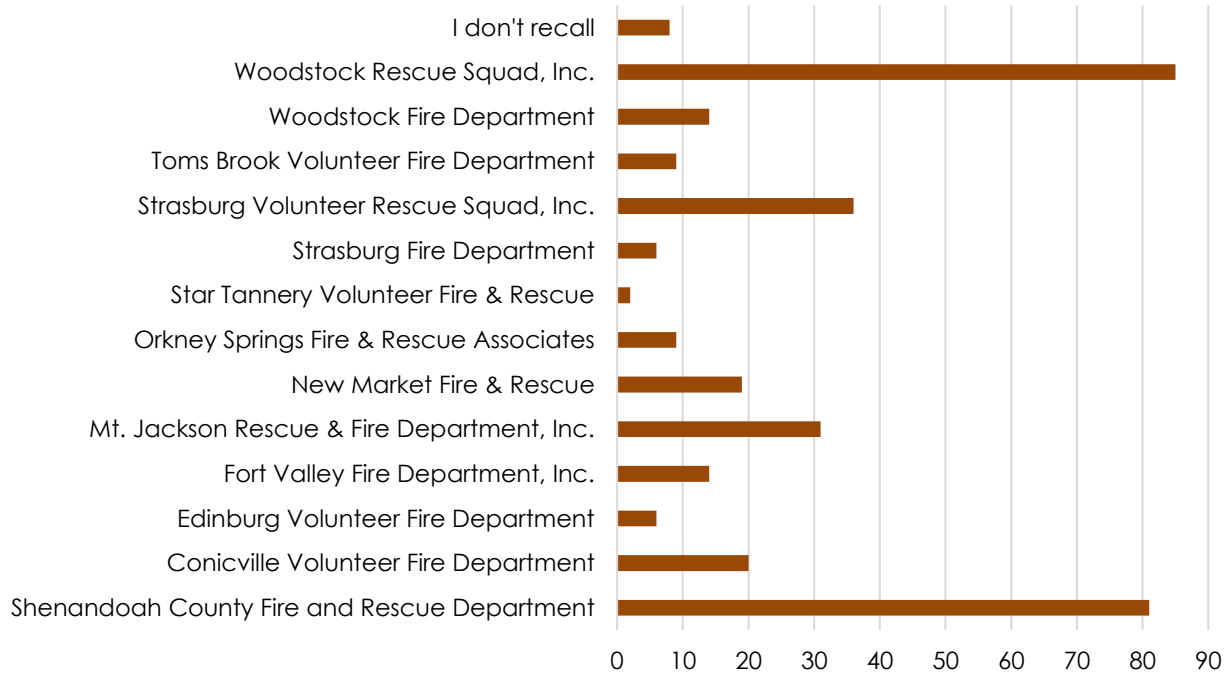

According to Figure 4, while community outreach is important to SCFR, it was not seen as crucial to the survey respondents. Smoke detector checks, blood pressure checks at fire stations, and fire station tours were not perceived as important to the community. The responses regarding these activities should be considered neutral, not as unimportant. This aspect of many fire departments may be an artifact of volunteer fire departments that may not be staffed 24 hours a day. Few demographic notable differences exist regarding perceptions of emergency services beyond natural fluctuations in responses.

*Picture retrieved from SCFR Facebook page.*

## Perceptions of Emergency Medical Transport (Ambulance) Services in Shenandoah County

Shenandoah County Fire and Rescue serves as the primary emergency medical transport provider for the county. Thus, the volunteer stations staffed by SCFR provide transport. Most respondents had either experienced medical transport in Shenandoah County themselves or knew someone who had. Figure 5 below indicates the stations that performed the transport. As shown, survey respondents had most experience with Woodstock Rescue Squad, Inc. (n = 85), followed by Shenandoah County Fire and Rescue Department (n = 81).

### Figure 5: Stations Responsible for Medical Transport

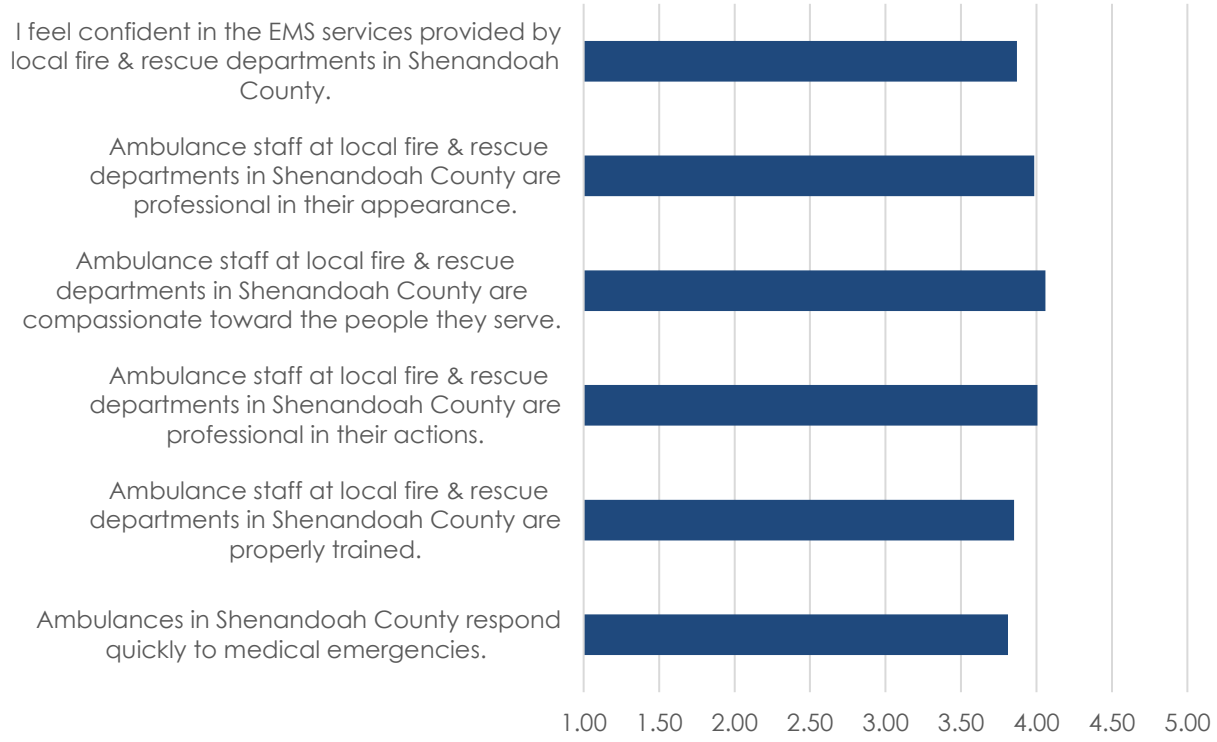



Similar to prior question groups, respondents were asked to rate a series or statements in terms of their level of agreement on a scale of 1 to 5 (1 = Strongly disagree; 5 = Strongly agree). Average responses were positive for all statements as shown in Figure 6. Further, over 83% of respondents had a good or excellent general perception of the ambulance services provided in Shenandoah County.

**83% have a good general perception of emergency medical transport**

Star Tannery Volunteer Fire & Rescue and Toms Brook Volunteer Fire Department were the only stations with different findings regarding the questions in Figure 6. While Star Tannery's responses were largely below the rest with regard to perceived performance, Toms Brook Volunteer Fire Department seemed to exceed the others in their perceived performance. It should be noted, however, that only 2 respondents had experience with Star Tannery Volunteer Fire & Rescue, and 9 respondents had experience with Toms Brook Volunteer Fire Department. Thus, the findings are interesting, but should be interpreted with caution.

## Figure 6: Average Response for Emergency Medical Transport (Ambulance) Performance




It should be noted that while the difference is not significant, respondents report greater approval and higher general perceptions of the ambulance services provided in Shenandoah County than the fire-related emergency services. Interestingly, more respondents had experience with emergency medical transport than fire emergencies (70% vs. 55%, respectively).

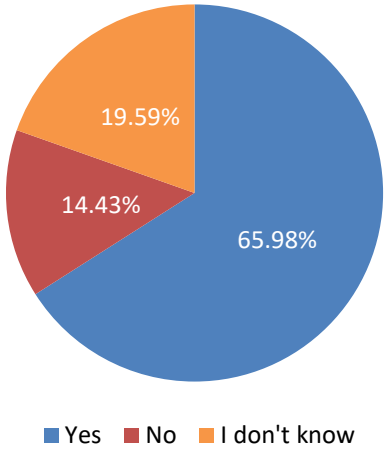
While there was overall approval for ambulance services in Shenandoah County, there were some demographic differences worth noting. Respondents from zip code 22652 trended toward disagreement with the statement "Ambulances in Shenandoah County respond quickly to emergencies." Similar to the fire performance responses, gender impacted the perceptions of emergency medical transport performance. Those who did not identify as either male or female reported negative perceptions when it came to proper training, professionalism, and confidence in the services provided by ambulance staff. Non-White respondents also reported negative perceptions regarding proper training of ambulance staff. Finally, non-White respondents, those aged 65 years or older, and respondents from Mt. Jackson reported lower overall perceptions of ambulance services in Shenandoah County.


*Picture retrieved from SCFR Facebook page.*

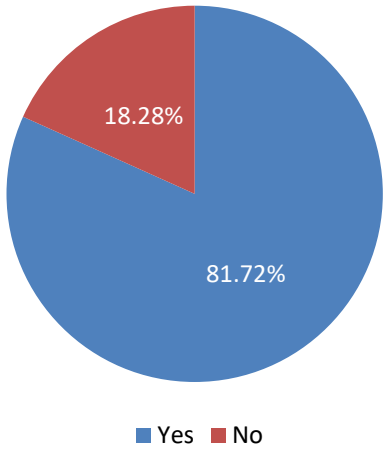
## Service Level Knowledge and Opinion

A primary goal of this community survey was to assess community members' knowledge of the Shenandoah County Fire and Rescue Department's current service model and staffing level while assessing opinion regarding the current service level and likelihood to support expansion of services or staffing. First, respondents were asked whether their local fire station was staffed by volunteers. Most respondents (n = 192) reported that their local station was staffed by mostly volunteers whereas only 14% responded that it was not. Interestingly, 237 respondents reported that they were aware that Shenandoah County funds career staff for six volunteer stations (Company 5: Woodstock Rescue Squad, Company 13: Conicville Fire Department, Company 18: Orkney Springs Fire Rescue, Company 21: Mt. Jackson Rescue and Fire, Company 23: New Market Fire and Rescue, and Company 25: Strasburg Rescue Squad) (see Figures 8 and 9 below).

### Figure 7: Local Station Mostly Volunteer



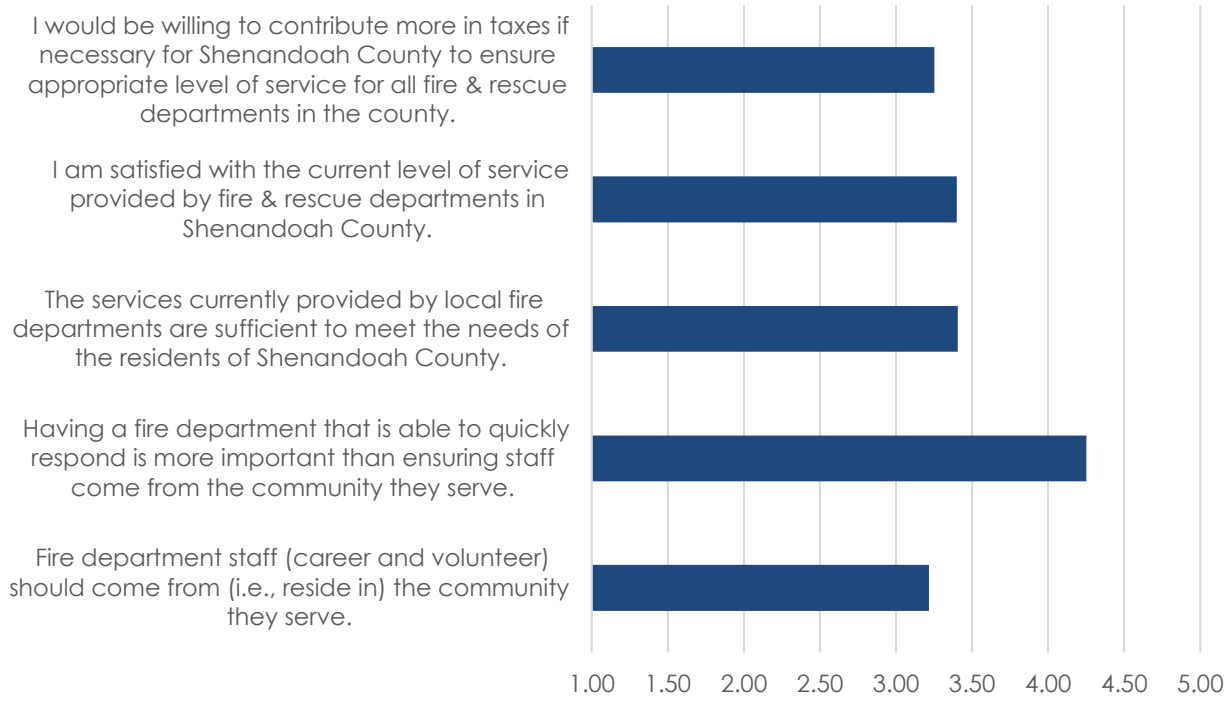

### Figure 8: Six Volunteer Stations Staffed with Career Staff



Responses to open-ended survey questions indicate an involvement in, and knowledge of the Shenandoah County Fire and Rescue Department (see full list of responses in Appendix A). These responses indicate a known distinction between the level of service provided by career and volunteer staff. However, responses are unclear or mixed regarding preference for volunteer or career staffing. What is consistent in the responses is the perceived need for additional resources and staffing, particularly in the Town of Fort Valley.

Again, similar to prior question groups, respondents were asked several questions regarding satisfaction with the current service level, priorities pertaining to volunteer services versus performance, and likelihood to support increased taxes to fund additional resources or staff. Responses were collected on a scale of 1 through 5, with 1 = Strongly disagree to 5 = Strongly agree. Results are presented in Figure 9 and Table 1 below.

## Figure 9: Fire Service Level Opinion




A preference for quick response and no clear preference regarding where fire and rescue staff reside would indicate overall acceptance of hiring career staff to meet performance goals. Regarding satisfaction with services, responses are slightly better than neutral in the level of agreement. Further, the overall support for additional taxes to ensure the appropriate level of services is just greater than neutral as well.

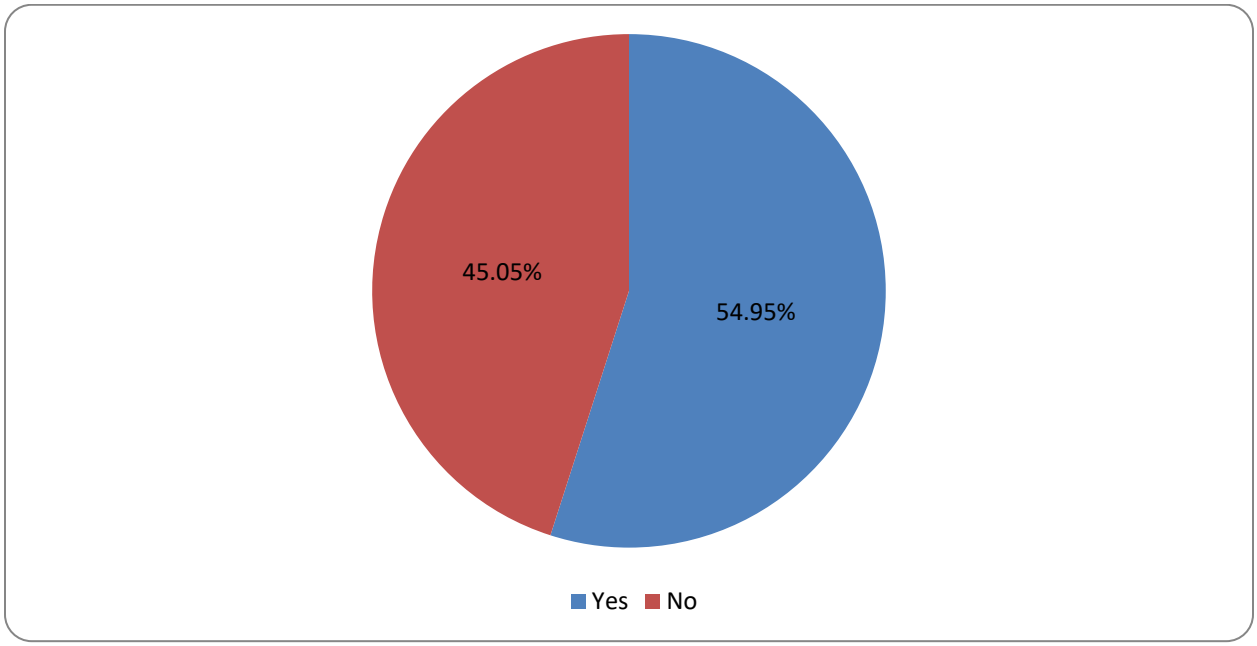
Table 1 sheds further light on the distribution of opinion about the services provided by Shenandoah County Fire and Rescue Department. Fifty-five percent of respondents consider the current services sufficient, and 56% of respondents are satisfied with the current level of service. Perhaps this level of support for the current level of services has led to less support for additional taxes. Only 48% of respondents agreed or strongly agreed that they would be willing to contribute more in taxes. Percentages are presented here in addition to the average scores from Figure 9 because the neutral category is informative in determining level of support.

While the overall rating of satisfaction was positive, respondents living in zip code 22652 did not think current services are sufficient nor were they satisfied with current services. They were supportive of paying more taxes, but residents of zip code 22842 were not. Respondents who live in the Town of New Market also did not agree that they were satisfied with the current level of services. However, the respondents from the Town of New Market were not willing to pay more in taxes. As prior findings might indicate, those respondents who do not identify as either male or female do not approve of the current services, but they are willing to pay more in taxes to increase services. Finally, respondents aged 65 or older and non-White respondents did not believe the current level of service to be sufficient. Further, non-White respondents were less aware of current service level than others as one third were unaware that Shenandoah County funds career staff at six volunteer stations.

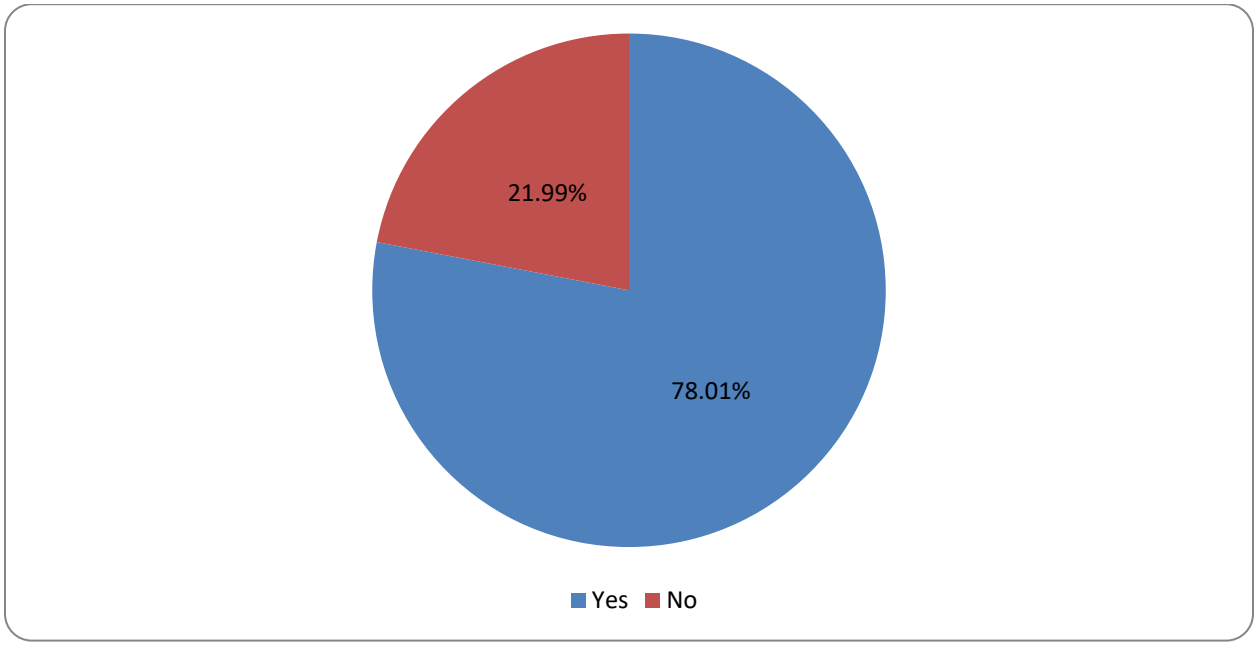
## Table 1: Percent Response for Fire Service Level Opinion

| | Strongly Disagree | Disagree | Neither Agree nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| Fire department staff (career and volunteer) should come from (i.e., reside in) the community they serve. | 7% | 16% | 40% | 22% | 14% |
| Having a fire department that is able to quickly respond is more important than ensuring staff come from the community they serve. | 2% | 2% | 16% | 30% | 51% |
| The services currently provided by local fire departments are sufficient to meet the needs of the residents of Shenandoah County. | 9% | 16% | 20% | 34% | 20% |
| I am satisfied with the current level of service provided by fire & rescue departments in Shenandoah County. | 9% | 17% | 19% | 37% | 19% |
| I would be willing to contribute more in taxes if necessary for Shenandoah County to ensure an appropriate level of service for all fire & rescue departments in the county. | 13% | 15% | 24% | 29% | 18% |

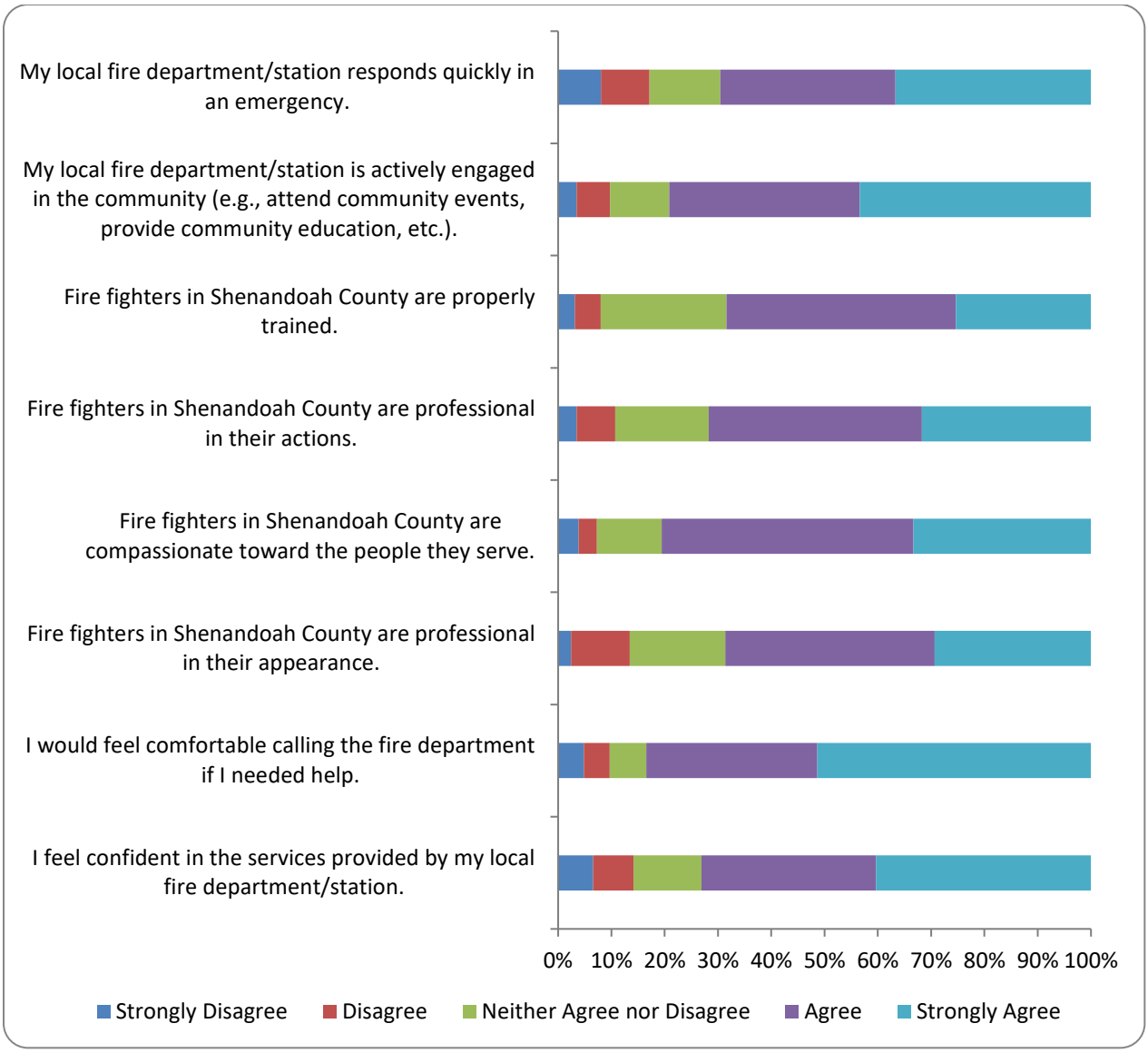
Has a fire department within Shenandoah County ever responded to a fire emergency (e.g., motor vehicle accident, house fire, report of suspicious odors) that you have been involved with?



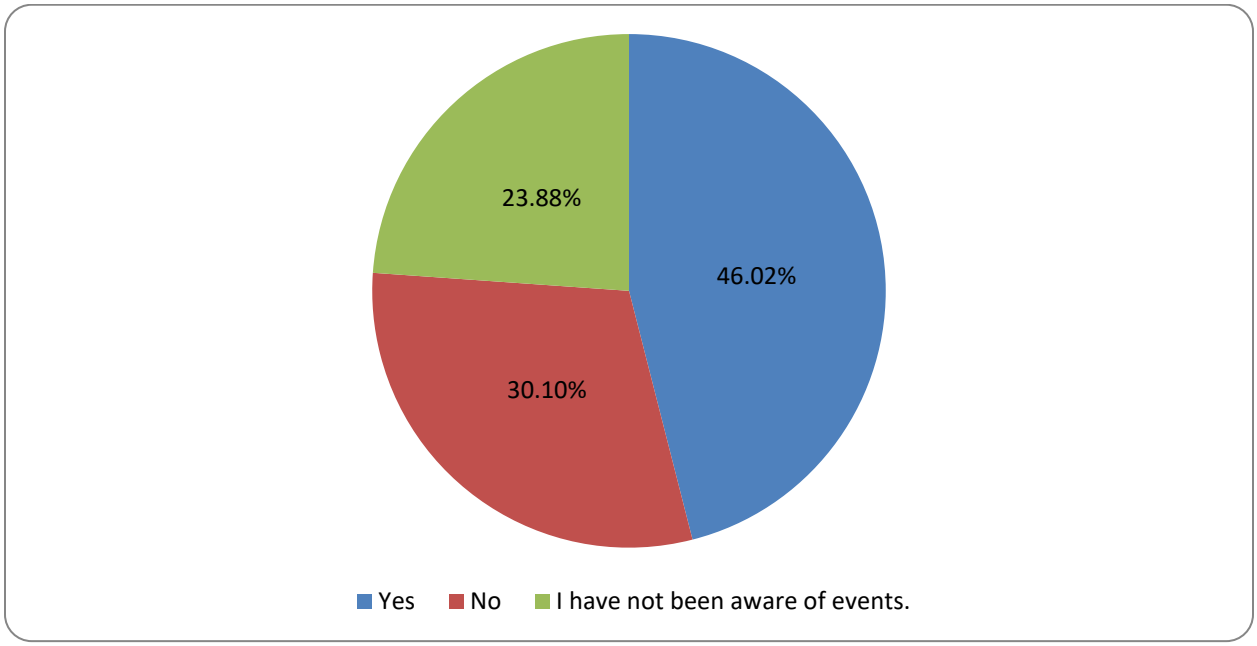

Have you had interactions with a Shenandoah County fire department that were not related to an emergency?



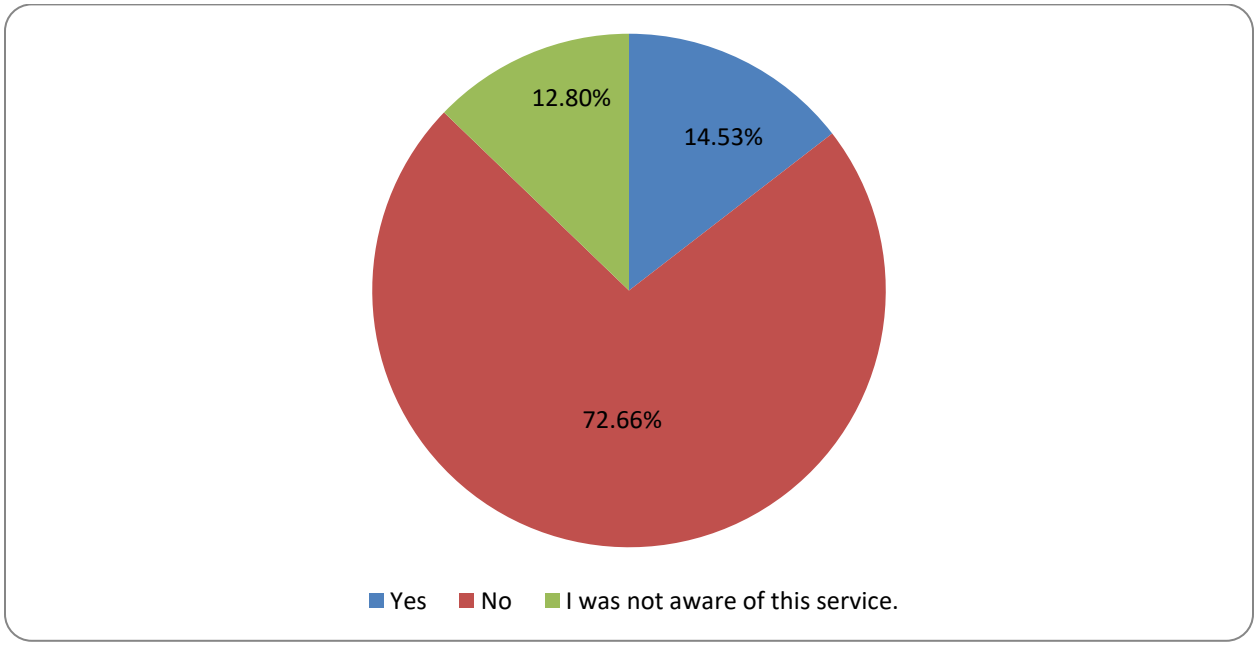

Please rate your level of agreement with the following statements, with options ranging from "strongly disagree" to "strongly agree."


My local fire department/station responds quickly in an emergency.
My local fire department/station is actively engaged in the community (e.g., attend community events, provide community education, etc.).
Fire fighters in Shenandoah County are properly trained.
Fire fighters in Shenandoah County are professional in their actions.
Fire fighters in Shenandoah County are compassionate toward the people they serve.
Fire fighters in Shenandoah County are professional in their appearance.
I would feel comfortable calling the fire department if I needed help.
I feel confident in the services provided by my local fire department/station.
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Strongly Disagree
Disagree
Neither Agree nor Disagree
Agree
Strongly Agree

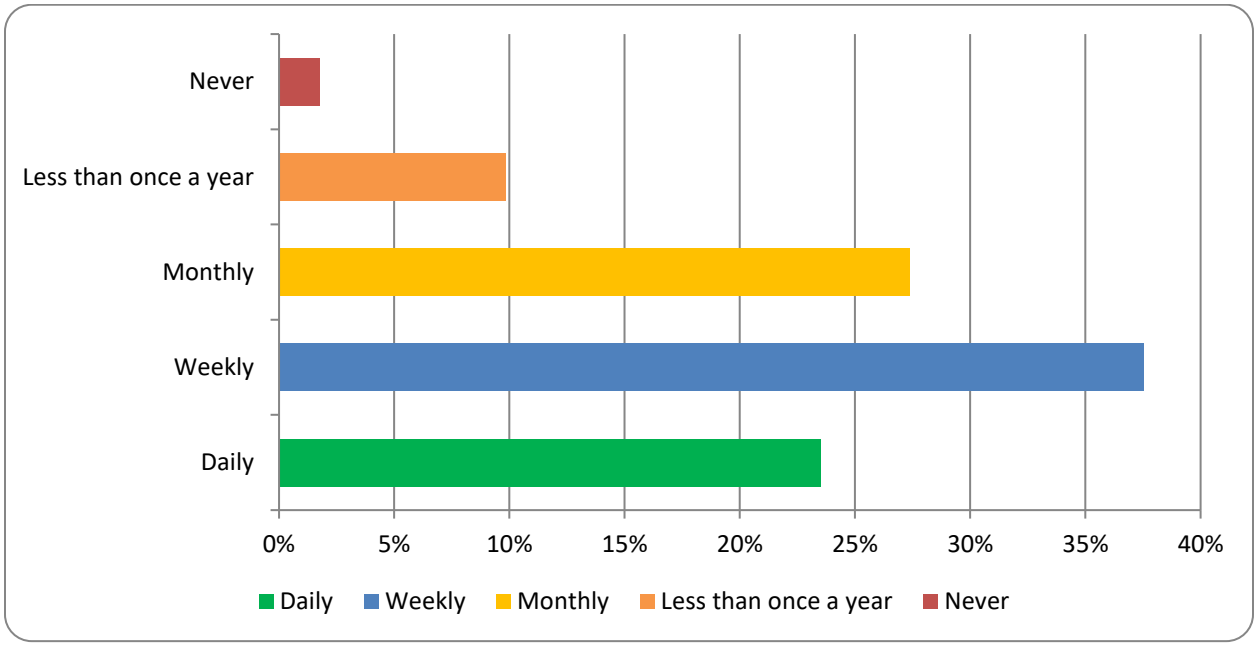
Have you ever attended a community education event or presentation (e.g., school event, homeowners' association presentation, etc.) by a fire department in Shenandoah County?



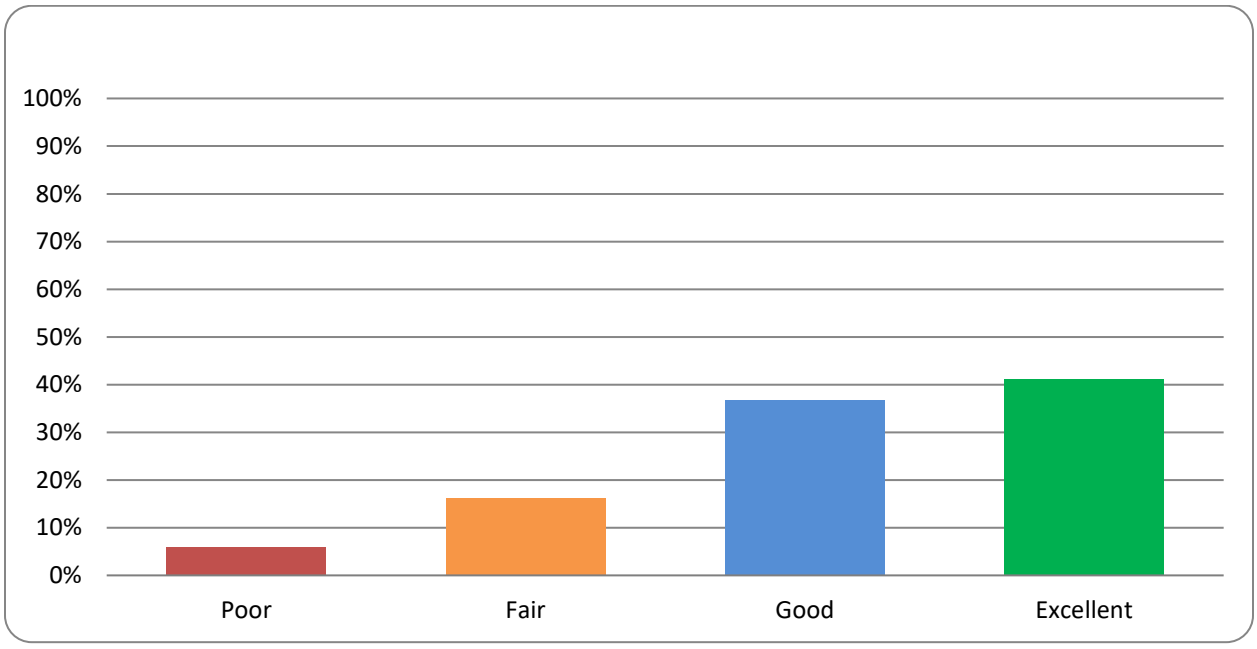

Have you ever received smoke detectors from a fire department in Shenandoah County?



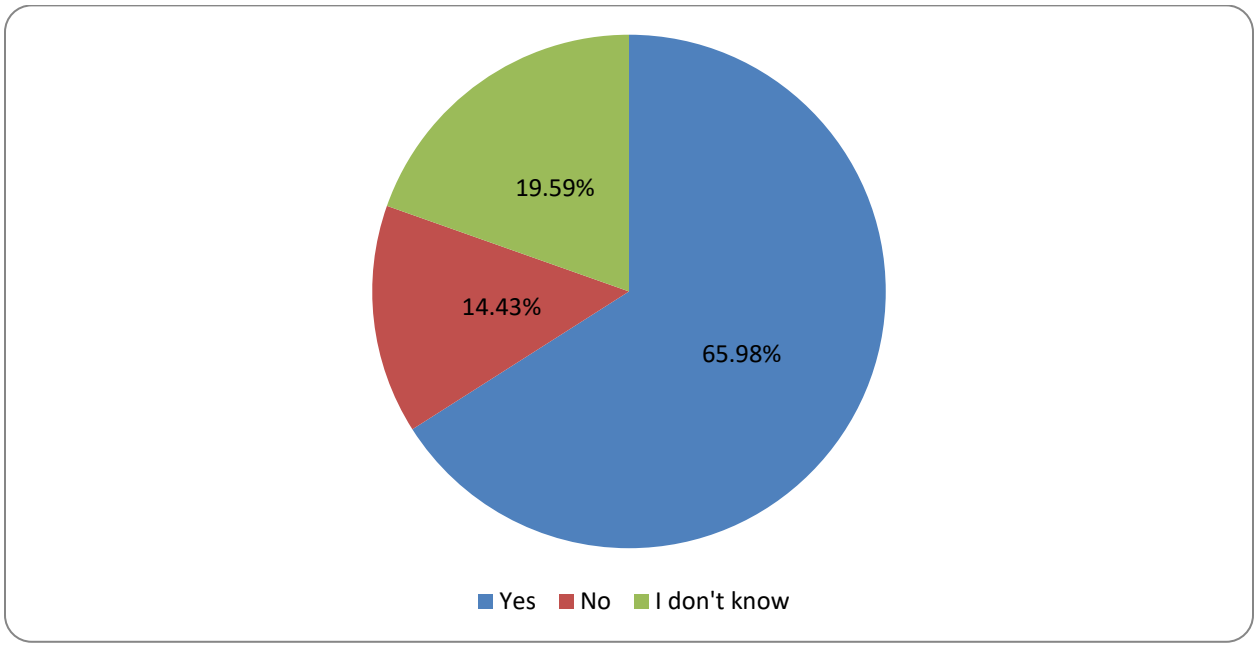
How often do you see the fire department in any capacity in the community (i.e., emergency response, community education, local community or sporting events)?



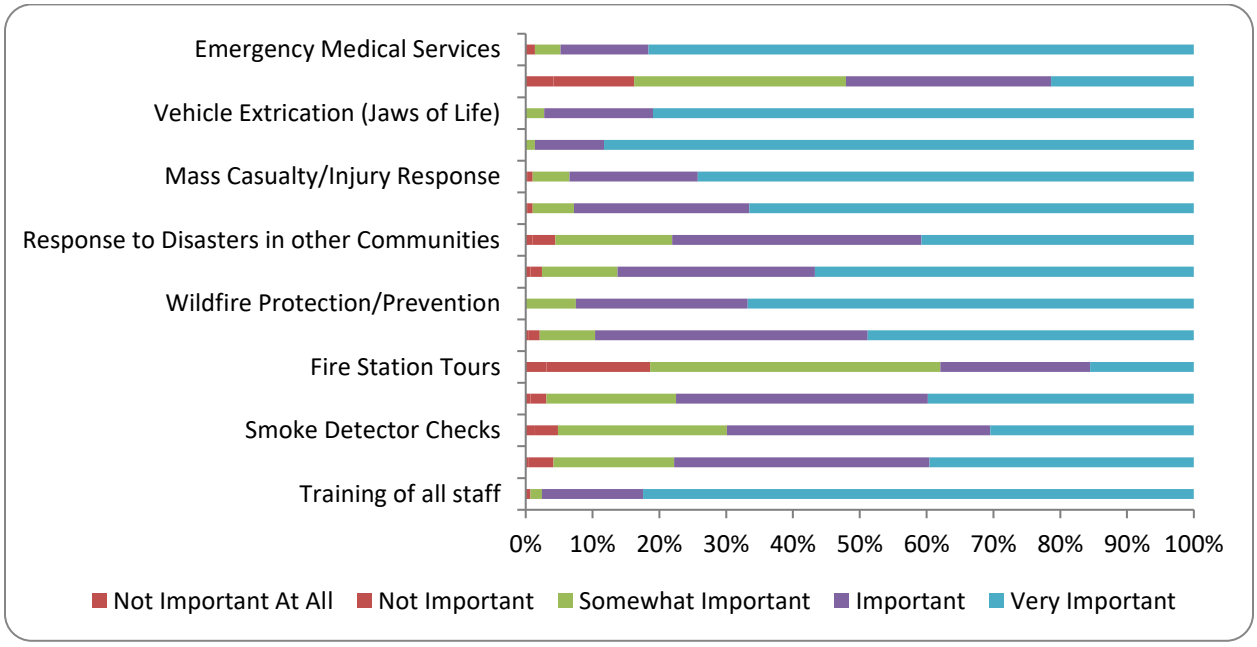

What is your general perception of your local fire department/station and the services it provides?



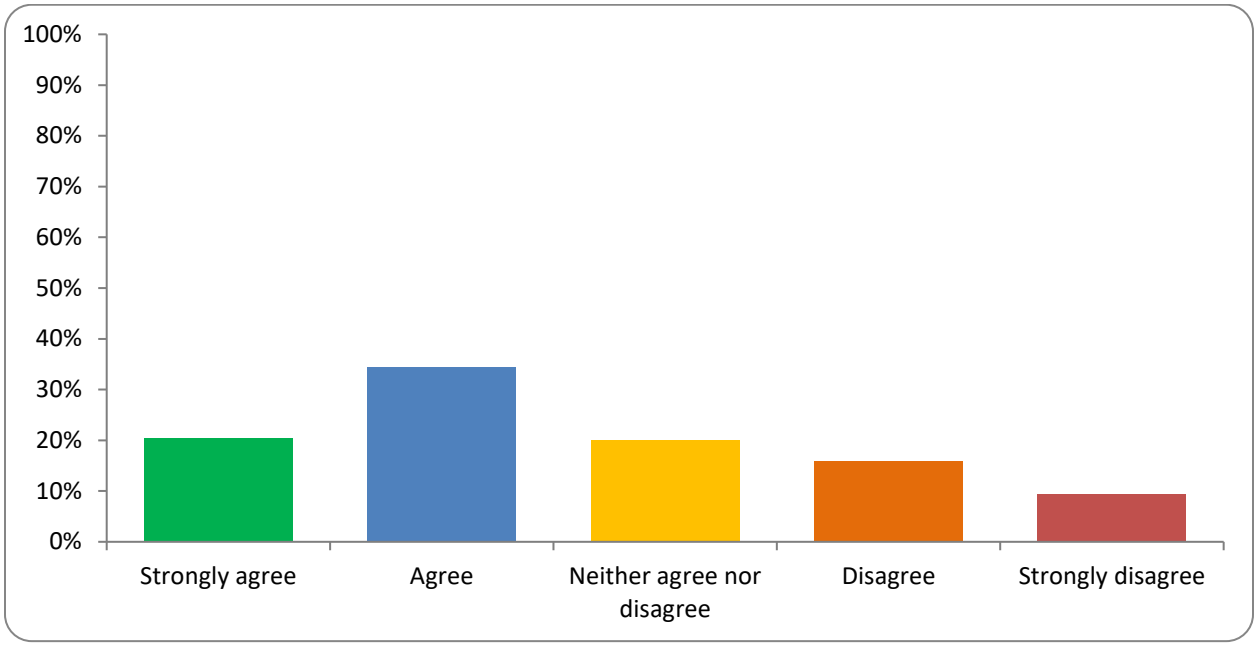
Are the members of your local fire department/station mostly volunteers?



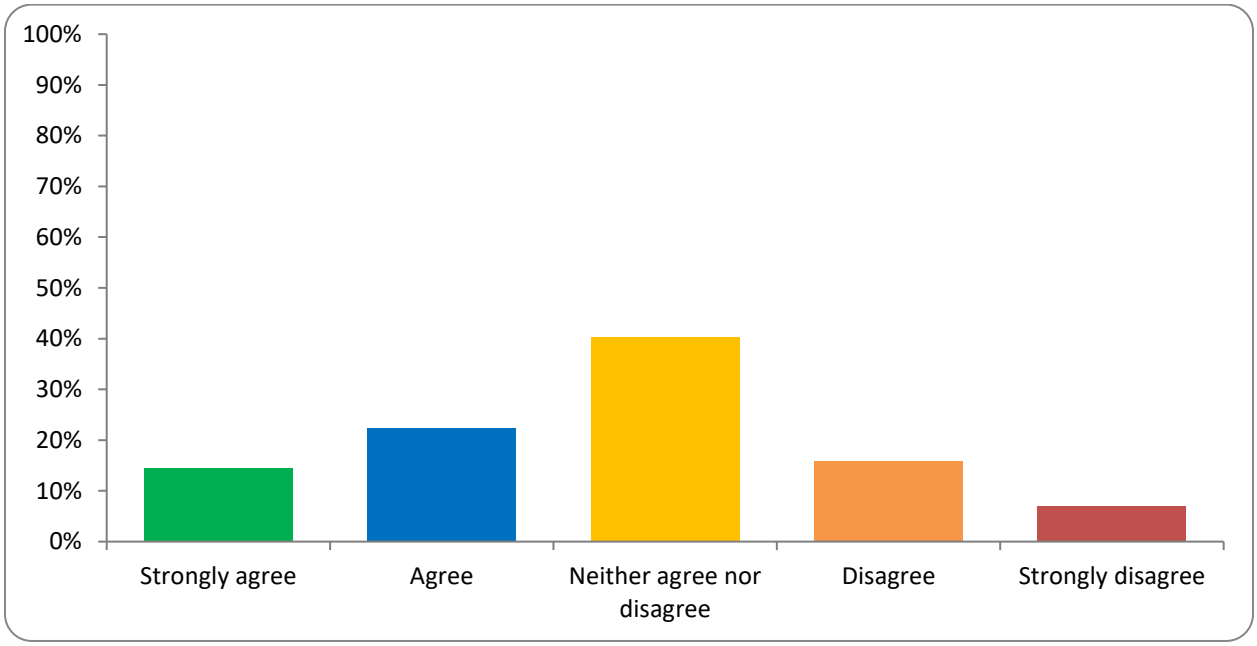

Please indicate how important you think each task is for a high-performing Fire Department, with 1 indicating "Not Important At All, and 5 indicating "Very Important".



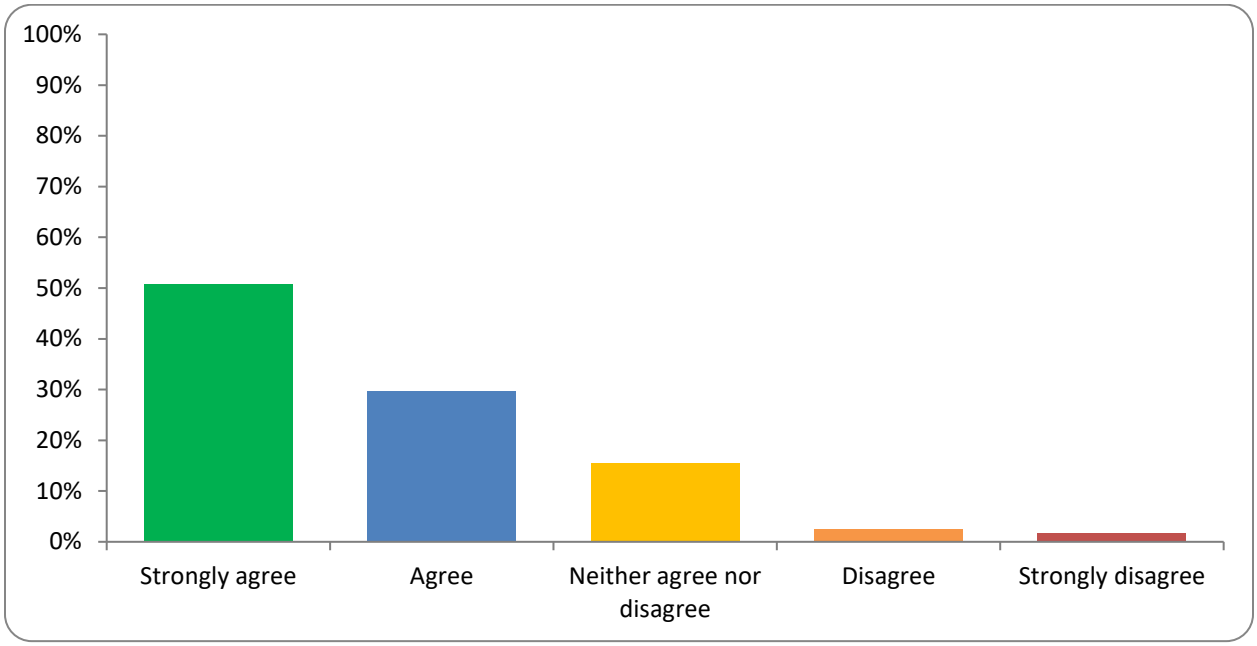
The services currently provided by local fire departments are sufficient to meet the needs of the residents of Shenandoah County.



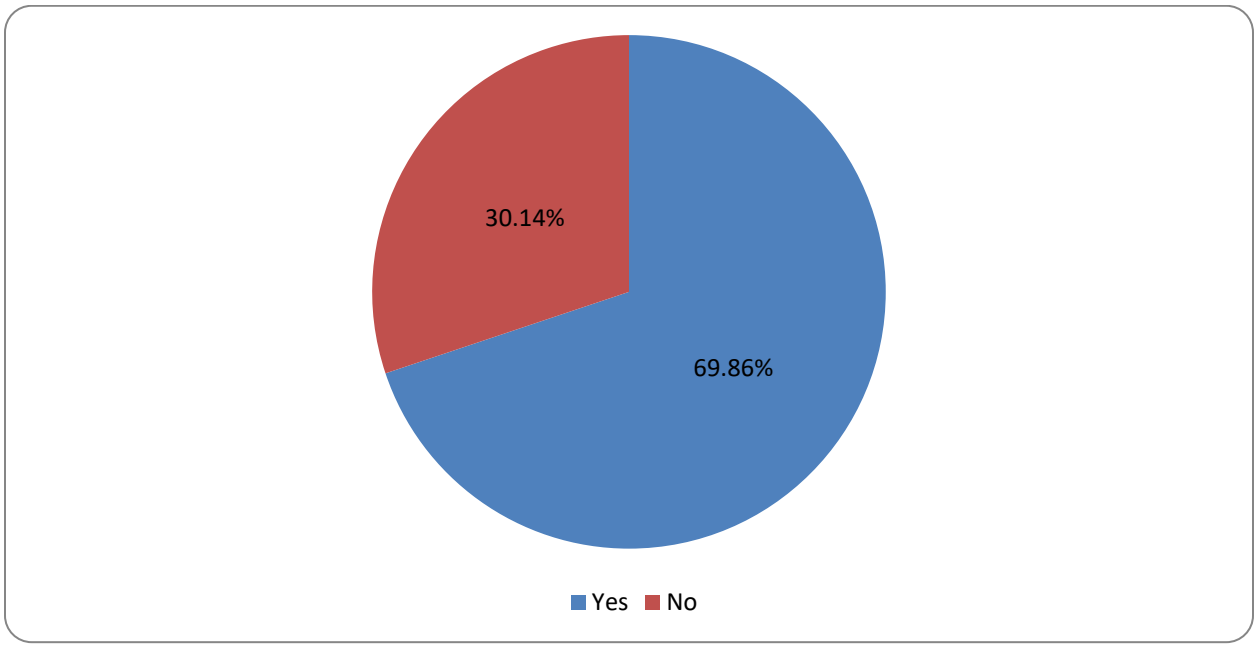

Fire department staff (career and volunteer) should come from (i.e., reside in) the community they serve.



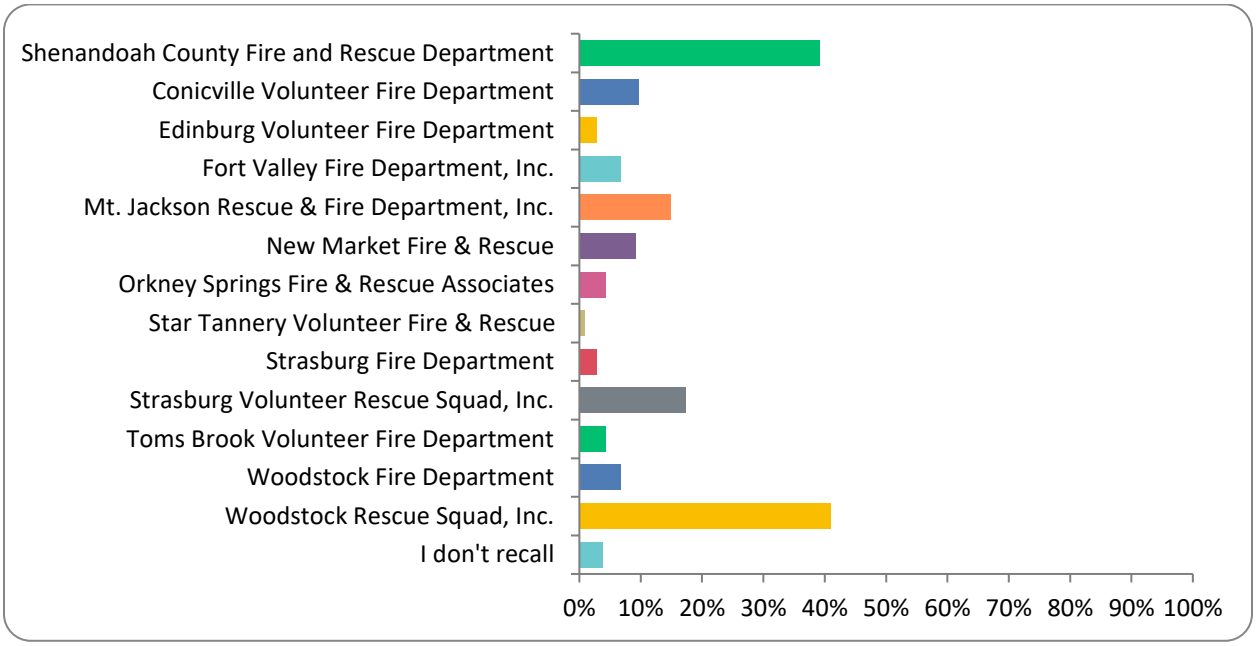
Having a fire department that is able to quickly respond is more important than ensuring staff come from the community they serve.



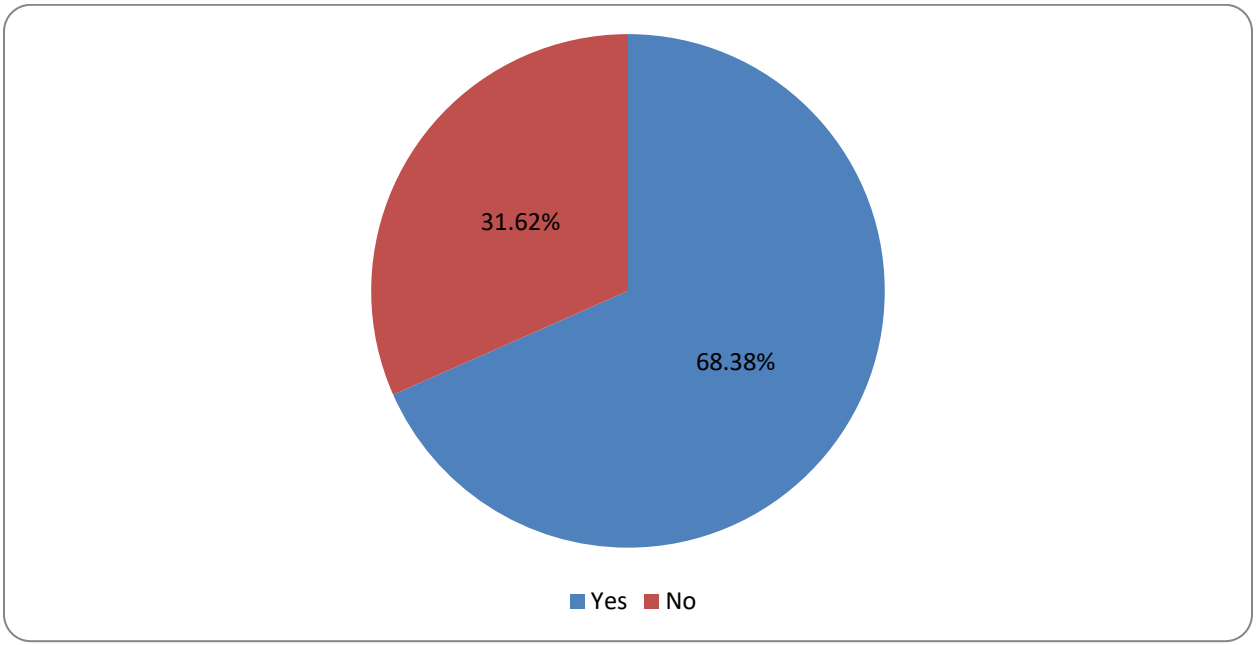

Have you or a member of your immediate family ever been transported in a fire & rescue department ambulance in Shenandoah County?



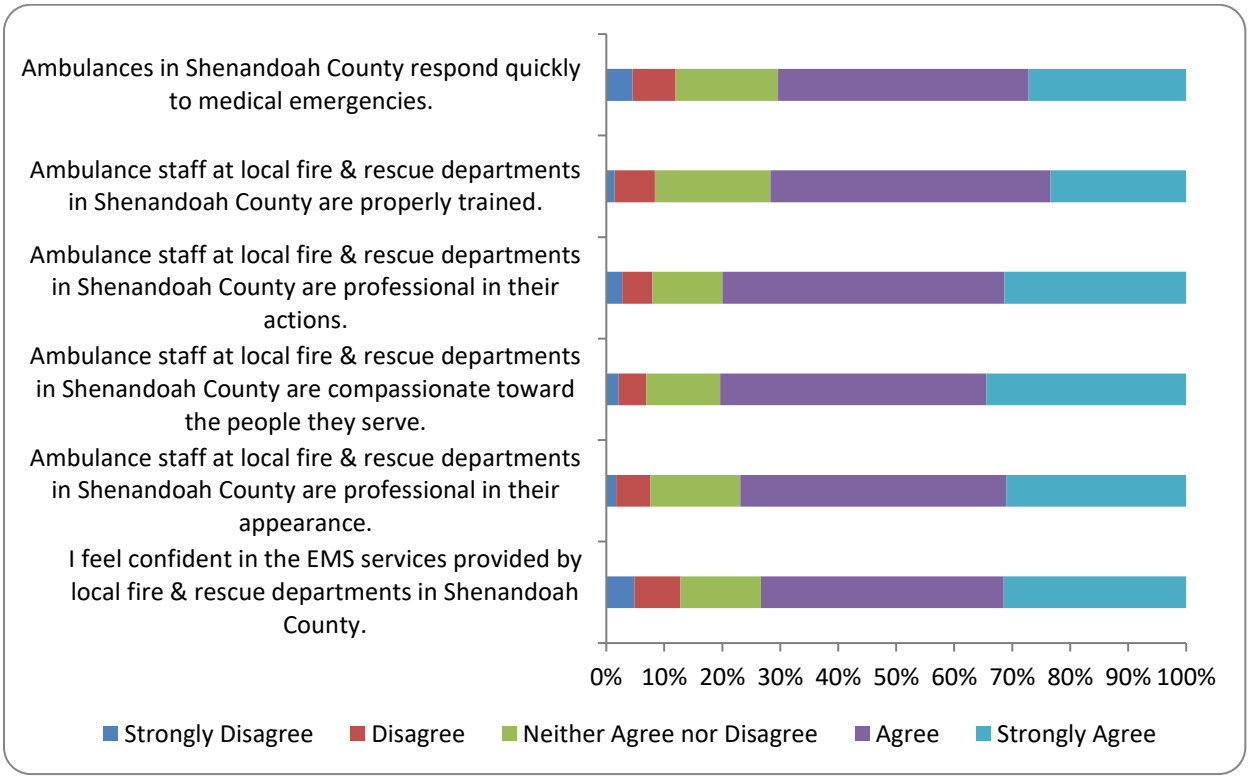
If yes, which local fire & rescue department was the ambulance from? (Choose all that apply)



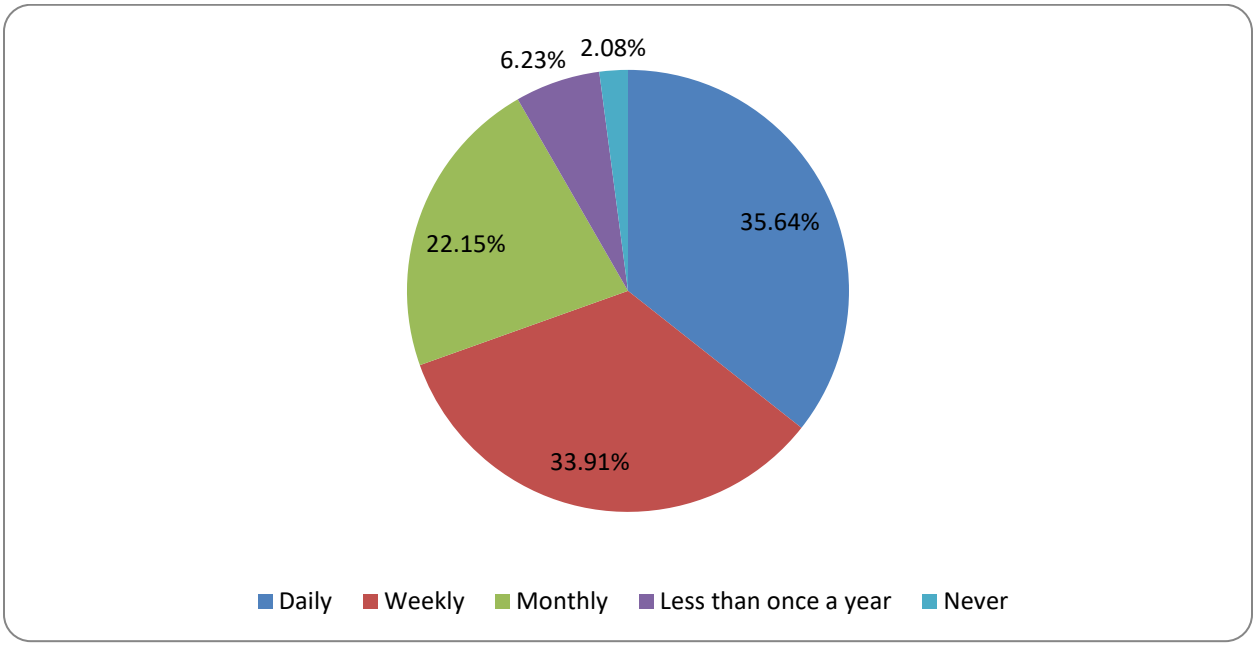

Have you ever had a non-emergency interaction with a local fire & rescue ambulance?



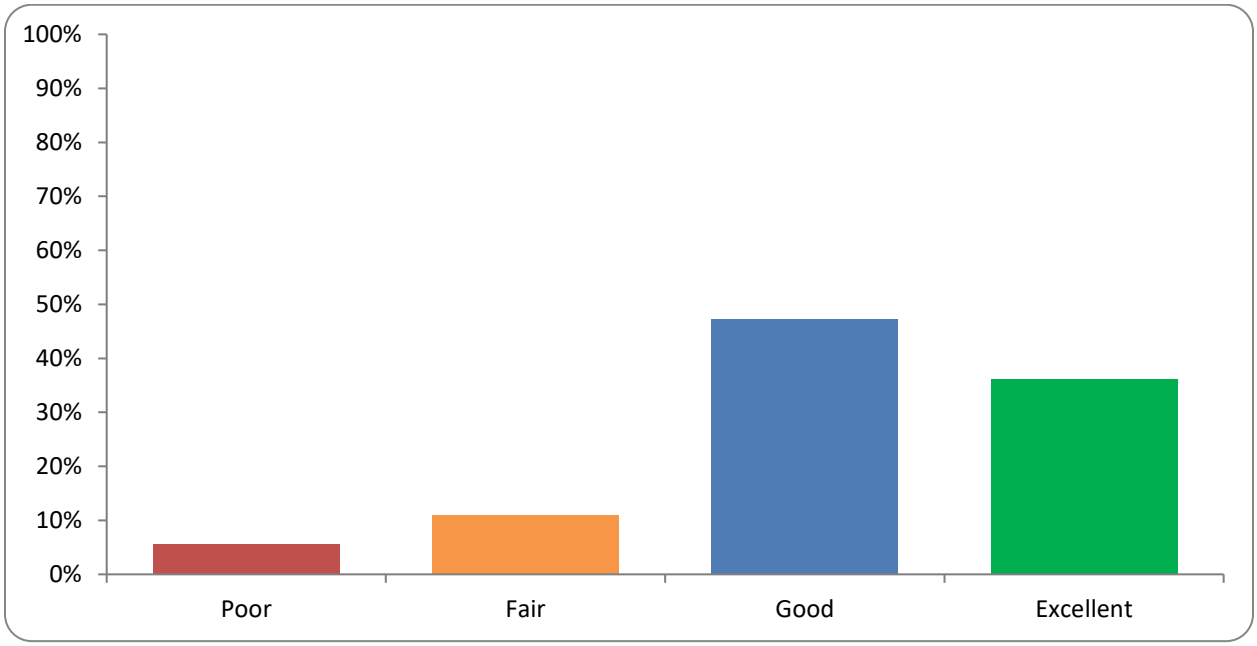
Please rate your level of agreement with the following statements. With 1 indicating that you "strongly disagree" to 5 indicating that you "strongly agree".




How often do you see ambulances from local fire & rescue departments in any capacity in the community (i.e., emergency response, community events, etc.)?

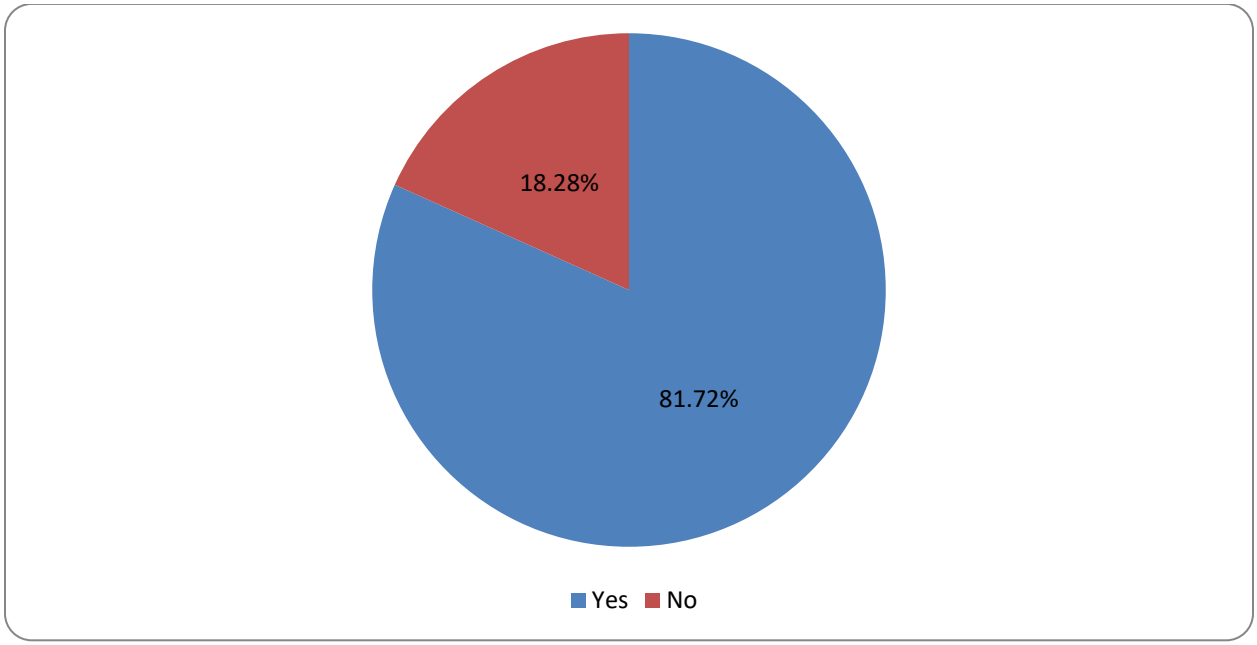


What is your general perception of EMS services provided by local fire and rescue departments in Shenandoah County?

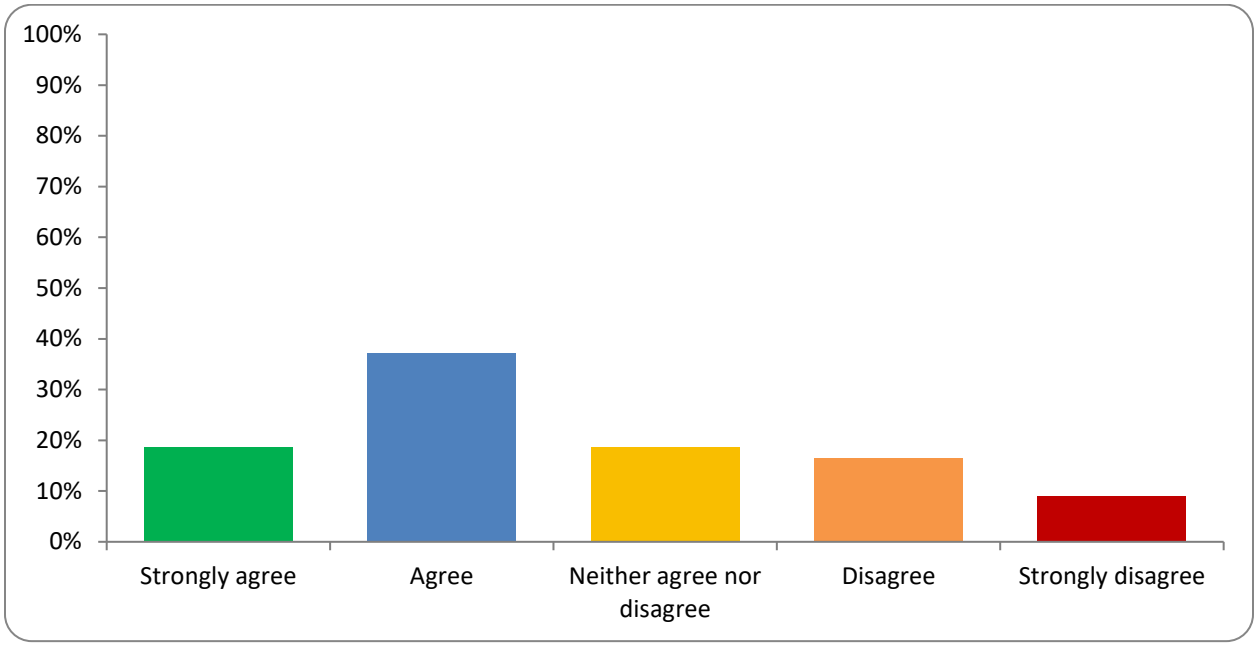



Are you aware that Shenandoah County taxes fund and provide career staff currently in six volunteer stations?

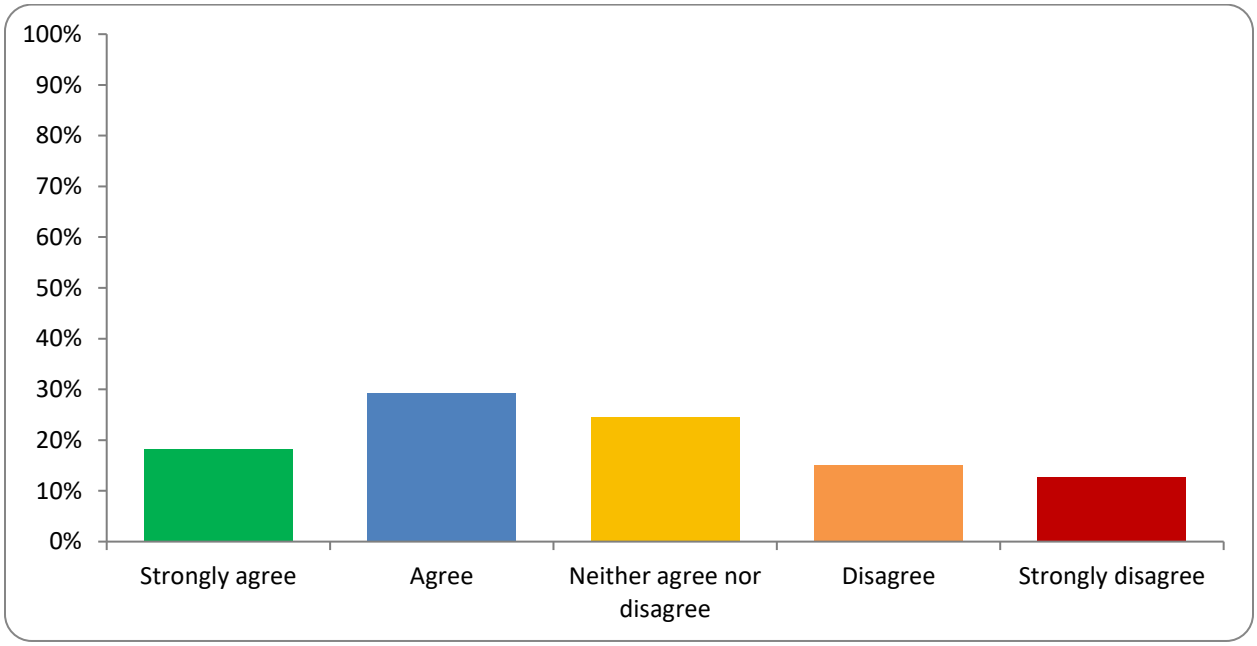
They are: Company 5: Woodstock Rescue Squad, Company 13: Conicville Fire Department, Company 18: Orkney Springs Fire Rescue, Company 21: Mt. Jackson Rescue and Fire, Company 23: New Market Fire and Rescue, and Company 25: Strasburg Rescue Squad



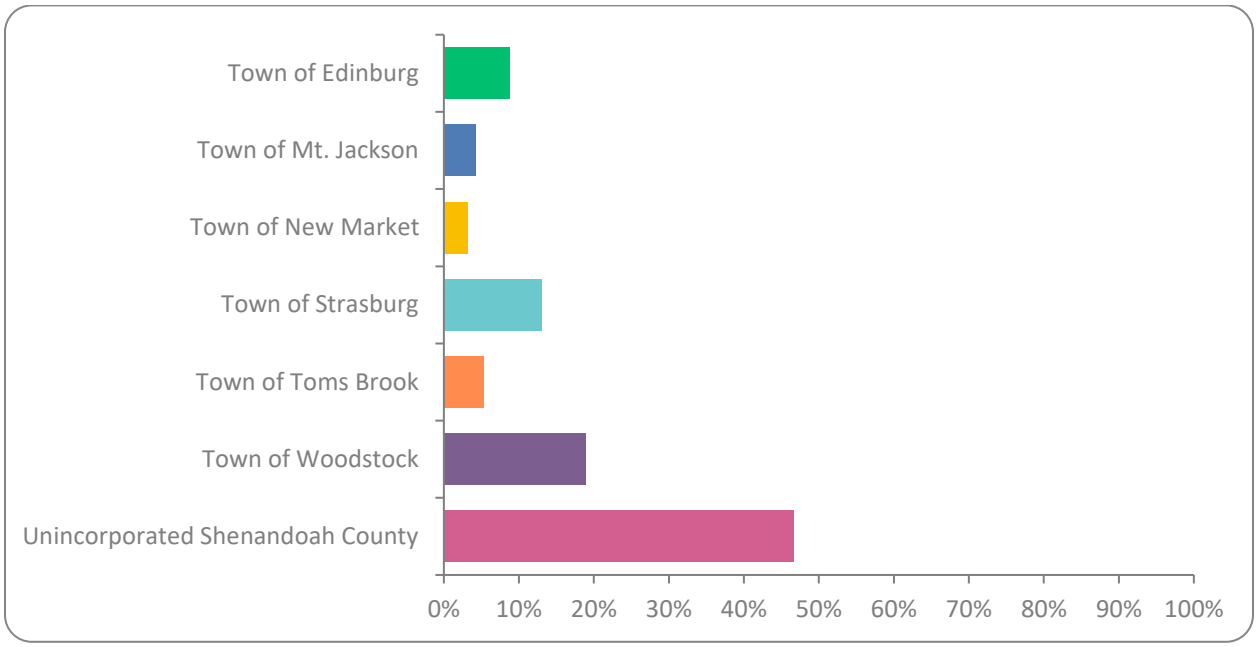
I am satisfied with the current level of service provided by fire & rescue departments in Shenandoah County.



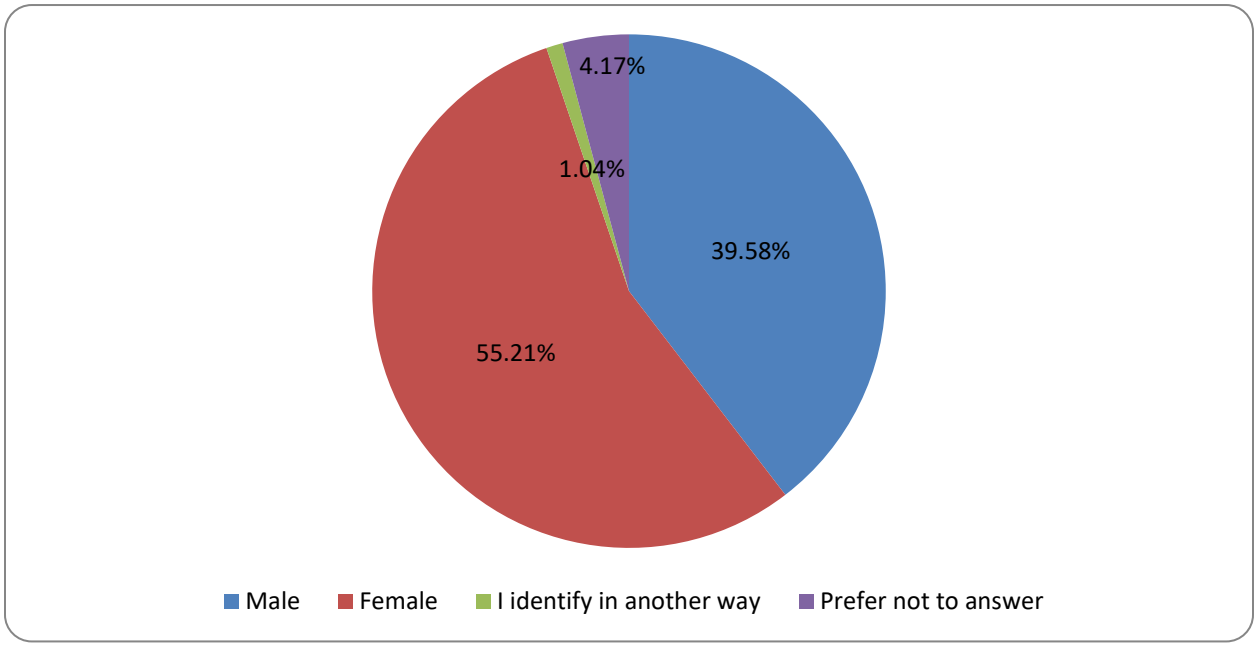

I would be willing to contribute more in taxes if necessary for Shenandoah County to ensure an appropriate level of service for all fire & rescue departments in the county.



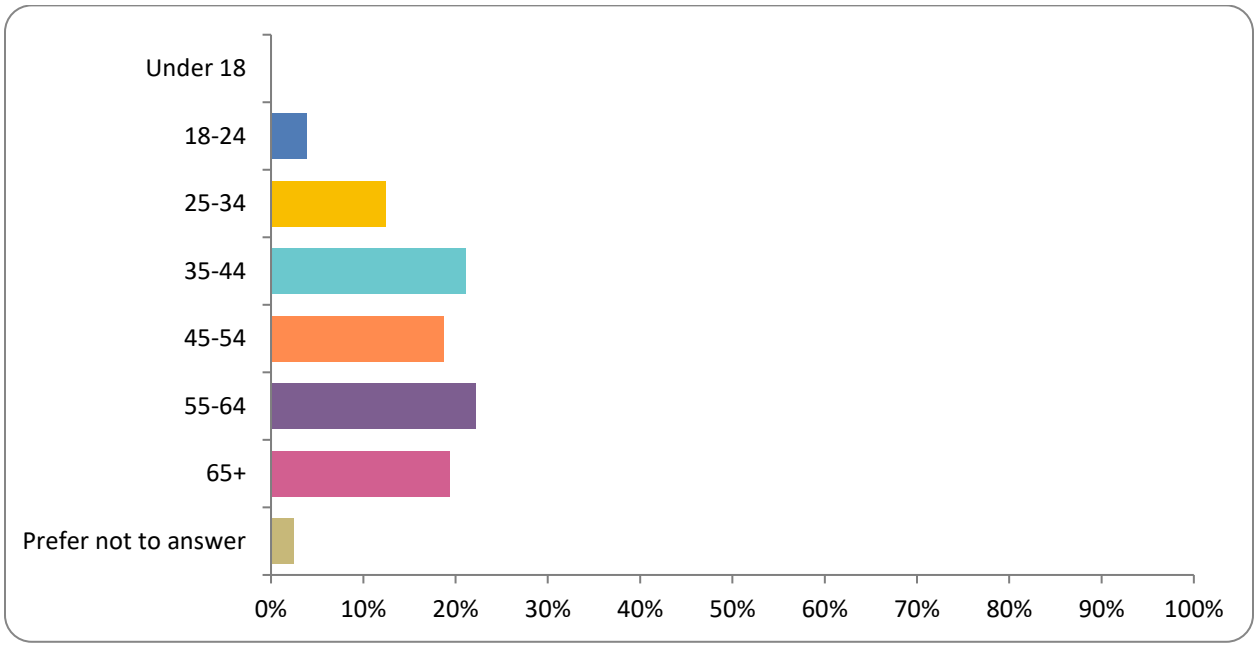
Which town do you live in?



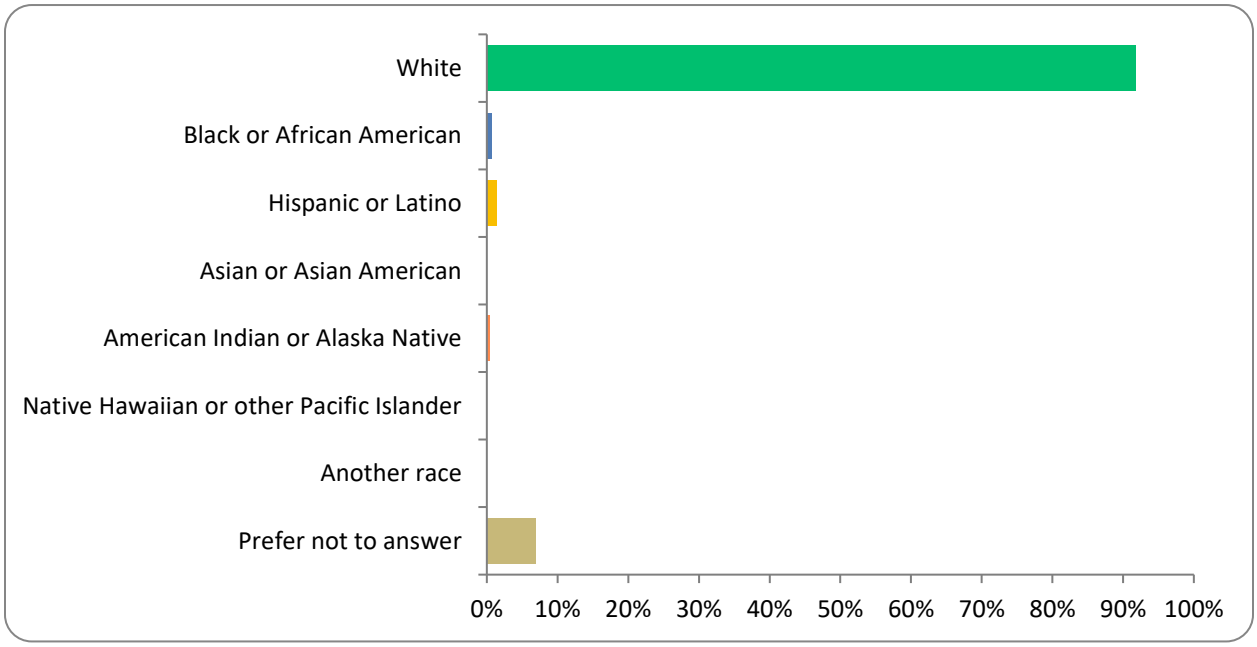

What is your gender?



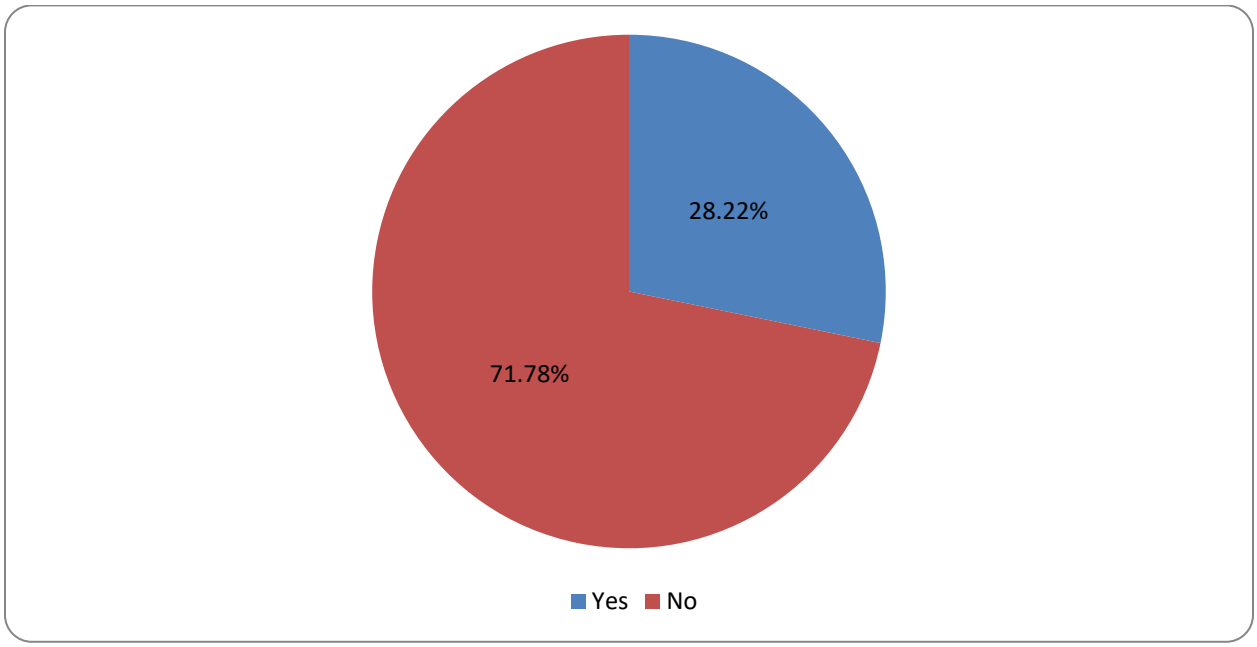
What is your age?



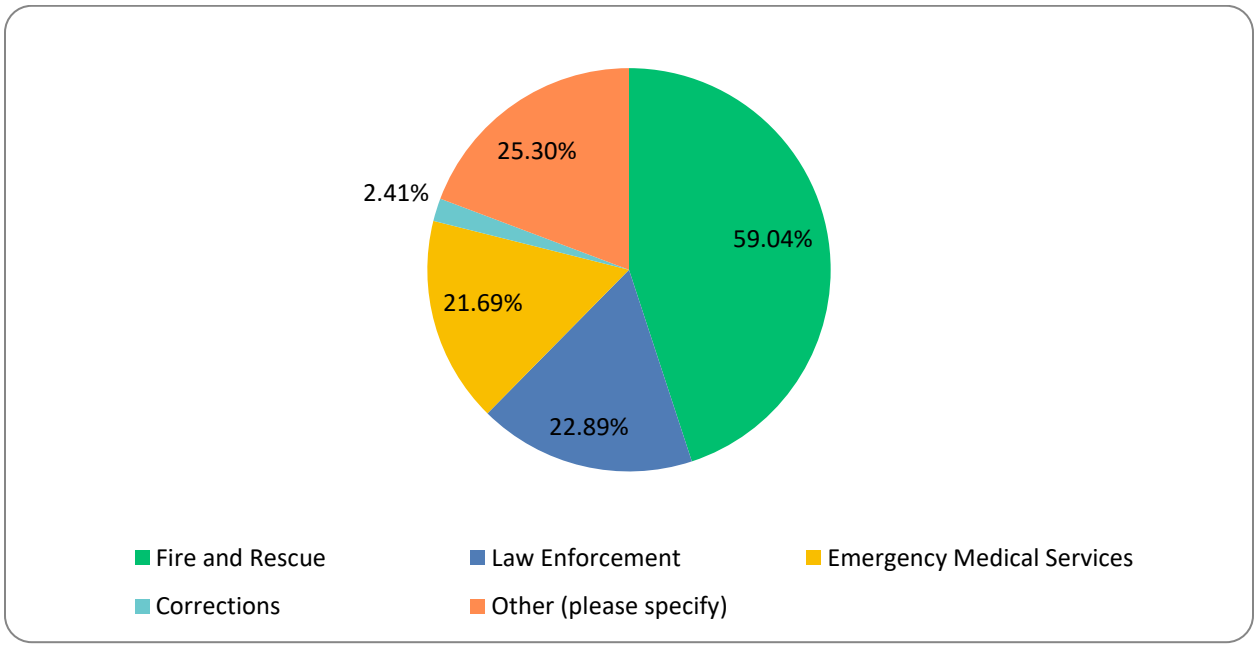

Which option(s) best describes your race? (Check all that apply)



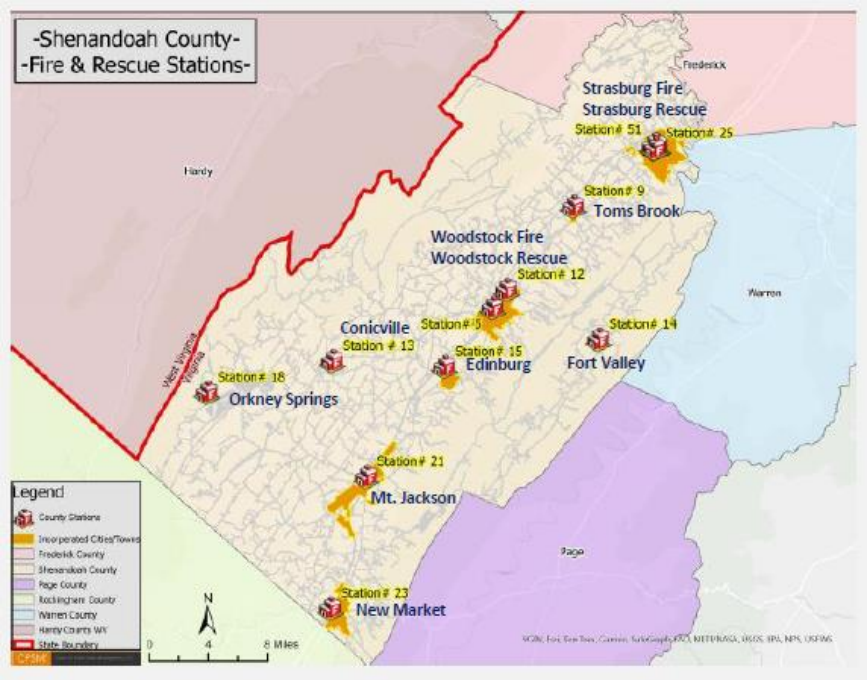
Have you ever worked for or are you currently employed by a public safety agency?



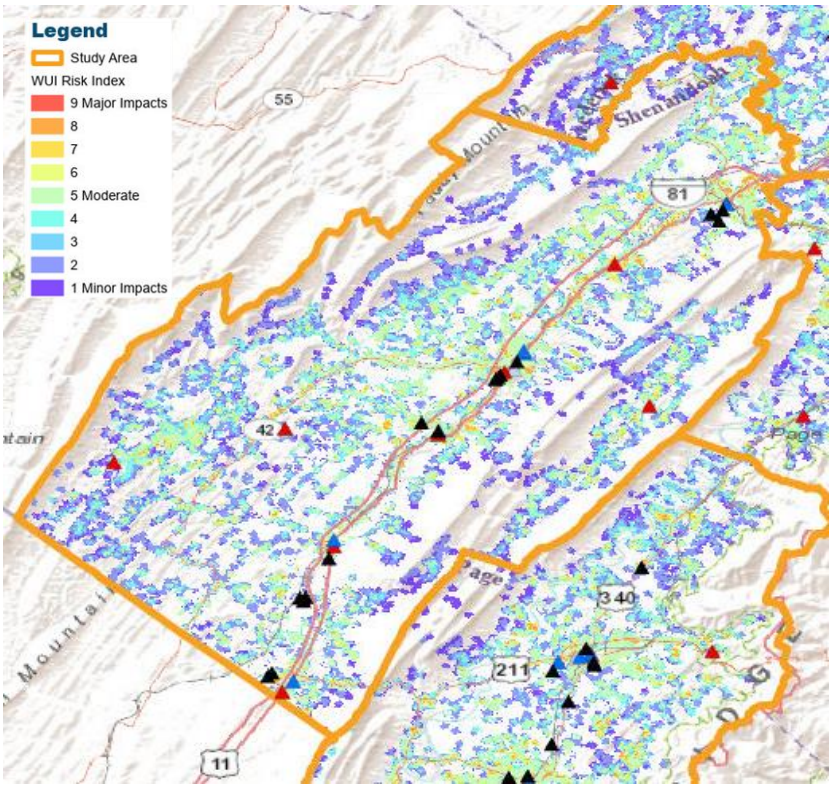

If yes, what kind of agency did/do you work for? (Select all that apply)



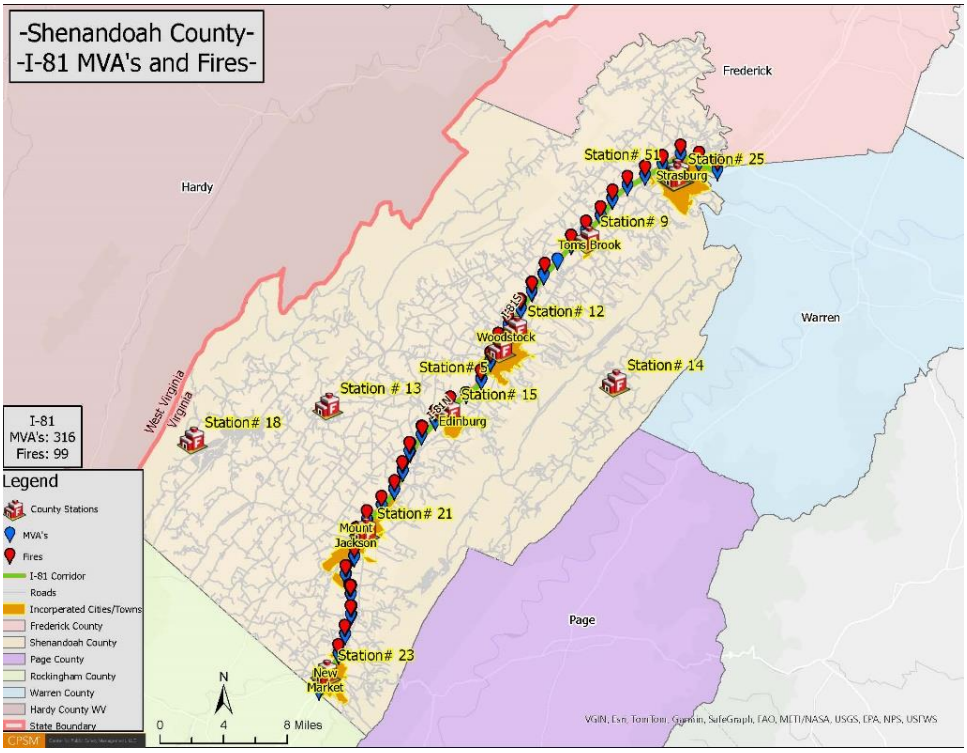
## From Page 10: SCFR System Stations and Locations.



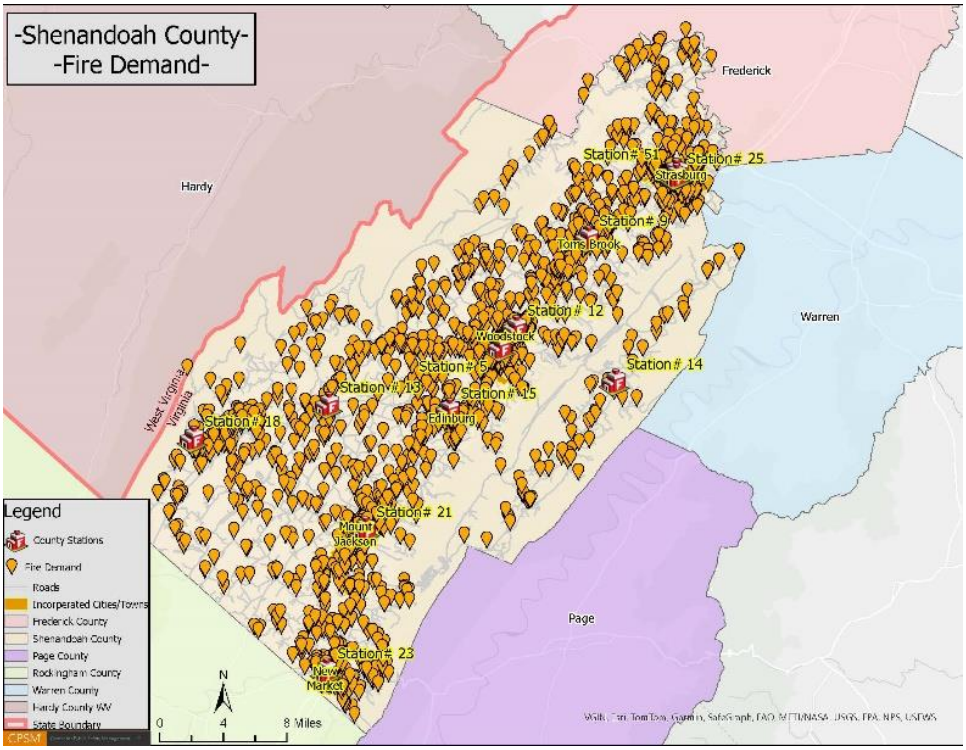

## From Page 12: Shenandoah County Wildland-Urban Interface Risk.



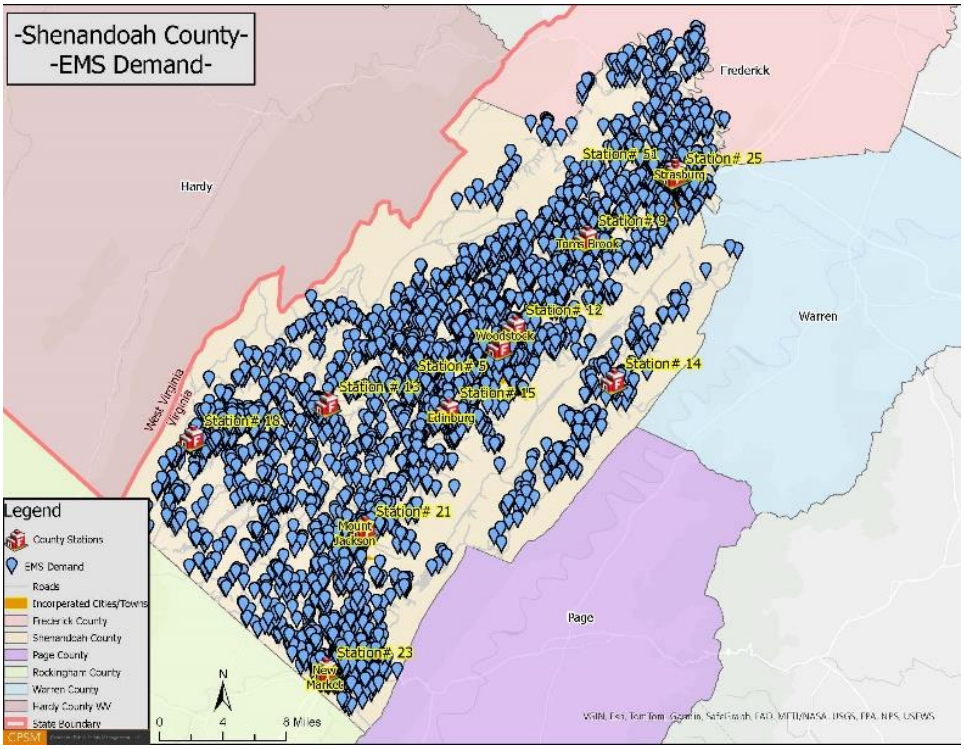
## From Page 12: SCFR System Interstate 81 Fire and EMS Responses.



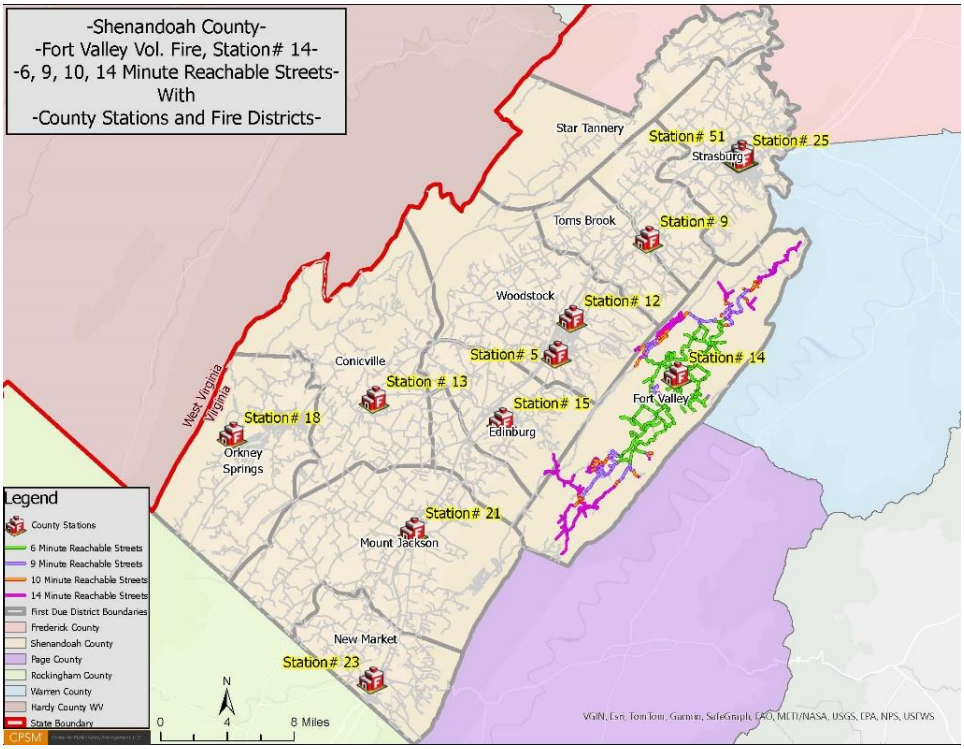

## From Page 14: SCFR System Fire Demand.



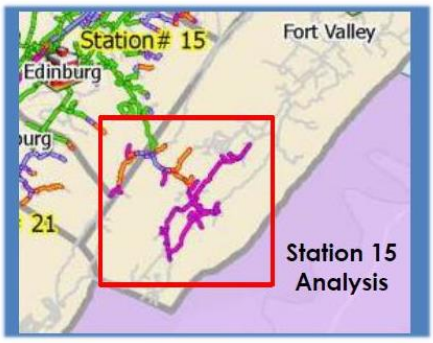
## From Page 14: SCFR System EMS Demand.

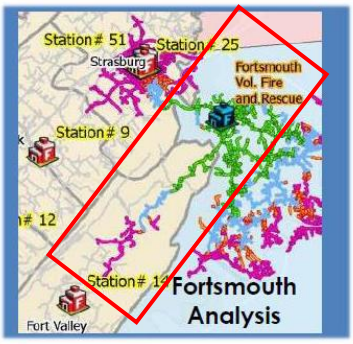


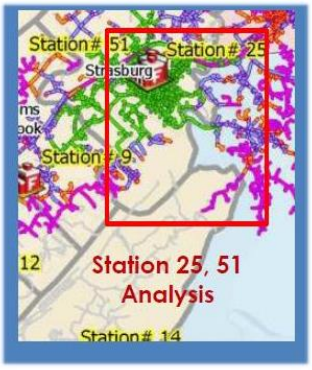

## From Page 21: Fort Valley 9, 10, 14 Minute Travel Time Bleeds.



## From Page 21: Fort Valley Assisting Companies 9, 10, 14 Minute Travel Time Bleeds.

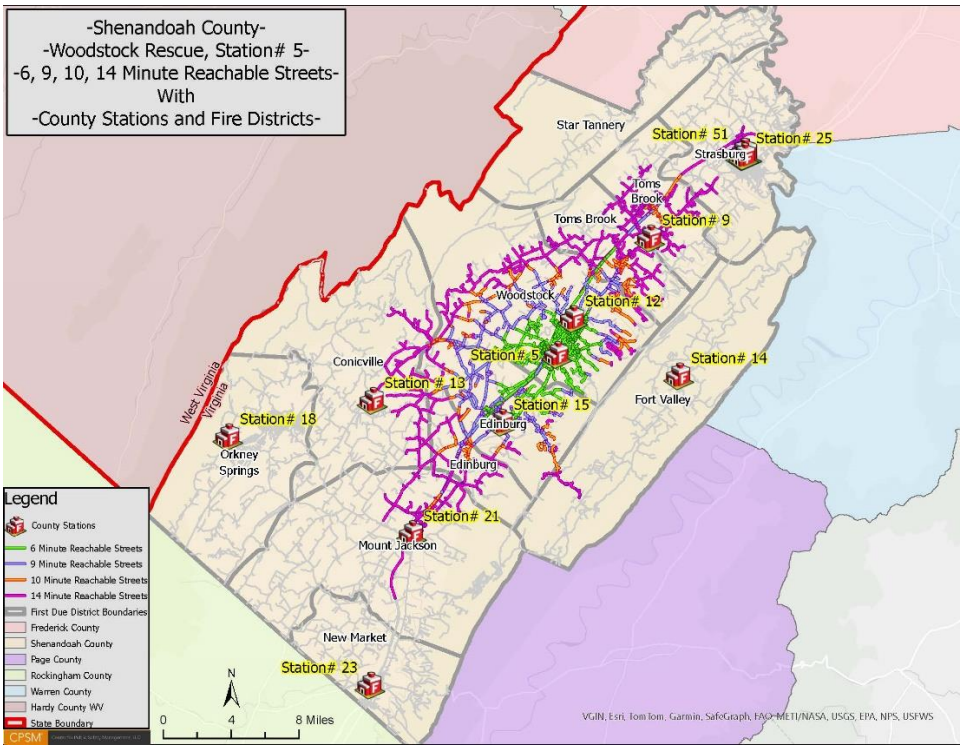


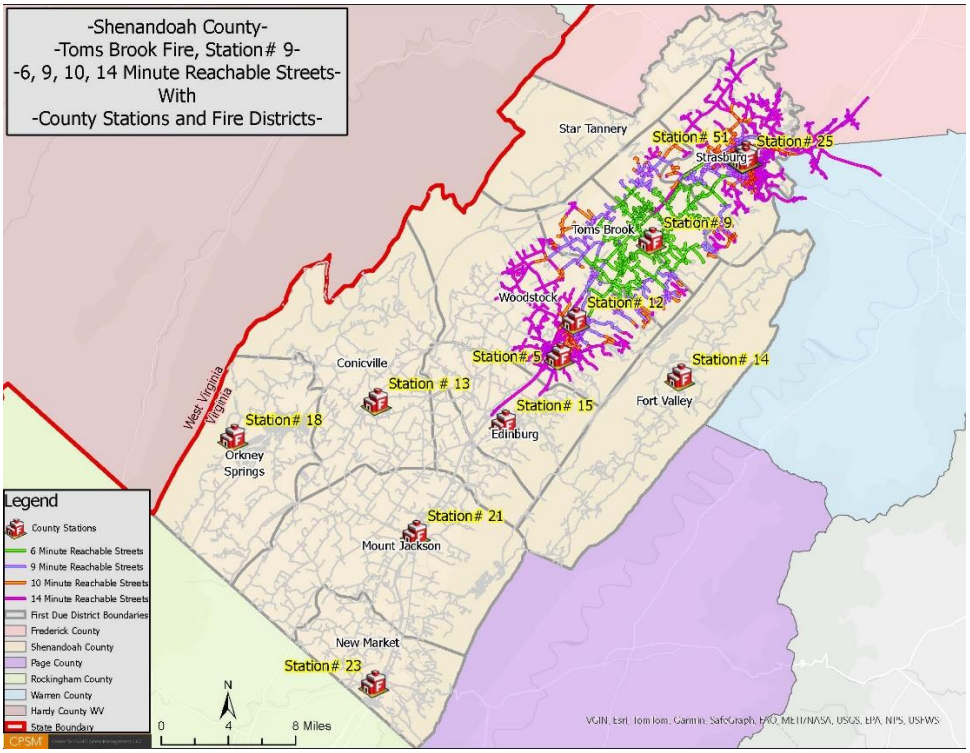




Overall, when benchmarked against the NFPA 1720 standard of 14-minutes (rural response zone) there is limited travel time saturation into the southern end of the Fort Valley district from Station 15, and limited travel time saturation into the northern end of the Fort Valley district from Station 51. The Fortsmouth station in Warren County offers better coverage overall in the northern area of Fort Valley. *These maps illustrate the time and distance challenges the Fort Valley district has.*

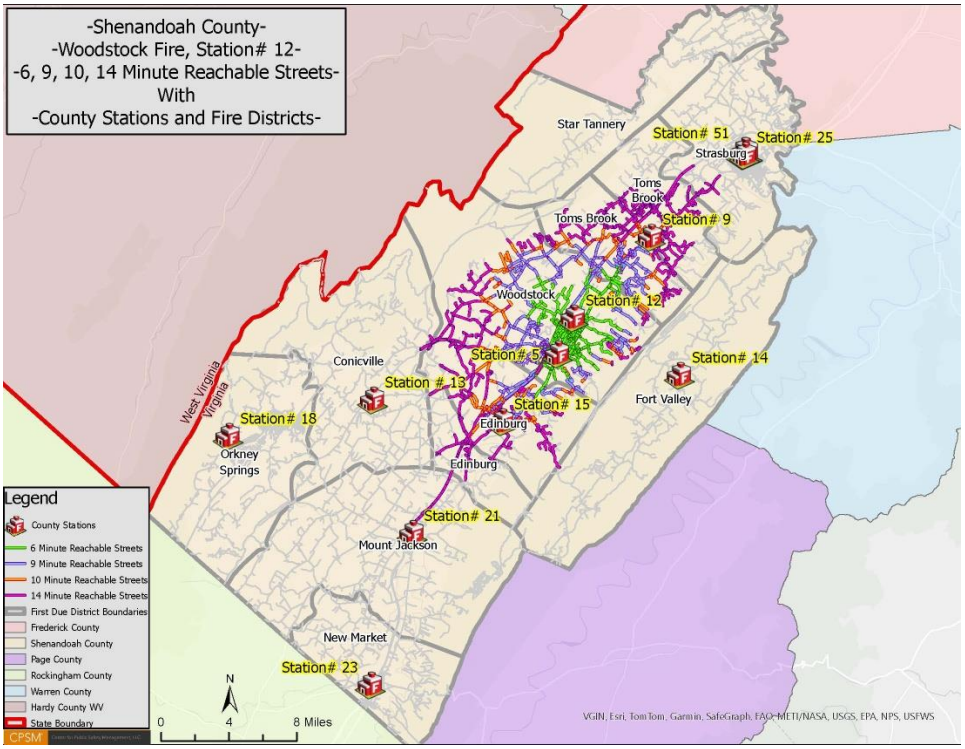
## From Page 22: Woodstock Rescue 9, 10, 14 Minute Travel Time Bleeds.



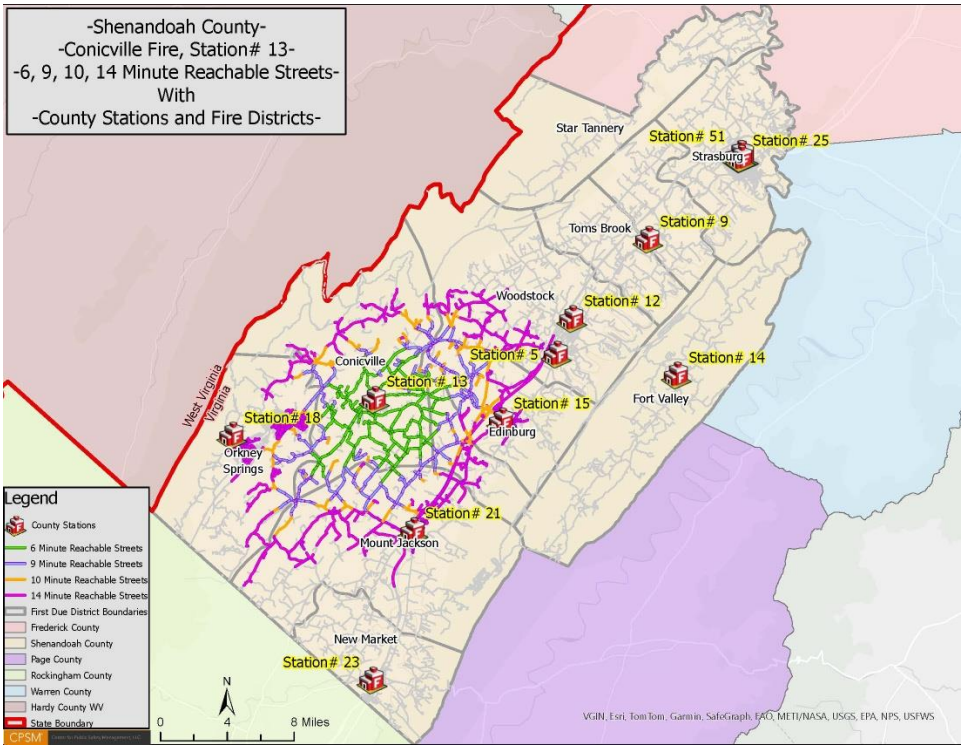
## From Page 22: Toms Brook 9, 10, 14 Minute Travel Time Bleeds.



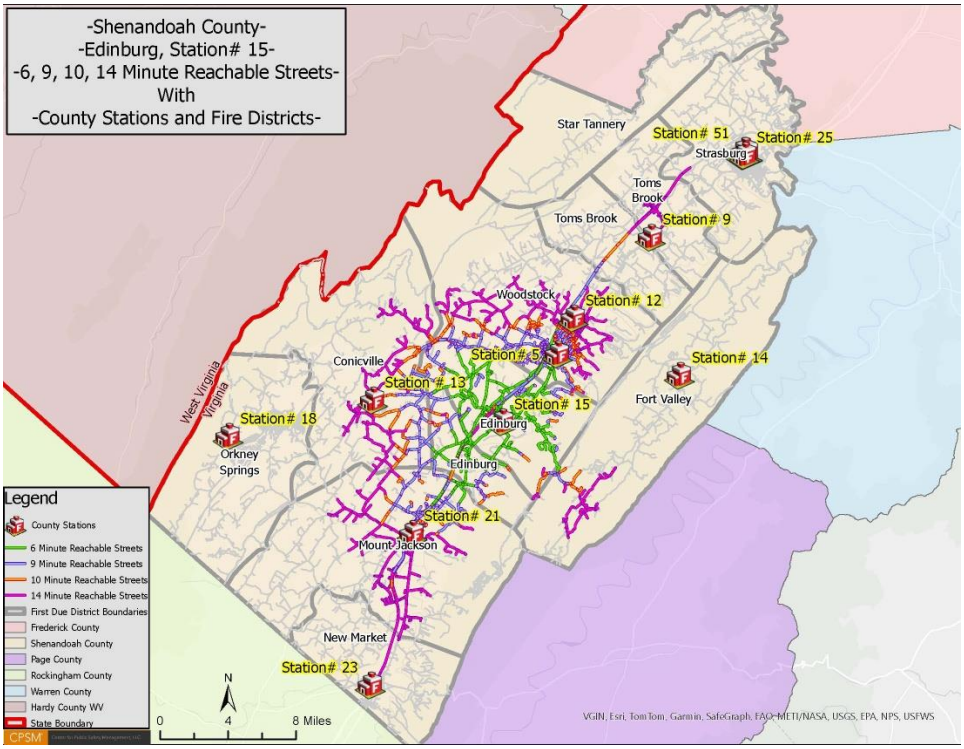

## From Page 23: Woodstock Fire 9, 10, 14 Minute Travel Time Bleeds.



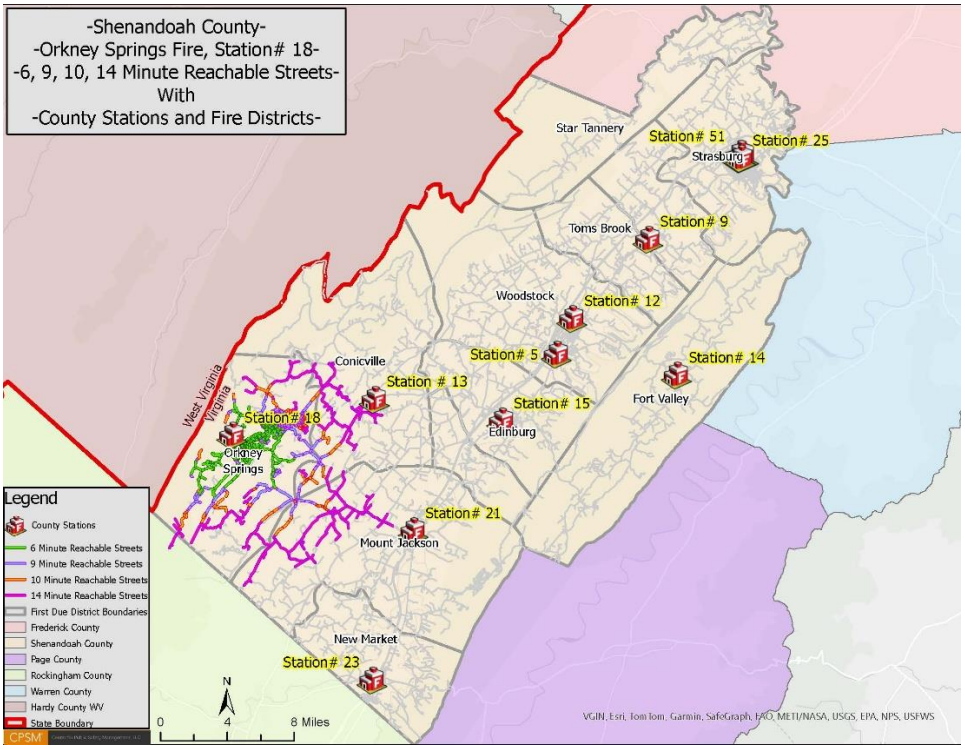
## From Page 23: Conicville 9, 10, 14 Minute Travel Time Bleeds.



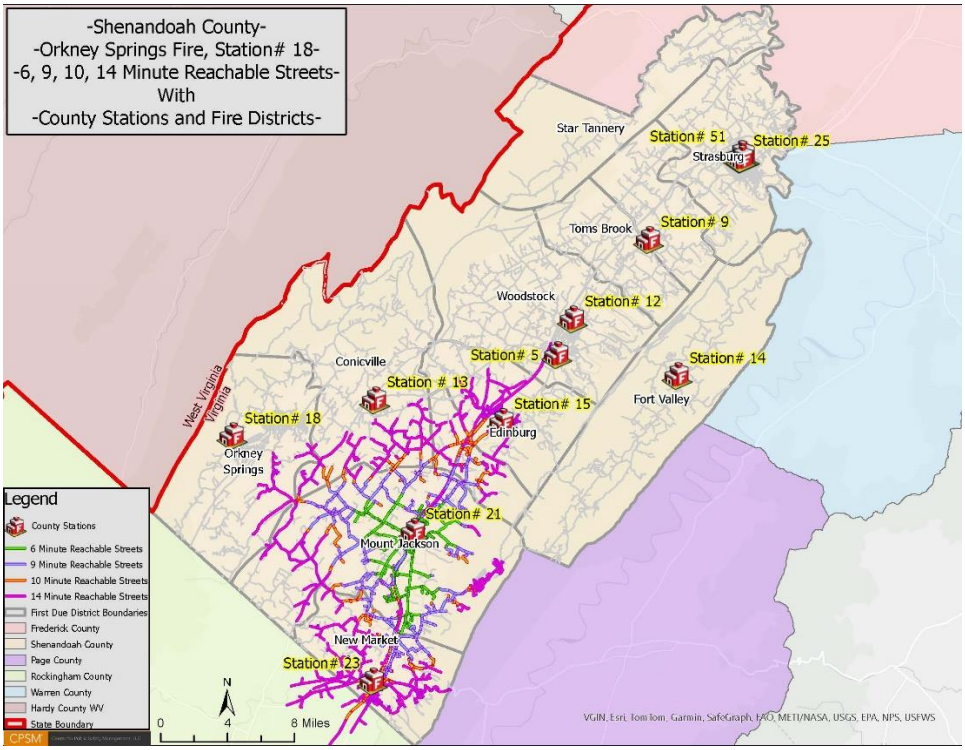

## From Page 24: Edinburg 9, 10, 14 Minute Travel Time Bleeds.



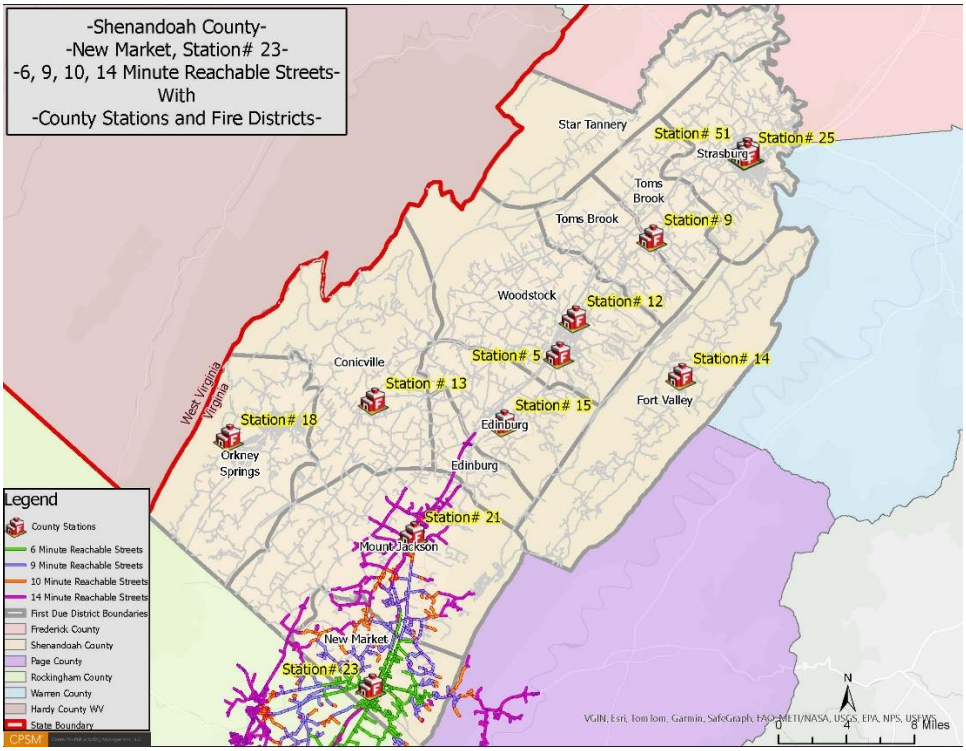
## From Page 24: Orkney Springs 9, 10, 14 Minute Travel Time Bleeds.



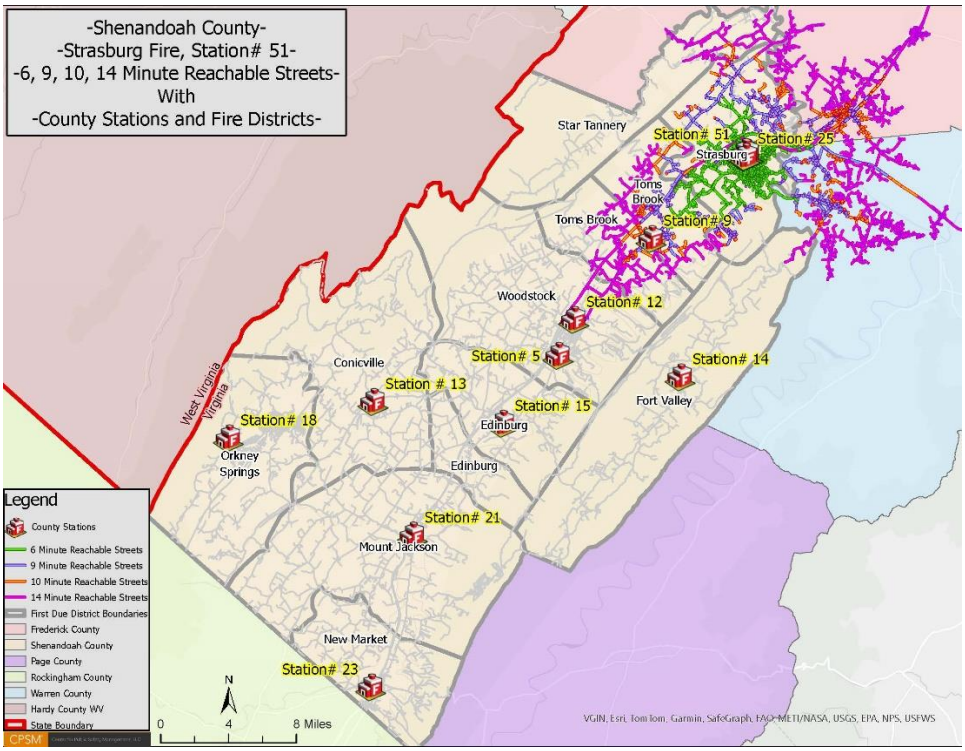

## From Page 25: Mt. Jackson 9, 10, 14 Minute Travel Time Bleeds.



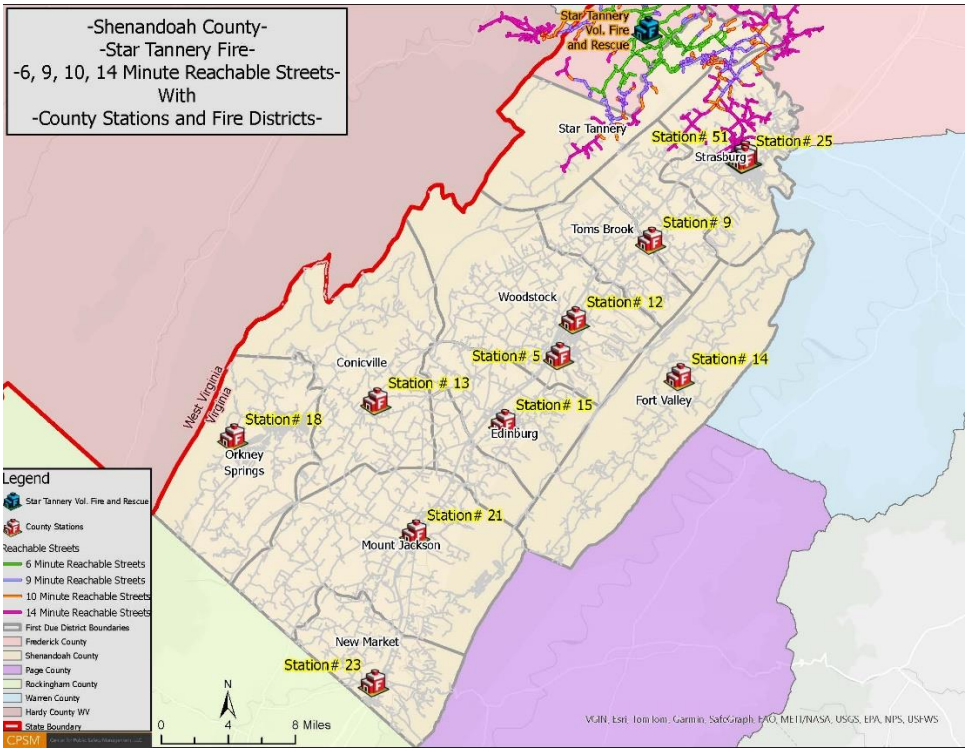
## From Page 25: New Market 9, 10, 14 Minute Travel Time Bleeds.



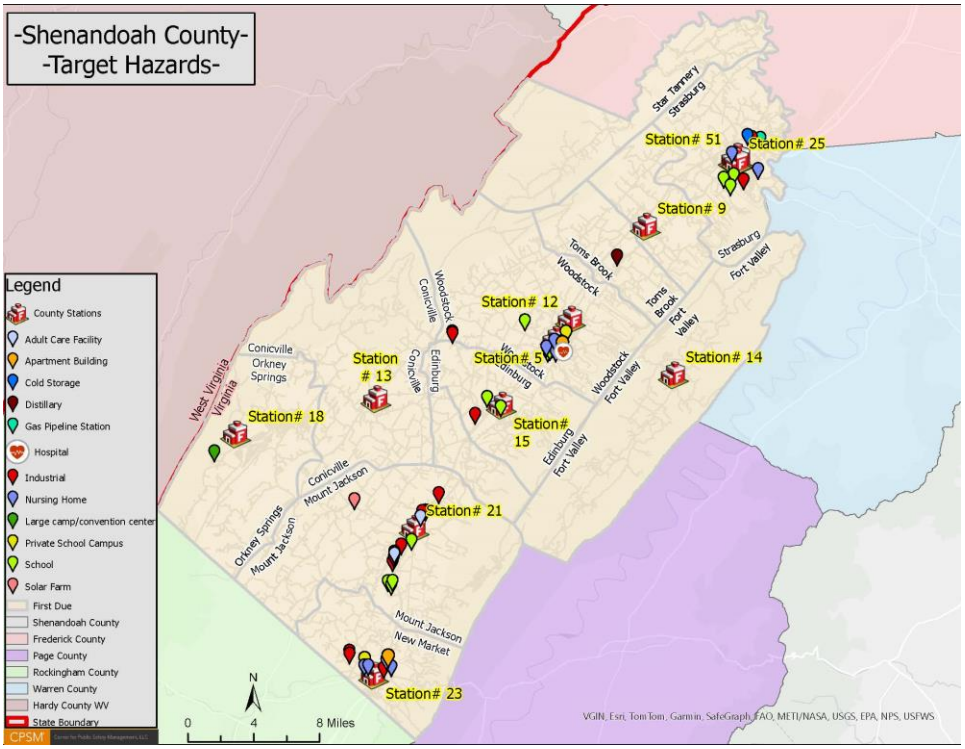

## From Page 26: Strasburg Fire & Rescue 9, 10, 14 Minute Travel Time Bleeds.



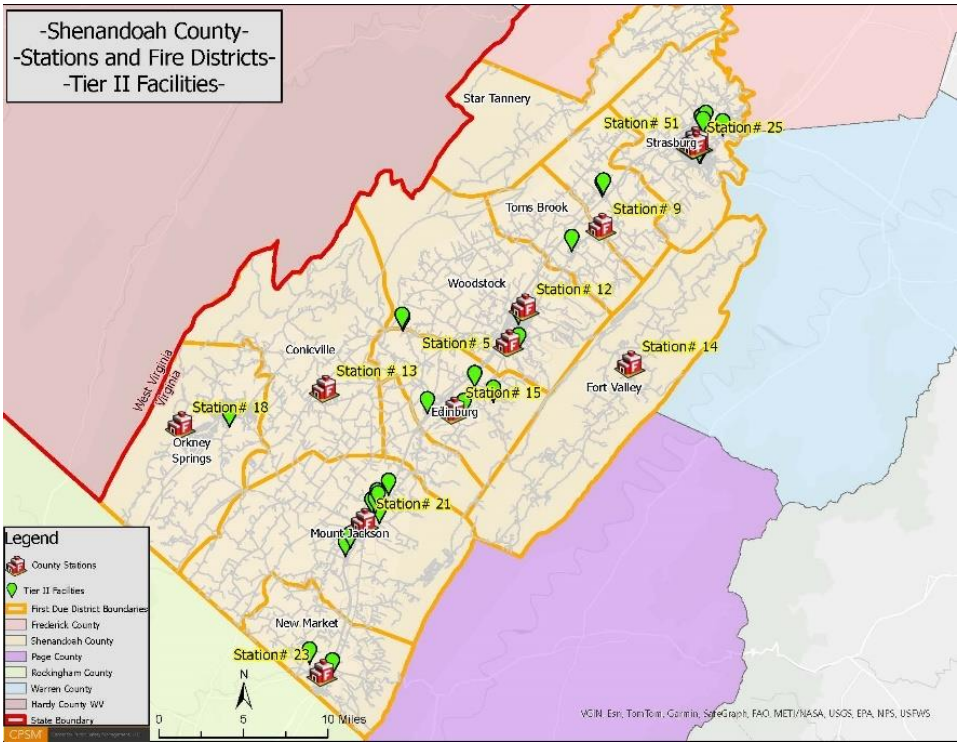
## From Page 26: Star Tannery 9, 10, 14 Minute Travel Time Bleeds.



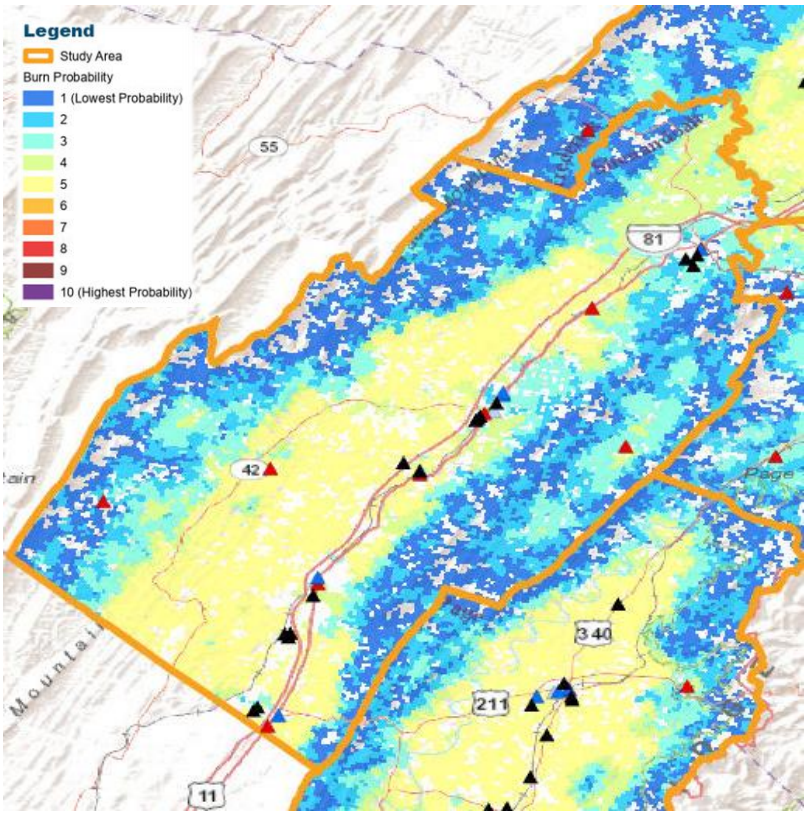

## From Page 52: Target Hazard Locations.



## From Page 53: Hazardous Materials Tier II Locations.

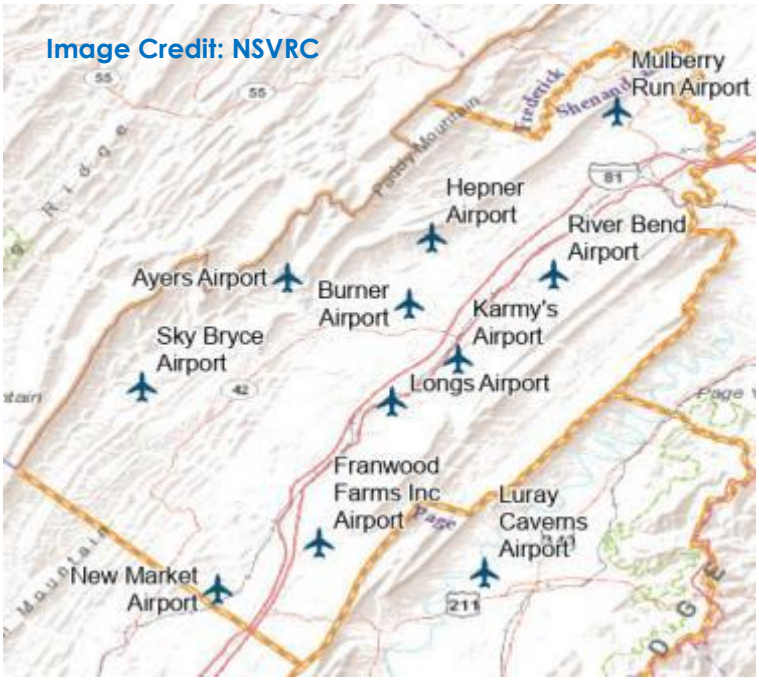



## From Page 54: Wildland- Brush Fure Risks.

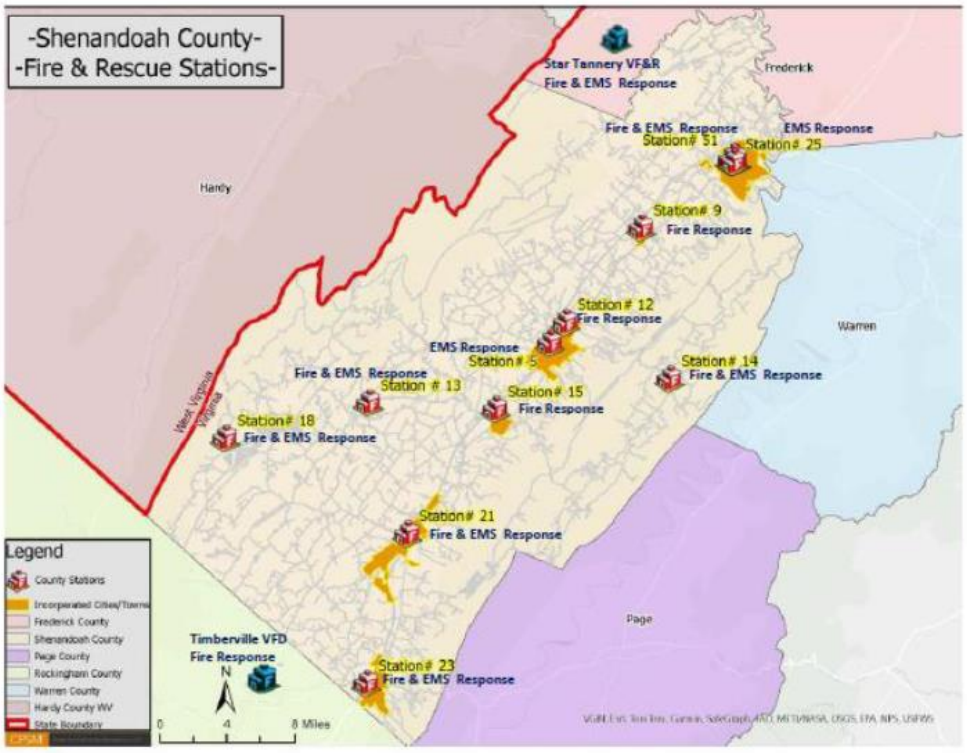


## From Page 55: Freight Rail in Shenandoah County


## From Page 55: Air Traffic/Airports in Shenandoah County



## From Page 78: SCFR System Resource Map




## From Page 125: SCFR System NFPA 1720 Demand Zones